

BRUMMITT ELEMENTARY SCHOOL ADDITIONS

O & M

Owner

Duneland School Corporation
800 South 5th Street
Chesterton, IN 46304

Architect

Tria Architecture
901 McClintock Dr., Suite 100
Burr Ridge, IL 60527

Contractor

Gariup Construction Co., Inc.
3965 Harrison St., P.O. Box 64879 (46401)
Gary, Indiana 46408
(219) 887-5233
(219) 981-3679



GARIUP CONSTRUCTION CO., INC.

P.O. BOX 64879 • GARY, IN 46401 • PHONE: (219) 887-5233 • FAX (219) 981-3679

TO DUNELAND SCHOOL SYSTEM

DATE 12/19/18

SUBJECT BRUMMITT ATTIC STOCK

M E S S A G E

SO BRICK

WALL PAINT - BRILLIANT WHITE

CEILING PAINT - " "

WALL PRIMER

BLOCK SEALER

DOOR/TRIM PAINT - GREY

SIGNED

RECEIVED BY

DATE

R E P L Y

DATE

[Handwritten Signature]

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Project Directory

Carter-Waters LLC
Dru Previs
910 W. Ireland Road
South Bend, IN 46614

Ph: (574)231-9000
Fx: (574)231-9188

Circle "R" Electric, Inc.
Nikolas Shields
5740 Central Avenue
Portage, IN 46368

Ph: (219)762-5588
Fx: (219)763-4178

E.C. Babilla, Inc.
Chuck Babilla
3974 Harrison Street
Gary, IN 46408

Ph: (219)884-3851
Fx: (219)884-3852

Gariup Construction Co., Inc.
Darren Demaree
PO Box 64879
Gary, IN 46401

Ph: (219)887-5233
Fx: (219)981-3679

Gatlin Plumbing and Heating
Robert DePyssler
1111 E. Main Street
Griffith, IN 46319

Ph: (219)924-6972
Fx: (219)924-1401

Mulhaupt's, Inc
Jack Zenz
209-213 North 5th Street
Lafayette, IN 47901

Ph: (765)807-5907
Fx: (765)423-2622

Omega Steel Contractor Supply
Craig Fowler
1640 E. Main Street
Griffith, IN 46319

Ph: (219)934-8500
Fx: (219)934-8521

Prism Painting Company
Mike Helm
368 Kennedy Avenue
Schererville, IN 46375

Ph: (219)322-4800
Fx: (219)322-7321

South County Gypsum
Luis Sanchez
11130 Delaware Parkway
Crown Point, IN 46307

Ph: (219)661-0337
Fx: (219)661-1353

Trout Glass and Mirror
Mike Trout
3602 Enterprise Ave., Suite A
Valparaiso, IN 46383

Ph: (219)926-8675
Fx: (219)929-4387

Section 02485

Lawns General Seeding & Sodding

02485



CONSTRUCTION

General Contractor + Construction Manager

August 29, 2018

Duneland School Corporation
601 W. Morgan Avenue
Chesterton, IN 46304

Re: 2018 Additions at Brummitt Elementary School

To Whom It May Concern:

The undersigned, Gariup Construction Company, Inc., by Matthew Gariup, Treasurer does hereby guarantee all work and materials furnished and installed by Gariup Construction Company, Inc., against all defects in material and/or workmanship for a period of one year from the date of substantial completion.

Should you have any questions or comments, please contact our office.

Sincerely,

GARIUP CONSTRUCTION CO., INC.

Matthew Gariup
Treasurer

MMG/sd

Phone: (219) 887-5233 • Fax: (219) 981-3679
Office: 3965 Harrison St., Gary, IN 46408 • Mailing: P.O. Box #64879, Gary, IN 46401
www.gariup.com

An Equal Opportunity Employer

Section 03300

Concrete



CONSTRUCTION

General Contractor + Construction Manager

August 29, 2018

Duneland School Corporation
601 W. Morgan Avenue
Chesterton, IN 46304

Re: 2018 Additions at Brummitt Elementary School

To Whom It May Concern:

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Office: 3965 Harrison St., Gary, IN 46408 • Mailing: P.O. Box #64879, Gary, IN 46401
www.gariup.com

An Equal Opportunity Employer

Section 05120
Structural Steel

0.5120

**Ω OMEGA STEEL
AND CONTRACTOR SUPPLY**

1640 E. MAIN ST. • GRIFFITH, IN 46319
PHONE (219) 934-8500 • FAX (219) 934-8521

August 14, 2018

TO: Gariup Construction Co., INC.
P.O. Box 64879
Gary, IN 46401

RE: Brummitt Elementary School
250 Indian Boundary Road
Chesterton, IN
Project# 18-018

Omega Steel and Contractor Supply Company, Inc. hereby warrants all structural steel work provided by Omega Steel on the above-referenced project for site against any defective or substandard labor, material, equipment or workmanship for a period of (one) year from date of substantial completion August 5, 2018 in accordance with the contract documents.

Signed this 14th day of August 2018

Ag Ju
Title President

Section 07505
Roofing Repairs

Section 07212

Board & Batt Insulation



FOAMULAR® 400/600/1000

Extruded Polystyrene (XPS) Rigid Foam Insulation

Product Data Sheet



Energy-Saving¹, Moisture-Resistant XPS Insulation

High Compressive Strength

FOAMULAR® 400 XPS

Insulation: ASTM C578 Type VI, 40 psi minimum

FOAMULAR® 600 XPS

Insulation: ASTM C578 Type VII, 60 psi minimum

FOAMULAR® 1000 XPS

Insulation: ASTM C578 Type V, 100 psi minimum

Description

Owens Corning™ FOAMULAR® 400, 600 and 1000 are high strength Extruded Polystyrene (XPS) Insulation products designed for use in engineered applications requiring additional load-bearing capability such as under slab, concrete floors, foundations, roadways and rail beds, plaza and parking decks and cold storage installations.

The unique closed-cell structure of FOAMULAR® XPS Insulation helps to make it highly resistant to moisture, retaining its excellent

R-value year after year—even following prolonged exposure to moisture and freeze/thaw cycling.

Key Features

- Designed for use in high load bearing applications. High compressive strength helps resist damage from heavy loads. Available in 40, 60 and 100 psi compressive strengths.
- Excellent long-term stable insulating performance with an R-value² of R-5 per inch.
- Exceptional moisture resistance, long-term durability.
- Limited lifetime warranty³—maintains 90% of R-value and covers all ASTM C578 properties.
- GREENGUARD Gold Certified.
- The only XPS foam with certified recycled content—certified by SCS Global Services to contain a minimum 20% recycled content.
- Will not corrode, rot or support mold growth.
- Zero ozone depletion potential with 70% less global warming potential than our previous formula.
- Reusable
- Lightweight, durable rigid foam panels are easy to handle and install.
- Easy to saw, cut or score.

Product Applications

- Owens Corning FOAMULAR® 400, 600, and 1000 Extruded Polystyrene (XPS) Rigid Foam Insulation are great for under slab, cold storage installations, concrete floors, foundations, plaza and parking decks, roofing, roadways and rail beds, permafrost protection and other high load-bearing applications
- Designed for use in high load bearing applications. High compressive strength resists damage from heavy loads. Available in 40, 60, and 100 psi compressive strengths

Technical Information

This product is combustible. A protective barrier or thermal barrier is required as specified in the appropriate building code. For additional information, consult MSDS or contact Owens Corning World Headquarters at 1-800-GET-PINK®.

All construction should be evaluated for the necessity to provide vapor retarders. See current ASHRAE Handbook of Fundamentals.

FOAMULAR® XPS Insulation is a non-structural material and must be installed on framing which is independently braced and structurally adequate to meet required construction and service loading conditions.

FOAMULAR® XPS Insulation can be exposed to the exterior during normal construction cycles. During that time some fading of color may begin due to UV exposure, and, if exposed for extended periods of time, some

¹ Savings vary. Find out why in the seller's fact sheet on R-values. Higher R-values mean greater insulating power.

² R means the resistance to heat flow; the higher the R-value, the greater the insulating power.

³ See actual warranty for complete details, limitations and requirements.



FOAMULAR® 400/600/1000

Extruded Polystyrene (XPS) Rigid Foam Insulation

Product Data Sheet

degradation or "dusting" of the polystyrene surface may begin. It is best if the product is covered within 60 days to minimize degradation. Once covered, the deterioration stops, and damage is limited to the thin top surface layers of cells. Cells below are generally unharmed and still useful insulation.

FOAMULAR® Extruded Polystyrene Insulation has a maximum service temperature of 165°F. Taking simple precautions during construction can minimize the potential for heat related damage. Install only as much FOAMULAR® XPS Insulation as can be covered in the same day. For horizontal applications, always turn the print side down so the black print does not show to the sun which may at times act as a solar collector, raising the temperature of the foam under the print to an unacceptable level. Provide a final finish covering or temporary white opaque covering to avoid possible damage when dark (non-white) surfaces are used over FOAMULAR® XPS Insulation. Do not cover FOAMULAR® XPS Insulation either stored (factory wrapped or unwrapped), or partially installed, with dark colored (non-white), or clear (non-opaque) coverings and leave it exposed to the sun. Examples of such coverings include but are not limited to filter fabrics, membranes, temporary tarps, clear polyethylene, etc. If improperly covered, and exposed to the right combination of sun, time and temperature, FOAMULAR® XPS Insulation deformation damage may occur rapidly. See

Typical Physical Properties¹

FOAMULAR® 400/600/1000 Extruded Polystyrene (XPS) Rigid Foam Insulation

Property	Test Method ²	FOAMULAR® Insulation		
		400	600	1000
Thermal Resistance ³ , R-Value (180 day) minimum, hr•ft ² •°F/Btu (RSI, °C•m ² /W)		ASTM C518		
@ 75°F (24°C) mean temperature				
1" Thickness		5.0 (0.88)	5.0 (0.88)	—
1½" Thickness		—	7.5 (1.32)	7.5 (1.32)
2" Thickness		10.0 (1.76)	10.0 (1.76)	10.0 (1.76)
3" Thickness		15.0 (2.64)	15.0 (2.64)	15.0 (2.64)
@ 40°F (4.4°C) mean temperature				
1" Thickness		5.4 (0.95)	5.4 (0.95)	—
1½" Thickness		—	8.1 (1.43)	8.1 (1.43)
2" Thickness		10.8 (1.90)	10.8 (1.90)	10.8 (1.90)
3" Thickness		16.2 (2.85)	16.2 (2.85)	16.2 (2.85)
Long Term Thermal Resistance, LTTR-Value ³ minimum hr•ft ² •°F/Btu (RSI, °C•m ² /W)		CAN/ULC S770-03		
@ 75°F (24°C) mean temperature				
1" Thickness		5.0 (0.88)	5.0 (0.88)	—
1½" Thickness		—	7.8 (1.37)	7.8 (1.37)
2" Thickness		10.6 (1.87)	10.6 (1.87)	10.6 (1.87)
3" Thickness		16.2 (2.85)	16.2 (2.85)	16.2 (2.85)
Compressive Strength ⁴ , minimum psi (kPa)	ASTM D1621	40 (276)	60 (414)	100 (689)
Flexural Strength ⁵ , minimum psi (kPa)	ASTM C203	115 (793)	140 (965)	140 (965)
Water Absorption ⁶ , maximum % by volume	ASTM C272	0.05	0.05	0.05
Water Vapor Permeance ⁷ , maximum perm (ng/Pa•s•m ²)	ASTM E96	1.1 (63)	1.1 (63)	1.1 (63)
Dimensional Stability, maximum % linear change	ASTM D2126	2.0	2.0	2.0
Flame Spread ^{8,9}	ASTM E84	5	5	5
Smoke Developed ^{8,9,10}	ASTM E84	45-175	45-175	45-175
Oxygen Index ⁸ , minimum % by volume	ASTM D2863	24	24	24
Service Temperature, maximum °F (°C)	—	165 (74)	165 (74)	165 (74)
Linear Coefficient of Thermal Expansion, in/in/°F (m/m/°C)	ASTM E228	← 3.5 × 10 ⁻⁵ (6.3 × 10 ⁻⁵) →		

- Properties shown are representative values for 1" thick material, unless otherwise specified.
- Modified as required to meet ASTM C578.
- R means the resistance to heat flow; the higher the value, the greater the insulation power. This insulation must be installed properly to get the marked R-value. Follow the manufacturer's instructions carefully. If a manufacturer's fact sheet is not provided with the material shipment, request this and review it carefully. R-values vary depending on many factors including the mean temperature at which the test is conducted, and the age of the sample at the time of testing. Because rigid foam plastic insulation products are not all aged in accordance with the same standards, it is useful to publish comparison R-value data. The R-value for FOAMULAR® XPS Insulation is provided from testing at two mean temperatures, 40°F and 75°F, and from two aging (conditioning) techniques, 180 day real-time aged (as mandated by ASTM C578) and a method of accelerated aging sometimes called "Long Term Thermal Resistance" (LTTR) per CAN/ULC S770-03. The R-value at 180 day real-time age and 75°F mean temperature is commonly used to compare products and is the value printed on the product.
- Values at yield or 10% deflection, whichever occurs first.
- Value at yield or 5%, whichever occurs first.
- Data ranges from 0.00 to value shown due to the level of precision of the test method.
- Water vapor permeance decreases as thickness increases.
- These laboratory tests are not intended to describe the hazards presented by this material under actual fire conditions.
- Data from Underwriters Laboratories Inc.® classified. See Classification Certificate U-197.
- ASTM E84 is thickness-dependent, therefore a range of values is given.

Owens Corning publication number 10015704, "Heat Build Up Due to Solar Exposure" for more information.

Standards, Codes Compliance

- Meets ASTM C578 Type VI (FOAMULAR® 400 XPS Insulation), Type VII (FOAMULAR® 600 XPS Insulation), or Type V (FOAMULAR® 1000 XPS Insulation).



FOAMULAR® 400/600/1000

Extruded Polystyrene (XPS) Rigid Foam Insulation

Provide size and
PSI per
specifications

Product Data Sheet

Product and Packaging Data

FOAMULAR® 400/600/1000 Extruded Polystyrene (XPS) Rigid Foam Insulation

Material

Extruded polystyrene closed-cell foam panel with continuous skin on face and back surface.

Packaging

Shipped in poly-wrapped units with individually wrapped or banded bundles.

Product Dimensions		Pallet (Unit) Dimensions	Square	Board	Bundles	Pieces	Pieces	Edges
Thickness (in)	Thickness (in) x Width (in) x Length (in)	(typical) Width (ft) x Length (ft) x Height (ft)	feet per Pallet	feet per Pallet	per Pallet	per Bundle	per Pallet	
FOAMULAR® 400 XPS Insulation								
1	1 x 24 x 96	4 x 8 x 8	3,072	3,072	8	24	192	Square Edge
2	2 x 24 x 96	4 x 8 x 8	1,536	3,072	8	12	96	
	2 x 48 x 96	4 x 8 x 8	1,536	3,072	8	6	48	
3	3 x 24 x 96	4 x 8 x 8	1,024	3,072	8	8	64	
	3 x 48 x 96	4 x 8 x 8	1,024	3,072	8	4	32	
FOAMULAR® 600 XPS Insulation								
1	1 x 24 x 96	4 x 8 x 8	3,072	3,072	8	24	192	Square Edge
1½	1.5 x 24 x 96	4 x 8 x 8	2,048	3,072	8	16	128	
2	2 x 24 x 96	4 x 8 x 8	1,536	3,072	8	12	96	
	2 x 48 x 96	4 x 8 x 8	1,536	3,072	8	6	48	
3	3 x 24 x 96	4 x 8 x 8	1,024	3,072	8	8	64	
	3 x 48 x 96	4 x 8 x 8	1,024	3,072	8	4	32	
FOAMULAR® 1000 XPS Insulation								
1.5	1.5 x 24 x 96 (Half unit)	4 x 8 x 4	1,024	1,536	4	16	64	Square Edge
2	2 x 24 x 96 (Half unit)	4 x 8 x 4	768	1,536	4	12	48	

T: Product availability and lead times vary by region and by product. Consult your local Owens Corning sales representative for availability and lead times.

- UL Classified.
A copy of UL Classification Certificate U-197 is available at www.owenscorning.com



- See UL ER8811-01 at UL.com
- See www.foamular.com for details on listings, constructions and assemblies
- Meets California Quality Standards and HUD UM #71a
- Compliance verification by RADCO (AA-650)

Certifications and Sustainable Features of FOAMULAR® XPS Insulation

- FOAMULAR® XPS Insulation is reusable
- FOAMULAR® XPS Insulation is made with a zero ozone depletion formula
- Certified by SCS Global Services to contain a minimum of 20% recycled content
- Certified to meet indoor air quality standards under the stringent GREENGUARD Indoor Air Quality Certification Program, and the GREENGUARD Gold Certification

- Utilizing FOAMULAR® XPS Insulation can help achieve green building certifications including the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED®) certification

Environmental and Sustainability

Owens Corning is a worldwide leader in building material systems, insulation and composite solutions, delivering a broad range of high-quality products and services. Owens Corning is committed to driving sustainability by delivering solutions, transforming markets and enhancing lives. More information can be found at <http://sustainability.owenscorning.com>.



FOAMULAR® 400/600/1000

Extruded Polystyrene (XPS) Rigid Foam Insulation

Product Data Sheet

Warranty

FOAMULAR® XPS Insulation limited lifetime warranty maintains 90% of its R-value for the lifetime of the building and covers all ASTM C578 properties. See actual warranty for complete details, limitations and requirements at www.owenscorning.com.

All products described here may not be available in all geographic markets. Consult your local sales office representative for more information.

For more information on the Owens Corning family of building products, contact your Owens Corning dealer, call 1-800-GET-PINK®, or access www.owenscorning.com.

Disclaimer of Liability

Technical information contained herein is furnished without charge or obligation and is given and accepted at recipient's sole risk. Because conditions of use may vary and are beyond our control, Owens Corning makes no representation about, and is not responsible or liable for the accuracy or reliability of data associated with particular uses of any product described herein.

SCS Global Services provides independent verification of recycled content in building materials and verifies recycled content claims made by manufacturers. For more information, visit www.SCSglobalservices.com.

GREENGUARD Certified products are certified to GREENGUARD standards for low chemical emissions into indoor air during product usage. For more information, visit ul.com/gg.

LEED is a registered trademark of the U.S. Green Building Council.



OWENS CORNING FOAM INSULATION, LLC
ONE OWENS CORNING PARKWAY
TOLEDO, OHIO 43659
1-800-GET-PINK®
www.owenscorning.com

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Section 07531

EPDM

07531

TECHNICAL INFORMATION SHEET

Firestone
BUILDING PRODUCTS

Low Slope Fire Retardant (LSFR) RubberGard™ EPDM Membrane

Item Description

1 Roll

Item Number

Various

Product Information

Description:

Firestone LSFR RubberGard EPDM is a non-reinforced, cured, single-ply roofing membrane that can be used in ballasted, fully adhered and mechanically attached systems.

Preparation of Substrate:

- Substrates must be clean, dry, smooth, and free of sharp edges, fins, loose or foreign materials, oil, grease, and other materials that may damage the membrane.
- All roughened surfaces that can damage the membrane shall be repaired as specified to offer a smooth substrate.
- All surface voids greater than 1/4" (6.3 mm) wide shall be properly filled with an acceptable fill material.

Product Packaging

Membrane Thickness	Width	Length	Weight
0.045" (1.14 mm)	7.5' (2.3 m)	100' (30.5 m)	0.31 lb/ft² (1.5 kg/m²)
	10' (3.05 m)	100' (30.5 m)	
	16.7' (5.09 m)	100' (30.5 m)	
	20' (6.10 m)	100' (30.5 m)	
	30' (9.14 m)	100' (30.5 m)	
	40' (12.19 m)	100' (30.5 m)	
	50' (15.24 m)	100' (30.5 m)	
0.060" (1.52 mm)	7.5' (2.3 m)	100' (30.5 m)	0.43 lb/ft² (2.1 kg/m²)
	10' (3.05 m)	100' (30.5 m)	
	16.7' (5.09 m)	100' (30.5 m)	
	20' (6.10 m)	100' (30.5 m)	
	30' (9.14 m)	100' (30.5 m)	
	40' (12.19 m)	100' (30.5 m)	
	50' (15.24 m)	100' (30.5 m)	

NOTE: Available sizes vary by product. Contact your Firestone Customer Service Representative for availability and packaging information.

Method of Application:

RubberGard Non-Reinforced LSFR EPDM Membrane must be installed in accordance with current RubberGard specifications, details and workmanship requirements.

Storage:

- Store away from sources of punctures and physical damage.
- Assure that structural decking will support the loads incurred by material when stored on rooftop. The deck load limitations should be specified by the project designer.
- Store away from ignition sources as membrane will burn when exposed to open flame.

Precautions:

- Take care when moving, transporting, handling, etc. to avoid sources of punctures and physical damage.
- Isolate waste products, such as petroleum products, greases, oils (mineral and vegetable) and animal fats from the RubberGard membrane.
- Refer to Safety Data Sheets (SDS) for safety information.

TECHNICAL INFORMATION SHEET



Low Slope Fire Retardant (LSFR) RubberGard™ EPDM Membrane

LEED® Information:

Post Consumer Recycled Content: 0%

Post Industrial Recycled Content: 0%

Manufacturing Location: Prescott, AR

*NOTE: LEED® is a registered trademark of the U.S. Green Building Council.



CCMC 13266-L

Typical Properties

Property	ASTM Standard	Units	Performance Minimum	Typ. Values - 45 mil	Typ. Values - 60 mil
Thickness, minimum	D 412	in (mm)	0.0405 (1.016)	0.0405	0.059 (1.499)
Sheet overall:			0.0504 (1.372)	(1.092)	
Tensile Strength, min.:	D 412 (Die C)	psi (MPa)	1305 (9.0)	1435 (9.9)	1454 (10.0)
Elongation, Ultimate, min.:	D 412 (Die C)	%	300	450	622
Tensile set, max.:	D 412, Method A (Die C)	%	10	5	2.18
Tear Resistance, min.:	D 624 (Die C)	lbf/in (kN/m)	150 (26.27)	190 (33.2)	219 (38.4)
Brittleness point, max.:	D 2137	°F (°C)	-49 (45)	-62 (-52)	-49 (-45)
Ozone resistance, no cracks:	D 1149	---	---	Pass	Pass
Heat Aging:	D 573				
Tensile Strength, min.	D 412 (Die C)	psi (MPa)	1205(8.3)	1425 (9.8)	1490 (10.3)
Elongation, ultimate, min.	D 412	%	200	240	322
Tear resistance, min.	D 624	lbf/in (kN/m)	125 (21.9)	180 (31.5)	179 (31.3)
Linear dimensional change, max.	D 1204	%	±1.0	-0.5	-32
Water absorption, max., mass%:	D 471	%	+8, -2	+1.8	+1.51
Factory Seam Strength, min.:	D 816 Method B (modified)	lbf/in (kN/m)	50 (8.8) or Sheet Failure	Sheet Failure	Sheet Failure
Weather Resistance:					
Visual inspection	D518	---	Pass	Pass	Pass
PRFSE, min.	D518	%	30	52	53
Elongation, ultimate, min.	D 412 (Die C)	%	200	240	255
Air Permeance (Material):	E2178*	ft³/ft² (L/(s·m²))	<0.004 (0.02)	Pass	Pass

*The ASTM 2178 values listed are for the air permeance of the RubberGard LSFR Membrane component only. For use of the product as a component in an air barrier assembly, please consult your Firestone Building Systems Advisor (BSA), Code Agency or Authority having Jurisdiction (AHJ) for the acceptable air barrier assembly details.

RubberGard LSFR membrane meets or exceeds the minimum requirements set forth by ASTM D 4637 for Type I non-reinforced EPDM single-ply roofing membranes.

Please contact Quality Building Services Technical Department at 1-800-428-4511 for further information.

This sheet is meant to highlight Firestone products and specifications and is subject to change without notice. Firestone takes responsibility for furnishing quality materials which meet published Firestone product specifications or other technical documents, subject to normal roof manufacturing tolerances. Neither Firestone nor its representatives practice architecture. Firestone offers no opinion on and expressly disclaims any responsibility for the soundness of any structure. Firestone accepts no liability for structural failure or resultant damages. Consult a competent structural engineer prior to installation if the structural soundness or structural ability to properly support a planned installation is in question. No Firestone representative is authorized to vary this disclaimer.

TECHNICAL INFORMATION SHEET



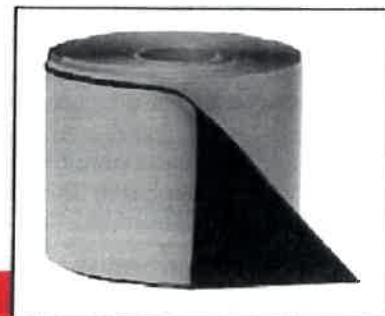
RubberGard™ EPDM FormFlash™ Flashing

Item Description

6" x 100' (152 mm x 30.5 m)
9" x 100' (229 mm) x 30.5 m)
12" x 100' (305 mm x 30.5 m)
18" x 100' (457 mm x 30.5 m)
24" x 100' (609 mm x 30.5 m)
36" x 100' (914 mm x 30.5 m)
48" x 100' (1219 mm x 30.5 m)

Item Number

W563581508
W563581509
W563581510
W563581511
W563581512
W563581514
W563581515



Product Information

Description:

Firestone RubberGard EPDM FormFlash Flashing is an uncured EPDM flashing membrane that cures in place after installation.

Product Packaging

Product Packaging		
Rolls per Carton:	2	1
Roll Size:	6" x 100' (152 mm x 30.5 m) 9" x 100' (229mm) X 30.5 m) 12" x 100' (305 mm X 30.5 m)	18" x 100' (457 mm X 30.5 m) 24" x 100' (609 mm x 30.5 m) 36" x 100' (914 mm x 30.5 m) 48" x 100' (1219 mm x 30.5 m)
Weight per Carton:	0.35 lb/sf (1.7 kg/m ²)	

Method of Application:

RubberGard EPDM FormFlash Flashing must be installed in accordance with current RubberGard specifications, details and workmanship requirements.

Storage:

- Store in original unopened cartons at temperatures between 60 °F (15.6 °C) and 80 °F (26.7 °C) until ready for use.
- During hot weather, do not expose to sunlight or elevated temperatures until use as curing will begin.
- Rotate stock to ensure stored material will not extend beyond the shelf life of twelve months from date of manufacture.
- A shelf life of twelve months from date of manufacture can be expected when stored at temperatures between 60 °F (15.6 °C) and 80 °F (26.7 °C).

TECHNICAL INFORMATION SHEET



RubberGard™ EPDM FormFlash™ Flashing

Precautions:

- Take care when moving, transporting, handling, etc. to avoid sources of punctures and physical damage.
- Use of heat guns during cold weather will improve workability of flashing, but a wide nozzle should be used and care should be taken not to localize heat, as a hole in the flashing can result.
- Isolate waste products, such as petroleum products, greases, oils (mineral and vegetable) and animal fats from the RubberGard EPDM FormFlash.
- Refer to Safety Data Sheets (SDS) for safety information.

LEED® Information:

Post Consumer Recycled Content: 0%

Post Industrial Recycled Content: 0%

Manufacturing Location: Prescott, AR

*NOTE: LEED® is a registered trademark of the U.S. Green Building Council.



Physical Properties

Property	ASTM Standard	Performance Minimum	Typical Performance 60 mil
Vulcanization, at 320 °F (160 °C)	Practice D 3182	20 ± 2	20 ± 2
Thickness, minimum		0.055 (1.4)	
Thickness, minimum	D 412	0.055 (1.4)	0.055 (1.4)
Tensile Strength, minimum	D 412	1205 (8.3)	1800 (12.4)
Elongation, minimum	D 412 (Die C)	250	425
Tear Resistance, minimum	D 624 (Die C)	125 (22)	195 (35)
Brittleness Point, maximum	D 2137	-31 (-35)	-34 (-37)
Tensile Set, maximum	D 412	10	10
Ozone Resistance, (7X)	D 1149	No Cracks	No Cracks
Heat Aging, Air Oven	D 573		
Tensile Strength, minimum	D 412 (Die C)	1205 (8.3)	1600 (11.0)
Elongation, minimum	D 412 (Die C)	200	210
Tear Resistance, minimum	D 624 (Die C)	125 (22)	160 (28)
Water Absorption, weight change, range	D 471	+8,-2	+2
Linear Dimensional Change, maximum	D 1204	± 2	-1.0
Weatherability, no cracks or crazing	D 518	Pass	Pass

^a Specimens to be prepared from coating rubber compound, vulcanized in a similar method to the reinforced products.

Please contact Quality Building Services Technical Department at 1-800-428-4511 for further information.

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TECHNICAL INFORMATION SHEET

Firestone
BUILDING PRODUCTS

EPDM Bonding Adhesive BA-2004(T)

Item Number
W563587052



Product Information

Description:

Firestone EPDM Bonding Adhesive BA-2004 (T) is a solvent based contact adhesive designed specifically for bonding Firestone RubberGard™ membranes and flashings to ISO 95+™ Insulation, wood, metal, masonry and other acceptable substrates.

Method of Application:

1. Surfaces to receive EPDM Bonding Adhesive BA-2004 (T) shall be clean, smooth, dry, free of sharp edges, loose and foreign materials, oil, grease, and other contaminants. Sweep the mating surface of the membrane with a stiff broom to remove excess dusting agent, if present, or other contaminants from the mating surface.
2. Stir the adhesive thoroughly before and during use, achieving a uniform mix with no sediment on the bottom and no marbling evident.
3. Apply adhesive at about the same time to both the exposed underside of the sheet and the substrate to allow approximately the same flash-off time.
4. EPDM Bonding Adhesive BA-2004(T) may be applied with a solvent-resistant paint roller or mechanical equipment designed to apply flammable solvent based adhesives.
5. Apply by rolling the adhesive on both mating surfaces. EPDM Bonding Adhesive BA-2004(T) should be applied evenly so as to avoid globs or puddles.
6. As an option, spray EPDM Bonding Adhesive BA-2004(T) and back-roll the adhesive uniformly and evenly with a solvent-resistant paint roller. Care must be taken not to apply EPDM Bonding Adhesive BA-2004(T) over any area that will later be cleaned and spliced to another sheet or flashing.
7. Allow EPDM Bonding Adhesive BA-2004(T) to flash off until tacky. Touch the EPDM Bonding Adhesive BA-2004(T) surface with a clean, dry finger to be certain that the adhesive is dry and does not stick or string. While pushing straight down to check for stringing, also push forward on the adhesive at an angle to ensure that the adhesive is ready (flushed off) throughout its thickness. If either motion exposes wet or stringy adhesive when the finger is lifted, then it is not ready for mating. Flash-off time will vary depending on ambient air conditions.
8. Starting at the fold, roll the previously coated portion of the sheet into the coated substrate slowly and evenly so as to minimize wrinkles.
9. To ensure proper contact, compress the bonded half of the sheet to the substrate with a stiff push broom using heavy pressure.

Storage:

- Store in original unopened containers at temperatures between 60 °F (15.6 °C) and 80 °F (26.7 °C) until ready for use.
- For optimum results, rotate your stock to ensure stored material has not exceeded the shelf life of one year.
- Shelf life of one year can be expected if stored in original sealed container at temperatures between 60 °F (15.6 °C) and 80 °F (26.7 °C). If exposed to lower temperatures, restore to room temperature prior to use.
- Shelf life will be shortened if exposed to elevated temperatures. Rotate stock to insure stored material will not go beyond the shelf life of one year.

TECHNICAL INFORMATION SHEET



EPDM Bonding Adhesive BA-2004(T)

Precautions:

- Flammable. Keep away from fire and open flame and other possible ignition sources during storage and use. Do not smoke when using.
- Harmful or fatal if swallowed.
- Avoid prolonged inhalation.
- Avoid prolonged contact with skin. Gloves should be worn (OSHA approved).
- Avoid eye contact by wearing safety glasses with side shields or safety goggles.
- For professional use only.
- Keep out of reach of children.
- Thinning is not allowed.
- Do not use for splicing.
- Do not use with TPO.
- Use only in well ventilated areas.
- Cover tightly when not in use.
- Review Safety Data Sheet specified on the Bonding Adhesive container label.
- Recommended cleaner is Firestone Splice Wash SW-100 Cleaner.

LEED® Information:

Post Consumer Recycled Content: 0%

Post Industrial Recycled Content: 0%

Manufacturing Location: South Bend, IN

*NOTE: LEED® is a registered trademark of the U.S. Green Building Council



Typical Properties

Base:	A blend of synthetic rubbers
Color:	Yellow
Solvents:	A blend of Acetone, Hexane, Toluene and Xylene
Viscosity:	3,300-3,800 cps, with R.V.F. #3 spindle @ 10 rpm
Weight/Gallon:	6.7 - 7.4 lb/gal
Specific Gravity:	0.803 – 0.887
V.O.C. Content:	5.282 lb/gal (633 g/L)

Packaging Data

Pail:	5 gal (18.9 L)
Weight:	41 lb (18.6 kg)
Coverage:	<p>A coverage rate of 45 - 60 ft²/gal (1.10 – 1.47 m²/L) may be obtained depending on the substrate. Some insulation surfaces are more uneven and porous and will result in a lower coverage rate while smooth non-porous substrates will result in higher coverage rates. Rates are based on roller application to both mating surfaces.</p> <p>Very porous substrates (rough wood, concrete block) may require <u>two</u> coats of EPDM Bonding Adhesive BA-2004(T), to ensure proper adhesion. This can be determined by adhering a small piece of membrane to the porous substrate to verify the bonding strength.</p>
Units per Pallet:	45 – 5 gal pails

TECHNICAL INFORMATION SHEET



EPDM Bonding Adhesive BA-2004(T)

Approved Power Application Equipment:

Garlock 25ST Roller Boss Power Roller

4 hp Honda Engine, 4 CFM Compressor, 25 gal pressurized supply tank (20 gal for material; 60-80 psi), up to 100 psi rating, 2 – ¾" x 30' supply hoses with swivels, 2 – 18" roller head assemblies

Garlock 2120 Commander Sprayer

18 hp Kohler Engine, 4500 psi Rating, 5 gallon per minute flow, 1200 psi pressure (minimum), Pump Displacement 45:1, GPM Rating: up to 5 GPM, ½" x 100' hose, 2" Intake pipe with screen, 5 or 55 gal drum containers, Graco Spray Tips: .023 to .031 diameter hose

Garlock Twin Gun Airless Sprayer

6.5 hp Honda Engine, 3000 psi Rating, Pump Displacement 30:1, GPM Rating: up to 1 gpm, Up to 400' of single ½" diameter hose, Up to 200' of dual ½" diameter hose, ¾" Intake pipe with screen, 5 or 55 gal drum containers, Bulk tank containers, Graco Spray Tips: .019 to .025 diameter hose (1850 psi operating pressure)

Graco Spray Equipment:

P70EC4-70 – 70:1 Xtreme Sprayer Package w/Heavy Duty car, Hopper package, w/NXT motor and Data Track, Xtreme-Duty high pressure hose, ¾" x 50', 7250 psi, with ¼" x 6' whip hose, XTR-7 applicator with XHD821-825 tips.

Please contact Quality Building Services Technical Department at 1-800-428-4511 for further information.

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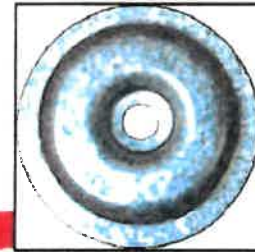
TECHNICAL INFORMATION SHEET



2" Metal Plate

Item Description
Pail: 1,000 Pieces

Item Number
W56RAC4180



Product Information

Description:

The Firestone 2" (51 mm) Metal Plates are specifically designed to be used with Firestone All-Purpose, Heavy Duty (HD) and Concrete Drive Fasteners in roofing system applications for attaching Firestone Reinforced Perimeter Fastening (RPF) Strips as specified in Firestone Specifications and Details.

Product Packaging

Pail:	1,000 pieces
Pail Weight:	34 lb (15.4 kg) per pail
Pallet:	40 pails

Method of Application:

Position plates along the Reinforced Perimeter Fastening (RPF) Strip as specified by Firestone Specifications and Details. Attach plates to roof deck using the appropriate length Firestone fastener. Install plates with ribbed side up, showing the "Firestone" label.

Storage:

Store in unopened original containers protected from the weather.

Precautions:

1. Do not overdrive or underdrive fastener.
2. Plates are designed to anchor Reinforced Perimeter Fastening Strips (RPFS and QSRPFS) only.
3. Cannot be used with Firestone Heavy Duty (HD) Plus Fasteners.

LEED® Information:

Postconsumer Recycled Content: 8%
Preconsumer Recycled Content: 17%
Manufacturing Locations: Cleveland & Bryan, OH



Physical Properties

Property	Typical Performance
Material:	Steel with Galvalume® coating
Material Thickness:	0.030" (0.76 mm) - 0.036" (0.91 mm)
Diameter:	2" (51 mm)
Corrosion Resistant Coating:	Meets FM No. 4470 Criteria
Pull Through Resistance:	400 lbf (181.4 kgf) from center hole

Galvalume® is a registered trademark of BIEC International, Inc.

Please contact the Quality Building Services Technical Department at 1-800-428-4511 for further information.

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Firestone Building Products | Sales: (800) 428-4442 | Technical: (800) 428-4511 | www.firestonebpco.com

TIS # 1101

1/13/2015

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TECHNICAL INFORMATION SHEET

Heavy Duty Fastener

Red Fasteners

1 ¼"	W56RAC4230
2"	W56RAC4232
3"	W56RAC4234
4"	W56RAC4236
5"	W56RAC4237
6"	W56RAC4249
7"	W56RAC4239
8"	W56RAC4240
10"	W56RAC4241
12"	W56RAC4242
14"	W56RAC4243

White Fasteners*

1 ¼"	W56RAC4390
2"	W56RAC4391
3"	W56RAC4392
4"	W56RAC4393
5"	W56RAC4394
6"	W56RAC4395



Product Information

Description:

The Firestone Heavy Duty Fastener is specifically designed to be used in roofing applications which require additional corrosion protection and additional pullout resistance. The Heavy Duty Fastener may be used for attachment of roofing insulation and base sheets in combination with Firestone Insulation Plates, or for attachment of Firestone Batten Strips, Seam Plates, Termination Bars, and other accessories to steel, wood, concrete and other decks where approved by Firestone Technical Specifications.

*NOTE: Firestone is not responsible for, nor guarantees that the white coating will remain on the fastener during or after installation. Because the coating on Firestone white fasteners is removed to some degree during the installation process, Firestone suggests that 1) the building owner be made aware of the expectations of the white fasteners and that repainting of the deck may be required after roofing is complete or 2) any deck painting take place after the roof is installed. In this case, any color of screw will work.

Product Packaging

<u>Screw Length</u>	<u>Thread Length</u>	<u>Pieces per Plastic Pail</u>	<u>Pails per Pallet</u>
1 ¼" (31.8 mm)	Full	1,000	40
2" (50.8 mm)	Full	1,000	40
3" (76.2 mm)	Full	1,000	60
4" (101.6 mm)	3" (76.2 mm)	1,000	60
5" (127.0 mm)	4" (101.6 mm)	1,000	40
6" (152.4 mm)	4" (101.6 mm)	500	60
7" (177.8 mm)	4" (101.6 mm)	500	60
8" (203.2 mm)	4" (101.6 mm)	500	60
10" (254.0 mm)	4" (101.6 mm)	500*	24
12" (304.8 mm)	4" (101.6 mm)	500*	24
14" (355.6 mm)	4" (101.6 mm)	500*	24

* Packaged in cardboard boxes due to fastener length. May require lead time of thirty (30) days

TECHNICAL INFORMATION SHEET



Heavy Duty Fastener

Method of Application:

1. Using the #3 Phillips tip provided, and a variable speed drill, engage the fastener into the deck as noted below. Take care not to over or under drive the fastener. Threads must engage the decking material per Firestone Technical Specifications.
2. Determine screw length as follows:
 - a. Steel Decks: Select fastener length to penetrate through the deck a minimum of $\frac{3}{4}$ " (19.1 mm).
 - b. Wood Decks: Select fastener length to penetrate into or through the deck a minimum of 1" (25.4 mm).
 - c. Concrete Decks: Select fastener length to penetrate into deck a minimum of 1" (25.4 mm).
3. If pre-drilling of the deck substrate is necessary, use a hammer drill in impact mode with a $\frac{7}{32}$ " (5.6 mm) carbide drill bit. Install fasteners by using a variable speed drill at a maximum of 1,500 rpm.

Storage:

Store in original, unopened packaging protected from the weather.

Precautions:

Eye protection must be worn during the installation of the fasteners and any drilling operation.

LEED® Information:

Postconsumer Recycled Content: 25%
Preconsumer Recycled Content: 0%
Manufacturing Location: West Chicago, IL
*NOTE: LEED® is a registered trademark of the U.S. Green Building Council.



Physical Properties

Property	Typical Performance
Material:	SAE 1022, Heat Treated Steel
Thread Size:	0.275" (6.98 mm) Nominal Diameter
Threads/Inch:	13 min.
Thread Design:	Buttress thread
Fastener Tip:	Drill point design
Fastener Head:	#3 Phillips drive
Pullout in New 22 gauge (0.76 mm) Steel Deck:	
Grade C (Grade 33):	595 lb (270 kg) min.
Grade E (Grade 80):	650 lb (295 kg) min.
Pullout in New Structural Concrete:	700 lb (317.5 kg) min.
Pullout in New $\frac{3}{4}$ " (19.0 mm) Plywood Deck:	360 lb (163 kg) min.
Corrosion Resistant Coating:	Electrocoating of Firestone's Red and White fasteners both exhibit 15% or less red rust after 30 cycles of Kesternich and exceed requirements of FM 4470.

Please contact Quality Building Services Technical Department at 1-800-428-4511 for further information.

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TECHNICAL INFORMATION SHEET



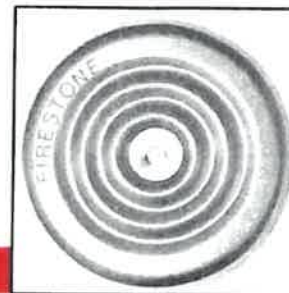
Insulation Fastening Plate

Item Description

Pail: 1,000 Pieces

Item Number

W56RAC4190



Product Information

Description:

Firestone Insulation Fastening Plates are specially designed to be used with Firestone All-Purpose, Heavy-Duty, Concrete Drive and Stainless Steel Fasteners in roofing applications for attaching insulation as required by Firestone Specifications.

Product Packaging

Plate Diameter	Weight	Pieces per Plastic Pail	Pails per Pallet
3" (76 mm)	42 lb (19 kg) per pail	1,000	60

Method of Application:

Position insulation plates over insulation as specified by Firestone Specifications. Attach plates to roof deck using the appropriate Firestone fastener. Install plates ribbed side up with the "Firestone" identification visible.

Storage:

Store in unopened original containers protected from the weather.

Precautions:

1. Do not overdrive or underdrive fastener.
2. Plates are designed to anchor roof insulation only.
3. Avoid field seams directly over insulation plates.
4. **Cannot be used with Firestone Heavy Duty (HD) Plus Fasteners.**

LEED® Information:

Postconsumer Recycled Content:

8%

Preconsumer Recycled Content:

17%

Manufacturing Location:

Cleveland, OH



Physical Properties

Property	Typical Performance
Material:	AZ50 Galvalume®
Material Thickness:	0.017" (0.43 mm) - 0.023" (0.58mm)
Diameter:	3" (76 mm)
Corrosion Resistant Coating:	Meets FM No. 4470 Criteria
Pull Through Resistance:	400 lbf (181.4 kgf) from center hole

Galvalume® is a registered trademark of BIEC International, Inc.

Please contact your Firestone Roof Systems Advisor at 1-800-428-4511 for further information.

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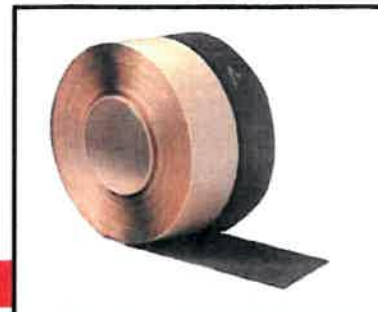
TECHNICAL INFORMATION SHEET



QuickSeam™ Reinforced Perimeter Fastening (RPF) Strip

Item Description
3" x 100' Roll

Item Number
W56RAC1632



Product Information

Description:

QuickSeam Reinforced Perimeter Fastening (RPF) Strip is a 6" (152.4 mm) wide RubberGard™ MAX membrane with 3" (76.2 mm) wide QuickSeam Tape factory laminated to it along one edge. It is used for non-penetrating base flashing details as specified in Firestone Specifications and Details.

Method of Application:

1. Unroll the QuickSeam RPF Strip with the release paper up and the tape portion farthest away from the wall or penetration.
2. Anchor QuickSeam RPF Strip using Firestone 2" seam plates and fasteners 12" o.c. max. (305 mm) per current base tie-in details.
3. **Attachment option:** QuickSeam RPF Strip may be fastened with metal or polymer batten strips to the deck (in the mechanically-attached and fully- adhered systems only) or fastened into the wall (metal battens only). Polymer batten may be used to fasten into wood sheathed parapet walls. Refer to appropriate Firestone details for specifics.
4. Position EPDM membrane over QuickSeam RPF Strip with release paper in place and allow membrane to relax.
5. Fold back EPDM membrane to expose the tape.
6. Prime the EPDM to be spliced to the tape using QuickPrime™ Plus, QuickPrime Plus LVOC, Single-Ply QuickPrime or Single-Ply LVOC Primer and QuickScrubber™ or QuickScrubber Plus pad and handle per current procedures.
7. Use touch-push test to determine when the Primer is ready to be mated to the tape.
8. Remove the release liner from tape.
9. Roll the primed EPDM membrane into the tape.
10. The portion of the QuickSeam RPF Strip without tape may be bonded to the membrane using Firestone EPDM Bonding Adhesive BA-2004, Water-Based Bonding Adhesive, Single-Ply LVOC Bonding Adhesive, or Splice Adhesive SA-1065.
11. Roll the EPDM membrane over the QuickSeam RPF Strip with a 1½" (50.8 mm) wide silicone hand roller to ensure proper adhesion.

Storage:

- Store in original unopened containers indoors at temperatures between 60 °F (15.6 °C) and 80 °F (26.7 °C).
- Do not store on roof in direct sunlight or at temperatures above 80 °F (26.7 °C).
- When exposed to lower temperatures; restore to room temperature prior to use.
- Shelf life of two years can be expected when stored in original container at temperatures between 60 °F (15.6 °C) and 80 °F (26.7 °C).
- Shelf life will be shortened if exposed to elevated temperatures.

TECHNICAL INFORMATION SHEET



QuickSeam™ Reinforced Perimeter Fastening (RPF) Strip

Shelf Life:

- Shelf life of two years can be expected when stored in original container at temperatures between 60 °F (15.6 °C) and 80 °F (26.7 °C).
- Shelf life will be shortened if exposed to elevated temperatures.

Precautions:

Refer to Safety Data Sheet (SDS).

LEED® Information:

Post Consumer Recycled Content: 0%

Post Industrial Recycled Content: 0%

Manufacturing Location: Prescott, AR

*NOTE: LEED® is a registered trademark of the U.S. Green Building Council.

Packaging:

2 rolls per carton

21 cartons per pallet

NOTE: QuickScrubber and/or QuickScrubber Plus pads and handles are included in each carton. Quantities vary depending on the QuickSeam product.

Typical Properties

QuickSeam Tape		RubberGard Max	
Property	Test Method	Property	Test Method
Base	Rubber Polymers	Base	EPDM
Color	Black	Color	Black
Solvents	None	Solvents	None
Solids	100%	Solids	100%
Specific Gravity	98 ± 0.02 (H ₂ O = 1)	Cured State	Cured
Cured State	Cured	Thickness	0.060" (1.52 mm) ± 10%
Thickness	0.030" (0.77 mm) ± 0.007" (0.18 mm)	Width	6" + 0, - 0.125"
Width	3" (133.3 mm) + 0, - 1/16"	Breaking Strength	80 lb/ft (355.9 N)
Length	100' (30.48 m) +1/-0		

Please contact Quality Building Services Technical Department at 1-800-428-4511 for further information.

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TECHNICAL INFORMATION SHEET

Metal Batten Strip

TIS #1202

ITEM NUMBER: W56RAC3053

Description:

Metal Batten Strip is specifically designed to be used for anchoring Firestone membrane and flashing details as specified in Firestone Specifications and Details.

Method of Application:

1. Attach batten strips to the roof substrate or penetration using the appropriate Firestone fastener. Do not overdrive or underdrive fasteners. Start at one end of the batten strip and fasten towards the other to reduce bowing between fasteners.

Storage:

- Store in original unopened containers protected from the weather.

Precautions:

- All cut surfaces must be rounded and filed to remove burrs and sharp edges.

Compliance:

Post Consumer Recycled Content: 8%
Pre Consumer Recycled Content: 17%
Manufacturing Location: Cleveland, OH



Packaging:

Tube	50 – 10' (3.05 m) pieces per cardboard tube
------	---

Physical Properties:

Minimum Performance

Material	Galvalume® AZ 55
Corrosion Resistance	Meets FM No. 4470 criteria
Length	10' (3.05 Meters)
Width	1.0" (25.4 mm)
Thickness	0.0448"/0.0508" (1.13 mm/1.29 mm)
Holes	0.280" (7.11 mm) diameter, at 6" (152 mm) o.c.

Galvalume® is a registered trademark of BIEC International, Inc.

Please Contact your Firestone Technical Coordinator at 1-800-428-4511 for further information.

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TECHNICAL INFORMATION SHEET

Firestone
BUILDING PRODUCTS

Termination Bar

Item Description

10' x 1.08" x 0.106"

(3.1 m x 27.4 mm x 2.7 mm)

Item Number

W56RAC3061



Product Information

Description:

Termination Bar is intended for attaching and sealing flashing terminations as outlined by Firestone Specifications and Details.

Method of Application:

1. Substrates must be free from dust, dirt, oil, water and other contaminants. Wall areas above Termination Bar must be waterproof. Install per Firestone Specifications and Details.
2. Install a continuous bead of Firestone Water Block Seal behind top of flashing.
3. Anchor bar through pre-punched holes to maintain constant compression (max. 12" o.c. (304.8 mm)).
4. Install flat side of bar towards flashing so a reservoir is formed along the top edge for Firestone sealant.
5. Keep each 10' (3.1 m) length of Termination Bar separated from adjoining bar by 1/4" (6.3 mm).
6. Install termination bar vertically where base flashing(s) end.
7. Remove excess flashing material showing above the bottom of sealant reservoir channel.
8. Install Firestone AP Sealant into reservoir channel.

Storage:

Store in original unopened containers protected from the weather.

Precautions:

- Do not use as a batten strip.
- Where field cutting is necessary, remove any burrs from bar ends.
- Clean up shavings, etc. that may occur from field cutting.
- Termination bars must be installed directly to the wall surface, not to existing sheet metal, flashings, etc.
- Install termination bar on hard, smooth surfaces only. Do not install on substrates where seal is lost at mortar joints, etc.
- Do not install termination bar to wood or other porous surfaces.

LEED® Information:

Post Consumer Recycled Content: 0%

Post Industrial Recycled Content: 67%

Manufacturing Location: Cleveland, OH

*NOTE: LEED® is a registered trademark of the U.S. Green Building Council.



Termination Bar

Packaging:

Tube: 50, 10' (3.05 m) pieces per tube
Weight: 86 lb (39 kg) per tube

Typical Properties

Property	Minimum Performance
Material	3003-H14, 3105-H14 or 6063-T5, or T6 Aluminum
Length	10' (3.1 m)
Height	1.08" (27.4 mm)
Thickness	0.106" (2.7 mm)
Holes	Slotted, 0.28" x 0.39" (7.1 x 9.9 mm) 30 at 3.9" (99.8 mm) o.c.

Galvalume® is a registered trademark of BIEC International, Inc.

Please contact Quality Building Services Technical Department at 1-800-428-4511 for further information.

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TECHNICAL INFORMATION SHEET



AP Sealant

Item Description

Cartridge: 10 fl oz (300 mL)

Item Number

W563587078



Complies with ASTM C 920. Classified as Type S, Grade NS, Class 35, Use NT, M, A, O and I.

Product Information

Description:

AP Sealant is a single-component polyurethane non-sag moisture-curing sealant. It can be used to caulk sheet metal, masonry, brick, and concrete block. It may be used as an exterior sealant at termination bar details and as a fastener sealer over fastener heads per current Firestone Building Products specifications and details.

Method of Application:

1. Surfaces to receive AP Sealant must be clean, dry, sound, frost-free, and grease-free. If grease or oil is present, it must be removed with a suitable solvent prior to the application of AP Sealant.
2. Apply AP Sealant to substrates above 40 °F (4 °C).
3. AP Sealant is supplied in cartridges or sausage chubs ready to apply. Do not open cartridges until all substrate cleaning and preparation work has been completed.
4. Fill joints from the deepest point to the surface by holding a properly sized nozzle against the back of the joint.
5. Dry tooling is recommended.
6. **Do not** use soapy water when tooling.

Storage:

- Store in original unopened containers at temperatures between 60 and 80 °F (15.6 and 26.7 °C).
- When exposed to lower temperatures, restore to room temperature prior to use.
- For optimum results, rotate stock to ensure stored material has not exceeded the shelf life of one (1) year.

Shelf Life:

- Shelf life of one (1) year can be expected when stored in original, sealed containers at temperatures between 60 and 80 °F (15.6 and 26.7 °C).
- Shelf life will be shortened if exposed to elevated temperatures.

Coverage Rate:

- Cartridge seals 24' (7.3 m) in a ¼" x ¼" (6.3 mm x 6.3 mm) joint.
- Sausage chub seals 48' (14.6 m) in a ¼" x ¼" (6.3 mm x 6.3 mm) joint.

Clean-Up:

For clean-up, use mineral spirits or Firestone Splice Wash SW-100 while material is fresh, generally within twenty-four (24) hours. After AP Sealant cures, it can be removed by abrasion or mechanical means.

TECHNICAL INFORMATION SHEET



AP Sealant

Precautions:

1. Review Safety Data Sheets (SDS) prior to use.
2. Flammable. Keep away from fire and open flames during storage and use. Do not smoke when using.
3. Use only in well-ventilated areas.
4. Do not contaminate with foreign materials.
5. Do not thin.
6. AP Sealant is **not** to be used for: aquariums, food contact surfaces, hot stacks/stove pipes/fireplaces, structural glazing, below-grade applications, or splices.

LEED® Information:

Post Consumer Recycled Content: 0%

Post Industrial Recycled Content: 0%

Manufacturing Location: Brighton, CO

*NOTE: LEED® is a registered trademark of the U.S. Green Building Council.

Typical Properties

(Complies with ASTM C 920. Classified as Type S, Grade NS, Class 35, Use NT, M, A, O and I)

Property	Typical Performance
Base:	Polyurethane
Color:	Gray
Solids:	92.5% ± 2
Tooling Time:	Less than 20 minutes
UV & Ozone Resistance:	Excellent
Specific Gravity:	1.186 ± 0.024
Cure System:	Moisture Activated
V.O.C. Content:	111 ± 1 g/L

Packaging:

30 Cartridges per carton; approximately 26 lb per carton.

Please contact Quality Building Services Technical Department at 1-800-428-4511 for further information.

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TECHNICAL INFORMATION SHEET



Lap Sealant HS

Item Description

5 Gallon Pails
11 fl oz Cartridges (Plastic Pail)
Sausage Chubs
11 fl oz Cartridges (Cardboard Carton)

Item Number

W563587032
W563587031
W563587030
W56358703E



Product Information

Description:

Firestone Lap Sealant HS is a low volatile organic compound (LVOC) sealant designed to be used with Firestone Splice Adhesive SA-1065 for seam edge treatment applications and as a sealant in other applications as indicated by current Firestone specifications and details.

Product Packaging

<u>Shipping Unit:</u>	<u>Quantity:</u>	<u>Contents:</u>
Pail:	One each	5 gal (18.9 L)
Plastic Pail:	28 Cartridges per Pail	11 fl oz (0.33 L) Cartridges
Cardboard Carton:	25 Cartridges per Pail	11 fl oz (0.33 L) Cartridges
Carton:	20 Chubs per Carton	20 fl oz (0.57 L) Chubs

Method of Application:

1. Surfaces to which Lap Sealant HS is applied must be clean, dry, and free from loose or foreign materials, oil, and grease.
2. Wait to apply seam edge treatment a minimum of four (4) hours after the completion of a flashing seam, but no later than the end of the next day following the completion of the seam. If inclement weather is threatening, apply Splice Adhesive SA-1065 to the edge of the flashing splice before leaving project.
3. Prior to application of the Splice Adhesive SA-1065, if the seam edge has been contaminated, clean the seam edge a minimum of 1" (25.4 mm) on each side of the step-off with Firestone QuickPrime™ Plus Primer, and allow to dry.
4. Apply a layer of Splice Adhesive SA-1065 along the entire seam edge, a minimum of 1" (25.4 mm) on each side of the step-off, following current Firestone Splice Adhesive SA-1065 application procedures. Allow the Splice Adhesive SA-1065 to flash-off properly. (Refer to current Firestone Specifications for readiness check.)
5. Using the plastic nozzle applicator supplied by Firestone, apply a continuous bead of Lap Sealant HS approximately $\frac{3}{8}$ " x $\frac{1}{4}$ " (9.5 mm x 6.3 mm) centered over the flashing seam edge. Be sure to keep the nozzle applicator centered over the lap step-off. Refer to current Firestone seam details.

Storage:

- Store in original unopened containers at temperatures between 60 and 80 °F (15.6 and 26.7 °C).
- When exposed to lower temperatures, restore to room temperature prior to use.

TECHNICAL INFORMATION SHEET



Lap Sealant HS

Storage (Continued):

- For optimum results, rotate stock to ensure stored material has not exceeded the shelf life of one (1) year.

Shelf Life:

- Shelf life of one (1) year can be expected when stored in original, sealed containers at temperatures between 60 and 80 °F (15.6 and 26.7 °C).
- Shelf life will be shortened if exposed to elevated temperatures.

Coverage Rate:

11 fl oz (0.33 L) Cartridge: 20' to 22' (6 m to 6.7 m) of $\frac{3}{8}$ " x $\frac{1}{4}$ " (9.5 mm x 6.3 mm) bead per cartridge
20 fl oz (0.57 L) Chub: 35' to 38' (10.7 m to 11.6 m) of $\frac{3}{8}$ " x $\frac{1}{4}$ " (9.5 mm x 6.3 mm) bead per chub
5 Gallon (18.93 L) Pail: 1,250' to 1,280' (381.0 m to 390.1 m) of $\frac{3}{8}$ " x $\frac{1}{4}$ " (9.5 mm x 6.3 mm) bead per pail

Clean-Up:

Recommended cleaner is rubbing alcohol followed by soap and water.

Precautions:

1. Review Safety Data Sheet (SDS) prior to use.
2. Flammable. Keep away from fire and open flame during storage and use. Do not smoke during use.
3. Use only in well ventilated areas.
4. Do not contaminate with foreign materials.

LEED® Information:

Post Consumer Recycled Content: 0%

Post Industrial Recycled Content: 0%

Manufacturing Location: Michigan Center, MI

*NOTE: LEED® is a registered trademark of the U.S. Green Building Council.



Physical Properties

Property	Typical Performance
Base:	EPDM Rubber
Color:	Black
Solvents:	Light Aliphatic Solvent
Solids by Volume:	80% (minimum)
Press-Flow Viscosity:	30 to 50 seconds to extrude 20 g through 0.104" (2.64 mm) diameter orifice at 72 °F to 74 °F (22.2 °C to 23.3 °C)
Weight:	11.2 to 12.2 lb/gal (1.34 to 1.46 kg/L)
Specific Gravity:	1.34 to 1.46
V.O.C. Content:	Less than 2.1 lb/gal (250 g/L)

Please contact Quality Building Services Technical Department at 1-800-428-4511 for further information.

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TECHNICAL INFORMATION SHEET

Water Block Seal (S-20)

Item Description

Cartridge: 10 fl oz (300 mL)
Carton: 25 Cartridges

Item Number

W563587071



Product Information

Description:

Water Block Seal (S-20) is designed to provide a seal when used in compression as required by Firestone Details.

Product Packaging

Cartridge:	10 fl oz (300 mL)
Carton:	25 Cartridges
Carton Weight:	Approximately 27 lb (12 kg)

Method of Application:

1. Surfaces which Water Block Seal (S-20) is applied shall be free from loose concrete, stone, mortar, foreign materials, and other contaminants.
2. Apply a 3/8" (9.5 mm) to 1/2" (12.7 mm) bead to substrate surface.
3. Bring the mating surface of the flashing membrane into contact with the Water Block Seal (S-20).
4. Roll or press the flashing membrane firmly against the Water Block Seal (S-20) and substrate, avoiding wrinkles.
5. Complete the detail per Firestone Specifications and Details.

Storage:

- Store in original unopened containers, at temperatures between 60 and 80 °F (15.6 and 26.7 °C) until ready for use.
- When exposed to lower temperatures, restore to room temperature prior to use.
- For optimum results, rotate stock to ensure stored material has not exceeded the shelf life of one (1) year.

Shelf Life:

- Shelf life of one (1) year can be expected when stored in original sealed containers at temperatures between 60 and 80 °F (15.6 and 26.7 °C).
- Shelf life will be shortened if exposed to sustained elevated temperatures.

Coverage Rate:

Coverage of approximately 10' (3.1 m) per cartridge of 3/8" to 1/2" (9.5 to 12.7 mm) bead.

Clean-Up:

Recommended cleaners are mineral spirits, naphtha, or kerosene.

TECHNICAL INFORMATION SHEET



Water Block Seal (S-20)

Precautions:

1. Review Material Safety Data Sheet (MSDS) prior to use.
2. Flammable. Keep away from fire and open flames during storage and use. Do not smoke when using.
3. Do not thin.
4. Do not contaminate with foreign materials.
5. Avoid prolonged contact with skin.
6. Use only in well ventilated areas.
7. Water Block Seal (S-20) is **not** designed to be used as an exposed caulk.

LEED® Information:

Postconsumer Recycled Content: 0%
Preconsumer Recycled Content: 0%
Manufacturing Location: Evansville, IN

Physical Properties

Property	Typical Performance
Base:	Butyl Rubber
Color:	Gray
Solvents:	Heptane
Solids:	86%
Viscosity at 80 °F (27 °C):	1,6000,000 ± 300,000 cps
Specific Gravity:	1.31
Weight/Gallon:	10.93 lb/gal (1.31 kg/L)
V.O.C. Content:	1.47 lb/gal (176 g/L)

Please contact your Firestone Roof Systems Advisor at 1-800-428-4511 for further information.

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TECHNICAL INFORMATION SHEET

QuickSeam™ Corner Flashing

TIS #1408

ITEM NUMBER: W56RAC1646

Description:

QuickSeam Corner Flashing consists of Firestone FormFlash™ factory laminated to QuickSeam Tape. It is 8.5" (216 mm) in diameter and is designed to flash inside and outside corners of RubberGard™ EPDM roof systems.



Method of Application:

1. Use QuickPrime™ Plus and a QuickScrubber™ or QuickScrubber Plus pad and handle to clean and prime mating surfaces.
2. When cloudy conditions below 60 °F (15.6 °C) occur, use heat guns (without ignition sources) to heat QuickSeam Corner Flashing. This will ensure good formability of the QuickSeam Corner Flashing to the primed substrate.
3. On sunny days less than 70 °F (21.1 °C), place QuickSeam Corner Flashing on roof (prior to application) with flashing side up to allow QuickSeam Corner Flashing to warm to ensure good formability.
4. On sunny days greater than 70 °F (21.1 °C), place QuickSeam Corner Flashing on roof (prior to application) with release paper side up to prevent QuickSeam Corner Flashing from gaining too much heat and to ensure good formability.
5. Refer to Firestone Specifications and Details. Refer to application instructions for specifics: Technical Database, www.firestonebpco.com.

Storage:

- Store in original unopened containers indoors at temperatures between 60 °F (15.6 °C) and 80 °F (26.7 °C).
- Do not store on roof in direct sunlight or at temperatures above 80 °F (26.7 °C).
- When exposed to lower temperatures; restore to room temperature prior to use.
- Shelf life of one year can be expected when stored in original container at temperatures between 60 °F (15.6 °C) and 80 °F (26.7 °C).
- Shelf life will be shortened if exposed to elevated temperatures.

Precautions:

- Refer to Material Safety Data Sheet (MSDS).

Compliance:

Post Consumer Recycled Content: 0%
Pre Consumer Recycled Content: 0%
Manufacturing Location: Prescott, AR

Packaging:	
Units	20 units per carton 100 cartons per pallet

Physical Properties:	Value	Physical Properties:	Value
QuickSeam Tape:		FormFlash:	
Base	Rubber Polymers	Base	EPDM
Color	Black	Color	Black
Solvents	None	Solvents	None
Solids	100%	Solids	100%
Cured State	Cured	Cured State	Uncured
Thickness	0.025" (0.64 mm) ± 0.005" (0.127 mm)	Thickness	0.065" (1.59 mm) ± 0.005" (0.127mm)

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TECHNICAL INFORMATION SHEET

Firestone
BUILDING PRODUCTS

QuickSeam™ Flashing

TIS #1402

ITEM NUMBER:

5" x 100' W56RAC1615

Description:

QuickSeam Flashing is a semi-cured EPDM flashing laminated to cured seam tape. QuickSeam Flashing is used to flash gravel stops and other details as specified in the Firestone Specifications and Details.



Method of Application:

1. Use QuickPrime™ Plus and QuickScrubber™ or QuickScrubber Plus pad and handle to clean and prime membrane and metal mating surfaces.
2. Refer to Firestone Specifications and Details.
3. Refer to application instructions for specifics: Technical Database, www.firestonebpco.com.

Storage:

- Store in original unopened containers indoors at temperatures between 60 °F (15.6 °C) and 80 °F (26.7 °C).
- Do not store on roof in direct sunlight or at temperatures above 80 °F (26.7 °C).
- When exposed to lower temperatures; restore to room temperature prior to use.
- Shelf life of one year can be expected when stored in original container at temperatures between 60 °F (15.6 °C) and 80 °F (26.7 °C).
- Shelf life will be shortened if exposed to elevated temperatures.

Precautions:

- Refer to Material Safety Data Sheet (MSDS).
- QuickSeam Flashing is semi-cured. **Do not stretch.**

Compliance:

Post Consumer Recycled Content: 0%
Pre Consumer Recycled Content: 0%
Manufacturing Location: Prescott, AR



Packaging:

Roll	5" (76.3 mm) x 100' (30.48 m) roll, 2 rolls per carton Rolls may consist of two separate sections of QuickSeam Flashing to make 100' (30.5 m) total length.
Pallet	36 cartons per pallet

NOTE: QuickScrubber and/or QuickScrubber Plus pads and handles are included in each carton. Quantities vary depending on the QuickSeam product.

Physical Properties:

	Value
QuickSeam Tape:	
Base	Rubber Polymers
Color	Black
Solvents	None
Solids	100%
Cured State	Cured
Thickness	0.045" (1.14 mm) ± 0.005" (0.13 mm)
Width	5-1/4" (133.3 mm) + 0, - 1/16"
Length	100' (30.5 m)

Physical Properties:

	Value
EPDM Flashing:	
Base	EPDM
Color	Black
Solvents	None
Solids	100%
Cured State	Semi-Cured
Thickness	0.045" (1.14 mm) ± 10%
Width	5" (133.3 mm) + 0, - 1/8"
Length	100' (30.5 m)

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TECHNICAL INFORMATION SHEET

QuickSeam™ Joint Cover

ITEM NUMBER: W56RAC1644

TIS #1406



Description:

QuickSeam Joint Cover is uncured FormFlash™ laminated to QuickSeam tape. A second 3" (76.2 mm) layer of tape is applied at the center and is a special uncured, flowable QuickSeam tape compound. The QuickSeam Joint Cover conforms to irregular surfaces such as encountered at "T" joints, readily providing an excellent seal.

QuickSeam Joint Covers are designed to cover and seal:

- "T" joints formed by field seam intersections.
- Joint covers for seams at change in plane on wall or curb flashings.
- 2" (51 mm) seam plates for RubberGard™ MAX pipe penetration attachment layouts.
- "T" joints formed by the installation of pre-fabricated pipe flashings over field or factory seams.
- As a protection pad under sheet metal joints for EdgeGard™ or snap-on metal.

Method of Application:

1. Clean the RubberGard membrane using QuickPrime™ Plus and the QuickScrubber™ or QuickScrubber Plus pad and handle to remove all dusting agents, dirt and other contaminants that will affect the finished seam.
2. Allow to dry according to the touch-push test.
3. Additional cleaning may be required to assure that the membrane is completely cleaned. (*Caution: more cleaning is needed at factory seams.*)
4. **Cleaning option:** clean the RubberGard membrane using clean cotton cloths and Firestone Splice Wash SW-100 to remove all dusting agents, dirt and other contaminants that will affect the finished seam. Allow to dry.
5. Brush apply Firestone Splice Adhesive SA-1065 over the RubberGard membrane to receive the QuickSeam Joint Cover.
6. Allow to dry according to the touch-push test.
7. Remove the release paper from the joint cover, taking care not to touch the outside edges of the joint cover.
8. Fold the joint cover in half. Position the center of the joint cover over the target point and mate the joint cover to the prepared surface.
9. Roll the mated surface of the joint cover with a 2" (51 mm) silicone roller from the center outward working the joint cover into the step-off or irregularity.
10. Install Seam Edge Treatment per Firestone Specifications and Details.
11. Refer to application instructions for specifics: Technical Database, www.firestonebpco.com

Storage:

- Store in original unopened containers indoors at temperatures between 60 °F (15.6 °C) and 80 °F (26.7 °C).
- Do not store on roof in direct sunlight or at temperatures above 80 °F (26.7 °C).
- When exposed to lower temperatures; restore to room temperature prior to use.
- Shelf life of one year can be expected when stored in original container at temperatures between 60 °F (15.6 °C) and 80 °F (26.7 °C).
- Shelf life will be shortened if exposed to elevated temperatures.

Precautions:

- FormFlash will cure when exposed to heat and over time.
- Uncured 3" (76.2 mm) tape center layer will cure when exposed to heat and over time.
- Refer to Material Safety Data Sheet (MSDS).

Compliance:

Post Consumer Recycled Content: 0%
Pre Consumer Recycled Content: 0%
Manufacturing Location: Prescott, AR

Packaging:

Count	100 per carton	60 cartons per pallet
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TECHNICAL INFORMATION SHEET

Physical Properties:	Value	Physical Properties:	Value
QuickSeam Tape:		FormFlash:	
Base	Rubber Polymers	Material	Uncured FormFlash, conforming to RMA minimum specifications
Color	Black	Color	Black
Solvents	None	Size	5.75" ± 0.125" diameter (146 mm ± 3.17 mm)
Solids	100%	Thickness	0.030" ± 0.005" (0.76 mm ± 0.13 mm)
Cured State	Cured		
Splice Tape (3' (76.2 mm) center layer)	Uncured and flowable		
Thickness	0.030" (0.77 mm) ± 0.005" (0.13 mm)		
Splice Tape (3" (76.2 mm) center layer)	0.037" (0.94 mm) ± 0.005" (0.13 mm)		

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TECHNICAL INFORMATION SHEET

Firestone
BUILDING PRODUCTS

QuickSeam™ Pipe Flashing

Item Description

Black Molded Pipe Flashing

Item Number

W563581063



Product Information

Description:

QuickSeam Pipe Flashings are specifically designed to be used in roofing applications for flashing of round penetrations. QuickSeam Pipe Flashings will fit various penetrations and must be cut to correct pipe diameter before installation. QuickSeam Pipe Flashings may be used to flash penetrations for both RubberGard™ EPDM as well as APP and SBS Modified Bitumen systems. Refer to Firestone details MB-P-5 for use with APP.

Method of Application:

1. Clean the RubberGard membrane using QuickPrime™ Plus, QuickPrime Plus LVOC, Single Ply QuickPrime Primer or Single Ply LVOC Primer using a QuickScrubber™ or QuickScrubber Plus pad and handle to remove all dusting agents, dirt and other contaminants that will affect the finished bond.
2. Allow to dry per the touch-push test.
3. Cut along the top edge of the ring on the QuickSeam Pipe Flashing corresponding to the size of the pipe.
4. Remove the release liner from the tape portion.
5. Install the pipe flashing and roll the flange with a silicone hand roller.
6. Install the clamping ring and Lap Sealant per Firestone Specifications and Details.
7. Install per specific requirements as outlined on the QuickSeam Pipe Flashing Technical Information Sheet located in the Firestone Asphalt Technical Manual.

Storage:

- Store in original unopened containers indoors at temperatures between 60 °F (15.6 °C) and 80 °F (26.7 °C).
- Do not store on roof in direct sunlight or at temperatures above 80 °F (26.7 °C).
- When exposed to lower temperatures; restore to room temperature prior to use.

Shelf Life:

- Shelf life of two years can be expected when stored in original container at temperatures between 60 °F (15.6 °C) and 80 °F (26.7 °C).
- Shelf life will be shortened if exposed to elevated temperatures.

Packaging:

10 Flashing, 10 Stainless Steel champs per carton

Precautions:

- Do not install on uneven substrates.
- Refer to Safety Data Sheet (SDS).

TECHNICAL INFORMATION SHEET



QuickSeam™ Pipe Flashing

LEED® Information:

Post Consumer Recycled Content: 0%

Post Industrial Recycled Content: 0%

Manufacturing Location: Bensenville, IL

*NOTE: LEED® is a registered trademark of the U.S. Green Building Council.

Fit Guidelines: Fits the pipe outside diameters

1.000" - 1.375"	25.4 mm – 34.9 mm
1.625" - 1.875"	41.3 mm – 47.6 mm
2.000" – 2.625"	50.8 mm – 66.7 mm
2.750" – 3.625"	69.8 mm – 92.1 mm
4.000" – 4.500"	102.0 mm – 114.0 mm
5.000" – 5.563"	127.0 mm – 141.0 mm
6.000" – 6.875"	152.4 mm – 174.6 mm

NOTE: For penetrations less than 1" in diameter, use Firestone QuickSeam Conduit Flashing.

Typical Properties

Property	Value
Molded Pipe Flashing:	
Base	Molded EPDM
Color	Black
Sizes	Universal – Fits 1" O.D. to 6.875" O.D. (25.4 mm to 174.6 mm)
Clamp	Stainless Steel – worm gear type (clamps are included)
Pipe Flange	13" (33 cm) outside diameter
Thickness	0.055"-0.075" (1.4 mm – 1.9 mm)
QuickSeam Tape:	
Base	Rubber Polymer
Color	Black
Solvents	None
Percent Solids	100%
Cured State	Cured
Thickness	0.030" (0.762 mm) + 0.005" (0.13 mm)

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TECHNICAL INFORMATION SHEET



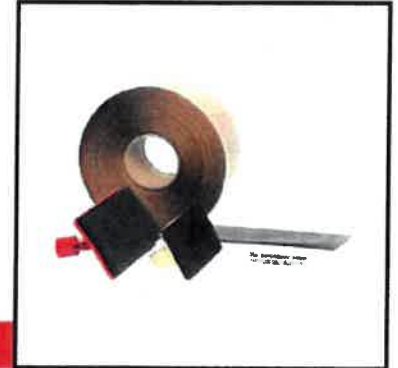
QuickSeam™ Splice Tape

Item Description

3" X 100'
4" X 100'
6" X 100'
7" X 100'

Item Number

W56RAC1603
W56RAC160A
W56RAC1626
W56RAC1617



Product Information

Description:

Firestone 3" (76.2 mm), 4" (101.6 mm) 6" (152.4 mm) and 7" (177.8 mm) QuickSeam Splice Tape is designed for field splicing of RubberGard™ EPDM membrane panels and flashing.

Method of Application:

1. Use QuickPrime™ Plus and a QuickScrubber™ or QuickScrubber Plus pad and handle to clean and prime mating surfaces.
2. Refer to Firestone Specifications and Details.
3. Refer to application instructions for specifics: Technical Database, www.firestonebpco.com.

Storage:

- Store in original unopened containers indoors at temperatures between 60 °F (15.6 °C) and 80 °F (26.7 °C).
- Do not store on roof in direct sunlight or at temperatures above 80 °F (26.7 °C).
- When exposed to lower temperatures; restore to room temperature prior to use.
- Shelf life of one year can be expected when stored in original container at temperatures between 60 °F (15.6 °C) and 80 °F (26.7 °C).
- Shelf life will be shortened if exposed to elevated temperatures.

Precautions:

Refer to Safety Data Sheet (SDS) for further information.

LEED® Information:

Post Consumer Recycled Content: 0%
Post Industrial Recycled Content: 0%
Manufacturing Location: Prescott, AR
*NOTE: LEED® is a registered trademark of the U.S. Green Building Council.



TECHNICAL INFORMATION SHEET



QuickSeam™ Splice Tape

Typical Properties

Property	Value
Base	Rubber Polymers
Color	Black
Solvents	None
Solids	100%
Cured State	Cured
Thickness	0.025" (0.635 mm) ± 0.003" (0.076 mm)
Roll	3" (76.3 mm) x 100' (30.48 m) roll, 6 rolls per carton 4" (101.6 mm) x 100' (30.48 m) roll, 4 rolls per carton 6" (152.4 mm) x 100' (30.48 m) roll, 2 rolls per carton 7" (177.8 mm) x 100' (30.48 m) roll, 2 rolls per carton
Pallet	3" (76.3 mm) x 100' (30.48 m) roll, 40 cartons per pallet 4" (101.6 mm) x 100' (30.48 m) roll, 56 cartons per pallet 6" (152.4 mm) x 100' (30.48 m) roll, 56 cartons per pallet 7" (177.8 mm) x 100' (30.48 m) roll, 56 cartons per pallet

NOTE: QuickScrubber and/or QuickScrubber Plus pads and handles are included in each carton. Quantities vary depending on the QuickSeam product.

Please contact your Firestone Building System Advisor at 1-800-428-4511 for further information.

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TECHNICAL INFORMATION SHEET

Firestone
BUILDING PRODUCTS

QuickPrime™ Plus

TIS #1411

ITEM NUMBER:

1 Quart	W56RAC1695
1 Gallon	W563587041
3 Gallon	W563587044

Description:

QuickPrime Plus is designed to clean and prime RubberGard™ EPDM membranes (LSFR, Platinum, RubberGard Max) prior to application of QuickSeam™ products where required by Firestone Specifications and Details. QuickPrime Plus is NOT acceptable for use on EcoWhite™ EPDM or UltraPly™ TPO.



QuickPrime Plus must be applied with a QuickScrubber™ or QuickScrubber Plus pad and handle when preparing RubberGard membrane to receive QuickSeam Tape products. It may also be used to clean membrane prior to the application of Firestone Splice Adhesive (SA-1065).

Method of Application:

1. Splice surfaces must be clean, dry, and free of foreign materials and excess dusting agent. Clean with broom or rags to remove contaminants.
2. Stir QuickSeam Plus thoroughly before and during use. Apply QuickPrime Plus at the rate of 200 - 250 square feet per gallon (4.91 - 6.14 square meters per liter) per side to the splicing surfaces using the QuickScrubber or QuickScrubber Plus pad and handle.
3. Use back and forth strokes with heavy pressure along the length of the splicing area, until membrane surfaces become dark gray in color with no streaking or puddling.
4. Additional scrubbing is required at factory seams, areas of excess dusting agent, or other contaminated areas of the RubberGard membrane. Change pads every 200' (61 m).
5. When using the QuickScrubber or the QuickScrubber Plus pad and handle, factory seams require parallel as well as perpendicular application motions along the factory seam. Apply sufficient pressure on the QuickScrubber Plus pad and handle during application so the pad holder flattens to allow the total surface of the pad to contact with the RubberGard membrane.
6. Allow the surfaces to dry according to the touch-push test (usually less than 10 minutes) before applying QuickSeam products or Splice Adhesive SA-1065.
7. Complete seaming procedures per Firestone's Specifications and Details.

Storage:

- Store in original unopened containers indoors at temperatures between 60 °F (15.6 °C) and 80 °F (26.7 °C).
- Do not store on roof in direct sunlight or at temperatures above 80 °F (26.7 °C).
- When exposed to lower temperatures; restore to room temperature prior to use.
- Shelf life of one year can be expected when stored in original container at temperatures between 60 °F (15.6 °C) and 80 °F (26.7 °C).
- Shelf life will be shortened if exposed to elevated temperatures.

Precautions:

- Thinning is not allowed.
- Flammable. Keep away from fires (open flame) and other possible ignition sources during storage and use. Do not smoke when using.
- Use only in well-ventilated areas.
- Use of neoprene or nitrile gloves and eye protection with side shield is recommended.
- Use only in conjunction with QuickScrubber or QuickScrubber Plus. Do not apply with rollers, brushes or rags.
- Mix thoroughly before and during use.
- Refer to Material Safety Data Sheet (MSDS).

Compliance:

Post Consumer Recycled Content:	0%
Pre Consumer Recycled Content:	0%
Manufacturing Location:	South Bend, IN



TECHNICAL INFORMATION SHEET

Packaging:		Weight
Container:		
1 Quart (.95 Liter) can	12-1 Quart can/carton	23 lbs/ 10.45 kg
	600-1 Quart cans (50 ctns) /pallet	1150 lbs/ 522.7 kg
1 Gallon (3.78 Liter) pail	4-1 Gallon pails/ carton	32 lbs/14.5 kg
	216-1 Gallon pails (54 ctns)/pallet	1728 lbs/785.5 kg
3 Gallon (11.4 liter) pail	75-3 Gallon pails/pallet	1658.25 lb/ 753.35 kg

Coverage Rates:		
General	200 - 250 square feet per gallon (4.91 - 6.14 square meter per liter) for a one side application	
	100-125 square feet per gallon (2.45 – 3.07 square meter per liter) for a two side application.	
Various Products	3" QuickSeam Tape	375-450' (114-137 m)/ gal
	6" QuickSeam Tape	180-225' (55-68 m)/ gal
	7" QuickSeam Tape	150-200' (46-61 m)/gal
	6" QuickSeam Batten Cover	300-375' (91-114 m)/gal
	5" QuickSeam Flashing	340-400' (104-122 m)/gal

Physical Properties:	Value
Base	Synthetic Rubber Polymers
Color	Translucent Grey
Solvents	Heptane, Toluene
Percent Solids	16-18%
Viscosity	Very thin, free flowing
Weight (Nominal)	6.62 lb/gal (0.79 kg/L)
Specific Gravity	0.793 nominal (h ₂ O=1)
Flash Point	0.0°F (-17.8°C)
V.O.C. Content	Not to exceed 5.55 lb/Gal (664 g/L)

Please Contact your Firestone Roof Systems Advisor at 1-800-428-4511 for further information.

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TECHNICAL INFORMATION SHEET

ISO 95+™ GL Insulation

Provide flat and tapered insulation per drawings.

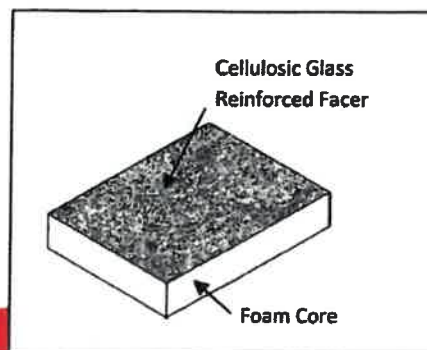
Item Description

Flat and Tapered Polyiso Boards

<u>Flat Boards:</u>	4' x 4' (1.22 m x 1.22 m)
	4' x 8' (1.22 m x 2.44 m)
<u>Tapered Boards:</u>	4' x 4' (1.22 m x 1.22 m)
<u>Slope range:</u>	1/16" per foot (.5%) to 1/2" per foot (4%)
<u>Thickness range:</u>	0.5" (12.7 mm) to 4.5" (114.3 mm)

Meets or exceeds performance requirements of ASTM C 1289, Type II, Class 1

Product Information



Description:

Firestone ISO 95+ GL flat and tapered roof insulation consists of a closed-cell polyiso foam core laminated to a black glass reinforced mat facer on both major surfaces. Flat and tapered ISO 95+ GL insulation provides outstanding thermal performance on commercial roofing applications, while providing positive rooftop drainage to help eliminate ponding water when tapered ISO 95+ GL insulation is used.

All Firestone polyisocyanurate insulations use EPA accepted blowing agents. Firestone ISO 95+ GL incorporates a HCFC-free blowing agent that does not contribute to the depletion of the ozone layer (ODP-free).

Method of Application:

1. Insulation shall be neatly fitted to all roof penetrations, projections and nailers.
2. No more insulation shall be installed than can be covered with membrane and completed before the end of each day's work or before the onset of inclement weather.
3. Firestone ISO 95+ GL board may be installed using:
 - Firestone fasteners and plates

NOTE: For ballasted systems, the top layer of Firestone insulation may not be mechanically attached.

 - Hot asphalt (requires a cover board)
 - Firestone approved insulation adhesives
 - I.S.O. Twin Pack™
 - I.S.O. Stick™
 - I.S.O. Spray™ R
 - I.S.O. FIX™ II

Acceptable Immediate Substrates:

- 3,000 psi Structural concrete (must be clean, dry, and properly cured)
- Steel deck (min 22 ga)
- Plywood and OSB (min 1/2")
- Lightweight concrete
- Gypsum deck (min 2")

NOTE: Please consult the Design Guides and QuickSpecs online at www.firestonebpco.com to review specific information regarding the assembly.

Storage:

- Keep insulation dry at all times
- Elevate insulation above the deck or ground
- Cover insulation with waterproof tarps

TECHNICAL INFORMATION SHEET

ISO 95+™ GL Insulation

Precautions:

- Polyiso foam will burn if exposed to a flame of sufficient heat and intensity. Keep away from heat, sparks, and open flames.
- Protect against dust that may be generated during installation.
- Refer to Safety Data Sheet (SDS) for additional information.
- Take care when transporting and handling Firestone insulation to avoid physical damage.

Specification Compliance:

ASTM C1289, Type II, Class 1
UL Classified—UL1256
FM Class 1 Approved
Manufactured in an ISO 9001 Registered Facility
CAN/ULC-S704, Type 1, Class 3



CCMC 13274-L

LEED® Information:

See Recycled Content in table below.

Manufacturing Locations: Florence, KY Corsicana, TX Bristol, Ct
De Forest, WI Salt Lake City, UT Youngwood, PA
Jacksonville, FL

NOTE: Miami Dade Classified polyiso is only produced in the Jacksonville, FL and Youngwood, PA facilities.

Typical Properties (Meets ASTM C 1289, Type II, Class 1)

Property	ASTM Test Method	Firestone Typical Performance
Compressive Strength:	D1621	Grade 2: 20 psi (138 kPa)
		Grade 3: 25 psi (172 kPa) *
Density:	D1622	2 pcf (32 kg/m³)
Dimensional Stability:	D2126	<2%
Moisture Vapor Transmission:	E96	<1 perm (<57.5 ng/(Pa·s·m²))
Water Absorption:	C209	<1% by volume
Service Temperature:	—	-100 to 250 °F (-73 to 121 °C)
Flame Spread:	E84	Index 50
Smoke Development:	E84	Index 160 - 180

*25 psi (172 kPa) available upon request.

TECHNICAL INFORMATION SHEET



ISO 95+™ GL Insulation

Product Information

Thickness*		(R-Value) **	Max Flute Span		Approx. Recycled Content		
inches	mm		inches	mm	Post Consumer	Post Industrial	Total
0.5	12.70	2.9	1.50	38.10	52%	15%	67%
1.0	25.40	5.7	2.62	66.67	37%	15%	52%
1.1	27.94	6.3	2.62	66.67	36%	15%	51%
1.2	30.48	6.8	2.62	66.67	34%	15%	49%
1.3	33.02	7.4	3.67	93.34	32%	15%	47%
1.4	35.56	8.0	3.67	93.34	30%	15%	45%
1.5	38.10	8.6	4.37	111.12	29%	15%	44%
1.6	40.64	9.1	4.37	111.12	27%	15%	42%
1.7	43.18	9.7	4.37	111.12	26%	15%	41%
1.75	44.45	10.0	4.37	111.12	26%	15%	41%
1.8	45.72	10.3	4.37	111.12	25%	15%	40%
1.9	48.26	10.8	4.37	111.12	24%	15%	39%
2.0	50.80	11.4	4.37	111.12	24%	15%	39%
2.1	53.34	12.0	4.37	111.12	22%	15%	37%
2.2	55.88	12.6	4.37	111.12	21%	15%	36%
2.25	57.15	12.9	4.37	111.12	21%	15%	36%
2.3	58.42	13.2	4.37	111.12	21%	15%	36%
2.4	60.96	13.8	4.37	111.12	20%	15%	35%
2.5	63.50	14.4	4.37	111.12	20%	15%	35%
2.6	66.04	15.0	4.37	111.12	19%	15%	34%
2.7	68.58	15.6	4.37	111.12	18%	15%	33%
2.75	69.85	15.9	4.37	111.12	18%	15%	33%
2.8	71.12	16.2	4.37	111.12	18%	15%	33%
2.9	73.66	16.8	4.37	111.12	17%	15%	32%
3.0	76.20	17.4	4.37	111.12	17%	15%	32%
3.1	78.74	18.0	4.37	111.12	16%	15%	31%
3.2	81.28	18.6	4.37	111.12	16%	15%	31%
3.25	82.55	18.9	4.37	111.12	16%	15%	31%
3.3	83.82	19.2	4.37	111.12	16%	15%	31%
3.4	86.36	19.9	4.37	111.12	15%	15%	30%
3.5	88.90	20.5	4.37	111.12	15%	15%	30%
3.6	91.44	21.1	4.37	111.12	14%	15%	29%
3.7	93.98	21.7	4.37	111.12	14%	15%	29%
3.75	95.25	22.0	4.37	111.12	14%	15%	29%
3.8	96.52	22.3	4.37	111.12	14%	15%	29%
3.9	99.06	23.0	4.37	111.12	14%	15%	29%
4.0	101.60	23.6	4.50	114.30	14%	15%	29%
4.1	104.14	24.2	4.50	114.30	13%	15%	28%
4.2	106.68	24.9	4.50	114.30	13%	15%	28%
4.25	107.95	25.2	4.50	114.30	13%	15%	28%
4.3	109.22	25.5	4.50	114.30	13%	15%	28%
4.4	111.76	26.1	4.50	114.30	13%	15%	28%
4.5	114.3	26.8	4.50	114.30	13%	15%	28%

*Other thicknesses available upon request.

**R- values provide a 15-year time-weighted average in accordance with CAN/ULC-S770.

Please contact Quality Building Services Technical Department at 1-800-428-4511 for further information.

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Manufacturer

Georgia-Pacific Gypsum LLC Georgia-Pacific Canada LP
 133 Peachtree Street 2180 Meadowvale Boulevard, Suite 200
 Atlanta, GA 30303 Mississauga, ON L5N 5S3
 Technical Service Hotline: 1-800-225-6119

Description

DensDeck® Prime Roof Board is an exceptional fire barrier, thermal barrier and recovery board used in various commercial roofing systems. The product features a pre-primed surface to make the bond even stronger. The DensDeck design employs fiberglass mats front and back that are embedded into a gypsum core, providing excellent fire resistance and wind uplift properties. The unique construction of DensDeck Prime Roof Board provides superior flute spanning and will help stiffen and stabilize the roof deck. Additionally, DensDeck Prime Roof Board has been shown to withstand delamination, deterioration and jobsite damage more effectively than roofing membrane substrates such as paper-faced gypsum board, fiberboard and perlite insulation. DensDeck Prime Roof Board is resistant to the growth of mold when tested as manufactured, per ASTM D 3273.

Primary Uses

Roof system manufacturers and designers have found DensDeck Prime Roof Board to be compatible with many types of roofing systems, including: modified asphalt, single-ply, metal systems, recover board, as well as an overlayment for polyisocyanurate and polystyrene insulation. DensDeck Prime Roof Board can also be used as a form board for poured gypsum concrete deck in roof applications as well as a substrate for spray foam roofing systems. 1/2" (12.7 mm) and 5/8" (15.9 mm) DensDeck Prime Roof Board may also be used in vertical applications as a backer board or liner for the roof side of parapet walls.

DensDeck Prime Roof Board may allow the bonding of cold mastic modified bitumen and torching directly to the surface. *Consult with the system manufacturer for recommendations on this application.*

DensDeck Prime Roof Board is the preferred substrate for vapor retarders.

Standards and Code Approvals

DensDeck Prime Roof Boards are manufactured to meet ASTM C 1177 and have the following approvals:

- Florida Product Approval Code FL 1250
- Miami-Dade County, Florida NOA 08-0908.10

Recommendations and Limitations

DensDeck Prime Roof Boards are manufactured to act with a properly designed roof system following good roofing practices. The actual use of DensDeck Prime Roof Board as a roofing component in any system or assembly is the responsibility of the roofing system's design authority. Consult with the appropriate system manufacturer and/or design authority for system and assembly specifications and instructions on applying other products to DensDeck Prime Roof Board. Georgia-Pacific does not warrant and is not responsible for any systems or assemblies utilizing DensDeck Prime Roof Board or any component in such systems or assemblies other than DensDeck Prime Roof Board.

The need for a separator sheet between the DensDeck Prime Roof Board and the roofing membrane must be determined by the roof membrane manufacturer or roofing system designer.

Confirm any priming requirements with the membrane manufacturer. When applying solvent-based adhesives or primers, allow sufficient time for the solvent to flash off to avoid damage to roofing components.

DensDeck Prime Roof Boards should not be subjected to abnormal or excessive loads

or foot traffic, such as, but not limited to, use on plaza decks or under steel-wheeled equipment that may fracture or damage the panels. Provide suitable roofing system protection when required.

When using DensDeck Prime Roof Boards for hot-mopped applications, Georgia-Pacific recommends maximum asphalt application temperatures for Type III asphalt of 425°F (218°C) to 450°F (232°C). Application temperatures above these recommended temperatures may adversely affect roof system performance. For application temperatures in excess of 450°F (232°C) and for mopping of type IV asphalt, ribbon or spot mopping or the installation of a perforated base sheet are recommended methods of bonding asphalt in lieu of full mopping. Consult and follow the roofing system manufacturer's specifications for full mopping applications and temperature requirements.

When using DensDeck Prime Roof Board as a substrate for torch applications, ensure that the product is dry and that the proper torching technique is used. Limit the heat to the DensDeck Prime Roof Board. Maintain a majority of the torch flame directly on the roll.

Conditions beyond the control of Georgia-Pacific, such as weather conditions, dew, leaks, application temperatures and techniques may cause adverse effects with roofing systems.

Moisture Management

DensDeck Prime Roof Boards, like other components used in roofing systems, must be protected from exposure to moisture before, during and after installation.

Remove the plastic packaging from all DensDeck Prime Roof Board immediately upon receipt of delivery. Failure to remove the plastic packaging may result in entrapment of condensation or moisture. DensDeck Prime Roof Board stored outside must be stored level and off the ground and protected by a breathable waterproof covering. Provide means for air circulation around and under stored bundles of DensDeck Prime Roof Board. DensDeck Prime Roof Board must be covered the same day as installed.

Avoid application of DensDeck Prime Roof Boards during rain, heavy fog and any other conditions that may deposit moisture on the surface, and avoid the overuse of non-vented, direct-fired heaters during winter months. When roofing systems are installed on new poured concrete or light weight concrete decks or when re-roofing over a wet existing concrete deck, a venting base sheet or vapor retarder should be installed above the concrete to retard the migration of water from the concrete into the roof assembly. Always consult the roofing system manufacturer or design authority for specific instructions for applying other products to DensDeck Prime Roof Boards.

Moisture vapor movement by convection must be eliminated, and the flow of water by gravity through imperfections in the roof system must be controlled. After a leak has occurred, no condensation on the upper surface of the system should be tolerated, and the water introduced by the leak must be dissipated to the building interior in a minimum amount of time.

Although DensDeck Prime Roof Boards are engineered with fiberglass facings and high density gypsum cores, the presence of free moisture can have a detrimental effect on the performance of the product and the installation of roofing membranes. For example, hot asphalt applications can blister; torched modified bitumen may not properly bond; and adhesives for single ply membranes may not dry properly. Moisture accumulation may also significantly decrease wind uplift and vertical pull resistance in the system or assembly. DensDeck Prime Roof Boards containing excessive free moisture content may need to be evaluated for structural stability to assure wind uplift performance.

Fire Resistance Classifications

DensDeck Prime Roof Boards are excellent fire barriers over combustible and noncombustible roof decks, including steel decks.

Submittal Approvals

Job Name _____
 Contractor _____
 Date _____

continued →

Stamps / Signatures

UL 790 Classification. DensDeck Prime Roof Boards have been classified by Underwriters Laboratories (UL) for use as a fire barrier over combustible and noncombustible decks in accordance with the ANSI/UL 790 test standard.

The UL classification includes a comprehensive Class A, B or C rating. For additional information concerning the UL 790 classification, consult the UL Certification Directory.

UL 1256 Classification. DensDeck® Prime Roof Boards have also been classified by UL in roof deck constructions for internal (under deck) fire exposure in accordance with the ANSI/UL 1256 Steiner Tunnel test. For additional information concerning the UL 1256 classification, consult the UL Certification Directory.

FM Class 1 Approvals. DensDeck Prime Roof Boards are included in numerous roofing assemblies with a Factory Mutual (FM) Class 1 fire rating. 1/4" (6.4 mm) DensDeck Prime Roof Boards have passed testing under the FM Calorimeter Standard 4450 and have been approved by FM as such for insulated steel deck roofs when installed according to the conditions identified by FM. For more information concerning FM Approvals and FM Class 1 assemblies with DensDeck Prime Roof Boards, consult FM or RoofNav®.

Type X. 5/8" (15.9 mm) DensDeck® Prime Fireguard® Roof Boards are manufactured to meet the "Type X" requirements of ASTM C 1177 for increased fire resistance beyond regular gypsum board.

UL Fire Resistance Ratings. 5/8" (15.9 mm) DensDeck Prime Fireguard Roof Boards are designated as **Type DD** by UL and included in assembly designs investigated by UL for hourly fire resistance ratings. 5/8" (15.9 mm) DensDeck Prime Fireguard Roof Boards may also replace any unclassified 5/8" (15.9 mm) gypsum board in an assembly in the UL Fire Resistance Directory under the prefix "P".

Flame Spread and Smoke Developed. When tested in accordance with ASTM E 84, DensDeck Prime Roof Boards had Flame Spread 0, Smoke Developed 0.

Wind Uplift

DensDeck Prime Roof Boards are included in numerous assemblies evaluated by FM or other independent laboratories for wind uplift performance. For information concerning such assemblies, please visit www.roofnav.com.

Physical Properties

Properties	1/4" (6.4 mm)	1/2" (12.7 mm)	5/8" (15.9 mm)
Thickness, nominal	1/4" (6.4 mm) ± 1/16" (1.6 mm)	1/2" (12.7 mm) ± 1/32" (.8 mm)	5/8" (15.9 mm) ± 1/32" (.8 mm)
Width, standard	4' (1219 mm) ± 1/8" (3 mm)	4' (1219 mm) ± 1/8" (3 mm)	4' (1219 mm) ± 1/8" (3 mm)
Length, standard	4' (1219 mm) and 8' (2438 mm) ± 1/4" (6.4 mm)	4' (1219 mm) and 8' (2438 mm) ± 1/4" (6.4 mm)	4' (1219 mm) and 8' (2438 mm) ± 1/4" (6.4 mm)
Weight, nominal, lbs./sq. ft. (Kg/m²)	1.2 (5.9)	2.0 (9.8)	2.6 (12.7)
Surfacing	Fiberglass mat with non-asphaltic coating	Fiberglass mat with non-asphaltic coating	Fiberglass mat with non-asphaltic coating
Flexural Strength¹, parallel, lbf. min. (N)	40 (178)	80 (356)	100 (444)
Flute Spanability²	2-5/8" (66.7 mm)	5" (127 mm)	8" (203 mm)
Permeance³, perms (ng/Pa·S·m²)	>50 (>2850)	>35 (>1995)	>32 (>1824)
R Value⁴, ft²·°F·hr/BTU (m²·K/W)	.28	.56	.67
Linear Variation with Change in Temp., in/in °F (mm/mm/°C)	8.5 x 10⁻⁶ (15.3 x 10⁻⁶)	8.5 x 10⁻⁶ (15.3 x 10⁻⁶)	8.5 x 10⁻⁶ (15.3 x 10⁻⁶)
Linear Variation with Change in Moisture	6.25 x 10⁻⁴	6.25 x 10⁻⁴	6.25 x 10⁻⁴
Water Absorption⁵, % max	10.0	10.0	10.0
Compressive Strength⁶, psi nominal	900	900	900
Surface Water Absorption, grams, nominal	≤2.0	≤2.0	≤2.0
Flame Spread, Smoke Developed (ASTM E 84)	0/0	0/0	0/0
Bending Radius	5' (1524 mm)	8' (2438 mm)	12' (3658 mm)

1. Tested in accordance with ASTM C 473 method B.
2. Tested in accordance with ASTM E 661.
3. Tested in accordance with ASTM E 96 (dry cup method).

4. Tested in accordance with ASTM C 518 (heat flow meter).
5. Tested in accordance with ASTM C 1177.
6. Tested in accordance with ASTM C 473.



U.S.A. — Georgia-Pacific Gypsum LLC
 Canada — Georgia-Pacific Canada LP

SALES INFORMATION AND ORDER PLACEMENT

U.S.A. Midwest: 1-800-876-4746 West: 1-800-824-7503
 South: 1-800-327-2344 Northeast: 1-800-947-4497

CANADA Canada Toll Free: 1-800-387-6823
 Quebec Toll Free: 1-800-361-0486

TECHNICAL INFORMATION

U.S.A. and Canada: 1-800-225-6119
www.gpgypsum.com

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WARRANTIES, REMEDIES AND TERMS OF SALE For current warranty information for this product, please go to www.gpgypsum.com and select the product for warranty information. All sales of this product by Georgia-Pacific are subject to our Terms of Sale available at www.gpgypsum.com.

UPDATES AND CURRENT INFORMATION The information in this document may change without notice. Visit our website at www.gpgypsum.com for updates and current information.

CAUTION For product fire, safety and use information, go to www.gp.com/safetyinfo or call 1-800-225-6119.

HANDLING AND USE—CAUTION This product contains fiberglass facings which may cause skin irritation. Dust and fibers produced during the handling and installation of the

product may cause skin, eye and respiratory tract irritation. Avoid breathing dust and minimize contact with skin and eyes. Wear long sleeve shirts, long pants and eye protection. Always maintain adequate ventilation. Use a dust mask or NIOSH/MSHA-approved respirator as appropriate in dusty or poorly ventilated areas.

FIRE SAFETY CAUTION Passing a fire test in a controlled laboratory setting and/or certifying or labeling a product as having a one-hour, two-hour, or any other fire resistance or protection rating and, therefore, as acceptable for use in certain fire rated assemblies/systems, does not mean that either a particular assembly/system incorporating the product, or any given piece of the product itself, will necessarily provide one-hour fire resistance, two-hour fire resistance, or any other specified fire resistance or protection in an actual fire. In the event of an actual fire, you should immediately take any and all actions necessary for your safety and the safety of others without regard for any fire rating of any product or assembly/system.

Section 07900

Joint Sealants

Vulkem® 45SSL

Semi-Self-Leveling, Single-Component, Polyurethane Sealant

Product Description

Vulkem® 45SSL is a semi-self-leveling, single-component, moisture-curing, low-modulus, polyurethane sealant.

Basic Uses

Vulkem 45SSL is formulated for use in expansion joints in sidewalks, swimming pool decks, plazas, floors and any other horizontal surfaces with slopes up to 6% (e.g. 1' rise for every 16' run).

Features and Benefits

- Vulkem 45SSL is a traffic rated, pourable, semi-self-leveling sealant with exceptional primerless adhesion and movement capability.
- Vulkem 45SSL is suitable for continuous immersion in non-chlorinated water.
- The Vulkem 45SSL technology provides the sealant with greater UV resistance and will not out gas.
- Vulkem 45SSL provides exceptional wear and tear resistance required in high traffic areas.
- Formulated with an innovative polymer technology, similar to TREMproof® 250GC and Dymonic® 100, Vulkem 45SSL is highly versatile and has a unique capability to adhere to damp or green concrete.

Availability

Vulkem 45SSL is immediately available from your local Tremco Sales Representative, distributor, or warehouse.

Coverage Rates

308' of joint per gallon for a 1/4" x 1/4" (6 mm x 6 mm) joint. For specific coverage rates that include joint size, and usage efficiencies, visit our website usage calculator at www.tremcosealants.com

Packaging

1-qt (890-mL) cartridges
2-gal (7.6-L) pails
5-gal (18.9-L) pails
55-gal (208-L) drums

Colors

Black, Buff, Gray, Limestone, White.

Shelf Life

1 year when stored at 40 to 100 °F (5 to 38 °C)

Storage

Store Vulkem 45SSL in original, undamaged packaging in a clean, dry, protected location with temperatures between 40 to 110 °F (5 to 43 °C).

Applicable Standards

Vulkem 45SSL meets or exceeds the requirements of the following specifications:

- ASTM C920, Type S, Grade P, Class 35, Use T, M, A, O and I (Class 2)
- CAN/CGSB 19.13-M87, MC-1-25-B-N
- ASTM E 1966/UL 2079

Fire Rated Systems

FF-D-1062, and FW-D-1058

Limitations

- Use with adequate ventilation.

- Always utilize the accompanying MSDS for information on Personal Protective Equipment (PPE) and Health Hazards.
- Vulkem 45SSL is not recommended for use in chlorinated, potable, heavy or waste water.
- Although Vulkem 45SSL is paintable, this does not imply adhesion to and compatibility with all paints. Please refer to Tremco Technical Bulletin No. S-09-05 for more information.

Substrate Preparation

Surfaces must be sound and clean. All release agents, existing waterproofing, dust, loose mortar, paints, other finishes or field applied coating must be removed. This can be accomplished with a thorough wire brushing, grinding, sandblasting, or solvent washing, depending on the contamination.

Tremco recommends that surface temperatures be 40 °F (5 °C) or above at the time the sealant is applied. If sealant must be applied in temperatures below 40 °F, please refer to the Tremco Technical Bulletin for Applying Sealants in Cold Conditions (No. S-08-44 rev 1) that can be found on our website at www.tremcosealants.com

Priming

Vulkem 45SSL typically adheres to common construction substrates without primers. However, Tremco always recommends that a mock-up or field adhesion test be performed on the actual materials being used on the job to verify the need for a primer, proper cleaning and prep requirements. A description of the field adhesion test can be found in appendix X1 of ASTM C1193, Standard Guide for Use of Joint Sealants.

Where deemed necessary, use Vulkem® Primer #191 Low-VOC QD on porous substrates and TREMprime® Non-Porous Primer for metals or plastics.

Application

Vulkem 45SSL is easy to apply with conventional caulking equipment. Ensure that the backer rod is properly friction-fitted and any primers have been applied.

Fill the joint completely with a proper width-to-depth ratio, and then tool to ensure intimate contact of sealant with joint substrates.

Dry tooling is always preferred, although compatible wetting agents can be used in limited amounts to slick the spatula if needed after an initial pass.

For a cleaner finish, mask the sides of the joint with tape prior to filling.

Joint Design

Vulkem 45SSL may be used in horizontal joints designed in accordance with accepted architectural/engineering practices. Joint width should be 4 times anticipated movement but not less than 1/4" (6 mm).

Joint Backing

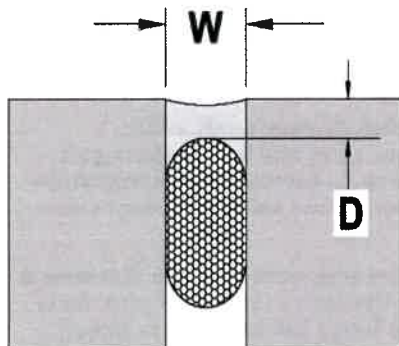
Polyethylene backer rod is recommended as joint backing to control sealant depth and ensure intimate contact of sealant with joint substrate when tooling. Where depth of joint will prevent the use of backer rod, an adhesive backed polyethylene tape (bond breaker tape) should be used to prevent three-sided adhesion. All backing should be dry at the time of sealant application.

Vulkem® 45SSL

Semi-Self-Leveling, Single-Component, Polyurethane Sealant

Sealant Dimensions

W = Sealant width, D = Sealant depth,



Expansion Joints- The minimum width and depth of any sealant application should be 1/4" x 1/4" (6 mm x 6 mm). The depth (D) of sealant may be equal to width (W) of joints that are less than 1/2" wide.

For joints ranging from 1/2" to 1" (13 mm to 25 mm) wide, the sealant depth should be approximately one-half of the joint width. The maximum depth (D) of any sealant application should be 1/2" (13 mm). For joints that are wider than 1" (25 mm) contact Tremco Technical Services or your local Tremco Sales Representative.

Cure Time

At 75 °F (23.9 °C), 50% RH a skin forms within 5 hr. Curing continues at a rate of approximately 1/16" (1.6 mm) per day. The cure time will increase as the temperature and/or humidity decrease. A good rule of thumb is one additional day of cure for every 10 °F decrease in temperature. Cure time can be increased by adding water when using pails of Vulkem 45SSL. Please refer to the Technical Bulletin on Vulkem 45SSL Activator that can be found on our website at: www.tremcosealants.com

Clean Up

Excess sealant and smears adjacent to the joint interface can be carefully removed with xylene or mineral spirits before the sealant cures. Any utensils used for tooling can also be cleaned with xylene or mineral spirits.

Warranty

Tremco warrants its Products to be free of defects in materials, but makes no warranty as to appearance or color. Since methods of application and on-site conditions are beyond our control and can affect performance, Tremco makes no other warranty, expressed or implied including warranties of MERCHANTABILITY and FITNESS FOR A PARTICULAR PURPOSE with respect to Tremco Products. Tremco's sole obligation shall be, at its option, to replace or refund the purchase price of the quantity of Tremco Products proven to be defective, and Tremco shall not be liable for any loss or damage.

Please refer to our website at www.tremcosealants.com for the most up-to-date Product Data Sheets.

Vulkem® 45SSL

Semi-Self-Leveling, Single-Component, Polyurethane Sealant

TYPICAL PHYSICAL PROPERTIES

PROPERTY	TEST METHOD	TYPICAL VALUES
Type		Single component polyurethane sealant
Color		4 Standard Colors
Solids		98%
Specific Gravity		1.32
Application		Semi self leveling sealant, applied with typical caulking equipment
Rheological Properties	ASTM C639	Type I Single component, flowable
Hardness, durometer scale "A"	ASTM C661	40 +/-5
Weight Loss	ASTM C1246	Pass
Skin Time	ASTM C679	2 hr
Tack Free Time	73.4°F (23°C) 50% RH	5 hr
Stain and Color Change	ASTM C510	Pass
Adhesion to Concrete	ASTM C794	31 pli (before water)
Adhesion to Concrete After Immersion	ASTM C794	28 pli
Adhesion to Green Concrete	ASTM C794	>15 pli
Adhesion to Damp Concrete	ASTM C794	>15 pli
Effects of Accelerated Aging	ASTM C793	Pass
Movement Capability	ASTM C719	+/-35%
Movement Capability	ASTM C719* Modified	+100/-50%
Tensile Strength	ASTM D412	250 to 300 psi
% Elongation	ASTM D412	600 to 750%
Tear Strength	ASTM D412	35 psi
Service Temperature		-40 to (-40 to 37°C)
Application Temperature		40 to 100°F (4 to 37 °C)

0815/V45SSLDS-STPlease refer to our website at www.tremcosealants.com for the most up-to-date Product Data Sheets.**Tremco Commercial Sealants & Waterproofing**

3735 Green Rd
Beachwood OH 44122
216.292.5000 / 800.321.7906

1451 Jacobson Ave
Ashland OH 44805
419.289.2050 / 800.321.6357

220 Wicksteed Ave
Toronto ON M4H1G7
416.421.3300 / 800.363.3213

1445 Rue de Coulomb
Boucherville QC J4B 7L8
514.521.9555

Tremflex® 834

Siliconized Interior Acrylic Latex Sealant

Product Description

Tremflex® 834 is a pure acrylic latex sealant formulated to provide a fast-setting pliable seal with minimal shrinkage.

Features and Benefits

Tremflex 834 is an easy gunning, non-staining, general purpose sealant formulated from the highest quality acrylic polymer to offer exceptional flexibility and workability for any commercial construction acrylic sealant application. It can be used indoors or outside, and is tack-free in 15 minutes and ready to paint in 30-45 minutes with latexes or oil-based paint. It also has been tested for acoustical properties to reduce sound transmissions when constructing partition walls.

Basic Uses

Tremflex 834 can be used for general purpose interior and exterior caulking and as a back bedding glazing compound. It is also highly recommended as an acoustical seal in the construction of interior walls, ceilings and floors. It is also suitable for use on vinyl, aluminum and wood siding as well as on bathroom and kitchen fixtures.

Colors

Clear, Limestone, White

Packaging

10.1 oz (300 mL) cartridges, 20 oz. (600 mL) sausages, and 5 gallon (18.9 L) pails.

Availability

Tremflex 834 is immediately available from your local Tremco Sales Representative or Distributor. For Distributor locations, visit www.tremcosealants.com

Coverage Rate

35 linear feet of joint per 10.1 oz (300ml) cartridge for a 1/4" x 1/4" joint. For specific coverage rates that include joint size, and usage efficiencies, visit our website usage calculator at tremcosealants.com

Applicable Standards

Tremflex 834 meets or exceeds the requirements of the following specifications:

- ASTM C-834, Type OP, Grade -18°C
- CAN/CGSB 19-GP-17M

Joint design

Tremflex 834 may be used in any vertical or horizontal joint designed in accordance with accepted architectural/engineering practices. Joint width should be 4 times anticipated movement, but not less than 1/4" (6.4mm).

Joint backing

Closed cell or reticulated polyethylene backer rod is recommended as joint backing to control sealant depth and to ensure intimate contact of sealant with joint walls when tooling. Where depth of joint will prevent the use of backer rod, an adhesive backed polyethylene tape (bond breaker tape) should be used to prevent three-sided adhesion. All backing should be dry at time of sealant application.

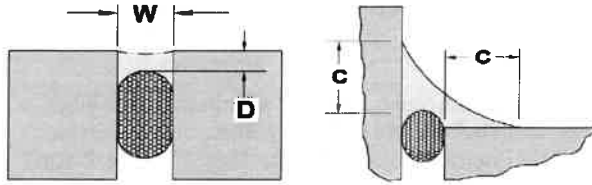
TYPICAL PHYSICAL PROPERTIES

ASTM C834

Extrudability	(ASTM C 1183)	6 g/s
Artificial Weathering	(ASTM C 732)	
Wash-out		None
Slump		None
Cracking		None
Discoloration		None
Adhesion Loss		None
Volume Shrinkage	(ASTM C 1241)	22.4% (Type OP) 35.3% (Type C)
Low Temperature Flexibility	(ASTM C 734)	No cracks, No adhesion loss
Extension – Recovery and Adhesion	(ASTM C 736)	
Recovery		93.7%
Adhesion Loss		None
Slump	(ASTM D2202)	2 mm
Stain Index	(ASTM D 2203)	0 mm
Tack-free Time	(ASTM D 2377)	15 min.
Tack-free Time	(ASTM C 679)	3 hours, 55 minutes
Movement Capability		±12.5%

Sealant dimensions

W = Sealant width, D = Sealant depth, C = Contact area.



EXPANSION JOINTS - The minimum width and depth of any sealant application should be 1/4" by 1/4" (6 mm by 6 mm).

The depth (D) of sealant may be equal to the width (W) of joints that are less than 1/2" wide. For joints ranging from 1/2" to 1" (13 mm to 25 mm) wide, the sealant depth should be approximately one-half of the joint width.

The maximum depth (D) of any sealant application should be 1/2" (13 mm). For joints that are wider than 1" (25 mm) contact Tremco's Technical Service Department, or your local Tremco field representative.

WINDOW PERIMETERS - For fillet beads, or angle beads around windows and doors, the sealant should exhibit a minimum surface contact area (C) of 1/4" onto each substrate.

Surface preparations

Surfaces must be sound, clean, and dry. All release agents, existing waterproofing, dust, loose mortar, laitance, paints, or other finishes must be removed. This can be accomplished with a thorough wire brushing, grinding, sandblasting, or solvent washing, depending on the contamination.

Tremco recommends that surface temperatures be 40°F (5°C) or above at the time the sealant is applied. If sealant must be applied in temperatures below 40°F, please refer to the Tremco Guide for Applying Sealants in Cold Weather that can be found on our website at www.tremcosealants.com.

Priming

Tremflex 834 adheres to common construction substrates without primers; however, Tremco always recommends that a mock-up or field adhesion test on the actual materials being used on the job be conducted to verify adhesion. The field adhesion test can be found in appendixes X1 of ASTM C 1193, Standard Guide for Use of Joint Sealants.

Application

Apply Tremflex 834 with conventional caulking equipment filling the joint from the bottom first. Immediately tool the sealant with a spatula to ensure intimate contact with the joint walls. Dry tooling is always preferred, although water can be used in limited amounts to slick the spatula if needed. For window and door perimeter fillet bead applications, a 1/4" minimum surface area is recommended.

Dry Time

At 72°F (22°C), 50% R.H., Tremflex 834 is tack free in 15 minutes and dries at a rate of about 1/8" per day but can be painted after only 30 to 45 minutes with latexes, or oil-based paint. As the temperatures decrease, the dry time of Tremflex 834 will increase. A good rule of thumb is one additional day for every 10°F decrease in temperature.

Clean up

Excess sealant and smears along the joint interface can be cleaned up or removed with soapy water before the sealant skins. Any utensils used for tooling can also be cleaned with soapy water.

Limitations

- Do not apply Tremflex 834 to damp or contaminated surfaces.
- Always utilize the accompanying MSDS for information on Personal Protective Equipment (PPE), and health hazards.

Warranty

Tremco warrants its sealants to be free of defects in materials, but makes no warranty as to appearance or color. Since methods of application and on-site conditions are beyond our control and can affect performance, Tremco makes no other warranty, expressed or implied including warranties of MERCHANTABILITY and FITNESS FOR A PARTICULAR PURPOSE, with respect to Tremco sealants. Tremco's sole obligation shall be, at its option, to replace or refund the purchase of the quantity of Tremco sealant proven to be defective and Tremco shall not be liable for any loss or damage.

Please refer to our website at www.tremcosealants.com for the most up-to-date Product Data Sheets.



Dymonic® 100

High Performance, High Movement Polyurethane Sealant

Product Description

Dymonic® 100 is a high performance, medium-modulus, low-VOC, UV stable, non-sag polyurethane sealant. Formulated with an innovative polymer technology similar to TREMproof 250GC and Vulkem 45 SSL, Dymonic 100 is a highly versatile sealant that has a unique capability to adhere to damp or green concrete.

Basic Uses

Dymonic 100 is a durable, flexible, sealant that offers excellent performance in moving joints and exhibits tenacious adhesion once fully cured. Typical applications for Dymonic 100 include expansion and control joints, precast concrete panel joints, perimeter caulking (windows, door, panels), aluminum, masonry and vinyl siding.

Features and Benefits

Dymonic 100 can adhere to damp or green concrete and has a skin time of 2 hours with a tack-free time of 6-8 hours to significantly reduce dirt pickup. It has a movement capability of +100/-50% in typical field conditions, is low-VOC, paintable and will not crack, craze or yellow under extreme UV exposure. It is also jet fuel resistant.

Dymonic 100 is compatible with Tremco's line of Vulkem Deck Coatings, ExoAir air barrier products and the cold, fluid-applied TREMproof line of below-grade waterproofing products.

Availability

Dymonic 100 is immediately available from your local Tremco Sales Representative, Tremco distributor or warehouse.

Colors

Almond, Aluminum Stone, Anodized Aluminum, Beige, Black, Bronze, Buff, Dark Bronze, Gray, Gray Stone, Hartford Green, Ivory, Light Bronze, Limestone, Natural Clay, Off White, Precast White, Redwood Tan, Sandalwood, Stone, White

Packaging

10.1-oz (300ml) cartridges; 20-oz (600ml) sausages.

Coverage Rates

308 linear feet of joint per gallon for a 1/4 in. x 1/4 in. (6mm x 6mm) joint. For specific coverage rates that include joint size, and usage efficiencies, visit our website usage calculator at www.tremcosealants.com.

Applicable Standards

Dymonic 100 meets or exceeds the requirements of the following specifications:

- ASTM C920 Type S, Grade NS, Class 50, Use NT, T, M, A, O, I
- U.S. Federal Specification TT-S-00230C, Class A, Type II
- CAN/CGSB-19,13-M87

Joint Design

Dymonic 100 may be used in vertical or horizontal joints designed in accordance with accepted architectural/engineering practices. Joint width should be 4 times anticipated movement, but not less than 1/4 in. (6mm).

TYPICAL PHYSICAL PROPERTIES

Property	Test Method	Typical Value
Rheological Properties	ASTM C639	non-sag (NS), 0" of sag in channel
Hardness Properties	ASTM C661	40 ± 5
Weight Loss	ASTM C1246	Pass
Skin Time	ASTM C679	2-3 hr
Tack Free Time at 73.4° F (23° C) 50% RH		6-8 hr
Stain & Color Change	ASTM C510	No visible color change/No stain
Effects of Accelerated Aging	ASTM C793	Pass
Movement Capability	ASTM C719	+50%
	ASTM C719*	+100/-50%
	ASTM D412	
Tensile Properties		
Tensile Strength		350-450 psi
% Elongation		800-900%
Modulus at 100%		75-85 psi
Tear Strength	ASTM D624	65-75 psi
Service Range		-40° F (-40° C) to 180° F (82° C)
Application Temperature		32° F (0° C) to 100° F (38° C)
Smoke Development	ASTM E84	5
Flame Spread	ASTM E84	5

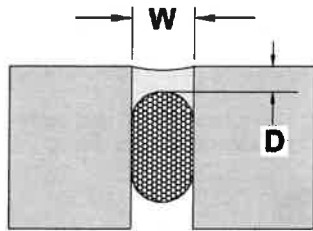
*Modified ASTM C 719

Joint Backing

Closed cell or reticulated polyethylene backer rod is recommended as joint backing to control sealant depth and to ensure intimate contact of sealant with joint walls when tooling. Where depth of joint will prevent the use of backer rod, an adhesive backed polyethylene tape (bond breaker tape) should be used to prevent three-sided adhesion. All backing should be dry at time of sealant application.

Sealant dimensions

W = Sealant width, D = Sealant depth, C = Contact area.



EXPANSION JOINTS - The minimum width and depth of any sealant application should be 1/4 in. by 1/4 in. (6mm by 6mm). The depth (D) of sealant may be equal to the width (W) of joints that are less than 1/2 in. wide. For joints ranging from 1/2 in. to 1 in. (13mm to 25mm) wide, the sealant depth should be approximately one-half of the joint width.

The maximum depth (D) of any sealant application should be 1/2 in. (13mm). For joints that are wider than 1 in. (25mm) contact Tremco Technical Services or your local Tremco Sales Representative.

WINDOW PERIMETERS - For fillet beads, or angle beads around windows and doors, the sealant should exhibit a minimum surface contact area (C) of 1/4 in. (6mm) onto each substrate, with provisions for release at the heel of the angle using backer rod or bond breaker tape.

Surface Preparations

Surfaces must be sound and clean. All release agents, existing waterproofing, dust, loose mortar, paints, or other finishes must be removed. This can be accomplished with a thorough wire brushing, grinding, sandblasting, or solvent washing, depending on the contamination.

Tremco recommends that surface temperatures be 40° F (5° C) or above at the time the sealant is applied. If sealant must be applied in temperatures below 40° F, please refer to the Tremco Guide for Applying Sealants in Cold Weather that can be found on our website at www.tremcosealants.com.



Priming

Dymonic 100 typically adheres to common construction substrates without primers. However, Tremco always recommends that a mock-up or field adhesion test be performed on the actual materials being used on the job to verify the need for a primer. A description of the field adhesion test can be found in appendix X1 of ASTM C 1193, Standard Guide for Use of Joint Sealants. Where deemed necessary, use Vulkem Primer #171 on porous substrates and TREMPRIME Non-Porous Primer for metals or plastics.

Application

Dymonic 100 is easy to apply with conventional caulking equipment. Ensure that the backer rod is friction fitted properly and any primers have been applied. Fill the joint completely with a proper width-to-depth ratio, and tool to ensure intimate contact of sealant with joint walls. Dry tooling is always preferred, although compatible wetting agents can be used in limited amounts to slick the spatula if needed after an initial pass. For a cleaner finish, mask the sides of the joint with tape prior to filling.

Cure Time

Dymonic 100 generally cures at a rate of 3/32 in. per day at 75° F (24° C) and 50% relative humidity. Dymonic 100 will skin in 2 hours and be tack free in 6-8 hours. The cure time will increase as temperatures and/or humidity decrease. A good rule of thumb is one additional day for every 10° F decrease in temperature.

Clean up

Excess sealant and smears adjacent to the joint interface can be carefully removed with xylene or mineral spirits before the sealant cures. Any utensils used for tooling can also be cleaned with xylene or mineral spirits.

Limitations

- Use with adequate ventilation.
- Always utilize the accompanying MSDS for information on Personal Protective Equipment (PPE) and health hazards.

Warranty

Tremco warrants its Products to be free of defects in materials but makes no warranty as to appearance or color. Since methods of application and on-site conditions are beyond our control and can affect performance, Tremco makes no other warranty, expressed or implied including warranties of MERCHANTABILITY and FITNESS FOR A PARTICULAR PURPOSE, with respect to Tremco Products. Tremco's sole obligation shall be, at its option, to replace or refund the purchase of the quantity of Tremco Product proven to be defective, and Tremco shall not be liable for any loss or damage.

Please refer to our website at www.tremcosealants.com for the most up-to-date Product Data Sheets.

Tremco Commercial Sealants & Waterproofing

3735 Green Road, Beachwood, OH 44122 // Phone: 216.292.5000 // 800.321.7906
220 Wicksteed Avenue, Toronto, ON M4H 1G7 // Phone: 416.421.3300 // 800.363.3213
1451 Jacobson Avenue, Ashland OH 44805 // Phone: 419.289.2050 // 800.321.6357


COLORSEAL™

U. S. Patent No. 5,130,176

TECH DATA

Manufacturer:

EMSEAL JOINT SYSTEMS, LTD

25 Bridle Lane

Westborough, MA 01581

PH: 508-836-0280 TOLL FREE: 1-800-526-8365 FX: 508-836-0281

EMSEAL, LLC

120 Carrier Drive

Toronto, Ontario, Canada M9W 5R1

PH: 416-740-2090 FX: 416-740-0233

Product Description

- **COLORSEAL** combines factory-applied low-modulus silicone, acrylic-impregnated expanding foam sealant and closed-cell (EVA) foam into a unified binary sealant system.

- The expanding foam laminations are EMSEAL's GREYFLEX™ – open-cell polyurethane foam impregnated with a water-based, stabilized, polymer-modified acrylic.

- The silicone external and color weather facing is factory-applied to the foam while it is partially pre-compressed. The silicone is then cured and when finally compressed, a bellows is formed in the coating. The bellows virtually eliminates tensile stresses at the silicone/substrate interface.

- Puncturing of the silicone facing does not affect seal integrity (ASTM 1105-90).

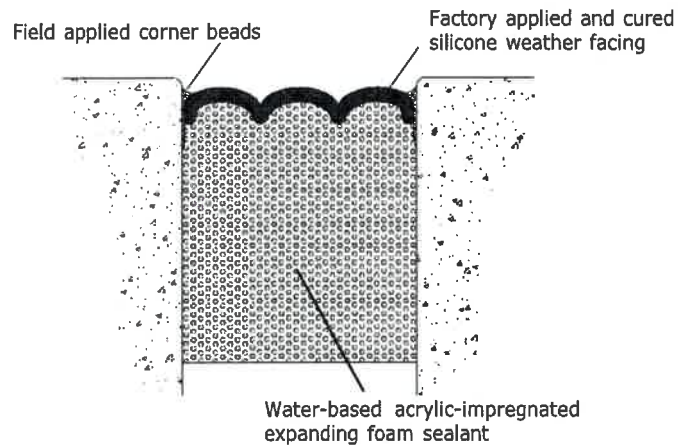
- **COLORSEAL** is supplied precompressed to less than the joint size. It is packaged in shrink-wrapped lengths called sticks, with a self-adhesive on one side. After insertion, it expands to fill and seal the joint.

- Sealing against the substrate is achieved through a combination of the pressure-sensitive adhesive impregnation, and 2 ½ pounds of backpressure per square inch of the expanding foam in conjunction with a field applied corner bead.

Uses

- **Facades:** **COLORSEAL** is used in vertical and horizontal joints in building facades, soffits etc. of precast concrete, brick, natural stone, metal and most other substrates.

FIGURE 1: COLORSEAL in Typical Installation
(substrates may vary).



COLORSEAL with silicone corner beads in a typical installation. Corner beads shown may be dispensed with in certain applications.

- **EIFS:** **COLORSEAL** is uniquely suited to properly sealing both new and retrofit expansion joints in Exterior Insulation and Finish Systems. These potentially weak substrates benefit from the minimal tension at joint interface; effects of air-pressure differential are reduced by virtue of **COLORSEAL's** depth and density; elimination of the moisture-trap area commonly created between wet sealants and backer rods; it thermally insulates the EIFS cladding at joints.

- **Panelized Systems:** As in EIFS, **COLORSEAL** is ideally suited to sealing many other panelized cladding systems that rely on "barrier-wall" sealing principles including metal cladding, window-wall systems, skylights, precast panels, etc.

- **Horizontal Deck Joints** (See "HORIZONTAL COLORSEAL" Tech Data Sheet.

- **Seismic & High Movement Joints:** Reduced compression of the expanding foam backing, a field-applied corner-bead, and the silicone "bellows" acting as the sealing element means **SEISMIC COLORSEAL** is capable of movements up to $\pm 50\%$ (total 100%) of joint size at mean temperature. (See "**SEISMIC COLORSEAL**" Tech Data).

Advantages

- A binary seal – the combined unified primary and secondary seal confers redundancy.
- Features the UV resistance, durability and impermeability of silicone.
- Virtually eliminates tensile stresses at bond line and adverse effects of movement occurring before field applied silicone cures.

....cont/

TABLE 1: TYPICAL PHYSICAL PROPERTIES & TESTING

PROPERTY / TEST	VALUE	TEST METHOD
COLORS	STANDARD: PRECAST WHITE, BLACK, GREY, LIMESTONE, NATURAL STONE, BRONZE, SAND-STONE, ADOBE TAN, DUSTY ROSE, RUSTIC BRICK, BLUE SPRUCE, CHARCOAL	
Durometer Hardness	Silicone Coating: Shore A, 15 pts.	ASTM D2240
STAINING	NONE	ASTM C510
Weatherometer	Xenon Arc Weatherometer	ASTM G26-77
	2000 hrs—No visible deterioration	
INTENTIONAL DAMAGE	XENON ARC WEATHEROMETER	ASTM G26-77
PRIMARY SURFACE	2000 HRS.—NO PERFORMANCE CHANGE.	
Primary Surface Weathering	Atlas Weatherometer	ASTM G26-77
	6000 hrs—Minimal hardness change	
TEMPERATURE RANGE		
HIGH PERMANENT	185°F (85°C)	ASTM C711
LOW PERMANENT	-40°F (-40°C)	
Tensile Strength	21 psi min; 145 kPa	ASTM D3574
THERMAL CONDUCTIVITY	0.34 BTU. IN/HR. FT ² °F (0.05 W/M. °C)	ASTM C518
Rate of Air Leakage Through Curtain Walls	Passed	ASTM E283
WATER PENETRATION OF CURTAIN WALLS BY UNIFORM STATIC AIR PRESSURE DIFF.	UP TO 20.88 PSF—PASSED	ASTM E331
Structural Performance of Curtain Walls by Uniform Air Pressure Diff. (Gust Loads)	+62.66 PSF, -56.39 PSF—Passed	ASTM E330

Warranty

Standard or project-specific warranties are available from EMSEAL on request.

Technical Services

For detail and project review, and recommendations for the proper use of EMSEAL products, consult manufacturer and local representatives.

Availability & Price

EMSEAL products are available throughout the United States and Canada. Prices are available from local representatives or direct from the manufacturer. The EMSEAL product range is continually being updated. Accordingly, we reserve the right to modify or withdraw any product without prior notice.

"Dow Corning" is a registered trademark of Dow Corning Corporation, Midland, MI

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TABLE 2: COLORSEAL SIZING

JOINT SIZE AT MEAN		DEPTH OF SEAL
T°F		
1/2"	(12mm)	1-1/2" (40mm)
3/4"	(20mm)	1-1/2" (40mm)
1"	(25mm)	1-3/4" (40mm)
1-1/4"	(30mm)	2-1/4" (55mm)
1-1/2"	(40mm)	2-3/8" (60mm)
1-3/4"	(45mm)	2-3/8" (60mm)
2"	(50mm)	2-1/2" (65mm)
2-1/4"	(55mm)	2-1/2" (65mm)
2-1/2"	(65mm)	2-3/4" (70mm)
2-3/4"	(70mm)	3" (75mm)
3"	(75mm)	3-1/2" (90mm)
3-1/2"	(90mm)	3-3/4" (95mm)
4"	(100mm)	4-3/4" (120mm)
5"	(125mm)	5-1/2" (140mm)
6"	(150mm)	6" (150mm)
7"	(175mm)	7" (175mm)
8"	(200mm)	8" (200mm)

• Select nominal material size to correspond to joint size at mean temperature.

• Material is supplied in shrink-wrapped sticks of 6.56 ft. (2 m).

Advantages cont...

- Reduces installation labor and materials, ex: priming; need for accurate positioning of a backer-rod; site mixing and tooling; etc; and less reliant on meticulous substrate-preparation.
- Seal integrity maintained even if silicone facing punctured.
- Mechanically anchored by back-pressure inherent in the permanently elastic open-cell foam as well as adhered to the substrate by the pressure sensitive adhesive impregnation.
- Eleven colors (see list in table above, or contact EMSEAL).
- Supplied precompressed to less than joint size--no field compression required.
- Standard sizes from 1/2" (12mm) to 8" (200mm). For other sizes, consult EMSEAL Technical Services.

- Joint movement capacity $\pm 25\%$ (50% total) of mean temperature joint size.

Installation

- Store indoors at room temperature. Expansion is quicker when warm, slower when cold.
- Ensure material nominal size ordered matches field-measured, mean-temperature joint size.
- Remove shrink-wrap packaging, hardboard, and self-adhesive release paper.
- Cut 45° miter where material will be joined and wipe silicone onto miter face.
- Insert material into joint and adhere to one side. Material expands to seal joint. (Wedge larger-sized material in place while it expands).
- Install corner beads where specified.

BC-158

One-Part Butyl Rubber Sealant

Specification Data Sheet



**PECORA
CORPORATION**
Architectural Weatherproofing Products
U.S.A. • since 1962

1. BASIC USES

Provides a durable long-lasting seal between all types of masonry, steel, aluminum, glass, wood and other common construction materials. Also for sealing glass in channel glazing panels, caulking joints, mullions and flashings in curtain wall construction, and installation of insulated glass units in metal or wood frames. BC-158 is USDA approved for use in food processing plants.

2. MANUFACTURER

Pecora Corporation
165 Wambold Road
Harleysville, PA 19438
Phone: 215-723-6051
800-523-6688
Fax: 215-721-0286
Website: www.pecora.com

3. PRODUCT DESCRIPTION

Pecora BC-158 is a one-part gun grade caulking, sealing and glazing compound formulated from virgin butyl rubber. Because of the well-known durability of butyl rubber, BC-158 provides a long-lasting durable seal between joints of similar and dissimilar surfaces.

Limitations:

- Where joints are continuously submerged in water, joints subjected to foot or vehicular traffic.
- In window glazing applications or hidden joint details, which require a non-skinning, non-hardening sealant

PACKAGING

- 10.1 fl. Oz (300 ml) cartridge

COLOR

- Black, Tru-White, Aluminum Stone

4. TECHNICAL DATA

Applicable Standards: Meets requirements of Federal Specification AAMA 808.3-05, ASTM C-1311 (+/- 7.5% joint movement), TT-S-001657, Type I and TT-C-1796A

5. INSTALLATION

Joint Design: For optimum performance, joints should be designed for no more than 5% extension or compression. Neither the width or the depth of the joint should be less than 1/4" (6 mm). Ideally, the depth should be one half the width. The maximum recommended width is 3/4" (19 mm), with a depth range of 1/4" to 3/8" (6 to 9 mm).

Surface preparation: Joints must be clean, dry and free of foreign matter, including form-release and curing agents in concrete joints or protective coatings on aluminum. Priming is not required.

Joint Backing: Joint backing materials control the depth of the sealant and permit the sealant to be installed under pressure. Joints should be filled to within 1/2" of the surface with polyethylene or polyurethane backer rod, preferably of a non-gassing, non-absorbing type. Use a size that will compress about 25% when installed. Where it is not possible to use a backer rod, use a bondbreaker tape at the bottom of the joint to prevent three-sided adhesion and allow for free movement of the sealant after it has cured.

TYPICAL PHYSICAL PROPERTIES

Test Property	Typical Values	Test Results
Tack Free Time (hrs.)	2	ASTM D-2377
Shrinkage	20% max.	ASTM D-2453
Press-Flow Viscosity (sec./g)	3 @40 psi	ASTM D-2452
Cure Through (days)	21	ASTM D-2377
VOC (g/L)	<250	ASTM D-3960
Solids (%)	80	ASTM C-681
Flow (inches)	0.15	ASTM D-2202
Weight per Gallon (lbs.)	11.0	ASTM D-1475
Specific Gravity	1.32	ASTM D-1475
Stain Index	#3	ASTM D-2203
Flash Point	105°F (40°C)	ASTM D-56
Service Temp.	-20°F to +200°F	ASTM D-3359
Application Temp.	40°F to +120°F	ASTM C-603

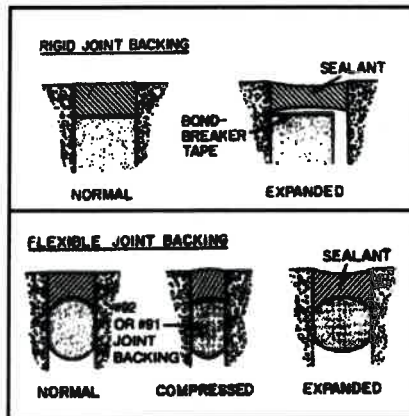
Application: Apply BC-158 at temperatures between 40°F to 120°F using a standard caulking gun.

Glazing: BC-158 offers many advantages in glazing windows due to its extreme durability. Because of the many variables involved in glazing, consult your Pecora representative or Technical Service department for specific recommendations.

Tooling: Tool the joint immediately to assure maximum contact between the sealant and the surfaces to be sealed. Tooling without slicking agents is preferred but if conditions require one, mineral spirits is recommended (follow safety precautions on supplier's SDS).

Cleaning: Tools and equipment can be cleaned with mineral spirits.

Storage Life: BC-158 has a shelf life of 24 months when stored in original unopened containers between 65°F and 110°F.



Precautions: Combustible: Keep away from heat and flame. May cause respiratory tract irritation. Avoid prolonged or repeated breathing of vapor. Use only with adequate ventilation or wear an appropriate NIOSH-approved respirator. Contact with skin or eyes may cause irritation. Avoid contact and wash thoroughly after handling. May be harmful or fatal if swallowed. Refer to the Safety Data Sheet (SDS) for more information.

**FOR PROFESSIONAL USE ONLY.
KEEP OUT OF THE REACH
OF CHILDREN.**

6. AVAILABILITY AND COST

Pecora products are available from stocking distributors nationwide. For the name and telephone number of your nearest representative, call the number below or visit our website at www.pecora.com.

7. WARRANTY

Pecora Corporation warrants its products to be free of defects. Under this warranty, we will provide, at no charge, replacement materials for, or refund the purchase price of, any product proven to be defective when used in strict accordance with our published recommendations and in applications considered by us as suitable for this product. The determination of eligibility for this warranty, or the choice of remedy available under this warranty, shall be made in our sole discretion and any decisions made by Pecora Corporation shall be final. This warranty is in lieu of any and all other warranties, expressed or implied, including but

not limited to a warranty of merchantability or fitness for a particular purpose and in no case will Pecora be liable for damages other than those expressly stated in this warranty, including but not limited to incidental or consequential damages.

8. MAINTENANCE

If the sealant is damaged and the bond is intact, cut out the damaged area and recaulk. No primer is required. If the bond has been affected, remove the sealant, clean and prepare the joint in accordance with the instructions in "INSTALLATION".

9. TECHNICAL SERVICES

Pecora representatives are available to assist you in selecting an appropriate product and to provide on-site application instructions or to conduct jobsite inspections. For further assistance call our Technical Service Department at 800-523-6688.

10. FILING SYSTEMS

- <http://www.4specs.com>
- 07 10 00 Waterproofing
- 07 92 00 Joint Sealants



PEOPLE • PRODUCTS • PERFORMANCE

www.pecora.com

Section 08255

FRP Flush Door Systems

GENERAL CLEANING AND MAINTENANCE

CARE AND MAINTENANCE OF ALUMINUM ENTRANCES

PAGE 22

CAUTION: *Most damage occurs during construction and installation, follow pre-installation cautions to protect your work during this critical stage.*

*** CLEAR 204R-1 ANODIZE FINISH:**

To clean, apply T-43 Xylene (mineral spirits) with a clean rag. If door has fluted pattern, brush with an ordinary cleaning hand brush after applying solvent. If door or frame has a smooth pattern, dry door with a clean rag. For your safety, safety glasses and gloves should be worn when cleaning doors and frames.

To touch-up minor scratches or gouges, use aluminum colored touch-up paint.

*** BRONZE ANODIZED FINISH:**

To clean, follow the same directions above. If you need to repair minor damages that may occur over a period of time, such as scratches or gouges, complete the following procedures:

Clean door. Apply with a small artist brush, Aluminum Black Metal Touch Up by Birchwood Casey (you may substitute gun bluing found in any gun store, for the Aluminum Black). Apply directly to the damaged area and allow to dry a few seconds for lighter bronze finishes and up to one minute for darker bronze finishes. With a clean rag, wipe area with T-43 Xylene. The scratch will turn dark. You may need to repeat this procedure in order to achieve the desired color.

*** PAINTED FINISHES:**

To clean, use a gentle cleaner and lint free cloth. If cleaning fluted pattern, use a clean hand brush to get to dirt in grooves.

Scratches can be touched up by using a small paint brush with approved touch up paint applied directly to the scratch and left to air dry. *(With most paint jobs, Cross Aluminum will provide a spray can of touchup paint.)*

*** SEVERELY DAMAGED DOORS:**

May be repaired on site, in many cases by owner maintenance staff. Call our home office in Niles, Michigan (800)806-DOOR to receive further instructions on how to repair a Cross Aluminum door. This procedure may save several dollars instead of having to replace the door.

*** GLASS CLEANING:**

The following website is a good resource to get up-to-date cleaning procedures for cleaning and protecting different kinds of architectural glass:

Glass Association of North America www.glasswebsite.com - informational bulletins
Proper Procedures for Cleaning Architectural Glass Products

Cross

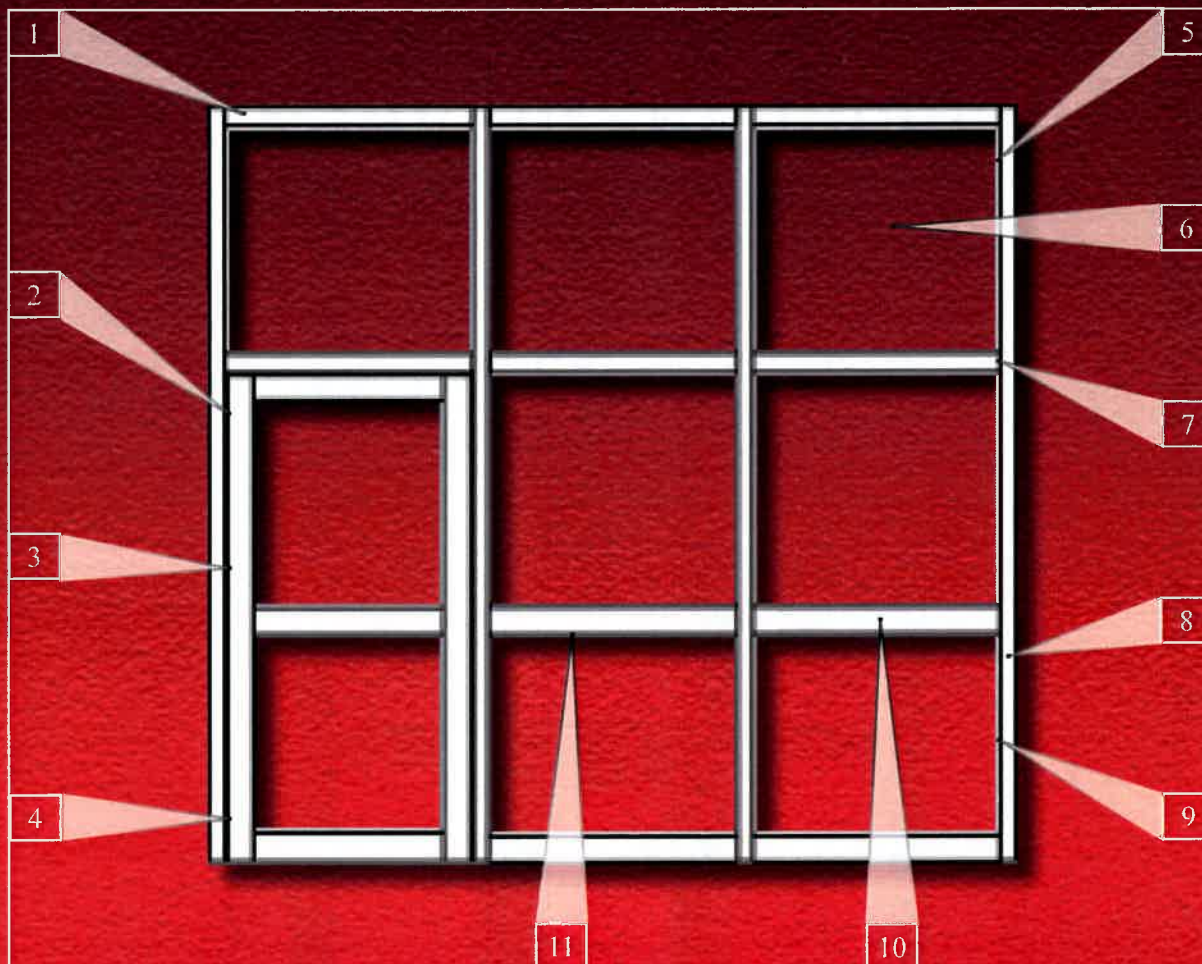
Aluminum Products Inc.

Framing Systems



CROSS...

THE ONLY WAY TO ENTER.



1. Frame Tube Extrusions Sizes Available are:

1-3/4" x 4-1/2"

2" x 4-1/2"

1-3/4" x 6-3/8"

2" x 6- 1/2"

2. Minimum Nominal 1/8" Wall Thickness for Door Opening.

3. Closed Back Tubular Extrusion for Immediate Door Frames - For Added Strength and Durability.

4. 3/16" Thick by 1-1/2" Wide Door Stop for Closer and Strike Reinforcement and Stability (Except on 1-3/4" x 6-3/8" and 2" x 6" Frame Tubes).

5. Flush Glaze Snap In Stops to Hold Glass (In Some Cases a Snap In Sash Will Be Used).

6. Capable of Housing 1/4" or 1" Glass Infill.

7. Frame Joints Tied Together by Either Heavy Duty Shear Block or Screwsplining.

8. Also Available in Thermally Broken 2" x 4-1/2" Tube Extrusions for Sidelites, Transoms, and Fixed Windows.

9. No Two Piece Vertical Snap In Frame Members.

10. Multiple Frame Horizontal Tube Sizes.

11. Infinite Storefront and Fixed Window Designs Available.

FRAMING SYSTEMS SPECIFICATIONS

- ☑ Aluminum framing shall be Cross CDM-450 or CDM-1450 flush glaze series or equal.
- ☑ 4500 Series Framing-1/4" flush glaze framing to be 1-3/4" x 4 1/2" with minimum wall thickness of .125".
- ☑ 14000 Series Framing-1" flush glaze framing to be 2" x 4-1/2" with minimum wall thickness of .125".
- ☑ Cross heavy-duty door stop CDM-32 with 3/16" thick face to be used with immediate door frame.
- ☑ 4500 Series Framing members shall provide for flush glazing of 1/4" glass by use of (70 DURO EPDM) gaskets on both sides of the glass.
- ☑ 14000 Series Framing members shall provide for flush glazing of 1" glass by use of (70 DURO EPDM) gaskets on both sides of the glass.
- ☑ Glass stops to be flush glaze snap in where applicable in 4500 and 14000 Series Framing
- ☑ Screw applied are accepted in certain applications.
- ☑ (MATERIAL) Aluminum framing alloy to be 6063-T5.
- ☑ (FINISHES) Anodized and painted finishes are readily available; subject to architect's request.
- ☑ (OPTIONAL) Steel reinforcement in vertical jambs is available upon request.
- ☑ (OPTIONAL) Aluminum reinforcement in vertical jamb for gear hinge (inside hinge jamb of frame)
- ☑ Cross insert sub frame CDM-10 with heavy-duty walls is available upon request.

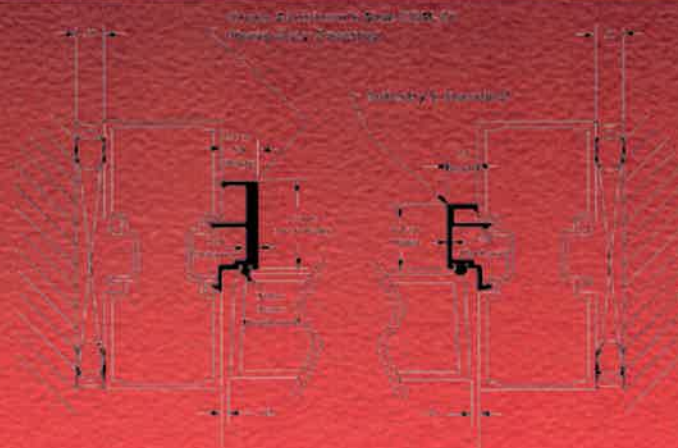


Call our sales team today for our guide specifications written in CSI's Master Format 2004!

Cross Aluminum's Unique Heavy-Duty Doorstop Features:

Our own custom extruded doorstop : 3/16" thick x 5/8" high x 1-1/2" wide. This provides the strength needed to apply closer PA brackets or rim panic strikes without the need for additional expensive reinforcement.

This 5/8" high door stop provides better weathering and added security for uses when overhead concealed stops are called for in hardware specification.



Along with our heavy duty flush and stile & rail doors, Cross Aluminum can provide complete framing systems. Our Framing systems provide customers with the same satisfaction of quality standards found in all of our door series. Immediate frames, sidelites, and transoms, are fabricated in standard and custom designs. Various frame extrusion sizes are available. Thermally broken frame also available.

Additional Frame Advantages:

- ☑ Immediate frames around the doors are fabricated from a tubular "closed back" extrusion.
- ☑ .125" minimum wall thickness.
- ☑ Heavy-duty insert sub-frame available for special applications.
- ☑ Various frame extruded sizes available.
- ☑ Heavy duty custom door stop, 3/16" thick.



FL-400 ENTRANCES

FLUSH PLANK DOORS

The FL-400 series entrances are the most versatile doors we have to offer. This heavy duty entrance is typically used in high traffic and abused areas, such as; schools, universities, waste water treatment plants, highway rest and welcome centers, secure government training facilities, etc. The flexibility inherent with these entrances allows many options for vision lites without compromising quality or strength.

This door type has been our most popular entrance system to date. It is unique in construction from nearly every flush door manufacturer. The door is comprised of 4" aluminum planks interlocked with one another. This eliminates de-lamination of face sheets and increases a building's security. The FL-400 door exceeds the specifications and structural integrity of any flush sheet door on the market. These entrances are constructed to take heavy abuse and last many years.



FL-400 FEATURES



MaintenanceFree- All entrances come with our standard 10 year warranty.



RetroFit- Entrances can replace any existing opening and improve efficiency.



SecureWall- Face thickness is 1/8" with 1/4" internal reinforcement every 4 inches.



InterLock- Doors are interlocked together and completely sealed from the elements.



CustomIntegration- Configurations to match architectural decor of building.



SecureGlaze- Extruded non-removable exterior glazing stops.



MissileImpact- Missile Impact tested in accordance with ASTM E 1886.



EcoFriendly- Secondary billet, acid-etch anodizing, and zero VOC emissions painting.

FL-400 SERIES

FLUSH PLANK DOORS



Features:

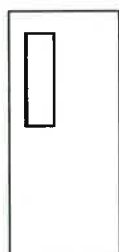
- Hinge and lock stile edges have 3/16" (.1875") thick.
- 3/8" (.375) steel tie rod 3 per door (2 for FG door type)
- 3/8" (.375") thick wall every 4 inches. Minimum 3/8" (0.375") interlock every 4 inches.
- Fluted pattern standard. Smooth pattern also available.
- 1/8" (.125") Closer reinforcement (Eliminates through-bolting).
- Custom finishes available.
- 1-1/2" (1.5") Polyisocyanurate rigid board stock.
- "R" Value 11.23; U Value .089

Advantages:

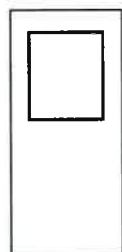
- No back up plates necessary for butt hinges. This eliminates mortising into stile and weakening it.
- No additional charge for larger vision lites in doors.
- Constructed with interlocking extrusions. No delamination of face sheets.
- No need for hardware backups necessary.
- A true 1/8" wall thickness. Almost double the thickness of face sheet manufactured doors.
- Cross Aluminum will provide factory installation of any commercial door hardware as manufactured by other suppliers.

FL-400 Options

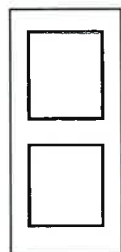
The FL-400 entrances are constructed in a way that allows many visually-appealing options. Custom sizes and configurations of vision lites are available upon request. A few examples are shown below.



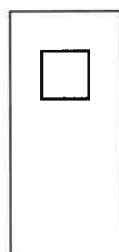
FL-400 NG
Narrow Glass



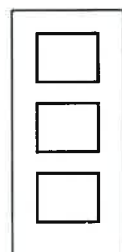
FL-400 HG
Half Glass



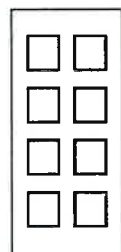
FL-400 DG
Double Glass



FL-400 SG
Square Glass



FL-400 SG-3
Square Glass x 3



FL-400 SG-8
Square Glass x 8

General Composition

- Flush plank doors are 1-3/4" thick.
- Stiles are 4" wide, with a fluted surface and optional smooth surface.
- Door Face Thickness is 1/8" thick with 1/4" thick reinforcing wall every 4".
- Flush plank doors are individual extrusions interlocked together. Minimum 3 tie rods per door.*

*Note: Full Glass Doors will typically have 2 rods.

Glazing and Glass

- Glass stops will always match finish on door unless specified otherwise.
- Exterior glazing is a part of the plank extrusion increasing security. Exterior glazing is non-removable.
- All interior glass stops are screw applied and only removable from the interior. Interior glass stops have 1/8" thick walls.
- Glass infill 1/4" through 1-5/16".

Versatility

- The FL-400 doors have been fabricated to 6' wide and up to 18' tall.
- FL-400 entrances can be manufactured to have narrow lites, half lites, double lites, full lites, etc.

Finishes

- Available in Class I and Class II anodized finishes.
- Kynar painted fluoropolymer finishes with 10 year warranties. AAMA 2605
- Color charts and warranties on finishes are available on request.



1770 Mayflower Road
Niles, MI. 49120
P: 800-806-DOOR
F: 269-697-8340
email: info@crossaluminum.com

Tests:

ASTM E 283 Air Infiltration
ASTM E 330 Uniform Load Structural
ASTM E 331 Water Penetration
ASTM E 1886 Missile Impact Cyclic Pressure
ASTM E 1996 Missile Impact

VISIT US AT WWW.CROSSALUMINUM.COM

WS-500 ENTRANCES

WIDE STILE MONUMENTAL DOORS

The WS-500 stile and rail entrance is the most popular glass door design that Cross Aluminum manufactures. This door design addresses customers' needs to have a heavy-duty, long term maintenance free entrance, and yet enjoy a wide variety of design choices. Cross Aluminum strives to design and manufacture this aesthetically pleasing entrance and still maintain a high degree of structural integrity and security. This entrance is typically used in high traffic and abused areas, such as; schools, universities, malls, highway rest and welcome centers, secure government office buildings, etc. The WS-500 series door exceeds the specifications and structural integrity of typical monumental stile and rail glass door entrances. These entrances will accept virtually all commercial hardware and are very cost competitive. These entrances come with Cross Aluminum's standard ten (10) year warranty on materials and workmanship.



WS-500 FEATURES



MaintenanceFree- All entrances come with our standard 10 year warranty.



RetroFit- Entrances can replace any existing opening and improve efficiency.



InterLock- All entrances will be mortise and tenon construction.



CustomIntegration- Configurations to match architectural decor of building.



SecureGlaze- Extruded non-removable exterior glazing stops.



MissileImpact- Missile Impact tested in accordance with ASTM E 1886.

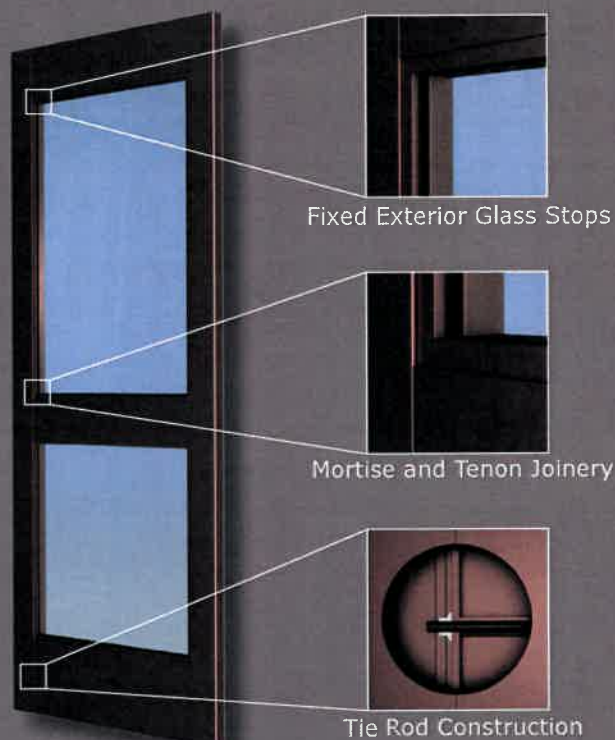


EcoFriendly- Secondary billet, acid-etch anodizing, and zero VOC emissions painting.

WS-500 SERIES

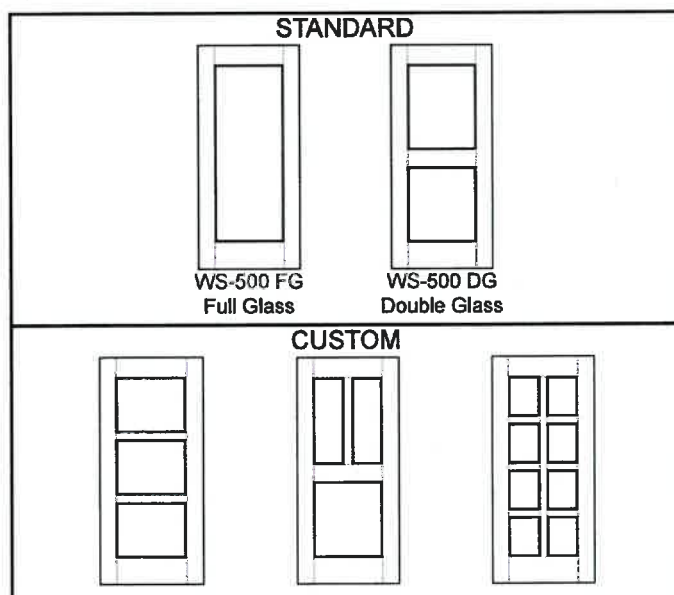
WIDE STILE AND RAIL DOORS

ATTRIBUTES



WS-500 OPTIONS

The WS-500 entrances are constructed in a way that allows many visually-appealing options. Custom sizes and configurations of vision lites are available upon request. A few examples are shown below.



General Composition

- Wide stile glass doors are 1-3/4" thick.
- Stiles are 5" wide, with a smooth surface.
- Stile face thickness is 3/16" thick.
- Horizontal rails are available from 6" to 20".
- Standard top rails are 7" and have a 3/16" wall thickness on interior face in order to avoid through bolting closers.
- Top rail extrusions accept all necessary reinforcements for overhead stops, closers, door position switches, etc.

Glazing and Glass

- Glass stops will always match finish on door unless specified otherwise.
- Exterior glazing is a part of the stile and rail extrusions increasing entrance security.
- All interior glass stops are snap-in or interlocking screw-applied and only removable from the interior.
- Glass infill 1/4" through 1-5/16".

Versatility

- The WS 500 doors have been fabricated to 5' wide and up to 12' tall.
- Horizontal Rails are not limited to the above sizes. Optional sizes available are 2", 4", 8", 12", or more.
- Horizontal rail locations can be adjusted to any location necessary to meet individual preference, building design, and specs.
- Historical Glass Stops can be incorporated to match building decor.

Finishes

- Available in standard Class I and Class II anodized finishes.
- Kynar painted fluoropolymer finishes with 10 year warranties. AAMA 2605
- Decoral® wood grain options available.
- Color charts and warranties on finishes are available on request.

Tests:

ASTM E 283 Air Infiltration
ASTM E 330 Uniform Load Structural
ASTM E 331 Water Penetration
ASTM E 1886 Missile Impact Cyclic Pressure
ASTM E 1996 Missile Impact



1770 Mayflower Road
Niles, MI. 49120
P: 800-806-DOOR
F: 269-697-8340
email: info@crossaluminum.com

VISIT US AT WWW.CROSSALUMINUM.COM



FINISHER OF CHOICE™

ANODIZING

Anodizing is the process of electrochemically accelerating and controlling the oxidation of an aluminum substrate, creating an extremely hard, durable, and aesthetically pleasing coating on the aluminum. Architectural anodize finishes are limited to certain colors; however their hardness and scratch-resistance far surpass that of paint coatings.

QUALITY

Our automated system controls and monitors your product through the entire anodizing process. It tracks all aspects of the process including tank sequencing, voltage, current, time, and temperature, ensuring the most consistent anodize finish available.

CARE & CLEANING

Anodized material has an extremely hard surface that is colorfast and mar resistant. An anodized finish should be cleaned using mild soap solutions to retain its original beauty. The cleaning solution should be applied with a soft cloth, sponge or brush. Avoid the use of acidic or alkaline cleaners. To avoid damage to the finish, anodized aluminum should be placed into walls after mortar has cured. Any uncured masonry product that is not immediately removed from the anodized aluminum will destroy the finish, sometimes beyond repair.

Linetec anodize finishes meet the AAMA-611 specification.

*Standard Finishes



***Clear ANO-215 or ANO-204 AE**



Champagne ANO-300 AE



Light Bronze ANO-301 AE



Medium Bronze ANO-302 AE



Dark Bronze ANO-303 AE



***Dark Bronze (stat.) ANO-304 AE**



Black ANO-305 AE

Section 08710

Door Hardware



Frame, Door, & Hardware Schedule

Project # 18211

BRUMMITT ELEMENTARY

Furnished by:
Mulhaupt's, Inc.
209 North 5th Street
Lafayette, IN 47901
Phone: 765-423-2610
Fax: 765-423-2622

Project Manager:

JACK ZENZ
765-807-5907 direct dial
765-423-2610, ext. 305
jackz@mulhaupt.com

Architect:

TRIA ARCHITECTURE
1820 RIDGE RD, STE 209
HOMWOOD, IL 60430
630-455-4500
630-455-4040

Contractor:

GARIUP CONST. CO.
3965 HARRISON STREET
GARY, IN 46410
(219) 887-5233

Index & Manufacturers List

A. Appendix

1. General note page
2. Project specific note page
3. Hardware mounting height locations

B. Finish hardware schedule

C. Door and frame schedule

D. Frame elevations

E. Door elevations

F. Catalog Cuts

Manufacturers List:

Mfr ID	Manufacturer
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IV	IVES
LC	LCN
SC	SCHLAGE
ZE	ZERO

Product Supplied

CONS FLUSH BOLT, CONT HINGE, COORDINATOR, DUST PRF STRIKE, MOUNTING BRKT CLOSER FULL SIZE CORE, MORTISE LOCK GASKET, SMOKE SEAL, SWEEP, THRESHOLD

GENERAL NOTE PAGE

Submittals

1. Please note this submittal represents our understanding of your requirements based on the contract documents received, information provided by the customer, and qualifications made by us at the time of bid.
2. Please review this entire submittal very carefully and make specific revisions required. Items not revised shall be presumed to be correct as shown and will be manufactured accordingly.
3. Changes to this submittal made by the Architect and/or General Contractor may result in a change to the contract value. Changes made to the approved submittals will be incorporated and proceeded upon. A change order request will be forwarded to the customer if applicable.
4. If ASI's, proposal requests, RFI's, etc. are referenced by the Architect and/or General Contractor on the returned submittals, please include the referenced documents with the returned submittals so all of the information may be forwarded to the engineering department. The absence of referenced documents may delay having the changes incorporated and delay a required resubmittal.

Ordering Materials

1. Please note the General Contractor and/or the Architect must approve and correct the shop drawings prior to the ordering and fabrication of material.
2. Upon receipt of approved shop drawings, clarifications, and field measurements, please allow 7-8 weeks delivery for hollow metal, 10-12 weeks for wood door deliveries, and 7-8 weeks for hardware deliveries. If all or part of this job is required prior to these lead times, please call our office regarding fast track programs.

Product information

1. Please note thru-bolts may not have been scheduled for this job. If they are required, they may be added at this time at no extra charge. If they are required at a later date, there will be an added cost to provide these to you.
2. Per WDMA standards, wood doors must be stored on a flat, level surface in a dry, well-ventilated building. Doors should not be subjected to high heat and/or humidity. Relative humidity should not be less than 25% or greater than 55% and temperatures should not be less than 50 degrees F. or greater than 90 degrees F.
3. Adhesive gasketing products must be stored between 50 degrees F. and 80 degrees F. Higher temperatures may cause the adhesive to melt.
4. If cylinders and keying are part of this scope of work, please provide the Owner's keying contact name, phone number, and email address so that a keying meeting may be arranged.
5. If wood doors are specified to be custom color matched, the General Contractor will be required to submit to Mulhaupt's a minimum of two 8" x 8" samples of the existing/custom veneer. The custom color samples provided by the general contractor will not be returned.

HARDWARE MOUNTING HEIGHT LOCATIONS

Unless noted otherwise in the hardware set, locations shall be as follows:

- | | |
|---|----------------------------------|
| 1. Push Plates | 50" to centerline of plate |
| 2. Pulls | 43" to centerline of pull |
| 3. Pull Plates | 43" to centerline of plate |
| 4. Push Bars | 45" to centerline of bar |
| 5. Exit Device & Outside Trim | Manufacturer's standard template |
| 6. Lever sets | 40" centerline of strike |
| 7. Hospital Latches | 40" to centerline of strike |
| 8. Deadlocks | 34" to centerline of cylinder |
| 9. Hinges | Manufacturer's standard |
| 10. Other hardware items shall be located as recommended by the manufacturer. | |
| 11. All dimensions are from the finished floor. | |

Hardware Schedule

Project ID: 18211 BRUMMITT ELEMENTARY
Current Revision: REV1 FRAME CHANGES

Heading #: 2

* REV1 *	1	PR	Door:1	STORAGE A131 TO STORAGE C-100	RHA/LH	90 MIN	90 °
			2-3'0" x 7'0" x 1 3/4" HMD/HMF 90 MIN				
2	EA	CONT HINGE	224HD 83"	628	(HC-1) IVES		
1	EA	CONS FLUSH BOLT	FB51P - CONSTANT (METAL)	US32D	(BO-1) IVES		
			* INACTIVE LEAF				
1	EA	DUST PRF STRIKE	DP2	US26D	(BO-2) IVES		
			* INACTIVE LEAF				
1	EA	MORTISE LOCK	L9466JD 07A	626	(LO-1) SCHLAGE		
			* ACTIVE LEAF				
2	EA	FULL SIZE CORE	23-030 X VERIFY KEYWAY	626	(CY-1) SCHLAGE		
1	EA	COORDINATOR	COR52-FL20	US28	(CO-1) IVES		
2	EA	MOUNTING BRKT	MB2 (UP TO 2-1/2" STOP)	USP	(CO-2) IVES		
2	EA	CLOSER	4111 SCUSH (PUSH SIDE)	ALUM	(CL-1) LCN		
1	EA	THRESHOLD	545A #223 72"	ALUM	(TH-1) ZERO		
1	EA	SMOKE SEAL	188S BK PSA 21 FT	BLACK	(GA-1) ZERO		
			* PERIMETER SEAL				
1	EA	GASKET	488SBK PS 7 FT	BLACK	(GA-2) ZERO		
			* ASTRAGAL SEAL				
2	EA	SWEEP	39A 36"	ALUM	(SW-1) ZERO		

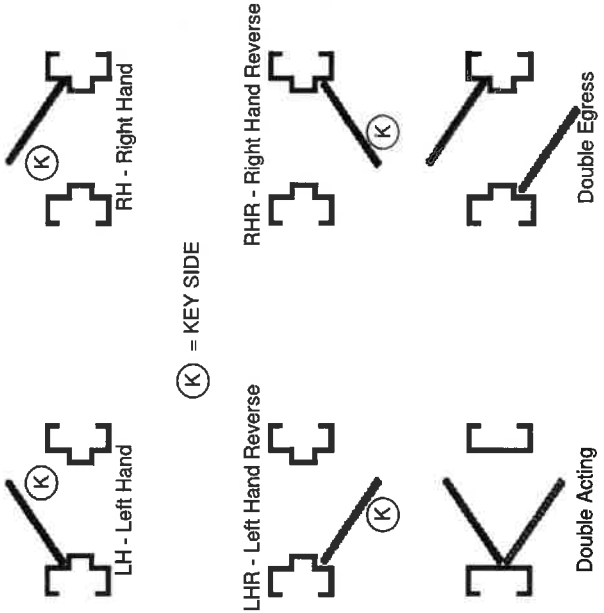
* MOUNT COORDINATOR AND MOUNTING BRACKETS BEFORE CLOSERS.

* STEEL ASTRAGAL SUPPLIED WITH HOLLOW METAL DOOR.

CURRIES Door & Frame Schedule

Distributed By:
MULHAUPT'S, INC.
 209-213 N. 5TH STREET
 LAFAYETTE, IN 47901-
 Phone: (765) 423-2610
 Fax: (765) 423-2622

					
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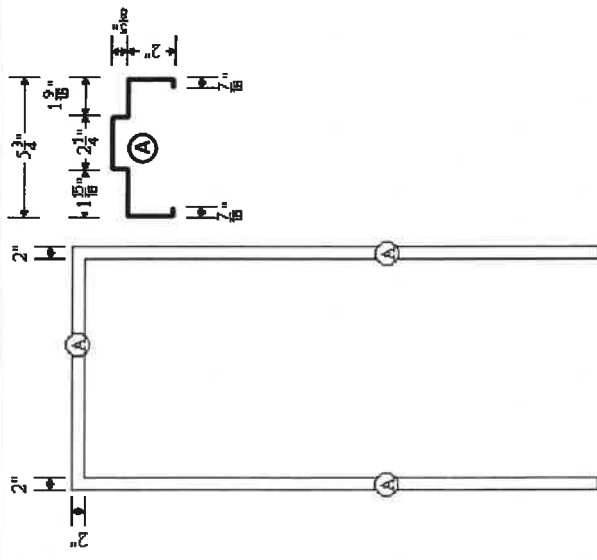
RECORD OF SUBMITTALS		DOOR HANDING CHART		JOB NO. 18211
SUBMITTED	RETURNED	 <p>(K) = KEY SIDE</p> <p>LH - Left Hand Reverse</p> <p>RH - Right Hand Reverse</p> <p>Double Acting</p> <p>Double Egress</p>		PROJECT BRUMMITT ELEMENTARY
1ST				LOCATION CHESTERTON, IN
2ND				ARCHITECT TRIA ARCHITECTURE
3RD				CONTRACTOR GARIUP CONST. CO.
4TH				FINISH HARDWARE BY MULHAUPT'S, INC.
RECEIVED APPROVED DRAWINGS				SHEET NO. OF
RECEIVED APPROVED HARDWARE				
DRAWN BY: RICHARD WOODHEAD				

LEGEND

HM Frames		HM Doors	Wood Doors
<u>Anchor</u>			
WPS	WELD IN PS ANCHORS (8)	SEAM ON EDGE	
<u>Construction</u>			
SW	MULHAUPT'S SEAM WELDED	FLUSH DOOR	
<u>Face Jamb</u>			
1.75	1 3/4" FACE JAMBS	"B" 90 MIN - UL - POSITIVE PRESSURE	
<u>Head Jamb</u>			
1.38	1 3/8" FACE HEAD	COLD ROLLED STEEL	
<u>Label - Agency / Rating / Cert</u>			
L/90	UL 1 1/2 HR LABEL (DBL)		
<u>Steel</u>			
CR	COLD ROLLED STEEL		

Project ID: 18211
Job Number: 18211

Page 3 of 5



F1
Doors #s: 1 (6'0" x 7'0")



F



Meets ANSI A156.3 Type 27.
UL Listed 3 Hour Fire Doors 8'0" x 10'0"

FB51P Top and Bottom Bolts (Pair)

- Constant Latching—Inactive door remains latched until the active door is opened, releasing the automatic bottom bolt and then the top bolt can be manually released. Inactive door will relatch automatically when closed.
- Low Actuation Forces.
- Fits standard ANSI A115.4 Door and Frame Preparations.
- Non-handed.
- 3/4" bolt throw with a 7/8" vertical adjustment.
- 3/4" backset
- Standard Rod Length is 12", which is measured from the center of the flush bolt body to the bolt tip. Optional rod lengths available for top bolt only on non-fire rated openings—18", 24", 36" and 48".

DP1 or DP2 optional dust proof strike available, see page C11.

A
Hinges & Pivots

B
Pulls & Plates

C4
Flush Bolts & Coordinators

D
Latches, Catches & Bolts

E
Stops

F
Exterior Hardware

G
Miscellaneous Hardware



DP1



DP2

Meets Meets ANSI/BHMA 156.16, L14011.

DP1**DP2****Dust Proof Strikes**

- Designed for use with the bottom bolt of all flush bolts.
- Spring-loaded plunger returns to floor or threshold level anytime flush bolt is retracted, eliminating need to clean standard floor strikes.
- Strike hole is 3/4" Diameter and 1-1/8" Deep

Dimensions

DP1 Face Plate: 1-7/16" Diameter

DP2 Face Plate: 1-5/8" W x 3-1/2" L x 1/8" Thick

Body: 1-3/16" Diameter x 1-7/8" Deep

Hinges & Pivots

A

Pulls & Plates

B

Flush Bolts & Coordinators

C11

Latches, Catches & Bolts

D

Stops

E

Exterior Hardware

F

Miscellaneous Hardware

G

A
Hinges & Pivots

B
Pulls & Plates

C12
Flush Bolts & Coordinators

D
Latches, Catches & Bolts

E
Stops

F
Exterior Hardware

G
Miscellaneous Hardware



Meets ANSI/BHMA A156.3, Type 21A.
UL Listed for installation on labeled frame.

COR Series Bar Coordinators

- The COR Series Coordinators are designed for use on pairs of doors when one door needs to close before the other.
- All COR units function easily. The active door lever, located nearest to the active stop, holds the active door open until the trigger mechanism is released by the closing of the inactive leaf.
- All COR units may not function correctly with swingclear hinges.
- All COR units are equipped with an adjustable override feature which allows the active door to close under extreme pressure.
- All COR units are compatible with Flush Bolts.
- The COR Series is available in five sizes for variable door opening widths.
- The COR Series does not cover the entire length of the stop, so a FL filler bar can be provided to maintain architecturally clean lines.
- COR Series Coordinator Channels and FL fillers are made of aluminum.
- Optional Filler Bars: FL20 - 20", FL32 - 32" and FL44 - 44", available to maintain clean line.
- Optional Mounting Brackets available: MB1, MB2, MB1F, MB2F, MB3F, MB1V, MB2V, and MB3V for other stop applied hardware.

For Openings Where Doors Are Same Size

Coordinator Number	Length of Channel	For Opening Widths	Common Applications
COR32	32"	34" - 52"	Pair of 2'0" Doors
COR42	42"	52" - 72"	Pair of 2'6" Doors
COR52	52"	62" - 92"	Pair of 3'0" Doors
COR60	60"	70" - 108"	Pair of 3'6" Doors
COR72	72"	84" - 132"	Pair of 4'0" Doors

For Openings Where Doors Are Unequal Size

The coordinator length should equal the active door width plus approximately 1/2 the inactive door width. The coordinator must be 6" longer than the active door width and shorter than the overall frame opening between stops.



FL

Series Filler Bars

- The FL Filler Bars are available in three sizes for variable frame openings.
- FL Filler Bars are made of aluminum
- FL Filler Bars are field sized to frame opening.

Filler Bar Number	Length	Dimensions
FL20	20"	1-5/8" W x 5/8" D x 20" L
FL32	32"	1-5/8" W x 5/8" D x 32" L
FL44	44"	1-5/8" W x 5/8" D x 44" L

MB1 and MB2

Mounting Brackets



- Allows stop mounted hardware to be properly installed without damaging the COR coordinator, such as a parallel arm closer or a non-fire-rated surface vertical rod strike.
- Stop mounted hardware will need to be lowered to compensate for the height of the coordinator and mounting bracket.
- MB mounting brackets are made of aluminum

Product	Jamb Depth	Stop Width	Dimensions
MB1	4-3/4" Min.	Over 2-1/2"	4" W x 3" D x 15/16" T
MB2	4-3/4" Min.	Up to 2-1/2"	4" W x 3-1/4" D x 1-5/8" T

Hinges & Pivots

A

Pulls & Plates

B

Flush Bolts & Coordinators

C13

Latches, Catches & Bolts

D

Stops

E

Exterior Hardware

F

Miscellaneous Hardware

G

**224HD Full Mortise Aluminum Geared Continuous Hinge**

- Handing required when modified
- Door Edge Protector
- 48" Maximum Door Width
- 1/16" Door Inset
- Beveled or Square Edge Doors

For Doors Weighing up to 450 pounds without reinforcing,
600 pounds with reinforcing

Standard lengths 83", 85", 95", 120"

Standard Mounting Hardware

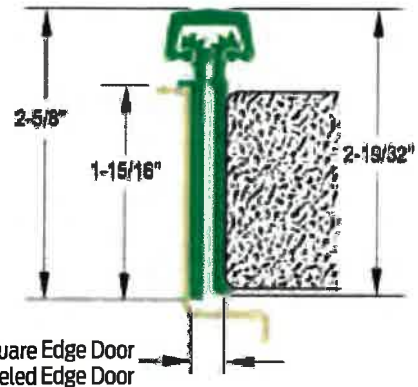
12-24 X 3/4" Steel Self Drilling, Self Tapping Screws

Optional WD - Wood Screws or SEC - Security Fasteners Available

Finishes

Clear (CL), Dark Bronze (DB)

Custom Anodizing and Painting are available, consult factory.



5/16" Clearance for Square Edge Door
1/32" Clearance For Beveled Edge Door

Hinges & Pivots

A23

Pulls & Plates

B

Flush Bolts & Coordinators

C

Latches, Catches & Bolts

D

Stops

E

Exterior Hardware

F

Miscellaneous Hardware

G



The 4110 is LCN's best performing heavy duty closer designed specifically for institutional and other rugged high traffic applications.

Certifications Grade 1 - ANSI A156.4, UL 10C, ADA, 100 Hour Salt Spray, Meets BAA - Buy American Act

Body Construction

- Cast Iron Body
- Full Complement Bearing
- 1-1/2" Diameter Piston
- 11/16" Diameter Double Heat Treated Pinion Journal

Fluid All Weather Fluid

Handing Handed

Templating Peel-n-Stick templates - 2-1/2" x 6" Mounting Hole Pattern

Size Adjustable Spring Size 1-5, or Sized 6, Includes Patented Green Dial

Warranty 30 years

Cover

- Plastic, Standard
- Metal, Optional

Fasteners

Self Reaming and Tapping Screws (SRT)

Mounting

Parallel Arm (Push Side)

Arms

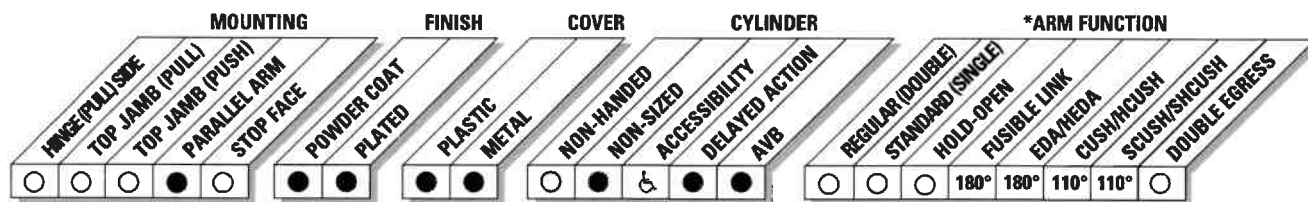
Extra-Duty arm

Finishes/Colors/ Powder Coat

- Aluminum (689)
- Statuary Bronze (690)
- Light Bronze (691)
- Black (693)
- Dark Bronze (695)
- Brass (696)
- Custom colors optional
- Optional SRI primer - powder coat only
- Optional plated finishes

Special Templates

Customized installation templates or products may be available to solve unusual applications. Contact LCN Product Support for assistance.



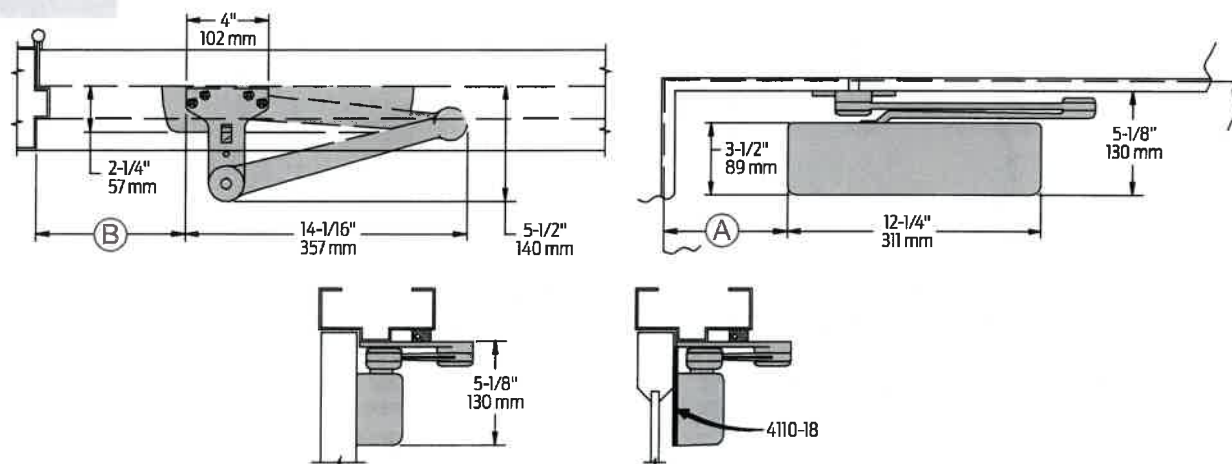
● AVAILABLE
○ NOT AVAILABLE

♿ Closer available with less than 5.0 lbs. opening force on 36" door.
* Maximum opening/hold-open point with standard template.

4110 Series

Mounting details

Parallel Arm (Push Side) Mounting



Butt Hinges	Should not exceed 5" (127 mm) in width	
Auxiliary Stop	Recommended at hold-open point, where a door cannot swing 180°, or where CUSH-N-STOP arm is not used	
Clearance	EDA, or CUSH shoe is 5-1/2" (140 mm) from door face	
Top Rail	<ul style="list-style-type: none"> ■ Less than 5-1/8" (130 mm) measured from stop requires PLATE, 4110-18 ■ Plate requires 2" (51 mm) minimum measured from the stop 	
Stop Width	Minimum 1" (25 mm)	
Head Frame	Flush or rabbeted requires CUSH FLUSH PANEL ADAPTER, 4110-419	
Reveal	Less than 2-3/4" (70 mm), use CUSH SHOE SUPPORT, 4110-30 with CUSH arms	
Blade Stop Spacer	4110-61 required to clear 1/2" (13 mm) blade stop	
Crush Arm	Requires CUSH SHOE SUPPORT, 4110-30 for fifth screw anchorage with CUSH arms	
Delayed Action	<ul style="list-style-type: none"> ■ Add suffix "DEL" to selected cylinder (eg. 4111 DEL) ■ Not available with 4116 cylinder. Delays closing from maximum opening to approximately 70° ■ Delay time adjustable up to approximately 1 minute 	
Advanced Variable Backcheck	<ul style="list-style-type: none"> ■ Cylinder starts backcheck at approximately 45° instead of the normal 75° ■ Add suffix "AVB" to selected cylinder 	
Maximum opening	EDA or Fusible Link arm can be templated for 100°	CUSH arm can be templated for maximum opening at 85°
	A = 5-15/16" (151 mm) B = 7-1/4" (184 mm)	A = 8-5/16" (211 mm) B = 9-5/8" (244 mm)
	140° A = 4-7/16" (113 mm) B = 5-3/4" (146 mm)	90° A = 7-11/16" (195 mm) B = 9" (229 mm)
	or 180° A = 2-15/16" (75 mm) B = 2-15/16" (75 mm)	or 110° A = 5-9/16" (141 mm) B = 6-7/8" (175 mm)
	<ul style="list-style-type: none"> ■ Hold-open points up to maximum opening with HEDA or Fusible Link arm ■ Hold-open point at maximum opening with HCUSH arm ■ Spring Cush hold-open points are approximately 5° less than templated stop point 	

4110 Series

Accessories

Arms



4110-3049CNS
HCUSH Arm

- Non-handed
- Provides hold-open function with templated stop/ hold-open points.
- Handle controls hold-open function



4110-3077SCNS
Spring CUSH Arm

- Non-handed
- For abusive applications features solid forged steel main arm and forearm with spring loaded stop in the soffit shoe
- Optional



4110-3049SCNS
Spring HCUSH Arm

- Non-handed
- For abusive applications features solid forged steel main arm and forearm with spring loaded stop in the soffit shoe
- Handle controls hold-open function
- Optional

Installation Accessories



4110-18
Plate

- Required for push side mount where top rail is less than 5-1/8" (130 mm), measured from the stop
- Requires minimum 2" (51 mm) minimum top rail



4110-30
CUSH Shoe Support

- Provides anchorage for fifth screw used with CUSH arm, where reveal is less than 3-1/16" (78 mm)



4110-61
Blade Stop Spacer

- Lowers parallel arm shoe to clear 1/2" (13 mm) blade stop



4110-419
PA Flush Panel Adapter

- Provides horizontal mounting surface for CUSH shoe on single rabbetted or flush frame

Cores

Full size interchangeable core cylinders for Schlage locksets

Full size core only	
Number	Mechanism
23-030	Conventional core
23-031	Conventional core, less logo
30-120	Conventional core for hotel function (specify hand)
30-121	Hotel function conventional core, less logo
20-740	Primus core
20-741	Primus Core, less logo
20-740-XP	Primus XP core (not available in hotel function)
20-741-XP	Primus XP core, less logo

Available in 606 and 626 finish only. Order control keys separately.



The Right Lock for Every Application

Schlage L9000 Series

Our L9000 Series locks are ideal for use in schools, hospitals and factories, where the finest hardware must also deliver consistent, dependable operation and stand up to constant use and abuse.

Strength and Durability

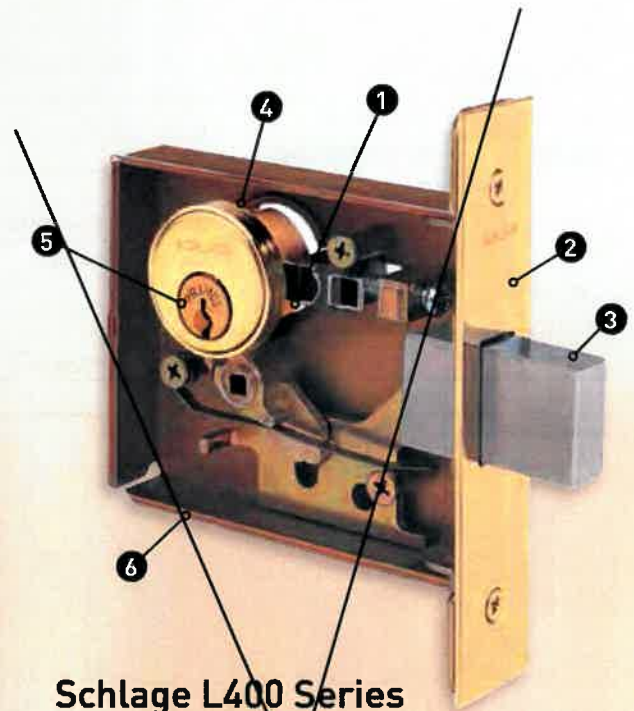
1. Fully wrapped heavy-gauge steel case protects against door edge attacks
2. All-metal zinc dichromate-plated working parts
3. Inside lock case protects electronic components
4. Two-piece anti-friction tongue reduces wear and tear
5. Outside and inside trim thru-bolted together and through the door

Security Built In

6. Break-away spindle prevents unsecured failures and provides easy spindle replacement
7. Hub blocking plate protects lock against spindle manipulation
8. Spring-loaded fusible link provides fail secure mode in case of fire
9. Inside lever applied by screwless shank mounting – no exposed trim mount screws

Adaptable To Your Application

10. Universal lock case – ten functions in one case
11. Floating mounting tabs automatically adjust to fit a beveled door edge
12. Field-reversible handing without opening lock case
13. External spring cages allow for simple trim retrofit
14. Locking thumbturn on the inside of door visually shows when the door is locked and unlocked
15. Lever rotation in both directions (up and down) for ease of use
16. Independent lever rotation



Schlage L400 Series

Our L400 Series locks are designed for use as primary locks where no latching is required, such as restrooms and small doors to utility spaces. They also offer optimum security when used as auxiliary locks in other applications.

1. High-strength steel alloy cylinder retainer
2. Armored front in brass, bronze or stainless steel; adjustable for door bevel
3. 1" (25 mm) stainless steel throw deadbolt
4. Deeper retainer groove in cylinder shell increases security against wrenching and pullout; all cylinders backward compatible
5. 6-pin Everest® cylinder with patented keys standard
6. Steel case and parts are corrosion resistant

Standard Lever Designs



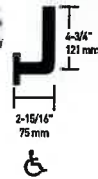
01

Material: Forged brass,
bronze and cast stainless
steel



02

Material: Forged brass,
bronze and cast stainless
steel



06

Material: Forged brass,
bronze and cast stainless
steel



07

Material: Forged brass,
bronze and cast stainless
steel



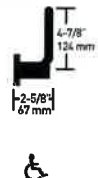
18

Material: Forged brass,
bronze and cast stainless
steel



Accent (ACC)

Material:
Forged brass



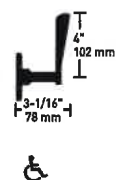
Longitude

Material: Forged brass
and cast stainless steel



Merano

Material:
Forged brass



Escutcheons and Roses

Choose from three types of escutcheon and two rose sizes to add tough, durable performance to your lockset.

Escutcheons



L Full Face

Material: Cold-forged brass, bronze or stainless steel

Finishes: 605, 606, 609, 612, 613, 619, 625, 626, 629, 630, 643e

Size: 8" x 1 3/4" x 7/16"
(203 mm x 44 mm x 11 mm)



L Concealed

Material: Cold-forged brass, bronze or stainless steel

Finishes: 605, 606, 609, 612, 613, 619, 625, 626, 629, 630, 643e

Size: 8" x 1 3/4" x 7/16" (203 mm x 44 mm x 11 mm)



N Escutcheon

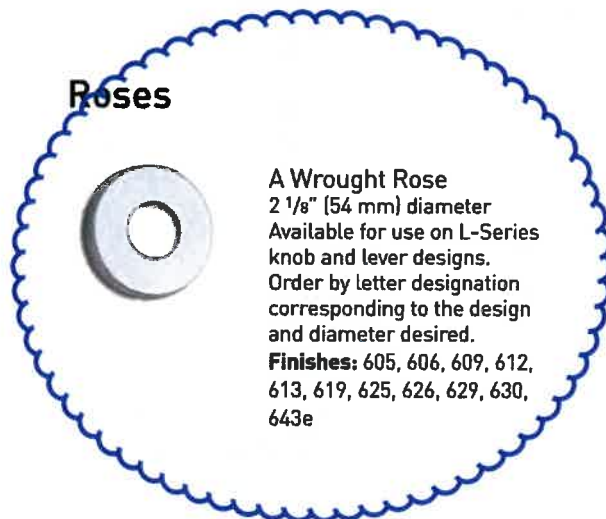
Material: Heavy wrought reinforced brass, bronze or stainless steel

Finishes: 605, 606, 609, 612, 613, 619, 625, 626, 629, 630, 643e

Size: 8" x 2 9/16" x 7/16"
(203 mm x 65 mm x 11 mm)



Roses



A Wrought Rose

2 1/8" (54 mm) diameter
Available for use on L-Series knob and lever designs.

Order by letter designation corresponding to the design and diameter desired.

Finishes: 605, 606, 609, 612, 613, 619, 625, 626, 629, 630, 643e



B Wrought Rose

2 9/16" (65 mm) diameter
Available for use on L-Series knob and lever designs.

Order by letter designation corresponding to the design and diameter desired.

Finishes: 605, 606, 609, 612, 613, 619, 625, 626, 629, 630, 643e

Lock Functions | Double Cylinder Non-Deadbolt Functions

Schlage ANSI



**L9060
LV9060**

Apartment Entrance Lock

Latchbolt retracted by knob/lever from either side unless outside is locked by key from inside. When locked, latchbolt retracted by key outside or knob/lever inside. Auxiliary latch deadlocks latchbolt when door is closed. Inside lever is always free for immediate egress.



**L9071
LV9071**

Classroom Security Lock

Latchbolt retracted by knob/lever from either side unless outside is locked by key from either side. When locked, latchbolt retracted by key outside or knob/lever inside. Auxiliary latch deadlocks latchbolt when door is locked. Inside lever is always free for immediate egress.



**L9077
LV9077**

Classroom Security Holdback Lock

Latchbolt retracted by knob/lever from either side unless outside is locked by key from either side. When locked, latchbolt retracted by key outside or knob/lever inside. Auxiliary latch deadlocks latchbolt when door is locked. Depress inside knob/lever and turn key 360° for holdback feature. Inside lever is always free for immediate egress.



**L9082
LV9082**

Institution Lock

Latchbolt retracted by key from either side. Knob/lever on both sides always inoperative. Auxiliary latch deadlocks latchbolt when door is closed.



**L9082EL
L9082EU**

L9082 Electrically Locked or Electrically Unlocked Both Sides*

EL: Outside and inside knob or lever continually locked electrically. Latchbolt retracted by key either side. Switch or power failure allows outside and inside knob/lever to retract latchbolt. Auxiliary latch deadlocks latchbolt when door is closed. EU: Outside and inside knob/lever unlocked electrically. Latchbolt retracted by key either side. Switch or power failure keeps inside and outside knob/lever locked. Auxiliary latch deadlocks latchbolt when door is closed. (Previously XL11-452)

Lock Functions | Double Cylinder Deadbolt Functions

Schlage ANSI



**L9457
LV9457**

Classroom Security Lock with Deadbolt

Latchbolt retracted by knob/lever from either side. Deadbolt thrown or retracted by key from either side. Throwing deadbolt locks outside knob/lever. Turning inside knob/lever simultaneously retracts deadbolt and latchbolt, and unlocks outside knob/lever. Inside lever is always free for immediate egress.



L9466 F14

Store/Utility Room Lock with Deadbolt*

Latchbolt retracted by knob/lever from either side. Deadbolt thrown or retracted by key from either side.



**L9482 x XL11-943
LV9482 x XL11-943**

Institution Lock with Deadbolt*

Latchbolt retracted by key from either side. Knob/lever on both sides always inoperative. Deadbolt thrown or retracted by key either side. Auxiliary latch deadlocks latchbolt when door is closed. Specify per XL11-543.

In a double-door application where the dummy will be used as the strike order 10-091 Armored Front Strike separately.

*Caution: Double cylinder locks on residences and any door in any structure which is used for egress are a life safety hazard in times of emergency and their use is not recommended. Installation should be in accordance with existing codes only.

Self-Adhesive Weatherstripping



Note:

N = Neoprene

S-Bk = Silicone, Black

S-Wh = Silicone, White

PSA* is equipped with 3M self-adhesive tape

All products are available with ZAG feature (Anti-Ligature)

S-Br = Silicone, Brown

S-CI = Silicone, Clear

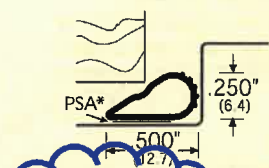
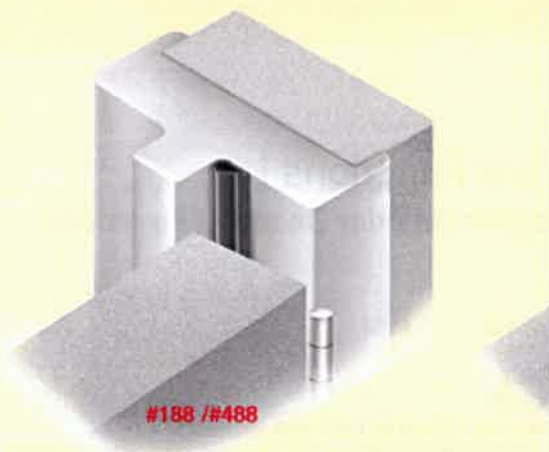
S-Gy = Silicone, Grey

FS = Intumet™ Rubber

Y-Bk = Polyvinyl, Black

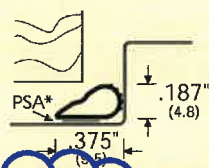
BIO = Antibacterial

Gasketing, White



#188S-Bk #188S-Wh
#188S-Br #188FS
#188S-CI #188BIO
#188S-Gy

ZERO Compress-O-Matic®



#488S-Bk #488S-Wh
#488S-Br #488FS
#488S-CI #488BIO
#488S-Gy

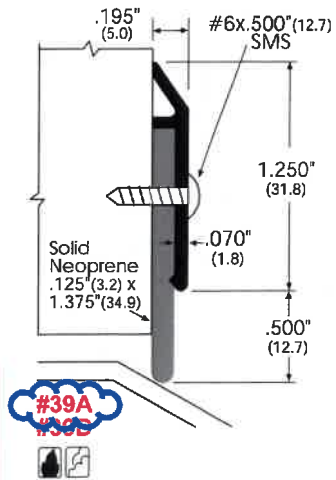
ZERO Mini-Matic®



Sill Protection Sweeps



Note: A = Aluminum
AA = Clear Anodized
B = Bronze
D = Dark Bronze Anodized
G = Gold Anodized
PVC = Polyvinyl, clear



Door Sweeps

Utility Thresholds

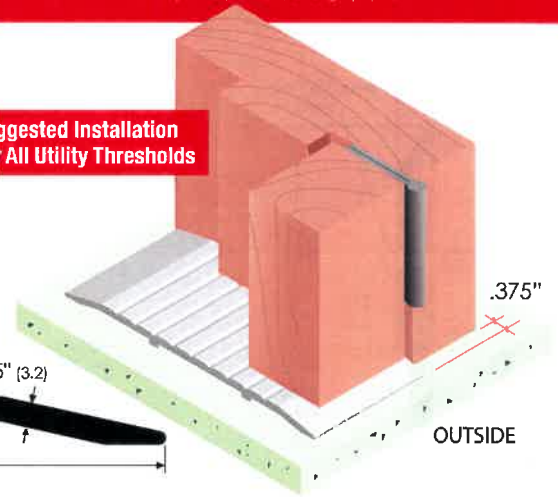


Note: A = Aluminum B = Bronze
D = Dark Bronze Anodized STST = Stainless Steel
Thresholds can be ordered with E (Epoxy Abrasive) EL (Epoxy Abrasive
Photoluminescent) or V3 (Full Body Strength) options.

Thresholds



Suggested Installation
for All Utility Thresholds



Expansion Joints Adjustable Thresholds



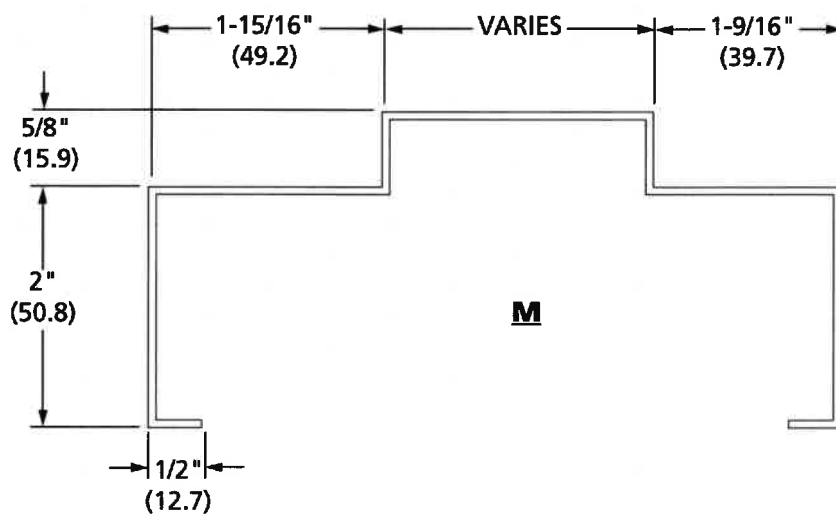
Note: A = Aluminum
R = Rubber

STST = Stainless Steel

Thresholds can be ordered with E (Epoxy Abrasive) or EL (Epoxy Abrasive Photoluminescent).



Masonry 2" Face Flush Frame Unequal Rabbet



Ⓛ

Seam Weld Flush

FRAME TECHNICAL DATA

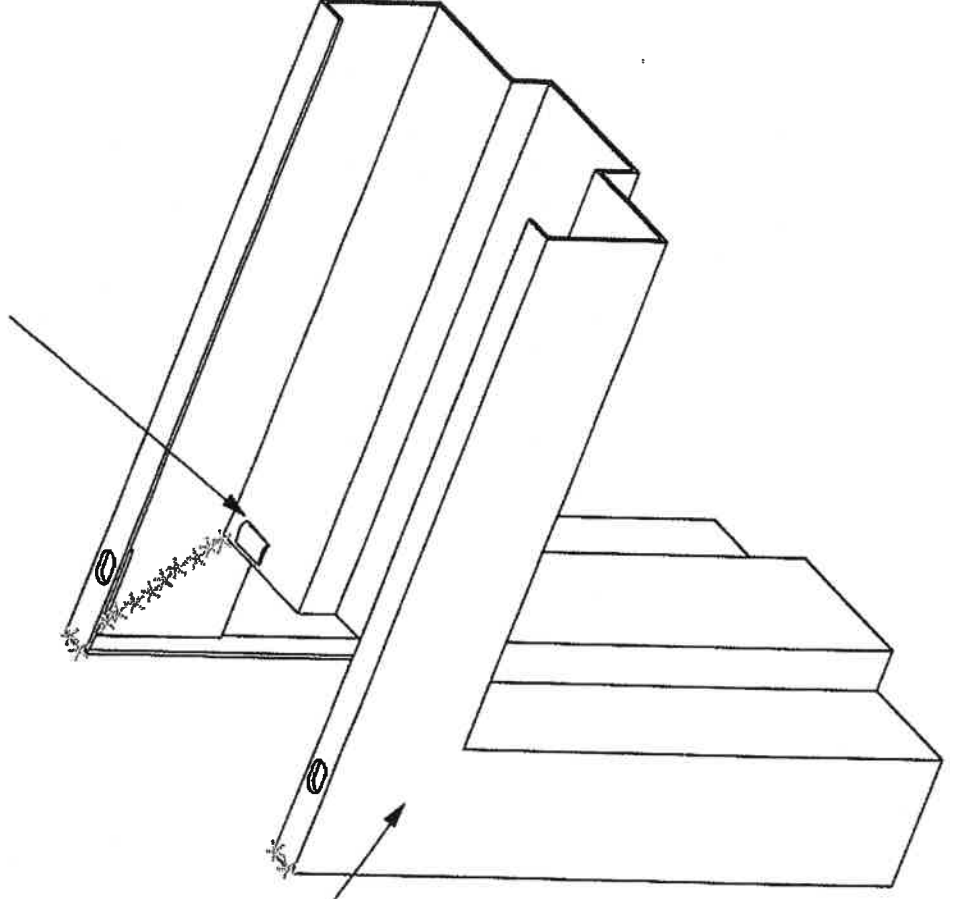
April 1, 2002

(L)

WELD CODE SW

BEND TABS

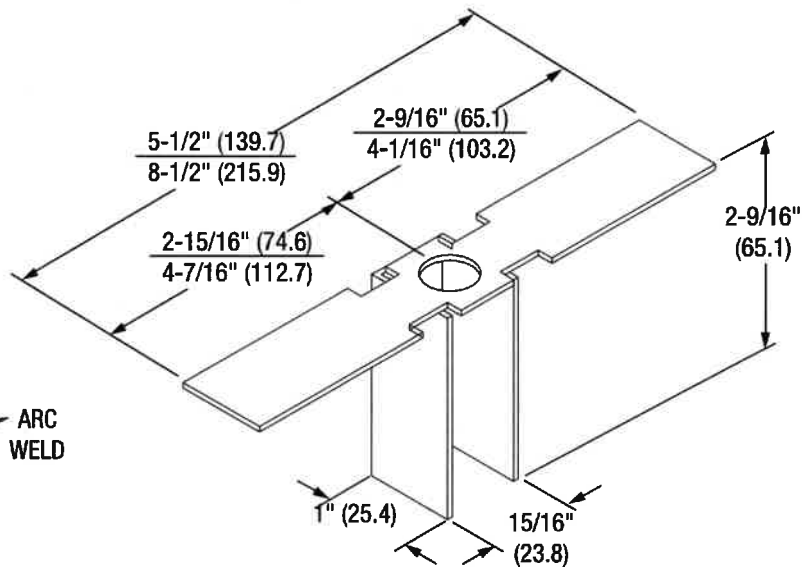
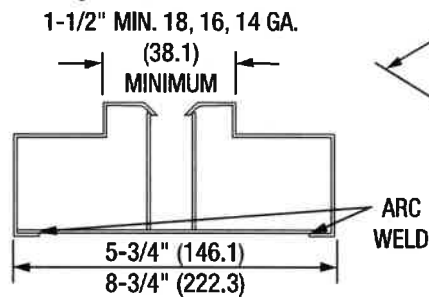
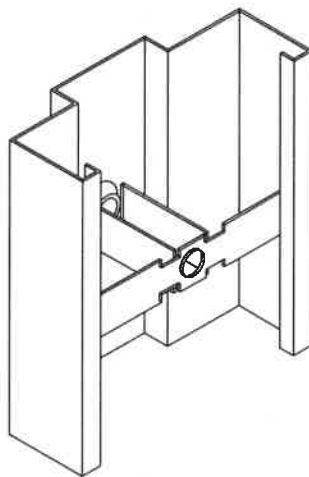
CONTINUOUS WELD FACE SEAM
GRIND AND FINISH SMOOTH



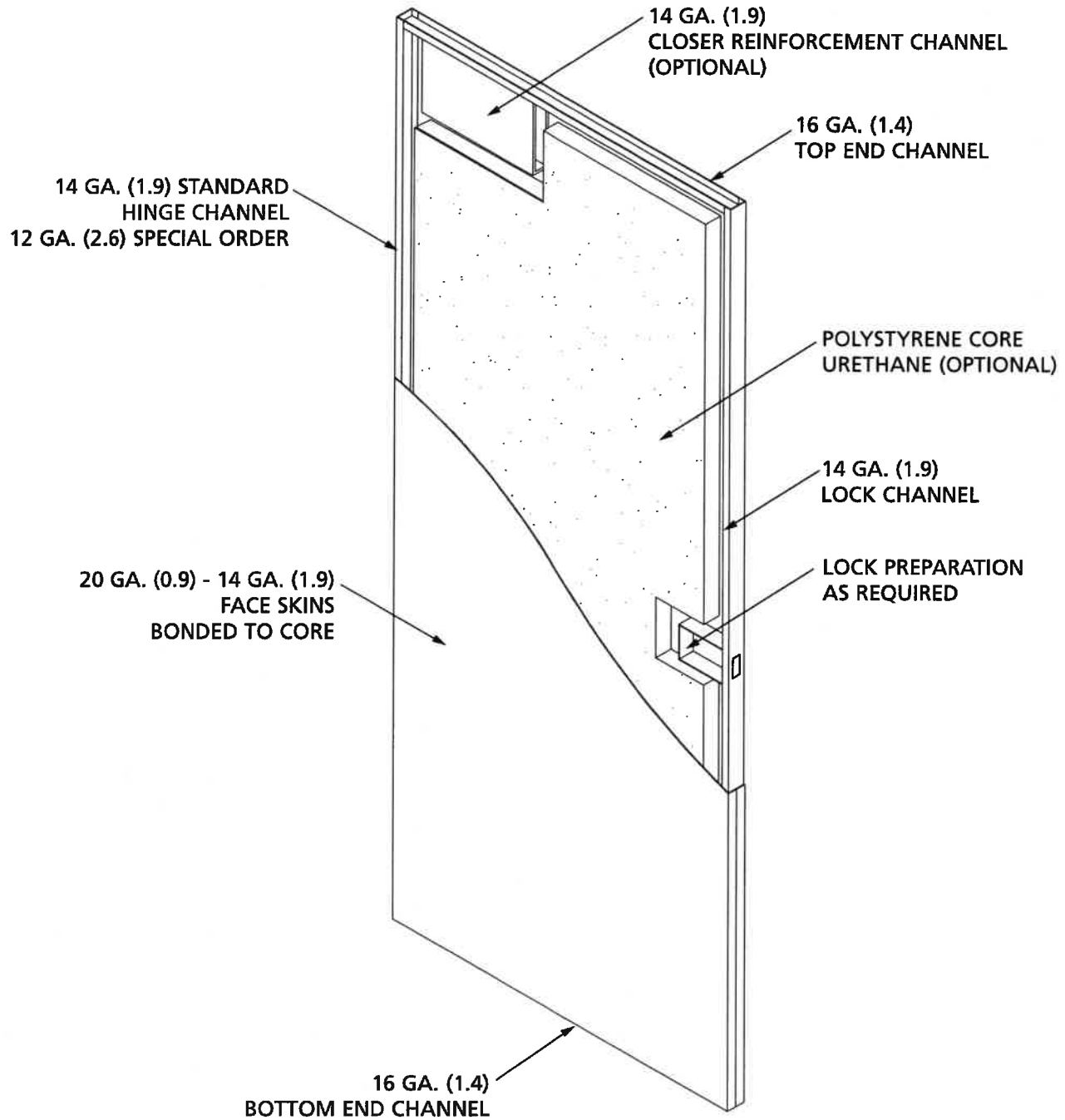


FOR STANDARD RABBETED FRAMES 1-15/16" (49.2) X 1-9/16" (39.7)
THE EWA ANCHOR IS AVAILABLE IN 5-1/2" (139.7) & 8-1/2" (215.9) SIZES TO
FIT 5-3/4" (146.1) & 8-3/4" (222.3) STANDARD RABBETED FRAMES RESPECTIVELY.
3/8" FLAT HEAD BOLT RECOMMENDED.

ANCHOR PART NUMBER: P0070
ORDER CODE LOOSE: EWA
ORDER CODE WELDED: WEWA



DIAMETER 3/8" (9.5) X 1-3/4" (44.5)
EMBEDMENT LENGTH OR STEEL
EXPANSION SHELL OR 3/8" (9.5)
FLATHEAD BOLT

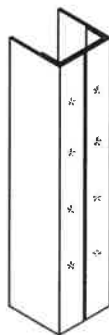
**NOTE: SEE PAGE 162 FOR HONEYCOMB OPTION**

January, 2007

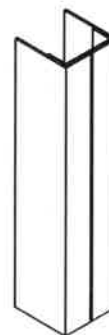
**Visible Edge Seam Types "S"**

ANSI/SDI A250.8 - 2014 Model 1, Full flush

1. Skins are spot welded to hinge and lock channels



2. Spot welds are filled and ground smooth



Section 09900

Paints & Coatings



GARIUP CONSTRUCTION CO., INC.

P.O. BOX 64879 • GARY, IN 46401 • PHONE: (219) 887-5233 • FAX (219) 981-3679

TO DUNELAND SCHOOL SYSTEM

DATE 12/19/18

SUBJECT BRUMMITT ATTIC STOCK

M E S S A G E

50 BRICK

WALL PAINT - BRILLIANT WHITE

CEILING PAINT - " "

WALL PRIMER

BLOCK SEALER

DOOR/TRIM PAINT - GREY

SIGNED

RECEIVED BY

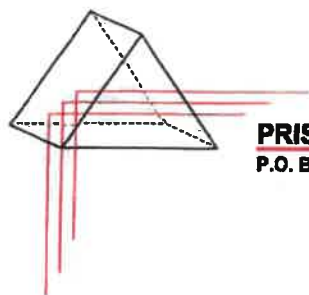
DATE

R E P L Y

DATE

Greg S. G.

PROPOSAL



PRISM PAINTING COMPANY
P.O. BOX 1944 * Highland IN 46322

Phone: 219-322-4800
Fax: 219-322-7321
Email: scott@prismpainting.com

SUBMITTALS

March 20, 2018

Contractor: Gariup Construction Company, Inc.

Project: 2018 Addition at Brummitt Elementary School
Section 09900 – 2.3 – Paints and Coatings

Drywall Walls

1. Sherwin Williams ProMar 200 Zero VOC Interior Latex Primer.
2. Sherwin Williams ProMar 200 Zero VOC Interior Latex Low Gloss Eg-Shel.
3. Sherwin Williams ProMar 200 Zero VOC Interior Latex Low Gloss Eg-Shel.

Hollow Metal Doors and Frames

1. Sherwin Williams Pre-Catalyzed Water-based Epoxy.
2. Sherwin Williams Pre-Catalyzed Water-based Epoxy.

CMU

1. PrepRite Interior/Exterior Latex Block Filler
1. Sherwin Williams Pre-Catalyzed Water-based Epoxy.
2. Sherwin Williams Pre-Catalyzed Water-based Epoxy.

Exposed Ceiling

1. Sherwin Williams Alkyd Dry Fall Flat.



ALKYD DRY FALL FLAT

B48W60
B48BW1

BRILLIANT WHITE
BLACK

As of 07/10/2017, Complies with:			
OTC	Yes	LEED® 00 NC, CI	No
OTC Phase II	No	LEED® 08 CS	No
SCAQMD	No	LEED® 08 S	No
CARB	Yes	LEED® v4 Endpoints	No
CARB SCM 2007	No	LEED® v4 VOC	No
Canada	Yes	MPI	Yes

CHARACTERISTICS

ALKYD DRY FALL FLAT is a modified alkyd paint for interior use. Overspray dries to a removable dust within eight feet @77°F(25°C) and 50% relative humidity.

Features:

- Overspray cleans up easily
- Eight foot dry fallout
- High light reflectance white
- Interior use
- Flash Rust Resistant

For use on properly prepared:

- Structural Steel
- Galvanized Metal
- Concrete/Masonry
- Drywall/Plaster
- Wood

Recommended for use in:

- Warehouses
- Industrial, commercial, and institutional buildings
- Textile mills
- Manufacturing facilities
- Gymnasiums
- Parking garage ceilings not exposed to direct weathering
- Suitable for use in USDA inspected facilities
- Light Reflectance Value is 83 ± 3%, White

SPECIFICATIONS

Color:

White and Black

Recommended Spread Rate per coat: White B48W00060

wet mils: 8.0 -12.0

dry mils: 2.9 - 4.3

coverage: 200 - 135 sq ft/gal approximate

Theoretical coverage: 577 sq ft/gal @ 1 mil dry

Drying Schedule @ 8.0 mils wet, 50% RH:

	@ 55°F	@ 77°F	@ 100°F
To touch:	40 minutes	10 minutes	3 minutes
To recoat:	6 hours	4 hour	2 hour
To full cure:	9 days	7 days	1 day
Dry fallout:	8-16 feet	8 feet	8 feet

Drying and recoat times are temperature, humidity, and film thickness dependent.

Flash Point: White 76°F TCC, Black 58°F PMCC

Tinting with BAC: White, 0-2 oz/gal, not controlled for tinting strength

Tinting will affect the dryfall characteristics.

Shelf Life: 12 months, unopened

Finish:

B48W00060

Flat 0-10°@85°

B48BW0001

Flat 0-10°@85°

VOC (less exempt solvents): 329 g/L - 2.74 lb/gal

(as per 40 CFR 59.406 and SOR/2009-284, s. 12)

358 g/L - 2.97 lb/gal

Volume Solids: 36 ± 2%

37 ± 2%

Weight Solids: 61 ± 2%

60 ± 2%

Weight per Gallon: 12.13 lb/gal ± .2 lb

11.54 lb/gal ± .2 lb

RECOMMENDED SYSTEMS

Steel & Rusted Galvanized,

Acrylic Primer:

1ct. Pro Industrial Pro-Cryl Primer

1-2cts. Alkyd Dry Fall Flat

Steel, Alkyd Primer:

1ct. Kern Bond HS

1-2cts. Alkyd Dry Fall Flat

Aluminum:

1ct. DTM Wash Primer

1-2cts. Alkyd Dry Fall Flat

Galvanized Metal:

1ct. DTM Wash Primer

1-2cts. Alkyd Dry Fall Flat

Concrete Block:

1ct. Loxon Block Surfer

1-2cts. Alkyd Dry Fall Flat

Concrete/Masonry:

1ct. Loxon Concrete and Masonry Primer

1-2cts. Alkyd Dry Fall Flat

Plaster:

1ct. Premium Wall & Wood Primer

1-2cts. Alkyd Dry Fall Flat

Drywall:

1ct. ProMar 200 Zero VOC Primer

1-2cts. Alkyd Dry Fall Flat

Wood:

1ct. Premium Wall & Wood Primer

1-2cts. Alkyd Dry Fall Flat

The systems listed above are representative of the product's use, other systems may be appropriate. Other primers may be appropriate.

ALKYD DRY FALL FLAT



SHERWIN-WILLIAMS.

SURFACE PREPARATION

WARNING! Removal of old paint by sanding, scraping or other means may generate dust or fumes that contain lead. Exposure to lead dust or fumes may cause brain damage or other adverse health effects, especially in children or pregnant women. Controlling exposure to lead or other hazardous substances requires the use of proper protective equipment, such as a properly fitted respirator (NIOSH approved) and proper containment and cleanup. For more information, call the National Lead Information Center at 1-800-424-LEAD (in US) or contact your local health authority.

Iron & Steel

Minimum surface preparation is Hand Tool Clean per SSPC-SP2. Remove all oil and grease from surface by Solvent Cleaning per SSPC-SP1. For better performance, use Commercial Blast Cleaning per SSPC-SP6/NACE 3, blast clean all surfaces using a sharp, angular abrasive for optimum surface profile (2 mils). Prime any bare steel within 8 hours or before flash rusting occurs. Primer required.

Aluminum

Remove all oil, grease, dirt, oxide and other foreign material by Solvent Cleaning per SSPC-SP1. Primer required.

Galvanized Steel

Remove all oil, grease, dirt, oxide and other foreign material by Solvent Cleaning per SSPC-SP1. When the surface has been treated with chromates or silicates, first Solvent Clean per SSPC-SP1 and apply a test patch. Allow paint to dry at least one week before testing adhesion. If adhesion is poor, brush blasting per SSPC-SP16 is necessary to remove these treatments. Rusty galvanizing requires a minimum of Hand Tool Cleaning per SSPC-SP2, prime the area the same day as cleaned. Primer required.

Concrete and Masonry

For surface preparation, refer to SSPC-SP13/NACE 6, or ICRI No. 310.2, CSP 1-3. Remove all loose mortar and foreign material. Surface must be free of laitance, concrete dust, dirt, form release agents, moisture curing membranes, loose cement and hardeners. Concrete and mortar must be cured at least 28 days @ 75°F. On tilt-up and poured-in-place concrete, commercial detergents and abrasive blasting may be necessary. Fill bug holes, air pockets and other voids. Primer required.

Drywall

Must be clean and dry. All nail heads must be set and spackled. Joints must be taped and covered with joint compound. Spackled nail heads and tape joints must be sanded smooth and all dust removed prior to the application of paint. Primer required.

Wood

Surface must be clean, dry and sound. Prime with recommended primer and paint as soon as possible. Knots and pitch streaks must be scraped, sanded and spot primed before full coat of primer is applied. All nail holes or small openings must be properly caulked.

Previously Painted Surfaces - If in sound condition, clean the surface of all foreign material. Smooth, hard or glossy coatings and surfaces should be dulled by abrading the surface. Apply a test area, allowing paint to dry one week before testing adhesion. If adhesion is poor, additional abrasion of the surface and/or removal of the previous coating may be necessary. Retest surface for adhesion. If paint is peeling or badly weathered, clean surface to sound substrate and treat as a new surface as above. Recognize that any surface preparation short of total removal of the old coating may compromise the service length of the system.

APPLICATION PROCEDURES

Apply paint at the recommended film thickness and spreading rate as indicated on front page. Spreading rates are calculated on volume solids and do not include an application loss factor due to surface profile, roughness, or porosity of the surface, skill, and technique of the applicator, method of application, various surface irregularities, material lost during mixing, spillage, overthinning, climatic conditions, and excessive film build.

SAFETY PRECAUTIONS

Refer to the Safety Data Sheets (SDSs) before use.

PERFORMANCE TIPS

Stripe coat crevices, welds, and sharp angles to prevent early failure in these areas.

When using spray application, use a 50% overlap with each pass of the gun to avoid holidays, bare areas, and pinholes. If necessary, cross spray at a right angle.

NOTE: Dryfall characteristics will be adversely affected at temperatures below 77°F (25°C) or above 50% relative humidity.

APPLICATION

Refer to the SDS sheet before use

Temperature: 50°F minimum
120°F maximum
(Air, surface, and material)

Relative humidity: At least 5°F above dew point
85% maximum

The following is a guide. Changes in pressures and tip sizes may be needed for proper spray characteristics. Always purge spray equipment before use with listed reducer. Any reduction must be compatible with the existing environmental and application conditions.

Reducer/Clean Up:

Below 100°F (38°C): VM&P Naphtha, R1K3

Above 100°F (38°C): Mineral Spirits, R1K4

Airless Spray

Pressure 2500 psi

Hose 1/4" ID

Tip017" - .019"

Filter 60 mesh

Reduction: As needed, up to 5% maximum

Conventional Spray

Gun Binks 95

Fluid Nozzle 63C

Air Nozzle 63PB

Atomization Pressure 60 PSI

Fluid Pressure 50 PSI

Reduction: As needed, up to 5% maximum

Brush & Roll Not recommended

CLEANUP INFORMATION

Clean spills, spatters and tools immediately with compliant solvent. Follow manufacturer's safety recommendations when using any solvent.

In order to avoid blockage of spray equipment, clean equipment before use or before periods of extended downtime with compliant solvent.

CAUTION

Overspray landing on hot surfaces may adhere to these surfaces. Immediately remove overspray from hot surfaces before adhesion occurs. Note that surface temperatures can be higher than air temperature.

DANGER: Rags, steel wool, other waste soaked with this product, and sanding residue may spontaneously catch fire if improperly discarded. Immediately place rags, steel wool, other waste soaked with this product, and sanding residue in a sealed, water-filled, metal container. Dispose of in accordance with local fire regulations.

HOTW 07/10/2017 B48W00060 45 329
FRC, SP

The information and recommendations set forth in this Product Data Sheet are based upon tests conducted by or on behalf of The Sherwin-Williams Company. Such information and recommendations set forth herein are subject to change and pertain to the product offered at the time of publication. Consult your Sherwin-Williams representative or visit www.paintdocs.com to obtain the most current version of the PDS and/or an SDS.

SAFETY DATA SHEET

B48W60

Section 1. Identification

Product name : Dry Fall
Flat Brilliant White

Product code : B48W60

Other means of identification : Not available.

Product type : Liquid.

Relevant identified uses of the substance or mixture and uses advised against
Not applicable.

Manufacturer : THE SHERWIN-WILLIAMS COMPANY
101 W. Prospect Avenue
Cleveland, OH 44115

National contact : Sherwin-Williams Canada Inc.
180 Brunel Road
Mississauga, Ontario L4Z 1T5 Canada

Emergency telephone number of the company : US / Canada: (216) 566-2917
Mexico: SETIQ 01-800-00-214-00 / (52) 55-5559-1588 24 hours / 365 days a year

Product Information Telephone Number : US / Canada: (800) 524-5979
Mexico: Not Available

Regulatory Information Telephone Number : US / Canada: (216) 566-2902
Mexico: Not Available

Transportation Emergency Telephone Number : US / Canada: (800) 424-9300
Mexico: SETIQ 01-800-00-214-00 / (52) 55-5559-1588 24 hours / 365 days a year

Section 2. Hazards identification

Classification of the substance or mixture : FLAMMABLE LIQUIDS - Category 3
SKIN CORROSION/IRRITATION - Category 2
SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 2A
CARCINOGENICITY - Category 1A
TOXIC TO REPRODUCTION (Unborn child) - Category 2
SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Respiratory tract irritation) - Category 3
SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) - Category 2
ASPIRATION HAZARD - Category 1
Percentage of the mixture consisting of ingredient(s) of unknown oral toxicity: 67.3%
Percentage of the mixture consisting of ingredient(s) of unknown dermal toxicity: 67.3%
Percentage of the mixture consisting of ingredient(s) of unknown inhalation toxicity: 67.3%

GHS label elements

Hazard pictograms :



Date of Issue/Date of revision : 11/3/2017 Date of previous issue : 9/6/2017 Version : 8 1/14

Section 2. Hazards identification

Signal word : Danger

Hazard statements : Flammable liquid and vapor.
Causes serious eye irritation.
Causes skin irritation.
May cause cancer.
Suspected of damaging the unborn child.
May be fatal if swallowed and enters airways.
May cause respiratory irritation.
May cause damage to organs through prolonged or repeated exposure.

Precautionary statements

Prevention : Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Wear protective gloves. Wear eye or face protection. Wear protective clothing. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Use explosion-proof electrical, ventilating, lighting and all material-handling equipment. Use only non-sparking tools. Take precautionary measures against static discharge. Keep container tightly closed. Use only outdoors or in a well-ventilated area. Do not breathe vapor. Wash hands thoroughly after handling.

Response : Get medical attention if you feel unwell. IF exposed or concerned: Get medical attention. IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER or physician if you feel unwell. IF SWALLOWED: Immediately call a POISON CENTER or physician. Do NOT induce vomiting. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower. IF ON SKIN: Wash with plenty of soap and water. Take off contaminated clothing and wash it before reuse. If skin irritation occurs: Get medical attention. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical attention.

Storage : Store locked up. Store in a well-ventilated place. Keep cool.

Disposal : Dispose of contents and container in accordance with all local, regional, national and international regulations.

Supplemental label elements DELAYED EFFECTS FROM LONG TERM OVEREXPOSURE. Contains solvents which can cause permanent brain and nervous system damage. Intentional misuse by deliberately concentrating and inhaling the contents can be harmful or fatal. WARNING: This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm. FOR INDUSTRIAL USE ONLY. Adequate ventilation required when sanding or abrading the dried film. If Adequate ventilation cannot be provided wear an approved particulate respirator (NIOSH approved). Follow respirator manufacturer's directions for respirator use. DELAYED EFFECTS FROM LONG TERM OVEREXPOSURE. Abrading or sanding of the dry film may release Crystalline Silica which has been shown to cause lung damage and cancer under long term exposure.

Please refer to the SDS for additional information. Keep out of reach of children. Do not transfer contents to other containers for storage.

Hazards not otherwise classified : DANGER: Rags, steel wool, other waste soaked with this product, and sanding residue may spontaneously catch fire if improperly discarded. Immediately place rags, steel wool, other waste soaked with this product, and sanding residue in a sealed, water-filled, metal container. Dispose of in accordance with local fire regulations.

Section 3. Composition/information on ingredients

Substance/mixture : Mixture

Other means of identification : Not available.

CAS number/other identifiers

Section 3. Composition/information on ingredients

Ingredient name	% by weight	CAS number
Calcium Carbonate	46.37	1317-65-3
Lt. Aliphatic Hydrocarbon Solvent	10.58	64742-89-8
Titanium Dioxide	7.12	13463-67-7
Light Aliphatic Hydrocarbon	3.26	64742-47-8
Crystalline Silica, respirable powder	0.45	14808-60-7
Toluene	0.15	108-88-3

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

Description of necessary first aid measures

- Eye contact** : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention.
- Inhalation** : Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention. If necessary, call a poison center or physician. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.
- Skin contact** : Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Get medical attention. Wash clothing before reuse. Clean shoes thoroughly before reuse.
- Ingestion** : Get medical attention immediately. Call a poison center or physician. Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Aspiration hazard if swallowed. Can enter lungs and cause damage. Do not induce vomiting. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Most important symptoms/effects, acute and delayed

Potential acute health effects

- Eye contact** : Causes serious eye irritation.
- Inhalation** : May cause respiratory irritation.
- Skin contact** : Causes skin irritation.
- Ingestion** : May be fatal if swallowed and enters airways.

Over-exposure signs/symptoms

- Eye contact** : Adverse symptoms may include the following:
pain or irritation
watering
redness

Section 4. First aid measures

- Inhalation** : Adverse symptoms may include the following:
respiratory tract irritation
coughing
reduced fetal weight
increase in fetal deaths
skeletal malformations
- Skin contact** : Adverse symptoms may include the following:
irritation
redness
reduced fetal weight
increase in fetal deaths
skeletal malformations
- Ingestion** : Adverse symptoms may include the following:
nausea or vomiting
reduced fetal weight
increase in fetal deaths
skeletal malformations

Indication of immediate medical attention and special treatment needed, if necessary

- Notes to physician** : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
- Specific treatments** : No specific treatment.
- Protection of first-aiders** : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media : Use dry chemical, CO₂, water spray (fog) or foam.

Unsuitable extinguishing media : Do not use water jet.

Specific hazards arising from the chemical : Flammable liquid and vapor. Runoff to sewer may create fire or explosion hazard. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion.

Hazardous thermal decomposition products : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide
metal oxide/oxides

Special protective actions for fire-fighters : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

- For non-emergency personnel** : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
- For emergency responders** : If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".
- Environmental precautions** : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods and materials for containment and cleaning up

- Small spill** : Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.
- Large spill** : Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Section 7. Handling and storage

Precautions for safe handling

- Protective measures** : Put on appropriate personal protective equipment (see Section 8). Avoid exposure - obtain special instructions before use. Avoid exposure during pregnancy. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not swallow. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use only non-sparking tools. Take precautionary measures against electrostatic discharges. Empty containers retain product residue and can be hazardous. Do not reuse container.
- Advice on general occupational hygiene** : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Section 7. Handling and storage

Conditions for safe storage, including any incompatibilities : Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Eliminate all ignition sources. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits (OSHA United States)

Ingredient name	Exposure limits
Calcium Carbonate	NIOSH REL (United States, 10/2016). TWA: 5 mg/m ³ 10 hours. Form: Respirable fraction TWA: 10 mg/m ³ 10 hours. Form: Total OSHA PEL (United States, 6/2016). TWA: 5 mg/m ³ 8 hours. Form: Respirable fraction TWA: 15 mg/m ³ 8 hours. Form: Total dust
Lt. Aliphatic Hydrocarbon Solvent	None.
Titanium Dioxide	ACGIH TLV (United States, 3/2016). TWA: 10 mg/m ³ 8 hours. OSHA PEL (United States, 6/2016). TWA: 15 mg/m ³ 8 hours. Form: Total dust OSHA PEL (United States, 6/2016). TWA: 100 ppm 8 hours. TWA: 400 mg/m ³ 8 hours.
Light Aliphatic Hydrocarbon	OSHA PEL Z3 (United States, 6/2016). TWA: 250 mppcf / (%SiO ₂ +5) 8 hours. Form: Respirable TWA: 10 mg/m ³ / (%SiO ₂ +2) 8 hours. Form: Respirable OSHA PEL (United States, 6/2016). TWA: 50 µg/m ³ 8 hours. Form: Respirable dust ACGIH TLV (United States, 3/2016). TWA: 0.025 mg/m ³ 8 hours. Form: Respirable fraction
Crystalline Silica, respirable powder	NIOSH REL (United States, 10/2016). TWA: 0.05 mg/m ³ 10 hours. Form: respirable dust OSHA PEL Z2 (United States, 2/2013). TWA: 200 ppm 8 hours. CEIL: 300 ppm AMP: 500 ppm 10 minutes. NIOSH REL (United States, 10/2016). TWA: 100 ppm 10 hours. TWA: 375 mg/m ³ 10 hours. STEL: 150 ppm 15 minutes. STEL: 560 mg/m ³ 15 minutes. ACGIH TLV (United States, 3/2016). TWA: 20 ppm 8 hours.
Toluene	

Occupational exposure limits (Canada)

Section 8. Exposure controls/personal protection

Ingredient name	Exposure limits
Solvent naphtha (petroleum), medium aliph. toluene	CA Québec Provincial (Canada, 1/2014). TWA _{EV} : 400 ppm 8 hours. TWA _{EV} : 1590 mg/m ³ 8 hours. CA Ontario Provincial (Canada, 7/2015). TWA: 525 mg/m ³ 8 hours. CA Alberta Provincial (Canada, 4/2009). Absorbed through skin. 8 hrs OEL: 50 ppm 8 hours. 8 hrs OEL: 188 mg/m ³ 8 hours. CA British Columbia Provincial (Canada, 7/2016). TWA: 20 ppm 8 hours. CA Ontario Provincial (Canada, 7/2015). TWA: 20 ppm 8 hours. CA Québec Provincial (Canada, 1/2014). Absorbed through skin. TWA _{EV} : 50 ppm 8 hours. TWA _{EV} : 188 mg/m ³ 8 hours. CA Saskatchewan Provincial (Canada, 7/2013). Absorbed through skin. STEL: 60 ppm 15 minutes. TWA: 50 ppm 8 hours.

Occupational exposure limits (Mexico)

Ingredient name	Exposure limits
toluene	NOM-010-STPS-2014 (Mexico, 4/2016). TWA: 20 ppm 8 hours.

- Appropriate engineering controls** : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapor or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.
- Environmental exposure controls** : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual protection measures

- Hygiene measures** : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.
- Eye/face protection** : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles.

Skin protection

Section 8. Exposure controls/personal protection

Hand protection	: Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.
Body protection	: Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. When there is a risk of ignition from static electricity, wear anti-static protective clothing. For the greatest protection from static discharges, clothing should include anti-static overalls, boots and gloves.
Other skin protection	: Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
Respiratory protection	: Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use.

Section 9. Physical and chemical properties

Appearance

Physical state	: Liquid.
Color	: Not available.
Odor	: Not available.
Odor threshold	: Not available.
pH	: 7.2
Melting point	: Not available.
Boiling point	: 100°C (212°F)
Flash point	: Closed cup: 24°C (75.2°F) [Tagliabue Closed Cup]
Evaporation rate	: 1.5 (butyl acetate = 1)
Flammability (solid, gas)	: Not available.
Lower and upper explosive (flammable) limits	: Lower: 0.9% Upper: 6%
Vapor pressure	: 2.3 kPa (17.5 mm Hg) [at 20°C]
Vapor density	: 1 [Air = 1]
Relative density	: 1.45
Solubility	: Not available.
Partition coefficient: n-octanol/water	: Not available.
Auto-ignition temperature	: Not available.
Decomposition temperature	: Not available.
Viscosity	: Kinematic (40°C (104°F)): <0.205 cm ² /s (<20.5 cSt)
Molecular weight	: Not applicable.

Aerosol product

Heat of combustion	: 6.481 kJ/g
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Section 10. Stability and reactivity

- Reactivity** : No specific test data related to reactivity available for this product or its ingredients.
- Chemical stability** : The product is stable.
- Possibility of hazardous reactions** : Under normal conditions of storage and use, hazardous reactions will not occur.
- Conditions to avoid** : Avoid all possible sources of ignition (spark or flame). Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition.
- Incompatible materials** : Reactive or incompatible with the following materials:
oxidizing materials
- Hazardous decomposition products** : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Toluene	LC50 Inhalation Vapor	Rat	49 g/m ³	4 hours
	LD50 Oral	Rat	636 mg/kg	-

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
Titanium Dioxide	Skin - Mild irritant	Human	-	72 hours 300 Micrograms Intermittent	-
Toluene	Eyes - Mild irritant	Rabbit	-	0.5 minutes 100. milligrams	-
	Eyes - Mild irritant	Rabbit	-	870 Micrograms	-
	Eyes - Severe irritant	Rabbit	-	24 hours 2 milligrams	-
	Skin - Mild irritant	Pig	-	24 hours 250 microliters	-
	Skin - Mild irritant	Rabbit	-	435 milligrams	-
	Skin - Moderate irritant	Rabbit	-	24 hours 20 milligrams	-
	Skin - Moderate irritant	Rabbit	-	500 milligrams	-

Sensitization

Not available.

Mutagenicity

Not available.

Carcinogenicity

Not available.

Classification

Section 11. Toxicological information

Product/Ingredient name	OSHA	IARC	NTP
Titanium Dioxide	-	2B	-
Crystalline Silica, respirable powder	-	1	Known to be a human carcinogen.
Toluene	-	3	-

Reproductive toxicity

Not available.

Teratogenicity

Not available.

Specific target organ toxicity (single exposure)

Name	Category	Route of exposure	Target organs
Calcium Carbonate	Category 3	Not applicable.	Respiratory tract irritation
Lt. Aliphatic Hydrocarbon Solvent	Category 3	Not applicable.	Respiratory tract irritation and Narcotic effects
Light Aliphatic Hydrocarbon	Category 3	Not applicable.	Respiratory tract irritation and Narcotic effects
Toluene	Category 3	Not applicable.	Respiratory tract irritation and Narcotic effects

Specific target organ toxicity (repeated exposure)

Name	Category	Route of exposure	Target organs
Lt. Aliphatic Hydrocarbon Solvent	Category 2	Not determined	Not determined
Light Aliphatic Hydrocarbon	Category 2	Not determined	Not determined
Crystalline Silica, respirable powder	Category 1	Inhalation	Not determined
Toluene	Category 2	Not determined	Not determined

Aspiration hazard

Name	Result
Lt. Aliphatic Hydrocarbon Solvent	ASPIRATION HAZARD - Category 1
Light Aliphatic Hydrocarbon	ASPIRATION HAZARD - Category 1
Toluene	ASPIRATION HAZARD - Category 1

Information on the likely routes of exposure : Not available.

Potential acute health effects

Eye contact : Causes serious eye irritation.
Inhalation : May cause respiratory irritation.
Skin contact : Causes skin irritation.
Ingestion : May be fatal if swallowed and enters airways.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact : Adverse symptoms may include the following:
 pain or irritation
 watering
 redness

- Inhalation** : Adverse symptoms may include the following:
respiratory tract irritation
coughing
reduced fetal weight
increase in fetal deaths
skeletal malformations
- Skin contact** : Adverse symptoms may include the following:
irritation
redness
reduced fetal weight
increase in fetal deaths
skeletal malformations
- Ingestion** : Adverse symptoms may include the following:
nausea or vomiting
reduced fetal weight
increase in fetal deaths
skeletal malformations

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential Immediate effects : Not available.

Potential delayed effects : Not available.

Long term exposure

Potential Immediate effects : Not available.

Potential delayed effects : Not available.

Potential chronic health effects

Not available.

- General** : May cause damage to organs through prolonged or repeated exposure.
- Carcinogenicity** : May cause cancer. Risk of cancer depends on duration and level of exposure.
- Mutagenicity** : No known significant effects or critical hazards.
- Teratogenicity** : Suspected of damaging the unborn child.
- Developmental effects** : No known significant effects or critical hazards.
- Fertility effects** : No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

Not available.

Section 12. Ecological information

Toxicity

Product/ingredient name	Result	Species	Exposure
Lt. Aliphatic Hydrocarbon Solvent	Acute LC50 >100000 ppm Fresh water	Fish - Oncorhynchus mykiss	96 hours
Titanium Dioxide	Acute LC50 >1000000 µg/l Marine water	Fish - Fundulus heteroclitus	96 hours
Toluene	Acute EC50 12500 µg/l Fresh water	Algae - Pseudokirchneriella subcapitata	72 hours
	Acute EC50 11600 µg/l Fresh water	Crustaceans - Gammarus pseudolimnaeus - Adult	48 hours
	Acute EC50 6000 µg/l Fresh water	Daphnia - Daphnia magna -	48 hours

Date of issue/Date of revision : 11/3/2017 **Date of previous issue** : 9/6/2017 **Version** : 8 **11/14**

Section 12. Ecological Information

	Acute LC50 5500 µg/l Fresh water Chronic NOEC 1000 µg/l Fresh water	Juvenile (Fledgling, Hatchling, Weanling) Fish - Oncorhynchus kisutch - Fry Daphnia - Daphnia magna	96 hours 21 days
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Persistence and degradability

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
Toluene	-	-	Readily

Bioaccumulative potential

Product/ingredient name	LogP _{ow}	BCF	Potential
Lt. Aliphatic Hydrocarbon Solvent	-	10 to 2500	high
Toluene	-	90	low

Mobility in soil






Soil/water partition coefficient (K_{oc}) : Not available.

Other adverse effects : No known significant effects or critical hazards.

Section 13. Disposal considerations

Disposal methods : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Vapor from product residues may create a highly flammable or explosive atmosphere inside the container. Do not cut, weld or grind used containers unless they have been cleaned thoroughly internally. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Section 14. Transport information

	DOT Classification	TDG Classification	Mexico Classification	IATA	IMDG
UN number	UN1263	UN1263	UN1263	UN1263	UN1263
UN proper shipping name	PAINT	PAINT	PAINT	PAINT	PAINT
Transport hazard class(es)	3 	3 	3 	3 	3 
Packing group	III	III	III	III	III

Date of issue/Date of revision : 11/3/2017 Date of previous issue : 9/6/2017 Version : 8 12/14

Section 14. Transport information

Environmental hazards	No.	No.	No.	No.	No.
Additional information	-	Product classified as per the following sections of the Transportation of Dangerous Goods Regulations: 2.18-2.19 (Class 3).	-	-	<u>Emergency schedules</u> F-E, S-E
	<u>ERG No.</u> 128	<u>ERG No.</u> 128	<u>ERG No.</u> 128		

Special precautions for user : Multi-modal shipping descriptions are provided for informational purposes and do not consider container sizes. The presence of a shipping description for a particular mode of transport (sea, air, etc.), does not indicate that the product is packaged suitably for that mode of transport. All packaging must be reviewed for suitability prior to shipment, and compliance with the applicable regulations is the sole responsibility of the person offering the product for transport. People loading and unloading dangerous goods must be trained on all of the risks deriving from the substances and on all actions in case of emergency situations.

Transport In bulk according to Annex II of MARPOL and the IBC Code : Not available.

Proper shipping name : Not available.
Ship type : Not available.
Pollution category : Not available.

Section 15. Regulatory information

SARA 313

SARA 313 (40 CFR 372.45) supplier notification can be found on the Environmental Data Sheet.

California Prop. 65

WARNING: This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

Section 16. Other information

Hazardous Material Information System (U.S.A.)

Health	2
Flammability	3
Physical hazards	0

The customer is responsible for determining the PPE code for this material. For more information on HMIS® Personal Protective Equipment (PPE) codes, consult the HMIS® Implementation Manual.

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings and the associated label are not required on SDSs or products leaving a facility under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered trademark and service mark of the American Coatings Association, Inc.

Procedure used to derive the classification

Section 16. Other information

Classification	Justification
FLAMMABLE LIQUIDS - Category 3	On basis of test data
SKIN CORROSION/IRRITATION - Category 2	Calculation method
SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 2A	Calculation method
CARCINOGENICITY - Category 1A	Calculation method
TOXIC TO REPRODUCTION (Unborn child) - Category 2	Calculation method
SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Respiratory tract irritation) - Category 3	Calculation method
SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) - Category 2	Calculation method
ASPIRATION HAZARD - Category 1	Calculation method

History

Date of printing : 11/3/2017
Date of issue/Date of revision : 11/3/2017
Date of previous issue : 9/6/2017
Version : 8
Key to abbreviations : ATE = Acute Toxicity Estimate
 BCF = Bioconcentration Factor
 GHS = Globally Harmonized System of Classification and Labelling of Chemicals
 IATA = International Air Transport Association
 IBC = Intermediate Bulk Container
 IMDG = International Maritime Dangerous Goods
 LogPow = logarithm of the octanol/water partition coefficient
 MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
 UN = United Nations

Notice to reader

It is recommended that each customer or recipient of this Safety Data Sheet (SDS) study it carefully and consult resources, as necessary or appropriate, to become aware of and understand the data contained in this SDS and any hazards associated with the product. This information is provided in good faith and believed to be accurate as of the effective date herein. However, no warranty, express or implied, is given. The information presented here applies only to the product as shipped. The addition of any material can change the composition, hazards and risks of the product. Products shall not be repackaged, modified, or tinted except as specifically instructed by Sherwin-Williams, including but not limited to the incorporation of non Sherwin-Williams products or the use or addition of products in proportions not specified by Sherwin-Williams. Regulatory requirements are subject to change and may differ between various locations and jurisdictions. The customer/buyer/user is responsible to ensure that his activities comply with all country, federal, state, provincial or local laws. The conditions for use of the product are not under the control of the manufacturer; the customer/buyer/user is responsible to determine the conditions necessary for the safe use of this product. The customer/buyer/user should not use the product for any purpose other than the purpose shown in the applicable section of this SDS without first referring to the supplier and obtaining written handling instructions. Due to the proliferation of sources for information such as manufacturer-specific SDS, the manufacturer cannot be responsible for SDSs obtained from any other source.



**SHERWIN
WILLIAMS.**

As of 10/30/2017 Complies with:			
OTC	Yes	LEED® 09 NC, CI	Yes
OTC Phase II	Yes	LEED® 09 CS	Yes
SCAQMD	Yes	LEED® 09 H	Yes
CARB	Yes	LEED® v4 Emissions	Yes
CARB SCM2007	Yes	LEED® v4 VOC	Yes
Canada	Yes	MPI	Yes

107.10

PREPRITE®

**Interior/Exterior Latex
Block Filler
B25W25**

CHARACTERISTICS

- Allows topcoat on concrete block to be smooth and uniform
- Effective on above-grade, unpainted masonry surfaces

Use on unpainted:

- Masonry
- Concrete
- Cement
- Flat Surfaced Concrete Block

Color: Off White
Coverage: 75-125 sq ft/gal
@ 16 mils wet; 7.7 mils dry

Drying Time, @ 77°F, 50% RH:
temperature and humidity dependent
Touch: 2 hours
Recoat with latex based: 18 hours
Recoat with solvent based: 48 hours

Flash Point: N/A
Finish: 0-5 units @ 85°
Vehicle Type: Vinyl Acrylic

White B25W00025
VOC (less exempt solvents):
<50 g/L; <0.42 lb/gal
As per 40 CFR 59.406 and SOR/2009-264, s.12
Volume Solids: 48 ± 2%
Weight Solids: 68 ± 2%
Weight per Gallon: 13.47 lb
WVP Perms (US) 53.65
grains/(hr ft² in Hg)

SPECIFICATION

Masonry, Concrete, Cement, Block

1 ct. PrepRite Block Filler
2 cts. Appropriate topcoat

Recommended Architectural Topcoats

A-100 Exterior Latex
Loxon Acrylic Coating
SuperPaint Exterior
Duration Exterior

Duration Home
ProClassic Interior
ProMar Interior
SuperPaint Interior

Recommended Industrial Topcoats

Pro Industrial DTM Acrylic
Industrial Enamel
Metalatex Semi-Gloss
Water Based Catalyzed Epoxy

Other topcoats may be appropriate.

Industrial topcoats have been tested for interior use only. PrepRite Block Filler has not been tested in environments subject to chemical attack. Any recommendations for use in such areas must follow a thorough evaluation of the effects of the environment on the PrepRite Block Filler and topcoat system.

SURFACE PREPARATION

WARNING! Removal of old paint by sanding, scraping or other means may generate dust or fumes that contain lead. Exposure to lead dust or fumes may cause brain damage or other adverse health effects, especially in children or pregnant women. Controlling exposure to lead or other hazardous substances requires the use of proper protective equipment, such as a properly fitted respirator (NIOSH approved) and proper containment and cleanup. For more information, call the National Lead Information Center at **1-800-424-LEAD** (In US) or contact your local health authority.

Masonry, Concrete, Cement, Block

Remove all surface contamination, form release agents, moisture curing membranes, etc. by washing with an appropriate cleaner, rinse and allow to dry. Pressure wash the surface if needed. Remove existing peeled or checked paint to a sound surface. Concrete and mortar must be cured, generally 30 days, at 75°F before painting.

Complete removal of sealers, release compounds, and to provide a profile, tilt-up and poured-in-place concrete could require sandblasting or cleaning with commercial detergents. Do not apply to smooth, slick surfaces. Recognize that any surface preparation short of total removal of the old coating may compromise the service length of the system.

Masonry surfaces must be dry before priming. Moisture content must be 15% or lower, and the pH between 6 and 9. If the pH is greater than 9, use Loxon Block Surfer in place of PrepRite Block Filler.

For repairing exterior cracks, bugholes, air pockets, and other voids use an elastomeric patch or seal.



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PREPRITE®
Interior/Exterior Latex
Block Filler
B25W25

SURFACE PREPARATION**Mildew**

Prior to attempting to remove mildew, it is always recommended to test any cleaner on a small, inconspicuous area prior to use. Bleach and bleaching type cleaners may damage or discolor existing paint films. Bleach alternative cleaning solutions may be advised.

Mildew may be removed before painting by washing with a solution of 1 part liquid bleach and 3 parts water. Apply the solution and scrub the mildewed area. Allow the solution to remain on the surface for 10 minutes. Rinse thoroughly with water and allow the surface to dry before painting. Wear protective eyewear, waterproof gloves, and protective clothing. Quickly wash off any of the mixture that comes in contact with your skin. Do not add detergents or ammonia to the bleach/water solution.

APPLICATION

Apply at temperatures above 50°F.
No reduction necessary.

Brush - Use a nylon/polyester brush.

Roller - Use a 3/8" to 1-1/2" nap cover.

Spray - Airless

Pressure.....2300 psi

Tip......028"

Reduction.....as needed up to 1 pt/gal

Remove all in-line and gun filters

Apply paint at the recommended film thickness and spreading rate as indicated on front page. Application of coating below minimum recommended spreading rate may adversely affect the coating systems performance.

ProMar Block Filler is ready-to-spray (airless) and does not require thinning. Mix material thoroughly to a uniform consistency with power agitation and apply by brush, roller, or spray. If applied by airless spray, follow by roller, being careful to force material into pores in order to reduce pinholes and produce a relatively smooth surface. Squeegee or trowel will provide the smoothest finish. Two coats properly applied may be required to provide the most pinhole-free, uniform surface.

CAUTIONS

For interior and exterior use.

Must be topcoated for exterior use.

Protect from freezing.

Do not apply to damp or wet surfaces.

Do not use below grade as a hydrostatic waterproofer or in immersion service.

Before using, carefully read **CAUTIONS** on label.

HOTW 10/30/2017 B25W00025 44 44

FRC, SP

CLEANUP INFORMATION

Clean spills and spatters, hands and tools immediately with soap and warm water. After cleaning, flush spray equipment with compliant cleanup solvent to prevent rusting of the equipment. Follow manufacturer's safety recommendations when using solvents.

The information and recommendations set forth in this Product Data Sheet are based upon tests conducted by or on behalf of The Sherwin-Williams Company. Such information and recommendations set forth herein are subject to change and pertain to the product offered at the time of publication. Consult your Sherwin-Williams representative or visit www.paintdocs.com to obtain the most current version of the PDS and/or an SDS.

SAFETY DATA SHEET

B25W25

Section 1. Identification

Product name : PrepRite® Interior/Exterior Latex Block Filler
White

Product code : B25W25

Other means of identification : Not available.

Product type : Liquid.

Relevant Identified uses of the substance or mixture and uses advised against

Not applicable.

Manufacturer : THE SHERWIN-WILLIAMS COMPANY
101 W. Prospect Avenue
Cleveland, OH 44115

National contact : The Sherwin-Williams Company
418 North Service Road East
Oakville, Ontario L6H 5R2 Canada

Emergency telephone number of the company : US / Canada: (216) 566-2917
Mexico: SETIQ 01-800-00-214-00 / (52) 55-5559-1588 24 hours / 365 days a year

Product Information Telephone Number : US / Canada: Not Available
Mexico: Not Available

Regulatory Information Telephone Number : US / Canada: (216) 566-2902
Mexico: Not Available

Transportation Emergency Telephone Number : US / Canada: (800) 424-9300
Mexico: SETIQ 01-800-00-214-00 / (52) 55-5559-1588 24 hours / 365 days a year

Section 2. Hazards identification

Classification of the substance or mixture : SKIN CORROSION/IRRITATION - Category 2
SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 2A
CARCINOGENICITY - Category 1A
SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Respiratory tract irritation) - Category 3
SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) (lungs) - Category 1
Percentage of the mixture consisting of ingredient(s) of unknown oral toxicity: 58.6%
Percentage of the mixture consisting of ingredient(s) of unknown dermal toxicity: 58.6%
Percentage of the mixture consisting of ingredient(s) of unknown inhalation toxicity: 58.6%

GHS label elements

Hazard pictograms :



Signal word : Danger

Section 2. Hazards identification

Hazard statements : Causes serious eye irritation.
Causes skin irritation.
May cause cancer.
May cause respiratory irritation.
Causes damage to organs through prolonged or repeated exposure. (lungs)

Precautionary statements

General : Read label before use. Keep out of reach of children. If medical advice is needed, have product container or label at hand.

Prevention : Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Wear protective gloves. Wear eye or face protection. Wear protective clothing. Use only outdoors or in a well-ventilated area. Do not breathe vapor. Do not eat, drink or smoke when using this product. Wash hands thoroughly after handling.

Response : Get medical attention if you feel unwell. IF exposed or concerned: Get medical attention. IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER or physician if you feel unwell. IF ON SKIN: Wash with plenty of soap and water. Take off contaminated clothing and wash it before reuse. If skin irritation occurs: Get medical attention. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical attention.

Storage : Store locked up.

Disposal : Dispose of contents and container in accordance with all local, regional, national and international regulations.

Supplemental label elements WARNING: This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm. Adequate ventilation required when sanding or abrading the dried film. If Adequate ventilation cannot be provided wear an approved particulate respirator (NIOSH approved). Follow respirator manufacturer's directions for respirator use. DELAYED EFFECTS FROM LONG TERM OVEREXPOSURE. Abrading or sanding of the dry film may release Crystalline Silica which has been shown to cause lung damage and cancer under long term exposure. Please refer to the SDS for additional information. Keep out of reach of children. Do not transfer contents to other containers for storage.

Hazards not otherwise classified : None known.

Section 3. Composition/information on ingredients

Substance/mixture : Mixture
Other means of identification : Not available.

CAS number/other identifiers

Ingredient name	% by weight	CAS number
Calcium Carbonate	53.35	1317-65-3
Kaolin	4.08	1332-58-7
Titanium Dioxide	1.19	13463-67-7
Crystalline Silica, respirable powder	0.21	14808-60-7

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

Description of necessary first aid measures

- Eye contact** : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention.
- Inhalation** : Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention. If necessary, call a poison center or physician. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.
- Skin contact** : Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Get medical attention. Wash clothing before reuse. Clean shoes thoroughly before reuse.
- Ingestion** : Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Most important symptoms/effects, acute and delayed

Potential acute health effects

- Eye contact** : Causes serious eye irritation.
- Inhalation** : May cause respiratory irritation.
- Skin contact** : Causes skin irritation.
- Ingestion** : No known significant effects or critical hazards.

Over-exposure signs/symptoms

- Eye contact** : Adverse symptoms may include the following:
pain or irritation
watering
redness
- Inhalation** : Adverse symptoms may include the following:
respiratory tract irritation
coughing
- Skin contact** : Adverse symptoms may include the following:
irritation
redness
- Ingestion** : No specific data.

Indication of immediate medical attention and special treatment needed, if necessary

- Notes to physician** : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
- Specific treatments** : No specific treatment.
- Protection of first-aiders** : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media : Use an extinguishing agent suitable for the surrounding fire.

Unsuitable extinguishing media : None known.

Specific hazards arising from the chemical : In a fire or if heated, a pressure increase will occur and the container may burst.

Hazardous thermal decomposition products : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide
metal oxide/oxides

Special protective actions for fire-fighters : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders : If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods and materials for containment and cleaning up

Small spill : Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Large spill : Stop leak if without risk. Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Section 7. Handling and storage

Precautions for safe handling

Protective measures : Put on appropriate personal protective equipment (see Section 8). Avoid exposure - obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not ingest. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

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	White					

Section 7. Handling and storage

Advice on general occupational hygiene

: Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities

: Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits (OSHA United States)

Ingredient name	Exposure limits
Calcium Carbonate	NIOSH REL (United States, 10/2016). TWA: 5 mg/m ³ 10 hours. Form: Respirable fraction TWA: 10 mg/m ³ 10 hours. Form: Total
Kaolin	OSHA PEL (United States, 6/2016). TWA: 5 mg/m ³ 8 hours. Form: Respirable fraction TWA: 15 mg/m ³ 8 hours. Form: Total dust ACGIH TLV (United States, 3/2016). TWA: 2 mg/m ³ 8 hours. Form: Respirable fraction NIOSH REL (United States, 10/2016). TWA: 5 mg/m ³ 10 hours. Form: Respirable fraction TWA: 10 mg/m ³ 10 hours. Form: Total
Titanium Dioxide	OSHA PEL (United States, 6/2016). TWA: 5 mg/m ³ 8 hours. Form: Respirable fraction TWA: 15 mg/m ³ 8 hours. Form: Total dust ACGIH TLV (United States, 3/2016). TWA: 10 mg/m ³ 8 hours.
Crystalline Silica, respirable powder	OSHA PEL (United States, 6/2016). TWA: 15 mg/m ³ 8 hours. Form: Total dust OSHA PEL Z3 (United States, 6/2016). TWA: 250 mppcf / (%SiO ₂ +5) 8 hours. Form: Respirable TWA: 10 mg/m ³ / (%SiO ₂ +2) 8 hours. Form: Respirable OSHA PEL (United States, 6/2016). TWA: 50 µg/m ³ 8 hours. Form: Respirable dust ACGIH TLV (United States, 3/2016). TWA: 0.025 mg/m ³ 8 hours. Form: Respirable fraction NIOSH REL (United States, 10/2016). TWA: 0.05 mg/m ³ 10 hours. Form: respirable dust

Occupational exposure limits (Canada)

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Section 8. Exposure controls/personal protection

Ingredient name	Exposure limits
None.	

Occupational exposure limits (Mexico)

Ingredient name	Exposure limits
None.	

- Appropriate engineering controls** : Use only with adequate ventilation. If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.
- Environmental exposure controls** : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual protection measures

- Hygiene measures** : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.
- Eye/face protection** : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles.
- Skin protection**
- Hand protection** : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.
- Body protection** : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
- Other skin protection** : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
- Respiratory protection** : Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use.

Section 9. Physical and chemical properties

Appearance

- Physical state** : Liquid.
- Color** : Not available.
- Odor** : Not available.
- Odor threshold** : Not available.
- pH** : 9
- Melting point** : Not available.
- Boiling point** : 100°C (212°F)
- Flash point** : Closed cup: >93.3°C (>199.9°F)

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Section 9. Physical and chemical properties

Evaporation rate	: 0.09 (butyl acetate = 1)
Flammability (solid, gas)	: Not available.
Lower and upper explosive (flammable) limits	: Not available.
Vapor pressure	: 2.3 kPa (17.5 mm Hg) [at 20°C]
Vapor density	: 1 [Air = 1]
Relative density	: 1.62
Solubility	: Not available.
Partition coefficient: n-octanol/water	: Not available.
Auto-ignition temperature	: Not available.
Decomposition temperature	: Not available.
Viscosity	: Kinematic (40°C (104°F)): >0.205 cm ² /s (>20.5 cSt)
Molecular weight	: Not applicable.
<u>Aerosol product</u>	
Heat of combustion	: 0.633 kJ/g

Section 10. Stability and reactivity

Reactivity	: No specific test data related to reactivity available for this product or its ingredients.
Chemical stability	: The product is stable.
Possibility of hazardous reactions	: Under normal conditions of storage and use, hazardous reactions will not occur.
Conditions to avoid	: No specific data.
Incompatible materials	: No specific data.
Hazardous decomposition products	: Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

Not available.

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
Titanium Dioxide	Skin - Mild irritant	Human	-	72 hours 300 Micrograms Intermittent	-

Sensitization

Not available.

Mutagenicity

Not available.

Carcinogenicity

Not available.

Classification

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	White					

Section 11. Toxicological information

Product/ingredient name	OSHA	IARC	NTP
Titanium Dioxide	-	2B	-
Crystalline Silica, respirable powder	-	1	Known to be a human carcinogen.

Reproductive toxicity

Not available.

Teratogenicity

Not available.

Specific target organ toxicity (single exposure)

Name	Category	Route of exposure	Target organs
Calcium Carbonate	Category 3	Not applicable.	Respiratory tract irritation

Specific target organ toxicity (repeated exposure)

Name	Category	Route of exposure	Target organs
Kaolin	Category 1	Inhalation	lungs
Crystalline Silica, respirable powder	Category 1	Inhalation	Not determined

Aspiration hazard

Not available.

Information on the likely routes of exposure : Not available.

Potential acute health effects

Eye contact : Causes serious eye irritation.
Inhalation : May cause respiratory irritation.
Skin contact : Causes skin irritation.
Ingestion : No known significant effects or critical hazards.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact : Adverse symptoms may include the following:
pain or irritation
watering
redness
Inhalation : Adverse symptoms may include the following:
respiratory tract irritation
coughing
Skin contact : Adverse symptoms may include the following:
irritation
redness
Ingestion : No specific data.

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects : Not available.
Potential delayed effects : Not available.

Long term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Potential chronic health effects

Not available.

General : Causes damage to organs through prolonged or repeated exposure.
Carcinogenicity : May cause cancer. Risk of cancer depends on duration and level of exposure.
Mutagenicity : No known significant effects or critical hazards.
Teratogenicity : No known significant effects or critical hazards.
Developmental effects : No known significant effects or critical hazards.
Fertility effects : No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

Not available.

Section 12. Ecological information

Toxicity

Product/ingredient name	Result	Species	Exposure
Titanium Dioxide	Acute LC50 >1000000 µg/l Marine water	Fish - Fundulus heteroclitus	96 hours

Persistence and degradability

Not available.

Bioaccumulative potential

Not available.

Mobility in soil

Soil/water partition coefficient (K_{oc}) : Not available.

Other adverse effects : No known significant effects or critical hazards.

Section 13. Disposal considerations

Disposal methods : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Section 14. Transport information

	DOT Classification	TDG Classification	Mexico Classification	IATA	IMDG
UN number	Not regulated.	Not regulated.	Not regulated.	Not regulated.	Not regulated.
UN proper shipping name	-	-	-	-	-
Transport hazard class(es)	-	-	-	-	-
Packing group	-	-	-	-	-
Environmental hazards	No.	No.	No.	No.	No.
Additional information	-	-	-	-	-

Special precautions for user : Multi-modal shipping descriptions are provided for informational purposes and do not consider container sizes. The presence of a shipping description for a particular mode of transport (sea, air, etc.), does not indicate that the product is packaged suitably for that mode of transport. All packaging must be reviewed for suitability prior to shipment, and compliance with the applicable regulations is the sole responsibility of the person offering the product for transport. People loading and unloading dangerous goods must be trained on all of the risks deriving from the substances and on all actions in case of emergency situations.

Transport in bulk according to Annex II of MARPOL and the IBC Code : Not available.

Proper shipping name : Not available.
Ship type : Not available.
Pollution category : Not available.

Section 15. Regulatory information

U.S. Federal regulations : TSCA 5(a)2 final significant new use rules: Nonylphenoxypoly(ethoxy)ethanol

SARA 313

SARA 313 (40 CFR 372.45) supplier notification can be found on the Environmental Data Sheet.

California Prop. 65

WARNING: This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

Section 16. Other information

Hazardous Material Information System (U.S.A.)

Health	1
Flammability	0
Physical hazards	0

The customer is responsible for determining the PPE code for this material. For more information on HMIS® Personal Protective Equipment (PPE) codes, consult the HMIS® Implementation Manual.

Section 16. Other information

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings and the associated label are not required on SDSs or products leaving a facility under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered trademark and service mark of the American Coatings Association, Inc.

Procedure used to derive the classification

Classification	Justification
SKIN CORROSION/IRRITATION - Category 2	Calculation method
SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 2A	Calculation method
CARCINOGENICITY - Category 1A	Calculation method
SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Respiratory tract irritation) - Category 3	Calculation method
SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) (lungs) - Category 1	Calculation method

History

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Key to abbreviations : ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
IATA = International Air Transport Association
IBC = Intermediate Bulk Container
IMDG = International Maritime Dangerous Goods
LogPow = logarithm of the octanol/water partition coefficient
MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
UN = United Nations

Notice to reader

It is recommended that each customer or recipient of this Safety Data Sheet (SDS) study it carefully and consult resources, as necessary or appropriate, to become aware of and understand the data contained in this SDS and any hazards associated with the product. This information is provided in good faith and believed to be accurate as of the effective date herein. However, no warranty, express or implied, is given. The information presented here applies only to the product as shipped. The addition of any material can change the composition, hazards and risks of the product. Products shall not be repackaged, modified, or tinted except as specifically instructed by Sherwin-Williams, including but not limited to the incorporation of non Sherwin-Williams products or the use or addition of products in proportions not specified by Sherwin-Williams. Regulatory requirements are subject to change and may differ between various locations and jurisdictions. The customer/buyer/user is responsible to ensure that his activities comply with all country, federal, state, provincial or local laws. The conditions for use of the product are not under the control of the manufacturer; the customer/buyer/user is responsible to determine the conditions necessary for the safe use of this product. The customer/buyer/user should not use the product for any purpose other than the purpose shown in the applicable section of this SDS without first referring to the supplier and obtaining written handling instructions. Due to the proliferation of sources for information such as manufacturer-specific SDS, the manufacturer cannot be responsible for SDSs obtained from any other source.



PRO

TM

113.01

PRE-CATALYZED WATERBASED EPOXY

K45-150 SERIES

EG-SHEL

K46-150 SERIES

SEMI-GLOSS

As of 06/24/2015, Complies with:			
OTC	Yes	LEED® 09 CI	Yes
SCAQM	No	LEED® 09 NC	Yes
CARB	Yes	LEED® 09 CS	Yes
CARB SCM 2007	Yes	NGBS	Yes
MPI	Yes		

CHARACTERISTICS

Pro Industrial Pre-Catalyzed Waterbased Epoxies are single-component pre-catalyzed waterborne acrylic epoxies that offers the adhesion, durability and resistance to stains and most cleaning solvents usually characteristic of two-component waterborne acrylic epoxy products.

These products can be applied over a wide variety of primers on properly prepared interior metal, wood, masonry, plaster and drywall.

- Interior Institutional/commercial high maintenance areas
- Upgrade surfaces painted with conventional coatings with a high performance protection system with excellent adhesion
- Corrosion and Chemical resistant
- Hospitals and Schools
- Institutional dining and kitchen areas
- Suitable for use in USDA Inspected facilities

Color: most colors
Recommended Spread Rate per coat:

4.0 mils wet; 1.5 mils dry
350 - 400 sq ft/gal

NOTE: Brush or roll application may require multiple coats to achieve maximum film thickness and uniformity of appearance.

Drying Time @ 4.0 mils wet, 50% RH, 77°F:
temperature and humidity dependent

Touch: 1 hour
Recoat: 8 hours

Drying time is temperature, humidity, and film thickness dependent. If this product dries 72 hours or longer it must be sanded before it is recoated. This product is fully cured in approximately 5 - 7 days.

Finish:
Eg-Shel 20 - 30 units @ 85°
Semi-Gloss 55 - 65 units @ 60°

Flash Point: N/A
Shelf Life: 36 months, unopened

Store indoors at 40°F to 100°F.

Tinting with CCE or BAC:
Use SherCOLOR Formulation System
K45W00161

VOC (less exempt solvents):
135 g/L; 1.12 lb/gal

Volume Solids: 36 ± 2%

Weight Solids: 51 ± 2%

Weight per Gallon: 10.63 lb ± 0.2 lb

RECOMMENDED SYSTEMS

Block

1 ct. Loxon Block Surfacer
2 cts. Pro Industrial Pre-Catalyzed Epoxy

Steel, Aluminum, Galvanized

1 ct. Pro Industrial Pro-Cryl Primer
2 cts. Pro Industrial Pre-Catalyzed Epoxy

Drywall

1 ct. ProMar 200 Zero VOC Primer
2 cts. Pro Industrial Pre-Catalyzed Epoxy

Wood

1 ct. Premium Wall and Wood Primer
2 cts. Pro Industrial Pre-Catalyzed Epoxy

Masonry

1 ct. Loxon Concrete & Masonry Primer
2 cts. Pro Industrial Pre-Catalyzed Epoxy

System Tested:

Substrate: Steel
Surface Preparation: SSPC-SP6
Primer: 1 ct. DTM Acrylic Primer
Finish: 1 ct. Pro Industrial Pre-Catalyzed Epoxy Eg-Shel

Adhesion

Method: ASTM D3359
Result: 5B

100% Adhesion for light colors; Darker colors require longer cure time for same level of adhesion

Pencil Hardness:

Method: ASTM D3363
Result: 2B

Scrub Resistance

Method: ASTM D 2486
Result: 500 - 600 cycles
with Stiff Bristle Brush and Pumice Scrub Media

Block Resistance

Lab Assessment Excellent

Chemical Resistance

ASTM D 1308 Rating:

Excellent Resistance

Limited Resistance

Stain Resistance

ASTM D 3023 Rating:

Excellent Resistance

Limited Resistance

Distilled Water
(Hot and at Room Temperature)
Ethyl Alcohol
Vinegar (3% acetic acid)
Alkali (10% Sodium Hydroxide)
Acid (10% Sulfuric Acid)
Soap (10% Fantastik®)
50/50 Xylene/Mineral Spirits

Mustard
Grape Juice
Red Crayon
Lipstick, Red
Permanent Ink
Coffee
10% Sodium Hydroxide (alkali)
Acetic Acid

Mildew Resistant This coating contains agents which inhibit the growth of mildew on the surface of this coating film.

PRO INDUSTRIAL™
PRE-CATALYZED WATERBASED EPOXY



SHERWIN-WILLIAMS.

SURFACE PREPARATION

WARNING! Removal of old paint by sanding, scraping or other means may generate dust or fumes that contain lead. Exposure to lead dust or fumes may cause brain damage or other adverse health effects, especially in children or pregnant women. Controlling exposure to lead or other hazardous substances requires the use of proper protective equipment, such as a properly fitted respirator (NIOSH approved) and proper containment and cleanup. For more information, call the National Lead Information Center at 1-800-424-LEAD (in US) or contact your local health authority.

Remove all surface contamination including mildew by washing with an appropriate cleaner, rinse thoroughly and allow to dry. Scrape and sand peeled or checked paint to a sound surface. Sand glossy surfaces dull. Seal stains from water, smoke, ink, pencil, grease, etc. with an appropriate primer/sealer.

Iron & Steel - Minimum surface preparation is Hand Tool Clean per SSPC-SP2. Remove all oil and grease from surface per SSPC-SP1. For better performance, use Commercial Blast Cleaning per SSPC-SP6. Primer recommended for best performance.

Aluminum - Remove all oil, grease, dirt, oxide and other foreign material per SSPC-SP1.

Galvanizing - Allow to weather a minimum of six months prior to coating. Solvent Clean per SSPC-SP1. When weathering is not possible, or the surface has been treated with chromates or silicates, first Solvent Clean per SSPC-SP1 and apply a test patch. Allow paint to dry at least one week before testing adhesion. If adhesion is poor, brush blasting per SSPC-SP7 is necessary to remove these treatments. Rusty galvanizing requires a minimum of Hand Tool Cleaning per SSPC-SP2, prime the area the same day as cleaned.

Concrete and Masonry - For surface preparation, refer to SSPC-SP13/NACE 6 or ICRI 03732, CSP 1-3. Surfaces should be thoroughly cleaned and dry. Surface temperatures must be at least 55°F before filling. If required for a smoother finish, use the recommended filler/surfacer. The filler/surfacer must be thoroughly dry before topcoating per manufacturer's recommendations.

Weathered masonry and soft or porous cement board must be brush blasted or power tool cleaned to remove loosely adhering contamination and to get to a hard, firm surface. Apply one coat Loxon Conditioner, following label recommendations.

Drywall - Fill cracks and holes with patching paste/spackle and sand smooth. Joint compounds must be cured and sanded smooth. Remove all sanding dust.

Wood - Sand any exposed wood to a fresh surface. Patch all holes and imperfections with a wood filler or putty and sand smooth.

Previously Painted Surfaces - If in sound condition, clean the surface of all foreign material. Smooth, hard or glossy coatings and surfaces should be dulled by abrading the surface. Apply a test area, allowing paint to dry one week before testing adhesion. If adhesion is poor, additional abrasion of the surface and/or removal of the previous coating may be necessary. Retest surface for adhesion. If paint is peeling or badly weathered, clean surface to sound substrate and treat as a new surface as above.

APPLICATION

Refer to the SDS before use.

Temperature: 50°F minimum
120°F maximum
(Air, surface, and material)
At least 5°F above dew point
Relative humidity: 85% maximum

The following is a guide. Changes in pressures and tip sizes may be needed for proper spray characteristics. Always purge spray equipment before use with listed reducer. Any reduction must be compatible with the existing environmental and application conditions.

Airless Spray

Pressure 1800 - 2700 psi
Hose 1/4" ID
Tip015" - .021"
Filter 60 mesh
Reduction Not recommended

Brush Nylon / polyester
Reduction Not recommended

Roller 1/4 - 1/2" woven
Reduction Not recommended

If specific application equipment is listed above, equivalent equipment may be substituted.

CLEANUP INFORMATION

Clean spills, spatters, hands and tools immediately after use with soap and warm water. After cleaning, flush spray equipment with compliant cleanup solvent to prevent rusting of the equipment. Follow manufacturer's safety recommendations when using solvents.

CAUTION

Not for use on surfaces continuously wet or under water, such as bath tubs, sinks, showers, or countertops.

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The information and recommendations set forth in this Product Data Sheet are based upon tests conducted by or on behalf of The Sherwin-Williams Company. Such information and recommendations set forth herein are subject to change and pertain to the product offered at the time of publication. Consult your Sherwin-Williams representative or visit www.paintdocs.com to obtain the most current version of the PDS and/or an SDS.

SAFETY DATA SHEET

K46W151

Section 1. Identification

Product name : PRO INDUSTRIAL™ Pre-Catalyzed Waterbased Semi-Gloss Epoxy Extra White

Product code : K46W151

Other means of Identification : Not available.

Product type : Liquid.

Relevant identified uses of the substance or mixture and uses advised against
Not applicable.

Manufacturer : THE SHERWIN-WILLIAMS COMPANY
101 W. Prospect Avenue
Cleveland, OH 44115

National contact : Sherwin-Williams Canada Inc.
180 Brunel Road
Mississauga, Ontario L4Z 1T6 Canada

Emergency telephone number of the company : US / Canada: (216) 566-2917
Mexico: SETIQ 01-800-00-214-00 / (52) 55-5559-1588 24 hours / 365 days a year

Product Information Telephone Number : US / Canada: (800) 524-5979
Mexico: Not Available

Regulatory Information Telephone Number : US / Canada: (216) 566-2902
Mexico: Not Available

Transportation Emergency Telephone Number : US / Canada: (800) 424-9300
Mexico: SETIQ 01-800-00-214-00 / (52) 55-5559-1588 24 hours / 365 days a year

Section 2. Hazards identification

Classification of the substance or mixture : CARCINOGENICITY - Category 2
TOXIC TO REPRODUCTION (Unborn child) - Category 2
SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) - Category 2
Percentage of the mixture consisting of ingredient(s) of unknown oral toxicity: 22.1%
Percentage of the mixture consisting of ingredient(s) of unknown dermal toxicity: 22.1%
Percentage of the mixture consisting of ingredient(s) of unknown inhalation toxicity: 22.1%

GHS label elements

Hazard pictograms :



Signal word : Warning

Hazard statements : Suspected of damaging the unborn child.
Suspected of causing cancer.
May cause damage to organs through prolonged or repeated exposure.

Precautionary statements

Prevention : Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Wear protective gloves. Wear eye or face protection. Wear protective clothing. Do not breathe vapor.

Date of issue/Date of revision : 1/16/2018 **Date of previous issue** : 9/9/2017 **Version** : 6.01 **1/1**

K46W151 PRO INDUSTRIAL™ Pre-Catalyzed Waterbased Semi-Gloss Epoxy Extra White

Section 2. Hazards identification

- Response** : Get medical attention if you feel unwell. IF exposed or concerned: Get medical attention.
- Storage** : Store locked up.
- Disposal** : Dispose of contents and container in accordance with all local, regional, national and international regulations.
- Supplemental label elements** **WARNING:** This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm. FOR INDUSTRIAL USE ONLY.
This product contains a component that is either subject to a CEPA ministerial condition or an existing/proposed SNAC (Significant New Activity). See Environmental Data Sheet (EDS) for additional detail.

Please refer to the SDS for additional information. Keep out of reach of children. Do not transfer contents to other containers for storage.

Hazards not otherwise classified : None known.

Section 3. Composition/information on ingredients

- Substance/mixture** : Mixture
- Other means of identification** : Not available.

CAS number/other identifiers

Ingredient name	% by weight	CAS number
Titanium Dioxide	20.51	13463-67-7
2-(2-Methoxyethoxy)-ethanol	1.55	111-77-3

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

Description of necessary first aid measures

- Eye contact** : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention.
- Inhalation** : Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.
- Skin contact** : Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Continue to rinse for at least 10 minutes. Get medical attention. Wash clothing before reuse. Clean shoes thoroughly before reuse.
- Ingestion** : Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Section 4. First aid measures

Most important symptoms/effects, acute and delayed

Potential acute health effects

- Eye contact : No known significant effects or critical hazards.
- Inhalation : No known significant effects or critical hazards.
- Skin contact : No known significant effects or critical hazards.
- Ingestion : No known significant effects or critical hazards.

Over-exposure signs/symptoms

- Eye contact : No specific data.
- Inhalation : Adverse symptoms may include the following:
 - reduced fetal weight
 - increase in fetal deaths
 - skeletal malformations
- Skin contact : Adverse symptoms may include the following:
 - reduced fetal weight
 - increase in fetal deaths
 - skeletal malformations
- Ingestion : Adverse symptoms may include the following:
 - reduced fetal weight
 - increase in fetal deaths
 - skeletal malformations

Indication of immediate medical attention and special treatment needed, if necessary

- Notes to physician : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
- Specific treatments : No specific treatment.
- Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Extinguishing media

- Suitable extinguishing media : Use an extinguishing agent suitable for the surrounding fire.
- Unsuitable extinguishing media : None known.

- Specific hazards arising from the chemical : In a fire or if heated, a pressure increase will occur and the container may burst.

- Hazardous thermal decomposition products : Decomposition products may include the following materials:
 - carbon dioxide
 - carbon monoxide
 - metal oxide/oxides

- Special protective actions for fire-fighters : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

- Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

- For non-emergency personnel** : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
- For emergency responders** : If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".
- Environmental precautions** : This product contains a component that is either subject to a CEPA ministerial condition or an existing/proposed SNAC (Significant New Activity). See Environmental Data Sheet (EDS) for additional detail.

Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods and materials for containment and cleaning up

- Small spill** : Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.
- Large spill** : Stop leak if without risk. Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Section 7. Handling and storage

Precautions for safe handling

- Protective measures** : Put on appropriate personal protective equipment (see Section 8). Avoid exposure - obtain special instructions before use. Avoid exposure during pregnancy. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not ingest. If during normal use the material presents a respiratory hazard, use only with adequate ventilation or wear appropriate respirator. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.
- Advice on general occupational hygiene** : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.
- Conditions for safe storage, including any incompatibilities** : Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits (OSHA United States)

Ingredient name	Exposure limits
Titanium Dioxide	ACGIH TLV (United States, 3/2016). TWA: 10 mg/m ³ 8 hours. OSHA PEL (United States, 6/2016). TWA: 15 mg/m ³ 8 hours. Form: Total dust None.
2-(2-Methoxyethoxy)-ethanol	

Occupational exposure limits (Canada)

Ingredient name	Exposure limits
None.	

Occupational exposure limits (Mexico)

Ingredient name	Exposure limits
None.	

Appropriate engineering controls

: If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

Environmental exposure controls

: This product contains a component that is either subject to a CEPA ministerial condition or an existing/proposed SNAC (Significant New Activity). See Environmental Data Sheet (EDS) for additional detail.

Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual protection measures

Hygiene measures

: Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection

: Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: safety glasses with side-shields.

Skin protection

Hand protection

: Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

Body protection

: Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Other skin protection

: Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Section 8. Exposure controls/personal protection

Respiratory protection : Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use.

Section 9. Physical and chemical properties

Appearance

Physical state : Liquid.
Color : Not available.
Odor : Not available.
Odor threshold : Not available.
pH : 9.5
Melting point : Not available.
Boiling point : 100°C (212°F)
Flash point : Closed cup: >93.3°C (>199.9°F)
Evaporation rate : 0.09 (butyl acetate = 1)
Flammability (solid, gas) : Not available.
Lower and upper explosive (flammable) limits : Lower: 0.6%
Upper: 20.4%
Vapor pressure : 2.3 kPa (17.5 mm Hg) [at 20°C]
Vapor density : 1 [Air = 1]
Relative density : 1.24
Solubility : Not available.
Partition coefficient: n-octanol/water : Not available.
Auto-ignition temperature : Not available.
Decomposition temperature : Not available.
Viscosity : Kinematic (40°C (104°F)): >0.205 cm²/s (>20.5 cSt)
Molecular weight : Not applicable.

Aerosol product

Heat of combustion : 2.19 kJ/g

Section 10. Stability and reactivity

Reactivity : No specific test data related to reactivity available for this product or its ingredients.

Chemical stability : The product is stable.

Possibility of hazardous reactions : Under normal conditions of storage and use, hazardous reactions will not occur.

Conditions to avoid : No specific data.

Incompatible materials : No specific data.

Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

Not available.

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
Titanium Dioxide	Skin - Mild irritant	Human	-	72 hours 300 Micrograms	-
2-(2-Methoxyethoxy)-ethanol	Eyes - Mild irritant	Rabbit	-	Intermittent 24 hours 500 milligrams	-
	Eyes - Moderate irritant	Rabbit	-	500 milligrams	-

Sensitization

Not available.

Mutagenicity

Not available.

Carcinogenicity

Not available.

Classification

Product/ingredient name	OSHA	IARC	NTP
Titanium Dioxide	-	2B	-

Reproductive toxicity

Not available.

Teratogenicity

Not available.

Specific target organ toxicity (single exposure)

Name	Category	Route of exposure	Target organs
2-(2-Methoxyethoxy)-ethanol	Category 3	Not applicable.	Respiratory tract irritation and Narcotic effects

Specific target organ toxicity (repeated exposure)

Name	Category	Route of exposure	Target organs
2-(2-Methoxyethoxy)-ethanol	Category 2	Not determined	Not determined

Aspiration hazard

Not available.

Information on the likely routes of exposure : Not available.

Potential acute health effects

Eye contact : No known significant effects or critical hazards.
Inhalation : No known significant effects or critical hazards.
Skin contact : No known significant effects or critical hazards.
Ingestion : No known significant effects or critical hazards.

Symptoms related to the physical, chemical and toxicological characteristics

- Eye contact** : No specific data.
- Inhalation** : Adverse symptoms may include the following:
reduced fetal weight
increase in fetal deaths
skeletal malformations
- Skin contact** : Adverse symptoms may include the following:
reduced fetal weight
increase in fetal deaths
skeletal malformations
- Ingestion** : Adverse symptoms may include the following:
reduced fetal weight
increase in fetal deaths
skeletal malformations

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

- Potential immediate effects** : Not available.
- Potential delayed effects** : Not available.

Long term exposure

- Potential immediate effects** : Not available.
- Potential delayed effects** : Not available.

Potential chronic health effects

Not available.

- General** : May cause damage to organs through prolonged or repeated exposure.
- Carcinogenicity** : Suspected of causing cancer. Risk of cancer depends on duration and level of exposure.
- Mutagenicity** : No known significant effects or critical hazards.
- Teratogenicity** : Suspected of damaging the unborn child.
- Developmental effects** : No known significant effects or critical hazards.
- Fertility effects** : No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

Not available.

Section 12. Ecological information

Toxicity

Product/ingredient name	Result	Species	Exposure
Titanium Dioxide 2-(2-Methoxyethoxy)-ethanol	Acute LC50 >1000000 µg/l Marine water	Fish - Fundulus heteroclitus	96 hours
	Acute EC50 >930 ppm Fresh water	Daphnia - Daphnia magna	48 hours
	Acute LC50 7500000 µg/l Fresh water	Fish - Lepomis macrochirus	96 hours

Persistence and degradability

Not available.

Bioaccumulative potential

Not available.

Section 12. Ecological information

Mobility in soil

Soil/water partition coefficient (K_{oc}) : Not available.

Other adverse effects : No known significant effects or critical hazards.

Section 13. Disposal considerations

Disposal methods : This product contains a component that is either subject to a CEPA ministerial condition or an existing/proposed SNAC (Significant New Activity). See Environmental Data Sheet (EDS) for additional detail.

The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Section 14. Transport information

	DOT Classification	TDG Classification	Mexico Classification	IATA	IMDG
UN number	Not regulated.	Not regulated.	Not regulated.	Not regulated.	Not regulated.
UN proper shipping name	-	-	-	-	-
Transport hazard class(es)	-	-	-	-	-
Packing group	-	-	-	-	-
Environmental hazards	No.	No.	No.	No.	No.
Additional information	-	-	-	-	-

Special precautions for user : Multi-modal shipping descriptions are provided for informational purposes and do not consider container sizes. The presence of a shipping description for a particular mode of transport (sea, air, etc.), does not indicate that the product is packaged suitably for that mode of transport. All packaging must be reviewed for suitability prior to shipment, and compliance with the applicable regulations is the sole responsibility of the person offering the product for transport. People loading and unloading dangerous goods must be trained on all of the risks deriving from the substances and on all actions in case of emergency situations.

Transport in bulk according to Annex II of MARPOL and the IBC Code : Not available.

Proper shipping name : Not available.

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Section 14. Transport Information

Ship type : Not available.
Pollution category : Not available.

Section 15. Regulatory Information

This product contains a component that is either subject to a CEPA ministerial condition or an existing/proposed SNAC (Significant New Activity). See Environmental Data Sheet (EDS) for additional detail.

SARA 313

SARA 313 (40 CFR 372.45) supplier notification can be found on the Environmental Data Sheet.

California Prop. 65

WARNING: This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

Section 16. Other Information

Hazardous Material Information System (U.S.A.)

Health	2
Flammability	0
Physical hazards	0

The customer is responsible for determining the PPE code for this material. For more information on HMIS® Personal Protective Equipment (PPE) codes, consult the HMIS® Implementation Manual.

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings and the associated label are not required on SDSs or products leaving a facility under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered trademark and service mark of the American Coatings Association, Inc.

Procedure used to derive the classification:

Classification	Justification
CARCINOGENICITY - Category 2	Calculation method
TOXIC TO REPRODUCTION (Unborn child) - Category 2	Calculation method
SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) - Category 2	Calculation method

History

Date of printing : 1/16/2018
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Version : 6.01
Key to abbreviations : ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
IATA = International Air Transport Association
IBC = Intermediate Bulk Container
IMDG = International Maritime Dangerous Goods
LogPow = logarithm of the octanol/water partition coefficient
MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
UN = United Nations

Notice to reader

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Section 16. Other information

It is recommended that each customer or recipient of this Safety Data Sheet (SDS) study it carefully and consult resources, as necessary or appropriate, to become aware of and understand the data contained in this SDS and any hazards associated with the product. This information is provided in good faith and believed to be accurate as of the effective date herein. However, no warranty, express or implied, is given. The information presented here applies only to the product as shipped. The addition of any material can change the composition, hazards and risks of the product. Products shall not be repackaged, modified, or tinted except as specifically instructed by Sherwin-Williams, including but not limited to the incorporation of non Sherwin-Williams products or the use or addition of products in proportions not specified by Sherwin-Williams. Regulatory requirements are subject to change and may differ between various locations and jurisdictions. The customer/buyer/user is responsible to ensure that his activities comply with all country, federal, state, provincial or local laws. The conditions for use of the product are not under the control of the manufacturer; the customer/buyer/user is responsible to determine the conditions necessary for the safe use of this product. The customer/buyer/user should not use the product for any purpose other than the purpose shown in the applicable section of this SDS without first referring to the supplier and obtaining written handling instructions. Due to the proliferation of sources for information such as manufacturer-specific SDS, the manufacturer cannot be responsible for SDSs obtained from any other source.

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108.24

PROMAR® 200 **Zero VOC** **Interior Latex** **Primer** **B28W02600**

As of 05/17/2018, Complies with:			
OTC	Yes	LEED® 09 NC CI	Yes
SCAQMD	Yes	LEED® 09 CS	Yes
CARB	Yes	LEED® 09 H.A.S.	Yes
CARB SCM 2007	Yes	LEED® v4 Emissions	Yes
MPI	Yes	LEED® v4 VOC	Yes

DESCRIPTION	CHARACTERISTICS	SURFACE PREPARATION
<p>ProMar 200 Zero VOC Interior Latex Primer is a durable, professional quality, interior vinyl acrylic primer.</p> <p>This primer has been designed for use with the ProMar Series Interior Latex topcoats providing a complete system.</p> <p>For use on these interior surfaces:</p> <ul style="list-style-type: none"> • Wood • Drywall • Plaster • Masonry • Primed Metal • Previously painted surfaces 	<p>Color: White</p> <p>Coverage: 350 - 400 sq ft/gal @ 4 mils wet; 1.0 mils dry</p> <p>Drying Time, @ 77°F, 50% RH:</p> <p>Touch: 1 hour</p> <p>Recoat: 4 hours</p> <p>Drying and recoat times are temperature, humidity and film thickness dependent.</p> <p>Flash Point: N/A</p> <p>Finish: 0 - 5 units @ 85°</p> <p>Vehicle Type: Vinyl Acrylic</p> <p>B28W02600</p> <p>VOC (less exempt solvents): <50 g/L; <0.42 lb/gal</p> <p>As per 40 CFR 59.408 and SOR/2008-284, s.12</p> <p>Volume Solids: 26 ± 2%</p> <p>Weight Solids: 43 ± 2%</p> <p>Weight per Gallon: 10.77 lb</p> <p>WVP Perme (US) 25.8 grains/(hr ft² in Hg)</p> <p>Tinting Requires ColorCast Ecotoners for tinting. For best topcoat color development, use the recommended "P"-shade primer. If desired, up to 4 oz per gallon of ColorCast Ecotoners can be used to approximate the topcoat color. Check color before use.</p> <p>When spot priming on some surfaces, a non-uniform appearance of the final coat may result, due to differences in holdout between primed and unprimed areas. To avoid this, prime the entire surface rather than spot priming.</p> <p>For optimal performance, this primer must be topcoated with a latex, alkyd/oil, water based epoxy, or solvent based epoxy coating on architectural applications.</p>	<p>WARNING! Removal of old paint by sanding, scraping or other means may generate dust or fumes that contain lead. Exposure to lead dust or fumes may cause brain damage or other adverse health effects, especially in children or pregnant women. Controlling exposure to lead or other hazardous substances requires the use of proper protective equipment, such as a properly fitted respirator (NIOSH approved) and proper containment and cleanup. For more information, call the National Lead Information Center at 1-800-424-LEAD (in US) or contact your local health authority.</p> <p>Remove all surface contamination by washing with an appropriate cleaner, rinse thoroughly and allow to dry. Existing peeled or checked paint should be scraped and sanded to a sound surface. Glossy surfaces should be sanded dull. Stains from water, smoke, ink, pencil, grease, etc. should be sealed with the appropriate primer/sealer. Recognize that any surface preparation short of total removal of the old coating may compromise the service length of the system.</p> <p>Caulking Fill gaps between walls, ceilings, crown moldings, and other trim with the appropriate caulk after priming the surface.</p> <p>Drywall Fill cracks and holes with patching paste/spackle and sand smooth. Joint compounds must be cured and sanded smooth. Remove all sanding dust.</p>



108.24

PROMAR[®] 200
Zero VOC
Interior Latex
Primer
B28W02600

SURFACE PREPARATION

Masonry, Concrete, Cement, Block
All new surfaces must be cured according to the supplier's recommendations—usually about 30 days. Remove all form release and curing agents. Rough surfaces can be filled to provide a smooth surface. If painting cannot wait 30 days, allow the surface to cure 7 days and prime the surface with Loxon Concrete & Masonry Primer.

Mildew

Prior to attempting to remove mildew, it is always recommended to test any cleaner on a small, inconspicuous area prior to use. Bleach and bleaching type cleaners may damage or discolor existing paint films. Bleach alternative cleaning solutions may be advised.

Mildew may be removed before painting by washing with a solution of 1 part liquid bleach and 3 parts water. Apply the solution and scrub the mildewed area. Allow the solution to remain on the surface for 10 minutes. Rinse thoroughly with water and allow the surface to dry before painting. Wear protective eyewear, waterproof gloves, and protective clothing. Quickly wash off any of the mildew that comes in contact with your skin. Do not add detergents or ammonia to the bleach/water solution.

Plaster

Bare plaster must be cured and hard. Textured, soft, porous, or powdery plaster should be treated with a solution of 1 pint household vinegar to 1 gallon of water. Repeat until the surface is hard, rinse with clear water and allow to dry.

APPLICATION

Use at temperatures above 50°F.
No reduction necessary.

Brush

Use a nylon/polyester brush.

Roller

Use a synthetic nap cover

Spray - Airless

Pressure2000 psi

Tip.....017"-021"

CLEANUP INFORMATION

Clean spills, spatters, hands and tools immediately after use with soap and warm water. After cleaning, flush spray equipment with a compliant cleanup solvent to prevent rusting of the equipment. Follow manufacturer's safety recommendations when using solvents.

CAUTIONS

For interior use only.
Protect from freezing.
Non-photochemically reactive.
Not for use under wallpaper.

Before using, carefully read **CAUTIONS** on label.

HOTW 05/17/2018 B28W02600 21 00

KOR, FRC, SP

The information and recommendations set forth in this Product Data Sheet are based upon tests conducted by or on behalf of The Sherwin-Williams Company. Such information and recommendations set forth herein are subject to change and pertain to the product offered at the time of publication. Consult your Sherwin-Williams representative or visit www.paintdocs.com to obtain the most current version of the PDS and/or an SDS.

ENVIRONMENTAL DATA SHEET

(Certified Product Data Sheet)

Date of Preparation
Jan 28, 2018

21 00 [0136]

PRODUCT NUMBER

B28V2800

PRODUCT NAME

PROMAR® 200 Zero VOC Interior Latex Primer, White

MANUFACTURER'S NAME

THE SHERWIN-WILLIAMS COMPANY

101 W. Prospect Avenue

Cleveland, OH 44115

This document includes all data required by 40 CFR 63.801(a) for a Certified Product Data Sheet under criteria specified in 40 CFR 63.805(a). All data given below are MAXIMUM THEORETICAL VALUES based on the product AS CURRENTLY FORMULATED. Variations may occur on individual batches due to adjustments made during production.

Product Weight

10.77 lb/gal

Specific Gravity

1.30

FLASH POINT

N.A.

Hazard Category (for SARA 311.312)

[Acute | Chronic |

Volatile Ingredients

Chemical / Compound	SARA 302 EHS	GERCLA	SARA 313 TC	HAPs 112	% by Weight	% by Volume
Water	N	N	N	N	57	74
7732-18-5						

Volatile Organic Compounds - U.S. EPA

A.	Coating Density	10.77 lb/gal	1280 g/l	
B.	Total Volatiles	57.1% by wt.	73.9% by vol.	
C.	Federally exempt solvents:			
	Water	57.1% by wt.	73.9% by vol.	
D.	Organic Volatiles	0.0% by wt.	0.0% by vol.	
E.	Percent Non-Volatile	42.9% by wt.	26.1% by vol.	
F.	VOC Content	0.00 lb/gal	0 g/l	total
		0.00 lb/gal	0 g/l	less exempt solvents
		0.00 lb/gal	0 g/l	of solids
		0.00 lb/lb	0.00 kg/kg	of solids
		0.0%		by wt LVP-VOC
	Maximum Incremental Reactivity (MIR) (per US EPA Aerosol Ctg Rule, MIR Values 2009)	0.00		

Volatile Organic Compounds - California

A.	Coating Density	10.77 lb/gal	1280 g/l	
B.	Total Volatiles	57.1% by wt.	73.9% by vol.	
C.	Exempt solvents:			
	Water	57.1% by wt.	73.9% by vol.	
D.	Organic Volatiles	0.0% by wt.	0.0% by vol.	
E.	Percent Non-Volatile	42.9% by wt.	26.1% by vol.	
F.	VOC Content	0.00 lb/gal	0 g/l	total
		0.00 lb/gal	0 g/l	less exempt solvents
		0.00 lb/gal	0 g/l	of solids
		0.00 lb/lb	0.00 kg/kg	of solids
		0.0%		by wt LVP-VOC
	Maximum Incremental Reactivity (MIR) (per California Air Resources Board Aerosol Products Regulation, MIR Values 2010)	0.00		

Volatile Organic Compounds - South Coast Air Quality Management District, California, US

A.	Coating Density	10.77 lb/gal	1290 g/l	
B.	Total Volatiles	57.1% by wt.	73.9% by vol.	
C.	Exempt solvents:			
	Water	57.1% by wt.	73.9% by vol.	
D.	Organic Volatiles	0.0% by wt.	0.0% by vol.	
E.	Percent Non-Volatile	42.9% by wt.	26.1% by vol.	
F.	VOC Content	0.00 lb/gal	0 g/l	total
		0.00 lb/gal	0 g/l	less exempt solvents
		0.00 lb/gal	0 g/l	of solids
		0.00 lb/lb	0.00 kg/kg	of solids
		0.0%		by wt LVP-VOC

Volatile Organic Compounds - EU Directive 2010/75/EU

Total Volatiles	57.1% by wt.	73.9% by vol.
VOC Content	0.00 lb/gal	0 g/l

Hazardous Air Pollutants (Clean Air Act, Section 112(b))

Volatile HAPS	0.00	lb/gal	0.000	kg/l
	0.00	lb/gal	0.000	kg/l of solids
	0.00	lb/lb	0.00	kg/kg of solids

Air Quality Data

Density of Organic Solvent Blend
10.77 lb/gal
Photochemically Reactive
No

Additional Regulatory Information

US EPA TSCA:

Not Applicable

Relevant identified uses of the substance or mixture and uses advised against:

Not Applicable

Waste Disposal

Waste from this product is not hazardous as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR 261.

Addition of reducers or other additives to this product may substantially alter the above data. Since conditions of use are outside our control, we make no warranties, express or implied, and assume no liability in connection with any use of this information.



101.79

PROMAR® 200 **Zero VOC** **Interior Latex** **Low Gloss Eg-Shel** **B41-2600 Series**

As of 12/03/2015. Complies with:

OTC	Yes	LEED® 09 CI	Yes
SCAQMD	Yes	LEED® 09 NC	Yes
CARB	Yes	LEED® 09 CS	Yes
CARB SCM 2007	Yes	LEED® 09 H & S	Yes
MPI	Yes	NGBS	Yes

CHARACTERISTICS

ProMar 200 Zero VOC Interior Latex Low Gloss Eg-Shel is a durable, professional quality, interior vinyl acrylic finish that is perfect for use in areas that require a more scrubbable surface, but where a lower gloss eg-shel finish is desired. It is recommended for use on walls, ceilings, and trim of primed plaster, wallboard, wood, masonry, and primed metal.

Color: most colors
 To optimize hide and color development, always use the recommended P-Shade primer

Coverage: 350 - 400 sq ft/gal
 @ 4 mils wet; 1.6 mils dry

Drying Time, @ 77°F, 50% RH:
 temperature and humidity dependent

Touch: 1 hour

Recoat: 4 hours

Drying and recoat times are temperature, humidity, and film thickness dependent

Finish: 15-20 units @ 85°
 <5 units @ 60°

Flash Point: N/A

Tinting with CCE only:

Base	oz/gal	Strength
High Ref White	0-6	100%
Extra White	0-7	125%
Deep Base	4-12	100%
Ultradeep	10-12	100%

Vehicle Type: Vinyl Acrylic
Extra White B41W02651

VOC (less exempt solvents):
 <50 g/L; 0.42 lb/gal

As per 40 CFR 59.406 and SOR/2009-264, s.12

Volume Solids: 41 ± 2%

Weight Solids: 56 ± 2%

Weight per Gallon: 11.22 lb

Anti-microbial

This product contains agents which inhibit the growth of microbes on the surface of this paint film.

SPECIFICATIONS

Block

- 1 ct. PrepRite Block Filler*
- 2 cts. ProMar 200 Zero VOC Interior Latex

Drywall

- 1 ct. ProMar 200 Zero VOC Interior Latex Primer
- 2 cts. ProMar 200 Zero VOC Interior Latex

Masonry

- 1 ct. Loxon Concrete & Masonry Primer*
- 2 cts. ProMar 200 Zero VOC Interior Latex

Plaster

- 1 ct. Premium Wall & Wood Primer*
- 2 cts. ProMar 200 Zero VOC Interior Latex

Wood

- 1 ct. Premium Wall & Wood Primer*
- 2 cts. ProMar 200 Zero VOC Interior Latex

* These primers contain relatively low amounts of VOCs, but could result in minor, noticeable odors.

Other primers may be appropriate.

When repainting involves a drastic color change, a coat of primer will improve the hiding performance of the topcoat color.

SURFACE PREPARATION

WARNING! Removal of old paint by sanding, scraping or other means may generate dust or fumes that contain lead. Exposure to lead dust or fumes may cause brain damage or other adverse health effects, especially in children or pregnant women. Controlling exposure to lead or other hazardous substances requires the use of proper protective equipment, such as a properly fitted respirator (NIOSH approved) and proper containment and cleanup. For more information, call the National Lead Information Center at 1-800-424-LEAD (in US) or contact your local health authority.

Remove all surface contamination by washing with an appropriate cleaner, rinse thoroughly and allow to dry. Existing peeled or checked paint should be scraped and sanded to a sound surface. Glossy surfaces should be sanded dull. Stains from water, smoke, ink, pencil, grease, etc. should be sealed with the appropriate primer/sealer. Recognize that any surface preparation short of total removal of the old coating may compromise the service length of the system.

Drywall

Fill cracks and holes with patching paste or spackle and sand smooth. Joint compounds must be cured and sanded smooth. Remove all sanding dust.

Masonry, Concrete, Cement, Block

All new surfaces must be cured according to the supplier's recommendations—usually about 30 days. Remove all form release and curing agents. Rough surfaces can be filled to provide a smooth surface. If painting cannot wait 30 days, allow the surface to cure 7 days and prime the surface with Loxon Concrete & Masonry Primer.



PROMAR® 200
Zero VOC
Interior Latex
Low Gloss Eg-Shel
B41-2600 Series

SURFACE PREPARATION

Plaster

Bare plaster must be cured and hard. Textured, soft, porous, or powdery plaster should be treated with a solution of 1 pint household vinegar to 1 gallon of water. Repeat until the surface is hard, rinse with clear water and allow to dry.

Wood

Sand any exposed wood to a fresh surface. Patch all holes and imperfections with a wood filler or putty and sand smooth.

Mildew

Prior to attempting to remove mildew, it is always recommended to test any cleaner on a small, inconspicuous area prior to use. Bleach and bleaching type cleaners may damage or discolor existing paint films. Bleach alternative cleaning solutions may be advised.

Remove before painting by washing with a solution of 1 part liquid bleach and 3 parts water. Apply the solution and scrub the mildewed area. Allow the solution to remain on the surface for 10 minutes. Rinse thoroughly with water and allow the surface to dry before painting. Wear protective eyewear, waterproof gloves, and protective clothing. Quickly wash off any of the mixture that comes in contact with your skin. Do not add detergents or ammonia to the bleach/water solution.

Caulking

Gaps between walls, ceilings, crown moldings, and other interior trim can be filled with the appropriate caulk after priming the surface.

APPLICATION

Apply at temperatures above 50°F. No reduction needed.

Brush

Use a nylon/polyester brush.

Roller

Use a 3/8" - 3/4" nap synthetic cover.

Spray—Airless

Pressure..... 2000 psi

Tip..... .017"-.021"

CLEANUP INFORMATION

Clean spills, spatters, hands and tools immediately after use with soap and warm water. After cleaning, flush spray equipment with compliant cleanup solvent to prevent rusting of the equipment. Follow manufacturer's safety recommendations when using solvents.

CAUTIONS

For interior use only.
 Protect from freezing.
 Non-photochemically reactive.

Use only with adequate ventilation. To avoid overexposure, open windows and doors or use other means to ensure fresh air entry during application and drying. If you experience eye watering, headaches, or dizziness, increase fresh air, or wear respiratory protection (NIOSH approved) or leave the area. Avoid contact with eyes and skin. Wash hands after using. Keep container closed when not in use. Do not transfer contents to other containers for storage. **FIRST AID:** In case of eye contact, flush thoroughly with large amounts of water. Get medical attention if irritation persists. If swallowed, call Poison Control Center, hospital emergency room, or physician immediately. **WARNING:** This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm. **DO NOT TAKE INTERNALLY. KEEP OUT OF THE REACH OF CHILDREN.**

HOTW 12/03/2015 B41W02651 06 00

SP, KOR, FRC

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SAFETY DATA SHEET

B41W2651

Section 1. Identification

Product name : PROMAR® 200 Zero VOC Interior Latex Low Gloss Eg-Shel
Extra White

Product code : B41W2651

Other means of identification : Not available.

Product type : Liquid.

Relevant identified uses of the substance or mixture and uses advised against

Not applicable.

Manufacturer : THE SHERWIN-WILLIAMS COMPANY
101 W. Prospect Avenue
Cleveland, OH 44115

National contact : The Sherwin-Williams Company
418 North Service Road East
Oakville, Ontario L6H 5R2 Canada

Emergency telephone number of the company : US / Canada: (216) 566-2917
Mexico: SETIQ 01-800-00-214-00 / (52) 55-5559-1588 24 hours / 365 d

Product Information Telephone Number : US / Canada: Not Available
Mexico: Not Available

Regulatory Information Telephone Number : US / Canada: (216) 566-2902
Mexico: Not Available

Transportation Emergency Telephone Number : US / Canada: (800) 424-9300
Mexico: SETIQ 01-800-00-214-00 / (52) 55-5559-1588 24 hours / 365 d

Section 2. Hazards identification

Classification of the substance or mixture : CARCINOGENICITY - Category 2

Percentage of the mixture consisting of ingredient(s) of unknown oral tox
Percentage of the mixture consisting of ingredient(s) of unknown dermal
Percentage of the mixture consisting of ingredient(s) of unknown inhalati
9%

GHS label elements

Hazard pictograms



Section 2. Hazards identification

- Response** : IF exposed or concerned: Get medical attention.
- Storage** : Store locked up.
- Disposal** : Dispose of contents and container in accordance with all local, regional, and international regulations.
- Supplemental label elements** **WARNING:** This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.
- Please refer to the SDS for additional information. Keep out of reach of children. Do not transfer contents to other containers for storage.
- Hazards not otherwise classified** : None known.

Section 3. Composition/information on ingredients

- Substance/mixture** : Mixture
- Other means of identification** : Not available.

CAS number/other identifiers

Ingredient name	% by weight	CAS number
Titanium Dioxide	13.7	13463-67-8
Calcium Carbonate	6.22	1317-65-0

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

There are no additional ingredients present which, within the current knowledge of the supplier and concentrations applicable, are classified as hazardous to health and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

Description of necessary first aid measures

- Eye contact** : Immediately flush eyes with plenty of water, occasionally lifting the upper eyelids. Check for and remove any contact lenses. Continue to rinse for at least 15 minutes. Get medical attention.
- Inhalation** : Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the rescuer to give mouth-to-mouth resuscitation. Get medical attention. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.
- Skin contact** : Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Continue to rinse for at least 10 minutes. Get medical attention. Do not reuse. Clean shoes thoroughly before reuse.
- Ingestion** : Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the person should be kept in the recovery position.

Section 4. First aid measures

Ingestion : No known significant effects or critical hazards.

Over-exposure signs/symptoms

Eye contact : No specific data.

Inhalation : No specific data.

Skin contact : No specific data.

Ingestion : No specific data.

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician : Treat symptomatically. Contact poison treatment specialist immediately if quantities have been ingested or inhaled.

Specific treatments : No specific treatment.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training. Do not give mouth-to-mouth resuscitation if dangerous to the person providing aid to give mouth-to-mouth resuscitation.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media : Use an extinguishing agent suitable for the surrounding fire.

Unsuitable extinguishing media : None known.

Specific hazards arising from the chemical : In a fire or if heated, a pressure increase will occur and the container may rupture.

Hazardous thermal decomposition products : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide
metal oxide/oxides

Special protective actions for fire-fighters : Promptly isolate the scene by removing all persons from the vicinity of the fire. No action shall be taken involving any personal risk or without suitable training.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Avoid breathing vapors. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders : If specialized clothing is required to deal with the spillage, take note of any

Section 6. Accidental release measures

- Small spill** : Stop leak if without risk. Move containers from spill area. Dilute with water if water-soluble. Alternatively, or if water-insoluble, absorb with an inert adsorbent and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.
- Large spill** : Stop leak if without risk. Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confine spillages into an effluent treatment plant or proceed as follows. Contain spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite, diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. See Section 1 for emergency contact information and Section 13 for waste disposal instructions.

Section 7. Handling and storage

Precautions for safe handling

- Protective measures** : Put on appropriate personal protective equipment (see Section 8). Avoid contact with skin. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. If during normal use the material presents a health hazard, use only with adequate ventilation or wear appropriate respirator. Use original container or an approved alternative made from a compatible material. Containers must be tightly closed when not in use. Empty containers retain product residue and are hazardous. Do not reuse container.
- Advice on general occupational hygiene** : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on personal protective measures.
- Conditions for safe storage, including any incompatibilities** : Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be properly resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for information on incompatible materials before handling or use.

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits (OSHA United States)

Ingredient name	Exposure limits
Titanium Dioxide	ACGIH TLV (United States, 3/24) TWA: 10 mg/m ³ 8 hours. OSHA PEL (United States, 6/24) TWA: 15 mg/m ³ 8 hours. Form 1 NIOSH REL (United States, 10/24) TWA: 5 mg/m ³ 10 hours. Form 1
Calcium Carbonate	

Section 8. Exposure controls/personal protection

Occupational exposure limits (Mexico)

Ingredient name	Exposure limits
None.	

- Appropriate engineering controls** : If user operations generate dust, fumes, gas, vapor or mist, use process local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.
- Environmental exposure controls** : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. Cases, fume scrubbers, filters or engineering modifications to the process may be necessary to reduce emissions to acceptable levels.

Individual protection measures

- Hygiene measures** : Wash hands, forearms and face thoroughly after handling chemical products, eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminating substances. Wash contaminated clothing before reusing. Ensure that eyewash and safety showers are close to the workstation location.

- Eye/face protection** : Safety eyewear complying with an approved standard should be used when the assessment indicates this is necessary to avoid exposure to liquid splashes, gases or dusts. If contact is possible, the following protection should be used: if the assessment indicates a higher degree of protection: safety glasses with side shields.

Skin protection

- Hand protection** : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.
- Body protection** : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist handling this product.
- Other skin protection** : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
- Respiratory protection** : Based on the hazard and potential for exposure, select a respirator that meets an appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other aspects of use.

Section 9. Physical and chemical properties

Appearance

- Physical state** : Liquid.
- Color** : White.

Section 9. Physical and chemical properties

Lower and upper explosive (flammable) limits	: Not available.
Vapor pressure	: 2.3 kPa (17.5 mm Hg) [at 20°C]
Vapor density	: 1 [Air = 1]
Relative density	: 1.35
Solubility	: Not available.
Partition coefficient: n-octanol/water	: Not available.
Auto-ignition temperature	: Not available.
Decomposition temperature	: Not available.
Viscosity	: Kinematic (40°C (104°F)): >0.205 cm ² /s (>20.5 cSt)
Molecular weight	: Not applicable.
<u>Aerosol product</u>	
Heat of combustion	: 0.995 kJ/g

Section 10. Stability and reactivity

Reactivity	: No specific test data related to reactivity available for this product or its in
Chemical stability	: The product is stable.
Possibility of hazardous reactions	: Under normal conditions of storage and use, hazardous reactions will not
Conditions to avoid	: No specific data.
Incompatible materials	: No specific data.
Hazardous decomposition products	: Under normal conditions of storage and use, hazardous decomposition p not be produced.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

Not available.

Irritation/Corrosion

Product/Ingredient name	Result	Species	Score	Exposure
Titanium Dioxide	Skin - Mild irritant	Human	-	72 hours 300 Micrograms Intermittent

Sensitization

Not available

Section 11. Toxicological information

Reproductive toxicity

Not available.

Teratogenicity

Not available.

Specific target organ toxicity (single exposure)

Name	Category	Route of exposure	Target
Calcium Carbonate	Category 3	Not applicable.	Respiratory irritant

Specific target organ toxicity (repeated exposure)

Not available.

Aspiration hazard

Not available.

Information on the likely routes of exposure : Not available.

Potential acute health effects

Eye contact : No known significant effects or critical hazards.
Inhalation : No known significant effects or critical hazards.
Skin contact : No known significant effects or critical hazards.
Ingestion : No known significant effects or critical hazards.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact : No specific data.
Inhalation : No specific data.
Skin contact : No specific data.
Ingestion : No specific data.

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Long term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Potential chronic health effects

Not available.

Acute toxicity estimates

Not available.

Section 12. Ecological information**Toxicity**

Product/ingredient name	Result	Species
Titanium Dioxide	Acute LC50 >1000000 µg/l Marine water	Fish - Fundulus heteroclitus

Persistence and degradability

Not available.

Bioaccumulative potential

Not available.

Mobility in soil

Soil/water partition coefficient (K_{oc}) : Not available.

Other adverse effects : No known significant effects or critical hazards.

Section 13. Disposal considerations

Disposal methods : The generation of waste should be avoided or minimized wherever possible of this product, solutions and any by-products should at all times comply with requirements of environmental protection and waste disposal legislation and regional local authority requirements. Dispose of surplus and non-recyclable material via a licensed waste disposal contractor. Waste should not be disposed down the sewer unless fully compliant with the requirements of all authorities with whom Waste packaging should be recycled. Incineration or landfill should only be used when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residue. Avoid dispersal of spilled material and runoff and contact with soil, water, and sewers.

Section 14. Transport information

	DOT Classification	TDG Classification	Mexico Classification	IATA	
UN number	Not regulated.	Not regulated.	Not regulated.	Not regulated.	Not regulated.
UN proper shipping name	-	-	-	-	-

Section 14. Transport information

Special precautions for user : Multi-modal shipping descriptions are provided for informational purposes only. They do not consider container sizes. The presence of a shipping description for a particular mode of transport (sea, air, etc.), does not indicate that the product is packaged or labeled suitably for that mode of transport. All packaging must be reviewed for compliance with applicable regulations prior to shipment, and compliance with the applicable regulations is the responsibility of the person offering the product for transport. People loading and unloading dangerous goods must be trained on all of the risks deriving from those substances and on all actions in case of emergency situations.

Transport in bulk according to Annex II of MARPOL and the IBC Code : Not available.

Proper shipping name : Not available.
Ship type : Not available.
Pollution category : Not available.

Section 15. Regulatory information

SARA 313

SARA 313 (40 CFR 372.45) supplier notification can be found on the Environmental Data Sheet.

California Prop. 65

WARNING: This product contains chemicals known to the State of California to cause cancer and birth defects or reproductive harm.

Section 16. Other information

Hazardous Material Information System (U.S.A.)

Health	*	3
Flammability		0
Physical hazards		0

The customer is responsible for determining the PPE code for this material. For more information on Personal Protective Equipment (PPE) codes, consult the HMIS® Implementation Manual.

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks and 4 representing significant hazards or risks. Although HMIS® ratings and the associated label are not SDSs or products leaving a facility under 29 CFR 1910.1200, the preparer may choose to provide the ratings if they are to be used with a fully implemented HMIS® program. HMIS® is a registered trademark and a mark of the American Coatings Association, Inc.

Procedure used to derive the classification

Classification	Justification
CARCINOGENICITY - Category 2	Calculation method

History

Date of printing : 2/12/2018
Date of issue/Date of revision : 2/12/2018

Section 15000
Mechanical



1111 East Main St.
 Griffith, IN 46319-2897
 Web: www.gatlinplumbing.com
 IN Plumbing License# 81009039

Phone: (219) 924-6972
 Fax: (219) 924-1401
 Email: gatlinplumbing@comcast.net
 IL Plumbing License# 055-010573

Celebrating Over 80 Years in Business!

OPERATIONS AND MAINTNANCE MANUAL

For

2018 Additions at Brummitt Elementary School

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Griffith, IN 46319-2897
Web: www.gatlinplumbing.com
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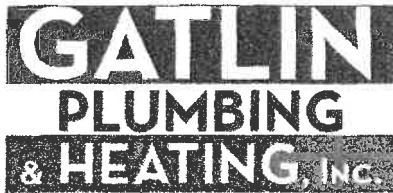
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GATLIN PLUMBING & HEATING, INC.

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CERTIFICATE OF WARRANTY

Gatlin Job Number: 18020

Name of Project:	2018 Renovations at Brummitt Elementary School
Address:	2500 Indian Boundary Road
	Chesterton, IN 46304

Owner	Board of School Trustees Duneland School Corporation
Address:	601 West Morgan Avenue
	Chesterton, IN 46304

The following certificate is hereby issued to provide normal guarantee of workmanship and materials provided by Gatlin Plumbing & Heating, Inc., in accordance with the plans and specifications of the subject project listed. All listed dates, special conditions, and/or exceptions are hereby noted and are all to be construed as part of this certificate.

☒ Plumbing work as per drawings from contract.

Architect: TRIA Architecture

☒ Mechanical work as per drawings from contract.

Date of Drawings:

Comments:

Period of: 1 year

STARTING DATE: AUGUST 6, 2018

EXPIRATION DATE: AUGUST 7, 2019

Date of Certification: September 19, 2018


Clara Murphy, Secretary/Treasurer

An Equal Opportunity Employer





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Celebrating Over 80 Years in Business!

OPERATIONS AND MAINTNANCE MANUAL

For

2018 Additions at Brummitt Elementary School

SECTION

WALL HYDRANT



Aug 8, 2018

BRUMMITT ELEMENTARY

O&M'S

NAME GATLIN PLUMBING
EMAIL gatlinplumbing@comcast.net
PHONE 219.924.6972

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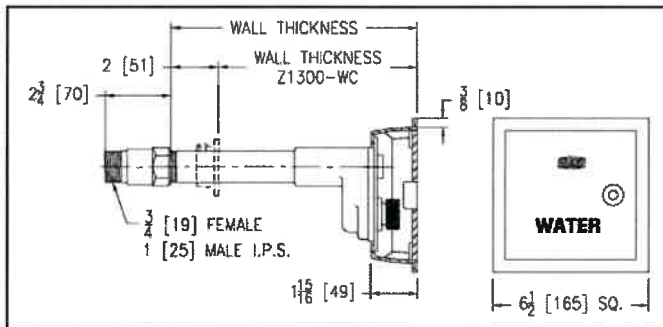
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VENDOR PART	VENDOR	DESCRIPTION	PAGE
Z1300	Zurn	Ecolotrol Wall Hydrant Encased Care & Warranty	4

HYDRANTS



Z1300 ECOLOTROL WALL HYDRANT – Encased, Non-Freeze, Anti-Siphon, Automatic Draining



ENGINEERING SPECIFICATION: ZURN Z1300 Encased Ecolotrol "anti-siphon" automatic draining wall hydrant for flush installation. Complete with non-freeze type integral backflow preventer, bronze casing, all bronze interior parts, non-turning operating rod with free-floating compression closure valve, replaceable bronze seat and seat washer, and combination 3/4" [19 mm] female or 1" [25 mm] male straight IPS inlet. Nickel bronze box and hinged cover with operating key lock and "WATER" cast on cover.

Wall Thickness Inches [mm]	6" [152]	8" [203]	10" [254]	12" [305]	14" [356]	16" [406]	18" [457]	20" [508]	22" [559]	24" [610]
Overall Length* Inches [mm]	8 3/4" [222]	10 3/4" [273]	12 3/4" [324]	14 3/4" [375]	16 3/4" [425]	18 3/4" [476]	20 3/4" [527]	22 3/4" [578]	24 3/4" [629]	26 3/4" [679]
Approx. Weight Lbs. [Kg]	9 [4]	9 [4]	12 [5]	12 [5]	12 [5]	15 [7]	15 [7]	18 [8]	18 [8]	18 [8]

*3/4" [19 mm] female and 1" [25 mm] male IPS connections.

Z1300 Ecolotrol Wall Hydrant

The Z1300 Ecolotrol is an encased, automatic draining, non-freeze, anti-siphon wall hydrant designed for commercial applications such as office buildings, institutions, hospitals, malls and retail outlets, and schools.

Hydrant Features

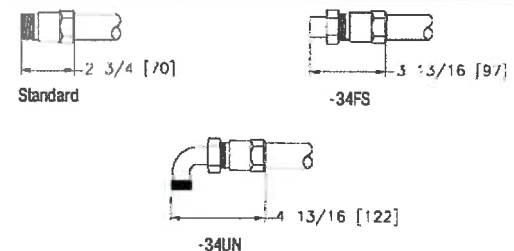
- **Certification** – IAPMO® and City of L.A. listed. Approved under ASSE standard 1019-A.
- **Integral Anti-Siphon Vacuum Breaker/Backflow Preventer** – Unique design utilizes an internal Equa-Balance® seal to prevent contamination of the potable water supply through back siphonage. The use of an additional hose-connection vacuum breaker with ASSE 1011 approval is not necessary.
- **Valve Seat** – Removable bronze valve seat with circular seating surface.
- **Valve** – One-piece assembly, replaceable, free-floating compression closure valve plunger operates the water flow and drainage with a maximum of two and one-half (2-1/2) turns. No adjustments are necessary.
- **Casing** – Threaded brass pipe nipple.
- **Operating Screw** – Chrome-plated brass.
- **Operating Rod** – 3/8" [10 mm] solid brass.
- **Faceplate** – Constructed of type 304 stainless steel with brush finish.
- **Box and Cover** – Cast nickel bronze box and hinged cover with "WATER" stamping.
- **Drainage** – Through circular drain ports of the nozzle.
- **Operating Pressures** – Minimum running pressure 8 psi. Maximum static pressure 125 psi.
- **Water Temperature Range** – Minimum 33°F. Maximum 130°F.

OPTIONS

SUFFIXES

- CL Cylinder Lock
- PB Polished Bronze Face
- RA2 12" [305 mm] Replacement Rod Assembly with Repair Kit (-RK)
- RA4 24" [610 mm] Replacement Rod Assembly with Repair Kit (-RK)
- RK Hydrant Parts Repair Kit
- SB Statuary Bronze Face (Specify light, medium, or dark finish.)
- SS Stainless Steel Box and Cover
- WC Wall Clamp
- 34FS 3/4" [19 mm] Solder Female Inlet Adapter
- 34UN 3/4" [19 mm] IP 90° Inlet Elbow with Union Nut

Inlet Descriptions

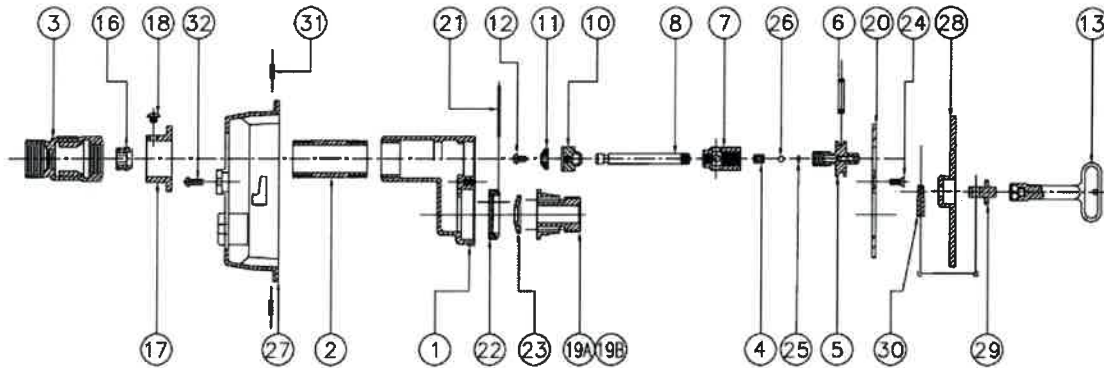


HYDRANTS



Z1300 ECOLOTROL WALL HYDRANT Parts Assembly, Parts List, and Operating Rod Assemblies

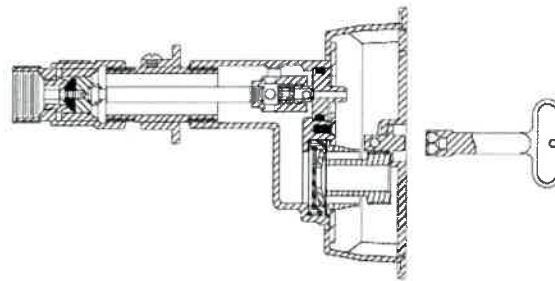
Z1300 Parts Assembly



Z1300 Parts List

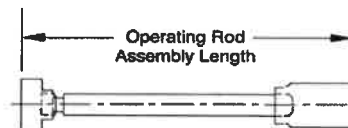
Item	Description	Qty.	Part No.
1	Head	1	56061-003
2	Casing	1	50270-XXX
3	Valve Housing	1	31258-001
*4	Setscrew	1	51459-001
*5	Operating Screw	1	25049-002
*6	O-Ring	1	23750-028
*7	Operating Coupling	1	25147-001
8	Operating Rod	1	45042-XXX
10	Washer Guide	1	25050-001
*11	Washer	1	23075-001
*12	Screw #10-24 NC	1	14853-042
*13	Key	1	59546-001
*16	Removable Seat	1	25262-001
17	Wall Clamp (Optional)	1	50268-001
18	Wall Clamp Screw (Optional)	1	26050-004
19A	3/4" Nozzle	1	50799-005
19B	1" Nozzle	1	50799-006
20	Faceplate	1	56115-005
*21	Disc O-Ring	1	23750-204
22	Disc	1	50819-001
*23	Equa-Balance® Seal	1	50785-001
24	Faceplate Screw	5	22698-047
*25	Ball O-Ring	1	23750-232
*26	Ball	1	51458-001
27	Hydrant Body	1	56068-002
28	Hydrant Cover	1	56069-001
29	Locking Pin Mounting	1	25306-001
30	Locking Pin	1	25307-001
31	Hinge Pin	2	45553-008
32	Screw #10-24 NC	2	14853-044

*Items are available in -RK Repair Kit Option bag (#66955-201-9).



Operating Rod Assemblies

6" Wall	4-3/4"
8" Wall	6-3/4"
10" Wall	8-3/4"
12" Wall	10-3/4"
14" Wall	12-3/4"
16" Wall	14-3/4"
18" Wall	16-3/4"
20" Wall	18-3/4"
22" Wall	20-3/4"
24" Wall	22-3/4"



HYDRANTS



Z1300 ECOLOTROL WALL HYDRANT Troubleshooting Guide

Z1300 Troubleshooting Guide

PROBLEM	CAUSE	SOLUTION
Hydrant will not operate when turned on.	Water supply is shut off.	Turn on water supply.
Cannot turn the hydrant on with key.	Hydrant hasn't been used for a long time – O-Ring has adhered to the operating screw and head.	Follow steps 1-2, 5, and 9-10 of the Service Guide.
Water running continuously from orifice in operating screw. (Note: When first turning hydrant on, water may spit for a few seconds until ball seats on O-Ring.)	Debris between ball and O-Ring (in operating screw).	Follow steps 1-2, 6, and 9-10 of the Service Guide.
	Ball O-Ring not seated properly (in operating screw).	Follow steps 1-2, 6, and 9-10 of the Service Guide.
Water sprays from holes around nozzle when hydrant is on.	Equa-Balance® seal is damaged.	Follow steps 1-3 and 9-10 of the Service Guide.
Hydrant will not self-drain when it is shut off (hose and nozzle are attached).	Screw nozzle is closed.	Open screw nozzle so hose will drain some, relieving pressure.
	Gun nozzle is closed.	Squeeze gun nozzle trigger so hose will drain some, relieving pressure.
Water does not shut off completely when hydrant is turned off.	Debris between seat and washer.	Follow steps 1-2, 4, and 8-10 of the Service Guide. Clean by turning water supply on and flush hydrant.
	Washer is worn out.	Follow steps 1-2, 4, and 7-10 of the Service Guide.
	Wire draw in seat.	Replace seat.
Hydrant exhibits low flow.	Water supply to the hydrant is restricted.	Check water supply to ensure that all upstream valves are fully open.
	Retaining washer is not properly orientated.	Check water supply to ensure that all upstream valves are fully open.

⚠ **WARNING:** Cancer and Reproductive Harm - www.P65Warnings.ca.gov
 ⚠ **ADVERTENCIA:** Cáncer y daño reproductivo - www.P65Warnings.ca.gov
 ⚠ **AVERTISSEMENT:** Cancer et effets néfastes sur la reproduction - www.P65Warnings.ca.gov

HYDRANTS



Z1300 ECOLOTROL WALL HYDRANT Service Guide

Z1300 Service Guide

Step 1: Shutting Off the Water Supply to the Hydrant

Locate the supply shut-off valve and rotate until water supply is off.

Step 2: Removing the Faceplate and Adjacent Components

Using 1/8" Allen wrench, remove the five faceplate screws (24) from head (1) by turning counterclockwise. Remove the faceplate (20), and nozzle (19).

If the Equa-Balance® seal was not the reason for service – skip to step 4.

Step 3: Replacing the Equa-Balance® Seal

Remove the current Equa-Balance® seal (23). Check seal for damage (punctures, rips, etc.). Replace damaged seal with a new seal (23) observing proper orientation (EQUA-BALANCE® SEAL SHOULD CUP INWARD IN ITS REPLACED STATE.)

Step 4: Removing the Internal Operating Assembly

The internal operating assembly (4-8, 10-12, and 25-26) can be removed by gripping the square end of the operating screw (5) with a pair of pliers and pulling straight out.

If the operating screw O-Ring was not the reason for service – skip to step 6.

Step 5: Replacing the Operating Screw O-Ring

Remove the operating screw (5) from operating coupling (7) by turning clockwise and slip the old O-Ring (6) off, and replace with new O-Ring (6). Reinstall operating screw (5) into operating coupling (7) by turning counterclockwise. (Note: Lubricate the operating screw (5) threads and the O-Ring (6) with Lubriplate FGL-2 if needed.)

If the operating screw assembly was not the reason for service – skip to step 7.

Step 6: Checking Operating Screw Assembly

Remove the operating screw (5) from the operating coupling (7) by turning clockwise, and using 5/32 Allen wrench, remove setscrew (4) by turning counterclockwise, remove stainless steel ball (26) and check orientation of O-Ring (25). If not seated properly, reseal, replace the ball (26) and replace setscrew (4) using Allen wrench and turning clockwise until flush with operating screw (5) or until tight and flush with operating screw (5). (Note: Lubricate and reinstall as in step 5.)

If the hydrant shutoff washer was not the reason for service – skip to step 8.

Step 7: Replacing the Hydrant Shutoff Washer

Remove #10-24 NC x 3/8 screw (12) using a flat screwdriver and turning screw (12) counterclockwise, remove washer (11) and replace with new washer (11) and new screw (12) turning screw clockwise until tight.

Step 8: Replacing the Internal Operating Assembly

There is a flat or a V-notched boss inside of the hydrant head (1) that keeps the operating coupling (7) from rotating when hydrant is turned on and off. With operating screw (5) turned counterclockwise into operating coupling (7) until it stops, and making sure that a flat side or corner of operating coupling (7) lines up with appropriate boss, reinsert the internal operating assembly into the hydrant.

Step 9: Replacing the Wall Plate

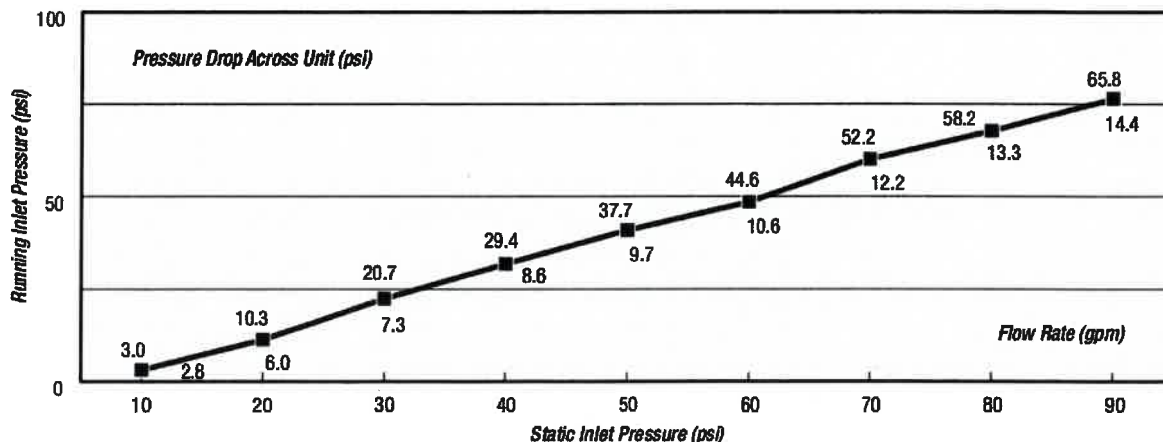
Insert nozzle (19) into place and fasten the faceplate (20) to head (1) using the 1/8" Allen wrench and the five faceplate screws (24). Rotate the screws clockwise until screws are snugged tight. (By hand only!)

Step 10: Turning On the Water Supply

Locate the water supply shut-off valve and rotate until water supply is on.

Z1300 Ecolotrol Wall Hydrant – 3/4" Hose Connection

Z1300 Ecolotrol Wall Hydrant – 3/4" Hose Connection				
Static Pressure (psi)	Running Inlet Pressure (psi)	Running Outlet Pressure (psi)	Flow Rate (gpm)	Pressure Drop Across Unit (psi)
10	3.1	0.1	2.8	3.0
20	11.3	1.0	6.0	10.3
30	22.4	1.7	7.3	20.7
40	31.8	2.5	8.6	29.4
50	40.9	3.2	9.7	37.7
60	48.5	3.9	10.6	44.6
70	60.1	7.9	12.2	52.2
80	67.8	9.5	13.3	58.2
90	76.5	10.7	14.4	65.8





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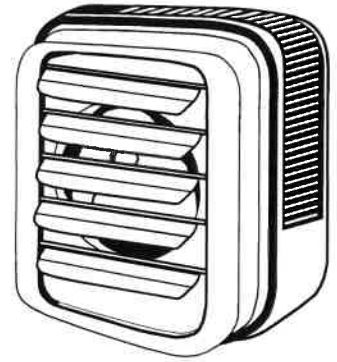
OPERATIONS AND MAINTNANCE MANUAL

For

2018 Additions at Brummitt Elementary School

SECTION

UNIT HEATER



MUH Series Modular Unit Heaters



Installation, Operation & Maintenance Instructions

Specifications

Basic Model No.	Height in (mm)	Width in. (mm)	Depth in. (mm)	Mounting Weight lbs. (kg)	Wiring Compartment Volume
MUH0381	16 (406.4)	14 (355.6)	7 1/2 (190.5)	27 (12.2)	90 in ³ (14.70 cm ³)
MUH0321				27 (12.2)	
MUH0371				27 (12.2)	
MUH0341				30 (13.6)	
MUH0581				27 (12.2)	
MUH0521				27 (12.2)	
MUH0571				27 (12.2)	
MUH0541				30 (13.6)	
MUH0331				30 (13.6)	
MUH0361				30 (13.6)	
MUH0531				30 (13.6)	
MUH0561				30 (13.6)	
MUH078	21 3/4 (552.5)	19 (482.6)	7 1/2 (190.5)	38 (17.2)	100 in ³ (1639 cm ³)
MUH072				38 (17.2)	
MUH077				38 (17.2)	
MUH074				38 (17.2)	
MUH108				38 (17.2)	
MUH102				38 (17.2)	
MUH107				38 (17.2)	
MUH104				38 (17.2)	
MUH073				38 (17.2)	
MUH076				38 (17.2)	
MUH103				38 (17.2)	
MUH106				38 (17.2)	

Basic Model No.	Height in (mm)	Width in. (mm)	Depth in. (mm)	Mounting Weight lbs. (kg)	Wiring Compartment Volume
MUH158	21 3/4 (552.5)	19 (482.6)	12 3/4 (323.9)	54 (24.5)	140 in ³ (2295 cm ³)
MUH152				50 (22.7)	
MUH154				50 (22.7)	
MUH208				60 (27.2)	
MUH202				55 (24.9)	
MUH204				55 (24.9)	
MUH156				55 (24.9)	
MUH206				55 (24.9)	
MUH252	30 (76.2)	26 5/8 (676.4)	11 3/4 (298.5)	89 (40.4)	504 in ³ (8260 cm ³)
MUH254				89 (40.4)	
MUH308				89 (40.4)	
MUH302				89 (40.4)	
MUH304				89 (40.4)	
MUH256				89 (40.4)	
MUH306				89 (40.4)	
MUH402				119 (54.0)	
MUH404	30 (76.2)	26 5/8 (676.4)	17 1/4 (435.1)	119 (54.0)	648 in ³ (10620 cm ³)
MUH508				119 (54.0)	
MUH502				119 (54.0)	
MUH504				119 (54.0)	
MUH406				119 (54.0)	
MUH506				119 (54.0)	

IMPORTANT INSTRUCTIONS



WARNING



WHEN USING ELECTRIC APPLIANCES, BASIC PRECAUTIONS SHOULD ALWAYS BE FOLLOWED TO REDUCE THE RISK OF FIRE, ELECTRIC SHOCK, AND INJURY TO PERSONS, INCLUDING THE FOLLOWING:

1. Read all instructions before installing or using this heater.
2. This heater is a commercial/industrial product not intended for use in a residential setting.
3. This heater is hot when in use. To avoid burns, do not let bare skin touch hot surfaces. Keep combustible materials, such as furniture, pillows, bedding, papers, clothes, etc. and curtains at least 3 feet (0.9 m) from the front of the heater.
4. Extreme caution is necessary when any heater is used by or near children or invalids and whenever the heater is left operating and unattended.
5. This heater has hot and arcing or sparking parts inside and is not intended for use in hazardous atmospheres where flammable vapors, gases, liquids or other combustible atmospheres as defined in the National Electrical Code are used or stored. Failure to comply can result in explosion or fire.
6. Do not operate any heater after it malfunctions. Disconnect power at service panel and have heater inspected by a reputable electrician before using.
7. Do not use outdoors.
8. To disconnect heater, turn controls to off, and turn off power to heater circuit at main disconnect panel.
9. Do not insert or allow foreign objects to enter any ventilation or exhaust opening as this may cause an electric shock, fire, or damage to the heater.
10. To prevent a possible fire, do not block air intake or exhaust in any manner.
11. Use this heater only as described in this manual. Any other use not recommended by the manufacturer may cause fire.
12. This heater is not intended for use in special environments. Do not use in damp or wet locations such as marine or greenhouse or in areas where corrosive or chemical agents are present.
13. When installing, see INSTALLATION INSTRUCTIONS for additional warnings and precautions.
14. For safe and efficient operation, and to extend the life of your heater, keep your heater clean - See MAINTENANCE INSTRUCTIONS.

SAVE THESE INSTRUCTIONS

INSTALLATION INSTRUCTIONS



WARNING



To prevent a possible fire, injury to persons or damage to the heater, adhere to the following:

1. Disconnect all power coming to heater at main service panel before wiring or servicing.

Important Note: This heater must be installed by a qualified person.

2. All wiring procedures and connections must be in accordance with the National and Local Codes having jurisdiction and the heater must be grounded.
3. Verify the power supply voltage coming to heater matches the ratings as shown on the heater nameplate.

CAUTION: ENERGIZING HEATER AT A VOLTAGE GREATER THAN THE VOLTAGE PRINTED ON THE NAMEPLATE WILL DAMAGE THE HEATER AND VOID THE WARRANTY AND COULD CAUSE A FIRE.

4. To reduce the risk of fire, do not store or use gasoline or other flammable vapors and liquids in the vicinity of the heater.
5. The ceiling or wall mounting structure and the anchoring provisions must be of sufficient strength to support the combined weight of the heater and mounting bracket.
6. All built-in thermostats: If the heater is used to prevent piping or liquids from freezing, and if the thermostat is set below 45° F (7°C), the fan must run continuously.
7. The heater must be mounted at least 7' (2134 mm) above the floor to avoid accidental contact with the fan blade which could cause injury.
8. Keep at least 5' clearance in front of the heater. Refer to Table 1 for side, top and back clearance requirements.
9. Do not mount mercury type thermostat directly on unit. Vibration could cause heater to malfunction.

Heater Location Instructions

Arrange units so that discharge air streams:

- a. are subjected to a minimum of interference from columns, machinery and partitions;
- b. wipe exposed walls without blowing directly at them;
- c. are directed away from room occupants in comfort heating;
- d. are directed along the windward side when installed in a building exposed to a prevailing wind.

Locate thermostats approximately 5' (1524mm) above the floor on interior partition walls or post away from cold drafts, internal heat sources and away from heater discharge air streams.

Small rooms can be heated by one unit heater.

Large rooms require multi-unit installations. Number and capacity of units will be determined by volume of building and square feet of floor area to be heated. Arrange units to provide perimeter air circulation where each unit supports the air stream from another.

Mounting the Heater - General

The heater may be mounted to discharge the heated air either horizontally or vertically. When the heater is mounted for vertical discharge, it is recommended that the heater be positioned so that the access door will open away from the wall to provide greater access to the wiring and control compartment. If the heater is to be mounted with the access door facing a wall, the heater must be mounted far enough from that wall to allow full opening of the access door (a distance approximately equal to the width of the heater, check clearance before installing). Refer to Table 1 for wall and ceiling clearances before mounting heater.

The heater may be mounted for either vertical or horizontal discharge by the use of threaded rods. (Refer to Table 2 for threaded rod sizes required.) Observe the detailed procedures in the following installation instructions.

The heater may also be suspended from the wall or ceiling by means of an optional mounting bracket (type MMB or MCMB) which permits horizontal pivoting of the heater.

After the heater is installed, the louvers may be positioned to direct the heated air in the desired direction. When the heater is installed for horizontal discharge, the louvers should direct the air either straight ahead or downward. Directing the air upward may cause the heated air to remain in the ceiling area and waste energy.

Table 1. Wall and Ceiling Clearance, inches (mm)

Unit	Discharge	Ceiling	Side Wall	Back Wall
3 & 5 kW	Horiz.	2 (50.8)	6 (152.4)	9 (228.6)
	Vert.	6 (152.4)	18 (457.2)	18 (457.2)
7.5 to 10 kW	Horiz.	6 (152.4)	6 (152.4)	13 (330.2)
	Vert.	6 (152.4)	24 (609.6)	24 (609.6)
15 to 10 kW	Horiz.	6 (152.4)	9 (228.6)	12½ (317.5)
	Vert.	6 (152.4)	24 (609.6)	24 (609.6)
25 to 50 kW	Horiz.	16 (406.4)	12 (304.8)	18½ (470.0)
	Vert.	12 (304.8)	39 (914.4)	39 (914.4)

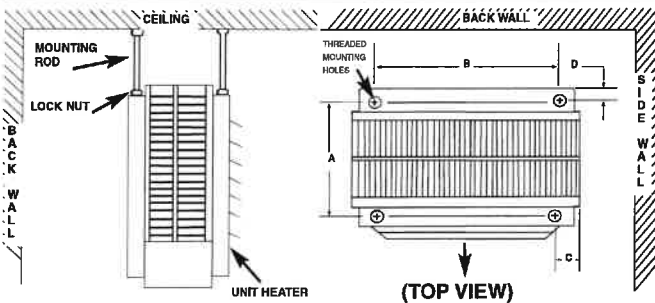


Figure 1. Horizontal Discharge Mounting and Spacing.

Table 2. Rod Thread and Spacing Dimensions, inches (mm) for Horizontal Discharge

Unit	Rod Thread Type	A	B	C	D
3 - 5 kW	5/16 - 18	6 1/16 (153.9)	6 (152.4)	4 1/16 (103.1)	3/4 (19.0)
7.5 - 10 kW					
15 - 20 kW		11 3/8 (289.0)	8 7/8 (225.6)	5 1/8 (130.3)	3/4 (19.0)
25 - 30 kW	3/8 - 16	10 9/16 (268.2)	14 - 12 (368.3)	6 3/16 (157.2)	5/8 (16.0)
40 - 50 kW		15 15/16 (404.9)	14 - 12 (368.3)	6 3/16 (157.2)	5/8 (16.0)

Horizontal Discharge (Rod-mount from Ceiling)

1. Install four threaded mounting rods in the threaded holes and secure in place using lock nuts. (See Table 2).
2. Securely attach the four mounting rods to the ceiling. (Refer to Table 1 for wall and ceiling clearances, and Table 2 for mounting rod spacing).

Table 3. Rod Thread and Spacing Dimensions, inches (mm) for Vertical Discharge

Unit	Rod Thread Type	E	F	G	H
3 - 5 kW	5/16 - 18	6 (152.4)	9 3/4 (247.7)	2 (50.8)	4 1/16 (103.1)
7.5 - 20 kW		8 7/8 (225.6)	14 5/8 (371.6)	2 (50.8)	5 1/8 (130.3)
25 - 30 kW	3/8 - 16	14 1/2 (368.3)	21 1/4 (539.8)	2 3/16 (56.0)	6 9/16 (157.2)

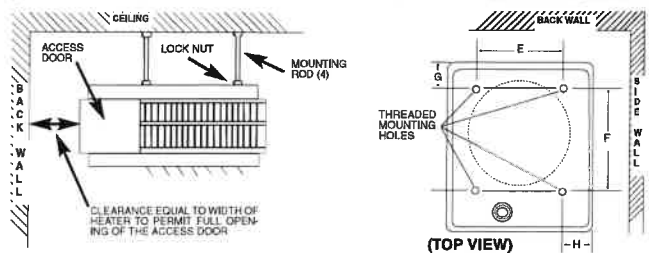


Figure 2. Vertical Discharge Mounting and Rod Spacing

Vertical Discharge (Rod-Mount from Ceiling)

1. Remove bolts from the threaded holes in the back of the heater.
2. Install four threaded mounting rods in the threaded holes and secure in place using lock nuts.
3. Securely attach the four mounting rods to the ceiling. (Refer to Table 1 for wall and ceiling clearances, and Table 3 for mounting rod spacing dimensions.)

Wiring Branch Circuit (Power)

1. Connect heater only to the voltage, amperage and frequency specified on the nameplate.
2. Field wiring must be properly sized to carry the amperage in accordance with the NEC.
3. The access door is hinged. There are either one or two screws accessible from the side that must be loosened to gain access. These screws are the captive type; do not try to remove them.
4. A knockout is provided in the back of the heater close to the power terminal block and the control terminal board. The control terminal board knockout is 1/2 inch (12.7 mm) conduit size. The power terminal block knockout is multiple diameter. Use the diameter that fits the required conduit size.
5. A ground terminal is provided near the power terminal board. The ground wire should be connected before other connections are made.
6. The power terminal block is equipped with box terminals sized to accept the correct size power supply wire. Branch circuit wire rated min 600V, 60° C is acceptable for heaters rated up to 80 amps. For heaters rated more than 80 amps, branch circuit wire must be rated at least 75°C. Either aluminum or copper wire is satisfactory for connection to the heater power terminal block box terminal. Copper wire is recommended and must be used with built-in disconnect switch.

7. Each heater has a wiring diagram affixed to the inside of the access door. Consult this diagram before making any field connections.

Important Note - Installation Screw Lug Torque:

During transportation it is possible screw lug connections can loosen. After installation, before power is turned on to the heater, check all screw lug connections for tightness to a recommended minimum torque of 35 in-lbs. (3.9 N-m). Loose connections may present a hazard.

8. Single or three-phase power connections may be used with heater models MUH0521, MUH0581, MUH072, MUH078, MUH102, MUH108, and MUH158. These units are factory wired for single-phase operation. If these heaters are for use with three-phased power, reconnect the wires as indicated in the wiring diagram attached to the heater. Additional information can be found by looking at the wiring illustrations in Figures 3a and 3b and following the directions shown below.

On models MUH0521, MUH0581, MUH072, MUH078, MUH102, and MUH108 (Figure 3a), move only the two wires marked "A1" and marked "B1"; do not move or change any other wiring. The element lead wire marked "B1" which is factory connected to the power terminal block (terminal located closest to the elements) must be moved to terminal "B" on the three-phase terminal block.

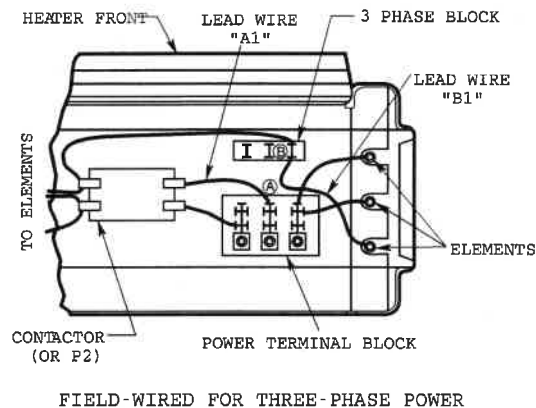
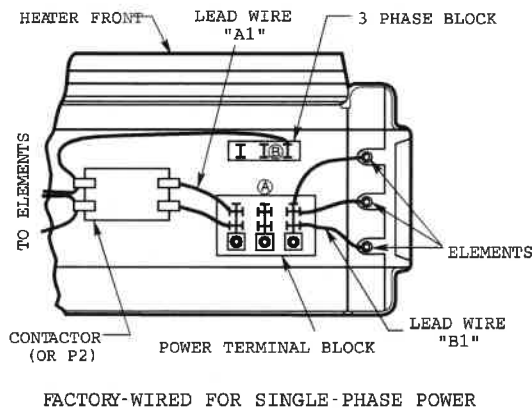


Figure 3a. Wiring Connections for Single-Phase and Three -Phase Power (MUH0521, MUH0581, MUH072, MUH078, MUH102 and MUH108)

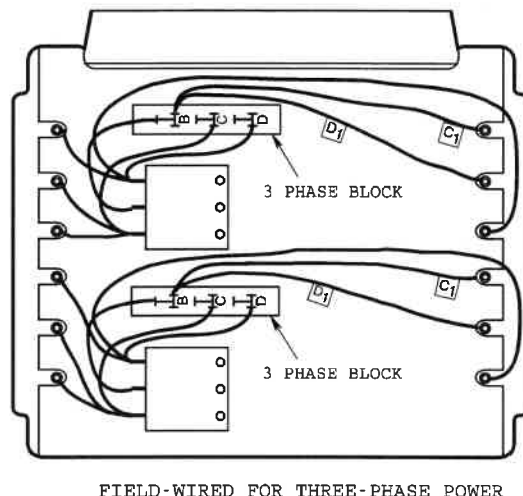
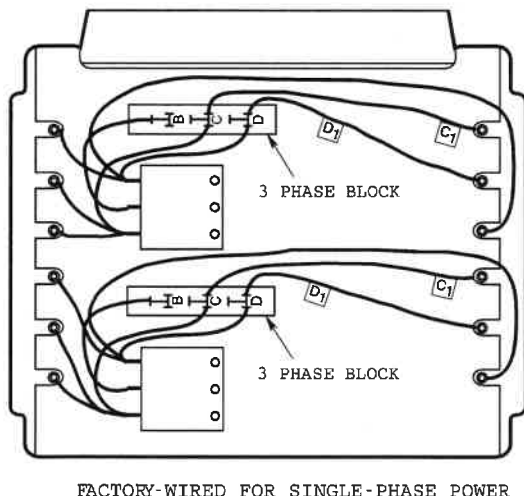


Figure 3b. Wiring Connections for Single-Phase and Three -Phase Power (MUH158)

The relay (contactor) lead wire "A1" must be moved from the end terminal of the power terminal block (terminal closest to the contactor or control terminal board) to the "A" terminal of the lower terminal block (center terminal).

Model MUH158 (Figure 3b) has two three-phase terminal blocks located adjacent to the relays (contactors). Move only the two wires marked "C1" and "D1" on each of these two three-phase terminal blocks to terminal "B". Do not move or change any other wires.

9. Electrical Accessories, either kits or factory-installed options, are shown connected by a dash line on the heater wiring diagram.
10. **208/240 VOLT HEATER:** The heaters are wired for 240V from factory. When heater is to be connected to 208V supply, the transformer leads **MUST BE** interchanged. For units rated 30/40kW or higher, interchange ORANGE and RED primary leads. The black colored lead is the COMMON for the transformer (50VA) provided with the high wattage units. For lower kW rated heaters, interchange BLACK and RED primary leads. The WHITE colored lead is the COMMON for the control transformer provided with these heaters. Always refer to the wiring diagram on the cover of the heater before making this reconnection of transformer primary leads.

Control Wiring

⚠ WARNING ⚠

LINE VOLTAGE IS PRESENT ON SOME OF THE TERMINALS ON THE CONTROL TERMINAL BOARD. ALWAYS DISCONNECT THE POWER FROM THE HEATER BEFORE MAKING ANY CONNECTIONS TO THE CONTROL BOARD TO PREVENT ELECTRIC SHOCK HAZARD.

1. Use min. 600 volts, NEC Class 1 insulated wire for all control circuit wiring.
2. Use a crimp-on type fork terminal on the wire ends that attach to the control terminal board if more than one connection is to be made under the terminal screw.
3. On units not provided with internal contactor (3 & 5 KW), refer to Figure 4 for wiring diagram.

NOTE: Thermostat and control circuit wiring must be suitable to handle the full load of the heater (example MUH0581 is rated 24 amps)

4. On units provided with internal contactor (units rated 7 KW and higher) refer to Figure 5 for wiring diagram. Control wiring must be rated minimum 18 AWG.

OPERATING INSTRUCTIONS

1. Heater must be properly installed before operation.
2. Turn power supply to heater "ON" at main switch panel.
3. Where applicable, refer to control accessory instructions regarding proper operation of any controls or accessories used with the heater.

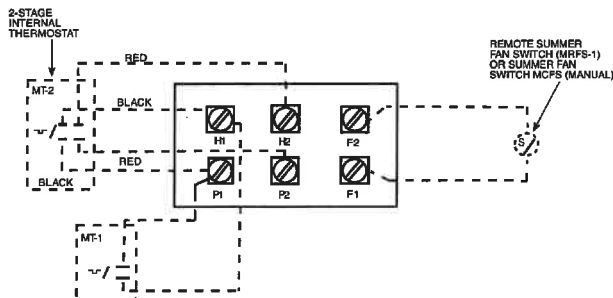


Figure 4. Control Terminal Board (for Heaters Without Contactors)

NOTES:

1. THIS STYLE CONTROL TERMINAL BOARD USED WITH MODELS MUH0321, MUH0371, MUH0381, MUH0521, MUH0571, AND MUH0581.
2. WHEN UNIT IS WIRED FOR SINGLE-PHASE, JUMPER H1 TO H2. IF SINGLE-POLE THERMOSTAT IS USED WITH SINGLE-PHASE UNIT, CONNECT THERMOSTAT LEADS TO P1 AND H1.
3. EXTERNAL LINE VOLTAGE THERMOSTATS SHOULD BE TREATED AS SINGLE STAGE ONLY.

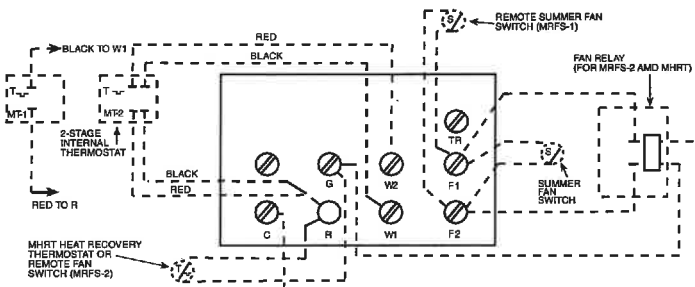


Figure 5. Control Terminal Board (for Heaters With Contactors)

NOTES:

1. THIS STYLE CONTROL TERMINAL BOARD USED WITH MODELS EXCEPT MUH0321, MUH0371, MUH0381, MUH0521, MUH0571, AND MUH0581.
2. REMOVE JUMPER W1 TO W2 WHEN 2-STAGE THERMOSTAT IS USED.
3. *ONLY ONE OF THESE ACCESSORIES MAY BE INSTALLED IN A SINGLE HEATER.
4. EXTERNAL LINE VOLTAGE THERMOSTATS SHOULD BE TREATED AS SINGLE STAGE ONLY.

How To Reset Over -Temperature Safety Control (Factory Installed Option Only):

The limit switch is located internally on the rear of the heater. On the 3KW and 5KW models, the access to the reset button is on the right side (when facing rear of heater); on all other models it is near the top rear of the heater.

The manual reset limit is in series with the automatic recycling protector (limit). The manual reset limit will not reset until the heater has cooled and the button is pushed in.

WARNING

DO NOT TAMPER WITH OR BYPASS ANY SAFETY LIMITS INSIDE HEATER.

CAUTION

CAUTION - DO NOT CONTINUE TO ATTEMPT TO USE THE HEATER IF THE SAFETY CONTROL REPEATEDLY OPERATES AFTER BEING RESET. TO DO SO COULD PERMANENTLY DAMAGE THE HEATER OR CREATE A FIRE OR SAFETY HAZARD.

It is important to keep this heater clean. Your heater will give you years of service and comfort with only minimum care. To assure efficient operation follow the simple instructions below.

WARNING

ALL SERVICING BEYOND SIMPLE CLEANING THAT REQUIRES DISASSEMBLY SHOULD BE PERFORMED BY QUALIFIED SERVICE PERSONNEL.

WARNING

TO REDUCE RISK OF FIRE AND ELECTRIC SHOCK OR INJURY, DISCONNECT ALL POWER COMING TO HEATER AT MAIN SERVICE PANEL AND CHECK THAT THE ELEMENT IS COOL BEFORE SERVICING OR PERFORMING MAINTENANCE.

User Cleaning Instructions:

1. After the heater has cooled, a vacuum cleaner with brush attachment may be used to remove dust and lint from exterior surfaces of the heater including the grille openings.
2. With a damp cloth, wipe dust and lint from grille and exterior surfaces.
3. Return power to heater and check to make sure it is operating properly.

Maintenance Cleaning Instructions:

(To be performed only by Qualified Service Personnel)

At least annually, the heater should be cleaned and serviced by a qualified service person to assure safe and efficient operation. This should include as necessary, vacuuming dust and debris from the elements and fan, and checking all screw lug connections for tightness to a recommended minimum torque of 35 in-lbs. (3.9 N-m). After completing the cleaning and servicing, the heater should be fully reassembled and checked for proper operation.

MAINTENANCE INSTRUCTIONS

It is important to keep this heater clean. Your heater will give you years of service and comfort with only minimum care. To assure efficient operation follow the simple instructions below.

WARNING

ALL SERVICING BEYOND SIMPLE CLEANING THAT REQUIRES DISASSEMBLY SHOULD BE PERFORMED BY QUALIFIED SERVICE PERSONNEL.

WARNING

TO REDUCE RISK OF FIRE AND ELECTRIC SHOCK OR INJURY, DISCONNECT ALL POWER COMING TO HEATER AT MAIN SERVICE PANEL AND CHECK THAT THE ELEMENT IS COOL BEFORE SERVICING OR PERFORMING MAINTENANCE.

User Cleaning Instructions:

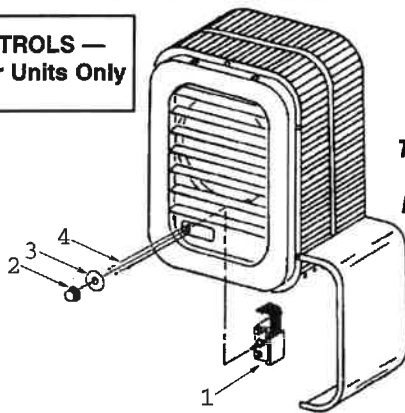
1. After the heater has cooled, a vacuum cleaner with brush attachment may be used to remove dust and lint from exterior surfaces of the heater including the grille openings.
2. With a damp cloth, wipe dust and lint from grille and exterior surfaces.
3. Return power to heater and check to make sure it is operating properly.

MUH

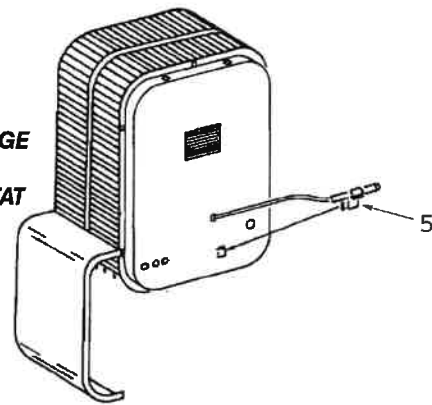
Built-in Controls

Key No.	Description	Part Number
1	Thermostat, One Pole (MT-1)	5813-0036-000
	Thermostat, Two Stage (MT-2)	5813-0035-000
2	Knob, Thermostat	3301-0060-000
3	Label, Thermostat	3502-1781-000
4	Screws, Fl. Hd., 6-32 x 1/4	5202-7009-021
5	Clip, Thermostat	1403-0041-000
6	Switch, 25A, OEM	5216-0132-000
	Switch, 25A, K & N	5216-0204-000
	Switch, 63A, OEM	5216-0131-000
	Switch, 63A, K & N	5216-0203-000
	Switch 25A, Electro	5216-0200-000
7	Screw, M4 x 10, Rd. Hd., (25A)	—
	Screw, 63A, M5 x 16, Rd. Hd.	—
8	Knob, 25A, OEM "T1"	OEM "T1"
	Knob, 25A, K & N	K & N S1B 6001
	Knob, 63A, OEM	OEM "S4"
	Knob, 63A, K & N	K & N S2B G001
	Knob, Electro	EI 141747
9	Switch, Toggle, 600V	5216-0130-000
10	Relay, Fan, 24V Coil	5018-0008-000
11	Switch Assembly	5216-0199-000
12	Manual Reset Limit	4520-0012-000

**BUILT-IN CONTROLS —
Made-to-Order Units Only**

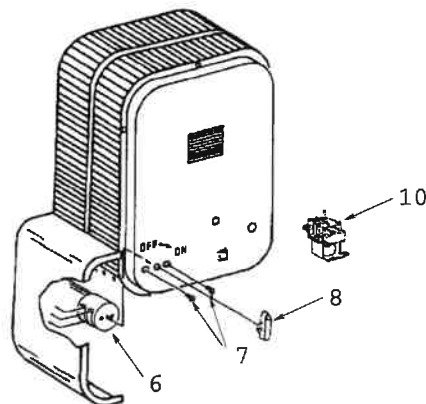


**SINGLE-POLE
THERMOSTAT, TWO-STAGE
THERMOSTAT, HEAT
RECOVERY THERMOSTAT**

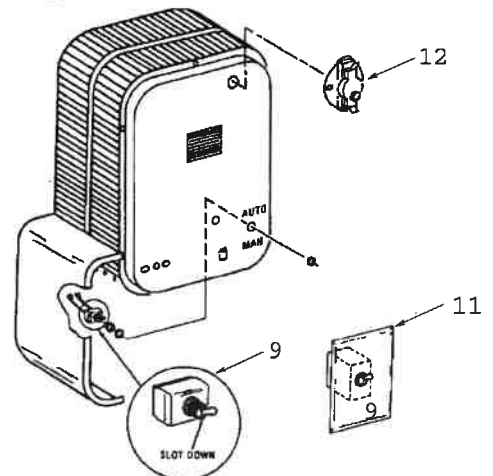


**SUMMER
FAN
SWITCH**

**POWER
DISCONNECT
SWITCH**



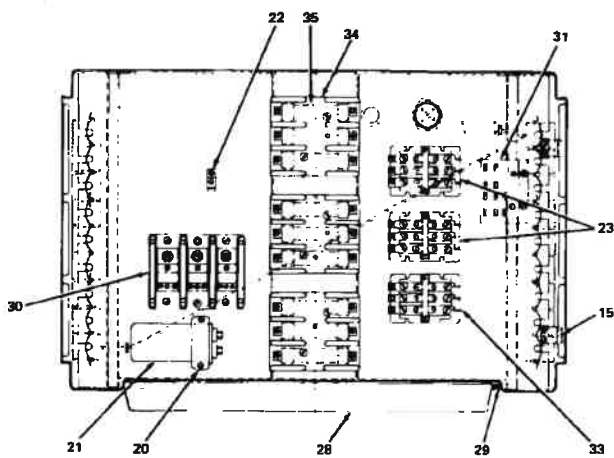
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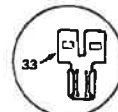
7

Heater Replacement Parts

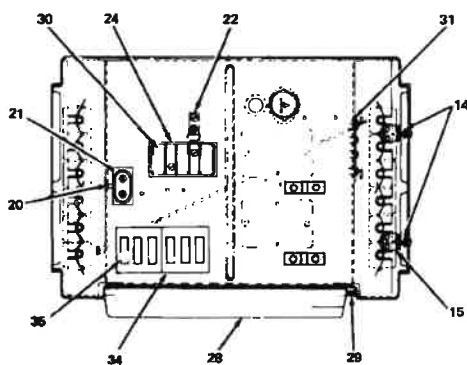
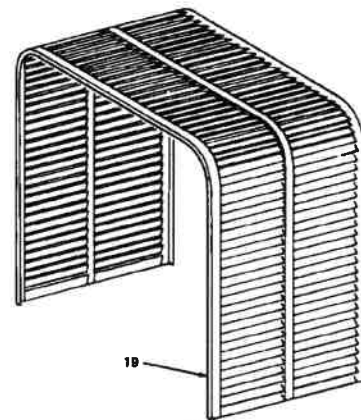
Key No.	Description	Part Number
1	Spring, Element (used on MUH03 thru MUH-20 only)	5208-0073-000
	Spring, Element (used on MUH-25 thru MUH-50 only)	5208-0073-001
2	Spring, Capillary Tube	5208-0072-000
3	Spring, Element Retainer	5208-0074-000
4	Switch (used on MUH-25 thru MUH-50 only)	5216-7076-001
5	Insulator (used on MUH-25 thru MUH-50 only)	2900-0031-000
6	Bracket Extension (used on MUH-15, MUH-20, MUH-40 and MUH-50 only)	1215-0282-000
7	Switch Bracket	1215-0256-000
8	Fan Delay	4520-0010-000
14	Speed Nut	4100-7036-026
15	Bracket, Captive Screw (used on MUH-03 thru MUH-20 only)	1215-0291-000
	Bracket, Captive Screw (used on MUH-25 thru MUH-50 only)	1215-0289-000
17	Protector, Linear Limit (used on MUH03 thru MUH05 only)	4520-0011-000
	Protector, Linear Limit (used on MUH-07 thru MUH-20 only)	4520-0011-001
	Protector, Linear Limit (used on MUH-25 thru MUH-50 only)	4520-0011-002
20	Clamp (used on MUH-20 thru MUH-50 only)	1417-5004-000
	Bracket, Mounting Capacitor (used on MUH-20-8 only)	1215-0314-000
22	Terminal Lug (used on MUH-07 thru MUH-50 only)	3504-7002-001
25	Bushing (used on MUH-20 thru MUH-50 only)	25221-60131
26	Washer, Ground (used on MUH03 thru MUH05 only)	6401-0084-000
27	Screw, Ground (used on MUH03 thru MUH05 only)	5202-0290-002
28	Louver (used on MUH03 thru MUH05 only)	3503-0036-000
	Louver (used on MUH-07 thru MUH-20 only)	3503-0036-001
	Louver (used on MUH-25 thru MUH-50 only)	3503-0036-002
29	Spring, Louver	5208-7005-001
32	Terminal Block, 3-Phase (used on MUH05-21, MUH-07-02, and MUH-10-2 only)	5823-0003-000
	Terminal Block, 3-Phase (used on MUH05-81, MUH-07-8, and MUH-15-8 only)	5823-0003-000
33	Terminal Doublers (used where required)	5819-7012-005



**VIEW D-D
(MUH-25 THRU MUH-50 ONLY)**



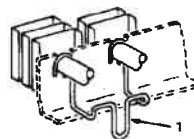
TERMINAL DOUBLER
(USED AS REQUIRED)



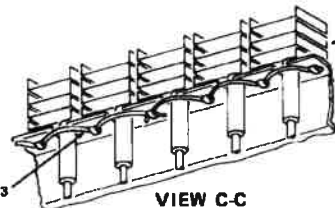
**VIEW D-D
(MUH-07 THRU MUH-20 ONLY)**



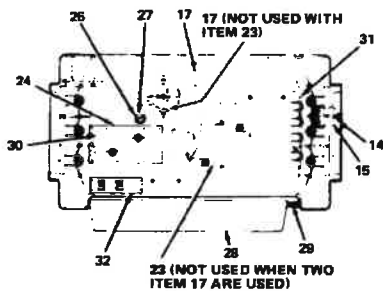
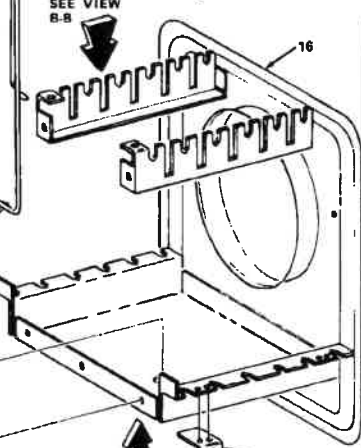
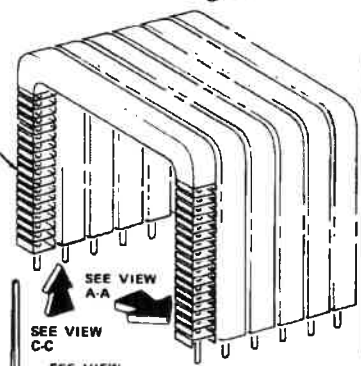
VIEW A-A



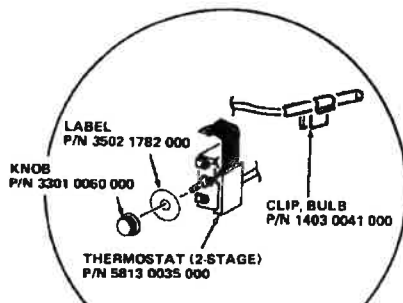
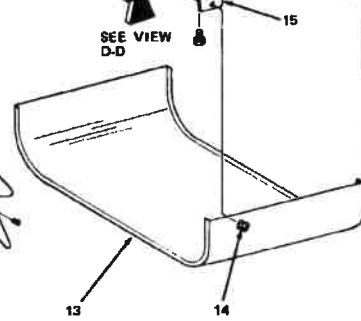
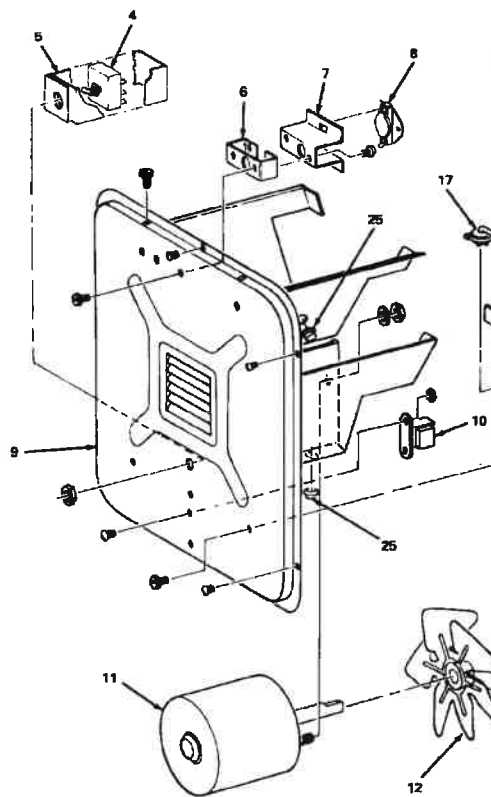
VIEW B-B



VIEW C-C



**VIEW D-D
(MUH03 THRU MUH05 ONLY)**



THESE PARTS ARE USED
ON MODEL MUH05-21T ONLY

Model No.	⑨ Back Case	⑩ Transformer**	⑪ Motor	⑫ Fan Blade	⑬ Cover	⑬ Cover	⑬ Cover	⑬ Cover	⑬ Cover	⑬ Cover
MUH03-21	1425-2004-000	—	3900-2002-006	1210-2000-000	1402-0336-001	1425-0009-005	1802-0087-000	2504-0011-000	—	—
MUH03-41	1425-2004-000	5814-0003-002	3900-2005-000	1210-2000-000	1402-0336-001	1425-0009-005	1802-0087-002	2504-0011-000	—	—
MUH03-71	1425-2004-000	—	3900-2002-007	1210-2000-000	1402-0336-001	1425-0009-005	1802-0087-001	2504-0011-000	—	—
MUH03-81	1425-2004-000	—	3900-2002-006	1210-2000-000	1402-0336-001	1425-0009-005	1802-0087-024	2504-0011-000	—	—
MUH05-21MG	1425-2004-000	—	3900-2002-006	1210-2000-000	1402-0336-001	1425-0009-005	1802-0087-003	2504-0011-000	—	—
MUH05-41	1425-2004-000	5814-0003-002	3900-2005-000	1210-2000-000	1402-0336-001	1425-0009-005	1802-0087-005	2504-0011-000	—	—
MUH05-71	1425-2004-000	—	3900-2002-007	1210-2000-000	1402-0336-001	1425-0009-005	1802-0087-004	2504-0011-000	—	—
MUH05-81MG	1425-2004-000	—	3900-2002-006	1210-2000-000	1402-0336-001	1425-0009-005	1802-0087-025	2504-0011-000	—	—
MUH-07-2	1425-0010-004	5814-0003-000	3900-2014-002	1210-0090-000	1402-0339-002	1425-0009-006	1802-0087-006	2504-0013-001	—	—
MUH-07-4	1425-0010-004	5814-0003-002	3900-0347-005	1210-0090-000	1402-0339-002	1425-0009-006	1802-0087-008	2504-0013-001	—	—
MUH-07-7	1425-0010-004	5814-0003-001	3900-2014-003	1210-0090-000	1402-0339-002	1425-0009-006	1802-0087-007	2504-0013-001	—	—
MUH-07-8	1425-0010-004	5814-0003-000	3900-2014-001	1210-0090-000	1402-0339-002	1425-0009-006	1802-0087-031	2504-0013-001	—	—
MUH-10-2	1425-0010-004	5814-0003-000	3900-2014-002	1210-0090-000	1402-0339-002	1425-0009-006	1802-0087-031	2504-0013-001	—	—
MUH-10-4	1425-0010-004	5814-0003-002	3900-0347-005	1210-0090-000	1402-0339-002	1425-0009-006	1802-0087-011	2504-0013-001	—	—
MUH-10-7	1425-0010-004	5814-0003-001	3900-2014-003	1210-0090-000	1402-0339-002	1425-0009-006	1802-0087-010	2504-0013-001	—	—
MUH-10-8	1425-0010-004	5814-0003-000	3900-2014-001	1210-0090-000	1402-0339-002	1425-0009-006	1802-0087-036	2504-0013-001	—	—
MUH-15-2	1425-0014-000	5814-0003-000	3900-0361-000	1210-0090-001	1402-0339-003	1425-0009-007	1802-0087-012	2504-0012-001	—	—
MUH-15-4	1425-0014-000	5814-0003-002	3900-0361-001	1210-0090-001	1402-0339-003	1425-0009-007	1802-0087-013	2504-0012-001	—	—
MUH-15-8	1425-0014-000	5814-0003-000	3900-0361-002	1210-0090-001	1402-0339-003	1425-0009-009	1802-0087-031	2504-0012-001	—	—
MUH-20-2	1425-0013-000	5814-0003-000	3900-0362-000	1210-0096-000	1402-0339-003	1425-0009-007	1802-0087-014	2504-0012-001	1432-0002-003	1432-0002-003
MUH-20-4	1425-0013-000	5814-0003-002	3900-0362-001	1210-0096-000	1402-0339-003	1425-0009-007	1802-0087-015	2504-0012-001	1432-0002-003	1432-0002-003
MUH-20-8	1425-0013-000	5814-0003-000	3900-0362-002	1210-0096-000	1402-0339-003	1425-0009-011	1802-0087-026	2504-0012-001	1432-0002-003	1432-0002-003
MUH-25-2	1425-0011-003	5814-0003-000	3900-0364-000	1210-0098-000	1402-0340-002	1425-0012-003	1802-0087-016	2504-0014-001	1432-0002-001	1432-0002-001
MUH-25-4	1425-0011-003	5814-0003-002	3900-0363-001	1210-0098-000	1402-0340-002	1425-0012-003	1802-0087-017	2504-0014-001	1432-0002-003	1432-0002-003
MUH-30-2	1425-0011-003	5814-0003-000	3900-0364-000	1210-0098-000	1402-0340-002	1425-0012-003	1802-0087-018	2504-0014-001	1432-0002-001	1432-0002-001
MUH-30-4	1425-0011-003	5814-0003-002	3900-0363-000	1210-0098-000	1402-0340-002	1425-0012-003	1802-0087-019	2504-0014-001	1432-0002-003	1432-0002-003
MUH-30-8	1425-0011-003	5814-0003-000	3900-0364-000	1210-0098-000	1402-0340-002	1425-0009-009	1802-0087-028	2504-0014-001	1432-0002-001	1432-0002-001
MUH-40-2	1425-0011-001	5814-0003-000	3900-0350-000	1210-0097-000	1402-0340-003	1425-0012-002	1802-0087-020	2504-0015-001	1432-0002-004	1432-0002-004
MUH-40-4	1425-0011-001	5814-0003-002	3900-0350-001	1210-0097-000	1402-0340-003	1425-0012-002	1802-0087-021	2504-0015-001	1432-0002-004	1432-0002-004
MUH-50-2	1425-0011-001	5814-0003-000	3900-0350-000	1210-0097-000	1402-0340-003	1425-0012-002	1802-0087-022	2504-0015-001	1432-0002-004	1432-0002-004
MUH-50-4	1425-0011-001	5814-0003-002	3900-0350-001	1210-0097-000	1402-0340-003	1425-0012-002	1802-0087-023	2504-0015-001	1432-0002-004	1432-0002-004
MUH-50-8	1425-0011-001	5814-0003-000	3900-0350-002	1210-0097-000	1402-0340-003	1425-0012-002	1802-0087-030	2504-0015-001	1432-0002-004	1432-0002-004

Model No.	②③ Relay***	②④ Insulator	③① Terminal Block, Power	③① Terminal Block, Control	③④ Fuse Block	③⑤ Fuse
MUH03-21	—	—	5823-0004-000	5823-0001-000	—	—
MUH03-41	5018-0004-100	2900-0030-000	5823-0004-000	5823-0002-000	—	—
MUH03-71	—	2900-0030-000	5823-0004-000	5823-0001-000	—	—
MUH03-81	—	—	5823-0004-000	5823-0001-000	—	—
MUH05-21MG	5018-0003-002	—	5823-0004-000	5823-0002-000	—	—
MUH05-41	5018-0004-100	2900-0030-000	5823-0004-000	5823-0002-000	—	—
MUH05-71	—	2900-0030-000	5823-0004-000	5823-0001-000	—	—
MUH05-81MG	5018-0003-002	—	5823-0004-000	5823-0002-000	—	—
MUH-07-2	5018-0003-000	—	5823-0004-000	5823-0002-000	—	—
MUH-07-4	5018-0004-100	2900-0030-000	5823-0004-000	5823-0002-000	—	—
MUH-07-7	5018-0004-100	2900-0030-000	5823-0004-000	5823-0002-000	—	—
MUH-07-8	5018-0003-000	—	5823-0004-000	5823-0002-000	—	—
MUH-10-2	5018-0003-000	—	5823-0004-000	5823-0002-000	—	—
MUH-10-4	5018-0004-100	2900-0030-000	5823-0004-000	5823-0002-000	—	—
MUH-10-7	5018-0003-000	2900-0030-000	5823-0004-000	5823-0002-000	—	—
MUH-10-8	5018-0004-100	—	5823-0004-000	5823-0002-000	—	—
MUH-15-2	5018-0005-004	—	5823-0004-001	5823-0002-000	—	—
MUH-15-4	5018-0004-100	2900-0030-000	5823-0004-000	5823-0002-000	—	—
MUH-15-8	5018-0005-008	—	5823-0004-003	5823-0002-000	2025-0002-000	2019-0007-010
MUH-20-2	5018-0006-000	—	5823-0004-002	5823-0002-000	—	—
MUH-20-4	5018-0004-100	2900-0030-000	5823-0004-000	5823-0002-000	—	—
MUH-20-8	5018-0005-000	—	5823-0004-002	5823-0002-000	2025-0002-000	2019-0007-008
MUH-25-2	5018-0005-004	—	5823-0004-002	5823-0002-000	2025-7002-000	2019-7008-077
MUH-25-4	5018-0005-004	2900-0030-000	5823-0004-001	5823-0002-000	—	—
MUH-30-2	5018-0005-004	—	5823-0004-003	5823-0002-000	2025-7002-000	2019-7008-079
MUH-30-4	5018-0005-004	2900-0030-000	5823-0004-001	5823-0002-000	—	—
MUH-30-8	5018-0006-000	—	5823-0005-000	5823-0002-000	2025-7002-000	2019-7008-080
MUH-40-2	5018-0005-004	—	5823-0005-000	5823-0002-000	2025-7002-000	2019-7008-079
MUH-40-4	*	2900-0030-000	5823-0004-002	5823-0002-000	2025-7002-000	2019-7008-079
MUH-50-2	5018-0005-004	—	5823-0005-000	5823-0002-000	2025-7002-000	2019-7008-080
MUH-50-4	*	2900-0030-000	5823-0004-002	5823-0002-000	—	—
MUH-50-8	5018-0006-000	—	5823-0005-000	5823-0002-000	2025-7002-000	2019-7008-078

* Two relays are used: 35A relay P/N 5018-0004-000 and 40A relay P/N 5018-0006-000.

** 24V secondary shown. For 120V secondary, increase last digit by 3. (i.e. for MUH03-41, 24V secondary use 5814-0003-002; for 120V secondary use 5814-0003-005.)

*** 24V H.C. shown. For 120 H.C., increase last digit by 1. (i.e.: for MUH03-41, 24V H.C. use 5018-0004-000; for 120V H.C. use 5018-0004-001.)

Maintenance Cleaning Instructions:

(To be performed only by Qualified Service Personnel)

At least annually, the heater should be cleaned and serviced by a qualified service person to assure safe and efficient operation. This should include as necessary, vacuuming dust and debris from the elements and fan, and checking all screw lug connections for tightness to a recommended minimum torque of 35 in-lbs. (3.9 N-m). After completing the cleaning and servicing, the heater should be fully reassembled and checked for proper operation.

LIMITED WARRANTY

All products manufactured by Marley Engineered Products are warranted against defects in workmanship and materials for one year from date of installation, except heating elements which are warranted against defects in workmanship and materials for five years from date of installation. This warranty does not apply to damage from accident, misuse, or alteration; nor where the connected voltage is more than 5% above the nameplate voltage; nor to equipment improperly installed or wired or maintained in violation of the product's installation instructions. All claims for warranty work must be accompanied by proof of the date of installation.

The customer shall be responsible for all costs incurred in the removal or reinstallation of products, including labor costs, and shipping costs incurred to return products to Marley Engineered Products Service Center. Within the limitations of this warranty, inoperative units should be returned to the nearest Marley authorized service center or the Marley Engineered Products Service Center, and we will repair or replace, at our option, at no charge to you with return freight paid by Marley. It is agreed that such repair or replacement is the exclusive remedy available from Marley Engineered Products.

THE ABOVE WARRANTIES ARE IN LIEU OF ALL OTHER WARRANTIES EXPRESSED OR IMPLIED, AND ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE WHICH EXCEED THE AFORESAID EXPRESSED WARRANTIES ARE HEREBY DISCLAIMED AND EXCLUDED FROM THIS AGREEMENT. MARLEY ENGINEERED PRODUCTS SHALL NOT BE LIABLE FOR CONSEQUENTIAL DAMAGES ARISING WITH RESPECT TO THE PRODUCT, WHETHER BASED UPON NEGLIGENCE, TORT, STRICT LIABILITY, OR CONTRACT.

Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above exclusion or limitation may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

For the address of your nearest authorized service center, contact Marley Engineered Products in Bennettsville, SC, at 1-800-642-4328. Merchandise returned to the factory must be accompanied by a return authorization and service identification tag, both available from Marley Engineered Products. When requesting return authorization, include all catalog numbers shown on the products.

HOW TO OBTAIN WARRANTY SERVICE AND WARRANTY PARTS PLUS GENERAL INFORMATION

- | | |
|--------------------------------|---|
| 1. Warranty Service or Parts | 1-800-642-4328 |
| 2. Purchase Replacement Parts | 1-800-654-3545 |
| 3. General Product Information | www.marleymep.com |

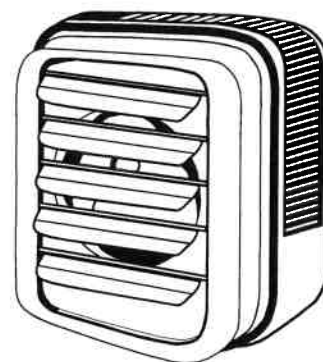
Note: When obtaining service always have the following:

1. Model number of the product
2. Date of manufacture
3. Part number or description



Marley®
Engineered Products

470 Beauty Spot Rd. East
Bennettsville, SC 29512 USA



Serie MUH

Unidades calefactoras modulares



Instrucciones de instalación, operación y mantenimiento

Especificaciones

Modelo básico N°	Altura, pulg. (mm)	Ancho, pulg. (mm)	Prof., pulg. (mm)	Peso de montaje lb (kg)	Volumen del compartimiento de cables
MUH0381	16 (406.4)	14 (355.6)	7 1/2 (190.5)	27 (12.2)	90 pulg. ³ (14.70 cm ³)
MUH0321				27 (12.2)	
MUH0371				27 (12.2)	
MUH0341				30 (13.6)	
MUH0581				27 (12.2)	
MUH0521				27 (12.2)	
MUH0571				27 (12.2)	
MUH0541				30 (13.6)	
MUH0331				30 (13.6)	
MUH0361				30 (13.6)	
MUH0531				30 (13.6)	
MUH0561				30 (13.6)	
MUH078	21 3/4 (552.5)	19 (482.6)	7 1/2 (190.5)	38 (17.2)	100 pulg. ³ (1639 cm ³)
MUH072				38 (17.2)	
MUH077				38 (17.2)	
MUH074				38 (17.2)	
MUH108				38 (17.2)	
MUH102				38 (17.2)	
MUH107				38 (17.2)	
MUH104				38 (17.2)	
MUH073				38 (17.2)	
MUH076				38 (17.2)	
MUH103				38 (17.2)	
MUH106				38 (17.2)	

Modelo básico N°	Altura, pulg. (mm)	Ancho, pulg. (mm)	Prof., pulg. (mm)	Peso de montaje lb (kg)	Volumen del compartimiento de cables
MUH158	21 3/4 (552.5)	19 (482.6)	12 3/4 (323.9)	54 (24.5)	140 pulg. ³ (2295 cm ³)
MUH152				50 (22.7)	
MUH154				50 (22.7)	
MUH208				60 (27.2)	
MUH202				55 (24.9)	
MUH204				55 (24.9)	
MUH156				55 (24.9)	
MUH206				55 (24.9)	
MUH252	30 (76.2)	26 5/8 (676.4)	11 3/4 (298.5)	89 (40.4)	504 pulg. ³ (8260 cm ³)
MUH254				89 (40.4)	
MUH308				89 (40.4)	
MUH302				89 (40.4)	
MUH304				89 (40.4)	
MUH256				89 (40.4)	
MUH306				89 (40.4)	
MUH402				119 (54.0)	
MUH404	30 (76.2)	26 5/8 (676.4)	17 1/4 (435.1)	119 (54.0)	648 pulg. ³ (10620 cm ³)
MUH508				119 (54.0)	
MUH502				119 (54.0)	
MUH504				119 (54.0)	
MUH406				119 (54.0)	
MUH506				119 (54.0)	

INSTRUCCIONES IMPORTANTES



ADVERTENCIA



AL UTILIZAR ARTEFACTOS ELÉCTRICOS, PARA REDUCIR EL RIESGO DE INCENDIO, CHOQUE ELÉCTRICO Y LESIONES PERSONALES DEBEN OBSERVARSE SIEMPRE ALGUNAS PRECAUCIONES BÁSICAS, COMO LAS SIGUIENTES:

1. Lea todas las instrucciones antes de instalar o utilizar este calefactor.
2. Este calefactor es un producto comercial/industrial, que no está destinado a su empleo en un entorno residencial.
3. Cuando está en funcionamiento, el calefactor está muy caliente. Para evitar quemaduras, no deje que su piel haga contacto directo con las superficies calientes. Mantenga los materiales combustibles como muebles, almohadas, ropas de cama, papeles, ropas, cortinas, etc. a 0.9 m (3 pies) como mínimo del frente del calefactor.
4. Se necesita extremo cuidado al utilizar cualquier calefactor junto a o cerca de niños o inválidos, y en todo momento en que el calefactor quede funcionando y desatendido.
5. Este calefactor tiene en su interior piezas calientes y piezas en las que se producen arcos o chispas, y no está destinado a su empleo en atmósferas peligrosas en las que se usen o almacenen vapores, gases o líquidos inflamables u otras atmósferas combustibles como las define el Código Eléctrico Nacional de los EE. UU. Si no se cumple esto puede producirse una explosión o incendio.
6. No opere ningún calefactor después de que haya tenido una falla de funcionamiento. Desconecte la alimentación eléctrica en el

tablero de servicio y haga revisar el calefactor por un electricista calificado antes de usarlo.

7. No use el equipo en exteriores.
8. Para desconectar el calefactor, lleve los controles a la posición Apagado (OFF) y desconecte la alimentación del circuito del calefactor en el tablero de desconexión principal.
9. No inserte ni permita que entren objetos extraños en ninguna abertura de ventilación o de descarga, porque esto puede ser causa de choque eléctrico, incendio o daño al calefactor.
10. Para evitar un posible incendio, no bloquee de ningún modo la entrada ni la descarga de aire.
11. Utilice este calefactor únicamente de la manera descrita en este manual. Todo otro uso no recomendado por el fabricante puede originar un incendio.
12. Este calefactor no está destinado a su empleo en entornos especiales. No lo use en lugares húmedos o mojados como zonas marítimas o invernaderos, ni en áreas en las que estén presentes agentes químicos o corrosivos.
13. Al realizar la instalación, vea las advertencias y precauciones adicionales en las INSTRUCCIONES DE INSTALACIÓN.
14. Para asegurar una operación segura y eficiente, y para extender la vida útil de su calefactor, manténgalo limpio. Vea las INSTRUCCIONES DE MANTENIMIENTO.

GUARDE ESTAS INSTRUCCIONES

INSTRUCCIONES DE INSTALACIÓN



ADVERTENCIA



Para evitar un posible incendio, lesiones personales o daños al calefactor, observe lo siguiente:

1. Antes de proceder a tareas de conexión o de reparación del calefactor, desconecte toda la alimentación eléctrica que llega al mismo desde el tablero principal de servicio.

Nota importante: este calefactor debe ser instalado por personal calificado.

2. Todos los procedimientos de cableado y conexiones deben hacerse de conformidad con los códigos nacionales y locales que tengan jurisdicción, y el calefactor debe estar conectado a tierra.
3. Verifique que la tensión de alimentación provista al calefactor coincida con la tensión nominal indicada en la placa de características del mismo.

ATENCIÓN: SI SE ENERGIZA UN CALEFACTOR CON UNA TENSIÓN MAYOR QUE EL VALOR DE TENSIÓN IMPRESO EN LA PLACA DE CARACTERÍSTICAS, SE DAÑARÁ EL CALEFACTOR, SE ANULARÁ LA GARANTÍA, Y PODRÍA PRODUCIRSE UN INCENDIO.

4. Para reducir el riesgo de incendio, no almacene ni use gasolina u otros vapores y líquidos inflamables en las cercanías del calefactor.
5. La estructura de montaje en el cielorraso o la pared, así como los medios de anclaje, deben tener la resistencia suficiente para soportar el peso combinado del calefactor y del soporte de montaje.
6. Todos los termostatos incorporados: si el calefactor se usa para prevenir el congelamiento de tuberías o líquidos y el termostato se ajusta por debajo de 7 °C (45 °F), el ventilador debe funcionar continuamente.
7. El calefactor debe montarse al menos a 2134 mm (7') encima del piso para evitar el contacto accidental con la paleta del ventilador, lo que podría causar lesiones.
8. Mantenga un espacio libre de 1524 mm (5') como mínimo delante del calefactor. Para ver los requisitos de espacio libre lateral, superior y posterior consulte la Tabla 1.
9. No monte un termostato de mercurio directamente sobre la unidad. La vibración podría hacer que el calefactor funcione mal.

Instrucciones sobre la ubicación del calefactor

Disponga las unidades de manera que las corrientes de aire de descarga:

- a. Estén sujetas a un mínimo de interferencia a causa de columnas, maquinaria y tabiques;
- b. Se deslicen por las paredes expuestas sin impactar directamente contra ellas.
- c. Se dirijan lejos de los ocupantes de la habitación en aplicaciones de calefacción ambiental;
- d. Se dirijan a lo largo del lado de donde viene el viento, cuando se instalan

en un edificio expuesto a un viento preponderante.

Localice los termostatos aproximadamente 1524 mm (5') por encima del piso, en paredes divisorias interiores, o colóquelos lejos de corrientes de aire frío, fuentes de calor internas y de las corrientes de aire de descarga de calefactores.

Las habitaciones pequeñas pueden usar una unidad calefactora única.

Las habitaciones grandes requieren instalaciones de unidades múltiples. La cantidad y la capacidad de las unidades se determinará de acuerdo con el volumen del edificio y el área de piso (pies cuadrados) a calefaccionar. Disponga las unidades para proporcionar una circulación de aire perimetral, en la que cada unidad soporte la corriente de aire de otra.

Montaje del calefactor - Generalidades

El calefactor puede montarse para descargar el aire caliente horizontalmente o verticalmente. Cuando el calefactor se monta para descarga vertical, se recomienda posicionarlo de manera que la puerta de acceso se abra en sentido contrario a la pared, a fin de proporcionar mayor acceso al compartimiento de cables y control. Si el calefactor se va a montar con la puerta de acceso enfrentada a una pared, debe montarse lo suficientemente lejos de esa pared a fin de permitir la apertura plena de la puerta (una distancia aproximadamente igual al ancho del calefactor; verifique el espacio libre antes de la instalación). Para ver los espacios libres en relación con las paredes y el cielorraso antes de montar el calefactor, consulte la Tabla 1.

El calefactor puede montarse para descarga vertical u horizontal, mediante el uso de varillas roscadas. (Para ver los tamaños de varillas roscadas requeridos, consulte la Tabla 2). Observe los procedimientos detallados en las instrucciones de instalación siguientes.

El calefactor puede también ir suspendido de la pared o del cielorraso por medio de un soporte de montaje opcional (tipo MMB o MCMB) que le permite pivotar horizontalmente.

Después de instalar el calefactor, las celosías pueden posicionarse para orientar el aire caliente en la dirección deseada. Cuando el calefactor se instala para descarga horizontal, las celosías deben dirigir el aire en línea recta hacia adelante, o hacia abajo. La orientación hacia arriba puede hacer que el aire caliente permanezca en el área del cielorraso, con lo que se desperdicia energía.

Tabla 1. Espacio libre en relación con las paredes y el cielorraso, pulgadas (mm)

Unidad	Descarga	Cielorraso	Pared lateral	Pared posterior
3 y 5 kW	Horiz.	2 (50.8)	6 (152.4)	9 (228.6)
	Vert.	6 (152.4)	18 (457.2)	18 (457.2)
7.5 a 10 kW	Horiz.	6 (152.4)	6 (152.4)	13 (330.2)
	Vert.	6 (152.4)	24 (609.6)	24 (609.6)
15 a 10 kW	Horiz.	6 (152.4)	9 (228.6)	12 1/2 (317.5)
	Vert.	6 (152.4)	24 (609.6)	24 (609.6)
25 a 50 kW	Horiz.	16 (406.4)	12 (304.8)	18 1/2 (470.0)
	Vert.	12 (304.8)	39 (914.4)	39 (914.4)

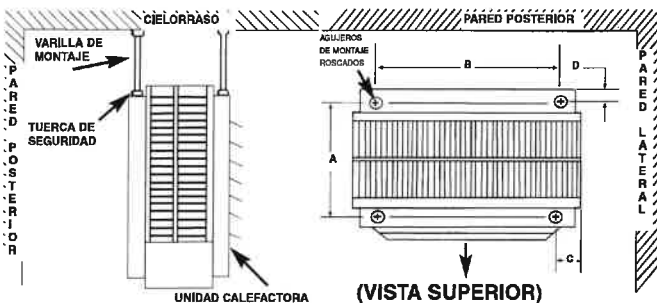


Figura 1. Montaje y espaciado de varillas para descarga horizontal

Tabla 2. Dimensiones de espaciado y rosca de las varillas, pulgadas (mm), para descarga horizontal

Unidad	Tipo de rosca de las varillas	A	B	C	D
3 - 5 kW	5/16 - 18	6 1/16 (153.9)	6 (152.4)	4 7/16 (103.1)	3/4 (19.0)
7.5 - 10 kW		11 9/16 (289.0)	8 7/8 (225.6)	5 1/8 (130.3)	3/4 (19.0)
15 - 20 kW	3/8 - 16	10 9/16 (268.2)	14 - 12 (368.3)	6 3/16 (157.2)	5/8 (16.0)
25 - 30 kW		15 15/16 (404.9)	14 - 12 (368.3)	6 3/16 (157.2)	5/8 (16.0)

Descarga horizontal (montaje con varillas desde el cielorraso)

1. Instale cuatro varillas roscadas de montaje en los agujeros roscados, y asegúrelas en su posición mediante tuercas de seguridad (vea la Tabla 2).
2. Fije firmemente las cuatro varillas de montaje al cielorraso. (Para ver los espacios libres en relación con las paredes y el cielorraso consulte la Tabla 1, y para ver el espaciado de las varillas de montaje consulte la Tabla 2).

Tabla 3. Dimensiones de espaciado y rosca de las varillas, pulgadas (mm), para descarga vertical

Unidad	Tipo de rosca de las varillas	E	F	G	H
3 - 5 kW	5/16 - 18	6 (152.4)	9 3/4 (247.7)	2 (50.8)	4 1/16 (103.1)
7.5 - 20 kW		8 7/8 (225.6)	14 5/8 (371.6)	2 (50.8)	5 1/8 (130.3)
25 - 30 kW	3/8 - 16	14 1/2 (368.3)	21 1/4 (539.8)	2 3/16 (56.0)	6 3/16 (157.2)

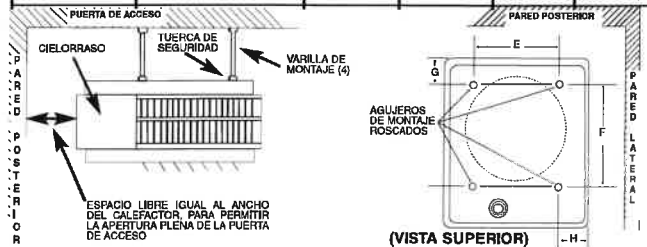


Figura 2. Montaje y espaciado de varillas para descarga vertical

Descarga vertical (montaje con varillas desde el cielorraso)

1. Quite los pernos de los agujeros roscados que están en la parte trasera del calefactor.
2. Instale cuatro varillas roscadas de montaje en los agujeros roscados, y asegúrelas en su posición mediante tuercas de seguridad.
3. Fije firmemente las cuatro varillas de montaje al cielorraso. (Para ver los espacios libres en relación con las paredes y el cielorraso consulte la Tabla 1, y para ver las dimensiones de espaciado de las varillas de montaje consulte la Tabla 3).

Cableado del circuito de derivación (alimentación)

1. Conecte el calefactor únicamente a un circuito apto para la tensión (V), corriente (A) y frecuencia (Hz) especificadas en la placa de características.
2. El cableado de campo debe estar dimensionado correctamente para la corriente (A) que debe conducir, de acuerdo con el NEC.
3. La puerta de acceso está abisagrada. Existen uno o dos tornillos accesibles desde el costado, que deben aflojarse para tener acceso. Estos tornillos son del tipo prisionero; no intente quitarlos.
4. Se ha provisto un prepunzonado en la parte posterior del calefactor, cerca de las borneras de alimentación eléctrica y de control. El prepunzonado para la bornera de control es para un tamaño de conducto de 12.7 mm (1/2 pulgada). El prepunzonado para la bornera de alimentación eléctrica es de diámetro múltiple. Use el diámetro que corresponda al tamaño de conducto necesario.
5. Se ha provisto un terminal de masa cerca de la bornera de alimentación eléctrica. El cable de masa debe conectarse antes de hacer las otras conexiones.
6. La bornera de alimentación eléctrica está equipada con terminales dimensionados para aceptar el cable de alimentación eléctrica de calibre correcto. El cable para circuitos de derivación con especificación de 600 V, 60 °C, es aceptable para los calefactores que consumen hasta 80 A. Para los calefactores que consumen más de 80 A, el cable del circuito de derivación debe tener una especificación de 75 °C como mínimo. Para la conexión a los terminales de la bornera de alimentación eléctrica del calefactor pueden usarse tanto cables de cobre como de aluminio. Se recomiendan los cables de cobre, y deben usarse con un interruptor de desconexión incorporado.

7. Cada calefactor tiene un diagrama de conexionado fijado en el interior de la puerta de acceso. Consulte este diagrama antes de hacer las conexiones de campo.

Nota importante – Par de apriete de los terminales de tornillo en la instalación:

Durante el transporte es posible que las conexiones de los terminales de tornillo se aflojen. Después de la instalación, antes de conectar la alimentación eléctrica al calefactor, revise las conexiones de los terminales de tornillo para verificar que cumplan con el valor de par de apriete recomendado de 3.9 N·m (35 lb·pulg.). Las conexiones flojas pueden ser riesgosas.

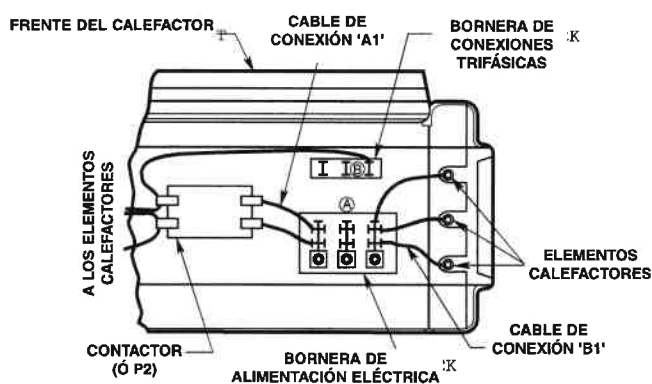
8. En los modelos de calefactor MUH0521, MUH0581, MUH072, MUH078, MUH102, MUH108 y MUH158 pueden usarse conexiones monofásicas o trifásicas. Estas unidades están cableadas en fábrica para operación monofásica. Si estos calefactores van a usarse con alimentación trifásica, reconecte los cables según se indica en el diagrama de conexionado fijado al calefactor. Puede encontrarse información adicional en las ilustraciones de conexionado de las Figuras 3a y 3b, y en las instrucciones que siguen a continuación.

En los modelos MUH0521, MUH0581, MUH072, MUH078, MUH102 y MUH108 (Figura 3a), mueva sólo los dos cables marcados 'A1' y 'B1'; no mueva ni cambie ninguna otra conexión. El cable de conexión del elemento calefactor marcado 'B1', que está conectado en fábrica a la bornera de alimentación eléctrica (terminal más cercano a los elementos calefactores), debe moverse al terminal 'B' de la bornera de conexiones trifásicas.

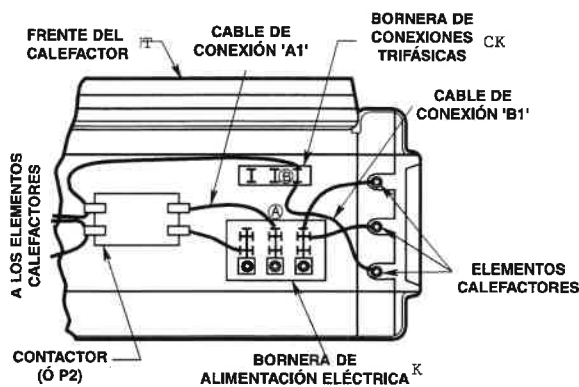
El cable de conexión 'A1' del relé (contactor) debe moverse del terminal extremo de la bornera de alimentación eléctrica (terminal más cercano al contactor o a la bornera de control) al terminal 'A' de la bornera inferior (terminal central).

El modelo MUH158 (Figura 3b) tiene dos borneras de conexiones trifásicas ubicadas adyacentes a los relés (contactores). Mueva únicamente los dos cables marcados 'C1' y 'D1' en cada una de las dos borneras de conexiones trifásicas, al terminal 'B'. No mueva ni cambie ningún otro cable.

9. Los accesorios eléctricos, ya sea kits u opciones instaladas en fábrica, se muestran conectados por una línea de trazos en el diagrama de conexionado del calefactor.
10. **CALEFACTOR DE 208/240 VOLTS:** los calefactores están cableados de fábrica para 240 V. Cuando conecte el calefactor a una fuente de alimentación de 208 V DEBE intercambiar los cables de conexión del transformador. Para unidades con una especificación de 30/40 kW o mayor, intercambie los cables de conexión NARANJA y ROJO del primario. El cable de conexión de color NEGRO es el COMÚN (retorno) del transformador (50 VA) suministrado con las unidades de alta potencia (watts). Para calefactores con una especificación más baja de potencia (kW), intercambie los cables de conexión NEGRO y ROJO del primario. El cable de conexión de color BLANCO es el COMÚN (retorno) del transformador de control suministrado con estos calefactores. Antes de realizar esta reconexión de los cables de conexión del primario del transformador, consulte siempre el diagrama de conexionado en la cubierta del calefactor.

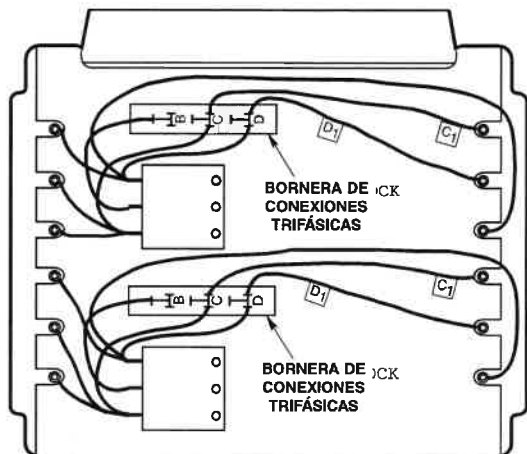


CABLEADO EN FÁBRICA PARA ALIMENTACIÓN MONOFÁSICA

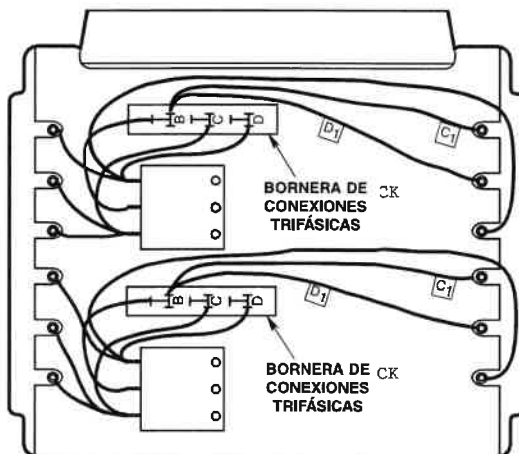


CABLEADO EN CAMPO PARA ALIMENTACIÓN TRIFÁSICA

Figura 3a. Conexiones de cables para alimentación monofásica y trifásica (MUH0521, MUH0581, MUH072, MUH078, MUH102 y MUH108)



CABLEADO EN FÁBRICA PARA ALIMENTACIÓN MONOFÁSICA



CABLEADO EN CAMPO PARA ALIMENTACIÓN TRIFÁSICA

Figura 3b. Conexiones de cables para alimentación monofásica y trifásica (MUH158)

Conexionado de control

⚠ ADVERTENCIA ⚠

EN ALGUNOS TERMINALES DE LA BORNERA DE CONTROL ESTÁ PRESENTE LA TENSIÓN DE LÍNEA. DESCONECTE SIEMPRE LA ALIMENTACIÓN ELÉCTRICA DEL CALEFACTOR ANTES DE HACER CONEXIONES A LA PLACA DE CONTROL, A FIN DE EVITAR UN RIESGO DE CHOQUE ELÉCTRICO.

1. Use para el cableado del circuito de control cables aislados, NEC Clase 1, 600 volts como mínimo.
2. Si se va a hacer más de una conexión bajo el tornillo de un terminal de la bornera de control, use un terminal tipo horquilla engarzado a presión en los extremos de cable.
3. Para ver el diagrama de conexionado de las unidades no provistas de contactor interno (3 y 5 kW), consulte la Figura 4.

NOTA: el cableado del termostato y del circuito de control deben ser aptos para manejar la carga plena del calefactor (por ejemplo, el consumo nominal del MUH0581 es 24 A).

4. Para ver el diagrama de conexionado de las unidades provistas de contactor interno (unidades de 7 kW y mayores), consulte la Figura 5.
5. El cableado de control debe tener un calibre 18 AWG como mínimo.

INSTRUCCIONES DE OPERACIÓN

1. El calefactor debe instalarse correctamente antes de ponerlo en funcionamiento.
2. Conecte la alimentación eléctrica al calefactor en el tablero de distribución principal.
3. Donde sea aplicable, para ver la operación correcta de los controles y accesorios que pueda utilizar el calefactor consulte las instrucciones de los accesorios de control.

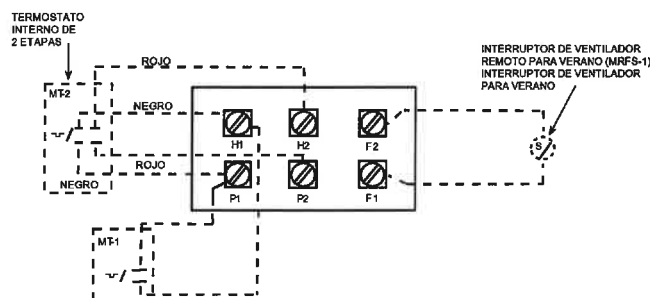


Figura 4. Bornera de control (para calefactores sin contactor)

NOTAS:

1. LA BORNERA DE CONTROL DE ESTE TIPO SE USA CON LOS MODELOS MUH0321, MUH0371, MUH0381, MUH0521, MUH0571 Y MUH0581.
2. CUANDO LA UNIDAD SE CABLEA PARA CONEXIÓN MONOFÁSICA, PUENTE H1 CON H2. SI SE USA UN TERMOSTATO UNIPOLAR CON LA UNIDAD MONOFÁSICA, CONECTE LOS CABLES DE CONEXIÓN DEL TERMOSTATO A P1 Y H1.
3. LOS TERMOSTATOS PARA TENSIÓN DE LÍNEA EXTERNA DEBEN CONSIDERARSE COMO DE UNA ETAPA ÚNICAMENTE.

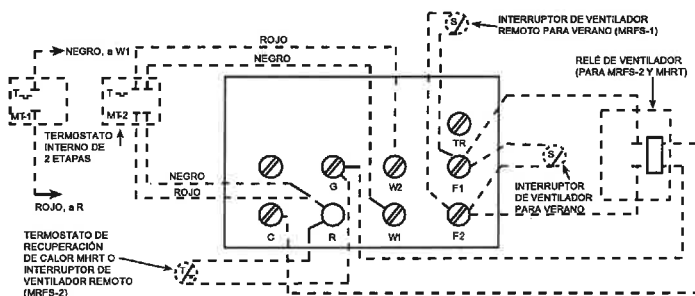


Figura 5. Bornera de control (para calefactores con contactor)

NOTAS:

1. LA BORNERA DE CONTROL DE ESTE TIPO NO SE USA CON LOS MODELOS MUH0321, MUH0371, MUH0381, MUH0521, MUH0571 NI MUH0581.
2. CUANDO USE UN TERMOSTATO DE 2 ETAPAS, quite el puente que une W1 y W2.
3. *SÓLO UNO DE ESTOS ACCESORIOS PUEDE INSTALARSE EN UN CALEFACTOR ÚNICO.
4. LOS TERMOSTATOS PARA TENSIÓN DE LÍNEA EXTERNA DEBEN CONSIDERARSE COMO DE UNA ETAPA ÚNICAMENTE.

Cómo efectuar la reposición del control de seguridad contra sobretensión (opción instalada en fábrica únicamente):

El interruptor límite está ubicado internamente, en la parte posterior del calefactor. En los modelos de 3 kW y de 5 kW, el acceso al botón de reposición es por el lado derecho (al mirar a la parte trasera del calefactor); en todos los demás modelos está cerca de la parte superior trasera del calefactor.

El límite de reposición manual está en serie con el protector (límite) de reciclado automático. El límite de reposición manual no se repondrá hasta que el calefactor se haya enfriado y se oprima el botón.

⚠ ADVERTENCIA ⚠

NO ALTERE NI PUENTE NINGÚN LÍMITE DE SEGURIDAD INTERNO DEL CALEFACTOR.

PRECAUCIÓN ⚠

ATENCIÓN: SI EL CONTROL DE SEGURIDAD SE ACTIVA REPETIDAMENTE DESPUÉS DE LA REPOSICIÓN, NO VUELVA A INTENTAR USAR EL CALEFACTOR. SI LO HACE, EL CALEFACTOR PUEDE SUFRIR DAÑOS PERMANENTES, O PROVOCAR UN INCENDIO O RIESGO PARA LA SEGURIDAD.

Es importante mantener limpio este calefactor. Su calefactor le brindará muchos años de servicio y confort con sólo un mínimo de cuidado. Para asegurar un funcionamiento eficiente, observe las instrucciones simples que se indican a continuación.

⚠ ADVERTENCIA ⚠

TODO SERVICIO, MÁS ALLÁ DE UNA SIMPLE LIMPIEZA, QUE REQUIERA UN DESMONTAJE DEBE SER REALIZADO POR PERSONAL DE SERVICIO CALIFICADO.

⚠ ADVERTENCIA ⚠

PARA REDUCIR EL RIESGO DE INCENDIO Y DE CHOQUE ELÉCTRICO O LESIONES, DESCONECTE TODA LA ALIMENTACIÓN ELÉCTRICA QUE LLEGA AL CALEFACTOR EN EL TABLERO PRINCIPAL DE SERVICIO Y VERIFIQUE QUE EL ELEMENTO CALEFACTOR ESTÉ FRÍO ANTES DE PRESTAR SERVICIO O DE REALIZAR EL MANTENIMIENTO.

Instrucciones de limpieza para el usuario:

1. Después de que el calefactor se haya enfriado, puede utilizarse una aspiradora con accesorio de cepillo para eliminar el polvo y la pelusa de las superficies exteriores del calefactor, incluidas las aberturas de la rejilla.
2. Con un paño húmedo, elimine el polvo y la pelusa de la rejilla y las superficies exteriores.
3. Vuelva a conectar la alimentación eléctrica al calefactor y asegúrese de que funcione correctamente.

Instrucciones de limpieza de mantenimiento:

(a realizarse únicamente por personal de servicio calificado)

Al menos una vez por año, un técnico de servicio calificado debe limpiar y prestar servicio al calefactor para asegurar un funcionamiento seguro y eficiente. Esto debe incluir, según sea necesario, la aspiración del polvo y los desperdicios de los elementos calefactores y del ventilador, y la revisión de las conexiones de los terminales de tornillo para verificar que cumplan con el valor de par de apriete recomendado de 3.9 N·m (35 lb·pulg.). Después de terminada la limpieza y servicio, el calefactor debe volver a montarse completamente y verificarse que funcione correctamente.

INSTRUCCIONES DE MANTENIMIENTO

Es importante mantener limpio este calefactor. Su calefactor le brindará muchos años de servicio y confort con sólo un mínimo de cuidado. Para asegurar un funcionamiento eficiente, observe las instrucciones simples que se indican a continuación.

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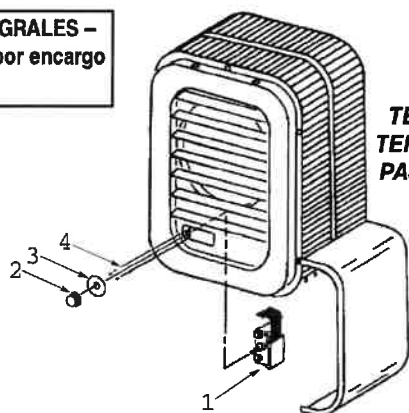
Controles integrales MUH

Nº clave	Descripción	Nº de pieza
	Termostato unipolar (MT-1)	5813-0036-000
	Termostato, dos etapas (MT-2)	5813-0035-000
2	Perilla termostato	3301-0060-000
3	Etiqueta termostato	3502-1781-000
4	Tornillos cab. plana, 6-32 x 1/4	5202-7009-021
5	Clip termostato	1403-0041-000
6	Interruptor 25 A, OBM	5216-0132-000
	Interruptor 25 A, K&N	5216-0204-000
	Interruptor 63 A OBM	5216-0131-000
	Interruptor 63 A, K&N	5216-0203-000
	Interruptor 25 A Electro	5216-0200-000
7	Tornillo M4 x 10, cab. red. (25 A)	—
	Tornillo 63 A M5 x 16, cab. red.	—
8	Perilla 25 A OBM "T1"	OEM "T1"
	Perilla 25 A, K&N	K & N S1B 6001
	Perilla 63 A OBM	OEM "S4"
	Perilla 63 A, K&N	K & N S2B G001
	Perilla Electro	EI 141747
9	Interruptor basculante 600 V	5216-0130-000
10	Relé ventilador, bobina 24 V	5018-0008-000
11	Conj. interruptor	5216-0199-000
12	Límite reposición manual	4520-0012-000

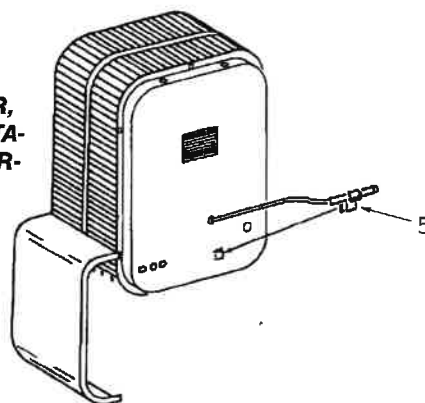
Piezas de repuesto del calentador

Nº clave	Descripción	Nº de pieza
1	Resorte elemento (utilizado en MUH-03 hasta MUH-20 solamente)	5208-0073-000
	Resorte elemento (utilizado en MUH-25 hasta MUH-50 solamente)	5208-0073-001
2	Resorte tubo capilar	5208-0072-000
3	Resorte retenedor elemento	5208-0074-000
4	Interruptor (utilizado en MUH-25 hasta MUH-50 solamente)	5216-7076-001
5	Aislador (utilizado en MUH-25 hasta MUH-50 solamente)	2900-0031-000
6	Extensión del soporte (utilizado en MUH-15, MUH-20, MUH-40 y MUH-50 solamente)	1215-0282-000
7	Soporte de interruptor	1215-0256-000
8	Retardo del ventilador	4520-0010-000
14	Tuerca velocidad	4100-7036-026
15	Soporte tornillo imperdible (utilizado MUH-03 hasta MUH-20 solamente)	1215-0291-000
	Soporte tornillo imperdible (utilizado en MUH-25 hasta MUH-50 solamente)	1215-0289-000
17	Protector límite lineal (utilizado en MUH-03 hasta MUH-05 solamente)	4520-0011-000
	Protector límite lineal (utilizado en MUH-07 hasta MUH-20 solamente)	4520-0011-001
	Protector límite lineal (utilizado en MUH-25 hasta MUH-50 solamente)	4520-0011-002
20	Abrazadera (utilizada en MUH-25 hasta MUH-50 solamente)	1417-5004-000
	Soporte montaje capacitor (utilizado en MUH-20-8 solamente)	1215-0314-000
22	Orejeta terminal (utilizada en MUH-07 hasta MUH-50 solamente)	3504-7002-001
25	Buje (utilizado en MUH-20 hasta MUH-50 solamente)	25221-60131
26	Arandela pulida (utilizada en MUH-03 hasta MUH-05 solamente)	6401-0084-000
27	Tornillo pulido (utilizado en MUH-03 hasta MUH-05 solamente)	5202-0290-002
28	Persiana (utilizada en MUH-03 hasta MUH-05 solamente)	3503-0036-000
	Persiana (utilizada en MUH-07 hasta MUH-20 solamente)	3503-0036-001
	Persiana (utilizada en MUH-25 hasta MUH-50 solamente)	3503-0036-002
29	Resorte persiana	5208-7005-001
32	Regleta terminales trifásica (utilizada en MUH-5-21, MUH-07-02, y MUH-10-2 solamente)	5823-0003-000
	Regleta terminales trifásica (utilizada en MUH-5-81, MUH-07-08, y MUH-15-8 solamente)	5823-0003-000
33	Dobladores terminales (utilizado según se requieran)	5819-7012-005

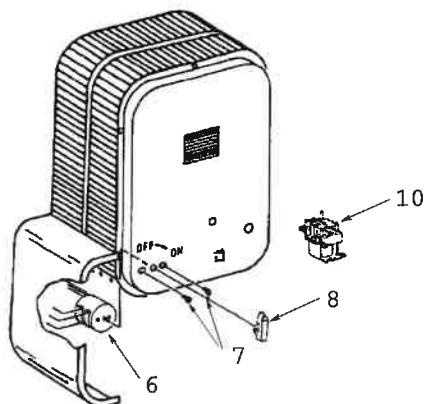
ROLES INTEGRALES –
Unidades hechas por encargo
solamente



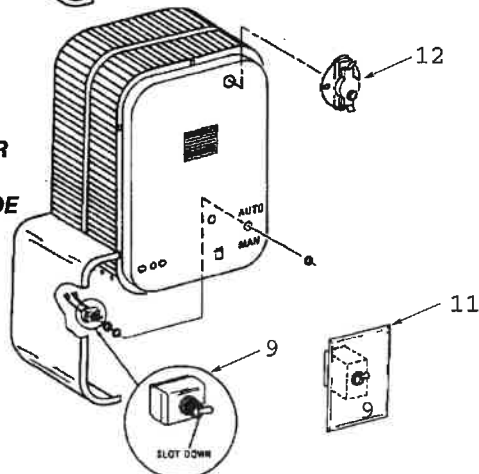
**TERMOSTATO UNIPOLAR,
TERMOSTATO DE DOS ETA-
PAS, TERMOSTATO DE TER-
MORECUPERACIÓN**

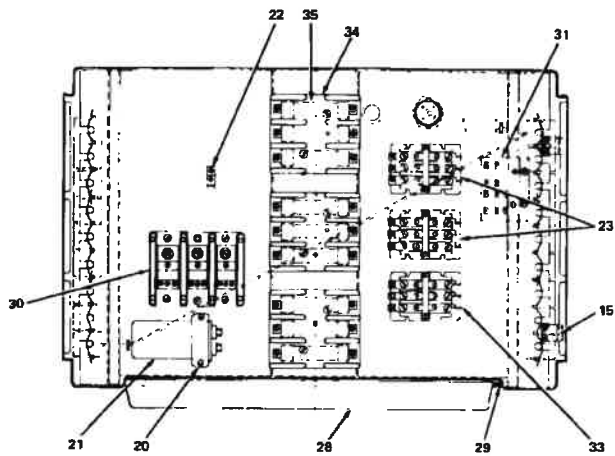


**INTERRUPTOR
DE POTENCIA**

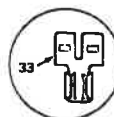


**INTERRUPTOR
DEL
VENTILADOR DE
VERANO**

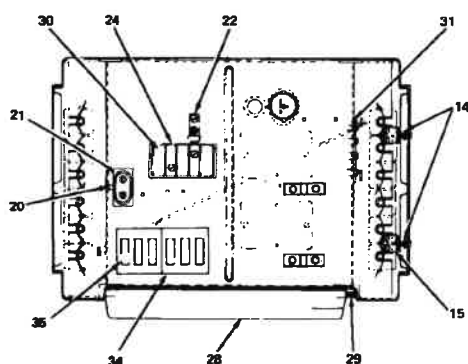
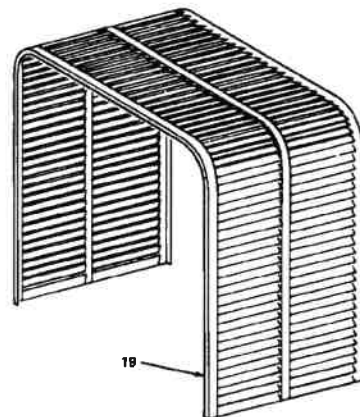




VISTA D-D
(MUH -25 HASTA MUH 50 SOLAMENTE)



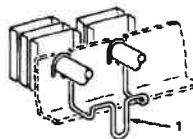
DOBLADOR TERMINAL
UTILIZAR SEGUN SE REQUIERA



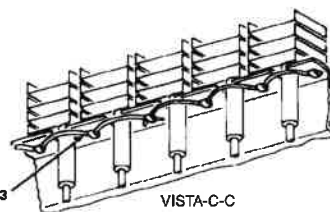
VISTA D-D
(MUH-07 HASTA MUH-20 SOLAMENTE)



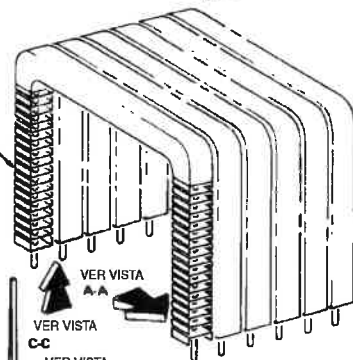
VISTA A-A



VISTA-B-B



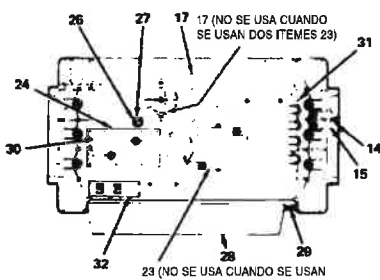
VISTA-C-C



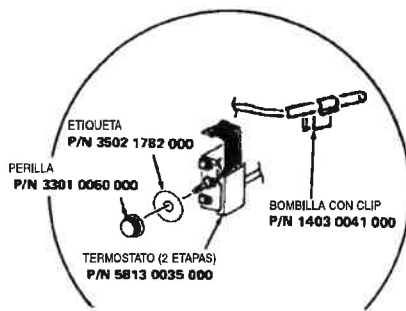
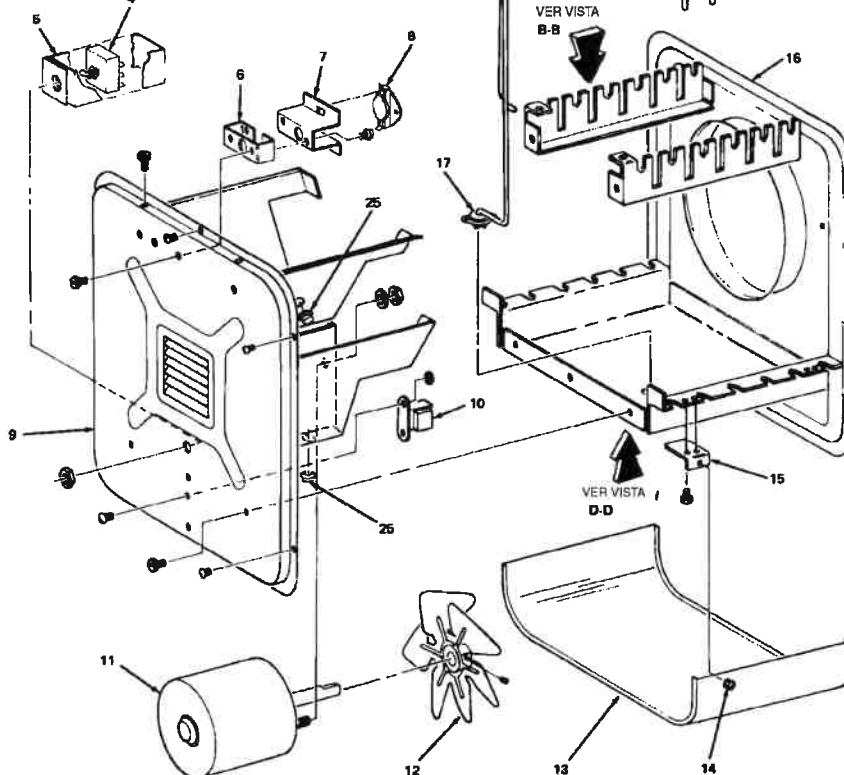
VER VISTA A-A

VER VISTA C-C

VER VISTA B-B



VISTA D-D
(MUH-03 HASTA MUH-05 SOLAMENTE)



ESTAS PIEZAS SE USAN EN
EL MODELO MUH05-21T SOLAMENTE

Nº de modelo	9	10	11	12	13	16	18	19	21
	Caja trasera	Transformador**	Motor	Paleta del ventilador	Cubierta	Caja delantera	Conj. elemento	Protector elemento	Capacitor
MUH03-21	1425-2004-000	—	3900-2002-006	1210-2000-000	1402-0336-001	1425-0009-005	1802-0087-000	2504-0011-000	—
MUH03-41	1425-2004-000	5814-0003-002	3900-2005-000	1210-2000-000	1402-0336-001	1425-0009-005	1802-0087-002	2504-0011-000	—
MUH03-71	1425-2004-000	—	3900-2002-007	1210-2000-000	1402-0336-001	1425-0009-005	1802-0087-001	2504-0011-000	—
MUH03-81	1425-2004-000	—	3900-2002-006	1210-2000-000	1402-0336-001	1425-0009-005	1802-0087-024	2504-0011-000	—
MUH05-21MG	1425-2004-000	—	3900-2002-006	1210-2000-000	1402-0336-001	1425-0009-005	1802-0087-003	2504-0011-000	—
MUH05-41	1425-2004-000	5814-0003-002	3900-2005-000	1210-2000-000	1402-0336-001	1425-0009-005	1802-0087-005	2504-0011-000	—
MUH05-71	1425-2004-000	—	3900-2002-007	1210-2000-000	1402-0336-001	1425-0009-005	1802-0087-004	2504-0011-000	—
MUH05-81MG	1425-2004-000	—	3900-2002-006	1210-2000-000	1402-0336-001	1425-0009-005	1802-0087-025	2504-0011-000	—
MUH-07-2	1425-0010-004	5814-0003-000	3900-2014-002	1210-0090-000	1402-0339-002	1425-0009-006	1802-0087-006	2504-0013-001	—
MUH-07-4	1425-0010-004	5814-0003-002	3900-0347-005	1210-0090-000	1402-0339-002	1425-0009-006	1802-0087-008	2504-0013-001	—
MUH-07-7	1425-0010-004	5814-0003-001	3900-2014-003	1210-0090-000	1402-0339-002	1425-0009-006	1802-0087-007	2504-0013-001	—
MUH-07-8	1425-0010-004	5814-0003-000	3900-2014-001	1210-0090-000	1402-0339-002	1425-0009-006	1802-0087-031	2504-0013-001	—
MUH-10-2	1425-0010-004	5814-0003-000	3900-2014-002	1210-0090-000	1402-0339-002	1425-0009-006	1802-0087-031	2504-0013-001	—
MUH-10-4	1425-0010-004	5814-0003-002	3900-0347-005	1210-0090-000	1402-0339-002	1425-0009-006	1802-0087-011	2504-0013-001	—
MUH-10-7	1425-0010-004	5814-0003-001	3900-2014-003	1210-0090-000	1402-0339-002	1425-0009-006	1802-0087-010	2504-0013-001	—
MUH-10-8	1425-0010-004	5814-0003-000	3900-2014-001	1210-0090-000	1402-0339-002	1425-0009-006	1802-0087-036	2504-0013-001	—
MUH-15-2	1425-0014-000	5814-0003-000	3900-0361-000	1210-0090-001	1402-0339-003	1425-0009-007	1802-0087-012	2504-0012-001	—
MUH-15-4	1425-0014-000	5814-0003-002	3900-0361-001	1210-0090-001	1402-0339-003	1425-0009-007	1802-0087-013	2504-0012-001	—
MUH-15-8	1425-0014-000	5814-0003-000	3900-0361-002	1210-0090-001	1402-0339-003	1425-0009-009	1802-0087-031	2504-0012-001	—
MUH-20-2	1425-0013-000	5814-0003-000	3900-0362-000	1210-0096-000	1402-0339-003	1425-0009-007	1802-0087-014	2504-0012-001	1432-0002-003
MUH-20-4	1425-0013-000	5814-0003-002	3900-0362-001	1210-0096-000	1402-0339-003	1425-0009-007	1802-0087-015	2504-0012-001	1432-0002-003
MUH-20-8	1425-0013-000	5814-0003-000	3900-0362-002	1210-0096-000	1402-0339-003	1425-0009-011	1802-0087-026	2504-0012-001	1432-0002-003
MUH-25-2	1425-0011-003	5814-0003-000	3900-0364-000	1210-0098-000	1402-0340-002	1425-0012-003	1802-0087-016	2504-0014-001	1432-0002-001
MUH-25-4	1425-0011-003	5814-0003-002	3900-0363-001	1210-0098-000	1402-0340-002	1425-0012-003	1802-0087-017	2504-0014-001	1432-0002-003
MUH-30-2	1425-0011-003	5814-0003-000	3900-0364-000	1210-0098-000	1402-0340-002	1425-0012-003	1802-0087-018	2504-0014-001	1432-0002-001
MUH-30-4	1425-0011-003	5814-0003-002	3900-0363-000	1210-0098-000	1402-0340-002	1425-0012-003	1802-0087-019	2504-0014-001	1432-0002-003
MUH-30-8	1425-0011-003	5814-0003-000	3900-0364-000	1210-0098-000	1402-0340-002	1425-0009-009	1802-0087-028	2504-0014-001	1432-0002-001
MUH-40-2	1425-0011-001	5814-0003-000	3900-0350-000	1210-0097-000	1402-0340-003	1425-0012-002	1802-0087-020	2504-0015-001	1432-0002-004
MUH-40-4	1425-0011-001	5814-0003-002	3900-0350-001	1210-0097-000	1402-0340-003	1425-0012-002	1802-0087-021	2504-0015-001	1432-0002-004
MUH-50-2	1425-0011-001	5814-0003-000	3900-0350-000	1210-0097-000	1402-0340-003	1425-0012-002	1802-0087-022	2504-0015-001	1432-0002-004
MUH-50-4	1425-0011-001	5814-0003-002	3900-0350-001	1210-0097-000	1402-0340-003	1425-0012-002	1802-0087-023	2504-0015-001	1432-0002-004
MUH-50-8	1425-0011-001	5814-0003-000	3900-0350-002	1210-0097-000	1402-0340-003	1425-0012-002	1802-0087-030	2504-0015-001	1432-0002-004

Nº de modelo	23	24	30	31	34	35
	Relé ***	Aislador	Regleta de terminales, alimentación	Regleta de terminales, control	Bloque de fusibles	Fusible
MUH03-21	—	—	5823-0004-000	5823-0001-000	—	—
MUH03-41	5018-0004-100	2900-0030-000	5823-0004-000	5823-0002-000	—	—
MUH03-71	—	2900-0030-000	5823-0004-000	5823-0001-000	—	—
MUH03-81	—	—	5823-0004-000	5823-0001-000	—	—
MUH05-21MG	5018-0003-002	—	5823-0004-000	5823-0002-000	—	—
MUH05-41	5018-0004-100	2900-0030-000	5823-0004-000	5823-0002-000	—	—
MUH05-71	—	2900-0030-000	5823-0004-000	5823-0001-000	—	—
MUH05-81MG	5018-0003-002	—	5823-0004-000	5823-0002-000	—	—
MUH-07-2	5018-0003-000	—	5823-0004-000	5823-0002-000	—	—
MUH-07-4	5018-0004-100	2900-0030-000	5823-0004-000	5823-0002-000	—	—
MUH-07-7	5018-0004-100	2900-0030-000	5823-0004-000	5823-0002-000	—	—
MUH-07-8	5018-0003-000	—	5823-0004-000	5823-0002-000	—	—
MUH-10-2	5018-0003-000	—	5823-0004-000	5823-0002-000	—	—
MUH-10-4	5018-0004-100	2900-0030-000	5823-0004-000	5823-0002-000	—	—
MUH-10-7	5018-0003-000	2900-0030-000	5823-0004-000	5823-0002-000	—	—
MUH-10-8	5018-0004-100	—	5823-0004-000	5823-0002-000	—	—
MUH-15-2	5018-0005-004	—	5823-0004-001	5823-0002-000	—	—
MUH-15-4	5018-0004-100	2900-0030-000	5823-0004-000	5823-0002-000	—	—
MUH-15-8	5018-0005-008	—	5823-0004-003	5823-0002-000	2025-0002-000	2019-0007-010
MUH-20-2	5018-0006-000	—	5823-0004-002	5823-0002-000	—	—
MUH-20-4	5018-0004-100	2900-0030-000	5823-0004-000	5823-0002-000	—	—
MUH-20-8	5018-0005-000	—	5823-0004-002	5823-0002-000	2025-0002-000	2019-0007-008
MUH-25-2	5018-0005-004	—	5823-0004-002	5823-0002-000	2025-7002-000	2019-7008-077
MUH-25-4	5018-0005-004	2900-0030-000	5823-0004-001	5823-0002-000	—	—
MUH-30-2	5018-0005-004	—	5823-0004-003	5823-0002-000	2025-7002-000	2019-7008-079
MUH-30-4	5018-0005-004	2900-0030-000	5823-0004-001	5823-0002-000	—	—
MUH-30-8	5018-0006-000	—	5823-0005-000	5823-0002-000	2025-7002-000	2019-7008-080
MUH-40-2	5018-0005-004	—	5823-0005-000	5823-0002-000	2025-7002-000	2019-7008-079
MUH-40-4	*	2900-0030-000	5823-0004-002	5823-0002-000	2025-7002-000	2019-7008-079
MUH-50-2	5018-0005-004	—	5823-0005-000	5823-0002-000	2025-7002-000	2019-7008-080
MUH-50-4	*	2900-0030-000	5823-0004-002	5823-0002-000	—	—
MUH-50-8	5018-0006-000	—	5823-0005-000	5823-0002-000	2025-7002-000	2019-7008-078

* Se utilizan dos relés: relé de 35A N/P 5018-0004-000 y relé de 40 A N/P 5018-0006-000.

** Se muestra secundario de 24V. Para secundario de 120V, aumentar el último dígito 3 veces (por ej., para secundario de 24V MUH03-41 utilizar 5814-0003-002; para secundario de 120V utilizar 5814-0003-005.)

***Se muestra H.C de 24V. Para H.C. de 120 aumentar el último dígito 1 vez. (por ej.; para MUH03-41, 24V H.C. de 24 V utilizar 5018-0004-000; para H.C. de 120V utilizar 5018-0004-001.)

GARANTÍA LIMITADA

Todos los productos fabricados por Marley Engineered Products están garantizados contra defectos de fabricación y de materiales por un año desde la fecha de instalación, a excepción de los elementos calefactores, que están garantizados contra defectos de fabricación y de materiales por cinco años desde la fecha de instalación. Esta garantía no se aplica a daños debidos a accidente, mal uso o alteración, ni a los casos en que la tensión eléctrica conectada supere a la tensión nominal -indicada en la placa de características- en más de 5 %, ni a equipos que hayan sido instalados o cableados incorrectamente, o mantenidos en forma que no cumpla lo indicado en las instrucciones de instalación del producto. Todo reclamo por trabajos en garantía debe acompañarse con una prueba de la fecha de instalación.

El cliente será responsable de todos los costos incurridos en el retiro o reinstalación de productos, incluyendo los costos de mano de obra y los costos de envío incurridos para regresar productos a un Centro de Servicio de Marley Engineered Products. Dentro de las limitaciones de esta garantía, las unidades que no funcionan deben regresarse al centro de servicio autorizado Marley más cercano, o al Centro de Servicio de Marley Engineered Products, y nosotros lo repararemos o reemplazaremos, a nuestra opción, sin cargo para usted, con el flete de retorno pagado por Marley. Se acuerda que tal reparación o reemplazo es el único recurso que Marley Engineered Products pone a su disposición.

LAS GARANTÍAS EXPUESTAS MÁS ARRIBA TOMAN EL LUGAR DE TODA OTRA GARANTÍA, EXPRESA O IMPLÍCITA, Y POR LA PRESENTE SE DECLINA Y EXCLUYE DE ESTE ACUERDO TODA GARANTÍA IMPLÍCITA DE COMERCIABILIDAD Y ADECUACIÓN A UN PROPÓSITO PARTICULAR QUE EXCEDA LAS GARANTÍAS EXPRESAS ANTEDICHAS. MARLEY ENGINEERED PRODUCTS NO SE HARÁ RESPONSABLE POR DAÑOS CONSIGUIENTES QUE SE PRODUZCAN CON RESPECTO AL PRODUCTO, EN BASE YA SEA A NEGLIGENCIA, AGRAVIO, RESPONSABILIDAD ESTRUCTA, O CONTRATO.

Algunos estados o jurisdicciones no permiten la exclusión o limitación de daños incidentales o consiguientes, de modo que la exclusión o limitación expresada más arriba puede no aplicarse a su caso. Esta garantía le da derechos legales específicos, y usted puede tener también otros derechos, que varían de un estado o jurisdicción a otro.

Para obtener la dirección de su centro de servicio autorizado más cercano comuníquese con Marley Engineered Products en Bennettsville, SC, Estados Unidos, llamando al 1-800-642-4328. Toda mercadería regresada a la fábrica debe ser acompañada por una autorización de retorno y una etiqueta de identificación de servicio, disponibles ambas en Marley Engineered Products. Cuando solicite la autorización de retorno, incluya todos los números de catálogo mostrados en los productos.

CÓMO OBTENER SERVICIO EN GARANTÍA, PIEZAS DE REPUESTO E INFORMACIÓN GENERAL

- | | |
|--|---|
| 1. Servicio o repuestos en garantía | 1-800-642-4328 |
| 2. Compra de repuestos | 1-800-654-3545 |
| 3. Información general sobre productos | www.marleymep.com |

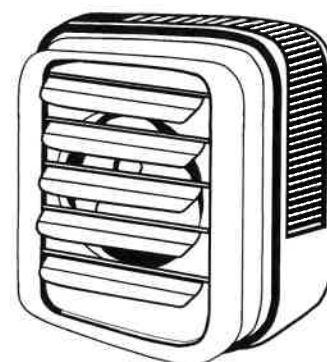
Nota: cuando solicite servicio, siempre dé la información que sigue:

1. Número de modelo del producto
2. Fecha de fabricación
3. Número de parte o descripción



Marley®
Engineered Products

470 Beauty Spot Rd. East
Bennettsville, SC 29512 USA



Séries MUHA

Radiateurs modulaires



Instructions d'installation, d'utilisation et d'entretien

Spécifications

N° de modèle de base	Hauteur pouces (mm)	Largeur pouces (mm)	Profondeur pouces (mm)	Poids de montage Lbs. (Kg)	Volume du compartiment de câblage
MUH0381	16 (406.4)	14 (355.6)	7 1/2 (190.5)	27 (12.2)	90 po³ (14.70 cm³)
MUH0321				27 (12.2)	
MUH0371				27 (12.2)	
MUH0341				30 (13.6)	
MUH0581				27 (12.2)	
MUH0521				27 (12.2)	
MUH0571				27 (12.2)	
MUH0541				30 (13.6)	
MUH0331				30 (13.6)	
MUH0361				30 (13.6)	
MUH0531				30 (13.6)	
MUH0561				30 (13.6)	
MUH078	21 1/4 (552.5)	19 (482.6)	7 1/2 (190.5)	38 (17.2)	100 po³ (1639 cm³)
MUH072				38 (17.2)	
MUH077				38 (17.2)	
MUH074				38 (17.2)	
MUH108				38 (17.2)	
MUH102				38 (17.2)	
MUH107				38 (17.2)	
MUH104				38 (17.2)	
MUH073				38 (17.2)	
MUH076				38 (17.2)	
MUH103				38 (17.2)	
MUH106				38 (17.2)	

N° de modèle de base	Hauteur pouces (mm)	Largeur pouces (mm)	Profondeur pouces (mm)	Poids de montage Lbs. (Kg)	Volume du compartiment de câblage
MUH158	21 1/4 (552.5)	19 (482.6)	12 3/4 (323.9)	54 (24.5)	140 po³ (2295 cm³)
MUH152				50 (22.7)	
MUH154				50 (22.7)	
MUH208				60 (27.2)	
MUH202				55 (24.9)	
MUH204				55 (24.9)	
MUH156				55 (24.9)	
MUH206				55 (24.9)	
MUH252	30 (76.2)	26 5/8 (676.4)	11 3/4 (298.5)	89 (40.4)	504 po³ (8260 cm³)
MUH254				89 (40.4)	
MUH308				89 (40.4)	
MUH302				89 (40.4)	
MUH304				89 (40.4)	
MUH256				89 (40.4)	
MUH306				89 (40.4)	
MUH402	30 (76.2)	26 5/8 (676.4)	17 1/4 (435.1)	119 (54.0)	648 po³ (10620 cm³)
MUH404				119 (54.0)	
MUH508				119 (54.0)	
MUH502				119 (54.0)	
MUH504				119 (54.0)	
MUH406				119 (54.0)	
MUH506				119 (54.0)	

INSTRUCTIONS IMPORTANTES



AVERTISSEMENT



LORS DE L'UTILISATION D'APPAREILS ÉLECTRIQUES, DES PRÉCAUTIONS DE BASE DOIVENT TOUJOURS ÊTRE SUIVIES AFIN DE RÉDUIRE LE RISQUE DE DÉPART D'INCENDIE, DE COMMOTION ÉLECTRIQUE ET DE BLESSURES AUX PERSONNES, INCLUANT CELLES QUI SUIVENT :

1. Lisez toutes les instructions avant d'installer ou d'utiliser le radiateur.
2. Ce radiateur est un produit commercial/industriel, non prévu pour une utilisation en résidentiel.
3. Ce radiateur est chaud quand il est en fonctionnement. Pour éviter des brûlures, ne laissez pas de peau nue toucher ses surfaces chaudes. Maintenez les matières combustibles comme le mobilier, les oreillers, la literie, les papiers, les vêtements et les couvertures, à au moins 3 pieds (90 cm) de distance de l'avant du radiateur.
4. Il faut faire très attention quand un radiateur quelconque est utilisé par des enfants ou des personnes invalides ou près d'eux, et à chaque fois que le radiateur est laissé en marche sans surveillance.
5. Ce radiateur comporte des pièces intérieures brûlantes qui génèrent des arcs ou des étincelles électriques, il ne doit pas être utilisé dans des atmosphères dangereuses, où sont entreposés ou utilisés des vapeurs ou liquides inflammables, ou d'autres combustibles tels que définis par NEC (norme électrique américaine). La non-observation de cette consigne peut entraîner explosion ou départ d'incendie.
6. N'utilisez plus un radiateur s'il a présenté des dysfonctionnements.

Débranchez son alimentation au panneau de distribution du secteur et faites-le inspecter par un bon électricien avant de le réutiliser.

7. Ne l'utilisez pas à l'extérieur.
8. Pour déconnecter le radiateur, passez sa commande sur arrêt (Off) et coupez le secteur en amont au panneau de distribution.
9. N'insérez pas d'objets étrangers, et ne permettez pas qu'il en entre, dans toute ouverture d'admission ou d'évacuation, car cela peut causer une commotion électrique ou un départ d'incendie, ou endommager le radiateur.
10. Pour éviter un possible départ d'incendie, n'obstruez en aucune façon les admissions et les échappements d'air.
11. N'utilisez ce radiateur que comme c'est décrit dans ce manuel. Tout autre type d'utilisation qui n'est pas recommandé par le constructeur peut provoquer un départ d'incendie.
12. Ce radiateur n'est pas prévu pour une utilisation dans des environnements spéciaux. Ne l'utilisez pas dans des lieux humides ou mouillés, tels que dans un contexte marin ou une serre, ou dans des endroits où il y a présence d'agents corrosifs ou chimiques.
13. Lors de l'installation, voyez les INSTRUCTIONS D'INSTALLATION pour des mises en gardes et précautions supplémentaires.
14. Pour un fonctionnement sûr et efficace, et pour prolonger sa durée de service, gardez votre radiateur propre – Voyez les INSTRUCTIONS D'ENTRETIEN.

CONSERVEZ CES INSTRUCTIONS

INSTRUCTIONS D'INSTALLATION



AVERTISSEMENT



Pour éviter un possible départ d'incendie, des blessures corporelles ou des dommages au radiateur, respectez ces consignes :

1. Débranchez toute alimentation secteur arrivant au panneau de service principal avant de câbler ou d'intervenir pour du service.

Remarque importante : Ce radiateur doit être installé par une personne qualifiée.

2. Toutes les procédures de câblage et les raccordements doivent être en conformité avec les normes nationales et locales applicables, et le radiateur doit être relié à la terre.
3. Vérifiez que la tension du secteur arrivant au radiateur correspond bien aux valeurs spécifiées sur sa plaque signalétique.

ATTENTION: ALIMENTER LE RADIATEUR AVEC UNE TENSION DÉPASSANT LA VALEUR IMPRIMÉE SUR LA PLAQUE SIGNALÉTIQUE ENDOMMAGERA LE RADIATEUR ET ANNULERA SA GARANTIE, ET CELA PEUT PROVOQUER UN DÉPART D'INCENDIE.

4. Pour réduire le risque de départ d'incendie, n'entreposez pas et n'utilisez pas d'essence ou d'autres produits inflammables sous

forme de liquide ou de vapeurs à proximité du radiateur.

5. La structure de montage au plafond ou au mur et les dispositions d'ancrage doivent avoir une résistance suffisante pour supporter le poids du radiateur et de son support de montage.
6. Tous les thermostats sont intégrés : Si le radiateur est utilisé pour éviter le gel de tuyauteries ou de liquides, et que le thermostat est réglé en dessous de 45°F (7 °C) le ventilateur doit tourner continuellement.
7. Le radiateur peut être monté à au moins 7' (213,4 cm) au-dessus du sol, pour éviter un contact accidentel avec la pale de ventilateur qui pourrait causer une blessure.
8. Gardez au moins 5' (152 cm) d'espacement sur l'avant du radiateur. Référez-vous au Tableau 1 pour les besoins en espacement sur les côtés, en haut et en bas.
9. Ne montez pas de thermostat de type au mercure directement sur le radiateur. La vibration pourrait causer un dysfonctionnement du radiateur.

Instructions de localisation du radiateur

Disposez les radiateurs de façon à ce que leur flux d'air envoyé :

- a. soit soumis à un minimum d'interférence venant de colonnes, machines ou cloisons
- b. passe sur les murs exposés sans souffler directement dessus
- c. ne soit pas dirigé vers des occupants de la pièce en chauffage de confort
- d. soit dirigé le long du côté face au vent quand l'installation est dans un bâtiment soumis à un vent dominant

Placez les thermostats à environ 5' (152,4 cm) au-dessus du sol sur des cloisons de séparation intérieures ou des poteaux, à l'écart des courants d'air froids, des sources de chaleur intérieures et à distance des évacuations d'air des radiateurs.

Des petites pièces peuvent être réchauffées avec un seul radiateur. Des pièces plus grandes nécessitent l'installation de plusieurs radiateurs. Le nombre et la capacité des radiateurs sont à déterminer en fonction du volume de bâtiment et de la surface en mètres carrés des zones à réchauffer. Disposez les radiateurs pour fournir une ventilation du périmètre, chaque radiateur renforçant le flux d'air du précédent.

Montage de radiateurs, généralités

Le radiateur peut être installé pour envoyer de l'air chaud soit horizontalement soit verticalement. Quand il est monté pour envoi verticalement, il est recommandé de le positionner de façon à ce que la porte d'accès s'ouvre en s'écartant du mur afin de donner plus de place pour entrer dans le compartiment de câblage et de contrôles. Si le radiateur doit être monté avec sa porte d'accès en face d'un mur, il faut le monter suffisamment loin de ce mur pour permettre une ouverture complète de la porte d'accès (à une distance approximativement égale à la largeur du radiateur, vérifiez l'écartement avant l'installation). Référez-vous au Tableau 1 pour les écartements par rapport aux murs ou plafond avant de monter le radiateur.

Le radiateur peut être monté pour distribution verticale ou horizontale en utilisant des tiges filetées (Référez-vous au Tableau 2 pour les tailles de tiges filetées nécessaires). Suivez les procédures détaillées dans les instructions d'installation ci-dessous.

Le radiateur peut aussi être suspendu depuis le mur ou le plafond au moyen d'un support de montage optionnel (type MMB ou MCMB) qui permet un pivotement horizontal du radiateur.

Une fois le radiateur installé, les volets peuvent être positionnés pour diriger l'air chauffé dans la direction voulue. Quand le radiateur est installé pour une évacuation horizontale, les volets doivent envoyer l'air soit droit devant soit vers le bas. Le fait de diriger l'air vers le haut ferait rester l'air chaud dans la zone du plafond, et ce serait un gaspillage d'énergie.

Tableau 1. Écartement par rapport aux murs et au plafond en pouces (mm)

Puissance	Distrib.	Plafond	Mur latéral	Mur arrière
3 et 5 kW	Horiz.	2 (50.8)	6 (152.4)	9 (228.6)
	Vert.	6 (152.4)	18 (457.2)	18 (457.2)
7.5 à 10 kW	Horiz.	6 (152.4)	6 (152.4)	13 (330.2)
	Vert.	6 (152.4)	24 (609.6)	24 (609.6)
15 à 10 kW	Horiz.	6 (152.4)	9 (228.6)	12 1/2 (317.5)
	Vert.	6 (152.4)	24 (609.6)	24 (609.6)
25 à 50 kW	Horiz.	16 (406.4)	12 (304.8)	18 1/2 (470.0)
	Vert.	12 (304.8)	39 (914.4)	39 (914.4)

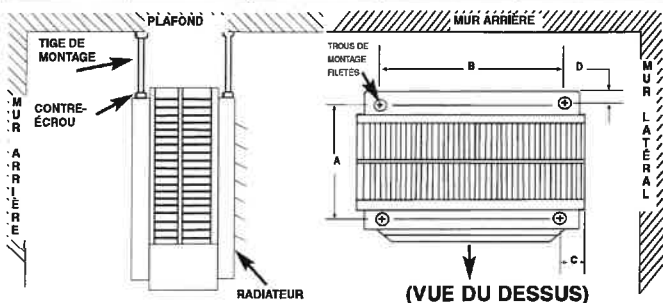


Figure 1. Montage à distribution horizontale et espacement.

Table 2. Type de tige filetée et dimensions d'espacement, en pouces (mm) pour envoi horizontal

Puissance	Type de tige	A	B	C	D
3 - 5 kW	5/16 - 18	6 1/16 (153.9)	6 (152.4)	4 1/16 (103.1)	3/4 (19.0)
7.5 - 10 kW			8 7/8 (225.6)	5 1/8 (130.3)	3/4 (19.0)
15 - 20 kW		11 3/8 (289.0)			
25 - 30 kW	3/8 - 16	10 9/16 (268.2)	14 - 12 (368.3)	6 3/16 (157.2)	5/8 (16.0)
40 - 50 kW		15 15/16 (404.9)	14 - 12 (368.3)	6 3/16 (157.2)	5/8 (16.0)

Distribution horizontale (montage sur tige depuis le plafond)

1. Installez quatre tiges de montage filetées dans les trous filetés et fixez en place en utilisant des contre-écrous (Voir le Tableau 2).
2. Fixez bien les quatre tiges de montage au plafond (Référez-vous au Tableau 1 pour les espacements par rapport au mur et au plafond, et au Tableau 2 pour l'écartement des tiges de montage).

Table 3. Type de tige filetée et dimensions d'espacement, en pouces (mm) pour distribution verticale

Puissance	Type de tige	E	F	G	H
3 - 5 kW	5/16 - 18	6 (152.4)	9 3/4 (247.7)	2 (50.8)	4 1/16 (103.1)
7.5 - 20 kW		8 7/8 (225.6)	14 5/8 (371.6)	2 (50.8)	5 1/8 (130.3)
25 - 30 kW	3/8 - 16	14 1/2 (368.3)	21 1/4 (539.8)	2 9/16 (56.0)	6 3/16 (157.2)

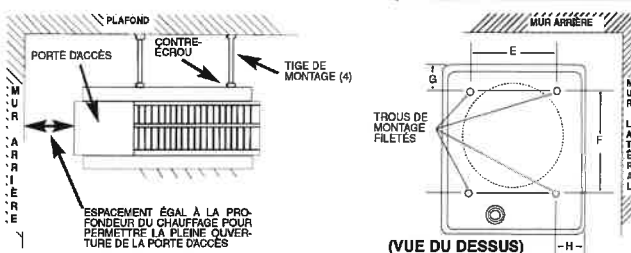


Figure 2. Montage à distribution verticale et espacement.

Distribution verticale (montage sur tige depuis le plafond)

1. Enlevez les boulons des trous filetés à l'arrière du radiateur.
2. Installez quatre tiges de montage filetées dans les trous filetés et fixez en place en utilisant des contre-écrous.
3. Fixez bien les quatre tiges de montage au plafond (Référez-vous au Tableau 1 pour les espacements par rapport au mur et au plafond, et au Tableau 3 pour l'écartement des tiges de montage).

Circuit d'alimentation (secteur)

1. Ne branchez le radiateur que sur un secteur conforme (tension/ampérage/fréquence) à la spécification de la plaque signalétique.
2. Le câblage sur site doit être correctement dimensionné pour supporter l'ampérage conformément à NEC.
3. La porte d'accès est à charnière. Il y a une ou deux vis accessibles depuis le dessous qu'il faut desserrer pour obtenir l'accès. Ce sont des vis de type imperdable, donc n'essayez pas de les enlever.
4. Une pastille à enfoncer est fournie au dos du radiateur près du bornier d'alimentation et près du connecteur de la carte de contrôle. Le passage près de la carte de contrôle peut recevoir un conduit de 1/2" (12,7 mm). Celui près du bornier d'alimentation a plusieurs diamètres possibles. Utilisez le diamètre à enfoncer qui correspond à votre taille de conduit d'arrivée secteur.
5. Une borne de raccordement de terre est fournie près de l'emplacement d'arrivée du secteur. Le fil d'arrivée de terre doit y être connecté avant d'effectuer toute autre connexion.
6. La carte de terminaison d'alimentation est équipée d'une boîte à bornes de taille à accepter le bon calibre de fils d'arrivée du secteur. Du fil prévu pour supporter 600 V et 60°C est adéquat pour le circuit d'alimentation secteur du radiateur. La composition des fils vers le radiateur peut être en aluminium ou en cuivre jusqu'au bornier. Du fil en cuivre est cependant recommandé et doit être utilisé pour le commutateur de coupure intégré.
7. Chaque radiateur possède un schéma de câblage sur l'intérieur de sa porte d'accès. Consultez ce schéma avant de réaliser de quelconques connexions sur le site.

Note importante – Couple des bornes à vis d'installation:

Durant le transport il est possible que les connexions par bornes à vis se soient desserrées. Après l'installation, avant de mettre sous tension l'appareil de chauffage, vérifiez toutes les connexions par borne à vis, leur serrage doit être à un couple d'au moins 35 in-lbs. (3,9 N-m).

8. Des connexions en secteur monophasé ou triphasé peuvent être utilisées avec les radiateurs de modèles MUH0521, MUH0581, MUH072, MUH078, MUH102, MUH108 et MUH158. Ces appareils sont câblés en usine pour un raccordement sur du secteur monophasé. Si ces radiateurs doivent être alimentés en secteur triphasé, reconnectez les fils comme c'est indiqué au schéma de câblage fixé sur le radiateur. Des informations supplémentaires peuvent être trouvées en examinant les illustrations de câblage données aux Figures 3a et 3b et en suivant les instructions données ci-dessous.

Sur les modèles MUH0521, MUH0581, MUH072, MUH078, MUH102 et MUH108 (Figure 3a), ne déplacez que les deux fils marqués "A1" et "B1"; ne déplacez ou ne modifiez aucun autre câblage. Le fil d'alimentation d'éléments chauffants marqué "B1" qui est connecté en usine au bornier d'alimentation (au plus près des éléments) doit être déplacé à la borne "B" sur le bornier du triphasé.

Le fil d'alimentation de relais (contacteur) "A1" doit être déplacé de sa connexion sur le bornier (borne la plus proche du contacteur ou du connecteur de carte de contrôle) vers la borne "A" sur le bloc de terminaison le plus bas (au centre).

Le modèle MUH158 (Figure 3b) possède des bornes pour triphasé située près des relais (contacteurs). Ne déplacez que les deux fils marqués "C1" et "D1" de chacun de ces deux bornier pour triphasé sur la borne "B". Ne déplacez ou ne modifiez aucun autre câblage.

9. Des accessoires électriques, soit en kits ou en options installées en usine, ont leur connexion indiquée en lignes pointillées sur le schéma de câblage du radiateur.

10. Radiateur en 208/240 volts : Les radiateurs sont câblés en usine pour du secteur 240 V. Quand un tel radiateur doit être alimenté en 208 V, les fils du transformateur DOIVENT être permutés. Pour des appareils de puissance 30/40 kW ou plus, permutez les fils de primaire ORANGE et ROUGE. Le fil NOIR est pour le COMMUN du transformateur (50 VA) fourni sur les radiateurs de forte puissance. Pour les radiateurs de puissance moindre, permutez les fils de primaire NOIR et ROUGE. Le fil de BLANC est pour le COMMUN du transformateur fourni avec ces radiateurs. Référez-vous toujours au schéma de câblage sur l'intérieur de porte du radiateur avant d'effectuer ces changements de connexion au primaire du transformateur.

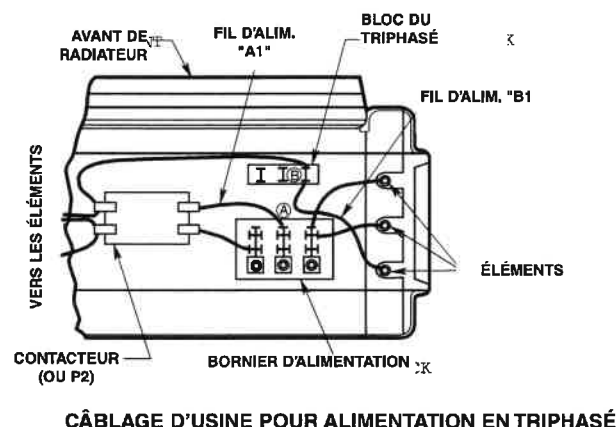
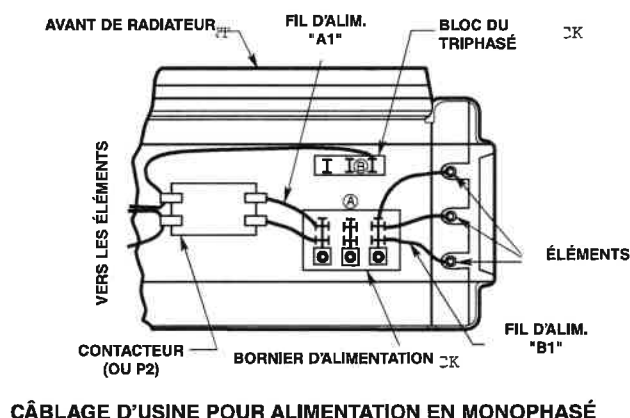


Figure 3a. Raccordements d'alimentation pour du secteur monophasé et triphasé MUH0521, MUH0581, MUH072, MUH078, MUH102 et MUH108)

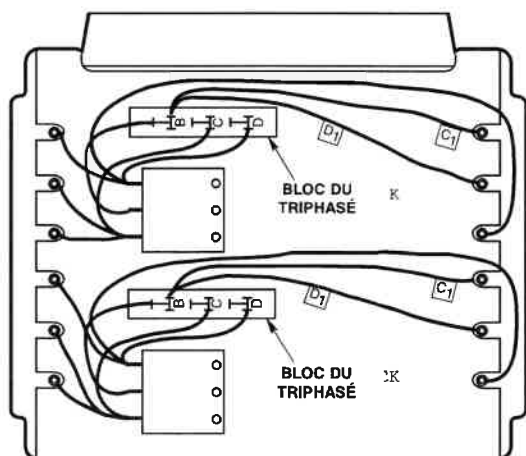
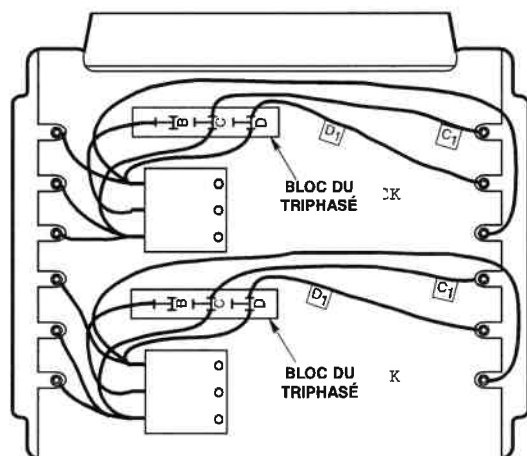


Figure 3b. Raccordements d'alimentation pour du secteur monophasé et triphasé (MUH158)

Câblage de contrôle

⚠ AVERTISSEMENT ⚠

LA TENSION SECTEUR EST PRÉSENTE SUR CERTAINES BORNES DE LA CARTE DE TERMINAISON DES CONTRÔLES. COUPEZ TOUJOURS L'ALIMENTATION SECTEUR EN AMONT DU RADIATEUR AVANT DE RÉALISER N'IMPORTE QUELLES CONNEXIONS À LA CARTE DE CONTRÔLE AFIN D'ÉVITER UNE POSSIBLE COMMOTION ÉLECTRIQUE.

1. Utilisez du fil isolé Classe 1 de NEC, supportant 600 V, pour tout câblage du circuit de contrôle.
2. Utilisez une cosse sertie en fourche sur les extrémités de fil pour réaliser la connexion à la carte de contrôle si plus d'un fil doit arriver sous la vis de terminaison.
3. Sur les radiateurs non fournis avec un contacteur interne (3 et 5 kW), référez-vous à la Figure 4 comme schéma de câblage.

REMARQUE : Le câblage de thermostat et de circuit de contrôle doit être prévu pour supporter la pleine charge du radiateur (par exemple un MUH0581 est spécifié pour 24 ampères).

4. Sur les radiateurs fournis avec un contacteur interne (7 et plus), référez-vous à la Figure 5 comme schéma de câblage. Le câblage pour le contrôle doit au moins être de calibre 18 AWG.

INSTRUCTIONS D'UTILISATION

1. Le radiateur doit être correctement installé avant d'être mis en marche.
2. Mettez le radiateur en marche (ON) au panneau de contrôle principal.
3. Là où c'est applicable, référez-vous aux instructions d'accessoires de contrôle en ce qui concerne le bon fonctionnement des accessoires ou contrôles utilisés avec le radiateur.

Comment restaurer la commande de sécurité sur dépassement de température : (Option installée en usine uniquement)

Le commutateur sur dépassement de limite est situé à l'intérieur vers l'arrière du radiateur.

Sur les modèles de 3 et 5 kW, l'accès au bouton de restauration est du côté droit (en regardant l'arrière du radiateur). Sur les autres modèles ce bouton est près du haut arrière du radiateur.

Cette commande de restauration manuelle après dépassement de limite est en série avec le protecteur de recyclage automatique (limite). La commande de restauration manuelle après dépassement de limite ne fonctionnera pas avant que le radiateur ne se soit refroidi, avec un appui sur le bouton.

⚠ AVERTISSEMENT ⚠

NE TOUCHEZ PAS ET NE CONTOURNEZ PAS LES LIMITES DE SÉCURITÉ À L'INTÉRIEUR DU RADIATEUR

ATTENTION ⚠

NE CONTINUEZ PAS D'ESSAYER D'UTILISER LE RADIATEUR SI SON CONTRÔLE DE SÉCURITÉ SE DÉCLENCHE À RÉPÉTITION APRÈS SA RESTAURATION. EN LE FAISANT VOUS POURRIEZ L'ENDOMMAGER DE FAÇON IRRÉMÉDIABLE OU CAUSER UN DÉPART D'INCENDIE OU DES RISQUES POUR LA SÉCURITÉ.

Il est important de garder propre le radiateur. Votre radiateur vous fournira des années de bon service et de confort avec juste un minimum de soins. Pour assurer son fonctionnement efficace, suivez les instructions simples ci-dessous.

⚠ AVERTISSEMENT ⚠

TOUTE INTERVENTION DE SERVICE AU-DELÀ D'UN SIMPLE NETTOYAGE, QUI NÉCESSITE UN DÉMONTAGE, DEVRA ÊTRE RÉALISÉE PAR DU PERSONNEL DE SERVICE QUALIFIÉ.

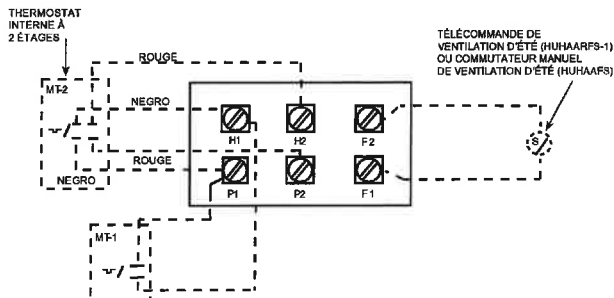


Figure 4. Carte de terminaison de commandes (pour radiateurs sans contacteur)

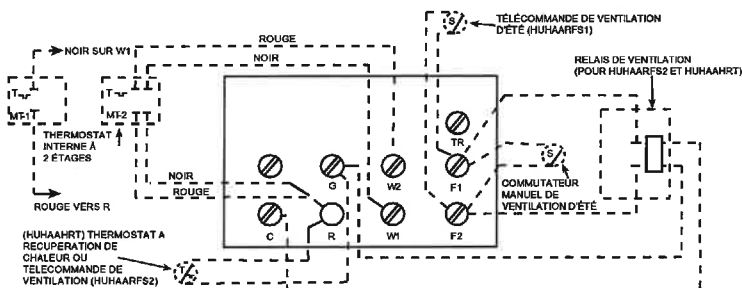


Figure 5. Carte de terminaison de commandes (pour radiateurs avec contacteur)

NOTES :

1. TYPE DE CARTE DE RACCORDEMENT UTILISÉ AVEC LES MODÈLES MUH0321, MUH0371, MUH0381, MUH0521, MUH0571, ET MUH0581.
2. QUAND LE RADIATEUR EST CÂBLÉ POUR DU MONOPHASÉ, RELIEZ H1 ET H2. SI UN THERMOSTAT UNIPOLAIRE EST UTILISÉ SUR UN RADIATEUR EN MONOPHASÉ, BRANCHEZ SES FILS SUR P1 ET H1.
3. DES THERMOSTATS ALIMENTÉS PAR TENSION EXTÉRIEURE SONT À CONSIDÉRER COMME À UN SEUL ÉTAGE.

NOTES :

1. TYPE DE CARTE DE RACCORDEMENT UTILISÉ AVEC LES MODÈLES MUH0321, MUH0371, MUH0381, MUH0521, MUH0571 ET MUH0581.
2. ÔTEZ LE CAVALIER ENTRE W1 ET W2 QUAND UN THERMOSTAT À 2 ÉTAGES EST UTILISÉ.
3. *SEULEMENT UN DE CES ACCESSOIRES PEUT ÊTRE INSTALLÉ SUR UN MÊME RADIATEUR.
4. DES THERMOSTATS ALIMENTÉS PAR TENSION EXTÉRIEURE SONT À CONSIDÉRER COMME À UN SEUL ÉTAGE.

⚠ AVERTISSEMENT ⚠

POUR RÉDUIRE LE RISQUE DE DÉPART D'INCENDIE ET DE COMMOTION ÉLECTRIQUE OU DE BLESSURE, DÉBRANCHEZ TOUTE ALIMENTATION ÉLECTRIQUE ALLANT AU RADIATEUR EN AMONT AU PANNEAU DE SERVICE, ET VÉRIFIEZ QUE L'ÉLÉMENT DE CHAUFFE EST FROID AVANT D'INTERVENIR POUR DU SERVICE OU DE L'ENTRETIEN.

Instructions de nettoyage par l'utilisateur :

1. Une fois que le radiateur est froid, vous pouvez utiliser un aspirateur avec son accessoire brosse pour éliminer la poussière et les peluches des surfaces extérieures du radiateur, y compris les ouvertures de la grille.
2. Avec un chiffon humide, enlevez toute poussière et peluche de la grille et des surfaces extérieures.
3. Remettez le radiateur sous tension et vérifiez son bon fonctionnement.

Instructions de nettoyage d'entretien :

(Ne doit être exécuté que par du personnel de service qualifié)

Au moins une fois par an le radiateur doit être nettoyé et vérifié par une personne de service qualifiée afin d'assurer un fonctionnement sûr et efficace. Cela doit inclure si nécessaire l'aspiration des poussières et débris des éléments et du ventilateur, et un contrôle du bon serrage de tous les raccords par cosses, avec un couple recommandé de 35 in-lbs. (3,9 N-m). Une fois le nettoyage et le service terminés, le radiateur doit être complètement remonté et son bon fonctionnement vérifié.

INSTRUCTIONS D'ENTRETIEN

Il est important de garder propre le radiateur. Votre radiateur vous fournira des années de bon service et de confort avec juste un minimum de soins. Pour assurer son fonctionnement efficace, suivez les instructions simples ci-dessous :

⚠ AVERTISSEMENT ⚠

TOUTE INTERVENTION DE SERVICE AU-DELÀ D'UN SIMPLE NETTOYAGE, QUI NÉCESSITE UN DÉMONTAGE, DEVRA ÊTRE RÉALISÉE PAR DU PERSONNEL DE SERVICE QUALIFIÉ.

⚠ AVERTISSEMENT ⚠

POUR RÉDUIRE LE RISQUE DE DÉPART D'INCENDIE ET DE COMMOTION ÉLECTRIQUE OU DE BLESSURE, DÉBRANCHEZ TOUTE ALIMENTATION ÉLECTRIQUE ALLANT AU RADIATEUR EN AMONT AU PANNEAU DE SERVICE, ET VÉRIFIEZ QUE L'ÉLÉMENT DE CHAUFFE EST FROID AVANT D'INTERVENIR POUR DU SERVICE OU DE L'ENTRETIEN.

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2. Avec un chiffon humide, enlevez toute poussière et peluche de la grille et des surfaces extérieures.
3. Remettez le radiateur sous tension et vérifiez son bon fonctionnement.

Instructions de nettoyage d'entretien :

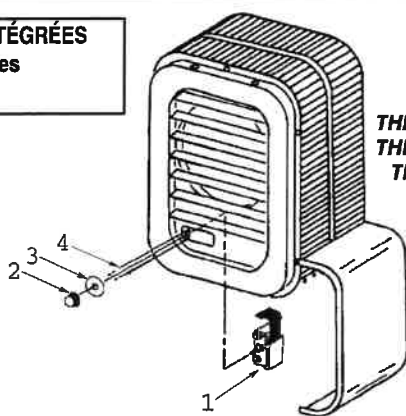
(Ne doit être exécuté que par du personnel de service qualifié)

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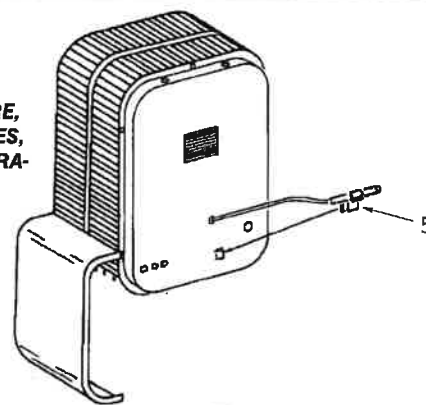
MUH Commandes intégrées

N° Réf.	Description	N° de pièce
1	Thermostat monopolaire (MT-1)	5813-0036-000
	Thermostat bipolaire (MT-2)	5813-0035-000
2	Bouton de thermostat	3301-0060-000
3	Étiquette de thermostat	3502-1781-000
4	Vis tête plate 6-32x1/4"	5202-7009-021
5	Attache de thermostat	1403-0041-000
6	Contacteur 25 A, OEM	5216-0132-000
	Contacteur 25 A, K & N	5216-0204-000
	Contacteur 63 A, OEM	5216-0131-000
	Contacteur 63 A, K & N	5216-0203-000
	Contacteur 25 A, Electro	5216-0200-000
7	Vis M4 x 10 tête ronde (25 A)	—
	Vis M5 x 16 tête ronde (63 A)	—
8	Bouton, 25 A OEM "T1"	OEM "T1"
	Bouton 25 A K&N	K & N S1B 6001
	Bouton 63 A OEM	OEM "S4"
	Bouton 63 A K & N	K & N S2B G001
	Bouton 25 A Electro	EI 141747
9	Commutateur à bascule 600 V	5216-0130-000
10	Relais, ventilateur, bobine en 24 V	5018-0008-000
11	Ensemble de commutateur	5216-0199-000
12	Limite de restauration manuelle	4520-0012-000

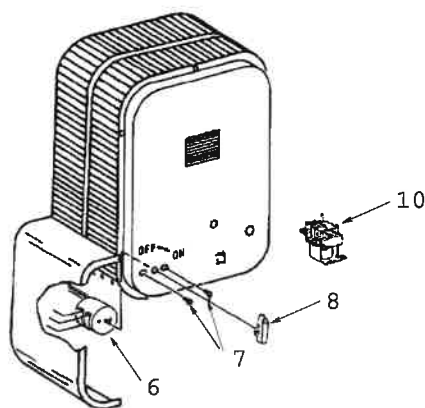
COMMANDES INTÉGRÉES Unités sur mesures uniquement



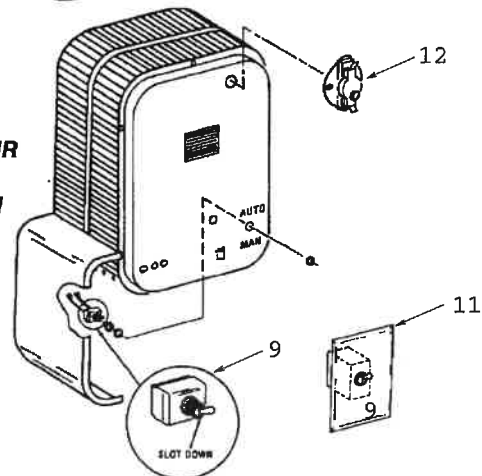
**THERMOSTAT MONOPOLAIRE,
THERMOSTAT À DEUX ÉTAGES,
THERMOSTAT DE RÉCUPÉ-
RATION DE CHALEUR**



INTERRUPTEUR DU SECTEUR

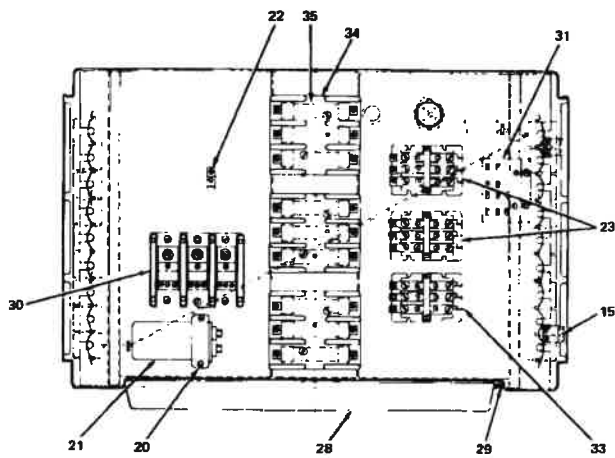


INTERRUPTEUR DE VENTILATION D'ÉTÉ

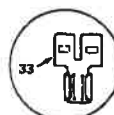


Pièces de rechange de chauffage

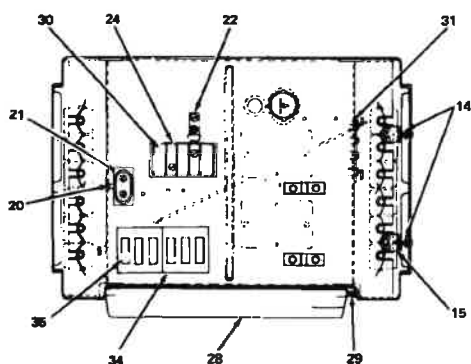
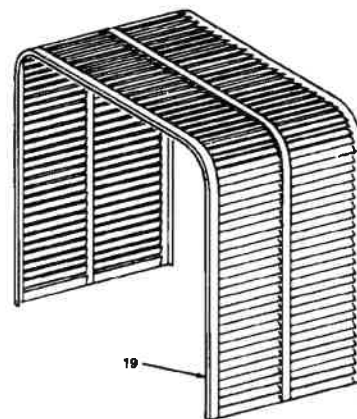
N° Réf.	Description	N° de pièce
1	Élément ressort (sur MUH-03 à MUH-20 seulement)	5208-0073-000
	Élément ressort (sur MUH-25 à MUH-50 seulement)	5208-0073-001
2	Ressort, tube capillaire	5208-0072-000
3	Élément de retenue ressort	5208-0074-000
4	Commutateur (sur MUH-25 à MUH-50 seulement)	5216-7076-001
5	Isolateur (sur MUH-25 à MUH-50 seulement)	2900-0031-000
6	Support prolongé (sur MUH-15, MUH-20, MUH-40 et MUH-50 seulement)	1215-0282-000
7	Commutateur le support	1215-0256-000
8	Retard ventilation	4520-0010-000
14	Écrou de vitesse	4100-7036-026
15	Support, vis captive (sur MUH-03 à MUH-20 seulement)	1215-0291-000
	Support, vis captive (sur MUH-25 à MUH-50 seulement)	1215-0289-000
17	Protecteur fin de course (sur MUH-03 à MUH-05 seulement)	4520-0011-000
	Protecteur fin de course (sur MUH-07 à MUH-20 seulement)	4520-0011-001
	Protecteur fin de course (sur MUH-25 à MUH-50 seulement)	4520-0011-002
20	Fixation (sur MUH-25 à MUH-50 seulement)	1417-5004-000
	Support, condensateur (sur MUH-20-8 seulement)	1215-0314-000
22	Cosse à borne (sur MUH-07 à MUH-50 seulement)	3504-7002-001
25	Bague (sur MUH-20 à MUH-50 seulement)	25221-60131
26	Rondelle de terre (sur MUH-03 à MUH-05 seulement)	6401-0084-000
27	Vis de terre (sur MUH-03 à MUH-05 seulement)	5202-0290-002
28	Grille d'air (sur MUH-03 à MUH-05 seulement)	3503-0036-000
	Grille d'air (sur MUH-07 à MUH-20 seulement)	3503-0036-001
	Grille d'air (sur MUH-25 à MUH-50 seulement)	3503-0036-002
29	Ressort de grille d'air	5208-7005-001
32	Bornier triphasé (sur MUH-05-21, MUH-07-2 et MUH-10-2 seulement)	5823-0003-000
	Bornier triphasé (sur MUH-05-81, MUH-07-8 et MUH-15-8 seulement)	5823-0003-000
33	Doubleurs de bornes (selon le besoin)	5819-7012-005



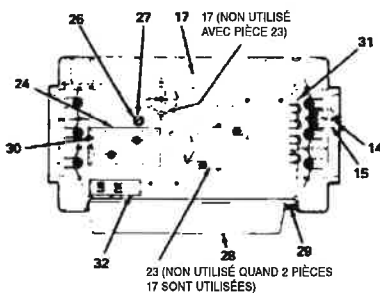
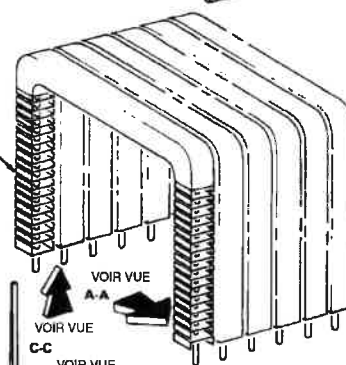
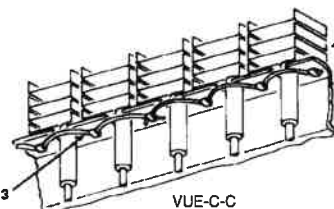
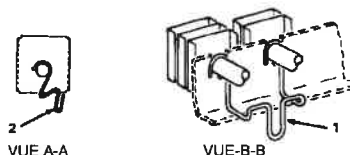
VUE D-D
(MUH-25 À MUH-50 SEULEMENT)



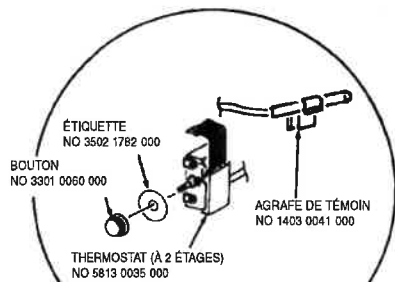
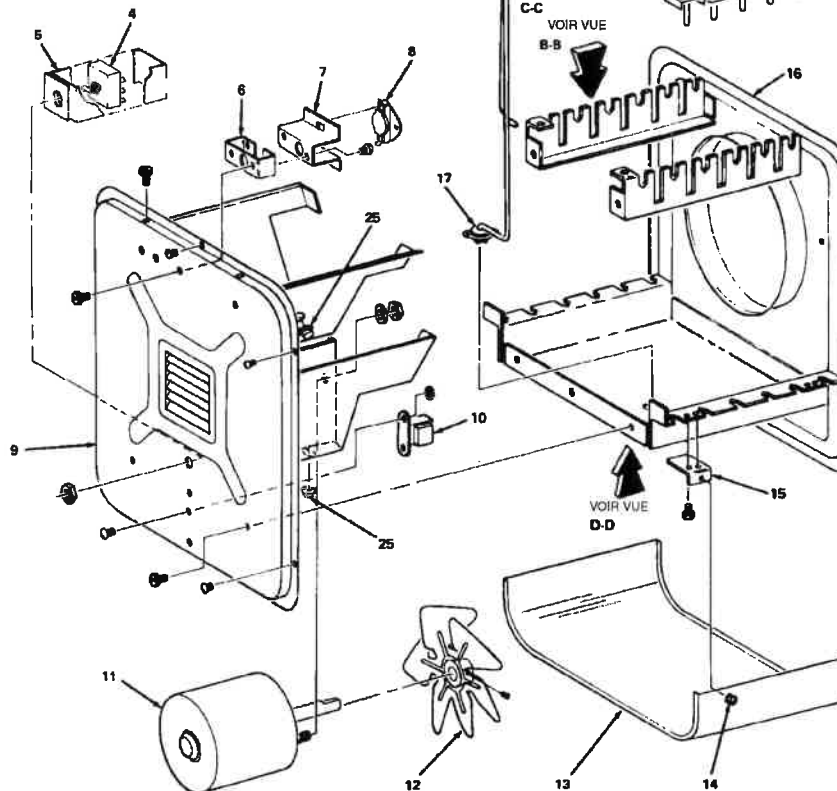
DOUBLE CONNECTION
(SI NÉCESSAIRE)



VUE D-D
(MUH-07 À MUH-20 SEULEMENT)



VUE D-D
(MUH-03 À MUH-05 SEULEMENT)



CES PIÈCES SONT UTILISÉES SUR
MODÈLES MUH05-21T SEULEMENT

N° de modèle	⑨ Carter arrière	⑩ Transformateur**	⑪ Moteur	⑫ Lame de ventilateur	⑬ Couvercle	⑯ Carter avant	⑰ Élément de chauffe	⑱ Protection d'élément	⑲ Condensateur
MUH03-21	1425-2004-000	—	3900-2002-006	1210-2000-000	1402-0336-001	1425-0009-005	1802-0087-000	2504-0011-000	—
MUH03-41	1425-2004-000	5814-0003-002	3900-2005-000	1210-2000-000	1402-0336-001	1425-0009-005	1802-0087-002	2504-0011-000	—
MUH03-71	1425-2004-000	—	3900-2002-007	1210-2000-000	1402-0336-001	1425-0009-005	1802-0087-001	2504-0011-000	—
MUH03-81	1425-2004-000	—	3900-2002-006	1210-2000-000	1402-0336-001	1425-0009-005	1802-0087-024	2504-0011-000	—
MUH05-21MG	1425-2004-000	—	3900-2002-006	1210-2000-000	1402-0336-001	1425-0009-005	1802-0087-003	2504-0011-000	—
MUH05-41	1425-2004-000	5814-0003-002	3900-2005-000	1210-2000-000	1402-0336-001	1425-0009-005	1802-0087-005	2504-0011-000	—
MUH05-71	1425-2004-000	—	3900-2002-007	1210-2000-000	1402-0336-001	1425-0009-005	1802-0087-004	2504-0011-000	—
MUH05-81MG	1425-2004-000	—	3900-2002-006	1210-2000-000	1402-0336-001	1425-0009-005	1802-0087-025	2504-0011-000	—
MUH-07-2	1425-0010-004	5814-0003-000	3900-2014-002	1210-0090-000	1402-0339-002	1425-0009-006	1802-0087-006	2504-0013-001	—
MUH-07-4	1425-0010-004	5814-0003-002	3900-0347-005	1210-0090-000	1402-0339-002	1425-0009-006	1802-0087-008	2504-0013-001	—
MUH-07-7	1425-0010-004	5814-0003-001	3900-2014-003	1210-0090-000	1402-0339-002	1425-0009-006	1802-0087-007	2504-0013-001	—
MUH-07-8	1425-0010-004	5814-0003-000	3900-2014-001	1210-0090-000	1402-0339-002	1425-0009-006	1802-0087-031	2504-0013-001	—
MUH-10-2	1425-0010-004	5814-0003-000	3900-2014-002	1210-0090-000	1402-0339-002	1425-0009-006	1802-0087-031	2504-0013-001	—
MUH-10-4	1425-0010-004	5814-0003-002	3900-0347-005	1210-0090-000	1402-0339-002	1425-0009-006	1802-0087-011	2504-0013-001	—
MUH-10-7	1425-0010-004	5814-0003-001	3900-2014-003	1210-0090-000	1402-0339-002	1425-0009-006	1802-0087-010	2504-0013-001	—
MUH-10-8	1425-0010-004	5814-0003-000	3900-2014-001	1210-0090-000	1402-0339-002	1425-0009-006	1802-0087-036	2504-0013-001	—
MUH-15-2	1425-0014-000	5814-0003-000	3900-0361-000	1210-0090-001	1402-0339-003	1425-0009-007	1802-0087-012	2504-0012-001	—
MUH-15-4	1425-0014-000	5814-0003-002	3900-0361-001	1210-0090-001	1402-0339-003	1425-0009-007	1802-0087-015	2504-0012-001	—
MUH-15-8	1425-0014-000	5814-0003-000	3900-0361-002	1210-0090-001	1402-0339-003	1425-0009-009	1802-0087-031	2504-0012-001	—
MUH-20-2	1425-0013-000	5814-0003-000	3900-0362-000	1210-0096-000	1402-0339-003	1425-0009-007	1802-0087-014	2504-0012-001	1432-0002-003
MUH-20-4	1425-0013-000	5814-0003-002	3900-0362-001	1210-0096-000	1402-0339-003	1425-0009-007	1802-0087-015	2504-0012-001	1432-0002-003
MUH-20-8	1425-0013-000	5814-0003-000	3900-0362-002	1210-0096-000	1402-0339-003	1425-0009-011	1802-0087-026	2504-0012-001	1432-0002-003
MUH-25-2	1425-0011-003	5814-0003-000	3900-0364-000	1210-0098-000	1402-0340-002	1425-0012-003	1802-0087-016	2504-0014-001	1432-0002-001
MUH-25-4	1425-0011-003	5814-0003-002	3900-0363-001	1210-0098-000	1402-0340-002	1425-0012-003	1802-0087-017	2504-0014-001	1432-0002-003
MUH-30-2	1425-0011-003	5814-0003-000	3900-0364-000	1210-0098-000	1402-0340-002	1425-0012-003	1802-0087-018	2504-0014-001	1432-0002-001
MUH-30-4	1425-0011-003	5814-0003-002	3900-0363-000	1210-0098-000	1402-0340-002	1425-0012-003	1802-0087-019	2504-0014-001	1432-0002-003
MUH-30-8	1425-0011-003	5814-0003-000	3900-0364-000	1210-0098-000	1402-0340-002	1425-0009-009	1802-0087-028	2504-0014-001	1432-0002-001
MUH-40-2	1425-0011-001	5814-0003-000	3900-0350-000	1210-0097-000	1402-0340-003	1425-0012-002	1802-0087-020	2504-0015-001	1432-0002-004
MUH-40-4	1425-0011-001	5814-0003-002	3900-0350-001	1210-0097-000	1402-0340-003	1425-0012-002	1802-0087-021	2504-0015-001	1432-0002-004
MUH-50-2	1425-0011-001	5814-0003-000	3900-0350-000	1210-0097-000	1402-0340-003	1425-0012-002	1802-0087-022	2504-0015-001	1432-0002-004
MUH-50-4	1425-0011-001	5814-0003-002	3900-0350-001	1210-0097-000	1402-0340-003	1425-0012-002	1802-0087-023	2504-0015-001	1432-0002-004
MUH-50-8	1425-0011-001	5814-0003-000	3900-0350-002	1210-0097-000	1402-0340-003	1425-0012-002	1802-0087-030	2504-0015-001	1432-0002-004

N° de modèle	⑳ Relais***	㉑ Isolateur	㉒ T. Bornier secteur r	㉓ T _i Bornier commandes I	㉔ Bornier fusible	㉕ Fusible
MUH03-21	—	—	5823-0004-000	5823-0001-000	—	—
MUH03-41	5018-0004-100	2900-0030-000	5823-0004-000	5823-0002-000	—	—
MUH03-71	—	2900-0030-000	5823-0004-000	5823-0001-000	—	—
MUH03-81	—	—	5823-0004-000	5823-0001-000	—	—
MUH05-21MG	5018-0003-002	—	5823-0004-000	5823-0002-000	—	—
MUH05-41	5018-0004-100	2900-0030-000	5823-0004-000	5823-0002-000	—	—
MUH05-71	—	2900-0030-000	5823-0004-000	5823-0001-000	—	—
MUH05-81MG	5018-0003-002	—	5823-0004-000	5823-0002-000	—	—
MUH-07-2	5018-0003-000	—	5823-0004-000	5823-0002-000	—	—
MUH-07-4	5018-0004-100	2900-0030-000	5823-0004-000	5823-0002-000	—	—
MUH-07-7	5018-0004-100	2900-0030-000	5823-0004-000	5823-0002-000	—	—
MUH-07-8	5018-0003-000	—	5823-0004-000	5823-0002-000	—	—
MUH-10-2	5018-0003-000	—	5823-0004-000	5823-0002-000	—	—
MUH-10-4	5018-0004-100	2900-0030-000	5823-0004-000	5823-0002-000	—	—
MUH-10-7	5018-0003-000	2900-0030-000	5823-0004-000	5823-0002-000	—	—
MUH-10-8	5018-0004-100	—	5823-0004-000	5823-0002-000	—	—
MUH-15-2	5018-0005-004	—	5823-0004-001	5823-0002-000	—	—
MUH-15-4	5018-0004-100	2900-0030-000	5823-0004-000	5823-0002-000	—	—
MUH-15-8	5018-0005-008	—	5823-0004-003	5823-0002-000	2025-0002-000	2019-0007-010
MUH-20-2	5018-0006-000	—	5823-0004-002	5823-0002-000	—	—
MUH-20-4	5018-0004-100	2900-0030-000	5823-0004-000	5823-0002-000	—	—
MUH-20-8	5018-0005-000	—	5823-0004-002	5823-0002-000	2025-0002-000	2019-0007-008
MUH-25-2	5018-0005-004	—	5823-0004-002	5823-0002-000	2025-7002-000	2019-7008-077
MUH-25-4	5018-0005-004	2900-0030-000	5823-0004-001	5823-0002-000	—	—
MUH-30-2	5018-0005-004	—	5823-0004-003	5823-0002-000	2025-7002-000	2019-7008-079
MUH-30-4	5018-0005-004	2900-0030-000	5823-0004-001	5823-0002-000	—	—
MUH-30-8	5018-0006-000	—	5823-0005-000	5823-0002-000	2025-7002-000	2019-7008-080
MUH-40-2	5018-0005-004	—	5823-0005-000	5823-0002-000	2025-7002-000	2019-7008-079
MUH-40-4	*	2900-0030-000	5823-0004-002	5823-0002-000	2025-7002-000	2019-7008-079
MUH-50-2	5018-0005-004	—	5823-0005-000	5823-0002-000	2025-7002-000	2019-7008-080
MUH-50-4	*	2900-0030-000	5823-0004-002	5823-0002-000	—	—
MUH-50-8	5018-0006-000	—	5823-0005-000	5823-0002-000	2025-7002-000	2019-7008-078

* Deux relais sont utilisés : N° 5018-0004-000 (35 A) et N° 5018-0006-000 (40 A)

** Secondaire en 24 V montré. Pour un secondaire en 120 V augmenter de 3 le dernier chiffre (par exemple pour un MUH03-41 à secondaire 24 V utiliser le numéro 5814-0003-002, mais pour le même en secondaire 120 V utiliser 5814-0003-005).

*** Montré en commande sous 24 V. Pour une commande en 120 V augmenter de 1 le dernier chiffre (par exemple pour un MUH03-41 à commande en 24 V utiliser le numéro 5018-0004-000, mais pour le même en commande 120 V utiliser 5018-0004-001).01.)

GARANTIE LIMITÉE

Tous les produits fabriqués par Marley Engineered Products sont garantis contre les défauts de fabrication et de matériau pendant une année à compter de leur date d'installation, sauf les éléments chauffants, lesquels sont garantis contre les défauts de fabrication et de matériau pendant cinq ans à compter de la date d'installation. Cette garantie ne couvre pas les dommages causés par un accident, une mauvaise utilisation ou une altération et ne s'applique pas si la tension d'alimentation dépasse de 5% ou plus celle de la plaque signalétique, si l'équipement est mal installé, mal câblé ou mal entretenu, contrairement aux instructions d'installation et d'utilisation du produit. Toutes les réclamations sous garantie doivent être accompagnées d'une preuve de date d'installation.

Le client sera responsable de tous les coûts encourus pour enlever et réinstaller le produit, ce qui inclut les frais de main d'œuvre et les frais de port encourus pour retourner le produit au centre de réparation de la société Marley Engineered Products. Sous réserve des restrictions figurant dans cette garantie, tout appareil défectueux doit être retourné au centre de réparation agréé par Marley le plus près ou au centre de réparation de la société Marley Engineered Products. Il sera ensuite gratuitement réparé ou remplacé, à notre discrétion, et les frais de port de retour seront pris en charge par Marley. Il est entendu que cette réparation ou ce remplacement constitue le seul et unique recours disponible auprès de la société Marley Engineered Products.

LA GARANTIE CI-DESSUS REMPLACE ET PRÉVAUT SUR TOUTE AUTRE GARANTIE EXPRESSE OU IMPLICITE ET TOUTE GARANTIE IMPLICITE DE COMMERCIALISATION OU DE CONVENANCE À UN USAGE QUELCONQUE ALLANT AU-DELÀ DE LA GARANTIE EXPRESSE CI-DESSUS EST PAR LES PRÉSENTES RÉFUTÉE ET EXCLUE DE CETTE ENTENTE. LA SOCIÉTÉ MARLEY ENGINEERED PRODUCTS NE PEUT SOUS AUCUNE CIRCONSTANCE ÊTRE RESPONSABLE DE QUELQUE DOMMAGE ACCESSOIRE ASSOCIÉ À CE PRODUIT, SANS QU'IL SOIT POSSIBLE D'INVOKER UNE NÉGLIGENCE, UN DÉLIT CIVIL, UNE RESPONSABILITÉ STRICTE OU UNE OBLIGATION CONTRACTUELLE.

Puisque certaines juridictions interdisent d'exclure ou de limiter les dommages indirects et accessoires, il est possible que les exclusions et restrictions ci-dessus ne s'appliquent pas à vous. Cette garantie vous accorde des droits juridiques spécifiques, mais il est possible que vous ayez également d'autres droits selon votre lieu de résidence.

Pour connaître l'adresse du centre de réparation agréé le plus près, contactez la société Marley Engineered Products à Bennettsville (Caroline du Sud) au 1-800-642-4328. Les produits retournés à l'usine doivent être accompagnés d'un numéro d'autorisation de retour et d'une étiquette d'identification de service, tous deux disponibles auprès de la société Marley Engineered Products. Lorsque vous demandez une autorisation de retour, indiquez tous les numéros de catalogue indiqués sur les produits.

POUR OBTENIR UNE RÉPARATION OU DES PIÈCES SOUS GARANTIE, DE MÊME QUE DES INFORMATIONS GÉNÉRALES

1. Réparations et pièces sous garantie **1-800-642-4328**
2. Achat de pièces de rechange **1-800-654-3545**
3. Informations générales sur les produits **www.marleymep.com**

Remarque : Lorsque vous demandez une intervention, ayez toujours en main les informations suivantes :

1. Numéro de modèle du produit
2. Date de fabrication
3. Numéro de pièce ou description



Marley®
Engineered Products

470 Beauty Spot Rd. East
Bennettsville, SC 29512 USA

Section 16000
Electrical

16000

KSA

LIGHTING & CONTROLS

KSA LIGHTING INC
1220 CENTRAL AVE
HANOVER PARK, IL 60133-5420
Phone: 630-307-6955 EXT:
Fax: 630-307-6965
Contact:

Brummitt Elementary School

18-12155

3/27/2018



LIGHTING & CONTROLS

Project 18-12155
Brummitt Elementary School

Submitted By
KSA LIGHTING INC

Type	Manufacturer/Brand	Catalog Number
AA	ABL-Lithonia Lighting	2GTL 4 30L GZ10 LP835
AA-EM	ABL-Lithonia Lighting	2GTL 4 30L GZ10 EL14L LP835
FA	ABL-Lithonia Lighting	ZL1N L48 5000LM FST MVOLT 35K 80CRI WH
FA	ABL-Lithonia Lighting	WGZ48
FA	ABL-Lithonia Lighting	HC36 M12
FAEM	ABL-Lithonia Lighting	ZL1N L48 5000LM FST 120 35K 80CRI E7W WH
FAEM	ABL-Lithonia Lighting	WGZ48
FAEM	ABL-Lithonia Lighting	HC36 M12
EA	ABL-Lithonia Lighting	WST LED P3 40K VF MVOLT E7WC DDBXD
XA	ABL-Lithonia Lighting	LE S W 1 G EL N

KSA LIGHTING & CONTROLS	Project 18-12155 Brummitt Elementary School	Catalog Number 2GTL 4 30L GZ10 LP835	Type AA
	Submitted By KSA LIGHTING INC	Notes	



FEATURES & SPECIFICATIONS

INTENDED USE — The 2GTL LED recessed troffer offers a wide range of lumen packages, color temperatures, and lens options to meet the lighting needs for a wide range of applications such as schools, offices, and hospitals. The light engine delivers long life and excellent color to ensure a sound quality, low-maintenance lighting installation. **Certain airborne contaminants can diminish the integrity of acrylic and/or polycarbonate. Click here for Acrylic-Polycarbonate Compatibility table for suitable uses.**

CONSTRUCTION — Housing formed from 22 gauge cold-rolled steel. Smooth hemmed sides and smooth inward formed end flanges for safe handling. Includes integral T-bar clips. Lighter-weight fixture allows for safe, easy installation.

OPTICS — Highly transmissive pattern #12 lens diffuses the light source without compromising output. Pattern # 19 and satin white lens options also available.

ELECTRICAL — Long-life LEDs, coupled with high-efficiency drivers, provide extended service life. 90% LED lumen maintenance at 60,000 hours (L90/60,000).

elidoLED driver options deliver choice of dimming range, and choices for control, while assuring flicker-free, low-current inrush, 89% efficiency and low EMI.

Optional nLight® embedded controls make each luminaire addressable - allowing it to digitally communicate with other nLight enabled controls such as dimmers, switches, occupancy sensors and photocontrols. Simply connect all the nLight enabled control devices and the GTL luminaires using standard Cat-5 cabling. Unique plug-and-play convenience as devices and luminaires automatically discover each other and self-commission. Lumen Management: Unique lumen management system (option N80) provides onboard intelligence that actively manages the LED light source so that constant lumen output is maintained over the system life, preventing the energy waste created by the traditional practice of over-lighting.

The step-level dimming option (SLD) allows the system to be switched to 50% power for compliance with common energy codes while maintaining fixture appearance.

Ballast disconnect is provided where required to comply with U.S. and Canadian codes.

INSTALLATION — LED boards include plug-in connectors for easy of upgradeability. Suitable for direct insulation contact. Suitable for damp location.

LISTINGS — CSA certified to meet U.S. and Canadian standards. IC rated. DesignLights Consortium® (DLC) Premium qualified product. Not all versions of this product may be DLC Premium qualified. Please check the DLC Qualified Products List at www.designlights.org/QPL to confirm which versions are qualified.

WARRANTY — 5-year limited warranty. Complete warranty terms located at www.acuitybrands.com/CustomerResources/Terms_and_conditions.aspx

Note: Actual performance may differ as a result of end-user environment and application. All values are design or typical values, measured under laboratory conditions at 25 °C. Specifications subject to change without notice.

Catalog Number
Notes
Type



GTL Series

2GTL

2' x 4'

LED Recessed Troffer

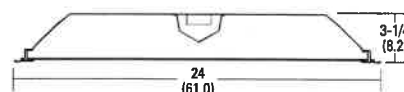


Specifications

Length: 48 (122.0)

Width: 24 (61.0)

Depth: 3-1/4 (8.2)



All dimensions are inches (centimeters) unless otherwise indicated.


CSA+ Capable Luminaire

This item is an A+ capable luminaire, which has been designed and tested to provide consistent color appearance and out-of-the-box control compatibility with simple commissioning.

- All configurations of this luminaire meet the Acuity Brands' specification for chromatic consistency
- This luminaire is part of an A+ Certified solution for nLight® control networks when ordered with drivers marked by a **shaded background***
- This luminaire is part of an A+ Certified solution for nLight control networks, providing advanced control functionality at the luminaire level, when selection includes driver and control options marked by a **shaded background***

To learn more about A+, visit www.acuitybrands.com/aplus

*See ordering tree for details

 KSA LIGHTING & CONTROLS	Project 18-12155 Brummitt Elementary School	Catalog Number 2GTL 4 30L GZ10 LP835	Type AA
	Submitted By KSA LIGHTING INC	Notes	

2GTL LED Troffer



A+ Capable options indicated by this color background.

ORDERING INFORMATION

Lead times will vary depending on options selected. Consult with your sales representative.

Example: 2GTL 4 48L EZ1 LP835

2GTL								
Series	Trim type	Length	Lumens ¹	Door	Lens	Voltage	Driver	Color temperature
2GTL 2' wide recessed LED luminaire	(blank) Grid F Overlapping flange	4 4'	30L 3000 lumens	(blank) Flush steel, white	(blank) #12 pattern acrylic, 0.125" thick	(blank) MVOLT (120-277V)	EZ1 eidoLED dims to 1%	LP830 3000 K
			40L 4000 lumens	FN Flush aluminum, natural	A19 #19 pattern acrylic, 0.156" thick	120 120V	GZ10 Dims to 10% (0-10V dimming) ³	LP835 3500 K
			48L 4800 lumens	FM Flush aluminum, matte black		277 277V		LP840 4000 K
			60L 6000 lumens	FW Flush aluminum, white		347 347V ²	SLD Step-level dimming ⁴	LP850 5000 K
			72L 7200 lumens	RN Regressed aluminum, natural			EKA1 eidoLED dims to 1%, XPoint wireless enabled	
				RM Regressed aluminum, matte black	SWL Satin white			
				RW Regressed aluminum, white				

Controls ⁵	Options
(blank) No controls	EL7L 700 lumen emergency battery (non-CEC compliant) ⁴
N80 nLight with 80% (L80) lumen management	EL14L 1400 lumen emergency battery (non-CEC compliant) ⁴
N80EMG nLight with 80% (L80) lumen management for use with generator supply emergency power	E10WLCP EM Self-Diagnostic battery pack, 10W Constant Power, CEC compliant ⁴
N100 nLight without lumen management	CP Chicago plenum
N100EMG nLight without lumen management for use with generator supply emergency power	PWS1836 6' pre-wire, 3/8" diameter, 18-gauge, 1-circuit
	PWS1846 6' pre-wire, 3/8" diameter, 18-gauge, 2-circuit
	ABC Door frame gasketing ⁶
	GLR Fast-blowing fuse ⁷
	GMF Slow-blowing fuse ⁷
	LATC Earthquake clip
	NPLT Narrow pallet
	PAF Paint after fab

Accessories: Order as separate catalog number.

DGA24	Drywall grid adapter for 2x4 recessed fixture.
2X45MK	Surface Mount Troffer Kit.

Notes

- 1 Approximate lumen output. Lumen output will vary depending upon lens option chosen.
- 2 Not available with EL7L, EL14L, or SLD.
- 3 GZ10 not available with nLight Controls.
- 4 When using pre-wire option, use PWS1846.
- 5 Not available with SLD.
- 6 Only available with aluminum door.
- 7 Must specify voltage, 120 or 277.

KSA LIGHTING & CONTROLS	Project 18-12155 Brummitt Elementary School Submitted By KSA LIGHTING INC	Catalog Number 2GTL 4 30L GZ10 LP835 Notes	Type AA
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2GTL LED Troffer

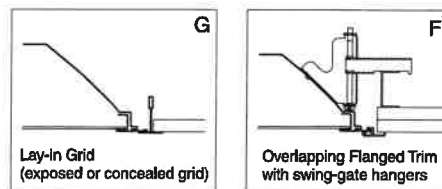
Performance Data			
Lumen package	Lumens	Input watts	LPW
30L LP830	3272	26.9	122
30L LP835	3435	26.9	128
30L LP840	3599	26.9	134
30L LP850	3676	26.9	136
40L LP830	4107	30.8	133
40L LP835	4309	30.8	140
40L LP840	4505	30.8	146
40L LP850	4613	30.6	151
48L LP830	4950	37.9	130
48L LP835	5200	37.9	137
48L LP840	5439	37.9	143
48L LP850	5577	37.8	147
60L LP830	6001	48.3	124
60L LP835	6300	48.3	130
60L LP840	6615	48.3	137
60L LP850	6785	48.3	141
72L LP830	7068	53.2	133
72L LP835	7420	53.2	139
72L LP840	7792	53.2	146
72L LP850	7916	53.3	149

How to Estimate Delivered Lumens in Emergency Mode

Use the formula below to estimate the delivered lumens in emergency mode
Delivered Lumens = 1.25 x P x LPW
P = Output power of emergency driver. P = 10W for E10WLCP option.
LPW = Lumen per watt rating of the luminaire.
This information is available on the ABL luminaire spec sheet. LPW = Lumen per watt rating of the luminaire. LPW information available in Performance Data section.

MOUNTING DATA

Continuous row mounting of flanged units requires CRE and CRM trim options (see Options).



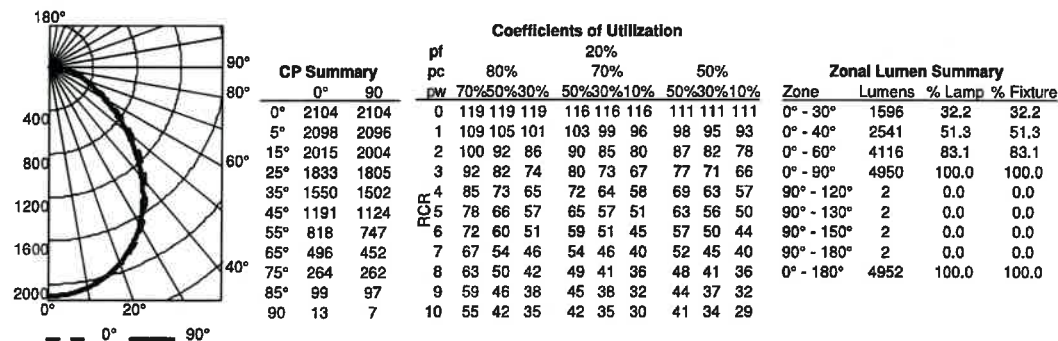
NOTE:

- 1 Recommended rough-in dimensions for F-trim fixtures 24"x48" (Tolerance is +1/4"-0"). Swing-gate range 1-3/16" to 3-15/16". Swing-gate span 23-3/8" to 26-11/16". Fixture swing-gate points require additional 1-1/16" over nominal fixture height.

Note: Performance based on standard #12 pattern acrylic lens.

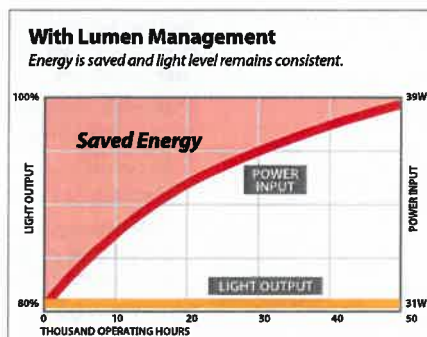
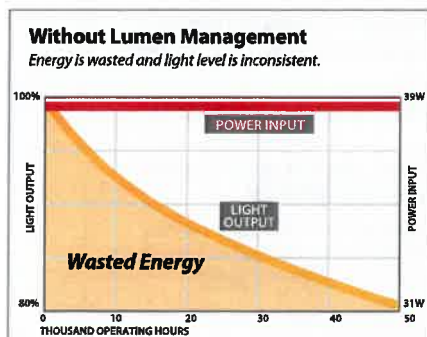
PHOTOMETRICS

2GTL 48L EZ1 LP835, 4953 delivered lumens, test no. LTL26406P109, tested in accordance to IESNA LM-79.



Constant Lumen Management

Enabled by the embedded nLight control, the GTL actively tracks its run-time and manages its light source such that constant lumen output is maintained over the system life. Referred to as lumen management, this feature eliminates the energy waste created by the traditional practice of over-lighting.



KSA LIGHTING & CONTROLS	Project 18-12155 Brummitt Elementary School Submitted By KSA LIGHTING INC	Catalog Number 2GTL 4 30L GZ10 EL14L LP835 Notes	Type AA-EM
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FEATURES & SPECIFICATIONS

INTENDED USE — The 2GTL LED recessed troffer offers a wide range of lumen packages, color temperatures, and lens options to meet the lighting needs for a wide range of applications such as schools, offices, and hospitals. The light engine delivers long life and excellent color to ensure a sound quality, low-maintenance lighting installation. **Certain airborne contaminants can diminish the integrity of acrylic and/or polycarbonate.** [Click here for Acrylic-Polycarbonate Compatibility table for suitable uses.](#)

CONSTRUCTION — Housing formed from 22 gauge cold-rolled steel. Smooth hemmed sides and smooth inward formed end flanges for safe handling. Includes integral T-bar clips. Lighter-weight fixture allows for safe, easy installation.

OPTICS — Highly transmissive pattern #12 lens diffuses the light source without compromising output. Pattern # 19 and satin white lens options also available.

ELECTRICAL — Long-life LEDs, coupled with high-efficiency drivers, provide extended service life. 90% LED lumen maintenance at 60,000 hours (L90/60,000).

elddLED driver options deliver choice of dimming range, and choices for control, while assuring flicker-free, low-current inrush, 89% efficiency and low EMI.

Optional nLight® embedded controls make each luminaire addressable - allowing it to digitally communicate with other nLight enabled controls such as dimmers, switches, occupancy sensors and photocontrols. Simply connect all the nLight enabled control devices and the GTL luminaires using standard Cat-5 cabling. Unique plug-and-play convenience as devices and luminaires automatically discover each other and self-commission. Lumen Management: Unique lumen management system (option N80) provides onboard intelligence that actively manages the LED light source so that constant lumen output is maintained over the system life, preventing the energy waste created by the traditional practice of over-lighting.

The step-level dimming option (SLD) allows the system to be switched to 50% power for compliance with common energy codes while maintaining fixture appearance.

Ballast disconnect is provided where required to comply with U.S. and Canadian codes.

INSTALLATION — LED boards include plug-in connectors for easy of upgradeability. Suitable for direct insulation contact. Suitable for damp location.

LISTINGS — CSA certified to meet U.S. and Canadian standards. IC rated. DesignLights Consortium® (DLC) Premium qualified product. Not all versions of this product may be DLC Premium qualified. Please check the DLC Qualified Products List at www.designlights.org/QPL to confirm which versions are qualified.

WARRANTY — 5-year limited warranty. Complete warranty terms located at www.acuitybrands.com/CustomerResources/Terms_and_conditions.aspx

Note: Actual performance may differ as a result of end-user environment and application. All values are design or typical values, measured under laboratory conditions at 25 °C.

Specifications subject to change without notice.

Catalog Number
Notes
Type



GTL Series

2GTL

2' x 4'

LED Recessed Troffer

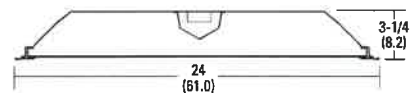


Specifications

Length: 48 (122.0)

Width: 24 (61.0)

Depth: 3-1/4 (8.2)



All dimensions are inches (centimeters) unless otherwise indicated.


A+ Capable Luminaire

This item is an A+ capable luminaire, which has been designed and tested to provide consistent color appearance and out-of-the-box control compatibility with simple commissioning.

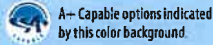
- All configurations of this luminaire meet the Acuity Brands' specification for chromatic consistency
- This luminaire is part of an A+ Certified solution for nLight® control networks when ordered with drivers marked by a **shaded background***
- This luminaire is part of an A+ Certified solution for nLight control networks, providing advanced control functionality at the luminaire level, when selection includes driver and control options marked by a **shaded background***

To learn more about A+, visit www.acuitybrands.com/aplus.

*See ordering tree for details

 KSA LIGHTING & CONTROLS	Project 18-12155 Brummitt Elementary School	Catalog Number 2GTL 4 30L GZ10 EL14L LP835	Type AA-EM
	Submitted By KSA LIGHTING INC	Notes	

2GTL LED Troffer



ORDERING INFORMATION

Lead times will vary depending on options selected. Consult with your sales representative.

Example: 2GTL 4 48L EZ1 LP835

2GTL								
Series	Trim type	Length	Lumens ¹	Door	Lens	Voltage	Driver	Color temperature
2GTL 2' wide recessed LED luminaire	(blank) Grid F Overlapping flange	4 4'	30L 3000 lumens 40L 4000 lumens 48L 4800 lumens 60L 6000 lumens 72L 7200 lumens	(blank) Flush steel, white FN Flush aluminum, natural FM Flush aluminum, matte black FW Flush aluminum, white RN Regressed aluminum, natural RM Regressed aluminum, matte black RW Regressed aluminum, white	(blank) #12 pattern acrylic, 0.125" thick A19 #19 pattern acrylic, 0.156" thick SWL Satin white	(blank) MVOLT (120-277V) 120 120V 277 277V 347 347V ²	EZ1 eLdoLED dims to 1% GZ10 Dims to 10% (0-10V dimming) ³ SLD Step-level dimming ⁴ EXA1 eLdoLED dims to 1%, XPoint wireless enabled	LP830 3000 K LP835 3500 K LP840 4000 K LP850 5000 K

Controls ⁵	Options
(blank) No controls	EL7L 700 lumen emergency battery (non-CEC compliant) ⁴
N80 nLight with 80% (L80) lumen management	EL14L 1400 lumen emergency battery (non-CEC compliant) ⁴
N80EMG nLight with 80% (L80) lumen management for use with generator supply emergency power	E10WLCP EM Self-Diagnostic battery pack, 10W Constant Power, CEC compliant ⁴
N100 nLight without lumen management	CP Chicago plenum
N100EMG nLight without lumen management for use with generator supply emergency power	PWS1836 6' pre-wire, 3/8" diameter, 18-gauge, 1-circuit
	PWS1846 6' pre-wire, 3/8" diameter, 18-gauge, 2-circuit
	ABC Door frame gasketing ⁶
	GLR Fast-blowing fuse ⁷
	GMF Slow-blowing fuse ⁷
	LATC Earthquake clip
	NPLT Narrow pallet
	PAF Paint after fab

Accessories: Order as separate catalog number.

DGA24	Drywall grid adapter for 2x4 recessed fixture.
2X4SMK	Surface Mount Troffer Kit.

Notes

- 1 Approximate lumen output. Lumen output will vary depending upon lens option chosen.
- 2 Not available with EL7L, EL14L, or SLD.
- 3 GZ10 not available with nLight Controls.
- 4 When using pre-wire option, use PWS1846.
- 5 Not available with SLD.
- 6 Only available with aluminum door.
- 7 Must specify voltage, 120 or 277.

2GTL LED Troffer

Performance Data			
Lumen package	Lumens	Input watts	LPW
30L LP830	3272	26.9	122
30L LP835	3435	26.9	128
30L LP840	3599	26.9	134
30L LP850	3676	26.9	136
40L LP830	4107	30.8	133
40L LP835	4309	30.8	140
40L LP840	4505	30.8	146
40L LP850	4613	30.6	151
48L LP830	4950	37.9	130
48L LP835	5200	37.9	137
48L LP840	5439	37.9	143
48L LP850	5577	37.8	147
60L LP830	6001	48.3	124
60L LP835	6300	48.3	130
60L LP840	6615	48.3	137
60L LP850	6785	48.3	141
72L LP830	7068	53.2	133
72L LP835	7420	53.2	139
72L LP840	7792	53.2	146
72L LP850	7916	53.3	149

How to Estimate Delivered Lumens in Emergency Mode

Use the formula below to estimate the delivered lumens in emergency mode

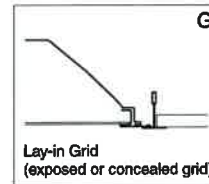
$$\text{Delivered Lumens} = 1.25 \times P \times \text{LPW}$$

P = Output power of emergency driver. P = 10W for E10W/LCP option.

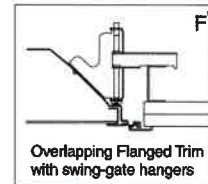
LPW = Lumen per watt rating of the luminaire. This information is available on the ABL luminaire spec sheet. LPW = Lumen per watt rating of the luminaire. LPW information available in Performance Data section.

MOUNTING DATA

Continuous row mounting of flanged units requires CRE and CRM trim options (see Options).



Lay-in Grid
(exposed or concealed grid)



Overlapping Flanged Trim
with swing-gate hangers

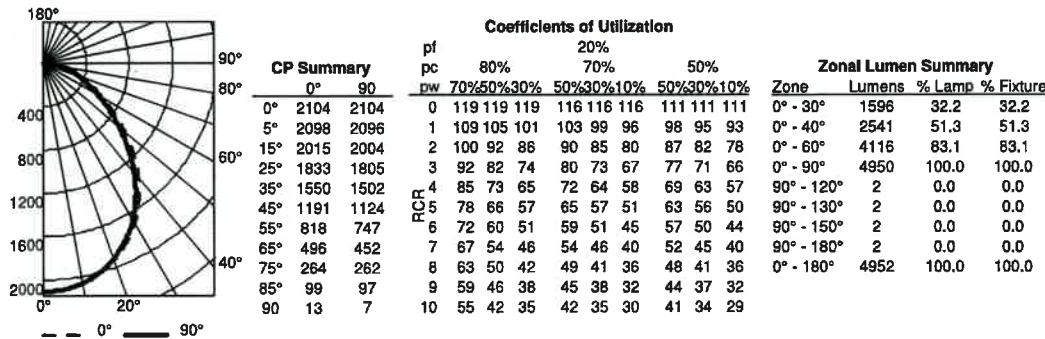
NOTE:

- 1 Recommended rough-in dimensions for F-trim fixtures 24"x48" (Tolerance is +1/4"-0"). Swing-gate range 1-3/16" to 3-15/16". Swing-gate span 23-3/8" to 26-11/16". Fixture swing-gate points require additional 1-1/16" over nominal fixture height.

Note: Performance based on standard #12 pattern acrylic lens.

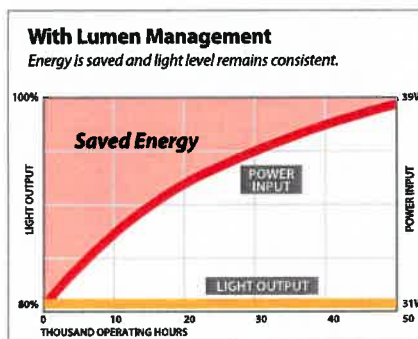
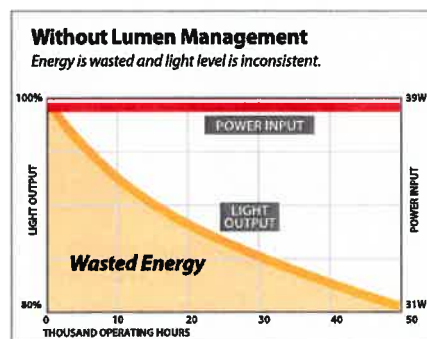
PHOTOMETRICS

2GTL4 48L EZ1 LP835, 4953 delivered lumens, test no. LTL26406P109, tested in accordance to IESNA LM-79.



Constant Lumen Management

Enabled by the embedded nLight control, the GTL actively tracks its run-time and manages its light source such that constant lumen output is maintained over the system life. Referred to as lumen management, this feature eliminates the energy waste created by the traditional practice of over-lighting.



KSA LIGHTING & CONTROLS	Project 18-12155 Brummitt Elementary School Submitted By KSA LIGHTING INC	Catalog Number ZL1N L48 5000LM FST MVOLT 35K 80CRI WH Notes	Type FA
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FEATURES & SPECIFICATIONS

INTENDED USE — Built on the compact, low-profile Z strip channel, this LED strip offers long maintenance-free life, several color temperatures, lumen outputs and lengths. Ideal for new construction and retrofit applications in T5 and T8 lengths. Ideal for uplight and downlight in commercial, retail, manufacturing, warehouse, cove and display applications. **Certain airborne contaminants can diminish the integrity of acrylic and/or polycarbonate.** [Click here for Acrylic-Polycarbonate Compatibility table for suitable uses.](#)

CONSTRUCTION — Compact-design channel and cover are formed from code-gauge cold-rolled steel. Easy to install row aligner included for continuous row mounting.

Finish: Paint options include high-gloss, baked white enamel (WH), galvanized (GALV), matte black (MB) and smoke gray (SGGY). Five-stage iron phosphate pre-treatment ensures superior paint adhesion and rust resistance.

OPTICS — Standard diffuse snap on/snap off lens eliminates pixels, improves uniformity and minimizes glare. L/LENS option available.

ELECTRICAL — Utilizes high-output LEDs integrated on a two-layer circuit board, ensuring cool-running operation. Optional internal pluggable wiring harness for reduced labor cost in row mounting applications. (See PLR ordering information on page 3.) Electronic LED driver is rated for 75 input watts maximum (see Operational Data on page two for actual wattage consumption), **multi-volt input and 0-10V dimming standard.** This fixture is designed to withstand a maximum line surge of 1.5kV at 0.75kA combination wave for indoor locations, for applications requiring higher level of protection additional surge protection must be provided.

LEDs provide nominal 80 CRI at 3000 K, 3500 K, 4000 K, or 5000 K.

Lumen output up to 2,000 lumens per foot. In 86°F (30°C) ambient environments. Luminaire should be installed in applications where ambient temperatures do not exceed 86°F (30°C).

INSTALLATION — Tool-less channel cover for easy installation.

Fixture may be surface mounted (with or without ZSPRG hanger), pendant or stem mounted with appropriate mounting options. Three-point aligner locks in place for easy continuous row mounting.

LISTINGS — CSA certified to US and Canadian safety standards. For use in damp locations between -4°F (-20°C) and 86°F (30°C).

DesignLights Consortium® (DLC) qualified product. Not all versions of this product may be DLC qualified. Please check the DLC Qualified Products List at www.designlights.org to confirm which versions are qualified.

WARRANTY — 5-year limited warranty. Complete warranty terms located at www.acuitybrands.com/CustomerResources/Terms_and_conditions.aspx

Note: Actual performance may differ as a result of end-user environment and application.

All values are design or typical values, measured under laboratory conditions at 25 °C.

Specifications subject to change without notice.

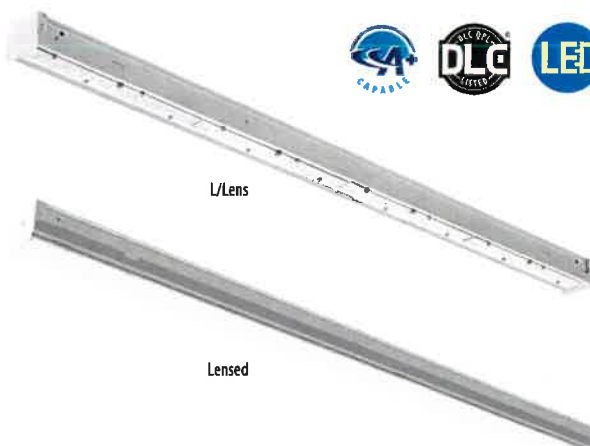
Catalog Number
Notes
Type



LED Striplight

ZL1N

24", 48" and 96" Lengths



Capable Luminaire

This item is an A+ capable luminaire, which has been designed and tested to provide consistent color appearance and out-of-the-box control compatibility with simple commissioning.

- All configurations of this luminaire meet the Acuity Brands' specification for chromatic consistency
- This luminaire is part of an A+ Certified solution for nLight® or XPoint™ Wireless control networks marked by a [shaded background*](#)

To learn more about A+, visit www.acuitybrands.com/aplus.

*See ordering tree for details

<div>KSA</div> <div>LIGHTING & CONTROLS</div>	<div>Project 18-12155</div> <div>Brummitt Elementary School</div> <div>Submitted By</div> <div>KSA LIGHTING INC</div>	<div>Catalog Number</div> <div>ZL1N L48 5000LM FST MVOLT 35K 80CRI WH</div> <div>Notes</div>	<div>Type</div> <div>FA</div>
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ZL1N LED Striplight



A+ Capable options indicated by this color background.

ORDERING INFORMATION

Lead times will vary depending on options selected. Consult with your sales representative.

Example: ZL1N L48 3000LM FST MVOLT 40K 80CRI WH

Series		Length		Nominal lumens ¹		Diffuser		Voltage		Color temperature	
ZL1N	LED striplight	L24	24"	1500LM	1,500 lumens ²	FST	Snap on frosted, diffuse	MVOLT	120-277V	30K	3000 K
				2500LM	2,500 lumens ²	L/LENS	No diffuser	120	120V	35K	3500 K
				3500LM	3,500 lumens	SBL	Straight blade louver	208	208V	40K	4000 K
				3000LM	3,000 lumens			240	240V	50K	5000 K
		L46	46"	5000LM	5,000 lumens			277	277V		
		L48	48"	7000LM	7,000 lumens			347	347V ³		
TZL1N	LED striplight	L92	92"	6000LM	6,000 lumens			480	480V ³		
				10000LM	10,000 lumens						
				14000LM	14,000 lumens						
		L96	96"								

Color rendering index		Options				Paint finish			
80CRI	80 CRI	PLR	Plug-in wiring ⁴	Cord sets: ⁶		WH	White		
90CRI	90 CRI	PLR1LVG	Plug-in wiring-low voltage	CS1W	Straight plug, 120V	GALV	Galvanized		
		E7W	Emergency battery pack ^{4,5}	CS3W	Twist-lock, 120V	MB	Matte black		
		OUTEND	Cord set to exit endplate of fixture	CS7W	Straight plug, 277V	SKGY	Smoke gray		
				CS11W	Twist-lock, 277V				
				CS25W	Twist-lock, 347V				
				CS97W	Twist-lock, 480V				
				CS93W	600V SE00W white cord, no plug (no voltage required)				

Accessories: Order as separate catalog number.

HC36	Hanger chain, 36"	LSXR	Sensor Switch* LSXR occupancy sensor ⁴
ZACVH	Aircraft cable 10' (one pair)	ZSPRG	For 15/16" T-grid only
ZLANGBKT	Luma-tilt™ angle bracket for shelf or ledge mounting only	WGZ24	24" wireguard, white
NPP16D	nLight® switching/dimming module	WGZ48	48" wireguard, white ⁷

Notes

- See Operational Data on page 2 for actual lumens.
- Not available with 0-10V dimming option.
- Not available with L24, 24" fixture. 347V and 480V utilize a step-down transformer.
- See ordering information on page 4.
- Must specify voltage. 120, 208, 240 or 277V.
- Cordsets exit back of fixture unless OUTEND option is specified.
- Order 2 for tandem double length fixtures (TZL1N).

KSA LIGHTING & CONTROLS	Project 18-12155 Brummitt Elementary School	Catalog Number ZL1N L48 5000LM FST MVOLT 35K 80CRI WH	Type FA
	Submitted By KSA LIGHTING INC	Notes	

ZL1N LED Striplight

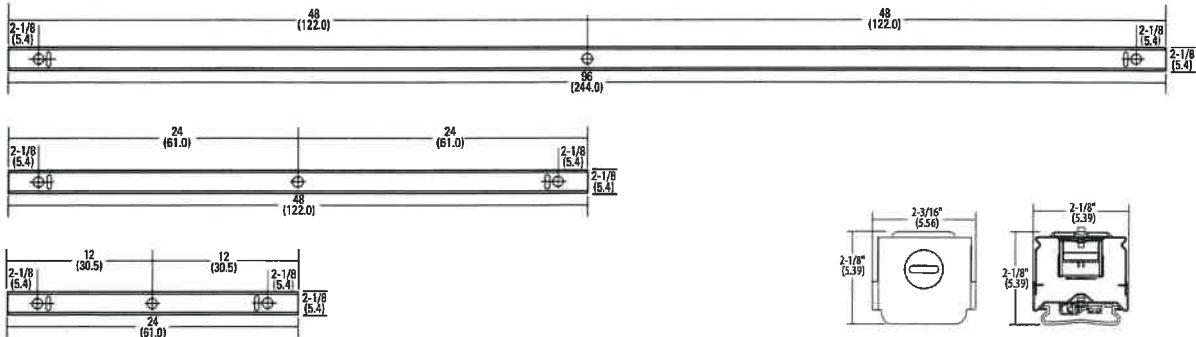
OPERATIONAL DATA								
	Nominal lumen package	Length (inches)	Delivered lumens 3000 K CCT @ 77°F (25°C) ambient temperature	Delivered lumens 3500 K CCT @ 77°F (25°C) ambient temperature	Delivered lumens 4000 K CCT @ 77°F (25°C) ambient temperature	Delivered lumens 5000 K CCT @ 77°F (25°C) ambient temperature	Wattage @120V	Comparable light source
Lensed	1,500LM	24	1,753	1,777	1,806	1,890	18W	1-lamp 17W T8
	2,500LM	24	2,365	2,413	2,478	2,500	22W	1-lamp 17W T8
	3,500LM	24	3,716	3,792	3,895	3,928	39W	1-lamp 32W T8, 1-lamp 54W TSH0, 50W HID
	3,000LM	46 or 48	3,302	3,381	3,438	3,596	33W	1-lamp 32W T8, 1-lamp 54W TSH0, 50W HID
	5,000LM	46 or 48	4,630	4,725	4,853	4,894	42W	2-lamp 32W T8, 1-lamp 54W TSH0, 70W HID
	7,000LM	46 or 48	6,535	6,668	6,849	6,907	67W	3-lamp 32W T8, 2-lamp 54W TSH0, 100W HID
	6,000LM	92 or 96	6,560	6,717	6,830	7,144	60W	3-lamp 32W T8, 2-lamp 54W TSH0, 100W HID
	10,000LM	92 or 96	9,230	9,418	9,673	9,756	83W	4-lamp 32W T8, 2-lamp 54W TSH0, 100W HID
	14,000LM	92 or 96	13,177	13,446	13,810	13,923	134W	4-lamp 32W T8, 3-lamp 54W TSH0, 150W HID
Unlensed	1,500LM	24	1,883	1,928	1,960	2,051	18W	1-lamp 17W T8
	2,500LM	24	2,566	2,618	2,689	2,712	22W	1-lamp 17W T8
	3,500LM	24	4,032	4,114	4,226	4,262	39W	1-lamp 32W T8, 1-lamp 54W TSH0, 50W HID
	3,000LM	46 or 48	3,582	3,668	3,730	3,901	33W	1-lamp 32W T8, 1-lamp 54W TSH0, 50W HID
	5,000LM	46 or 48	5,024	5,126	5,265	5,310	42W	2-lamp 32W T8, 1-lamp 54W TSH0, 70W HID
	7,000LM	46 or 48	7,090	7,235	7,431	7,494	67W	3-lamp 32W T8, 2-lamp 54W TSH0, 100W HID
	6,000LM	92 or 96	7,118	7,288	7,410	7,751	60W	3-lamp 32W T8, 2-lamp 54W TSH0, 100W HID
	10,000LM	92 or 96	10,015	10,218	10,495	10,585	83W	4-lamp 32W T8, 2-lamp 54W TSH0, 100W HID
	14,000LM	92 or 96	14,297	14,588	14,984	15,112	134W	4-lamp 32W T8, 3-lamp 54W TSH0, 150W HID

DIMENSIONS

All dimensions are shown in inches (centimeters) unless otherwise noted.
Specifications subject to change without notice.

PALLET DIMENSIONS

Length	Approximate weight	Fixtures per pallet	Approximate pallet dimensions (L x W x H)
L24	7 lbs.	408	46" X 51" X 32 11/16"
L46	11 lbs.	176	46" X 51" X 32 1/16"
L48	12 lbs.	176	46" X 51" X 31 3/8"
L92	22 lbs.	176	46" X 98 1/2" X 31 1/16"
L96	24 lbs.	176	46" X 98 1/2" X 31 1/16"



PHOTOMETRICS

Please see www.lithonia.com.

KSA LIGHTING & CONTROLS	Project 18-12155 Brummitt Elementary School Submitted By KSA LIGHTING INC	Catalog Number ZL1N L48 5000LM FST MVOLT 35K 80CRI WH Notes	Type FA
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ZL1N LED Striplight

PRODUCT INFORMATION

Advanced plug-in system with three-circuit capability. Available on industrial and strip products and a variety of architectural products mounted in continuous rows. 1, 2, 3 and 4-lamp fixtures. PLR22 (2-circuit) and PLR33 (3-circuit) crossover harness switches hot circuit serving next fixture in row. Reduces fixture types on job for alternating circuit applications (see example below.)

Easy one-step installation, saves up to 35% on labor costs. Expanded switching flexibility helps save energy. Rows can be 50% longer with two-circuit systems. Polarized, lock-together nylon connectors prevent miswiring in the field. #12 THHN conductor, rated 600V, 90°C. White neutral wire included. Grounding accomplished by fixture in-row connectors.

CSA certified systems available with up to 2 circuits. G ground required.

Note: Specifications subject to change without notice.

Wiring

PLR

Advanced 3-Circuit Plug-In

ORDERING INFORMATION Lead times will vary depending on options selected. Consult with your sales representative.

*Always use the correct number of branch circuits and dimmers for the number of ballasts and lamps. See the ballast and dimmer specifications for more information. Always use the correct number of branch circuits and dimmers for the number of ballasts and lamps. See the ballast and dimmer specifications for more information.										
Series	Number of hot wires		Branch circuits			Dimming		Ground		
PLR	(blank)	Not required for 22 or 33	Circuits to which ballast is connected		B	Red wire	LV	Low-voltage dimming	(blank)	No ground in PLR
PLR22	1	Black	(blank)	Not required for 22 or 33	C	Blue wire			G	Ground. Maximum 2 circuits
PLR33	2	Black and red	A	Black wire						
	3	Black, red and blue								

Typical Applications

- Multiple-circuit and single-circuit for longer continuous rows
- Multiple-circuit with alternating fixtures on separate circuits, 2-circuit (PLR 22) and 3-circuit (PLR 33)
- Multiple circuit with night-lights located along row as desired

TYPICAL APPLICATIONS										
PLR 3 C (All PLR22)	PLR 3 C	PLR 3 C	PLR 3 C	PLR 2 B	PLR 2 B	PLR 2 B	PLR 2 B	PLR 1	PLR 1	PLR 1
Circuit A	Circuit B	Circuit A	Circuit B	Circuit A	Circuit B	Circuit A	Circuit B	Circuit A	Circuit B	Circuit A
(All PLR33)										
Circuit A	Circuit B	Circuit C	Circuit A	Circuit B	Circuit C	Circuit A	Circuit B	Circuit C	Circuit A	Circuit B
PLR 3 A	PLR 3 A	PLR 3 A	PLR 3 C	PLR 3 B	PLR 3 B	PLR 3 B	PLR 3 C	PLR 3 A	PLR 3 A	PLR 3 A

PRODUCT INFORMATION

A standard occupancy time delay is also present to ensure lights turn off (once minimum on timer has also elapsed) if no occupancy is detected.

This timer is factory set at 10 minutes to promote energy savings, but is adjustable between 30 seconds and 30 minutes. These adjustments may be done through the unit's push-button.

FEATURES

- Four interchangeable lenses - high mount 360°, low mount 360°, high mount aisleway, and small motion 360°.
- Integrated mounting bracket drops lens down 3" from chase nipple - no bracket accessory required.
- 100% digital PIR detection - provides excellent RF immunity

Note: Specifications subject to change without notice.

Passive Infrared Indoor Occupancy Sensor

LSXR

Single Relay



ORDERING INFORMATION Lead times will vary depending on options selected. Consult with your sales representative.

Example: LSXR 10 ADC HVOLT 30M

LSXR												
Series		Lens option						Dimming/photocell				
LSXR	Passive Infrared Indoor Occupancy Sensor	(blank)	No lens	610	High and low mount 360°		(blank)	None				
		6	High mount, 360°	650	High mount 360° and aisleway		HL	High/low occupancy operation				
		10	Low mount, 360°	3PK	High and low mount 360° and aisleway		P	Switching photocell (on/off)				
		50	High mount aisleway	4PK	All lenses		ADC	Dimming and switching photocell				
		9	Small motion, 360°				ANL	Dimming and switching photocell with high/low occupancy operation				
Voltage		Max dim level		Min dim level		Lead length		Temp humidity		Default time delay		
(blank)	120-277 VAC (MVOLT)	(blank)	10 VDC	(blank)	Minimum dimming level of ballast		(blank)	14"	(blank)	None	(blank)	10 minutes (with minimum 15 minutes on time)
HVOLT	347-480 VAC	9H	9 VDC	1V	1 VDC		42L	42"	LT	Low temperature	5M	5 minutes (LED only)
		8H	8 VDC	2V	2 VDC						15M	15 minutes
		7H	7 VDC	3V	3 VDC						20M	20 minutes
				4V	4 VDC						30M	30 minutes
				5V	5 VDC							
		6V	6 VDC									

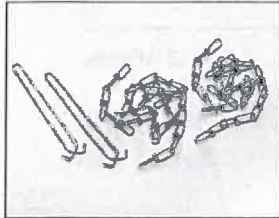
For additional information see www.lithonia.com

<div>KSA</div> <div>LIGHTING & CONTROLS</div>	<div>Project 18-12155</div> <div>Brummitt Elementary School</div> <div>Submitted By</div> <div>KSA LIGHTING INC</div>	<div>Catalog Number</div> <div>ZL1N L48 5000LM FST MVOLT 35K 80CRI WH</div> <div>Notes</div>	<div>Type</div> <div>FA</div>
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ZL1N LED Striplight

OPTIONS AND ACCESSORIES

The Z Series fixture offers numerous options for almost every electrical and optical component, including a long list of field-installable accessories.



HANGER CHAIN

36" chain with Y hanger.

Order as:
HC36



Z SPRING HANGER

Snap 'n' lock design requires no fasteners and can be used on T-grid ceiling or universal mounting systems.

Order as:
ZSPRG



ZACVH HANGER

10' Aircraft cable with Y hanger.

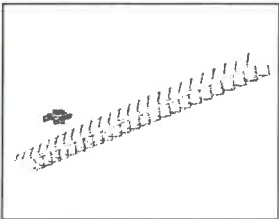
Order as:
ZACVH



ANGLE MOUNTING BRACKET

Luma-tilt™ angle bracket ships as a pair

Order as:
ZLANGBKT



WIRE GUARD

Order as:
WGZ24
WGZ48

<div>KSA</div> <div>LIGHTING & CONTROLS</div>	<div>Project 18-12155</div> <div>Brummitt Elementary School</div> <div>Submitted By</div> <div>KSA LIGHTING INC</div>	<div>Catalog Number</div> <div>ZL1N L48 5000LM FST 120 35K 80CRI E7W WH</div> <div>Notes</div>	<div>Type</div> <div>FAEM</div>
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FEATURES & SPECIFICATIONS

INTENDED USE — Built on the compact, low-profile Z strip channel, this LED strip offers long maintenance-free life, several color temperatures, lumen outputs and lengths. Ideal for new construction and retrofit applications in T5 and T8 lengths. Ideal for uplight and downlight in commercial, retail, manufacturing, warehouse, cove and display applications. **Certain airborne contaminants can diminish the integrity of acrylic and/or polycarbonate.** [Click here for Acrylic-Polycarbonate Compatibility table for suitable uses.](#)

CONSTRUCTION — Compact-design channel and cover are formed from code-gauge cold-rolled steel. Easy to install row aligner included for continuous row mounting.

Finish: Paint options include high-gloss, baked white enamel (WH), galvanized (GALV), matte black (MB) and smoke gray (SKGY). Five-stage iron phosphate pre-treatment ensures superior paint adhesion and rust resistance.

OPTICS — Standard diffuse snap on/snap off lens eliminates pixels, improves uniformity and minimizes glare. L/LENS option available.

ELECTRICAL — Utilizes high-output LEDs integrated on a two-layer circuit board, ensuring cool-running operation. Optional internal pluggable wiring harness for reduced labor cost in row mounting applications. (See PLR_ordering information on page 3.) Electronic LED driver is rated for 75 input watts maximum (see Operational Data on page two for actual wattage consumption), **multi-volt input and 0-10V dimming standard.** This fixture is designed to withstand a maximum line surge of 1.5kV at 0.75kA combination wave for indoor locations, for applications requiring higher level of protection additional surge protection must be provided.

LEDs provide nominal 80 CRI at 3000 K, 3500 K, 4000 K, or 5000 K.

Lumen output up to 2,000 lumens per foot. In 86°F (30°C) ambient environments. Luminaire should be installed in applications where ambient temperatures do not exceed 86°F (30°C).

INSTALLATION — Tool-less channel cover for easy installation.

Fixture may be surface mounted (with or without ZSPRG hanger), pendant or stem mounted with appropriate mounting options. Three-point aligner locks in place for easy continuous row mounting.

LISTINGS — CSA certified to US and Canadian safety standards. For use in damp locations between -4°F (-20°C) and 86°F (30°C).

DesignLights Consortium® (DLC) qualified product. Not all versions of this product may be DLC qualified. Please check the DLC Qualified Products List at www.designlights.org to confirm which versions are qualified.

WARRANTY — 5-year limited warranty. Complete warranty terms located at www.acuitybrands.com/CustomerResources/Terms_and_conditions.aspx

Note: Actual performance may differ as a result of end-user environment and application.

All values are design or typical values, measured under laboratory conditions at 25 °C.

Specifications subject to change without notice.

Catalog Number
Notes
Type



LED Striplight

ZL1N

24", 48" and 96" Lengths



A+ Capable Luminaire

This item is an A+ capable luminaire, which has been designed and tested to provide consistent color appearance and out-of-the-box control compatibility with simple commissioning.

- All configurations of this luminaire meet the Acuity Brands' specification for chromatic consistency
- This luminaire is part of an A+ Certified solution for nLight® or XPoint™ Wireless control networks marked by a shaded background*

To learn more about A+, visit www.acuitybrands.com/aplus.

*See ordering tree for details

KSA LIGHTING & CONTROLS	Project 18-12155 Brummitt Elementary School	Catalog Number ZL1N L48 5000LM FST 120 35K 80CRI E7W WH	Type FAEM
	Submitted By KSA LIGHTING INC	Notes	

ZL1N LED Striplight



A= Capable options indicated by this color background.

ORDERING INFORMATION

Lead times will vary depending on options selected. Consult with your sales representative.

Example: ZL1N L48 3000LM FST MVOLT 40K 80CRI WH

Series	Length	Nominal lumens ¹	Diffuser	Voltage	Color temperature
ZL1N LED striplight	L24 24"	1500LM 1,500 lumens ²	FST Snap on frosted, diffuse	MVOLT 120-277V	30K 3000 K
		2500LM 2,500 lumens ²	L/LENS No diffuser	120 120V	35K 3500 K
		3500LM 3,500 lumens	SBL Straight blade louver	208 208V	40K 4000 K
	L46 46"	3000LM 3,000 lumens		240 240V	50K 5000 K
	L48 48"	5000LM 5,000 lumens		277 277V	
TZL1N LED striplight	L92 92"	7000LM 7,000 lumens		347 347V ³	
		6000LM 6,000 lumens		480 480V ³	
	L96 96"	10000LM 10,000 lumens			
		14000LM 14,000 lumens			

Color rendering index	Options	Paint finish
80CRI 80 CRI	PLR Plug-in wiring ⁴	WH White
90CRI 90 CRI	PLR1LVG Plug-in wiring-low voltage	GALV Galvanized
	E7W Emergency battery pack ^{3,5}	MB Matte black
	OUTEND Cord set to exit endplate of fixture	SKGY Smoke gray
	Cord sets: ⁶	
	CS1W Straight plug, 120V	
	CS3W Twist-lock, 120V	
	CS7W Straight plug, 277V	
	CS11W Twist-lock, 277V	
	CS25W Twist-lock, 347V	
	CS97W Twist-lock, 480V	
	CS93W 600V SE00W white cord, no plug (no voltage required)	

Accessories: Order as separate catalog number.

HC36 Hanger chain, 36"	LSXR Sensor Switch* LSXR occupancy sensor ⁴
ZACVH Aircraft cable 10' (one pair)	ZSPRG For 15/16" T-grid only
ZLANGBKT Luma-tilt™ angle bracket for shelf or ledge mounting only	WGZ24 24" wireguard, white
NPP16D nLight* switching/dimming module	WGZ48 48" wireguard, white ⁷

Notes

- See Operational Data on page 2 for actual lumens.
- Not available with 0-10V dimming option.
- Not available with L24, 24" fixture. 347V and 480V utilize a step-down transformer.
- See ordering information on page 4.
- Must specify voltage. 120, 208, 240 or 277V.
- Cordsets exit back of fixture unless OUTEND option is specified.
- Order 2 for tandem double length fixtures (TZL1N).

KSA LIGHTING & CONTROLS	Project 18-12155 Brummitt Elementary School Submitted By KSA LIGHTING INC	Catalog Number ZL1N L48 5000LM FST 120 35K 80CRI E7W WH Notes	Type FAEM
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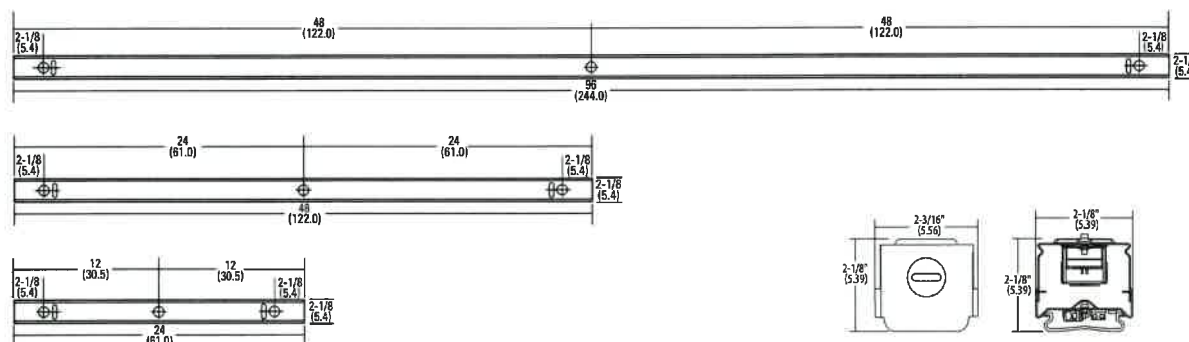
ZL1N LED Striplight

	OPERATIONAL DATA							
	Nominal lumen package	Length (inches)	Delivered lumens 3000 K CCT @ 77°F (25°C) ambient temperature	Delivered lumens 3500 K CCT @ 77°F (25°C) ambient temperature	Delivered lumens 4000 K CCT @ 77°F (25°C) ambient temperature	Delivered lumens 5000 K CCT @ 77°F (25°C) ambient temperature	Wattage @120V	Comparable light source
Lensed	1,500LM	24	1,753	1,777	1,806	1,890	18W	1-lamp 17W T8
	2,500LM	24	2,365	2,413	2,478	2,500	22W	1-lamp 17W T8
	3,500LM	24	3,716	3,792	3,895	3,928	39W	1-lamp 32W T8, 1-lamp 54W T5HO, 50W HID
	3,000LM	46 or 48	3,302	3,381	3,438	3,596	33W	1-lamp 32W T8, 1-lamp 54W T5HO, 50W HID
	5,000LM	46 or 48	4,630	4,725	4,853	4,894	42W	2-lamp 32W T8, 1-lamp 54W T5HO, 70W HID
	7,000LM	46 or 48	6,535	6,668	6,849	6,907	67W	3-lamp 32W T8, 2-lamp 54W T5HO, 100W HID
	6,000LM	92 or 96	6,560	6,717	6,830	7,144	60W	3-lamp 32W T8, 2-lamp 54W T5HO, 100W HID
	10,000LM	92 or 96	9,230	9,418	9,673	9,756	83W	4-lamp 32W T8, 2-lamp 54W T5HO, 100W HID
	14,000LM	92 or 96	13,177	13,446	13,810	13,923	134W	4-lamp 32W T8, 3-lamp 54W T5HO, 150W HID
Unlensed	1,500LM	24	1,883	1,928	1,960	2,051	18W	1-lamp 17W T8
	2,500LM	24	2,566	2,618	2,689	2,712	22W	1-lamp 17W T8
	3,500LM	24	4,032	4,114	4,226	4,262	39W	1-lamp 32W T8, 1-lamp 54W T5HO, 50W HID
	3,000LM	46 or 48	3,582	3,668	3,730	3,901	33W	1-lamp 32W T8, 1-lamp 54W T5HO, 50W HID
	5,000LM	46 or 48	5,024	5,126	5,265	5,310	42W	2-lamp 32W T8, 1-lamp 54W T5HO, 70W HID
	7,000LM	46 or 48	7,090	7,235	7,431	7,494	67W	3-lamp 32W T8, 2-lamp 54W T5HO, 100W HID
	6,000LM	92 or 96	7,118	7,288	7,410	7,751	60W	3-lamp 32W T8, 2-lamp 54W T5HO, 100W HID
	10,000LM	92 or 96	10,015	10,218	10,495	10,585	83W	4-lamp 32W T8, 2-lamp 54W T5HO, 100W HID
	14,000LM	92 or 96	14,297	14,588	14,984	15,112	134W	4-lamp 32W T8, 3-lamp 54W T5HO, 150W HID

DIMENSIONS

All dimensions are shown in inches (centimeters) unless otherwise noted.
Specifications subject to change without notice.

PALLET DIMENSIONS			
Length	Approximate weight	Fixtures per pallet	Approximate pallet dimensions (L x W x H)
L24	7 lbs.	408	46" X 51" X 32 11/16"
L46	11 lbs.	176	46" X 51" X 32 1/16"
L48	12 lbs.	176	46" X 51" X 31 3/8"
L92	22 lbs.	176	46" X 98 1/2" X 31 1/16"
L96	24 lbs.	176	46" X 98 1/2" X 31 1/16"



PHOTOMETRICS

Please see www.lithonia.com.

KSA LIGHTING & CONTROLS	Project 18-12155 Brummitt Elementary School	Catalog Number ZL1N L48 5000LM FST 120 35K 80CRI E7W WH	Type FAEM
	Submitted By KSA LIGHTING INC	Notes	

ZL1N LED Striplight

PRODUCT INFORMATION

Advanced plug-in system with three-circuit capability. Available on industrial and strip products and a variety of architectural products mounted in continuous rows. 1, 2, 3 and 4-lamp fixtures. PLR22 (2-circuit) and PLR33 (3-circuit) crossover harness switches hot circuit serving next fixture in row. Reduces fixture types on job for alternating circuit applications (see example below.)

Easy one-step installation, saves up to 35% on labor costs. Expanded switching flexibility helps save energy.

Rows can be 50% longer with two-circuit systems. Polarized, lock-together nylon connectors prevent miswiring in the field. #12 THHN conductor, rated 600V, 90°C. White neutral wire included. Grounding accomplished by fixture in-row connectors.

CSA certified systems available with up to 2 circuits. 6 ground required.

Note: Specifications subject to change without notice.

Wiring

PLR

Advanced 3-Circuit Plug-In

ORDERING INFORMATION Lead times will vary depending on options selected. Consult with your sales representative.

Series	Number of hot wires		Branch circuits		Dimming		Ground	
PLR	(blank)	Not required for 22 or 33	Circuits to which ballast is connected	B Red wire	LV	Low-voltage dimming	(blank)	No ground in PLR
PLR22	1	Black	(blank) Not required for 22 or 33	C Blue wire			G	Ground. Maximum 2 circuits
PLR33	2	Black and red	A Black wire					
	3	Black, red and blue						

Typical Applications

- Multiple-circuit and single-circuit for longer continuous rows
- Multiple-circuit with alternating fixtures on separate circuits, 2-circuit (PLR 22) and 3-circuit (PLR 33)
- Multiple circuit with night-lights located along row as desired

TYPICAL APPLICATIONS										
PLR 3 C (All PLR22)	PLR 3 C	PLR 3 C	PLR 3 C	PLR 2 B	PLR 2 B	PLR 2 B	PLR 2 B	PLR 1	PLR 1	PLR 1
Circuit A	Circuit B	Circuit A	Circuit B	Circuit A	Circuit B	Circuit A	Circuit B	Circuit A	Circuit B	Circuit A
(All PLR33)										
Circuit A	Circuit B	Circuit C	Circuit A	Circuit B	Circuit C	Circuit A	Circuit B	Circuit C	Circuit A	Circuit B
PLR 3 A	PLR 3 A	PLR 3 A	PLR 3 C	PLR 3 B	PLR 3 B	PLR 3 B	PLR 3 C	PLR 3 A	PLR 3 A	PLR 3 A

PRODUCT INFORMATION

A standard occupancy time delay is also present to ensure lights turn off (once minimum on timer has also elapsed) if no occupancy is detected.

This timer is factory set at 10 minutes to promote energy savings, but is adjustable between 30 seconds and 30 minutes. These adjustments may be done through the unit's push-button.

FEATURES

- Four interchangeable lenses - high mount 360°, low mount 360°, high mount aisleway, and small motion 360°.
- Integrated mounting bracket drops lens down 3" from chase nipple - no bracket accessory required.
- 100% digital PIR detection - provides excellent RF immunity

Note: Specifications subject to change without notice.

Passive Infrared Indoor Occupancy Sensor

LSXR

Single Relay



ORDERING INFORMATION Lead times will vary depending on options selected. Consult with your sales representative.

Example: LSXR 10 ADC HVOLT 30M

LSXR											
Series		Lens option				Dimming/photocell					
LSXR	Passive Infrared Indoor Occupancy Sensor	(blank)	No lens	610	High and low mount 360°	(blank)	None				
		6	High mount, 360°	650	High mount 360° and aisleway	HL	High/low occupancy operation				
		10	Low mount, 360°	3PK	High and low mount 360° and aisleway	P	Switching photocell (on/off)				
		50	High mount aisleway	4PK	All lenses	ADC	Dimming and switching photocell				
		9	Small motion, 360°			ANL	Dimming and switching photocell with high/low occupancy operation				
Voltage		Max dim level		Min dim level		Lead length		Temp humidity		Default time delay	
(blank)	120-277 VAC (MVOLT)	(blank)	10 VDC	(blank)	Minimum dimming level of ballast	(blank)	14"	(blank)	None	(blank)	10 minutes (with minimum 15 minutes on time)
		9H	9 VDC	1V	1 VDC	42L	42"	LT	Low temperature		
HVOLT	347-480 VAC	8H	8 VDC	2V	2 VDC					5M	5 minutes (LED only)
		7H	7 VDC	3V	3 VDC					15M	15 minutes
				4V	4 VDC					20M	20 minutes
				5V	5 VDC					30M	30 minutes
				6V	6 VDC						

For additional information see www.lithonia.com

INDUSTRIAL

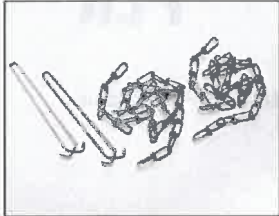
ZL1N
Page 4 of 5

<div>KSA</div> <div>LIGHTING & CONTROLS</div>	<div>Project 18-12155 Brummitt Elementary School</div> <div>Submitted By KSA LIGHTING INC</div>	<div>Catalog Number ZL1N L48 5000LM FST 120 35K 80CRI E7W WH</div> <div>Notes</div>	<div>Type FAEM</div>
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ZL1N LED Striplight

OPTIONS AND ACCESSORIES

The Z Series fixture offers numerous options for almost every electrical and optical component, including a long list of field-installable accessories.



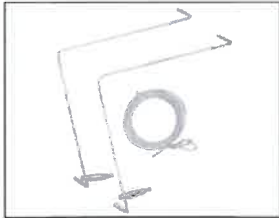
HANGER CHAIN
36" chain with Y hanger.

Order as:
HC36



Z SPRING HANGER
Snap 'n' lock design requires no fasteners and can be used on T-grid ceiling or universal mounting systems.

Order as:
ZSPRG



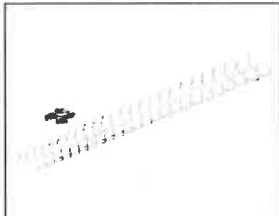
ZACVH HANGER
10' Aircraft cable with Y hanger.

Order as:
ZACVH



ANGLE MOUNTING BRACKET
Luma-tilt™ angle bracket ships as a pair

Order as:
ZLANGBKT



WIRE GUARD

Order as:
WGZ24
WGZ48

KSA LIGHTING & CONTROLS	Project 18-12155 Brummitt Elementary School Submitted By KSA LIGHTING INC	Catalog Number WST LED P3 40K VF MVOLT E7WC DDBXD Notes	Type EA
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WST LED Architectural Wall Sconce



Catalog Number	
Notes	
Type	

Hit the Tab key or mouse over this page to see all interactive elements.

Specifications

Luminaire

Height: 8-1/2"
(21.59 cm)

Width: 17"
(43.18 cm)

Depth: 10-3/16"
(25.9 cm)

Weight: 20 lbs
(9.1 kg)

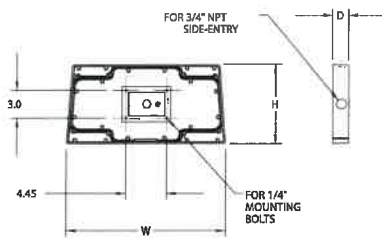


Optional Back Box (PBBW)

Height: 4"
(10.2 cm)

Width: 5-1/2"
(14.0 cm)

Depth: 1-1/2"
(3.8 cm)

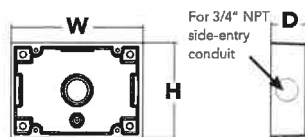


Optional Back Box (BBW)

Height: 4"
(10.2 cm)

Width: 5-1/2"
(14.0 cm)

Depth: 1-1/2"
(3.8 cm)



A+ Capable Luminaire

This item is an A+ capable luminaire, which has been designed and tested to provide consistent color appearance and system-level interoperability.

- All configurations of this luminaire meet the Acuity Brands' specification for chromatic consistency
- This luminaire is A+ Certified when ordered with DTL® controls marked by a shaded background. DTL DLL equipped luminaires meet the A+ specification for luminaire to photocontrol interoperability¹
- This luminaire is part of an A+ Certified solution for ROAM® or XPoint™ Wireless control networks, providing out-of-the-box control compatibility with simple commissioning, when ordered with drivers and control options marked by a shaded background¹

To learn more about A+, visit www.acuitybrands.com/aplus.

See ordering tree for details.

A+ Certified Solutions for ROAM require the order of one ROAM node per luminaire. Sold Separately: [Link to Roam](#); [Link to DTL DLL](#)

KSA LIGHTING & CONTROLS	Project 18-12155 Brummitt Elementary School Submitted By KSA LIGHTING INC	Catalog Number WST LED P3 40K VF MVOLT E7WC DDBXD Notes	Type EA
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A+ Capable options indicated by this color background.

Ordering Information

EXAMPLE: WST LED P1 40K VF MVOLT DDBTXD

WST LED					
Series	Performance Package	Color temperature	Distribution	Voltage	Mounting
WST LED	P1 1,500 Lumen package	27K 2700 K	VF Visual comfort forward throw	MVOLT ¹ 277 ²	Shipped included
	P2 3,000 Lumen package	30K 3000 K	VW Visual comfort wide	120 ² 347 ²	(blank) Surface mounting bracket
	P3 6,000 Lumen package	40K 4000 K		208 ² 480 ²	Shipped separately
		50K 5000 K		240 ²	BBW Surface-mounted back box ³ PBBW Premium surface-mounted back box ^{3,4}

Options			Finish (required)
PE Photoelectric cell, button type ⁵	E7WC Emergency battery backup, Non CEC compliant (cold, 7W) ^{10,11}	DDBXD Dark bronze	
PER NEMA twist-lock receptacle only (controls ordered separate) ⁶	E7WHR Remote emergency battery backup, Non CEC compliant (remote 7W) ^{10,12}	DBLXD Black	
PER5 Five-wire receptacle only (controls ordered separate) ⁶	E20WH Emergency battery pack 18W constant power, CEC compliant ¹⁰	DNAXD Natural aluminum	
PER7 Seven-wire receptacle only (controls ordered separate) ⁶	E20WC Emergency battery pack -20°C 18W constant power, CEC compliant ^{10,11}	DWHXD White	
PIR Motion/Ambient Light Sensor, 8-15' mounting height ^{2,8}	E23WHR Remote emergency battery backup, Non CEC compliant (remote 20W) ^{10,11,13}	DSSXD Sandstone	
PIR1FC3V Motion/ambient sensor, 8-15' mounting height, ambient sensor enabled at 1fc ^{2,8}	LCE Left side conduit entry ¹⁴	DDBTXD Textured dark bronze	
PIR180 Motion/ambient light sensor, 15-30' mounting height ^{2,8}	RCE Right side conduit entry ¹⁴	DBLBXD Textured black	
PIR180FC3V Motion/ambient sensor, 15-30' mounting height, ambient sensor enabled at 1fc ^{2,8}		DNATXD Textured natural aluminum	
SF Single fuse (120, 277, 347V) ⁹		DWHGXD Textured white	
DF Double fuse (208, 240, 480V) ⁹		DSSTXD Textured sandstone	
DS Dual switching ⁹			
E7WH Emergency battery backup, Non CEC compliant (7W) ¹⁰			
	Shipped separately		
	RBPW Retrofit back plate ³		
	VG Vandal guard ¹⁵		
	WG Wire guard ¹⁵		

Accessories

Ordered and shipped separately.

WSTVCPBBW DDBXD U	Premium Surface - mounted back box
WS8BW DDBTX U	Surface - mounted back box
RBPW DDBXD U	Retrofit back plate

NOTES

- MVOLT driver operates on any line voltage from 120-277V (50/60 Hz).
- Single fuse (SF) requires 120V, 277V or 347V. Double fuse (DF) requires 208V, 240V or 480V.
- Also available as a separate accessory; see accessories information.
- Top conduit entry standard.
- Need to specify 120, 208, 240 or 277 voltage.
- Photocell ordered and shipped as a separate line item from Acuity Brands Controls. Shorting Cap included.
- Not available with VG or WG. See PER Table.

- Reference Motion Sensor table.
- Not available with Emergency options, PE or PER options.
- Not available with 347/480V.
- Battery pack rated for -20° to 40°C.
- Comes with PBBW.
- Warranty period is 3-years.
- Not available with BBW.
- Must order with fixture; not an accessory.

Emergency Battery Operation

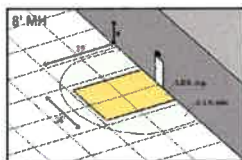
The emergency battery backup is integral to the luminaire — no external housing required! This design provides reliable emergency operation while maintaining the aesthetics of the product.

All emergency backup configurations include an independent secondary driver with an integral relay to immediately detect AC power loss, meeting interpretations of NFPA 70/NEC 2008 - 700.16

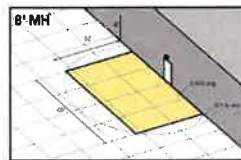
The emergency battery will power the luminaire for a minimum duration of 90 minutes (maximum duration of three hours) from the time supply power is lost, per International Building Code Section 1006 and NFPA 101 Life Safety Code Section 7.9, provided luminaires are mounted at an appropriate height and illuminate an open space with no major obstructions.

The examples below show illuminance of 1 fc average and 0.1 fc minimum of the P1 power package and VF distribution product in emergency mode.

10' x 10' Gridlines
8' and 12' Mounting Height



WST LED P1 27K VF MVOLT E7WH



WST LED P2 40K VF MVOLT E20WH



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WST-LED
Rev. 11/01/17

<div>KSA</div> <div>LIGHTING & CONTROLS</div>	Project 18-12155 Brummitt Elementary School	Catalog Number WST LED P3 40K VF MVOLT E7WC DDBXD	Type EA
	Submitted By KSA LIGHTING INC	Notes	

Performance Data

Lumen Ambient Temperature (LAT) Multipliers

Use these factors to determine relative lumen output for average ambient temperatures from 0-40°C (32-104°F).

Ambient	Lumen Multiplier
0°C 32°F	1.03
10°C 50°F	1.02
20°C 68°F	1.01
25°C 77°F	1.00
30°C 86°F	0.99
40°C 104°F	0.98

Electrical Load

Performance package	System Watts	Current (A)					
		120	208	240	277	347	480
P1	11	0.1	0.06	0.05	0.04	—	—
	14	—	—	—	—	0.04	0.03
P1 DS	14	0.12	0.07	0.06	0.06	—	—
P2	25	0.21	0.13	0.11	0.1	—	—
	30	—	—	—	—	0.09	0.06
P2 DS	25	0.21	0.13	0.11	0.1	—	—
P3	50	0.42	0.24	0.21	0.19	—	—
	56	—	—	—	—	0.16	0.12
P3 DS	52	0.43	0.26	0.23	0.21	—	—

Projected LED Lumen Maintenance

Values calculated according to IESNA TM-21-11 methodology and valid up to 40°C.

Operating Hours	0	25,000	50,000	100,000
Lumen Maintenance Factor	1.0	>0.95	>0.92	>0.87

Motion Sensor Default Settings

Option	Dimmed State	High Level (when triggered)	Photocell Operation	Ramp-up Time	Dwell Time	Ramp-down Time
*PIR or PIRH	3V (37%) Output	10V (100%) Output	Enabled @ 5FC	3 sec	5 min	5 min
PIR1FC3V or PIRH1FC3V	3V (37%) Output	10V (100%) Output	Enabled @ 1FC	3 sec	5 min	5 min

*for use with centralize Dusk to Dawn

PER Table

Control	PER (3 wire)	PER5 (5 wire)		PER7 (7 wire)		
			Wire 4/Wire5		Wire 4/Wire5	Wire 6/Wire7
Photocontrol Only (On/Off)	✓	⚠	Wired to dimming leads on driver	⚠	Wired to dimming leads on driver	Wires Capped inside fixture
ROAM	⚠	✓	Wired to dimming leads on driver	⚠	Wired to dimming leads on driver	Wires Capped inside fixture
ROAM with Motion	⚠	⚠	Wired to dimming leads on driver	⚠	Wired to dimming leads on driver	Wires Capped inside fixture
Futureproof*	⚠	⚠	Wired to dimming leads on driver	✓	Wired to dimming leads on driver	Wires Capped inside fixture
Futureproof* with Motion	⚠	⚠	Wired to dimming leads on driver	✓	Wired to dimming leads on driver	Wires Capped inside fixture

- ✓ Recommended
- ⚠ Will not work
- ⚠ Alternate


*Futureproof means: Ability to change controls in the future.

Lumen Output

Lumen values are from photometric tests performed in accordance with IESNA LM-79-08. Data is considered to be representative of the configurations shown, within the tolerances allowed by Lighting Facts.

Performance Package	System Watts (MVOLT*)	Dist. Type	27K (2700K, 70 CRI)					30K (3000K, 70 CRI)					40K (4000K, 70 CRI)					50K (5000K, 70 CRI)				
			Lumens	B	U	G	LPW	Lumens	B	U	G	LPW	Lumens	B	U	G	LPW	Lumens	B	U	G	LPW
P1	12W	VF	1,494	0	0	0	125	1,529	0	0	0	127	1,639	0	0	0	137	1,639	0	0	0	137
		VW	1,513	0	0	0	126	1,548	0	0	0	129	1,659	0	0	0	138	1,660	0	0	0	138
P2	25W	VF	3,163	1	0	1	127	3,237	1	0	1	129	3,469	1	0	1	139	3,468	1	0	1	139
		VW	3,201	1	0	0	128	3,276	1	0	0	131	3,512	1	0	0	140	3,512	1	0	0	140
P3	50W	VF	6,025	1	0	1	121	6,165	1	0	1	123	6,609	1	0	1	132	6,607	1	0	1	132
		VW	6,098	1	0	1	122	6,240	1	0	1	125	6,689	1	0	1	134	6,691	1	0	1	134

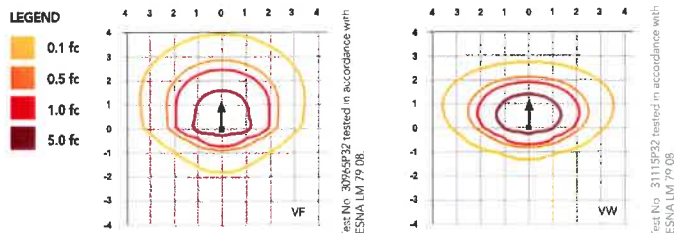


	Project 18-12155 Brummitt Elementary School Submitted By KSA LIGHTING INC	Catalog Number WST LED P3 40K VF MVOLT E7WC DDBXD Notes	Type EA
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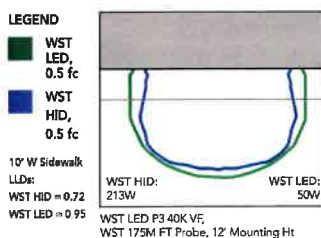
Photometric Diagrams

To see complete photometric reports or download .ies files for this product, visit Lithonia Lighting's [WST LED homepage](#).

Isofootcandle plots for the WST LED P3 40K VF and VW. Distances are in units of mounting height (10').



Distribution overlay comparison to 175W metal halide.



FEATURES & SPECIFICATIONS

INTENDED USE

The classic architectural shape of the WST LED was designed for applications such as hospitals, schools, malls, restaurants, and commercial buildings. The long life LEDs and driver make this luminaire nearly maintenance-free.

CONSTRUCTION

The single-piece die-cast aluminum housing integrates secondary heat sinks to optimize thermal transfer from the internal light engine heat sinks and promote long life. The driver is mounted in direct contact with the casting for a low operating temperature and long life. The die-cast door frame is fully gasketed with a one-piece solid silicone gasket to keep out moisture and dust, providing an IP65 rating for the luminaire.

FINISH

Exterior parts are protected by a zinc-infused Super Durable TGIC thermoset powder coat finish that provides superior resistance to corrosion and weathering. A tightly controlled multi-stage process ensures a minimum 3 mils thickness for a finish that can withstand extreme climate changes without cracking or peeling. Standard Super Durable colors include dark bronze, black, natural aluminum, sandstone and white. Available in textured and non-textured finishes.

OPTICS

Well crafted reflector optics allow the light engine to be recessed within the luminaire, providing visual comfort, superior distribution, uniformity, and spacing in wall-mount applications. The WST LED has zero uplight and qualifies as a Nighttime Friendly™ product, meaning it is consistent with the LEED® and Green Globes™ criteria for eliminating wasteful uplight.

ELECTRICAL

Light engine(s) consist of 98 high-efficacy LEDs mounted to a metal core circuit board and integral aluminum heat sinks to maximize heat dissipation and promote long life (100,000 hrs at 40°C, L87). Class 2 electronic driver has a power factor >90%, THD <20%. Easily-serviceable surge protection device meets a minimum Category B (per ANSI/IEEE C62.41.2).

INSTALLATION

A universal mounting plate with integral mounting support arms allows the fixture to hinge down for easy access while making wiring connections.

LISTINGS

CSA certified to U.S. and Canadian standards. Luminaire is IP65 rated. PIR and back box options are rated for wet location. Rated for -30°C to 40°C ambient.

DesignLights Consortium® (DLC) Premium qualified product. Not all versions of this product may be DLC Premium qualified. Please check the DLC Qualified Products List at www.designlights.org/QPL to confirm which versions are qualified.

WARRANTY

5-year limited warranty. Complete warranty terms located at: www.acuitybrands.com/CustomerResources/Terms_and_conditions.aspx.

Note: Actual performance may differ as a result of end-user environment and application. All values are design or typical values, measured under laboratory conditions at 25 °C. Specifications subject to change without notice.

KSA LIGHTING & CONTROLS	Project 18-12155 Brummitt Elementary School Submitted By KSA LIGHTING INC	Catalog Number LE S W 1 G EL N Notes	Type XA
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FEATURES & SPECIFICATIONS

INTENDED USE — Ideal for applications requiring attractive die-cast aluminum signage, superior illumination and low energy consumption.

CONSTRUCTION — Precision-molded, die-cast aluminum construction — ultra-slim, compact housing. Fine-grain brushed aluminum faceplate with matte black electrostatic polymeric trim. Clear lacquer finish on brushed face inhibits fingerprints and other surface contaminants.

All electronics located inside housing.

Fully overlapping light seal prevents light leaks. Universal directional chevron knockouts are completely concealed and easily removed. Hinged faceplate and spring latches for easy lamp compartment access, no exposed hardware.

Letters 6" high with 3/4" stroke, with 100 ft viewing distance rating, based upon UL924 standards.

U.S. Patent No. 5,739,639, 5,954,423 and 6,502,044. Canada Patent No. 2,204,218. Other patents pending.

OPTICS — Lamp is constructed using new LED technology. Provides perfectly uniform illumination to meet 3/4" letter stroke required by code.

The typical life of the exit LED lamp is 10 years, based on continuous operation. Unique LED lamp platform accommodates both single-face and double-face exits.

Low energy consumption — red exit consumes std. .81W, 1.3W (120V), green exit consumes std is 1W, 1.5W (120V). Universal input voltage capabilities (120V through 277V, 50 or 60 HZ).

ELECTRICAL — Solid-state electronic elements to eliminate risk of electromechanical failures.

Surge protection meets ANSI/IEEE C62.41 category B and IEC 1000 immunity standards for high voltage surges, electrostatic discharges, high frequency electrical fast transients and line voltage dips/swells.

Emergency Operation (for EL N option only): Battery: Sealed, maintenance-free nickel-cadmium battery delivers 90 minutes capacity to lamp.

Self-diagnostics (SD option only): Two-state constant-current charger maximizes battery life and automatically recharges after battery discharge. Test switch provided for manual testing.

Self-diagnostic testing for five minutes every 30 days, 30 minutes at 180-day interval, and 90 minutes annually.

Diagnostic evaluation of LED light source, AC to DC transfer, charging and battery condition.

Continuously monitors AC functionality.

Low voltage disconnect prevents excessive deep discharge that can permanently damage the battery.

Single-point microcomputer control for all electronic features.

Crystal oscillator timing system with watchdog protection for precision accuracy.

AC/LVD reset allows battery connection before AC power is applied and prevents battery damage from deep discharge.

Brownout protection is automatically switched to emergency mode when supply voltage drops below 80% of nominal.

Single multi-chromatic LED indicator to display two-state charging, test activation and three-state diagnostic status.

Test switch provides manual activation of 30-second diagnostic testing for on-demand visual inspection.

Catalog Number
Notes
Type



LE surface



LRE recessed



Die-Cast Aluminum Exits

LE and LRE



INSTALLATION — Universal mounting (top, end or back). Double face available with top or end mounting only. LRE: Trim ring has 3/4" depth adjustment to ensure a flush fit against the surface. Protrudes 1/10" from the surface. No exposed hardware.

Die-cast aluminum canopy provided for surface mount only.

LISTINGS — UL damp location listed 50°F - 104°F (10°C - 40°C). Meets UL 924, NFPA 101 (current Life Safety Code), NEC and OSHA illumination standards. North Carolina Department of Insurance. NEMA Premium certified.

WARRANTY — 5-year limited warranty. (Battery is prorated.) Complete warranty terms located at www.acuitybrands.com/CustomerResources/Terms_and_conditions

Actual performance may differ as a result of end-user environment and application.

All values are design or typical values, measured under laboratory conditions at 25 °C.

Note: Specifications subject to change without notice.

ORDERING INFORMATION

For shortest lead times, configure products using **bolded options**.

Example: LE S 1 R EL N SD

Series	Face type	Housing color	Number of faces	Letter color	Input voltage	Operation	Options
LE LED, surface mount	S Stencil P Panel ¹	(blank) Matte black, brushed aluminum face BZ Dark bronze W White B Matte black	1 Single face 2 Double face ²	R Red G Green	(blank) Universal input voltage (120-277V, 50 or 60 HZ)	(blank) AC only EL N Nickel-cadmium battery back-up X2 Lamp wired on two separate AC circuits ³	(blank) None TP Two tamper proof Torx-head screws VR Vandal-resistant shield (1/8" thick polycarbonate) ⁴ FI FA Field selectable fire alarm interface or flashing emergency operation with intermittent audible alarm (one flash per minute) ⁵ FI Fire alarm flashing interface ⁶ FA Flashing emergency operation and intermittent audible alarm ⁷ SD Self-diagnostics ⁷
LRE LED, recessed							

Accessories: Order as separate catalog number.

ELA US12	12" stem kit (see spec sheet ELA-StemKits) ^{2,4}	ELA LEHO 120/277 N	Remote-capable exit with black canopy; provides 90 minutes of 11.1W capacity for remote head (see spec sheet ELA-LEHO) ^{2,4}
ELA WG1	Back-mount wire guard (see spec sheet ELA-WG) ²		
ELA WGEXT	Top-mount wire guard (see spec sheet ELA-WG) ²	ELA ERK	Recess mounting rough-in kit for LRE only (see spec sheet ELA-ERK)
ELA WGEXE	End-mount wire guard (see spec sheet ELA-WG) ²		

Notes

- Panel face available for special wording only (see Custom Signage spec sheet).
- Not available with LRE models.
- UL Listed as emergency lighting.
- VR contains tamper proof screws.
- Available with SD option only.
- Available with AC only or EL N operation only.
- Available with EL N option only.
- Add W for white.

KSA LIGHTING & CONTROLS	Project 18-12155 Brummitt Elementary School Submitted By KSA LIGHTING INC	Catalog Number LE S W 1 G EL N Notes	Type XA
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LE-LRE LED, Signature

SPECIFICATIONS

ELECTRICAL				
Primary circuit				
Type	Typical LED life ¹	Supply voltage	Input watts	Max. amps
Red LED AC only	10 Years	120	0.81	0.05
		277	1.2	0.06
Green LED AC only	10 Years	120	1.05	0.05
		277	1.32	0.06
Red LED emergency	10 Years	120	1.3	0.06
		277	1.4	0.07
Green LED emergency	10 Years	120	1.5	0.07
		277	1.7	0.07

BATTERY			
Sealed Nickel-Cadmium			
Shelf life ²	Typical life ²	Maintenance ³	Optimum temperature ⁴
3 years	7-9 years	none	50°F – 104°F (10°C – 40°C)

Notes

- The typical life of the exit LED lamp is 10 years, based on continuous operation.
- At 77°F (25°C).
- All life safety equipment, including emergency lighting for path of egress must be maintained, serviced, and tested in accordance with all National Fire Protection Association (NFPA) and local codes. Failure to perform the required maintenance, service, or testing could jeopardize the safety of occupants and will void all warranties.
- Optimum ambient temperature range where unit will provide capacity for 90 minutes. Higher and lower temperatures affect life and capacity.

SELF-DIAGNOSTICS

(SD option only)

- Five-minute test every 30 days
- 30-minute test every six months
- 90-minute test annually
- Diagnostics evaluate the battery, lamp, charger and AC to DC transfer.

Condition	Indication
Normal mode	Steady green
Self-testing	Flashing green
Emergency mode	Off
Hi-charge	Steady red
Battery failure	Single-flash red
Lamp failure	Double-flash red
Circuit failure	Triple-flash red

KEY FEATURE

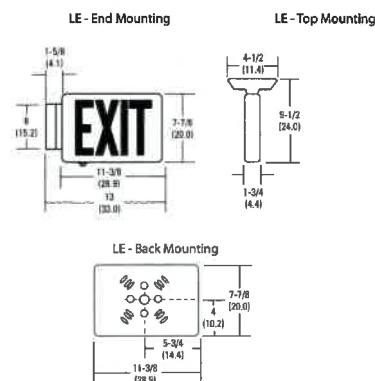


The typical life of the exit LED lamp is 10 years.

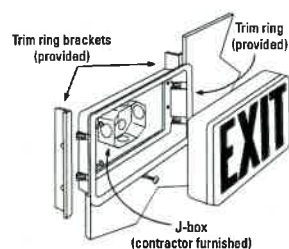
MOUNTING

All dimensions are in inches (centimeters). For VR option, add 1/4" to height and width. Add 1/8" depth for single face; 1/4" depth for double face.

Shipping weight: LE - 4 lbs (1.8 kgs)
LE EL N - 5 lbs (2.3 kgs)
LRE - 4 lbs (1.8 kgs)
LRE EL N - 5 lbs (2.3 kgs)

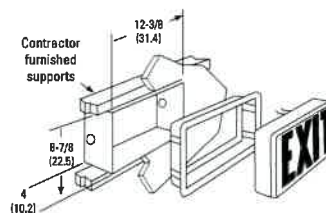


STANDARD MOUNTING



Wall opening dimensions: 8-3/4" H x 12-3/8" W x 1-3/4" D

MOUNTING WITH OPTIONAL ROUGH-IN KIT (ELA ERK)



Wall opening dimensions: 8-7/8" H x 12-3/8" W x 4" D

A+ Datacomm, Inc.

Low Voltage Equipment

Per building existing systems & Plans

*Submittal folder:
Circle "R" Electric, Inc.
5740 Central Avenue
Portage, IN 46368*

**For:
Duneland School Corporation
2018 Renovations
Brummit Elementary School**

5740 CENTAL AVENUE, PORTAGE, INDIANA 46368
PHONE (219) 472-1644
FAX (219) 979-2088

A+ Datacomm, Inc.

Low Voltage Systems

Fire Alarm

5740 CENTAL AVENUE, PORTAGE, INDIANA 46368
PHONE (219) 472-1644
FAX (219) 979-2088

NFS-320

Intelligent Addressable Fire Alarm System



Intelligent Fire Alarm Control Panels

General

The NFS-320 intelligent Fire Alarm Control Panel is part of the ONYX® Series of Fire Alarm Controls from NOTIFIER.

In stand-alone or network configurations, ONYX Series products meet virtually every application requirement.

The NFS-320's modular design makes system planning easier. The panel can be configured with just a few devices for small building applications, or networked with many devices to protect a large campus or a high-rise office block. Simply add additional peripheral equipment to suit the application. Wireless fire protection can be added with the SWIFT wireless gateway and devices.

For installations using NFS-320C, an optional ACM Series annunciator can be mounted in the same cabinet (up to 48 zones/points, order separately; see DN-60085).

NOTE: Unless called out with a version-specific "R", "C" or "E" at the end of the part number, "NFS-320" refers to models NFS-320, NFS-320R, NFS-320C, and NFS-320E.



NFS-320

Features

- Certified for seismic applications when used with the appropriate seismic mounting kit.
- Approved for Marine applications when used with listed compatible equipment. See DN-60688.
- One isolated intelligent Signaling Line Circuit (SLC) Style 4, 6 or 7.
- Up to 159 detectors and 159 modules per SLC; 318 devices maximum.
 - Detectors can be any mix of ion, photo, thermal, or multi-sensor; wireless detectors are available for use with the FWSG.
 - Modules include addressable pull stations, normally open contact devices, two-wire smoke detectors, notification, or relay; wireless modules are available for use with the FWSG.
- Optional FWSG Wireless SWIFT Gateway supports wireless SLC devices.
- Standard 80-character display.
- Network options:
 - High-speed network for up to 200 nodes (NFS2-3030, NFS2-640, NFS-320(C), NFS-320SYS, NCA-2, DVC-EM, ONYX-Works, NFS-3030, NFS-640, and NCA).
 - Standard network for up to 103 nodes (NFS2-3030, NFS2-640, NFS-320(C), NFS-320SYS, NCA-2, DVC-EM, ONYX-Works, NCS, NFS-3030, NFS-640, NCA, AFP-200, AFP-300/400, AFP-1010, and AM2020). Up to 54 nodes when DVC-EM is used in network paging.
- 6.0 A power supply with four Class A/B built-in Notification Appliance Circuits (NAC). Selectable System Sensor, Wheelock, or Gentex strobe synchronization.
- Built-in Alarm, Trouble, Security, and Supervisory relays.
- VeriFire® Tools online or offline programming utility. Upload/Download, save, store, check, compare, and simulate panel databases. Upgrade panel firmware.
- Autoprogramming and Walk Test reports.
- Multiple central station communication options:
 - Standard UDACT
 - Internet
 - Internet/GSM
- 80-character remote annunciators (up to 32).
- EIA-485 annunciators, including custom graphics.
- Printer interface (80-column and 40-column printers).
- History file with 800-event capacity in nonvolatile memory, plus separate 200-event alarm-only file.

- Alarm Verification selection per point, with automatic counter.
- Presignal/Positive Alarm Sequence (PAS).
- Silence inhibit and Auto Silence timer options.
- NAC coding functions:
 - March time.
 - Temporal.
 - California two-stage coding.
 - Canadian two-stage.
 - Strobe synchronization.
- Field-programmable on panel or on PC with VeriFire® Tools program check, compare, simulate.
- Full QWERTY keypad.
- Battery charger supports 18 – 200 AH batteries.
- Non-alarm points for lower priority functions.
- Remote ACK/Signal Silence/System Reset/Drill via monitor modules.
- Automatic time control functions, with holiday exceptions.
- Extensive, built-in transient protection.
- Powerful Boolean logic equations.

FLASHSCAN® INTELLIGENT FEATURES

- Polls up to 318 devices in less than two seconds.
- Activates up to 159 outputs in less than five seconds.
- Multicolor LEDs blink device address during Walk Test.
- Fully digital, high-precision protocol (U.S. Patent 5,539,389).
- Manual sensitivity adjustment — up to nine levels.
- Pre-alarm ONYX intelligent sensing — up to nine levels.
- Day/Night automatic sensitivity adjustment.
- Sensitivity windows:
 - Ion — 0.5 to 2.5%/foot obscuration.
 - Photo — 0.5 to 2.35%/foot obscuration.
 - Laser (VIEW®) — 0.02 to 2.0%/foot obscuration.
 - Acclimate® Plus™ — 0.5 to 4.0%/foot obscuration.
 - IntelliQuad — 1.0 to 4.0%/foot obscuration.
 - IntelliQuad™ PLUS — 1.0 to 4.0%/foot obscuration.
- Drift compensation (U.S. Patent 5,764,142).
- Degraded mode — in the unlikely event that the NFS-320's primary microprocessor fails, FlashScan detectors revert to degraded operation and can activate the control panel's NAC circuits and alarm relay. Each of the four built-in panel circuits includes a Disable/Enable switch for this feature.

- Multi-detector algorithm involves nearby detectors in alarm decision (U.S. Patent 5,627,515).
- Automatic detector sensitivity testing (NFPA-72 compliant).
- Maintenance alert (two levels).
- Self-optimizing pre-alarm.

FSL-751 VIEW (VERY INTELLIGENT EARLY WARNING)

SMOKE DETECTION TECHNOLOGY

- Advanced ONYX intelligent sensing algorithms differentiate between smoke and non-smoke signals (U.S. Patent 5,831,524).
- Addressable operation pinpoints the fire location.
- Early warning performance comparable to the best aspiration systems at a fraction of the lifetime cost.

FAPT-851 ACCLIMATE® PLUS™

LOW-PROFILE INTELLIGENT MULTI-SENSOR

- Detector automatically adjusts sensitivity levels without operator intervention or programming. Sensitivity increases with heat.
- Microprocessor-based technology; combination photo and thermal technology.
- Low-temperature warning signal at 40°F ± 5°F (4.44°C ± 2.77°C).

FSC-851 INTELLIQUAD

ADVANCED MULTI-CRITERIA DETECTOR

- Detects all four major elements of a fire (smoke, heat, CO, and flame).
- Automatic drift compensation of smoke sensor and CO cell.
- High nuisance-alarm immunity.

INTELLIGENT FAAST® DETECTORS FSA-5000, FSA-8000, FSA-20000 AND FSA-20000P

- Connects directly to the SLC loop of compatible ONYX series panels.
- Provides five event thresholds that can be individually programmed with descriptive labels for control-by-event programming; uses five detector addresses.

- Uses patented particle separator and field-replaceable filter to remove contaminants.
- Advanced algorithms reject common nuisance conditions
- FSA-5000 covers 5,000 square feet through one pipe.
- FSA-8000 covers 8,000 square feet through one pipe.
- FSA-20000 covers 28,800 square feet through one to four pipes.
- FSA-20000P covers 28,800 square feet through one to four pipes. Supports addressable pipes to pinpoint location of alarm events.

FCO-851 INTELLIQUAD™ PLUS

ADVANCED MULTI-CRITERIA FIRE/CO DETECTOR

- Detects all four major elements of a fire.
- Separate signal for life-safety CO detection.
- Optional addressable sounder base for Temp-3 (fire) or Temp-4(CO) tone.
- Automatic drift compensation of smoke sensor and CO cell.
- High nuisance-alarm immunity.

SWIFT WIRELESS

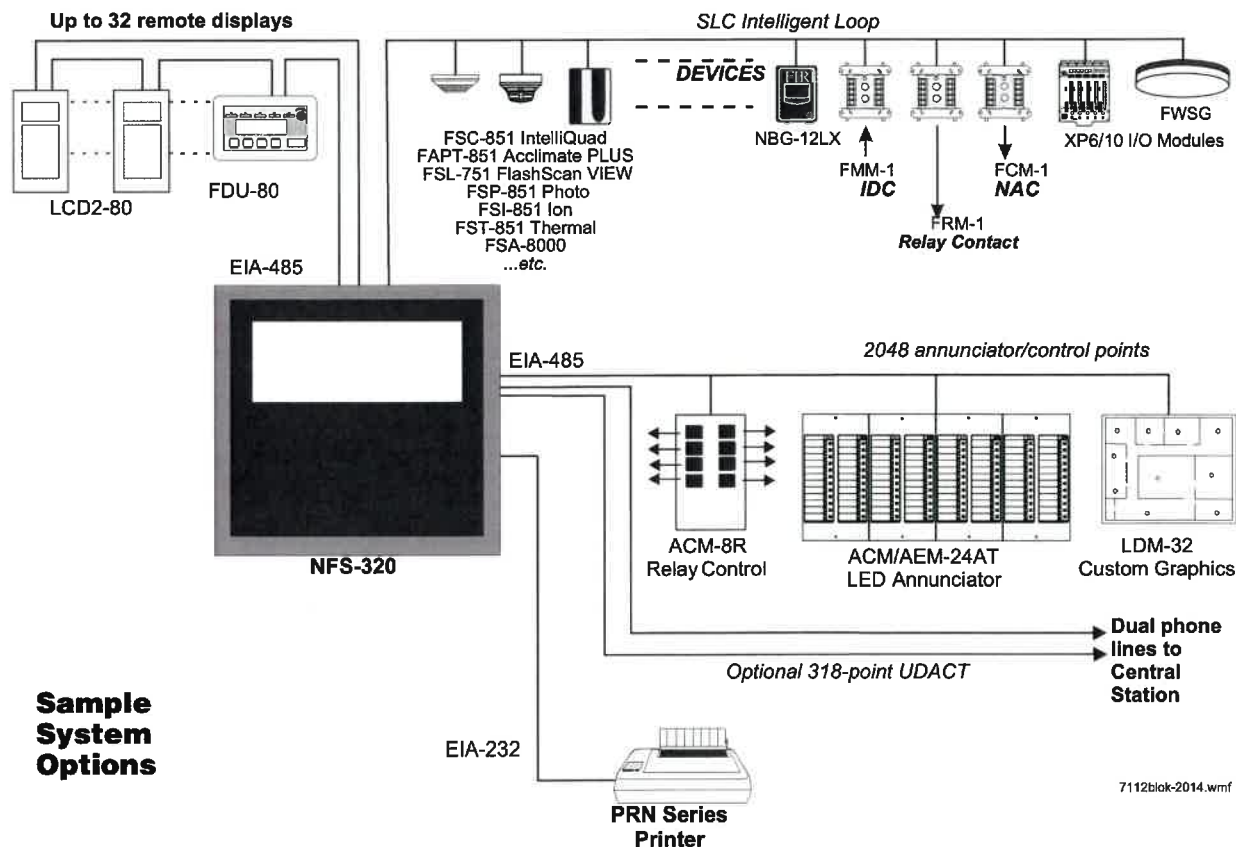
- Self-healing mesh wireless protocol.
- Each SWIFT Gateway supports up to 50 devices: 1 wireless gateway and up to 49 SWIFT devices.
- Up to 4 wireless gateways can be installed with overlapping network coverage.

RELEASING FEATURES

- Ten independent hazards.
- Sophisticated cross-zone (three options).
- Delay timer and Discharge timers (adjustable).
- Abort (four options).
- Low-pressure CO2 listed.

VOICE FEATURES

- Integrates with FirstCommand Series. See DN-60772.
- Telephone applications require NFC-FFT.



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HIGH-EFFICIENCY OFFLINE SWITCHING **3.0 A POWER SUPPLY (6.0 A IN ALARM)**

- 120 VAC (NFS-320/NFS-320C); 240 VAC (NFS-320E).
- Displays battery current/voltage on panel (with display).

FlashScan, Exclusive **World-Leading Detector Protocol**

At the heart of the NFS-320 is a set of detection devices and device protocol — FlashScan (U.S. Patent 5,539,389). FlashScan is an all-digital protocol that gives superior precision and high noise immunity.

In addition to providing quick identification of an active input device, this protocol can also activate many output devices in a fraction of the time required by competitive protocols. This high speed also allows the NFS-320 to have the largest device per loop capacity in the industry — 318 points — yet every input and output device is sampled in less than two seconds. The microprocessor-based FlashScan detectors have bicolor LEDs that can be coded to provide diagnostic information, such as device address during Walk Test.

ONYX Intelligent Sensing

Intelligent sensing is a set of software algorithms that provides the NFS-320 with industry-leading smoke detection capability. These complex algorithms require many calculations on each reading of each detector, and are made possible by the high-speed microcomputer used by the NFS-320.

Drift Compensation and Smoothing: Drift compensation allows the detector to retain its original ability to detect actual smoke, and resist false alarms, even as dirt accumulates. It reduces maintenance requirements by allowing the system to automatically perform the periodic sensitivity measurements required by NFPA 72. Smoothing filters are also provided by software to remove transient noise signals, such as those caused by electrical interference.

Maintenance Warnings: When the drift compensation performed for a detector reaches a certain level, the performance of the detector may be compromised, and special warnings are given. There are three warning levels: (1) Low Chamber value; (2) Maintenance Alert, indicative of dust accumulation that is near but below the allowed limit; (3) Maintenance Urgent, indicative of dust accumulation above the allowed limit.

Sensitivity Adjust: Nine sensitivity levels are provided for alarm detection. These levels can be set manually, or can change automatically between day and night. Nine levels of pre-alarm sensitivity can also be selected, based on predetermined levels of alarm. Pre-alarm operation can be latching or self-restoring, and can be used to activate special control functions.

Self-Optimizing Pre-Alarm: Each detector may be set for "Self-Optimizing" pre-alarm. In this special mode, the detector "learns" its normal environment, measuring the peak analog readings over a long period of time, and setting the pre-alarm level just above these normal peaks.

Cooperating Multi-Detector Sensing: A patented feature of ONYX intelligent sensing is the ability of a smoke sensor to consider readings from nearby sensors in making alarm or pre-alarm decisions. Without statistical sacrifice in the ability to resist false alarms, it allows a sensor to increase its sensitivity to actual smoke by a factor of almost two to one.

Field Programming Options

Autoprogram is a timesaving feature. The FACP "learns" what devices are physically connected and automatically loads them in the program with default values for all parameters. Requiring less than one minute to run, this routine allows the user to have almost immediate fire protection in a new installation, even if only a portion of the detectors are installed.

Keypad Program Edit (with KDM-R2) The NFS-320, like all NOTIFIER intelligent panels, has the exclusive feature of program creation and editing capability from the front panel keypad, while continuing to provide fire protection. The architecture of the NFS-320 software is such that each point entry carries its own program,

including control-by-event links to other points. This allows the program to be entered with independent per-point segments, while the NFS-320 simultaneously monitors other (already installed) points for alarm conditions.

VeriFire® Tools is an offline programming and test utility that can greatly reduce installation programming time, and increase confidence in the site-specific software. It is Windows®-based and provides technologically advanced capabilities to aid the installer. The installer may create the entire program for the NFS-320 in the comfort of the office, test it, store a backup file, then bring it to the site and download from a laptop into the panel.

Placement of Equipment **in Chassis and Cabinet**

The following guidelines outline the NFS-320's flexible system design.

Wiring: When designing the cabinet layout, consider separation of power-limited and non-power-limited wiring as discussed in the *NFS-320 Installation Manual*.

It is critical that all mounting holes of the NFS-320 are secured with a screw or standoff to ensure continuity of Earth Ground.

Networking: If networking two or more control panels, each unit requires a Network Communication Module or High-Speed Network Communication Module (HS-NCM) can support two nodes; see "Networking Options" on page 4). These modules can be installed in any option board position (see manual), and additional option boards can be mounted in front of them.

KDM-R2 Controls and Indicators

Program Keypad: QWERTY type (keyboard layout).

12 LED Indicators: Power; Fire Alarm; Pre-Alarm; Security; Supervisory; System Trouble; Signals Silenced; Points Disabled; Control Active; Abort; Pre-Discharge; Discharge.

Keypad Switch Controls: Acknowledge/Scroll Display; Signal Silence; Drill; System Reset; Lamp Test.

LCD Display: 80 characters (2 x 40) with long-life LED backlight.

Product Line Information

- "Configuration Guidelines" on page 3
- "Networking Options" on page 4
- "Auxiliary Power Supplies and Batteries" on page 4
- "Audio Options" on page 4
- "Compatible Devices, EIA-232 Ports" on page 4
- "Compatible Devices, EIA-485 Ports" on page 4
- "Compatible Intelligent Devices" on page 4
- "Enclosures, Chassis, and Dress Plates" on page 5
- "Other Options" on page 5

CONFIGURATION GUIDELINES

The NFS-320 system ships assembled; description and some options follow. See "Enclosures, Chassis, and Dress Plates" on page 5 for information about mounting peripherals.

NOTE: Stand-alone and network systems require a main display. On stand-alone systems, the panel's keypad provides the required display. On network systems (two or more networked fire panel nodes), at least one NCA-2, NCS, or ONYXWorks annunciation device is required. (For NCA-2, see DN-7047.)

NFS-320: The standard, factory-assembled NFS-320 system includes the following components: one control panel mounted on chassis (120 V operation — ships with grounding cable, battery interconnect cables, and document kit); includes integral power supply mounted to the main circuit board; one primary display KDM-R2 keypad/display; and one cabinet for surface or semi-flush mounting. Purchase batteries separately. One or two option boards may be mounted inside the NFS-320 cabinet; additional option boards can be used in remote cabinets. (Non-English versions also available. NFS-320-SP, NFS-320-PO.)

NFS-320R: Same as NFS-320, but in red enclosure.

NFS-320C: Based on NFS-320 above. NFS-320C supports installation of an optional ACM-series annunciator in the same cabinet. UL- and ULC-listed. (Non-English version also available: NFS-320C-FR.) For NFS-320C, see DN-60085.

NFS-320CR: Same as NFS-320C but in a red enclosure. For NFS-320C, see DN-60085.

NFS-320E: Same as NFS-320, but with 240 V operation. (Non-English versions also available. NFS-320E-SF, NFS-320E-PO.)

TR-320: Trim ring for the NFS-320 cabinet.

NETWORKING OPTIONS

NCM-W, NCM-F: Standard Network Communications Modules. Wire and multi-mode fiber versions available. See DN-6861.

HS-NCM-W/MF/SF/WMF/WSF/MFSF: High-speed Network Communications Modules. Wire, single-mode fiber, multi-mode fiber, and media conversion models are available. See DN-60454.

RPT-W, RPT-F, RPT-WF: Standard-network repeater board with wire connection (RPT-W), multi-mode fiber connection (RPT-F), or allowing a change in media type between wire and fiber (RPT-WF). Not used with high-speed networks. See DN-6971.

ONYXWorks: UL-listed graphics PC workstation, software, and computer hardware. See DN-7048 for specific part numbers.

NFN-GW-EM-3: NFN Gateway, embedded. See DN-60499.

NWS-3: NOTI-FIRE-NET™ Web Server. See DN-6928.

CAP-GW: Common Alerting Protocol Gateway. See DN-60756.

VESDA-HLI-GW: VESDAnet high-level interface gateway. See DN-60753.

LED SIGN-GW: UL-listed sign gateway. Interfaces with classic and high-speed NOTI-FIRE-NET networks through the NFN Gateway. See DN-60679.

OAX2-24V: UL-listed LED sign, used with LED SIGN-GW. See DN-60679.

AUXILIARY POWER SUPPLIES AND BATTERIES

ACPS-610: 6.0 A or 10.0 A addressable charging power supply. See DN-60244.

APS2-6R: Auxiliary Power Supply. Provides up to 6.0 amperes of power for peripheral devices. Includes battery input and transfer relay, and overcurrent protection. Mounts on two of four positions on a CHS-4L or CHS-4 chassis. See DN-5952.

FCPS-24S6/S8: Remote 6 A and 8 A power supplies with battery charger. See DN-6927.

BAT Series: Batteries. NFS-320 uses two 12 volt, 18 to 200 AH batteries. See DN-6933.

AUDIO OPTIONS

NFC-50/100: 25 watt, 25 VRMS, emergency Voice Evacuation Control Panel (VECP) with integral commercial microphone, digital message generator, and Class A or Class B speaker circuits. See DN-60772.

COMPATIBLE DEVICES, EIA-232 PORTS

PRN-7: 80-column printer. See DN-60897.

VS4095/5: Printer, 40-column, 24 V. Mounted in external backbox. See DN-3260.

DPI-232: Direct Panel Interface, specialized modem for extending serial data links to remotely located FACPs and/or peripherals; mount on NFS-320 chassis. See DN-6870.

COMPATIBLE DEVICES, EIA-485 PORTS

ACM-24AT: ONYX Series ACS annunciator – up to 96 points of annunciation with Alarm or Active LED, Trouble LED, and switch per circuit. Active/Alarm LEDs can be programmed (by powered-up switch selection) by point to be red, green, or yellow; the Trouble LED is always yellow. See DN-6862.

AEM-24AT: Same LED and switch capabilities as ACM-24AT, expands the ACM-24AT to 48, 72, or 96 points. See DN-6862.

ACM-48A: ONYX Series ACS annunciator – up to 96 points of annunciation with Alarm or Active LED per circuit. Active/Alarm LEDs can be programmed (by powered-up switch selection) in groups of 24 to be red, green, or yellow. Expandable to 96 points with one AEM-48A. See DN-6862.

AEM-48A: Same LED capabilities as ACM-48A, expands the ACM-48A to 96 points. See DN-6862.

ACM-8R: Remote Relay Module with eight Form-C contacts. Can be located up to 6,000 ft. (1828.8 m) from panel on four wires. See DN-3558.

FDU-80: Terminal mode. 80-character, backlit LCD display. Mounts up to 6,000 ft. (1828.8 m) from panel. Up to 32 per FACP. See DN-6820.

LCD2-80: Terminal and ACS mode. 80-character, backlit LCD display. Mounts up to 6,000 ft. (1828.8 m) from panel. Up to 32 per FACP. See DN-60548.

LDM: Lamp Driver Modules LDM-32, LDM-E32, and LDM-R32; remote custom driver modules. See DN-0551.

SCS: Smoke control stations SCS-8, SCE-8, with lamp drivers SCS-8L, SCE-8L; eight (expandable to 16) circuits (HVAC only). See DN-4818.

TM-4: Transmitter Module. Includes three reverse-polarity circuits and one municipal box circuit; mount on NFS-320 chassis or remotely. See DN-6860.

UDACT-2: Universal Digital Alarm Communicator Transmitter, 636 channel. See DN-60686.

UZX-256: Programmable Universal Zone Coder provides positive non-interfering successive zone coding. Microprocessor-controlled, field-programmable from IBM®-compatible PCs (requires optional programming kit). Mounts in BB-UZX. See DN-3404.

COMPATIBLE INTELLIGENT DEVICES

NOTE: “A” suffix indicates ULC-Listed model:

FWSG Wireless SWIFT Gateway: Addressable gateway supports wireless SLC devices. Not appropriate for ULC applications. See DN-60820.

FSA-5000: Intelligent FFAST® XS Fire Alarm Aspiration Sensing Technology. Intelligent aspirating smoke detector for applications up to 5,000 sq.ft. For Canadian applications, order FSA-5000A.

FSA-8000: Intelligent FFAST® XM Fire Alarm Aspiration Sensing Technology. Intelligent aspirating smoke detector for applications up to 8,000 sq.ft. For Canadian applications, order FSA-8000A. See DN-60792

FSA-20000: Intelligent FFAST® XT Fire Alarm Aspiration Sensing Technology. Intelligent aspirating smoke detector for applications up to 28,800 sq.ft. For Canadian applications, order FSA-20000A. See DN-60849.

FSA-20000P FFAST® XT PRO Intelligent Aspiration Detector For applications up to 28,800 sq. ft. (2601 sq. m.) through one to four addressable pipes. See DN-60792

FSB-200(A): Intelligent beam smoke detector. See DN-6985.

FSB-200S(A): Intelligent beam smoke detector with integral sensitivity test. See DN-6985

FSC-851(A): FlashScan IntelliQuad Advanced Multi-Criteria Detector. See DN-60412.

FCO-851(A): FlashScan IntelliQuad PLUS Advanced Multi-Criteria Fire/CO Detector. See DN-60689.

FSI-851(A): Low-profile FlashScan ionization detector. See DN-6934.

FSP-851(A): Low-profile FlashScan photoelectric detector. See DN-6935.

FSP-851T(A): Low-profile FlashScan photoelectric detector with 135°F (57°C) thermal. See DN-6935.

FSP-851R(A): Remote-test capable photoelectric detector for use with DNR(W) duct detector housings. See DN-6935.

FST-851(A): FlashScan thermal detector 135°F (57°C). See DN-6936.

FST-851R(A): FlashScan thermal detector 135°F (57°C) with rate-of-rise. See DN-6936.

FST-851H(A): FlashScan 190°F (88°C) high-temperature thermal detector. See DN-6936.

FAPT-851(A): FlashScan Acclimate Plus low-profile multi-sensor detector. See DN-6937.

FSL-751(A): FlashScan VIEW laser photo detector. See DN-6886.

DNR(A): InnovairFlex low-flow non-relay duct-detector housing (order FSP-851R separately). Replaces FSD-751PL/FSD-751RPL. See DN-60429.

DNRW(A): Same as above with NEMA-4 rating, watertight. See DN-60429.

B224RB: Low-profile relay base. See DN-60054.

B224BI: Isolator base for low-profile detectors. See DN-60054.

B210LP: Low-profile base. Standard U.S. style. Replaces B710LP. See DN-60054.

B501(A): European-style, 4" (10.16 cm) base. See DN-60054.

B200S: Intelligent programmable sounder base, capable of producing a variety of tone patterns including ANSI Temporal 3. Compatible with synchronization protocol. See DN-60054.

B200S-LF: Low-frequency version of B200S. See DN-60054.

B200SR: Sounder base, Temporal 3 or Continuous tone. See DN-60054.

B200SR-LF: Low-frequency version of B200SR. See DN-60054.

FMM-1: FlashScan monitor module. See DN-6720.

FDM-1(A): FlashScan dual monitor module. See DN-6720.

FZM-1(A): FlashScan two-wire detector monitor module. See DN-6720.

FMM-101(A): FlashScan miniature monitor module. See DN-6720.

FCM-1(A): FlashScan control module. See DN-6724.

FCM-1-REL(A): FlashScan releasing control module. See DN-60390.

FRM-1(A): FlashScan relay module. See DN-6724.

FDRM-1(A): FlashScan dual monitor/dual relay module. See DN-60709.

NBG-12LX: Manual pull station, addressable. See DN-6726.

ISO-X: Isolator module. See DN-2243.

ISO-6: Six Fault isolator module. For Canadian applications order ISO-6A. See DN-60844.

XP6-C(A): FlashScan six-circuit supervised control module. See DN-6924.

XP6-MA(A): FlashScan six-zone interface module; connects intelligent alarm system to two-wire conventional detection zone. See DN-6925.

XP6-R(A): FlashScan six-relay (Form-C) control module. See DN-6926.

XP10-M(A): FlashScan ten-input monitor module. See DN-6923.

SLC-IM: SLC integration module, for VESDAnet detectors. See DN-60755.

ENCLOSURES, CHASSIS, AND DRESS PLATES

CAB-BM Marine System: Protects equipment in shipboard and waterfront applications. Also order **BB-MB** for systems using 100 AH batteries. For a full list of required and optional equipment, see DN-60688.

BB-UZC: Backbox for housing the UZC-256. Required for NFS-320 applications. Black. For red, order BB-UZC-R.

NFS-LBB: Battery Box (required for batteries larger than 26 AH).

NFS-LBBR: Same as above, but red.

SEISKIT-320/B26: Seismic mounting kit. Required for seismic-certified applications with NFS-320 and BB-26. Includes battery bracket for two 26 AH batteries.

SEISKIT-BB25: Seismic mounting kit for the BB-25. Includes battery bracket for two 26 AH batteries.

SEISKIT-LBB: Seismic kit for the NFS-LBB. Includes battery bracket for two 55 AH batteries.

OTHER OPTIONS

411: Slave Digital Alarm Communicator. See DN-6619.

411UDAC: Digital Alarm Communicator. See DN-6746.

IPDACT-2/2UD, IPDACT Internet Monitoring Module: Connects to primary and secondary DACT telephone output ports for internet communications over customer-provided Ethernet connection. Requires compatible Teldat VisorALARM Central Station Receiver. Can use DHCP or static IP. See DN-60408.

IPSPLT: Y-adaptor option allow connection of both panel dialer outputs to one IPDACT-2/2UD cable input.

IPENC: External enclosure for IPDACT, includes IPBRKT mounting bracket; Red. For Black order **IPENC-B**.

IPGSM-4G: Internet and Digital Cellular Fire Alarm Communicator. Provides selectable configurable paths: cellular only, IP only, or IP primary with cellular backup. Connects to the primary and secondary ports of a DACT. See DN-60769.

BACKBOXES

NOTE: "C" suffix indicates ULC-Listed model:

ABF-1B Annunciator Flush Box.

ABF-1DB(C) Annunciator Flush Box with Door.

ABF-2B Annunciator Flush Box

ABF-2DB(C) Annunciator Flush Box with Door

ABF-4B Annunciator Flush Box

ABS-1TB(C) Annunciator Surface Box

ABS-1B(C) Annunciator Surface Box

ABS-2B Annunciator Surface Box

ABS-2D(C) Annunciator Surface Box

ABS-4D(C) Annunciator Surface Box

NFS-320-RB: Replacement board with central processing unit (CPU). **NOTE:** Keypad must be removed before shipping old unit out for repair.

- NFS-320-RBE: Replacement CPU, Export.
- NFS-320-RB-PO: Replacement CPU, Portuguese.
- NFS-320-RB-POE: Replacement CPU, Export, Portuguese.
- NFS-320-RBC-FR: Replacement CPU, Canadian French.
- NFS-320-RB-SP: Replacement CPU, Spanish.
- NFS-320-RB-SPE: Replacement CPU, Export, Spanish.

NOTE: For other options including compatibility with retrofit equipment, refer to the panel's installation manual, the SLC manual, and the Device Compatibility Document.

System Specifications

SYSTEM CAPACITY

- Intelligent Signaling Line Circuits 1
- Intelligent detectors 159
- Addressable monitor/control modules 159
- Programmable internal hardware and output circuits 4
- Programmable software zones 99
- Special programming zones 14
- LCD annunciators per NFS-320/-320E 32
- ACS annunciators
per NFS-320/-320E 32 addresses x 64 points

SPECIFICATIONS

- Primary input power
 - NFS-320: 120 VAC, 50/60 Hz, 5.0 A.
 - NFS-320E: 220/240 VAC, 50/60 Hz, 2.5 A.
- Current draw (standby/alarm):
 - NFS-320(E) board: 0.250 A. Add 0.035 A for each NAC in use.
 - KDM-R2 (Backlight on): 0.100 A.
- Total output 24 V power: 6.0 A in alarm.

NOTE: The power supply has a total of 6.0 A of available power. This is shared by all internal circuits. See Installation Manual for a complete current draw calculation sheet.

- Standard notification circuits (4): 1.5 A each.
- Resettable regulated 24V power: 1.25 A.
- Two non-resettable regulated 24V power outputs:
 - 1.25 A.
 - 0.50 A.
- Non-resettable 5V power: 0.15 A.
- Battery charger range: 18 AH – 200 AH. Use separate cabinet for batteries over 26 AH.
- Float rate: 27.6 V.

CABINET SPECIFICATIONS

NFS-320 cabinet dimensions:

- Backbox: 18.12 in. (46.025 cm) width; 18.12 in. (46.025 cm) height; 5.81 in. (14.76 cm) depth.
- Door: 18.187 in. (46.195 cm) width; 18.40 in. (46.736 cm) height; 0.75 in. (1.905 cm) depth.
- Trim ring: Molding width is 0.905 in. (2.299 cm).
- Shipping weight (without batteries): 36.15 lb. (16.4 kg).

TEMPERATURE AND HUMIDITY RANGES

This system meets NFPA requirements for operation at 0 – 49°C/ 32 – 120°F and at a relative humidity 93% ± 2% RH (noncondensing) at 32°C ± 2°C (90°F ± 3°F). However, the useful life of the system's standby batteries and the electronic components may be adversely affected by extreme temperature ranges and humidity. Therefore, it is recommended that this system and its peripherals be installed in an environment with a normal room temperature of 15 – 27°C/60 – 80°F.

AGENCY LISTINGS AND APPROVALS

The listings and approvals below apply to the basic NFS-320 control panel. In some cases, certain modules may not be listed by certain approval agencies, or listing may be in process. Consult factory for latest listing status.

- **UL/ULC Listed:** S635.
- **FM Approved.**

- **CSFM:** 7165-0028:0243.
- **MEA:** 128-07-E.
- **Fire Dept. of New York:** COA# 6212.
- **City of Chicago.**
- **ULC Listed:** S527-11

NOTE: For additional information on UL- and ULC-listed model NFS-320C, see DN-60085. For information on NFS-320SYS, see DN-60637.

Marine Applications: Marine approved systems must be configured using components itemized in this document. (See Main System Components, in "Product Line Information.") Specific connections and requirements for those components are described in the installation document, PN 54756. When these requirements are followed, systems are approved by the following agencies:

- **US Coast Guard** 161.002/50/0, 161.002/55/0 (Standard 46 CFR and 161.002).
- **Lloyd's Register** 11/600013 (ENV 3 category).
- **American Bureau of Shipping (ABS)** Type Approval.

NOTE: For information on marine applications, see DN-60688.

STANDARDS

The NFS-320 complies with the following UL Standards and NFPA 72, International Building Code (IBC), and California Building Code (CBC) Fire Alarm Systems requirements:

- **UL 864** (Fire).
- **UL 1076** (Burglary).
- **UL 2572** (Mass Notification Systems). (NFS-320 version 20 or higher).
- **ULC-S527-11** Standard for the Installation of Fire Alarm Systems.
- **LOCAL** (Automatic, Manual, Waterflow and Sprinkler Supervisory).
- **AUXILIARY** (Automatic, Manual and Waterflow) (requires TM-4).
- **REMOTE STATION** (Automatic, Manual, Waterflow and Sprinkler Supervisory) (requires TM-4).
- **PROPRIETARY** (Automatic, Manual, Waterflow and Sprinkler Supervisory). *Not applicable for FM.*
- **CENTRAL STATION** (Automatic, Manual, Waterflow and Sprinkler Supervisory) (requires DACT).
- **EMERGENCY VOICE/ALARM.**
- **OT, PSDN** (Other Technologies, Packet-switched Data Network).
- **IBC 2012, IBC 2009, IBC 2006, IBC 2003, IBC 2000** (Seismic).
- **CBC 2007** (Seismic).

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This document is not intended to be used for installation purposes.
We try to keep our product information up-to-date and accurate.
We cannot cover all specific applications or anticipate all requirements.
All specifications are subject to change without notice.



Country of Origin: USA

For more information, contact Notifier. Phone: (203) 484-7161, FAX: (203) 484-7118.
www.notifier.com

FST-851(A) Series

Intelligent Thermal (Heat) Detectors with FlashScan®



Intelligent / Addressable Devices

General

Notifier FST-851(A) Series intelligent plug-in thermal detectors with integral communication has features that surpass conventional detectors. Point ID capability allows each detector's address to be set with rotary, decimal address switches, providing exact detector locations. FST-851(A) Series thermal detectors use an innovative thermistor sensing circuit to produce 135°F/57°C fixed-temperature (FST-851/A) and rate-of-rise thermal detection (FST-851R/A) in a low-profile package. FST-851H(A) provides fixed high-temperature detection at 190°F/88°C. These thermal detectors provide effective, intelligent property protection in a variety of applications. FST-851(A) Series detectors are compatible with Notifier Onyx and CLIP series Fire Alarm Control Panels (FACPs).

FlashScan® (U.S. Patent 5,539,389) is a communication protocol developed by Notifier Engineering that greatly enhances the speed of communication between analog intelligent devices and certain NOTIFIER systems. Intelligent devices communicate in a grouped fashion. If one of the devices within the group has new information, the panel's CPU stops the group poll and concentrates on single points. The net effect is response speed greater than five times that of earlier designs.

Features

- Sleek, low-profile, stylish design.
- State-of-the-art thermistor technology for fast response.
- Rate-of-rise model (FST-851R/A), 15°F (8.3°C) per minute.
- Factory preset fixed temperature at 135°F (57°C); high-temperature model fixed at 190°F (88°C).
- Addressable by device.
- Compatible with FlashScan® and CLIP protocol systems.
- Rotary, decimal addressing (1-99 on CLIP systems, 1-159 on FlashScan systems).
- Two-wire SLC connection.
- Visible LEDs "blink" every time the unit is addressed.
- 360°-field viewing angle of the visual alarm indicators (two bi-color LEDs). LEDs blink green in Normal condition and turn on steady red in Alarm.
- Integral communications and built-in device-type identification.
- Remote test feature from the panel.
- Built-in functional test switch activated by external magnet.
- Walk test with address display (an address of 121 will blink the detector LED 12-(pause)-1).
- Low standby current.
- Backward-compatible.
- Built-in tamper-resistant feature.
- Designed for direct-surface or electrical-box mounting.
- Sealed against back pressure.
- Plugs into separate base for ease of installation and maintenance. Separate base allows interchange of photoelectric, ionization and thermal sensors.
- SEMS screws for wiring of the separate base.
- Constructed of off-white fire-resistant plastic, designed to commercial standards, and offers an attractive appearance.



FST-851(A) in B210LP(A) Base

B210-2251.jpg

- 94-5V plastic flammability rating.
- Remote LED output connection to optional RA100Z(A) remote LED annunciator.
- Optional sounder, relay, and isolator bases.
- Optional flanged surface mounting kit.

Specifications

Size: 2.1" (5.3 cm) high; base determines diameter.

- **B210LP(A):** 6.1" (15.5 cm) diameter.
- **B501(A):** 4.1" (10.4 cm) diameter.
- **B200S(A):** 6.875" (17.46 cm) diameter.
- **B200SR(A):** 6.875" (17.46 cm) diameter.
- **B224RB(A):** 6.2" (15.748 cm) diameter.
- **B224BI(A):** 6.2" (15.748 cm) diameter.

Shipping weight: 4.8 oz. (137 g).

Operating temperature range: FST-851(A) Series, FST-851R(A): -20°C to 38°C (-4°F to 100°F); FST-851H(A): -20°C to 66°C (-4°F to 150°F).

Detector spacing: UL approved for 50 ft. (15.24 m) center to center. FM approved for 25 x 25 ft. (7.62 x 7.62 m) spacing.

Relative humidity: 10% – 93% noncondensing.

Thermal ratings: fixed-temperature setpoint 135°F (57°C), rate-of-rise detection 15°F (8.3°C) per minute, high temperature heat 190°F (88°C).

ELECTRICAL SPECIFICATIONS

Voltage range: 15 - 32 volts DC peak.

Standby current (max. avg.): 300 µA @ 24 VDC (one communication every 5 seconds with LED enabled).

LED current (max.): 6.5 mA @ 24 VDC ("ON").

Applications

Use thermal detectors for protection of property. For further information, go to systemsensor.com for manual I56-407-00, Applications Manual for System Smoke Detectors, which provides detailed information on detector spacing, placement, zoning, wiring, and special applications.

Installation

The FST Series plug-in intelligent thermal detectors use a separate base to simplify installation, service, and maintenance. Installation instructions are shipped with each detector. A special tool allows maintenance personnel to plug in and remove detectors without using a ladder.

Mount base (all base types) on an electrical backbox which is at least 1.5" (3.81 cm) deep. For a chart of compatible junction boxes, see *DN-60054*.

NOTE: 1) Because of the inherent supervision provided by the SLC loop, end-of-line resistors are not required. Wiring "T-taps" or branches are permitted for Style 4 (Class "B") wiring. **2)** When using relay or sounder bases, consult the ISO-X(A) installation sheet I56-1380 for device limitations between isolator modules and isolator bases.

Agency Listings and Approvals

These listings and approvals apply to the modules specified in this document. In some cases, certain modules or applications may not be listed by certain approval agencies, or listing may be in process. Consult factory for latest listing status.

- **UL Listed:** S747.
- **ULC Listed:** S6978.
- **MEA Listed:** 383-02-E.
- **FM Approved.**
- **CSFM:** 7270-0028:0196.
- **BSMI:** CI313066760025.
- **CCCF:** Certif. # 2004081801000018.
- **U.S. Coast Guard:** 161.002/42/1 (NFS-640); 161.002/50/0 (NFS2-640/NFS-320/NFS-320C, excluding B210LP(A)).
- **Lloyd's Register:** 11/600013 (NFS2-640/NFS-320/NFS-320C, excluding B210LP(A)).

Product Line Information

NOTE: "A" suffix indicates ULC Listed model.

FST-851: Intelligent thermal detector. Must be mounted to one of the bases listed below.

FST-851A: Same as FST-851 but with ULC Listing.

FST-851R: Intelligent thermal detector with rate-of-rise feature.

FST-851RA: Same as FST-851R but with ULC Listing.

FST-851H: Intelligent high-temperature thermal detector.

FST-851HA: Same as FST-851H but with ULC Listing.

INTELLIGENT BASES

NOTE: "A" suffix indicates ULC Listed model.

NOTE: For details about intelligent bases and their mounting, see *DN-60054*.

B210LP(A): Standard U.S. flanged low-profile mounting base.

B210LPBP: Bulk pack of B210LP; package contains 10.

B501(A): Standard European flangeless mounting base.

B501BP: Bulk pack of B501; package contains 10.

B200S(A): Addressable Intelligent, programmable sounder base capable of producing sound output in high or low volume

with ANSI Temporal 3, ANSI Temporal 4, continuous tone, marching tone, and custom tone.

B200SR(A): Intelligent sounder base capable of producing sound output with ANSI Temporal 3 or continuous tone. Replaces B501BH series bases in retrofit applications.

B224RB(A): Intelligent relay base. Screw terminals: up to 14 AWG (2.0 mm²). Relay type: Form-C. Rating: 2.0 A @ 30 VDC resistive; 0.3 A @ 110 VDC inductive; 1.0 A @ 30 VDC inductive.

B224BI(A): Intelligent isolator base. Isolates SLC from loop shorts. Maximum: 25 devices between isolator bases; see Note 2 under Installation.

ACCESSORIES

F110: Retrofit flange to convert B210LP(A) to match the B710LP(A) profile, or to convert older high-profile bases to low-profile.

F110BP: Bulk pack of F110; package contains 15.

F210: Replacement flange for B210LP(A) base.

RA100Z(A): Remote LED annunciator. 3 – 32 VDC. Fits U.S. single-gang electrical box. Supported by B210LP(A) and B501(A) bases only.

SMB600: Surface mounting kit, flanged.

M02-04-00: Test magnet.

M02-09-00: Test magnet with telescoping handle.

XR2B: Detector removal tool. Allows installation and/or removal of FlashScan® Series detector heads from base in high ceiling installations. Includes T55-127-010.

T55-127-010: Detector removal tool without pole.

XP-4: Extension pole for XR2B. Comes in three 5-foot (1.524 m) sections.

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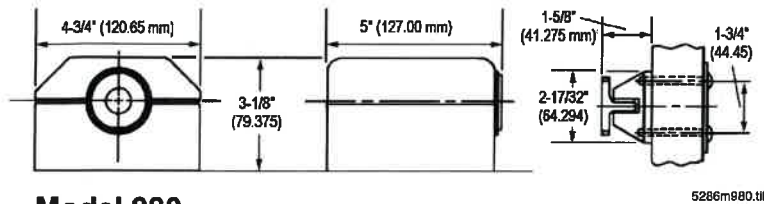
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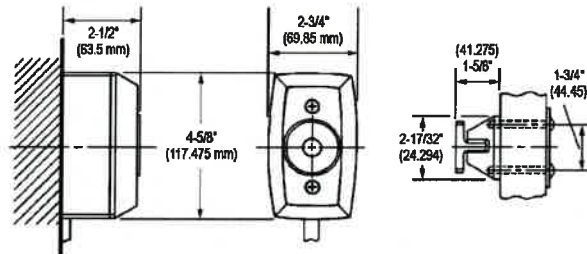


For more information, contact Notifier. Phone: (203) 484-7161, FAX: (203) 484-7118.
www.notifier.com



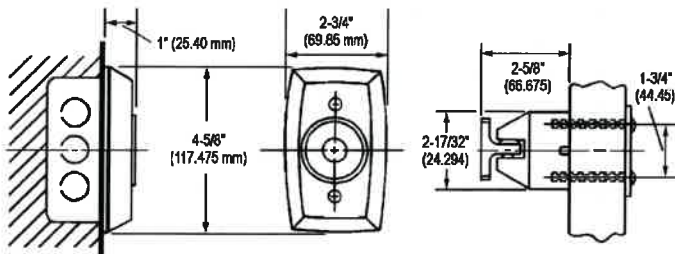
Model 980
Floor-Mount
Single Door

- Concealed wiring.
- Total floor space required: 6-5/8" (168 mm).
- Mounting requirements: Conduit connects directly to floor plate.
- UL-Listed door holder.
- Voltage/current:
120 VAC, 60 Hz, 0.020 amp.
24 VAC/VDC, 60 Hz, 0.020 amp.
12 VDC, 0.040 amp.
- Shipping weight: 4 lbs. (1.8 kg).



Model 996
Wall Mount
Surface Wiring

- Total projection: 4-1/8" (105 mm).
- Mounting requirements: 1-1/2" (38 mm) deep adapter housing.
- UL-Listed door holder.
- Shipping weight: 3 lbs. (1.4 kg).
- Voltage/Current:
120 VAC, 60 Hz, 0.020 amp.
24 VAC/VDC, 60 Hz, 0.020 amp.
12 VDC, 0.040 amp.



Model 998
Wall-Mount
Standard Doors
Concealed Wiring

- Total projection: 3-5/8" (92 mm).
- Mounting requirements: 2" x 4" x 1-3/4" (51 x 102 x 45 mm) outlet box.
- Wall must be properly reinforced and outlet box adequately fastened.
- UL-Listed door holder.
- Voltage/current:
120 VAC, 60 Hz, 0.020 amp.
24 VAC/VDC, 60 Hz, 0.020 amp.
12 VDC, 0.040 amp.
- Shipping weight: 2-1/2 lbs. (1.1 kg).

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GES3 / GEC3 Series

Selectable Candela Evacuation Signals

12 VDC and 24 VDC Commander3 Strobe and Horn/Strobe

24 units per carton, 28 pounds per carton

Applications

The Commander3 Series is a low profile strobe and horn/strobe combination that offers dependable audible and visual alarms and the absolute lowest current available.

The GE3 Series 24 VDC offers tamperproof field selectable candela options of 15, 30, 60, 75, and 110 candela. The 12 VDC offers tamperproof field selectable candela options of 15, 30, 60, and 75 candela. The GEC3 horn/strobe offers a continuous or synchable temporal 3 in 2400Hz, mechanical and chime as well as a whoop tone. All tones are easy for the professional to change in the field by the use of switches.

The Commander3 Series is shipped with a standard 4" metal mounting plate which incorporates the popular Super-Slide® feature that allows the installer to easily test for supervision. The product also features a locking mechanism which secures the product to the bracket without any screws showing. The Commander3 also features the patented Checkmate® instant voltage verification feature which allows the installer to check the voltage drop draw and match it to the blueprint.

The GE3 Series appliances are ANSI/UL 464, ANSI/UL 1971, CAN/ULC S525 (24 VDC only) and/or CAN/ULC S526 (24 VDC only), is listed for use with fire protective systems and are warranted for three years from date of purchase.

Standard Features

- Nominal voltage 12 VDC and 24 VDC
- 24 VDC field selectable candelas: 15, 30, 60, 75 & 110
- 12 VDC field selectable candelas: 15, 30, 60 & 75
- Unit Dimensions: 5" (12.7 cm) high x 4.5" (11.43 cm) wide x 2.5" (6.35 cm) deep
- Super-Slide® Bracket, Ease of Supervision Testing
- Checkmate® Instant Voltage Verification
- Prewire entire system, install mounting bracket, then install signals
- Documented lower installation and operating costs
- Input terminals accept 12 to 18 AWG
- Horn/strobe switch selection for high or low dBA
- Horn/strobe switch for 2400 Hz, mechanical, chime and whoop tones
- Horn/strobe switch for continuous or temporal 3 (not available on whoop tone)
- Synchronize strobe and/or horn with Gentex AVSM Control Module
- Silence audible while visual appliance will remain flashing
- Tamperproof re-entrant style grill and locking screw (optional use)
- Surface mount with the GSB (Gentex Surface Mount Box)
- Faceplate available in red or off-white
- Wall mount



Product Listings

SIGNALING
c  US
LISTED



- ANSI/UL 464 and ANSI/UL 1971 Listed
- CAN/ULC S525 and/or CAN/ULC S526 Listed (24 VDC only)
- CSFM: 7135-0569:122 (GEC3-24 & GEH-24)
7125-0569:123 (GES3-24)
7125-0569:129 (GES3-12)
7135-0569:130 (GEC3-12 & GEH-12)
- MEA: 285-91-E (GEC3-24 & GES3-24)
580-06-E (GEC3-12 & GES3-12)

Patents

- 7,375,617 May 20, 2008

Product Compliance

- NFPA 72
- Americans with Disabilities Act (ADA)
- IBC/IFC/IRC
- Quality Management System is certified to: ISO 9001:2008

GES3 12 VDC / GES 24 VDC Selectable Candela, Low Profile Evacuation Strobe

Model	Part Number	Voltage (VDC)	Candela
GES3-12WR	904-1235-002	12	15, 30, 60, 75
GES3-12WW	904-1237-002	12	15, 30, 60, 75
GES3-24WR	904-1321-002	24	15, 30, 60, 75, 110
GES3-24WW	904-1319-002	24	15, 30, 60, 75, 110

GEC3 12VDC / GEC3 24VDC Selectable Candela, Low Profile Evacuation Horn/Strobe

Model	Part Number	Voltage (VDC)	Candela	Reverberant dBA at 10ft.	Anechoic Room dBA at 10ft.
GEC3-12WR	904-1231-002	12	15, 30, 60, 75	62-82 dBA	100 dBA
GEC3-12WW	904-1233-002	12	15, 30, 60, 75	62-82 dBA	100 dBA
GEC3-24WR	904-1317-002	24	15, 30, 60, 75, 110	62-82 dBA	100 dBA
GEC3-24WW	904-1315-002	24	15, 30, 60, 75, 110	62-82 dBA	100 dBA

R = Red Faceplate, W = White Faceplate

All units are available in plain (no lettering)

Plain units are not returnable

ALERT and AGENT bezels available for order

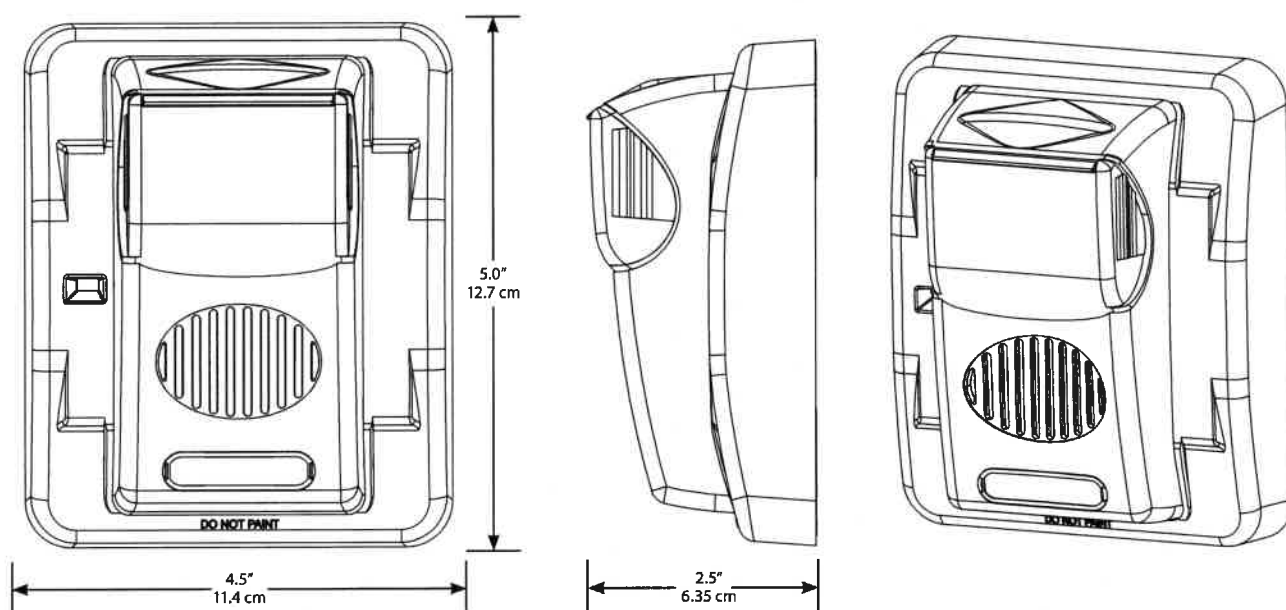
GE3 12 VDC / 24 VDC Strobe Current Ratings (mA)

12 VDC (8-17.5 Volts)			24 VDC (16-33 Volts)	
Candela	12 VDC	UL Max	24 VDC	UL Max
15cd	106 mA	92 mA	30 mA	42 mA
30cd	131 mA	141 mA	42 mA	58 mA
60cd	186 mA	260 mA	66 mA	97 mA
75cd	237 mA	312 mA	80 mA	116 mA
110cd			103 mA	161 mA

GE3 12 VDC / 24 VDC Horn Decibel (dBA) and Current Ratings (mA)

12 VDC (8-17.5 Volts)				24 VDC (16-33 Volts)		
Horn Mode	Horn Decibel Levels (dBA)		Horn Current Ratings (mA)	Horn Decibel Levels (dBA)		Horn Current Ratings (mA)
	Minimum SPL at 10ft., per ANSI/UL 464 (HIGH)	Minimum SPL at 10ft., per ANSI/UL 464 (LOW)	UL MAX Regulated 12 VDC Operating Current (HIGH)	Minimum SPL at 10ft., per ANSI/UL 464 (HIGH)	Minimum SPL at 10ft., per ANSI/UL 464 (LOW)	UL MAX Regulated 24 VDC Operating Current (HIGH)
Temporal 3 2400 Hz	76 dBA	69 dBA*	29 mA	78 dBA	71 dBA*	28 mA
Temporal 3 Mechanical	75 dBA	68 dBA*	26 mA	76 dBA	70 dBA*	25 mA
Temporal 3 Chime	62 dBA*	60 dBA*	13 mA	70 dBA*	66 dBA*	15 mA
Continuous 2400 Hz	79 dBA	74 dBA*	29 mA	81 dBA	74 dBA*	28 mA
Continuous Mechanical	78 dBA	72 dBA*	26 mA	80 dBA	72 dBA*	25 mA
Continuous Chime	63 dBA*	61 dBA*	13 mA	70 dBA*	66 dBA*	15 mA
Whoop	78 dBA	71 dBA*	55 MA	82 dBA	69 dBA*	56 mA

* Operating the horn in this mode at this voltage will result in not meeting the minimum ANSI/UL 464 reverberant sound level required for public mode fire protection service. These settings are acceptable only for private mode fire alarm use. Use the high dBA setting for public mode application (not applicable when using the chime tone. The chime tone is always private mode).



Gentex Super-Slide® Mounting Bracket

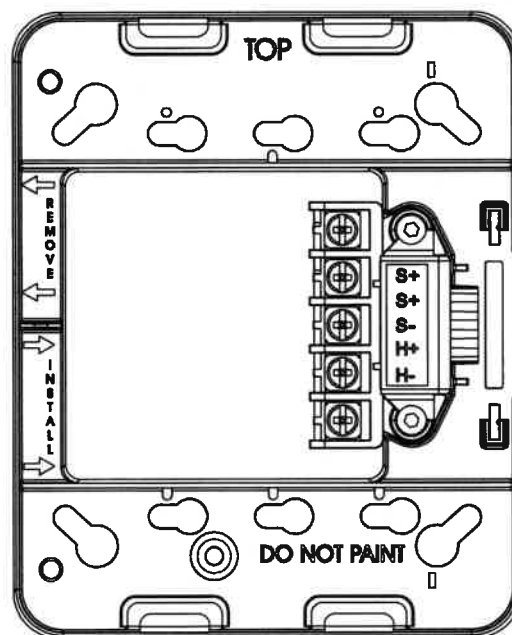
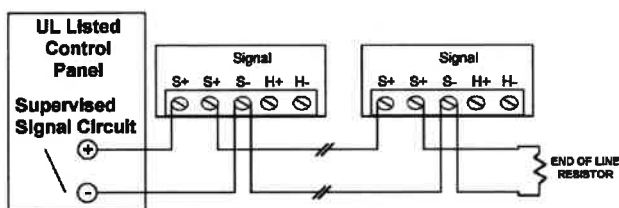
Allows the installer to prewire the system, test for system supervision, remove the signal head until occupancy, switch out Gentex signals without changing mounting brackets and has locking edge connector for snap-in-place installation.

Gentex Checkmate® Instant Voltage Verification

It is often necessary to confirm the voltage drop along a line of devices. The access holes are provided in the back of the terminal block to allow the voltage to be measured directly without removing the device. Typically this would be done at the end of the line to confirm design criteria. Most measurements will be taken using the S+ and S- locations although access is provided to other locations. *Notice: Care should be taken to not short the test probes.*

Notes

- Operating temperature: 32° to 120°F (0° to 49°C)
- The GES3/GEC3 Series is not listed for outdoor use
- For nominal and peak current across ANSI/UL regulated voltage range for filtered DC power and unfiltered (FWR [Full Wave Rectified]) power, see installation manual
- The sound output for the temporal 3 tone is rated lower since the time the horn is off is averaged into the sound output rating. While the horn is producing a tone in the temporal 3 mode, its sound pressure is the same as the continuous mode.
- This appliance is not recommended for use on coded or pulsing signaling circuits



GES3 / GEC3 Series

Selectable Candela Evacuation Signals

Architect & Engineering Specifications

The audible and/or visible signal shall be Gentex GES3, GEC3 Series or approved equal and shall be listed by Underwriters Laboratories (ANSI/UL) for use with fire protective signaling systems (ANSI/UL 1971 and/or ANSI/UL 464) and with CAN/ULC S526 (24 VDC only) and/or CAN/ULC S525 (24 VDC only) with intended use in fire alarm systems. The notification appliance (GEC3) shall produce a peak sound output of 100 dBA or greater at 12 VDC or 24 VDC as measured in an anechoic chamber and shall also have the capability to silence the audible signal while leaving the visible signal energized with the use of a single pair of power wires. Additionally, the user shall be able to select either continuous or temporal tone output with the temporal signal having the ability to be synchronized. The unit shall be capable of being installed so that any unauthorized attempt to change the candela setting will result in a trouble signal at the fire alarm control panel. The audible/visible and visible signaling appliance shall also maintain a minimum flash rate of 1 Hz or up to 2 Hz regardless of power input voltage. The strobe appliance shall have an operating current of 42 mA or less at 24 VDC for the 15 Cd strobe circuit and 92 mA or less at 12 VDC for the 15 Cd strobe circuit. The appliance shall be polarized to allow for electrical supervision of the system wiring. The unit shall be provided with a mounting bracket with terminals and barriers for input/output wiring and be able to mount to a single gang or double gang box or double workbox without the use of an adapter plate. The GE3 Series shall be mounted on the wall. The unit shall have an input voltage range of 16-33 volts with either direct current or full wave rectified power at 24 VDC or a voltage range of 8-17.5 volts at 12 VDC. The appliance shall be capable of testing supervision without disconnecting wires, verify voltage without removing unit and be capable of mounting to a surface back box.

GENTEX
CORPORATION

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551-0050-07

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