

## Firestop Products & Systems Submittal Documentation

     Service Penetrations  
**X** Construction Joints/Gaps

Project:

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Contractor:

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Installer:

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Supplier:

Grabber Construction Products, Inc.  
866-237-GRAB(4722)

Distributor:

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**Through-Penetrations Firestop Systems**

Type of assembly joint system:

BW – Bottom of Wall

FF – Floor to Floor

FW – Floor to Wall

HW – Head of Wall

PJ – Perimeter Joint

WW – Wall to Wall

Type of Assembly	System #	GrabberGard Product Used	System Details	
HW	HW-D-0354	EFS	2 hr - concrete wall to metal deck - 3/4 in. joint	10
HW	HW-D-0357	EFS	1,2,3&4 hr - gyp wall to metal deck - 3/4 in. joint	12
HW	HW-D-0358	EFS	1 & 2 hr - gyp wall to metal deck w/ open web truss and w/ mk-6 - 3/4 in. joint	15
HW	HW-D-0359	EFS	1 & 2 hr - concrete wall to metal deck w/ open web truss and w/ mk-6 - 1 in. joint	19
HW	HW-D-0404	EFS	1 & 2 hr - gyp wall to concrete floor - 1 in. joint	21
HW	HW-D-0531	EFS	1 & 2 hr - gyp wall to metal deck - 3/4 in. joint	24
HW	HW-D-0532	EFS	2 hr - gyp wall to concrete floor - 1 in. joint	26
HW	HW-D-0547	EFS	1 & 2 hr - gyp wall to concrete floor - wall parallel to beam - 1 in. joint	29
HW	HW-D-0566	EFS	2 hr - concrete wall to metal deck - 2 in. joint	33
HW	HW-D-0567	EFS	2 hr - concrete wall to metal deck - wall parallel to flutes 2 in. joint	35
HW	HW-D-0568	EFS	1 & 2 hr - concrete wall to concrete floor - wall parallel to beam 1 in. joint	37
HW	HW-D-0050	EFS	2 hr - concrete wall to concrete floor - 4 in. joint	40

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**GENERAL CERTIFICATE OF CONFORMANCE**

Grabber Construction Products, Inc.  
205 Mason Circle, Concord, CA 94520

GrabberGard EFC, IFC & EFS

**THESE PRODUCTS ARE TESTED TO THE FOLLOWING TEST STANDARDS**

In the USA:

ASTM E-814 Standard Test Method for Fire Tests of Through Penetrations Fire Stops

ASTM E-1399 Cyclic Movement and Measuring the Minimum and Maximum Joint Widths of Architectural Joint Systems

UL 1479 Fire Tests of Through-Penetration Firestops

UL 2079 Tests for Fire Resistance of Building Joint Systems

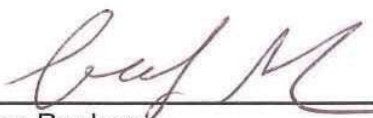
In Canada:

ULC S115-M95 Standard Method of Fire Tests of Firestop Systems

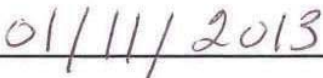
**TESTED BY THIRD PARTY AGENCIES**

Underwriters Laboratories, Inc. (UL)  
Intertek Testing Services Inc. – Warnock Hersey (WHI)

No Asbestos or PCBs are used or contained in this product.



George Rouhana  
Executive Director



Date



LEED is a trademark of the US Green Building Council

To Whom It May Concern:

Re: LEED Information on Grabber Construction Products' GrabberGard Firestopping Products

This letter will detail the contribution of Grabber Construction Products' GrabberGard firestopping products to the LEED® (Leadership in Energy and Environmental Design) Green Building Rating System® in accordance with LEED-NC Version 2009 For New Construction & Major Renovations.

In reference to LEED® Material and Resource (MR) – Credit 2 – Construction Waste Management – the following Grabber' materials are recyclable where facilities exist:

<u>Packaging</u>	<u>Recyclable Product</u>	<u>Weight Per Unit</u>
Carton	Cardboard	56 g – EBI-60 70 g – Putty Stick 190 g – 10 oz plastic tube 350 g – 20 oz foil package 410 g – 10 L plastic jar 600 g – 29 oz plastic tube
10.1 oz (300ml) plastic tube	HDPE	49 g / Tube
20 oz (600ml) foil pack	Aluminum	5 g / Pack
29 oz (850ml) tube	Fiberboard	84 g / Tube
35.2 oz (1L) EZ pour plastic bottle	HDPE	50 g / Bottle
2.5 gallon (9.5L) plastic pai	HDPE	0.8 kg / Pail
2.65 gallon (10 L) plastic jar	HDPE	345 g / Jar
5 gallon (18.9L) plastic pail	HDPE	1.2 kg / Pail
Wooden pallet	Wood	21 kg / Pallet

In reference to LEED® Material and Resources – Credits 4.1 & 4.2 – Recycled Content, all GrabberGard firestopping products contain 5% post-consumer recycled content.

In reference to LEED® Material and Resources – Credit 5 - Regional Materials, Grabber can confirm that a minimum of 50% of the raw materials used in manufacturing the GrabberGard firestopping products are sourced and processed within a 500-miles radius of our manufacturing facility in Vancouver, BC.

If the project site is located within a 500-mile radius of our manufacturing site then this manufacturing site can contribute to earning Materials and Resource Credit 5.1 & 5.2.

The volatile organic content (VOC) of GrabberGard firestopping products are listed below and meets the minimum LEED® requirements for low-emitting materials. These materials can assist to earn Indoor Environmental Quality (IEQ) – Credit 4.1 – Low-Emitting Materials: Adhesives & Sealants (Architectural Sealants) & Credit 4.2 – Low-Emitting Materials: Paints & Coatings (Architectural Sealants).

GrabberGard Firestopping Product	VOC content [g/L]
EFC	32.5
IFC	37.1
EFS	81.3

If you have any additional questions, please feel free to contact us at (800) 237-4722.

**PRODUCT DATA SHEET GRABBERGARD EFS**

1 of 4

**Description**

GRABBERGARD EFS is a sprayable elastomeric latexbased firestop mastic coating. This high solids compound is designed to stop the passage of fires, smoke and fumes through fire rated assemblies. GRABBERGARD EFS spray or brush-applied coating has been formulated to adhere to all common construction materials. It has been tested in rated assemblies to provide firestopping protection from 1 to 4 hours. After it has fully cured, GRABBERGARD EFS elastomeric coating remains flexible to accommodate normal building movement.

**Applications**

GRABBERGARD EFS spray material provides an effective firestop for joints and gaps at the intersection of similar or dissimilar rated assemblies. (i.e. top of wall; floor to floor; floor to wall; wall to wall; floor/ceiling steel deck; assembly to gypsum wallboard and concrete walls). GRABBERGARD EFS is also used on pipes, cables, conduit and cable tray installations through floors and walls. It has an installation advantage over caulk material when the service penetrations are in larger openings. For these applications GRABBERGARD EFS can be applied using a brush or conventional airless spray equipment. To make certain installation is correct, consult manufacturer's current listings, as well as, Third Party published Fire Resistance Directories and/or their websites. GRABBERGARD EFS common uses and features are listed below:

**Used on:** Single and multiple penetrations

Metallic pipes

- Copper, steel, cast iron
- Conduits

Electrical cables and wires

- Jacket & non-jacketed

Cable trays

Construction joints/gaps

- Top-of-Wall
- Horizontal and vertical joints
- Curtain wall safing joints
- Perimeter floor joints
- Control joints
- Floor to floor joints
- Wall to wall joints

Voids

**Features:** Red Color  
Non-toxic  
Safe and easy to use  
Easy clean up (Water Only)  
Low volatile organic content (VOC)  
No asbestos or PCB  
Water resistance (when fully cured)  
Mildew resistant (when fully cured)  
Paintable (with latex based paints)  
Easy and safe to apply  
Adheres to dry or damp surfaces  
Adheres to common construction substrate materials:

- Concrete
- Concrete block
- Steel deck
- Wood
- Gypsum wallboard

Up to 33% joint movement compression/ extension  
Remains flexible after fully cured

**Advantages**

Endothermic — When exposed to high temperatures or fire, GRABBERGARD EFS absorbs the heat and provides a fire barrier.

**System Design**

Whether for small or large joints, GRABBERGARD EFS spray is designed to be part of a multiple component system used with mineral wool and other damming materials. All these materials used in conjunction with one another maximize the firestopping characteristics.

**Versatility**

When applied properly, GRABBERGARD EFS will adhere to most common building materials. GRABBERGARD EFS bonds with dry or damp concrete as well as drywall, metals and wood. After GRABBERGARD EFS has fully cured it provides a strong bond, will not readily pull away and accommodates compressive and extension movement up to 33 per cent. GRABBERGARD EFS can be painted with a latex paint after it has completely cured.

**Flexibility**

When installed GRABBERGARD EFS caulk, when used in joints, accommodates up to 33 percent joint movement compression/ extension. It remains flexible and fully resistant to water after curing.

Disclaimer: All technical advice, recommendations and services rendered by the seller gratis. They are based on technical data, which the seller believes to be reliable, and are intended for use by persons having the skills and know how, at their own discretion and risk. In no event will the seller be liable for any consequential damages arising out of the use of this product.



**PRODUCT DATA SHEET GRABBERGARD EFS**

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**Limitations**

Consult the Installation Instructions, Storage and Handling and Transportation Sections. Exposure to rain, running or standing water; before, the sealant is cured may cause the installed material(s) to wash out. The curing process occurs naturally through the evaporation of its water content into the atmosphere. Slower cure times may be experienced if the sealant is installed at low temperatures, damp and/or in high humidity environments. Any materials used in the firestop system for damming, insulation or support that may not allow for the free passage of air could result in longer curing times. The environment in which the compound is being used should be considered when estimating cure times. This product is not designed to be a waterproof seal and should not be installed where there will be constant wet conditions or immersed in water continuously.

**Compliance/Approvals**

GRABBERGARD EFS has been installed in many system designs and Third Party tested to meet or exceed the requirements of ASTM E 814, ASTM E 119, ASTM E 1399, UL 1479, UL 2079, ULC S 115-M95, ULC S 101, ASTM E 84. Construction joints recently tested in conformance with "Perimeter Fire Containment Systems" (assimilation of NFPA 285, ANS/UL 2079). Underwriters Laboratories (UL) and Intertek Testing Service (ITS) NA Ltd (Warnock Hersey) are third party fire endurance-testing agency accredited by ICBO, BOCA and SBCCI (NES) in the United States.

**Additional Testing**

GRABBERGARD EFS spray material becomes an integral component in a complete building system of walls, floors and ceilings. Its physical and chemical compatibility with other materials used in these complex configurations requires more than just the necessary firestop tests. The results of additional and extensive tests are listed in Table 1. GRABBERGARD EFS – Physical and Chemical Properties.

GRABBERGARD EFS spray has been tested and meets the classifications for less than 25 flame spread index and less than 50 smoke development index (NFPA Class "A", Building Code Class "1").

GRABBERGARD EFS has been tested for chemical compatibility with all types of metal and plastic pipes and plastic or nylon coated wires that are listed in the system designs.

**Installation Instructions**

GRABBERGARD EFS must be installed in compliance with a listed system design published by a third party testing agency (UL, ITS). Refer to their respective published Fire Resistance Directory or their web site.

**Prep-work**

To install properly, remove excessive dust, dirt, rust, debris, grease, oil and standing water. Atmospheric temperatures should be considered. If the product is colder than the recommended temperatures, warming before attempting to spray should be considered. In cold temperatures the building should be sealed or heat protected. The spray equipment should be clean of material from previous applications. GRABBERGARD EFS can also be applied with a brush.

**Application**

Insulation and backing materials should be installed in accordance with a published system design (i.e. type, density, compression and orientation). When spraying GRABBERGARD EFS use airless spray equipment that has min 3000psi capabilities and reversible spray tips. (Consult the manufacturer for more information on equipment setup, hose, spray guns, tips, etc.) To achieve a dry thickness of 60-mil (1/16 in.) GRABBERGARD EFS should be applied at 80-mil (1/12 in.). All research testing was performed using a Spray Tech EP2510 airless sprayer with: 50 feet of 3/8 in. hose, Graco Flex Plus spray gun, tip sizes from 0.019 to 0.031, fan with from 4 in. to 12 in. Do not apply GRABBERGARD EFS to mineral wool that is or was wet from exposure to water, standing water, rain or snow. **Caution:** Mineral wool may cause eye, skin or respiratory tract irritation. Avoid contact with eyes, skin of clothing. Recommend using gloves and goggles. Refer to mineral wool manufacturer's Material Safety Data Sheets.

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**PRODUCT DATA SHEET GRABBERGARD EFS**

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**Installation Temperature**

For best results, installation temperatures should be between 43°-90°F(6°-32°C).

**Maintenance**

No special maintenance is required after the GRABBERGARD EFS sealant is installed and fully cured. If, after installation, the GRABBERGARD EFS sealant is damaged or cut, repairs should be made with the same sealant. GRABBERGARD EFS will form a full chemical bond and adhere to itself.

**Manufacturer's Recommendations**

The manufacturer recommends this product be installed by those trained in proper installation procedures (Approved Installer Card) and be able to read and understand a firestop system design listing (i.e. UL or WHI Listed System Design).

**Storage and Handling**

Keep product stored in a protected covered area in its original unopened containers. Manufacturer recommends storage temperatures to between 40°-90°F(4°-32°C).

**DO NOT ALLOW TO FREEZE**

Product may become damaged and unusable if exposed to extreme freezing conditions.

Do not dilute with water.

No mixing or stirring of the product is required.

Product has a shelf life of one(1) year. Stock rotation program is recommended.

**Transportation**

Product should be transported in a protection-equipped carrier when very low or high atmospheric temperatures will be experienced.

Recommended transportation temperatures should be between 40°-90°F (4°-32°C).

**DO NOT ALLOW TO FREEZE****First Aid**

In case of contact with eyes, flush with water and consult a physician. Skin contact, clean up thoroughly with water or soapy water. Consult a physician if eye or skin irritation develops or is persistent. SEE MSDS FOR ADDITIONAL INFORMATION.

**Availability**

GRABBERGARD EFS spray is supplied in:

- 5 gal. (18.9L) tapered plastic pails

**Coverage**

Estimated product usage will vary depending on opening size and configuration. Check GRABBERGARD'S estimating charts for coverage.

**Warranty**

Grabber Construction Products will not accept liability for more than product refund. Any claim regarding product defect must be received in writing within 1 year from date of shipment. Grabber makes no other Warranty or Guarantee express or implied, including warranties of fitness for a particular purpose or merchantability. The seller shall assume no other liability for incidental or consequential damages arising out of the sale or use of this product.

**Technical Services**

For technical information and assistance regarding application information, code requirements and performance specifications:

Toll Free 1-866-237-GRAB(4722)

Web Site [www.grabberman.com](http://www.grabberman.com)

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**PRODUCT DATA SHEET GRABBERGARD EFS**

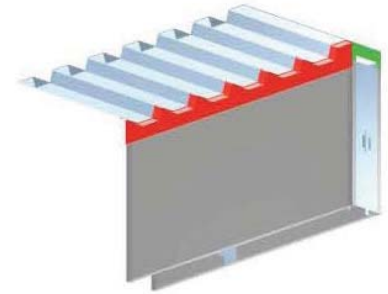
**Table 1 – Physical and Chemical Properties**

**As Supplied**

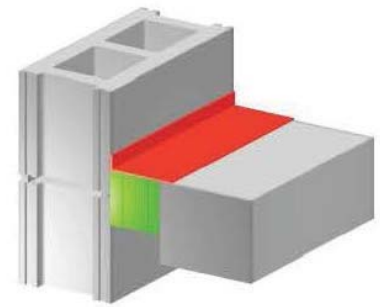
Type of Polymer	Waterborne Resin
Odor	Mild Latex
Solids Content (Wt%)	68 ± 5%
Application Temperatures	43° - 90°F (6° - 32°C)
Viscosity (ASTM D-2196)	50000-60000cps
Color - (ASTM C-834)	Red
Specific Gravity - (ASTM D-1475)	1.15-1.35
Dry Time - (ASTM D-1640)	
Dry to touch @ 6mils	20-30 mins
Full Cure	Time 7-14 days
(depends on thickness & environment)	
pH - (ASTM E-70)	8-9

**As Cured**

In Service Temperature	up to 120°F (49°C)
Volume Shrinkage - (ASTM C-1241)	Passed
Freeze/Thaw - (ASTM D-2243)	Excellent
Tensile Properties - (ASTM D-2370)	
Tensile Strength	28 psi
Maximum Elongation	1000%
Sag Resistance - (ASTM D-4410)	Passed
Surface Burning Characteristics - (ASTM E-84)	
Flame Spread Index	< 25
Smoke Developed Index	< 50
Joint Movement - (ASTM E-1399)	Passed
(compression/extension)	
Sprayability	
Fan Pattern	Excellent
Volume Output	Excellent



Typical Head of Wall Joint



Typical Floor to Wall Joint

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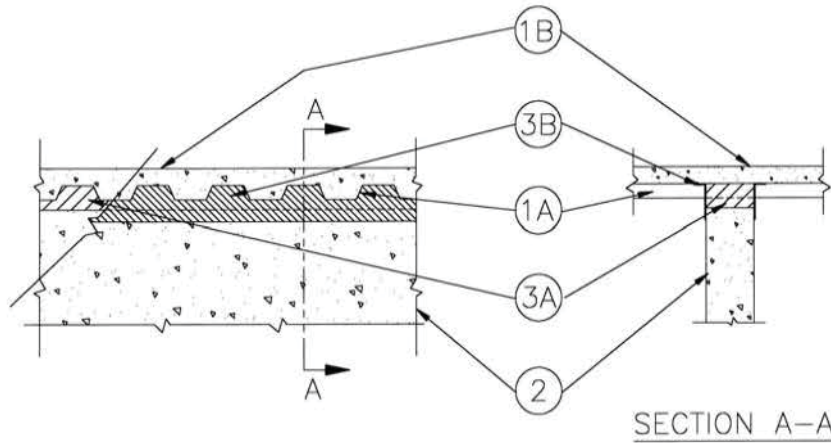


**System No. HW-D-0354**

Assembly Rating – 2 Hr (See Item 2)

Nominal Joint Width – 3/4 in.

Class II Movement Capabilities – 33% Compression or Extension



1. **Floor Assembly** – The fluted steel deck/concrete floor assembly shall be constructed of the materials and in the manner described in the individual Floor-Ceiling Design in the UL Fire Resistance Directory and shall include the following construction features:

- A. **Steel Floor and Form Units\*** – Max 3 in. deep galv fluted units.
- B. **Concrete** – Min 2-1/2 in. thick reinforced concrete, as measured from the top plane of the floor units.

1A. **Roof Assembly** – (Not Shown) – As an alternative to the floor assembly, a fire-rated fluted steel deck roof assembly may be used. The roof assembly shall be constructed of the materials and in the manner described in the individual P900 Series Roof-Ceiling Design in the UL Fire Resistance Directory. The hourly rating of roof assembly shall be equal or greater than the hourly rating of the wall assembly and shall include the following construction features:

- A. **Steel Roof Deck** – Max 3 in. deep galv steel fluted roof deck.
- B. **Roof Insulation** – Min 2-1/4 in. thick poured insulation concrete, as measured from the top plane of the floor units.
- C. **Roof Covering\*** – Hot-mopped or cold-application materials compatible with insulating concrete.

2. **Wall Assembly** – Min 4-7/8 in. thick reinforced lightweight or normal weight (100-150pcf) structural concrete. Wall may also be constructed of any UL Classified **Concrete Blocks\***

See **Concrete Blocks** (CAZT) category in the Fire Resistance Directory for names of manufacturers.





3. **Joint System** – Max separation between bottom of floor and top of wall is 3/4 in. The joint system is designed to accommodate a max 33 percent compression or extension from its installed width. The joint system consists of a forming material and a fill material, as follows:
- A. **Forming Material\*** – Min 4-7/8 in. thickness of min 4 pcf density mineral wool batt insulation cut to the shape of the fluted deck, approximately 25 percent larger than the area of the flutes with additional min 4-7/8 in. thick by 1 in. high sections at the bottom of the shapes to completely fill the 3/4 in. gap between the top of the wall and bottom of the steel floor units. Mineral wool to be compressed and firmly packed into the flutes and the gap between the top of the wall and bottom of the steel floor units, flush with both sides of wall.
    - IIG Minwool LLC – Paroc Safing Insulation
    - Thermafiber LLC – Type SAF
  - B. **Fill, Void or Cavity Material\*** – Min 1/16 in. thickness of fill material sprayed or brushed on each side of the wall in the flutes of the steel floor units and between the top of the wall and the bottom of the steel floor units to completely cover mineral wool and overlap a min of 1 in. onto wall and steel deck on both sides of wall.

GRABBER CONSTRUCTION PRODUCTS INC – GrabberGard EFS

\*Bearing the UL Classification Marking





**System No. HW-D-0357**

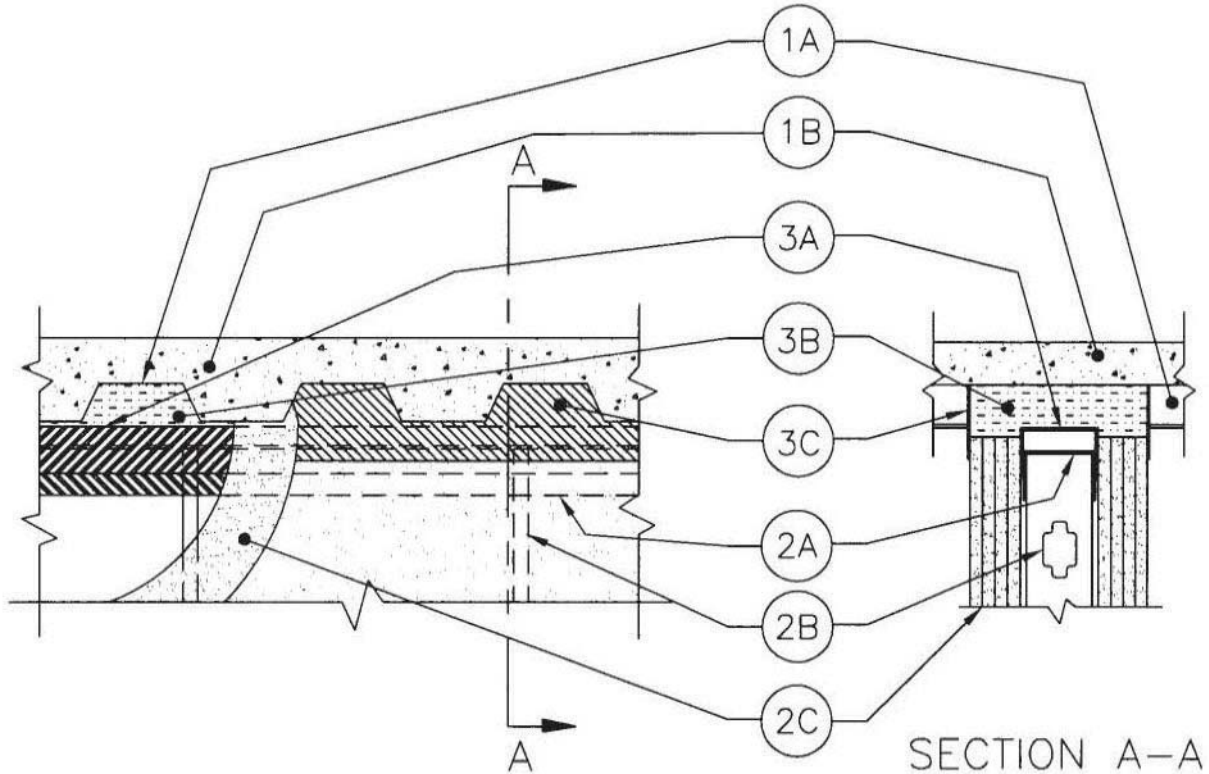
Assembly Ratings 1, 2, 3 and 4 Hr (See Item 2)

L Rating at Ambient – Less than 1 CFM/Lin Ft.

L Rating at 400 F – Less than 1 CFM/Lin Ft.

Nominal Joint Width – 3/4 in.

Class II Movement Capabilities – 33% Compression or Extension



1. **Floor Assembly** – The fluted steel deck/concrete floor assembly shall be constructed of the materials and in the manner described in the individual Floor-Ceiling Design in the UL Fire Resistance Directory and shall include the following construction features:

- A. **Steel Floor and Form Units\*** – Max 3 in. deep galv fluted units.
- B. **Concrete** – Min 2-1/2 in. thick reinforced concrete, as measured from the top plane of the floor units.

1A. **Roof Assembly (Not Shown)** – As an alternative to the floor assembly, a fire-rated fluted steel deck roof assembly may be used. The roof assembly shall be constructed of the materials and in the manner described in the individual P900 Series Roof-Ceiling Design in the UL Fire Resistance Directory. The hourly rating of roof assembly shall be equal or greater than the hourly rating of the wall assembly and shall include the following construction features:

- A. **Steel Roof Deck** – Max 3 in. deep galv steel fluted roof deck





- B. **Roof Insulation** — Min 2-1/4 in. thick poured insulation concrete, as measured from the top plane of the floor units
  - C. **Steel Roof Deck** — Max 3 in. deep galv steel fluted roof deck
2. **Wall Assembly** — The 1, 2, 3, or 4 hr fire rated gypsum board/steel stud wall assembly shall be constructed of the materials and in the manner described in the individual U400-Series Wall or Partition Design in the UL Fire Resistance Directory and shall include the following construction features:
- A. **Steel Floor and Ceiling Runners** — Floor and ceiling runners of wall assembly shall consist of galv steel channels sized to accommodate steel studs (Item 2B). When U-shaped deflection channel (Item 3A) is used, ceiling runner installed within the deflection channel with 1 in. gap maintained between the top of ceiling runner and top of deflection plate. When deflection channel is not used, ceiling runner is secured to valleys of steel floor units (Item 1A) with steel fasteners or by welds spaced max 24 in. OC.
  - A1. **Light Gauge Framing\* — Slotted Ceiling Runner** — As an alternate to the ceiling runner in Item 2A, slotted ceiling runner to consist of galv steel channel with slotted flanges sized to accommodate steel studs (Item 2B). Slotted ceiling runner is secured to floor with steel masonry anchors spaced max 24 in. OC. When slotted ceiling runner is used, deflection channel (Item 3A) shall not be used.  
**METAL-LITE** — The System  
**BRADY CONSTRUCTION INNOVATIONS INC,**  
**DBA SLIPTRACK SYSTEMS, INC — SLP-TRK**
  - A2. **Light Gauge Framing\* — Clipped Ceiling Runner** — As an alternate to the ceiling runner in Item 2A, 2A1, clipped runner to consist of galv steel channel with clips preformed in track flanges which positively engage the inside flange of the steel studs (Item 2B). Track sized to accommodate steel studs (Item 2B). Track flanges to be min 2-1/2 in. Clipped ceiling runner installed perpendicular to direction of fluted steel floor units and secured to valleys with steel fasteners spaced 24 in. OC. When clipped ceiling runner is used, deflection channel (Item 3A) shall not be used.  
**TOTAL STEEL SOLUTIONS LLC — Snap Trak**
  - A3. **Light Gauge Framing\* — Vertical Deflection Ceiling Runner** — As an alternate to the ceiling runner in Item 2A, 2A1 or 2A2, vertical deflection ceiling runner to consist of galv steel channel with slotted vertical deflection clips mechanically fastened within runner. Slotted clips, provided with step bushings, for permanent fastening of steel studs. Vertical deflection ceiling runner installed perpendicular to direction of fluted steel floor or roof deck and secured to valleys with steel fasteners spaced max 24 in. OC. When slotted ceiling runner is used, deflection channel (Item 3A) shall not be used.  
**THE STEEL NETWORK INC — VertiTrack VTD362, VTD400, VTD600 and VTD800**
  - B. **Studs** — Steel studs to be min 3-5/8 in. wide. Studs cut 1/2 to 3/4 in. less in length than assembly height. Studs attached to ceiling runner with sheet metal screws a min of 1/2 in. below bottom of deflection channel, when deflection channel is used. When deflection channel is not used, studs shall not be secured to ceiling runner. When slotted ceiling runner (Item 2A1) is used, steel studs secured to slotted ceiling runner with No. 8 by 1/2 in. long wafer head steel screws at mid-height of slot on each side of wall. When vertical deflection ceiling runner (Item 2A3) is used, steel studs secured to slotted vertical deflection clips, through bushings, with steel screws at mid-height of each slot Stud spacing not to exceed 24 in. OC





C. **Gypsum Board\*** – Gypsum board sheets installed to a min total thickness of 5/8, 1-1/4, 1-7/8 or 2-1/2 in. on each side of wall for 1, 2, 3 and 4 hr rated assemblies, respectively. Wall to be constructed as specified in the individual Wall and Partition Design in the UL Fire Resistance Directory, except that a nom 3/4 in. gap shall be maintained between the top of the gypsum board and the lower surface of the floor. The screws attaching the gypsum board to studs at the top of the wall shall be located 1 in. below the bottom of the deflection channel, when deflection channel is used. When deflection channel is not used, the screws attaching the gypsum board to studs at the top of the wall shall be located 1 in. below the bottom of the ceiling runner.

**The hourly fire rating of the joint system is dependent on the hourly fire rating of the wall.**

3. **Joint System – Max separation between bottom of floor and top of wall is 3/4 in. The joint system is designed to accommodate a max 33 percent compression or extension from its installed width.** The joint system consists of a deflection channel, forming material and a fill material, as follows:

A. **Deflection Channel** – (Optional) – A nom 3-5/8 in. wide by min 2 in. deep, min 24 ga. steel U-shaped channel. Deflection channel secured to valleys of steel floor units (Item 1A) with steel fasteners or by welds spaced max 24 in. OC. The ceiling runner (Item 2A) is installed within the deflection channel to maintain a 1 in. gap between the top of the ceiling runner and the top of the deflection channel. The ceiling runner is not fastened to the deflection channel.

B. **Forming Material\*** – Min 4-7/8 in. thickness of min 4 pcf density mineral wool batt insulation for 1 and 2 hr rated assemblies, min 7-3/8 in. and 8-5/8 in. thickness of min 4 pcf density mineral wool batt insulation for 3 and 4 hr rated assemblies, respectively, cut to the shape of the fluted deck, approximately 25 percent larger than the area of the flutes and compressed into flutes of the steel floor units between the top of the deflection channel and the steel deck, flush with both sides of wall. Additional pieces of min 5/8 in. thickness of min 4 pcf mineral wool batt insulation for 1 and 2 hr rated assemblies, min 1-7/8 in. and min 2-1/2 in. thickness of min 4 pcf density mineral wool batt insulation for 3 and 4 hr rated assemblies, respectively, cut into strips and compressed approximately 25 percent to fill the 3/4 in. gap between the top of the gypsum board and bottom of the steel floor units, flush with both sides of wall.

IIG Minwool LLC – MinWool-1200 Safing

Rock Wool Manufacturing Company – Delta Safing Board

Thermafiber LLC - Type SAF

C. **Fill, Void or Cavity Material\*** – Min 1/16 in. (dry) thickness of fill material sprayed or brushed on each side of the wall in the flutes of the steel floor units and between the top of the gypsum board and the bottom of the steel floor units to completely cover mineral wool and overlap a min of 1 in. onto gypsum board and steel deck, on both sides of wall.

GRABBER CONSTRUCTION PRODUCTS INC – GrabberGard EFS

\*Bearing the UL Classification Marking



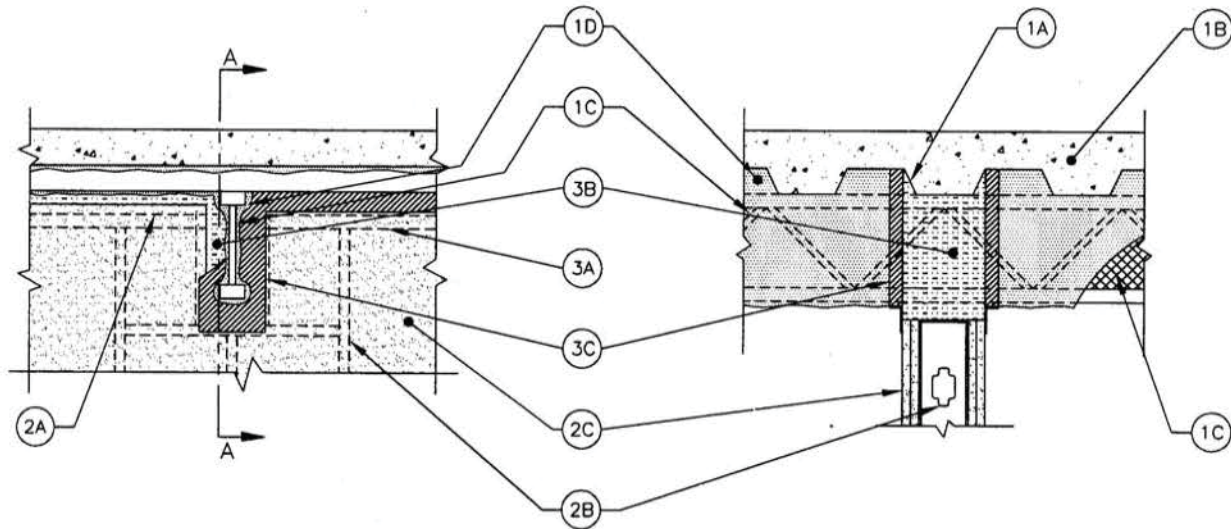


**System No. HW-D-0358**

Assembly Ratings – 1 & 2 Hr

Nominal Joint Width – 1 in.

CLASS II Movement Capabilities – 25% Compression or Extension



1. **Floor Assembly** – The fire-rated fluted steel deck/concrete floor assembly shall be constructed of the materials and in the manner described in the individual D700 Series Floor -Ceiling Design in the UL Fire Resistance Directory and shall include the following construction features:

- A. **Steel Floor and Form Units\*** – Max 3 in. deep galv steel fluted floor units.
- B. **Concrete** – Min 2-1/2 in. thick reinforced lightweight or normal weight (100-150 pcf) concrete, as measured from the top plane of the floor units.
- C. **Structural Steel Support (Optional)** – Steel beam or open-web steel joist, as specified in the individual D700Series Floor-Ceiling Design, used to support steel floor units. Structural steel support oriented perpendicular to wall assembly. Where open-web steel joists pass through the fire rated wall, 3/8 in. diamond mesh expanded steel lath having a nom weight of 1.7 to 3.4 lb per sq yd shall be secured to one side of each joist with galvanized steel tie wire and the lath shall be fully covered with spray-applied fire resistive material with no min thickness requirement.
- D. **Spray-Applied Fire Resistive Materials\*** – After installation of the ceiling runner (Item 2A) or deflection channel (Item 3A, if used), steel floor units and structural steel supports to be sprayed in accordance with the specifications in the individual D700 Series Design.

WR Grace & Co. Conn Construction Products Div. – Type MK-6/HY.





2. **Wall Assembly** — The 1 or 2 hr fire rated gypsum board/steel stud wall assembly shall be constructed of the materials and in the manner described in the individual U400 - Series Wall or Partition Design in the UL Fire Resistance Directory and shall include the following construction features:

A. **Steel Floor and Ceiling Runners** — Floor and ceiling runners of wall assembly shall consist of galv steel channels sized to accommodate steel studs (Item 2B). Ceiling runner to be provided with min 1-1/4 in. to max 3 in. flanges. When deflection channel (Item 3A) is used, ceiling runner is to nest within the deflection channel with 1/2 in. to 1 in. gap maintained between the top of ceiling runner and top of the deflection channel. When deflection channel is not used, ceiling runner to be provided with 3 in. flanges and secured to steel floor units (Item 1A) with steel fasteners or by welds spaced max 24 in. OC. Ceiling runner to be centered beneath and parallel with valley of steel floor units. A clearance of 1 to 1-1/4 in. shall be maintained between the end of the ceiling runner or deflection channel and the spray applied fire resistive material on the structural steel support members.

A1. **Light Gauge Framing\*** — Slotted Ceiling Runner — As an alternate to the ceiling runner in Item 2A, slotted ceiling runner to consist of galv steel channel with slotted flanges sized to accommodate steel studs (Item 2B). Slotted ceiling runner installed perpendicular to direction of fluted steel floor units and secured to valleys with steel fasteners spaced max 24 in. OC. When slotted ceiling runner is used, deflection channel (Item 3A) shall not be used.

**METAL-LITE** — The System

**BRADY CONSTRUCTION INNOVATIONS INC.,**

**DBA SLIPTRACK SYSTEMS, INC** — SLP-TRK

A2. **Light Gauge Framing\*** — Clipped Ceiling Runner — As an alternate to the ceiling runner in Item 2A, 2A1, clipped runner to consist of galv steel channel with clips preformed in track flanges which positively engage the inside flange of the steel studs (Item 2B). Track sized to accommodate steel studs (Item 2B). Track flanges to be min 2-1/2 in. Clipped ceiling runner installed perpendicular to direction of fluted steel floor units and secured to valleys with steel fasteners spaced 24 in. OC. When clipped ceiling runner is used, deflection channel (Item 3A) shall not be used.

**TOTAL STEEL SOLUTIONS LLC** — Snap Trak

A3. **Light Gauge Framing\*** — Vertical Deflection Ceiling Runner — As an alternate to the ceiling runner in Item 2A, 2A1 or 2A2, vertical deflection ceiling runner to consist of galv steel channel with slotted vertical deflection clips mechanically fastened within runner. Slotted clips, provided with step bushings, for permanent fastening of steel studs. Vertical deflection ceiling runner installed perpendicular to direction of fluted steel floor or roof deck and secured to valleys with steel fasteners spaced max 24 in. OC. When slotted ceiling runner is used, deflection channel (Item 3A) shall not be used.

**THE STEEL NETWORK INC** — VertiTrack VTD358, VTD400, VTD600 and VTD800

B. **Studs** — Steel studs to be min 3-5/8 in. wide. Studs cut 1/2 to 3/4 in. less in length than with bottom nesting in and secured to floor runner. When deflection channel (Item 3A) is used, steel studs attached to ceiling runner (Item 2A) with sheet metal screws located 1/2 in. below bottom of deflection channel. When deflection channel is not used, studs to nest in ceiling runner without attachment. When slotted ceiling runner (Item 2A1) is used, steel studs secured to slotted ceiling runner with No. 8 by 1/2 in. long wafer head steel screws at midheight of slot on each side of wall. When vertical deflection ceiling runner (Item 2A3) is used, steel studs secured to slotted vertical deflection clips, through bushings, with steel screws at mid-height of each slot. A framed opening shall be constructed around each structural steel support member. A min clearance of 1 in. to a max clearance of 3 in. shall be maintained between the framing and spray applied fire resistive material on the two sides of the structural support member. The clearance between the framing and the spray applied fire resistive material on the bottom of the structural steel support member shall be min 1/2 in. to max 1 in. Stud spacing not to exceed 24 in. OC





C. **Gypsum Board\*** — Gypsum Wallboard sheets installed to a min total thickness of 5/8 in. and 1-1/4 in. on each side of wall for 1 and 2 hr rated assemblies, respectively. Wall to be constructed as specified in the individual U400 Series Design in the UL Fire Resistance Directory, except that a max nom 1 in. gap shall be maintained between the top of the gypsum board and the spray applied fire resistive material on the steel floor units and min 1/2 in. to max 1 in. gap shall be maintained between the top edge of the gypsum board and the spray applied fire resistive material on the structural steel support member. The screws attaching the gypsum board to the studs along the top of the wall shall be located 1 in. below the bottom of the deflection channel, when deflection channel is used. When deflection channel is not used, the screws attaching the gypsum board at the top of the wall shall be located 1 in. below the bottom of the ceiling runner.

The hourly fire rating of the joint system is equal to the hourly fire rating of the wall.

3. **Joint System** — Max separation between bottom of the spray applied fire resistive material on the steel floor units and top of gypsum board (at time of installation of joint system) is 1 in. Max separation between spray applied fire resistive material on bottom of structural support member and framed opening in top of wall is 1 in. The joint system is designed to accommodate a max 25 percent compression or extension from its installed width as measured between the spray applied fire resistive material on the steel floor units and the top of the gypsum board. The joint system consists of a forming material and fill materials, with or without deflection channel (Item 3A), as follows:

A. **Deflection Channel** — (Optional) — Min 24 gauge galv steel channel, 3 in. deep, sized to accommodate ceiling runner (Item 2A). Deflection channel to be centered beneath and parallel with valley of steel floor unit and secured to steel floor unit with steel fasteners or by welds spaced max 24 in. OC. The ceiling runner (Item 2A) is installed within the deflection channel to maintain a 1/2 in. to 1 in. gap between the top of the ceiling runner and the top of the deflection channel. A clearance of 1 to 1-1/4 in. shall be maintained between the end of the deflection channel and the spray applied fire resistive material on the structural steel support members. The ceiling runner nest inside the deflection channel without attachment.

B. **Forming Material** — Min 4 pcf density mineral wool batt insulation cut to a length approximately the same as the overall thickness of wall and inserted cut edge first into the spaces between the spray-applied fire resistive material on the structural steel member and the framed notch at the top of the wall, flush with the gypsum board surface on both sides of the wall. The thickness of forming material shall be sufficient to attain a min compression of 33 percent between the sides of the framed notch and the protected structural steel member and between the bottom of the framed notch and bottom of the protected structural steel member. Additional sections of mineral wool batt insulation are compressed 33 percent in thickness and are installed cut edge first to completely fill the gap above the top of the gypsum board, flush with both surfaces of wall.

**Fibrex Insulations Inc.** — FBX Safing Insulation

**IIG Minwool LLC** — MinWool-1200 Safing

**Rock Wool Manufacturing Co.** — Delta Board

**Roxul Asia SDN BHD** — Type SAF

**Roxul** — Type Safe

**Thermafiber, LLC** — Type SAF





C. **Fill, Void or Cavity Material\*** – Min 1/16 in. wet thickness of fill material sprayed or brushed over the forming material on each side of the wall. Fill material to overlap a min of 1 in. onto gypsum board and a min 2 in. onto the spray applied fire resistive material (Item 1D) on the steel floor unit and on the structural steel support member on both sides of wall.

GRABBER CONSTRUCTION PRODUCTS INC – GrabberGard EFS

\*Bearing the UL Classification Marking





**System No. HW-D-0359**

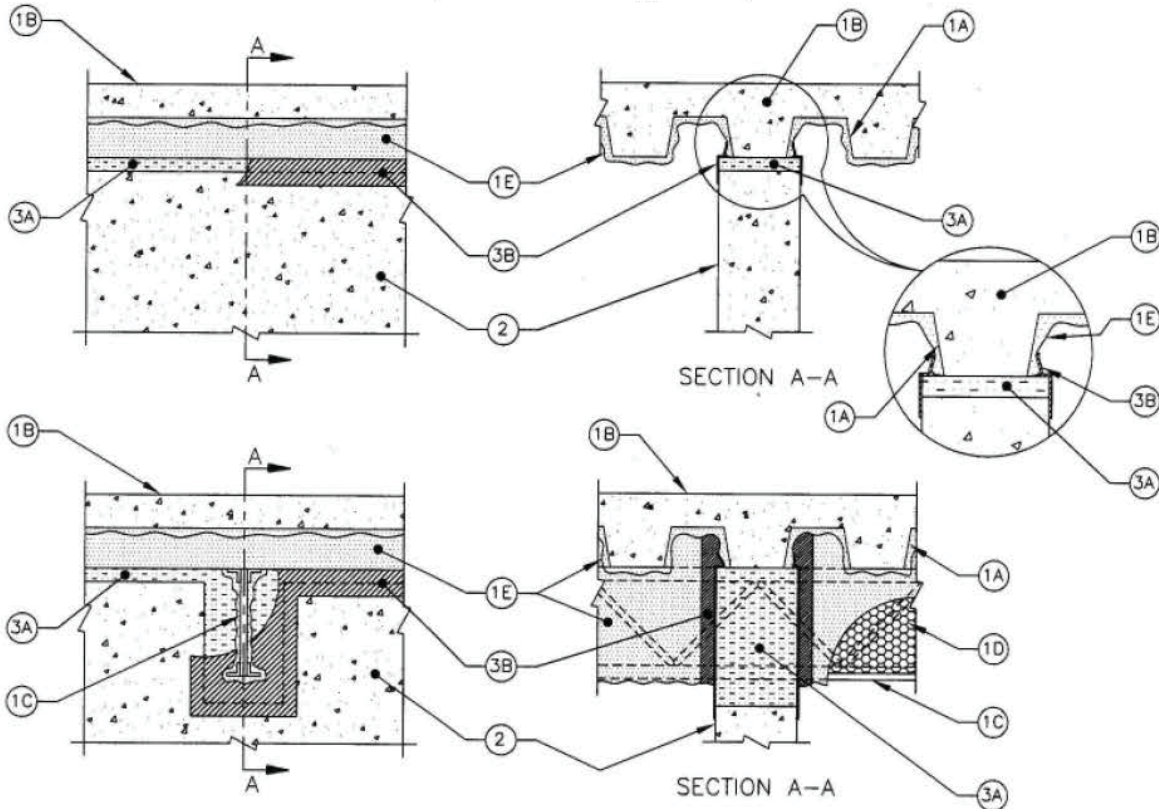
Assembly Rating – 2 Hr

L Rating at Ambient – Less than 1 CFM/Lin. Ft.

L Rating at 400°F – Less than 1 CFM/Lin. Ft.

Nominal Joint Width – 1 in.

Class II Movement Capabilities – 25% Compression or Extension



1. **Floor Assembly** – The fire-rated fluted steel deck/concrete floor assembly shall be constructed of the materials and in the manner described in the individual D700 Series Floor -Ceiling Design in the UL Fire Resistance Directory and shall include the following construction features:

- A. **Steel Floor and Form Units\*** – Max 3 in. deep galv steel fluted floor units.
- B. **Concrete** - Min 2-1/2 in. thick reinforced concrete, as measured from the top plane of the floor units.
- C. **Structural Steel Support (Optional)** – Steel beam or open-web steel joist, as specified in the individual D700 Series Floor-Ceiling Design, used to support steel floor units. Structural steel support oriented perpendicular to wall assembly.
- D. **Steel Lath** – Where open-web steel joists pass through the fire rated wall, 3/8 in. diamond mesh expanded steel lath having a nom weight of 1.7 to 3.4 lb per sq yd shall be secured to one side of each joist with steel tie wire and the lath shall be fully covered with spray-applied fire resistive material with no min thickness requirement.





E. **Spray-Applied Fire Resistive Materials\*** – Prior to installation of the forming material (Item 3A) and sealant (Item 3B), steel floor units and structural steel supports to be sprayed with the thickness of material specified in the individual D700 Series Design. Material is to be excluded from the steel deck in the area immediately above the wall. The spray applied fire resistive material is mixed with water in accordance with the mixing instructions on the bag. The min average density of the spray applied fire resistive material shall be 15 pcf with a min individual density of 14 pcf. See Design Information Section in Volume 1 of the Fire Resistance Directory for method of density determination.

**WR Grace & Co. Conn Construction Products Div.** – Type MK-6/HY.

2. **Wall Assembly** – Min 6-1/8 in. thick reinforced lightweight or normal weight (100-150 pcf) concrete. Wall may also be constructed of any UL Classified Concrete Block\*. Wall assembly to be centered beneath and parallel with valley of steel floor unit.

See **Concrete Block (CAZT)** category in Fire Resistance Directory for names of manufacturers.

3. **Joint System** – Max separation between bottom plane of steel floor unit and top of concrete wall (at time of installation of joint system) is 1 in. Max separation between spray applied fire resistive material on bottom of structural support member and notched opening in top of wall is 1 in. Max clearance between spray applied fire resistive material on sides of structural steel member and notched opening in top of wall in 3 in. The joint system is designed to accommodate a max 25 percent compression or extension from its installed width as measured between bottom plane of steel floor units and top of concrete wall. The joint system shall consists of forming and fill materials, as follows:

A. **Forming Material\*** – Nom 4 pcf density mineral wool batt insulation cut to a length approximately 1 in. longer than overall thickness of wall and inserted cut edge first into the spaces between the spray-applied fire resistive material on the structural steel member and the notched opening at the top of the wall. The thickness of forming material shall be sufficient to attain a min compression of 20 percent between the sides of the notched opening and the protected structural steel member and a min compression of 33 percent between the bottom of the notched opening and the bottom of the protected structural steel member. The mineral wool batt insulation is to be additionally compressed in the length direction such that it is flush with both surfaces of the wall. Additional min 8 in. wide sections of mineral wool batt insulation are compressed 50 percent in thickness and are installed cut edge first to completely fill the gap above the top of the wall. The forming material shall be flush with both surfaces of wall.

**Fibrex Insulations Inc.** – FBX Safing Insulation

**IIG Minwool LLC** – MinWool-1200 Safing

**Rock Wool Manufacturing Co.** – Delta Board or Delta-8

**Roxul Asia SDH BHD** – Type Safe

**Roxul** – Type Safe

**Thermafiber, LLC** – Type SAF

B. **Fill, Void or Cavity Material\*** – Min 1/8 in. thickness (dry) of fill material sprayed or brushed over the forming material on each side of the wall. Fill material to overlap a min of 1/2 in. onto the concrete wall and a min 2 in. onto the spray applied fire resistive material (Item 1E) on the steel floor unit and on the structural steel support member on both sides of wall.

GRABBER CONSTRUCTION PRODUCTS INC – GrabberGard EFS

\*Bearing the UL Classification Marking





**System No. HW-D-0404**

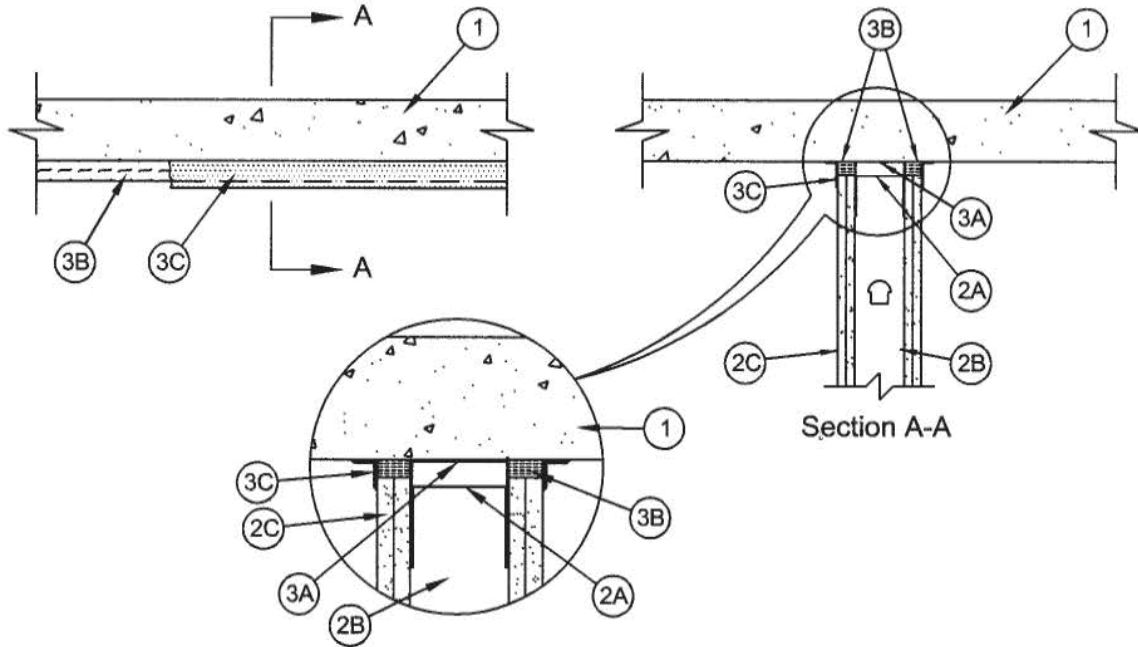
Assembly Rating – 1 & 2 Hr (See Item 2)

L Rating at Ambient – Less than 1 CFM/Lin Ft.

L Rating at 400°F – Less than 1 CFM/Lin Ft.

Nominal Joint Width – 1-1/2 in.

Class II Movement Capabilities – 25% Compression or Extension



1. **Floor Assembly** – Min 4-1/2 in (114 mm) thick steel-reinforced lightweight or normal weight (100-150 pcf or 1600- 2400 kg/m<sup>3</sup>) structural concrete.
2. **Wall Assembly** – The 1 or 2 hr fire rated gypsum board/steel stud wall assembly shall be constructed of the materials and in the manner described in the individual U400 or V400 Series Wall or Partition Design in the UL Fire Resistance Directory and shall include the following construction features:
  - A. **Steel Floor And Ceiling Runners** – Floor and ceiling runners of wall assembly shall consist of galv steel channels sized to accommodate steel studs (Item 2B). Ceiling runner to be provided with 3 in. (76 mm) flanges. When U-shaped deflection channel (Item 3A) is used, ceiling runner installed within the deflection channel with 1 in. (25 mm) gap maintained between the top of ceiling runner and top of deflection channel. When deflection channel is not used, ceiling runner is secured to concrete floor slab with steel masonry anchors spaced max 24 in. (610 mm) OC.





A1. **Light Gauge Framing\* – Slotted Ceiling Runner** – As an alternative to the ceiling runner in Item 2A, slotted ceiling runner to consist of galv. steel channels with slotted flanges sized to accommodate steel studs (Item 2B). Slotted ceiling runner secured to concrete floor slab with steel masonry anchors spaced max 24 in. (610 mm) OC. When slotted ceiling runner is used, deflection channel (Item 3A) shall not be used.

**METAL-LITE INC** – The System

**BRADY CONSTRUCTION INNOVATIONS INC,**

**DBA SLIPTRACK SYSTEMS, INC.** – SLP-TRK

A2. **Light Gauge Framing\* – Clipped Ceiling Runner** – As an alternate to the ceiling runner in Items 2A and 2A1, clipped runner to consist of galv steel channel with clips preformed in track flanges which positively engage the inside flange of the steel studs (Item 2B). Track sized to accommodate steel studs (Item 2B). Track flanges to be min 2-1/2 in. (64 mm). Clipped ceiling runner secured to concrete floor slab with steel masonry anchors spaced max 24 in. (610 mm) OC. When clipped ceiling runner is used, deflection channel (Item 3A) shall not be used.

**TOTAL STEEL SOLUTIONS LLC** — Snap Trak

A3. **Light Gauge Framing\* – Vertical Deflection Ceiling Runner** – As an alternate to the ceiling runner in Items 2A, 2A1 and 2A2, vertical deflection ceiling runner to consist of galv steel channel with slotted vertical deflection clips mechanically fastened within runner. Slotted clips provided with step bushings for permanent fastening of steel studs. Vertical deflection ceiling runner secured to concrete floor slab with steel masonry anchors spaced max 24 in. (610 mm) OC. When vertical deflection ceiling runner is used, deflection channel (Item 3A) shall not be used.

**THE STEEL NETWORK, INC.** – VertiTrack VTD362, VTD400, VTD600 AND VTD800

A4. **Light Gauge Framing\* – Notched Ceiling Runner** – As an alternate to the ceiling runner in Items 2A through 2A3, notched ceiling runner to consist of C-shaped galv steel channel with notched return flanges sized to accommodate steel studs (Item 2B). Notched ceiling runner secured to concrete floor slab with steel masonry anchors spaced max 24 in. (610 mm) OC. When notched ceiling runner is used, deflection channel (Item 3A) shall not be used.

**OLMAR SUPPLY INC** – Type SCR

B. **Studs Steel** - Studs to be min 3-5/8 in. (92 mm) wide. Studs cut 1/2 to 3/4 in. (13 to 19 mm) less in length than assembly height with bottom nesting in and resting on floor runner and with top nesting in ceiling runner without attachment. When slotted ceiling runner (Item 2A1) is used, steel studs secured to slotted ceiling runner with No. 8 by 1/2 in. (13 mm) long wafer head steel screws at midheight of slot on each side of wall. When vertical deflection ceiling runner (Item 2A3) is used, steel studs secured to slotted vertical deflection, through bushings, with steel screws at midheight of each slot. Stud spacing not to exceed 24 in OC (610 mm).

C. **Gypsum Board\*** – Gypsum board sheets installed to min total thickness of 5/8 in. and 1-1/4 in. (16 mm and 32 mm) on each side of wall for 1 and 2 hr rated assemblies, respectively. Wall to be constructed as specified in the individual Wall and Partition Design in the UL Fire Resistance Directory, except that a max 1-1/2 in. (38 mm) gap shall be maintained between the top of the gypsum board and the lower surface of the floor. The screws attaching the wallboard to studs (Item 2B) at the top of the wall shall be located 1 in. (25 mm) below the bottom of the deflection channel (Item 3A), when deflection channel is used. When deflection channel is not used, the screws attaching the gypsum board to studs at the top of the wall shall be located 1 in. (25 mm) below the bottom of the ceiling runner.

The hourly fire rating of the joint system is dependant of the hourly fire rating of the wall.





3. **Joint System** – Max separation between bottom of floor and top of wall is 1-1/2 in. (38 mm). The joint system is designed to accommodate a max 25 percent compression or extension from its installed width. The joint system consists of a deflection channel, forming material and a fill material, as follows:

A. **Deflection Channel** – (Optional) - A nom 3-5/8 in. (92 mm) wide by 3 in. (76 mm) deep min 24 ga steel U-shaped channel. Deflection channel secured to concrete floor slab with steel masonry anchors spaced max 24 in. OC (610 mm). The ceiling runner (Item 2A) is installed within the deflection channel to maintain a 1 in. (25 mm) gap between the top of the ceiling runner and the top of the deflection channel. The ceiling runner is not fastened to the deflection channel.

B. **Forming Material\*** – Min 4 pcf (64 kg/m<sup>3</sup>) mineral wool batt insulation cut into 5/8 in. and 1-1/4 in. (16 and 32 mm) wide strips for 1 and 2 Hr rated assemblies, respectively. Mineral wool to be compressed 50 percent in thickness and installed edge first into gap between top of gypsum board and bottom of floor, flush with both sides of wall.

**FIBREX INSULATIONS INC** – FBX Safing Insulation

**IIG MINWOOL LLC** – MinWool-1200 Safing

**ROCK WOOL MANUFACTURING CO** – Delta Board or Delta -8

**Roxul Asia SDB BHD** – Type Safe

**ROXUL INC** – Type Safe

**THERMAFIBER LLC** – Type SAF

C. **Fill, Void or Cavity Material\*** – Min 1/16 in. (1.6 mm) thickness (dry) of fill material sprayed or brushed on each side of the wall between the top of the gypsum board and the bottom of the floor to completely cover mineral wool and overlap a min of 1/2 in. (13 mm) onto gypsum board and floor on both sides of wall.

**GRABBER CONSTRUCTION PRODUCTS INC** – GrabberGard EFS

\*Bearing the UL Classification Marking





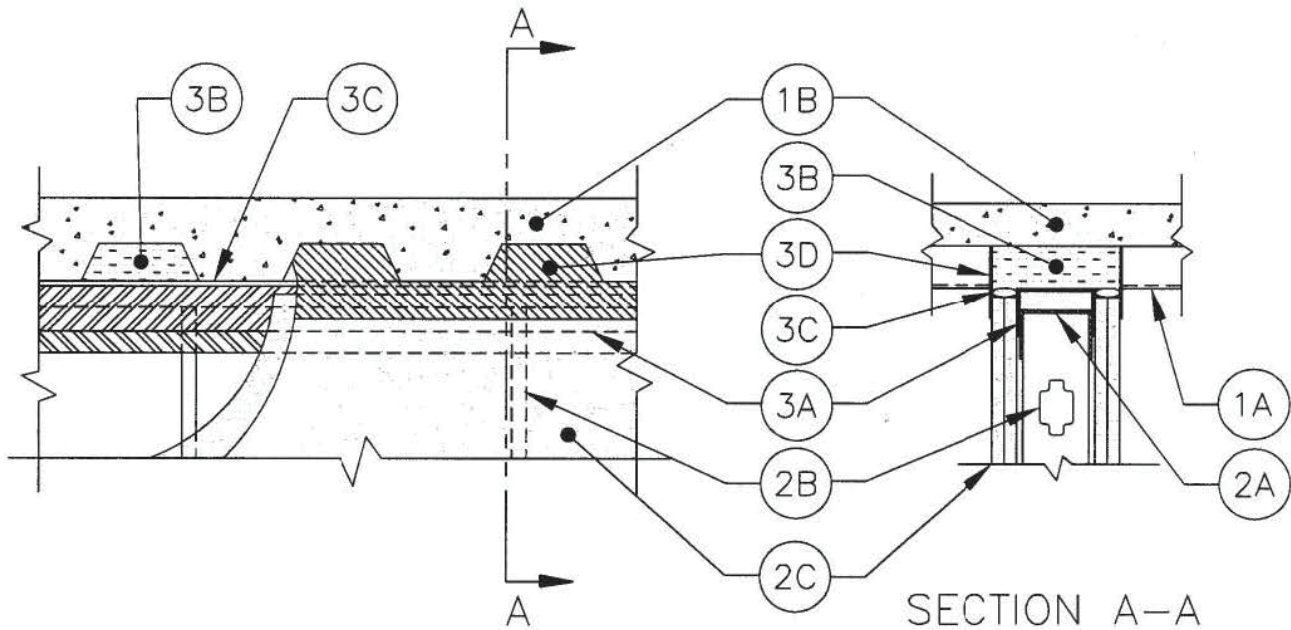


**System No. HW-D-0531**

Assembly Ratings 1 & 2 Hr (See Item 2)

Nominal Joint Width – 3/4 in.

Class II and III Movement Capabilities – 33% Compression or Extension



1. **Floor Assembly** – The fluted steel deck/concrete floor assembly shall be constructed of the materials and in the manner described in the individual Floor-Ceiling Design in the UL Fire Resistance Directory and shall include the following construction features:
  - A. **Steel Floor and Form Units\*** – Max 3 in. (76 mm) deep galv fluted units.
  - B. **Concrete** – Min 2-1/2 in. (64 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400kg/ m3) concrete, as measured from the top plane of the floor units.
- 1A. **Roof Assembly** – (not shown) – As an alternate to the floor assembly a fire-rated fluted steel deck roof assembly may be used. The roof assembly shall be constructed of the materials and in the manner described in the individual P900 series Roof-Ceiling Design in the UL Fire Resistance Directory. The hourly rating of the roof assembly shall be equal to or greater than the hourly rating of the wall assembly and shall include the following construction features:
  - A. **Steel Roof Deck** – Max 3 in. (76 mm) deep galv. steel fluted roof deck.
  - B. **Roof Insulation** – Min 2-1/4 in. (57 mm) thick poured insulating concrete, as measured from the top plane of the floor units.
  - C. **Roof Covering** – Hot-mopped or cold application materials compatible with insulating concrete.







2. **Wall Assembly** – The 1 or 2 hr fire rated gypsum wallboard/steel stud wall assembly shall be constructed of the materials and in the manner described in the individual U400 or V400 Series Wall and Partition Design in the UL Fire Resistance Directory and shall include the following construction features:
- A. **Steel Floor and Ceiling Runners** – Floor and ceiling runners of wall assembly shall consist of galv steel channels sized to accommodate steel studs (Item 2B). When U-shaped deflection channel (Item 3A) is used, ceiling runner installed within the deflection channel with 1 in. (25 mm) gap maintained between the top of ceiling runner and top of deflection plate. When deflection channel is not used, ceiling runner is secured to valleys of steel floor units (Item 1A) with steel fasteners or by welds spaced max 24 in. (610 mm) OC.
  - B. **Studs** – Steel studs to be min 3-5/8 in. (92 mm) wide. Studs cut 5/8 in. (16 mm) less in length than assembly height with bottom nesting in and resting on floor runner and with top nesting in ceiling runner without attachment. Stud spacing not to exceed 24 in. (610 mm).
  - C. **Gypsum Board\*** – Gypsum board sheets installed to a min total thickness of 5/8 in. (16 mm) on each side of wall. Wall to be constructed as specified in the individual Wall and Partition Design in the UL Fire Resistance Directory, except that a nom 3/4 in. (19 mm) gap shall be maintained between top of the wallboard and the bottom of the steel floor units and the top row of screws shall be installed into the studs 1 in. (25 mm) below the bottom of the ceiling runner or deflection channel, when used.

**The hourly fire rating of the joint system is equal to the hourly fire rating of the wall.**

3. **Joint System** – Max width of joint (at time of installation of joint system) is 3/4 in. (19 mm). The joint system is designed to accommodate a max 33 percent compression or extension from its installed width. The joint system consists of the following:
- A. **Deflection Channel (Optional)** – A nom 3-5/8 in. (92 mm) wide by min 2 in. (51 mm) deep, min 24 gauge steel U-shaped channel. Deflection channel secured to valleys of steel floor units (Item 1A) with steel fasteners or by welds spaced max 24 in. (610 mm) OC. The ceiling runner (Item 2A) is installed within the deflection channel to maintain a 1 in. (25 mm) gap between the top of the ceiling runner and the top of the deflection channel. The ceiling runner is not fastened to the deflection channel.
  - B. **Forming Material\*** – Min 4-7/8 in. (124 mm) and 6-1/8 in. (156 mm) thickness of min 4 pcf (64 kg/m<sup>3</sup>) density mineral wool batt insulation for 1 and 2 hr rated assemblies, respectively, cut to the shape of the fluted deck, approximately 20 percent larger than the area of the flutes and compressed into flutes of the steel floor units between the top of the ceiling runner and the steel deck, flush with the surface of the wall on both sides.  
    - Fibrex Insulation, Inc. – FBX Safing Insulation
    - IIG Minwool LLC – MinWool-1200 Safing
    - Rock Wool Manufacturing Co – Delta Safing Board
    - Thermafiber LLC – Type SAF
  - C. **Backer Rod** – Nom 1 in. (25 mm) diam polyethylene backer rod compressed and firmly packed into the nom 3/4 in. (19 mm) gap between the top of the gypsum board and the bottom of the steel deck and the bottom of the forming material in area of flutes. Backer rod compressed flush with both surfaces of the wall.
  - D. **Fill, Void or Cavity Material\*** – Min 1/16 in. (1.6 mm) dry thickness of fill material sprayed or brushed on each side of the wall in the flutes of the steel floor units and between the top of the gypsum board and the bottom of the steel floor units to completely cover mineral wool and backer rod and overlap a min of 1 in. (25 mm) onto gypsum board and steel deck on both sides of wall.

GRABBER CONSTRUCTION PRODUCTS INC – GrabberGard EFS

\*Bearing the UL Classification Marking





**System No. HW-D-0532**

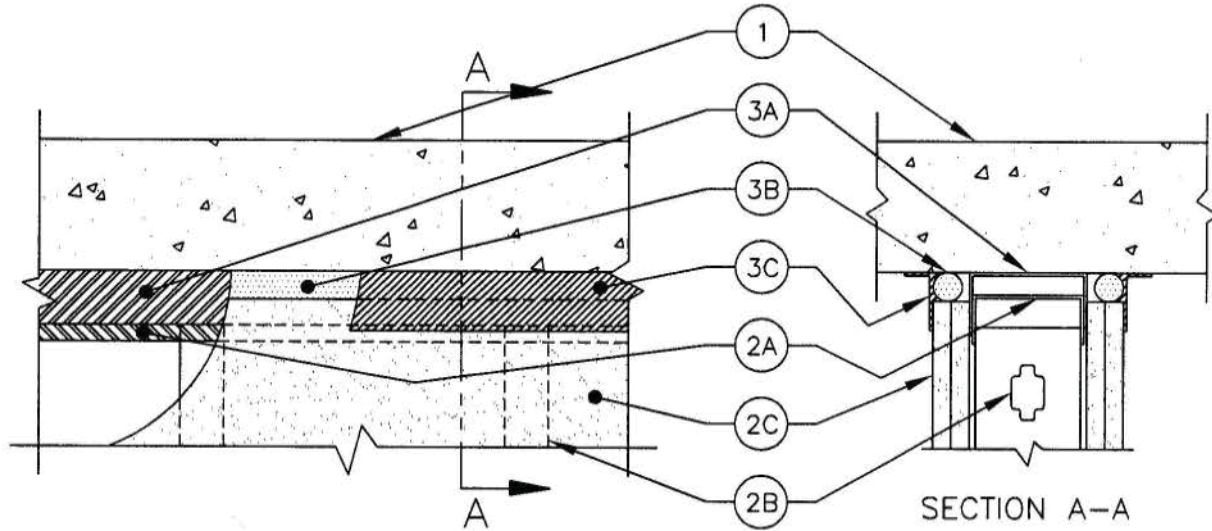
Assembly Rating – 2 Hr

L Rating at Ambient – Less than 1 CFM/Lin Ft.

L Rating at 400°F – Less than 1 CFM/Lin Ft.

Nominal Joint Width – 1 in.

Class II Movement Capabilities – 25% Compression or Extension



1. **Floor Assembly** – Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m<sup>3</sup>) concrete.
2. **Wall Assembly** – The 2 hr fire rated gypsum wallboard/steel stud wall assembly shall be constructed of the materials and in the manner described in the individual U400 or V400 - Series Wall or Partition Design in the UL Fire Resistance Directory and shall include the following construction features:
  - A. **Steel Floor and Ceiling Runners** – Floor and ceiling runners of wall assembly shall consist of galv steel channels sized to accommodate steel studs (Item 2B). When U-shaped deflection channel (Item 3A) is used, ceiling runner installed within the deflection channel with 1 in. (25 mm) gap maintained between the top of ceiling runner and top of deflection channel. When deflection channel is not used, ceiling runner is secured to floor assembly (Item 1) with steel masonry anchors spaced max 24 in. (610 mm) OC.





- A1. **Light Gauge Framing\* – Slotted Ceiling Runner** – As an alternate to the ceiling runner in Item 2A, slotted ceiling runner to consist of galv steel channel with slotted flanges sized to accommodate steel studs (Item 2B). Slotted ceiling runner installed with steel fasteners spaced max 24 in. (610 mm) OC. When slotted ceiling runner is used, deflection channel (Item 3A) shall not be used.
- Brady Construction Innovations Inc.,**  
**DBA Sliptrack Systems, Inc. – SLP-TRK**  
**Clarkwestern Building Systems Inc – Type SLT, SLT-H**  
**Metal-Lite, Inc. – The System**  
**SCAFCO Steel Stud Manufacturing CO**  
**Telling Industries LLC – True Action Deflection Track**
- A2. **Light Gauge Framing\* – Vertical Deflection Ceiling Runner** – As an alternate to the ceiling runners in Item 2A and 2A1, vertical deflection ceiling runner to consist of galv steel channel with slotted vertical deflection clips mechanically fastened with runner. Slotted clips provided with step bushing for permanent fastening of steel studs. Flanges sized to accommodate steel studs (Item 2B). Vertical deflection ceiling runner installed with steel fasteners spaced max 24 in. (610 mm) OC. When vertical deflection ceiling runner is used, deflection channel (Item 3A) shall not be used.
- The Steel Network, Inc. – VertiTrack VTD362, VTD400, VTD600 and VTD800**
- A3. **Light Gauge Framing\* – Clipped Ceiling Runner** – As an alternate to the ceiling runner in Items 2A, 2A1 and 2A2, clipped runner to consist of galv steel channel with clips performed in track flanges which positively engaged the inside flange of the steel studs (Item 2B). Track sized to accommodate steel studs (Item 2B). Track flanges to be min 3-1/4 in. (83 mm). Clipped ceiling runner installed with steel fasteners spaced max 24 in. (610 mm) OC. When clipped ceiling runner is used, deflection channel (Item 3A) shall not be used.
- Total Steel Solutions, LLC – Snap Trak**
- B. **Studs** – Steel studs to be min 3-5/8 in. (92 mm) wide. Studs cut 1/2 to 3/4 in. (13 to 19 mm) less in length than assembly height. Studs attached to ceiling runner with sheet metal screws a min of 1/2 in. (13 mm) below bottom of deflection channel, when deflection channel is used. When deflection channel is not used, studs shall not be secured to ceiling runner. When slotted ceiling runner is used (Item 2A1), steel studs secured to slotted ceiling runner with No. 8 by 1/2 in. (13 mm) long wafer head steel screws at midheight of slot on each side of wall. When vertical deflection ceiling runner (Item 2A3) is used, steel studs secured to slotted vertical deflection clips, through bushings, with steel screws at midheight of each slot. Stud spacing not to exceed 24 in. (610 mm) OC.
- C. **Gypsum Board\*** – Gypsum board sheets to be installed to a min total thickness of 1-1/4 in. (32 mm) on each side of the wall. Wall to be constructed as specified in the individual Wall and Partition Design in the UL Fire Resistance Directory, except that a nom 1 in. (25 mm) gap shall be maintained between the top of the gypsum board and lower surface of the floor. The screws attaching the wallboard to studs at the top of the wall shall be located 1 in. (25 mm) below the bottom of the ceiling runner or deflection channel (Item 3A).





3. **Joint System** – Max separation between bottom of floor and top of wall is 1 in. (25 mm) The joint system is designed to accommodate a max 25 percent compression or extension from its installed width. The joint system consists of a deflection channel and a fill material, as follows:

- A. **Deflection Channel** – (Optional) – A nom 3-5/8 in. (92 mm) wide by min 2 in. (51 mm) deep min 24 ga. steel U-shaped channel. Deflection channel secured to Floor with steel masonry anchors spaced max 24 in. (610 mm) OC. The ceiling runner (Item 2A) is installed within the deflection channel to maintain a 1 in. gap between the top of the ceiling runner and the top of the deflection channel. The ceiling runner is not fastened to the deflection channel.
- B. **Backer Rod** – Nom 1-1/4 in. (32 mm) diam polyethylene backer rod compressed and firmly packed into the 1 in. (25 mm) gap between the top of the wallboard and lower surface of the floor assembly. Backer rod to be flush with both surfaces of wall.
- C. **Fill Void or Cavity Material\*** – **Sealant** – Min 1/16 in. (1.6 mm) dry thickness (min 1/8 in. or 3.2 mm wet thickness) of fill material sprayed or brushed over joint, completely covering backer rod and overlapping min 1 in. (25 mm) onto wallboard and concrete floor.

GRABBER CONSTRUCTION PRODUCTS INC – GrabberGard EFS

\* Bearing UL Classification Marking





**System No. HW-D-0547**

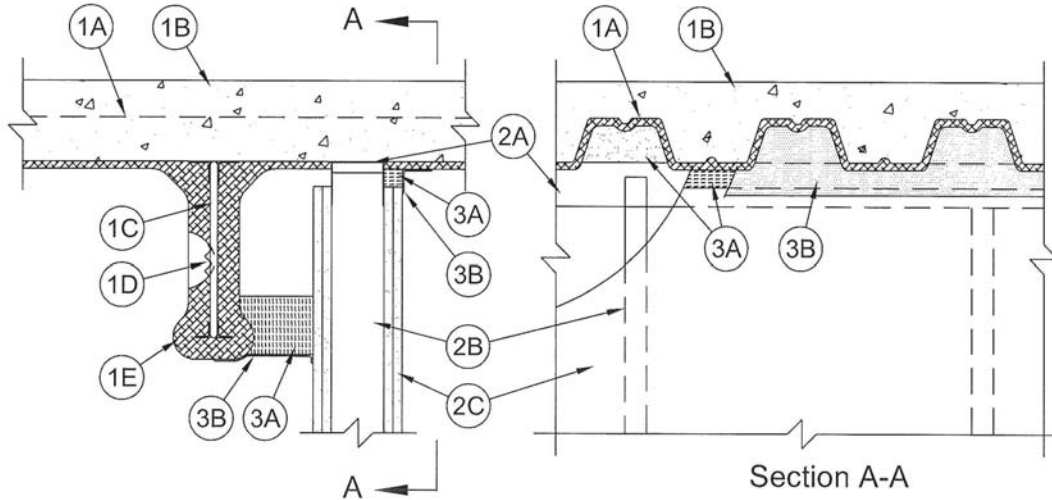
Assembly Rating – 1 & 2 Hr (See Item 2)

Nominal Joint Width – 1 in.

L Rating at Ambient – Less than 1 CFM/Lin Ft.

L Rating at 400°F – Less than 1 CFM/Lin Ft.

Class II Movement Capabilities – 12.5% Compression or Extension



1. **Floor Assembly** – The fire-rated fluted steel deck/concrete floor assembly shall be constructed of the materials and in the manner described in the individual D700 or D900 Series Floor-Ceiling Design in the UL Fire Resistance Directory. The hourly fire rating of the floor assembly shall be equal to or greater than the hourly fire rating of the wall assembly. The floor assembly shall include the following construction features:

- A. **Steel Floor and Floor Units\*** – Max 3 in. (76 mm) deep galv steel fluted floor units.
- B. **Concrete** – Min 2-1/2 in. (64 mm) thick reinforced concrete, as measured from the top plane of the floor units.
- C. **Structural Steel Support** – Steel beam or open-web steel joist, as specified in the individual D700 or D900 Series Floor-Ceiling Design, used to support steel floor units. Structural steel support oriented parallel to and 1 to 6 in. (25 to 152 mm) from wall assembly.
- D. **Steel Lath** – When structural steel support (Item 1C) consists of open-web steel joists, 3/8 in. (10 mm) diamond mesh expanded steel lath having a nom weight of 1.7 to 3.4 lb per sq yd (0.9 to 1.8 kg/m<sup>2</sup>) shall be installed to completely cover one side of each joist which is located within 6 in. (152 mm) of wall assembly. The lath shall be secured with steel tie wire and shall be fully covered with spray applied fire resistive material.





E. **Spray-Applied Fire Resistive Material\*** — After installation of the ceiling runner (Item 2A), steel floor units and structural steel supports to be sprayed with the thickness of material specified in the individual D700 Series Design or the structural steel supports to be sprayed in accordance with the specifications in the individual D900 Series Design. The flutes of the steel floor units above the structural steel supports and above the ceiling runner (Item 2A) shall be filled with spray-applied fire resistive material. As an alternate, the spray-applied fire resistive material in the flutes above the ceiling runner may be applied to follow the contour of the steel floor units. Excess material shall be removed from the flanges of the ceiling runner beyond the required thickness of spray-applied fire resistive material on the steel floor units.

**W R GRACE & CO - CONN** — Type MK-6/HY, MK-6/HY ES, MK-6s, RG

**ISOLATEK INTERNATIONAL** — Type 300

1A. **Roof Assembly** — (Not Shown) — As an alternate to the floor assembly (Item 1), a fire rated fluted steel deck roof assembly may be used. The roof assembly shall be constructed of the materials and in the manner described in the individual P700 Series Roof-Ceiling Design in the UL Fire Resistance Directory. The hourly fire rating of the roof assembly shall be equal to or greater than the hourly fire rating of the wall assembly. The roof assembly shall include the following construction features:

A. **Steel Roof Deck** — Max 3 in. (76 mm) deep galv steel fluted roof deck.

B. **Roof Insulation** — Mineral and Fiber Board\* — Min 3/4 in. (19 mm) thick boards applied in one or more layers directly over steel roof deck or over gypsum board sheathing laid atop steel roof deck.

C. **Roof Covering\*** — Hot-mopped or cold-application materials compatible with mineral and fiber board insulation.

D. **Structural Steel Support** — Steel beam or open-web steel joist, as specified in the individual P700 or P800 Series Roof-Ceiling Design, used to support steel floor units. Structural steel support oriented parallel to and 1 in. to 6 in. (25 to 152 mm) from wall assembly.

E. **Steel Lath** — When structural steel support (Item 1D) consists of open-web steel joists, 3/8 in. (10 mm) diamond mesh expanded steel lath having a nom weight of 1.7 to 3.4 lb per sq yd (0.9 to 1.8 kg/m<sup>2</sup>) shall be installed to completely cover one side of each joist which is located within 6 in. (152 mm) of wall assembly. The lath shall be secured with steel tie wire and shall be fully covered with spray applied fire resistive material.

F. **Spray-Applied Fire Resistive Material\*** — After installation of the ceiling runner (Item 2A), steel roof deck and structural steel supports to be sprayed with a thickness of spray applied fire resistive material as specified in the individual P700 Series Roof-Ceiling design. The flutes of the steel deck above the structural steel supports and above the ceiling runner (Item 2A) shall be filled with spray-applied fire resistive material. As an alternate, the spray-applied fire resistive material in the flutes above the ceiling runner may be applied to follow the contour of the steel roof deck. Excess material shall be removed from the flanges of the ceiling runner beyond the required thickness of spray-applied fire resistive material on the steel roof deck.

**W R GRACE & CO - CONN** — Type MK-6/HY, MK-6/HY ES, MK-6s, RG

**ISOLATEK INTERNATIONAL** — Type 300





2. **Wall Assembly** — The 1 or 2 hr fire-rated gypsum board/steel stud wall assembly shall be constructed of the materials and in the manner described in the individual U400 or V400 Series Wall or Partition Design in the UL Fire Resistance Directory and shall include the following construction features:
- A. **Steel Floor and Ceiling Runners** — Floor and ceiling runners of wall assembly shall consist of galv steel channels sized to accommodate steel studs (Item 2B). Ceiling runner to be provided with min 2 in. (51 mm) to max 3 in. (76 mm) flanges. Ceiling runner is secured to steel floor units (Item 1A) with steel fasteners or welds spaced max 24 in. (610 mm) OC. Ceiling runner to be installed parallel with structural steel support and located such that a max clearance of 4 in. (102 mm) is present between the finished wall and the spray-applied fire resistive material at the lowest elevation of the structural steel support.
  - A1. **Light Gauge Framing\* — Slotted Ceiling Runner** — As an alternate to the ceiling runner in Item 2A, ceiling runner to consist of galv steel channel with slotted flanges sized to accommodate steel studs (Item 2B). Ceiling runner secured to valleys with steel fasteners spaced max 24 in. (610 mm) OC.  
**CALIFORNIA EXPANDED METAL PRODUCTS COMPANY — CST**  
**BRADY CONSTRUCTION INNOVATIONS INC, DBA SLIPTRACK SYSTEMS — SLP-TRK**
  - A2. **Light Gauge Framing\* — Clipped Ceiling Runner** — As an alternate to the ceiling runner in Items 2A and 2A1, clipped runner to consist of galv steel channel with clips preformed in track flanges which positively engage the inside flange of the steel studs (Item 2B). Track sized to accommodate steel studs (Item 2B). Track flanges to be min 2-1/2 in. (64 mm). Clipped ceiling runner secured with steel fasteners spaced max 24 in. (610 mm) OC.  
**TOTAL STEEL SOLUTIONS LLC — Snap Trak**
  - A3. **Light Gauge Framing\* — Notched Ceiling Runner** — As an alternate to the ceiling runners in Items 2A through 2A2, notched ceiling runners to consist of C-shaped galv steel channel with notched return flanges sized to accommodate steel studs (Item 2B). Notched ceiling runner installed perpendicular to direction of fluted steel deck and secured to valleys with steel masonry anchors spaced max 24 in. (610 mm) OC.  
**OLMAR SUPPLY INC — Type SCR**
  - B. **Studs** — Steel studs to be min 3-1/2 in. (89 mm) wide. Studs cut 1/2 in. to 3/4 in. (13 to 19 mm) less in length than assembly height with bottom nesting in and secured to floor runner. When slotted ceiling runner (Item 2A1) is used, steel studs secured to slotted ceiling runner with No. 8 by 1/2 (13 mm) long wafer head steel screws at midheight of slot on each side of wall. Studs to nest in ceiling runner without attachment.
  - C. **Gypsum Board\*** — Gypsum board sheets installed to a min total 5/8 in. (16 mm) or 1-1/4 in. (32 mm) thickness on each side of wall for 1 and 2 hr fire rated assemblies, respectively. Wall to be constructed as specified in the individual U400 or V400 Series Design in the UL Fire Resistance Directory except that a max 1 in. (25 mm) gap shall be maintained between the top of the gypsum board and the bottom plane of the spray applied fire resistive material on the steel deck when D700 series assembly is used or between the top of gypsum board and the steel floor units when D900 series assembly is used, on both sides of the wall assembly. The screws attaching the gypsum board to the studs along the top of the wall shall be located 1 in. (25 mm) below the bottom of the ceiling runner. No gypsum board attachment screws shall be driven into the ceiling runner. Where the top of the wall assembly is inaccessible above the lowest elevation of the structural steel support, the gypsum board attachment screws may be omitted.  
**The hourly fire rating of the joint system is equal to the hourly fire rating of the wall.**







3. Joint System – Max separation between bottom of the spray applied fire resistive material on the steel floor units and top of gypsum board (at time of installation of joint system) is 1 in. (25 mm) when D700 series assembly is used. Max separation between bottom of the steel floor units and top of gypsum board (at time of installation of joint system) is 1 in. (25 mm) when D900 series assembly is used. Max separation between spray applied fire resistive material on structural support member and surface of wall is 4 in. (102 mm). The joint system is designed to accommodate a max 12.5 percent compression or extension from its installed width as measured between the bottom plane of the steel floor units or spray-applied fire resistive material on the steel floor units and the top of the gypsum board. The joint system shall consist of forming and fill materials, as follows:

A. **Forming Material\*** – Nom 4 pcf (64 kg/m<sup>3</sup>) density mineral wool batt insulation. Sections of mineral wool batt cut to a width of 4 in. (102 mm) and stacked to attain a thickness which is 50 percent greater than the width of the linear gap between the spray applied fire resistive material on the structural steel member and the surface of the wall assembly. Stacked sections of mineral wool compressed 33 percent in thickness and installed cut edge first into linear gap until the bottom edge is flush with the bottom surface of the spray applied fire resistive material on the structural steel member. When the spray-applied fire resistive material in the flutes above the wall follows the contour of the steel deck, sections of mineral wool batt cut to the shape of the fluted deck and stacked to a min 6 in. (152 mm) thickness shall be installed in the flutes of the steel floor or roof deck between the top of the ceiling runner and the spray-applied fire resistive material. The mineral wool batt insulation is to be installed flush with the gypsum board surface on the side of the wall opposite the structural steel support. Additional sections of mineral wool batt insulation are compressed 50 percent in thickness and are installed cut edge first to completely fill the gap above the top of the gypsum board.

FIBREX INSULATIONS INC – FBX Safing Insulation

IIG MINWOOL LLC – MinWool-1200 Safing

ROCK WOOL MANUFACTURING CO – Delta Board

ROXUL ASIA SDN BHD – SAFE

ROXUL INC – SAFE

THERMAFIBER INC – Type SAF

B. **Fill, Void or Cavity Material\*** – **Sealant** – Min 1/8 in. (3.2 mm) wet thickness or 1/16 in. (1.6 mm) dry thickness of fill material spray or brush applied over the forming material on each side of the wall. Fill material to overlap a min of 1 in. (25 mm) onto the gypsum board and onto the steel floor units or spray-applied fire resistive material on the steel floor units and on the structural steel support member.

GRABBER CONSTRUCTION PRODUCTS INC – GrabberGard EFS

\*Bearing the UL Classification Marking





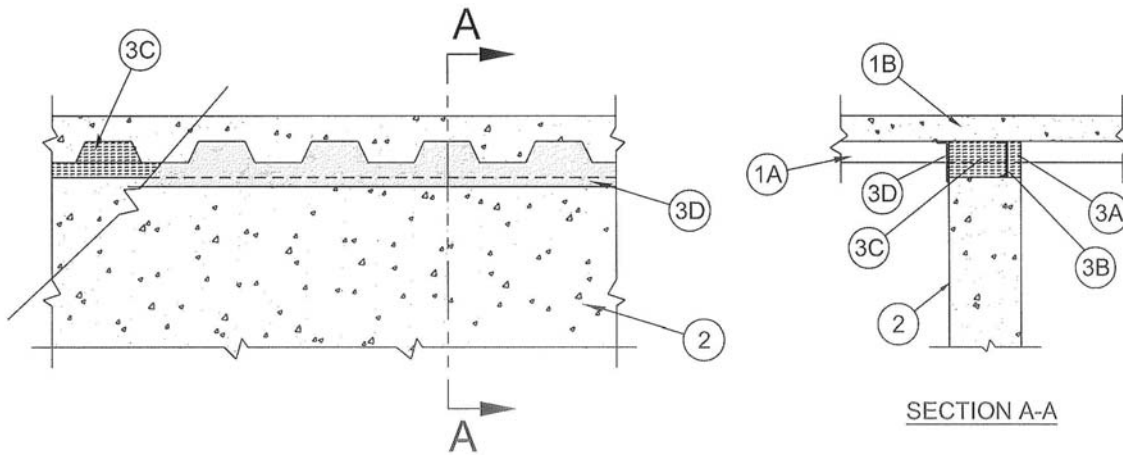


**System No. HW-D-0566**

Assembly Rating – 2 Hr

Nominal Joint Width – 2 in.

Class II Movement Capabilities – 12.5% Compression or Extension



1. **Floor Assembly** – The fire-rated fluted steel deck/concrete floor assembly shall be constructed of the materials and in the manner described in the individual D900 Series Floor-Ceiling Design in the UL Fire Resistance Directory. The hourly fire rating of the floor assembly shall be equal to or greater than the hourly fire rating of the wall assembly. The floor assembly shall include the following construction features:

- A. **Steel Floor and Floor Units\*** – Max 3 in. (76 mm) deep galv steel fluted floor units.
- B. **Concrete** – Min 2-1/2 in. (64 mm) thick reinforced concrete, as measured from the top plane of the floor units.

1A. **Roof Assembly** – (Not Shown) – As an alternate to the floor assembly (Item 1), a fire rated fluted steel deck roof assembly may be used. The roof assembly shall be constructed of the materials and in the manner described in the individual P900 Series Roof-Ceiling Design in the UL Fire Resistance Directory. The hourly fire rating of the roof assembly shall be equal to or greater than the hourly fire rating of the wall assembly. The roof assembly shall include the following construction features:

- A. **Steel Roof Deck** – Max 3 in. (76 mm) deep galv steel fluted roof deck.
- B. **Roof Insulation** – Min 2-1/4 in. (57 mm) thick poured insulating concrete, as measured from the top plane of the steel roof deck.
- C. **Roof Covering\*** – Hot-mopped or cold-application materials compatible with insulating concrete.

2. **Wall Assembly** – Min 8 in. (203 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/ m3) structural concrete. Wall shall be installed perpendicular with flutes of the steel floor and form units (Item 1A). Wall may also be constructed of any UL Classified 2 hr fire rated Concrete Blocks\*. When wall is constructed of concrete blocks, the top course of block shall be filled with concrete, grout or mortar.

See **Concrete Blocks (CAZT)** category in the Fire Resistance Directory for names manufacturers.





3. **Joint System** — Max separation between bottom of steel floor or roof units and top of wall (at time of installation of joint system) is 2 in. (51 mm). The joint system is designed to accommodate a max 12.5 percent compression or extension from its installed width as measured between the bottom plane of the steel floor units and the top of the wall. The joint system shall consist of forming and fill materials, as follows:

A. **Forming Material\*** — Min 2 in. (51 mm) wide sections of min 4 pcf (64 kg/m<sup>3</sup>) density mineral wool batt insulation cut to shape of flutes, compressed 33 percent in thickness and tightly packed into fluted area of floor or roof deck as a permanent form, flush with one surface of wall. Additional strips of mineral wool batt insulation cut to min 2 in. (51 mm) width, compressed 33 percent in thickness and inserted into the gap between the top of the wall and the bottom of the floor units as a permanent form, flush with one surface of the wall. Adjoining lengths of batt insulation to be tightly butted with seams spaced min 48 in. (1.2 m) apart along length of joint.

FIBREX INSULATIONS INC — FBX Safing Insulation

IIG MINWOOL LLC — MinWool-1200 Safing

ROCK WOOL MANUFACTURING CO — Delta Board

ROXUL ASIA SDN BHD — SAFE

ROXUL INC — SAFE

THERMAFIBER INC — Type SAF

B. **Fill, Void or Cavity Material\* — Sealant** — Min 1/8 in. (3.2 mm) wet thickness or 1/16 in. (1.6 mm) dry thickness of fill material spray or brush applied into joint to completely cover the mineral wool forming material and to overlap a min of 1 in. (25 mm) onto the steel deck and min 1/2 in. (13 mm) onto the top of concrete wall.

GRABBER CONSTRUCTION PRODUCTS INC — GrabberGard EFS

C. **Forming Material\*** — Min 6 in. (152 mm) wide sections of min 4 pcf (64 kg/m<sup>3</sup>) density mineral wool batt insulation cut to shape of flutes, compressed 33 percent in thickness and tightly packed into fluted area of floor or roof deck as a permanent form, flush with the installed forming material (Item 3A) and opposite surface of wall. Additional strips of mineral wool batt insulation cut to min 6 in. (152 mm) width, compressed 33 percent in thickness and inserted into the gap between the top of the wall and the bottom of the floor units as a permanent form, flush with the installed forming material (Item 3A) and the opposite surface of the wall. Adjoining lengths of batt insulation to be tightly butted with seams spaced min 48 in. (1.2 m) apart along length of joint.

FIBREX INSULATIONS INC — FBX Safing Insulation

IIG MINWOOL LLC — MinWool-1200 Safing

ROCK WOOL MANUFACTURING CO — Delta Board

ROXUL ASIA SDN BHD — SAFE

ROXUL INC — SAFE

THERMAFIBER INC — Type SAF

D. **Fill, Void or Cavity Material\* — Sealant** — Min 1/8 in. (3.2 mm) wet thickness or 1/16 in. (1.6 mm) dry thickness of fill material spray or brush applied to completely cover the mineral wool forming material and to overlap a min of 1/2 in. (13 mm) onto concrete wall and min 1 in. (25 mm) onto steel deck on accessible side of the wall.

GRABBER CONSTRUCTION PRODUCTS INC — GrabberGard EFS

\*Bearing the UL Classification Marking



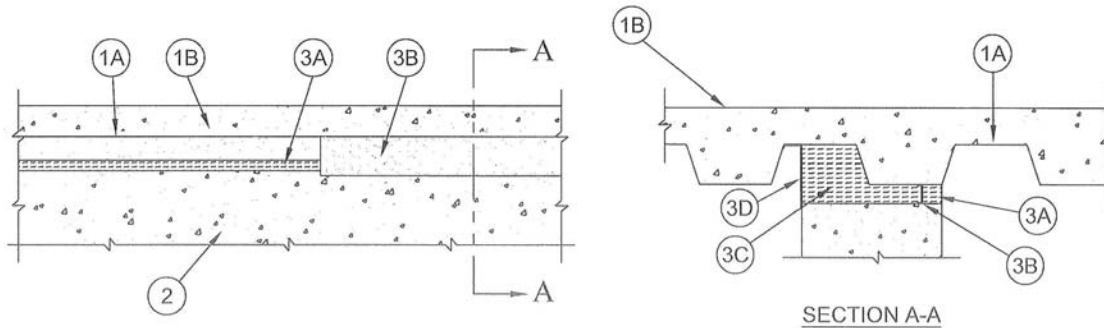


**System No. HW-D-0567**

Assembly Rating – 2 Hr

Nominal Joint Width – 2 in.

Class II Movement Capabilities – 12.5% Compression or Extension



1. **Floor Assembly** – The fire-rated fluted steel deck/concrete floor assembly shall be constructed of the materials and in the manner described in the individual D900 Series Floor-Ceiling Design in the UL Fire Resistance Directory and shall include the following construction features:

- A. **Steel Floor and Floor Units\*** – Max 3 in. (76 mm) deep galv steel fluted floor units.
- B. **Concrete** – Min 2-1/2 in. (64 mm) thick reinforced concrete, as measured from the top plane of the floor units.

1A. **Roof Assembly** – (Not Shown) – As an alternate to the floor assembly (Item 1), a fire rated fluted steel deck roof assembly may be used. The roof assembly shall be constructed of the materials and in the manner described in the individual P900 Series Roof-Ceiling Design in the UL Fire Resistance Directory. The hourly fire rating of the roof assembly shall be equal to or greater than the hourly fire rating of the wall assembly. The roof assembly shall include the following construction features:

- A. **Steel Roof Deck** – Max 3 in. (76 mm) deep galv steel fluted roof deck.
- B. **Roof Insulation** – Min 2-1/4 in. (57 mm) thick poured insulating concrete, as measured from the top plane of the steel roof deck.
- C. **Roof Covering\*** – Hot-mopped or cold-application materials compatible with insulating concrete.

2. **Wall Assembly** – Min 8 in. (203 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m<sup>3</sup>) structural concrete. Wall shall be installed parallel with flutes of the steel floor and form units (Item 1A). Wall may also be constructed of any UL Classified 2 hr fire rated **Concrete Blocks\***. When wall is constructed of concrete blocks, the top course of block shall be filled with concrete, grout or mortar. See **Concrete Blocks** (CAZT) category in the Fire Resistance Directory for names manufacturers.





3. **Joint System** – Max separation between bottom of steel floor or roof units and top of wall (at time of installation of joint system) is 2 in. (51 mm). The joint system is designed to accommodate a max 12.5 percent compression or extension from its installed width as measured between the bottom plane of the steel floor units and the top of the wall. The joint system shall consist of forming and fill materials, as follows:

A. **Forming Material\*** – Min 2 in. (51 mm) wide sections of min 4 pcf (64 kg/m<sup>3</sup>) density mineral wool batt insulation cut to shape of flutes, compressed 33 percent in thickness and tightly packed into fluted area of floor or roof deck as a permanent form, flush with one surface of wall. Additional strips of mineral wool batt insulation cut to min 2 in. (51 mm) width, compressed 33 percent in thickness and inserted into the gap between the top of the wall and the bottom of the floor units as a permanent form, flush with one surface of the wall. Adjoining lengths of batt insulation to be tightly butted with seams spaced min 48 in. (1.2 m) apart along length of joint.

FIBREX INSULATIONS INC – FBX Safing Insulation

IIG MINWOOL LLC – MinWool-1200 Safing

ROCK WOOL MANUFACTURING CO – Delta Board

ROXUL ASIA SDN BHD – SAFE

ROXUL INC – SAFE

THERMAFIBER INC – Type SAF

B. **Fill, Void or Cavity Material\* – Sealant** – Min 1/8 in. (3.2 mm) wet thickness or 1/16 in. (1.6 mm) dry thickness of fill material spray or brush applied into joint to completely cover the mineral wool forming material and to overlap a min of 1 in. (25 mm) onto the steel deck and min 1/2 in. (13 mm) onto the top of concrete wall.

GRABBER CONSTRUCTION PRODUCTS INC – GrabberGard EFS

C. **Forming Material\*** – Min 6 in. (152 mm) wide sections of min 4 pcf (64 kg/m<sup>3</sup>) density mineral wool batt insulation cut to shape of flutes, compressed 33 percent in thickness and tightly packed into fluted area of floor or roof deck as a permanent form, flush with the installed forming material (Item 3A) and opposite surface of wall. Additional strips of mineral wool batt insulation cut to min 6 in. (152 mm) width, compressed 33 percent in thickness and inserted into the gap between the top of the wall and the bottom of the floor units as a permanent form, flush with the installed forming material (Item 3A) and the opposite surface of the wall. Adjoining lengths of batt insulation to be tightly butted with seams spaced min 48 in. (1.2 m) apart along length of joint.

FIBREX INSULATIONS INC – FBX Safing Insulation

IIG MINWOOL LLC – MinWool-1200 Safing

ROCK WOOL MANUFACTURING CO – Delta Board

ROXUL ASIA SDN BHD – SAFE

ROXUL INC – SAFE

THERMAFIBER INC – Type SAF

D. **Fill, Void or Cavity Material\* – Sealant** – Min 1/8 in. (3.2 mm) wet thickness or 1/16 in. (1.6 mm) dry thickness of fill material spray or brush applied to completely cover the mineral wool forming material and to overlap a min of 1/2 in. (13 mm) onto concrete wall and min 1 in. (25 mm) onto steel deck on accessible side of the wall.

GRABBER CONSTRUCTION PRODUCTS INC – GrabberGard EFS

\*Bearing the UL Classification Marking





**System No. HW-D-0568**

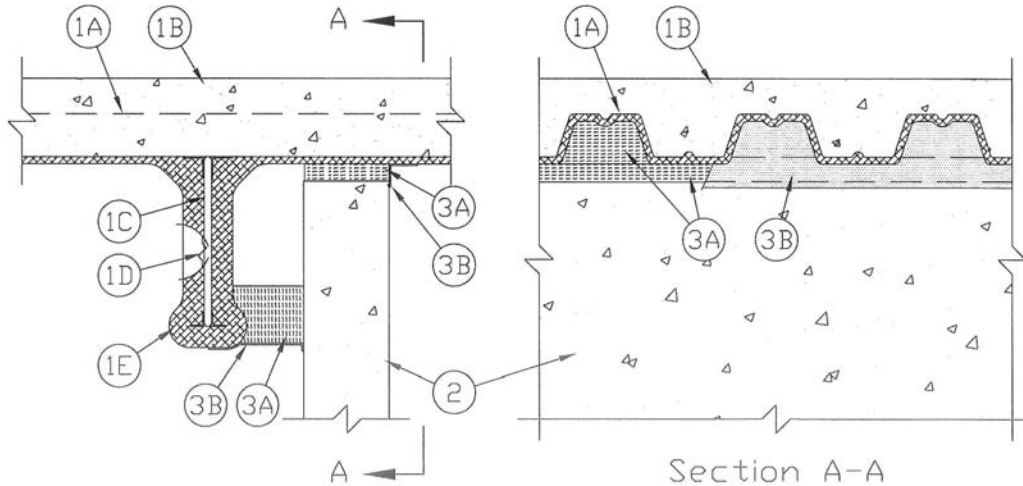
Assembly Rating – 2 Hr

Nominal Joint Width – 1 in.

L Rating at Ambient – Less than 1 CFM/Lin Ft.

L Rating at 400°F – Less than 1 CFM/Lin Ft.

Class II Movement Capabilities – 12.5% Compression or Extension



1. **Floor Assembly** – The fire-rated fire-rated fluted steel deck/concrete floor assembly shall be constructed of the materials and in the manner described in the individual D700 or D900 Series Floor-Ceiling Design in the UL Fire Resistance Directory. The hourly fire rating of the floor assembly shall be equal to or greater than the hourly fire rating of the wall assembly. The floor assembly shall include the following construction features:

- A. **Steel Floor and Floor Units\*** – Max 3 in. (76 mm) deep galv steel fluted floor units.
- B. **Concrete** – Min 2-1/2 in. (64 mm) thick reinforced concrete, as measured from the top plane of the floor units.
- C. **Structural Steel Support** – Steel beam or open-web steel joist, as specified in the individual D700 or D900 Series Floor-Ceiling Design, used to support steel floor units. Structural steel support oriented parallel to and 1 to 6 in. (25 to 152 mm) from wall assembly.
- D. **Steel Lath** – When structural steel support (Item 1C) consists of open-web steel joists, 3/8 in. (10 mm) diamond mesh expanded steel lath having a nom weight of 1.7 to 3.4 lb per sq yd (0.9 to 1.8 kg/m<sup>2</sup>) shall be installed to completely cover one side of each joist which is located within 6 in. (152 mm) of wall assembly. The





E. **Spray-Applied Fire Resistive Material\*** — Steel floor units and structural steel supports to be sprayed with the thickness of material specified in the individual D700 Series Design or the structural steel supports to be sprayed in accordance with the specifications in the individual D900 Series Design. The flutes of the steel floor units above the structural steel supports and above the wall shall be filled with spray-applied fire resistive material. As an alternate, the spray-applied fire resistive material in the flutes above the wall may be applied to follow the contour of the steel floor units.

**ISOLATEK INTERNATIONAL** — Type 300

**W R GRACE & CO - CONN** — Type MK-6/HY, MK-6/HY ES, MK-6s, RG

1A. **Roof Assembly** — (Not Shown) — As an alternate to the floor assembly (Item 1), a fire rated fluted steel deck roof assembly may be used. The roof assembly shall be constructed of the materials and in the manner described in the individual P700 or P900 Series Roof-Ceiling Design in the UL Fire Resistance Directory. The hourly fire rating of the roof assembly shall be equal to or greater than the hourly fire rating of the wall assembly. The roof assembly shall include the following construction features:

A. **Steel Roof Deck** — Max 3 in. (76 mm) deep galv steel fluted roof deck.

B. **Roof Insulation** — Mineral and Fiber Board\* — Min 3/4 in. (19 mm) thick boards applied in one or more layers directly over steel roof deck or over gypsum board sheathing laid atop steel roof deck.

C. **Roof Covering\*** — Hot-mopped or cold-application materials compatible with mineral and fiber board insulation.

D. **Structural Steel Support** — Steel beam or open-web steel joist, as specified in the individual P700 or P800 Series Roof-Ceiling Design, used to support steel floor units. Structural steel support oriented parallel to and 1 in. to 6 in. (25 to 152 mm) from wall assembly.

E. **Steel Lath** — When structural steel support (Item 1D) consists of open-web steel joists, 3/8 in. (10 mm) diamond mesh expanded steel lath having a nom weight of 1.7 to 3.4 lb per sq yd (0.9 to 1.8 kg/m<sup>2</sup>) shall be installed to completely cover one side of each joist which is located within 6 in. (152 mm) of wall assembly. The lath shall be secured with steel tie wire and shall be fully covered with spray applied fire resistive material.

F. **Spray-Applied Fire Resistive Material\*** — Steel roof deck and structural steel supports to be sprayed with a thickness of spray applied fire resistive material as specified in the individual P700 Series Roof-Ceiling design or the structural steel supports to be sprayed in accordance with the specifications in the individual D900 Series Design. The flutes of the steel deck above the structural steel supports and above the wall shall be filled with spray-applied fire resistive material. As an alternate, the spray-applied fire resistive material in the flutes above the wall may be applied to follow the contour of the steel roof deck.

**ISOLATEK INTERNATIONAL** — Type 300

**W R GRACE & CO - CONN** — Type MK-6/HY, MK-6/HY ES, MK-6s, RG

2. **Wall Assembly** — Min 6 in. (152 mm) thick reinforced lightweight or normal weight (100-150 pcf of 1600-2400 kg/m<sup>3</sup>) concrete. Wall may also be constructed of any **UL Classified Concrete Blocks\***.

See Concrete Blocks (CAZT) category in the Fire Resistance Directory for names of manufactures.





3. Joint System — Max separation between bottom of the spray applied fire resistive material on the steel floor units and top of concrete wall (at time of installation of joint system) is 1 in. (25 mm) when D700 or P700 series assembly is used. Max separation between bottom of the steel floor units and top of gypsum board (at time of installation of joint system) is 1 in. (25 mm) when D900 or P900 series assembly is used. Max separation between spray applied fire resistive material on structural support member and surface of wall is 4 in. (102 mm). The joint system is designed to accommodate a max 12.5 percent compression or extension from its installed width as measured between the bottom plane of the steel floor units or spray-applied fire resistive material on the steel floor units and the top of the concrete wall. The joint system shall consist of forming and fill materials, as follows:

A. **Forming Material\*** — Nom 4 pcf (64 kg/m<sup>3</sup>) density mineral wool batt insulation. Sections of mineral wool batt cut to a width of 4 in. (102 mm) and stacked to attain a thickness which is 50 percent greater than the width of the linear gap between the spray applied fire resistive material on the structural steel member and the surface of the wall assembly. Stacked sections of mineral wool compressed 33 percent in thickness and installed cut edge first into linear gap until the bottom edge is flush with the bottom surface of the spray applied fire resistive material on the structural steel member. When the spray-applied fire resistive material in the flutes above the wall follows the contour of the steel deck or when the steel deck is unprotected (D900 or P900 series assembly), sections of mineral wool batt insulation are compressed 50 percent in thickness and are installed cut edge first to completely fill the flutes above the wall flush with the wall surface opposite the structural support member. Additional sections of mineral wool batt insulation cut to the width of the wall and inserted edge-first between the top of the wall and the steel deck or the applied fire resistive material on the steel deck, compressed 50 percent in thickness beneath each valley and flush with the wall surface.

FIBREX INSULATIONS INC — FBX Safing Insulation

IIG MINWOOL LLC — MinWool-1200 Safing

ROCK WOOL MANUFACTURING CO — Delta Board

ROXUL ASIA SDN BHD — SAFE

ROXUL INC — SAFE

THERMAFIBER INC — Type SAF

B. **Fill, Void or Cavity Material\*** — **Sealant** — Min 1/8 in. (3.2 mm) wet thickness or 1/16 in. (1.6 mm) dry thickness of fill material spray or brush applied over the forming material on each side of the wall. Fill material to overlap a min of 1 in. (25 mm) onto the concrete wall and onto the steel floor units or spray-applied fire resistive material on the steel floor units and on the structural steel support member.

GRABBER CONSTRUCTION PRODUCTS INC — GrabberGard EFS

\*Bearing the UL Classification Marking

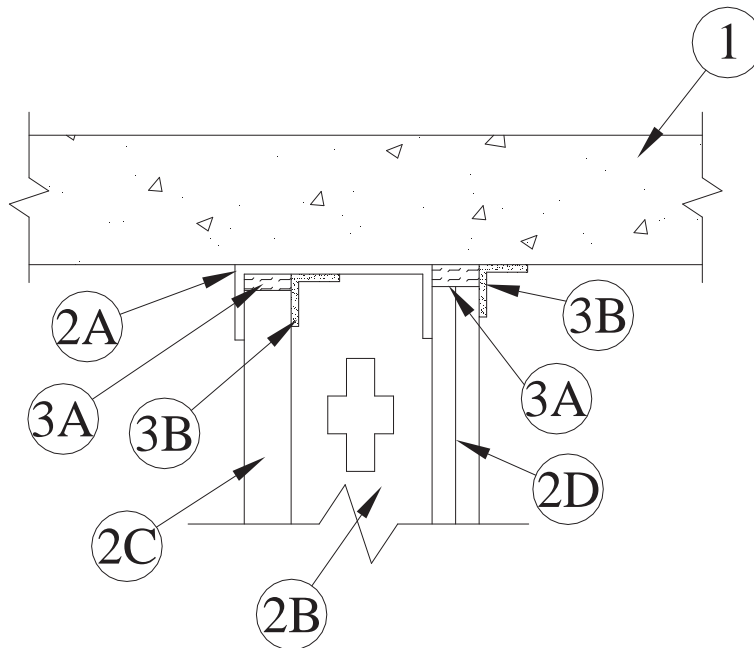






**System No. HW-D-0694**

ANSI/UL 2079	CAN/ULC S115
Assembly Rating – 2 Hr	F Rating – 2 hr
Nominal Joint Width – 3/4 in.	T Rating – 2 Hr
Class II or III Movement Capabilities – 25% Compression or Extension	FH Rating – 2 Hr
	FTH Rating – 2 Hr
	Nominal Joint Width – 19 mm
	Class II or III Movement Capabilities – 25% Compression or Extension



1. **Floor Assembly** – Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m<sup>3</sup>) structural concrete. Floor may also be constructed of any UL Classified hollow-core **Precast Concrete Units**\*.

See **Precast Concrete Units** (CFTV) in Fire Resistance Directory for names of manufacturers.

2. **Shaft Wall Assembly** – The 2 hr fire rated shaft wall assembly shall be constructed of the materials and in the manner described in the individual U400 or V400-Series Wall and Partition Design in the UL Fire Resistance Directory and shall include the following construction features:

- A. **Steel Floor and Ceiling Runners** – Floor and ceiling runners of wall assembly shall consist of galv steel channels sized to accommodate steel “C-H” studs. Flange height of ceiling runner shall be min 1/2 in. (13mm) greater than nom joint width. Ceiling runner secured with steel masonry anchors spaced max 24 in. (610 mm) OC.
- B. **Steel Studs** – “C-H”-shaped steel studs to be min 2-1/2 in. (64 mm) wide and formed of min 24 MSG galv steel. Studs cut 1/2 to 3/4 in. (13 to 19 mm) less in length than assembly height with bottom nesting in and resting on floor runner and with top nesting in ceiling runner or slotted ceiling track. Studs spaced 24 in. (610 mm) OC. After installation of gypsum board liner panels (Item 2D), studs secured to flange of floor runner on finished side of wall only with No. 6 by 1/2 in. (13 mm) long self-drilling, self-tapping steel screws. Studs secured to flange of slotted ceiling track on finished side of wall only with No. 8 by 1/2 in. (13 mm) long self-drilling, self-tapping wafer head steel screws at slot mid height.







3. **Joint System** – Max separation between bottom of floor and top of liner panel (Item 2D) and between bottom of floor and top of gypsum board sheets (Item 2E) at time of installation of joint system is 3/4 in. (19 mm). The joint system is designed to accommodate a maximum 19 percent compression or extension from its installed width. The joint system consists of the following:

- A. **Forming Material\*** – Min 4 pcf (64 kg/m<sup>3</sup>) density mineral wool batt insulation cut to a thickness equal to the overall thickness of the gypsum board and shaft liner and compressed 50 percent in height and inserted between the top of the gypsum board and bottom of floor on both sides of the wall.
- B. **Fill, Void or Cavity Material\* – Sealant** – Fill, Void or Cavity Material\* – Sealant – Prior to the installation of the gypsum board (Item 2D), a min 1/16 in. (1.6 mm) dry thickness (min 1/8 in. or 3.2 mm wet thickness) of fill material sprayed or brushed on inside of ceiling runner to completely cover mineral wool and overlap a min of 1/2 in. (13 mm) onto shaft liner (Item 2C) and runner (Item 2A). After installation of gypsum board (Item 2D) min 1/16 in. (1.6 mm) dry thickness (min 1/8 in. or 3.2 mm wet thickness) of fill material sprayed or brushed on gypsum board on the wall to completely cover mineral wool and overlap a min of 1/2 in. (13 mm) onto wall and floor

GRABBER CONSTRUCTION PRODUCTS INC – GrabberGard EFS

\*Bearing the UL Classification Marking





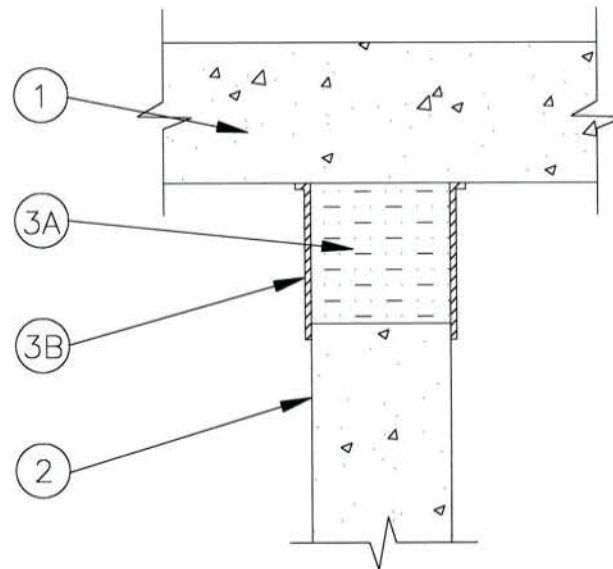
**System No. HW-D-1050**

HW-D-0568

Assembly Rating – 3 Hr

Joint Width – 4 in. Max

Class II Movement Capabilities – 12.5% Compression or Extension



1. **Floor Assembly** – Min 4-1/2 in. thick steel-reinforced lightweight or normal weight (100-150 pcf) structural concrete.
2. **Wall Assembly** – Min 4-1/2 in. thick reinforced lightweight or normal weight (100-150 pcf) structural concrete. Wall may also be constructed of any UL Classified **Concrete Blocks**\*.  
See **Concrete Blocks (CAZT)** category in the Fire Resistance Directory for names of manufacturers.
3. **Joint System** – Max width of joint (at time of installation of joint system) is 4 in. The joint system is designed to accommodate a max 12.5 percent compression or extension from its installed width. The joint system shall consist of the following:
  - A. **Forming Material\*** – Min 4 pcf mineral wool batt insulation installed into joint opening as a permanent form. Batt cut to min width of 4-1/2 in. and installed edge-first into joint opening, parallel with joint direction, such that batt sections are compressed min 33 percent in thickness and such that the compressed batt sections are flush with the top surface of floor.  
 IIG Minwool LLC – MinWool-1200 Safing  
 Rock wool Manufacturing Company – Delta Safing Board  
 Thermafiber LLC – Type SAF
  - B. **Fill, Void or Cavity Material\* – Sealant** – Min 1/16 in. dry thickness of fill material sprayed or brushed on joint completely covering mineral wool and overlapping a min of 1/2 in. onto concrete floor and wall assembly.

GRABBER CONSTRUCTION PRODUCTS INC – GrabberGard EFS

\*Bearing the UL Classification Marking



**MATERIAL SAFETY DATA SHEET**

HW-D-0568

MSDS Name: GrabberGard EFS

Revision Date: August 30, 2012

**1. Product and Company Identification**

Product Name: GrabberGard EFS  
 Product Code: GGEFS5  
 Supplier: Grabber Construction Products  
 205 Mason Circle  
 Concord, CA 94520  
 Medical Emergency: Passive Fire Protection Partners, 1412 Derwent Way, Delta, BC V3M 6H9, (800) 810-1788  
 Product Information: 800-877-TURN (Concord, California) 8:00 a.m. - 4:00 p.m. PST

**2. Composition/Information on Ingredients**

Ingredient	CAS Number	% (wt.)	LC50 (rat)	LD50 (rat)	TLV	STEL
Calcium Carbonate	1317-65-3	< 45	N/A	N/Av	N/A	N/E
Water	7732-18-5	< 35	N/A	N/A	N/E	N/E
Vinyl Acetate Polymers	Not disclosed	< 30	N/A	N/A	N/A	N/A
Modified Acrylic Polymer	Proprietary	< 10	N/A	N/A	N/A	N/E
Additives	N/A	< 5	N/A	20 - 34 g/Kg	50 ppm	N/A
Color Pigment	1309-37-1	< 1	N/A	N/A	N/A	N/A
Ammonia	7664-41-7	< 50ppm	2000 ppm/4H	N/A	25 ppm	N/A

**3. Physical Properties**

Appearance / Physical State	Red, viscous compound	Specific Gravity (@25°C)	1.15 – 1.35
Odour	Mild odour	Evaporation Rate	< 1
Odour Threshold	Slightly aromatic odour	Boiling Point (°C)	> 100
Vapour Pressure (mm Hg)	18.51880	Freezing Point (°C)	0
Vapour Density (Air = 1)	of Water vapor	pH	8.0 – 9.0
Coefficient of H2O/Oil Distrib	Not determined	VOC contents (g/L)	81.3

**4. Fire and Explosion Data**

Flammability	No
Means of Extinction	Normal fire fighting procedures should be followed to avoid inhalation of smokes and gases.
Special Fire-fighting Procedures	Firefighters should wear the usual protective gear use self-contained breathing apparatus.
Auto-ignition Temperature (°C)	N/A
Flash Point (°C) / Method	N/A
Upper Flammable Limit (% Volume)	N/A
Lower Flammable Limit (% Volume)	N/A
Sensitivity to Mechanical Impact	No
Sensitivity to Static Discharge	No
Hazardous Combustion Products	Carbon Monoxide, Carbon Dioxide, aliphatic hydrocarbons and hydrocarbon oxidation products

**5. Reactivity Data**

Stability	Stable at normal condition
Condition of Reactivity	Contact with incompatible substances
Incompatible Materials	Reacts with mineral acids and alkalis
Hazardous Decomposition Products	Dried films forced to burn will produce: Carbon Monoxide, Carbon Dioxide, and hydrocarbon oxidation products.

**MATERIAL SAFETY DATA SHEET**

MSDS Name: GrabberGard EFS

Revision Date: August 30, 2012

**6. Toxicological Properties**

Routes of Exposure	√ Skin contact	√ Skin absorption	√ Eye contact	√ Inhalation	√ Ingestion
Effects of Acute Exposure to Product	Skin and eye irritation may occur after contact with the product.				
Effects of Chronic Exposure to Product	None known				
Exposure Limits	None known				
Irritancy of Product	Slight on skin and eyes				
Sensitization of Product	None known				
Carcinogenicity	None known				
Teratogenicity	None known				
Reproductive Toxicity	None known				

**7. First Aid Measures**

Eye Contact	Flush with large quantities of water gently for 15 minutes and get medical attention.
Skin Contact	Wash with soap and water.
Inhalation	Remove affected person away from source of exposure to fresh air and get medical attention IMMEDIATELY
Ingestion	Get medical attention IMMEDIATELY.

**8. Preventive Measures**

Engineering Controls	Standard industrial ventilation is recommended.
Personal Protective Equipment	Chemical safety glasses and gloves were required during normal use and handling.
Eye Protection (Specify)	Face shield or chemical goggles were recommended.
Skin Protection (Specify)	Chemical resistant nitrile, neoprene or rubber gloves were recommended if contact to the product directly.
Respiratory (Specify)	Respiratory protection is not normally required. Use NIOSH/MSHA approved respirator if condition warrant.
Other	

**9. Precautions for Safe Handling and Use**

Handling Procedure and Equipment	N/A
Storage Requirement	Material should be kept in a closed container and stored between 4 – 32°C (40 – 90°F)
Spill, Leak or Releases	Wear protective equipment during cleanup.
Waste Disposal	Care should be taken to ensure that the material or it's containers and disposed of in an approved facility, state, provincial and local regulations.
Special Shipping Instructions	DO NOT FREEZE

**10. Regulation Information**

WHMIS	Not controlled
HMIS	Health 1, Flammability 0, Reactivity 0
TDG Regulation	Not classified as a hazardous material.
TSCA	All ingredients of this product are on the inventory list.
DSL	All ingredients of this product are on the list.

**MATERIAL SAFETY DATA SHEET**

MSDS Name: GrabberGard EFS

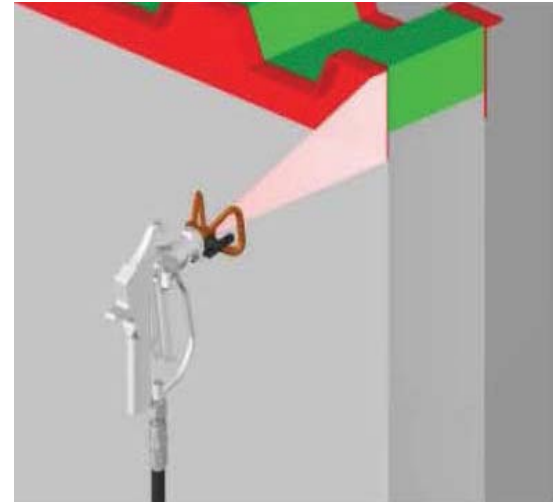
Revision Date: August 30, 2012

11. Preparation Information	
Prepared by:	Chemical Laboratory, Passive Fire Protection Partners
Preparation Date:	11 March 2003
Telephone:	(604) 515-1788
Reason for Revision:	Color was changed to RED, rev 002, May 24, 2005. New updating, rev 003, April 27, 2007 Logo updating, rev 004, June 18, 2007 Spelling mistake - Preventive Measures, rev 005, April 9, 2008 Formulation updating, rev 006, January 16, 2009 Spelling mistake - Precaution for Safe Handling and Use, rev 007, March 1, 2010 Formulation updating, rev008, January 3, 2011 Review, rev009, August 30, 2012
Revision Date:	August 30, 2012
Abbreviations Used:	% (wt.) = Weight Percentage ACGIH = American Conference of Governmental Industrial Hygienists CAS Number = Chemical Abstracts Series Number DSL = Domestic Substance List in Canada H = Hours HMIS = Hazardous Material Identification System IARC = International Agency for Research on Cancer LC50 = Lethal Concentration, 50% LD50 = Lethal Dose, 50% MSHA = Mine Safety and Health Administration N/A = Not Applicable or Not Available N/E = None Established NIOSH = The National Institute for Occupational Safety and Health NTP = National Toxicology Program OSHA = The Occupational Safety and Administration STEL = Short Term Exposure Limit TDG = Transportation of Dangerous Goods TLV = Threshold Limit Value TSCA = Toxic Substance Control Act in US VOC = Volatile Organic Compounds WHMIS = Workplace Hazardous Material Identification System
<p>This information is provided in good faith and is correct to the best of Grabber Construction Products' knowledge as of the date hereof; however, Grabber makes no representation as to its completeness or accuracy. Customers are encouraged to make their own determination as to the suitability of this product for their purpose prior to use. Grabber disclaims responsibility to damages of any kind resulting from the use of this information. THERE ARE NO WARRANTIES OR REPRESENTATIONS, EXPRESS OR IMPLIED, INCLUDING THOSE OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO THIS INFORMATION OR TO THE PRODUCT IT DESCRIBES.</p>	

## SPRAY INSTRUCTIONS - GRABBERGARD EFS

### Firestopping Construction Joints Grabbergard EFS

Determine the installation requirements. Select the appropriate firestop listing for the application. The installation of the safing material is crucial to the joint firestop system. If the mineral wool safing material is poorly installed several undesirable consequences could happen: (1) normal building movement may cause the firestop materials to fall out; (2) if loosely packed and safing is hit with the pressure from the spray gun, the material may blow out of the joint; (3) loosely packed mineral wool will require more firestop spray material to be applied (the wool fiber will open up and create more voids to be filled with the coating).



**Surface preparation:** To ensure an effective firestop system, remove excessive dust, dirt, debris, frost, water and oils. Remove any rust from supporting members.

**Safing Insulation:** Use minimum 4pcf mineral wool fiber (some systems may require 6 or 8 pcf)

- **For horizontal joints in wall assemblies:** Select the appropriate nominal thickness for the joint; cut the mineral wool safing material to fit tightly into the joint and compress it to the density (usually 25% compression) required by the listing. The mineral wool should be installed with the laminations (layers) being in a horizontal orientation (this will allow the wool to compress easier and not break apart).
- **Vertical joints in wall assemblies:** Install as outlined above, except for floor joints the safing laminations (layers) should be installed in a vertical orientation. This allows for maximum compression of the safing material.
- **Floor to floor and floor to wall joints:** Install as outlined above, except for the floor joints the safing material should be installed with the laminations (layers) in a vertical orientation. Larger floor joints may require impaling clips or pins, which help support the mineral wool (manufacturer recommends using clips or pins in joints 4 inches and larger).

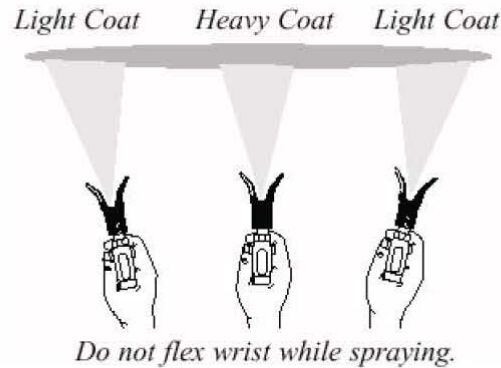
### Operating Electrical Spray Equipment

For optimum equipment operating and cleaning information, consult the spray pump manufacturer's **Owner's Manual** or their local distributor/representative.

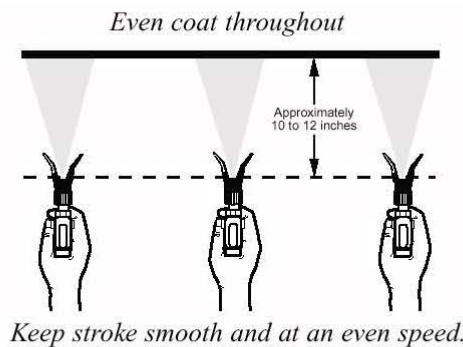
### Spraying Elastomeric Firestop Techniques

- An important factor when spray-applying Grabbergard EFS is to achieve an even coating over the entire surface being covered.
- Use even strokes to get the best results.
- As much as possible, keep you arm moving at a constant speed.
- Keep the spray gun at a constant distance from the surface. A good distance is 10-12 inches (25-30cm) between the spray tip and the surface.
- Grabbergard EFS can be applied in a single pass up to 80 mil (5/64") wet thickness.
- Overlap the interfacing surfaces with the correct amount of material [usually 1 inch (25cm)]
- If the coating starts to run when applied to vertical assemblies, more than one thin coat may be necessary. Begin the process by first applying a thin tack coating. After a short time apply the desired coating thickness.

**SPRAY INSTRUCTIONS - GRABBERGARD EFS**

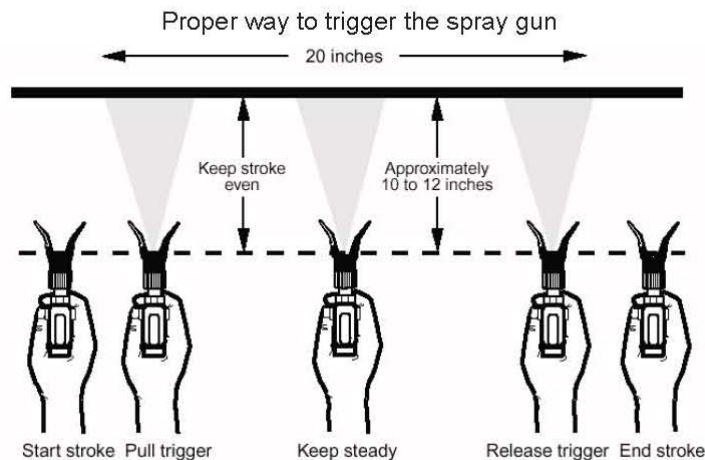


Keep the gun at right angles on the surface. This means moving your entire arm back and forth rather than flexing the wrist.



Keep the spray gun perpendicular to the surface.

The spray gun should be triggered by turning it on and off with an even stroke.



Overlap each stroke by approximately 30%. This will ensure an even coating.



**SPRAY INSTRUCTIONS - GRABBERGARD EFS**



Spray Equipment

Apply Grabbergard EFS using airless spray equipment. Recommended specifications:

Heavy to Moderate Duty



1.50 hp	
Maximum Working Pressure	3000 psi
Flow Output	1.25 gpm
20 Amp Mode Cord Min.	12 gauge (recommend 10 gauge)
Hose size	3/8" (9.5mm)
Hose length	Max. 100 ft.
Spray Gun	Mastic Gun
Spray Tips	Reversible 0.019 to 0.031 (recommend 0.021)
Fan width	2" – 12" (50mm-300m)

\*Note Remove the filter element and filter support attempting to spray. The screen in some applications could be removed.

Moderate to Heavy Duty

Electric Motor	1.50 hp
Maximum Working Pressure	3000 psi
Flow Output	0.67 gpm
20 Amp Mode Cord	12 gauge
Hose Size	1/4" or 3/8 " (6 or 9.5mm)
Hose Length	Max. 100ft. (30.5)
Spray Gun	Mastic Gun
Spray Tips	Reversible 0.019 to 0.025 (recommend 0.021)
Fan Width	2" – 12" (50-300mm)



\*Note Remove the filter element and filter support before spraying. The screen (rock) filter could also be removed.

## SPRAY INSTRUCTIONS - GRABBERGARD EFS

### Light to Moderate Duty

Electric Motor	1.1 hp
Maximum Working Pressure	3000 psi
Flow Output	0.55 gpm
Amp Mode Cord	12 gauge
Hose Size	1/4" (6mm)
Hose Length Max.	100 ft. (30.5)
Spray Gun	Mastic Gun
Spray Tips	Reversible 0.019 – 0.023
Fan Width	2" – 12" (50-300mm)

\*Note Remove the element filter and filter support before spraying.





**Grabber Branch Locations**

**GRABBER Atlanta**  
Duluth, GA  
Phone: 770-813-1332

**GRABBER Jacksonville**  
Jacksonville, FL  
Phone: 904-739-2760

**GRABBER Northwest**  
Portland, OR  
Phone: 503-467-5001

**GRABBER Tampa**  
Tampa, FL  
Phone: 813-249-2281

**GRABBER California**  
Concord, CA  
Phone: 925-687-6606

**GRABBER Honolulu**  
Honolulu, HI  
Phone: 808-836-1161

**GRABBER Los Angeles**  
Santa Fe Springs, CA  
Phone: 562-696-5122

**GRABBER Texas**  
Dallas, TX  
Phone: 972-470-9044

**GRABBER Canada**  
Langley, British Columbia  
Phone: 604-856-1444

**GRABBER Miami**  
Miami, FL  
Phone: 305-820-0975

**GRABBER Ohio**  
Fairfield, OH  
Phone: 513-874-9027

**GRABBER Utah**  
Murray, UT  
Phone: 801-266-4151

**GRABBER Frederick**  
Frederick, MD 21703-7300  
Phone: 301-371-0701

**GRABBER Midwest**  
Maumee, OH  
Phone: 419-794-8212

**GRABBER Orlando**  
Orlando, FL  
Phone: 407-297-7278

**GRABBER Virginia**  
Chantilly, VA  
Phone: 703-631-8770

**GRABBER Ft. Myers**  
Ft. Myers, FL  
Phone: 239-278-1888

**GRABBER Missouri**  
Kansas City, MO  
Phone: 816-931-8816

**GRABBER San Diego**  
San Diego, CA  
Phone: 858-292-6022

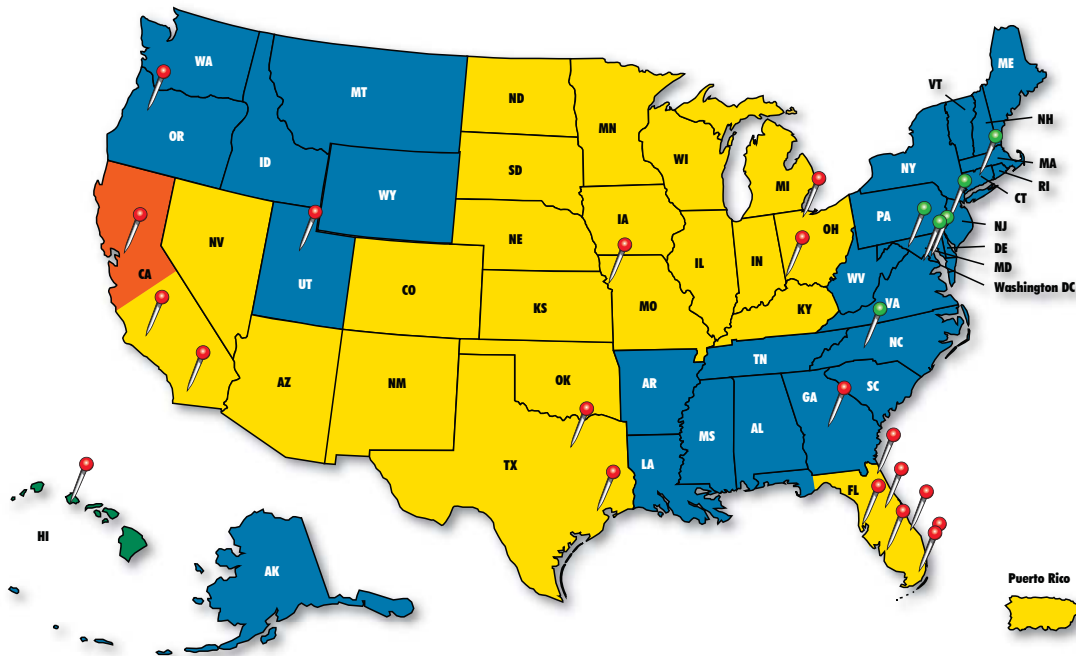
**Grabber/Scorpion Fasteners**  
East Windsor, CT  
Phone: 860-623-3600

**GRABBER Houston**  
Houston, TX  
Phone: 713-545-3918

**GRABBER Northeast**  
Pennsauken, NJ  
Phone: 856-662-2525

**GRABBER Southeast**  
Pompano Beach, FL  
Phone: 954-971-4730

**Grabber Branch Locations**



**International Division**  
Phone: 925.687.6606

**Home Centers**  
Phone: 800.606.6006

**U.S. North Division**  
Phone: 800-241-3161

**U.S. South Division**  
Phone: 800-925-0320

## Grabber has you covered with more than just great fastening products. . .

To put it simply, Grabber can help you build a better product while simultaneously making you more money. Through constant innovation, Grabber continues to simplify the way you work by providing the best, most technologically advanced products available today.



**Drywall Screws**  
**Metal Framing Screws**  
**Concrete Anchors**  
**Pneumatic Nails**

### Fasten it

Grabber has a full line of fasteners for just about any application. From drywall screws to heavy gauge framing screws Grabber has what you need. Grabber invented the drywall screw and changed an entire industry. For the past 40 years Grabber has been the name you can trust for professional grade fasteners.



**SuperDrive**  
**Screw Guns**  
**Chop Saws**  
**Lasers**

### Drive it

Grabber's SuperDrive tool is designed to make driving screws faster and more accurate. Along with SuperDrive, Grabber offers many other tools that make your work easier including chop saws, routers, lasers and more.



**Subfloor Adhesives**  
**Drywall Adhesives**  
**Acoustical Sealants**  
**Fire Stopping Caulks**

### Caulk it

Grabber offers a complete line of caulks including sound control sealants, subfloor adhesives, drywall adhesives, insulation foam and more. Grabber also offers EFC and IFC fire stopping caulks and sealants.



**NO-COAT® Stick Products**  
**NO-COAT® ULTRAFLEX**  
**HYDROTRIM®**  
**Drywall Tape**  
**Finishing Tools**

### Finish it

Grabber has everything you need for finishing your drywall projects. From fiberglass mesh tape and spark perforated drywall tape to the innovative No-Coat® structural drywall system, Grabber has what you need to do the job right.

## Quality every step of the way. . . the reason the pros choose Grabber

**Grabber sweats the small stuff, and that makes all the difference**

The professional's first choice for over 40 years, Grabber premium quality screws are built for performance. Sharper threads mean a better driving experience so Grabber changes thread dies more frequently. Tight recesses mean screws are less likely to cam-out and bit tips will last longer so Grabber changes recess dies more frequently. Consistent heat treating means screw heads will be less likely to pop off, so Grabber heat treats fewer screws at a time ensuring more even heat treatment. These are small things most people don't notice, but they are also small things that make the difference between average fasteners and professional grade fasteners.

Grabber is an international distributor of premium fasteners and fastening systems for wood, metal, and drywall applications in the commercial and residential construction markets. Grabber is home to the Deckmaster® Hidden Fastening System, the patented LOX® Drive System, and the SuperDrive Auto-Feed Fastening System. Grabber also distributes a wide range of proprietary tools and accessories, various equipment, and building materials to the construction industry.

Grabber screws and drywall nails are ICC ES (International Code Council Evaluation Service) evaluated, and engineered to meet or exceed the specifications for use, as prescribed in UBC 1997, IBC 2006, IRC 2006, IBC 2009, and IRC 2009. ASTM reports, approvals, shear, pullout and other technical information is available at [www.grabberman.com](http://www.grabberman.com)

Grabber screws and nails are produced in an ISO 9001 and ISO 14001 approved and certified manufacturing environments. Grabber also supports a complete line of US manufactured construction fasteners that meet "Buy American" and the "American Reinvestment and Recovery Act" requirements. GrabberGard® exterior grade coated fasteners are rated for use in ACQ, pressure and fire treated lumber.



**GRABBER**  
CONSTRUCTION PRODUCTS

[www.grabberman.com](http://www.grabberman.com)

**Visit [www.grabberman.com](http://www.grabberman.com) or  
call 800-477-8876  
to find a dealer near you.**

