Willseal FR-V provides a factory controlled, watertight, clean handling, UV stable, sound attenuating, energy efficient and fire rated joint seal in a single, unified installation process.

Willseal FR-V is designed to be used in vertical wall installations by itself, but it can be used behind any other expansion joint cover, plate or filler where joint depth allows. Because it is coated on both sides, it can be placed with either side exposed, adding to the versatility and increasing the aesthetic fireproof sealing options.

Willseal FR-V is a second generation, unified fire rated, sound, energy, and waterproof sealant system that can be supplied for +/- 25% and +/- 50% joints.

**MATERIAL**

Willseal FR-V features a waterproof silicone face on each side of a fire-retardant impregnated foam sealant without the need for additional intumescent bellows. Willseal FR-V does not rely on the silicone face or intumescent bellows to provide its fire rating. This is an important safety improvement over first generation materials that are subject to vandalism or damage to the thin silicone/intumescent bellows.

The main function of the silicone face is to enhance the waterproofing nature of the sealant and provide an aesthetic, colored finish. Willseal FR-V Type UC is supplied without silicone for use as a secondary seal.

Willseal FR-V is not made of thin, unbonded vertical layers that can delaminate with joint shear or thermal shock. In addition to UL 2079, Willseal FR-V has been independent lab tested to ASTM 330, 331, 283 & 547 for water and air penetration. It has been tested and passes TAS 202/203 requirements for hurricane force exposure. Contact Willseal for complete details.

**AVAILABLE SIZES**

- 1/2” (12mm) to 4 1/2” (112 mm)
- 2” depths only have a smoke barrier by request
- Depth of seal is 2”, 3” or 4”.
  Refer to UL listings at www.ul.com

**ADVANTAGES**

- Depending on application and UL listing, Willseal FR-V can be supplied with a silicone coating on one side, both sides, or uncoated for use as a secondary seal.
- Watertight: Installed with tensionless bellows, which when installed with an optional silicone bead on the weather face, maintains a watertight seal.
- Joint-Size Variation: Controlling uniform bellows appearance, and the ability to handle variations in joint size through incremental sizing, are additional product features.
- Movement Capability: +/- 25 (50% total) or +/- 50% (100% total) of nominal joint size, depending on the material selected.
- Smoke Barrier: Willseal’s innovative internal smoke barrier prevents toxic gases and fumes from penetrating the joint system.
- Sound Attenuation: Minimizes sound transfer which can occur at expansion joints and wide openings. Tested to ASTM E90.
- Non-Invasive Anchoring: There is no drilling or modification to the substrate required. This includes embedded pins, anchors, screws, bolts, tracks, rails, flanges or coverplates. The system is secured to the joint substrate by means of the internal recovery force of the foam, the epoxy adhesive, and the optional injected sealant bands at the joint face.

**AVAILABLE COLORS:** Refer to actual color chart for exact match

**DOW CORNING® 790 COLORS**

- Black
- Blue
- Bronze
- Natural Stone
- Adobe Tan
- Rustic Brick
- Dusty Rose
- Blue Spruce
- Charcoal
- Precast White
- Natural Stone
- Classic Bronze
- Aluminum Stone
- Beige
- Red Rock
- Hartford Green
- Anodized Aluminum
- London Grey
- Green

**PECORA 890NST COLORS**

- White
- Linen Brown
- Black
- Precast Black
- Red
- Blue
- Sandstone
- White Grey
- Limestone
- Red Stone
- Charcoal Grey
- Dark Green
- Shell

Willseal LLC • 34 Executive Drive • Hudson, NH 03051 • 800-274-2813 • 800-416-0550 (Fax) • willseal.com • email: custserv@willseal.com
TESTED PHYSICAL PROPERTIES

Willseal FR-V has been tested and certified under UL 2079. It meets the requirements of ASTM E1966, ASTM E119 and ASTM E1399. UL 2079, like ASTM E1966, was developed to encompass the fire testing of ASTM E119 and movement cycling regime of ASTM E1399.

It is also tested to ASTM E283, 330, 331 & 547 to confirm its sealing capabilities through its entire stated movement range. ASTM E90 testing has been completed to verify the sound attenuating properties of the system. Complete test results are available from Willseal technical support.

This material has been tested to UL 2079 and is manufactured under UL’s Follow-Up Service. Willseal FR-V is manufactured in an ISO 9001:2008 facility. In addition to being proof of our commitment to overall quality, the system ensures that any change to form, fit, function or safety of the product will be documented and published.

DESIGN AND ASSEMBLY

Because the material is being supplied as a fire-rated component of a wall assembly, it has been tested to UL 2079 in assemblies as depicted in our UL listings in the UL Certifications Directory. Use of this material in assembly configurations other than depicted in the named UL listings will not encumber or lower the resistance of the deck or wall assembly, but is done so at the designer’s discretion and responsibility for designing substrates as part of a fire rated assembly that meet applicable standards for the project.

The online information in the UL Listings cannot always address every construction nuance encountered in the field. Authorities having jurisdiction should be consulted in all cases as to the particular requirements covering the installation and use of UL Listed or Classified products or materials. Authorities having jurisdiction should be consulted before construction to ensure that specific adjacent substrates and assemblies are detailed and constructed to meet local fire-rating requirements.

UL Vertical Listings (Floor to Floor)
Visit the Online Certifications Directory at www.ul.com for complete & most current listing information

- WWW-D-0134
- WWW-D-0135
- WWW-D-0136
- WWW-D-0137
- WWW-D-0138
- WWW-D-0139
- WWW-D-0165
- WWW-D-1121
- WWW-D-1122
- WWW-D-1123
- WWW-D-1124
- WWW-D-1125
- WWW-D-1126
- WWW-D-1127
- WWW-D-1128

UL Vertical Listings (Head of Wall)

- HW-D-0700
- HW-D-1101

INSTALLATION

(see supplied installation data for complete procedures)

- Manufactured in 6.5 LF (2M) sticks which can be joined in the field to factory fabricated 90° transitions. These factory fabricated 90° units are coated on both sides with the silicone coating allowing them to be installed as an upturn or downturn transition.

- Typically, transitions have a 6” long horizontal leg and a 12” vertical leg. Custom sizes are available to meet actual field conditions. Transitions end in an uncoated 90° miter to be adhered to another transition piece as used in walls-to-decks, treads and risers, parapets, curbs and other applications.

- In addition to ensuring watertightness, 90° transitions can sometimes allow for much faster and secure installation by eliminating field cutting at angles.

- Can be installed facing out from an exterior or interior wall and maintain its two or three hour fire-rating. When either (or both) faces have a field applied band of silicone, that face is watertight. Willseal FR-V is installed with an epoxy adhesive field applied to the sides of the Willseal FR-V and on the face of the joint substrate. Although required by other competitive, but lower performing systems, Willseal FR-V does not require the “injected bead” for its waterproof characteristics. The unions between each stick are made using a field applied silicone sealant at the silicone bellows and a UL approved sealant on the ends of the foam sealant.

WARRANTY

- Standard or project specific warranties are available from the manufacturer upon request. This product can only perform its designed function if it, and the joint gap into which it is installed, is properly sized for the anticipated joint movements in consideration of the movement capability of the product. This can vary based on the temperature at time of installation and should be considered to determine the mean joint dimension.

- Material must be installed in strict accordance with our installation instructions.
1. Recommended Tools & Storage

- Tape Measure
- Sharp Knife
- Miter Saw
- Painters Tape
- Mineral Spirits
- Clean Cloth
- Isopropyl Alcohol
- Caulking Tool
- Wood Wedges
- Duct Tape
- Jiffy Mixer
- Margin Trowel
- 2 Empty, 1 Gallon, Clean Containers

Store material at a minimum of 68°F (20°C) for a minimum of 24 hours prior to installation.

2. Clean and Prepare Joint Substrate

Concrete:
- Verify that the joint is clean, sound, and will provide an appropriate surface for the installation of the joint sealant. Verify that the joint is uniform and that any spalls are repaired using proper materials and methods to ensure maintenance of the fire-rated wall assembly. Joint faces must be parallel.
- Joints must have a depth greater than or equal to the full depth of the material supplied plus 1/2-inch (6mm).
- Confirm joint substrate is dry and ready for the epoxy adhesive.

Metal:
- Confirm that the metal is clean and ready for the epoxy adhesive. Solvent-wipe the substrate just prior to applying epoxy.

Gypsum: (See detail in Appendix A)
- See UL for listed fire rated wall assemblies that yield the endurance rating equal to the installed FR Expansion Joint.
- For joints 3 1/4" and larger, use either 3/8" Hardiebacker® by James Hardie or PermaBase® Cement Board by National Gypsum Company instead of 5/8" Gypsum Type X at joint face (depicted in solid gray in the detail in Appendix A).
- Adjust finish course of gypsum so it is flush with the cement board as shown.

3. Measure Joint Width to Confirm Correct Size Material

- Check the material for appropriate length, width and depth.
- Material sizing is based on the mean temperature field-measured joint widths. Supplied material should be precompressed to a size smaller than the intended opening.
- Verify width of material supplied against the mean joint width. Joint depth must allow for the installed material to be recessed 1/8"-1/4".

Warning: Do not remove outer shrink wrapping from the FR Expansion Joint stick until you have read and understand the full instructions for proper installation. Failure to follow these directions may degrade fire endurance performance or make the material unsuitable (expanding before installed) for installation.

4. Mask Joint & Mixing Epoxy Adhesive

- Use blue painters tape or other suitable tape to protect the exposed joint face.

Mix Epoxy
- Epoxy adhesive may be used in the >40°F (5°C) to 95°F (35°C) temperature range.
- Transfer the contents of Part B (hardener) into the contents of Part A (base). Always add Part B to Part A.
- Mix the material thoroughly with a low speed drill (300 rpm) and mixing paddle. Scrape the walls and bottom of the container to ensure uniform and complete mixing with no streaks.
- IMPORTANT: DO NOT thin the epoxy.

TIPS:
- Mix only the required amount of the epoxy that will be used within 20-30 minutes to prevent the epoxy from curing prematurely.
- Epoxy will not cure when the temperature is below 40°F.
- For every +17°F, the epoxy cures twice as fast.
- For every -17°C, the epoxy takes twice as long to cure.
- Greater volume = less time to cure
- Smaller volume = more time to cure

Allow sufficient depth for the material to be recessed 1/8"-1/4" into the joint.
5. Apply Epoxy to Substrate, Unwrap Material

- Mix only the required amount of epoxy that will be used within a 30 minute time frame to prevent the epoxy from curing prematurely.
- WARNING: Epoxy will harden more quickly when left in the pot. Apply mixed epoxy onto the joint face as soon as possible.
- IMPORTANT: The epoxy must still be uncured and tacky when installing the FR Expansion Joint sealant into the joint.

6. Wipe Release Agent off Silicone Facing
(Not required for uncoated material - proceed to next step)

- Silicone facing may be coated in the factory with a release agent.
- Prior to installation, this agent must be wiped off in order for the finish bead to adhere along the edge of the FR Expansion Joint.
- To remove the release agent, lightly, quickly and thoroughly wipe the cured silicone facing with a lint-free rag dampened with water.
- Repeat cleansing for all FR Expansion Joint sticks as they are installed.

7. Join FR Foam Sections Together

- After verifying that the epoxy on the joint substrate has not cured, install the FR Expansion Joint into the gap starting from the bottom/end.
- Apply a bead of the UL Approved Sealant to the base of the FR Expansion Joint and smooth to an even 1/16” (2mm) thickness.
- Apply the supplied silicone along the top end edge of the installed silicone bellows. (See example 1 below)
- Apply the supplied UL Approved Sealant as shown to the end of the installed FR Expansion Joint. (See example 2 below)
- Flatten the supplied UL Approved Sealant on the end of the installed FR Expansion Joint to an even 1/16” (2mm) thickness. (See example 3 below)
- When the FR Expansion Joint material has expanded to a secure fit, it will support itself while the epoxy cures.
- Starting from the bottom/end, insert the next FR Expansion Joint into the opening while securely pushing the two joint sections together to ensure there are no voids at the union joints. If a void is apparent, fill it with the supplied UL Approved Sealant.

IMPORTANT: UL Approved Sealant must be applied to top, bottom and all terminations and splices. This should always be done while the FR Expansion Joint is installed in the joint opening.

8. Install Next Length and Repeat Until Finished

- Work in one direction towards the previously installed length or end of joint, making sure not to stretch material.
- Insert the uncoated bottom end of the stick into the joint and line it up with the previously installed stick.
- Coat the top end of the next stick with the supplied UL Approved Sealant as explained in Step 7.
- Securely compress the two pieces together. Ensure there are no voids at joint unions.
- In cold temperature installations, provide as much ambient heat as possible around installed FR Expansion Joint to accelerate recovery.
- Remove excess silicone left on the surface or material substrate. Be sure not to fill in the valleys of the bellows as this will constrain movement.

This material has been tested to UL 2079 standards. Authorities having jurisdiction should be consulted in all cases as to the particular requirements covering the installation and use of UL Listed or Classified products. The published information cannot address every construction nuance encountered in the field. When field issues arise, it is recommended to contact the product manufacturer. Users of fire resistance assemblies are advised to consult the general Guide Information for each product category and each group of assemblies. The Guide Information includes specifics concerning alternate materials and alternate methods of construction. Only products which bear the UL’s Mark are considered as Classified, Listed, or Recognized.
9. Silicone Sealant Bead at Substrates & Tool Excess Silicone

- Remove any excess epoxy from the face of material using a clean, dry, rag.
- Install a bead along the edge of the joint and tool the silicone firmly to bond with the substrates and cured silicone facing, and to ensure a proper bond and seamless appearance.
- Where the FR Expansion Joint meets at butt joints, tool the excess silicone that squeezes out from the top and between the bellows.

IMPORTANT: Silicone left between the fold or valleys of the bellows may constrain its movement - using a utility knife or caulking tool, remove excess sealant and smooth excess into the bellows.

Note: Silicone sealant is only applied to the weather side of the foam. No sealant required on the other side.

10. Coat Exposed Foam Ends

IMPORTANT: Any FR Expansion Joint that terminates with an exposed end and not terminating into another stick or structural termination should be coated on the exposed foam end using the UL Approved Sealant. This will ensure the FR Expansion Joint is properly terminated.

Only coat the FR Expansion Joint termination after it is installed in the joint or by applying the UL Approved Sealant to the terminating substrate.

Appendix A

Use either 3/8” Hardiebacker® by James Hardie or PermaBase® Cement Board by National Gypsum Company instead of 5/8” Gypsum Type X at joint face (depicted in solid gray).

See ul.com for complete listing information

* We recommend using a UL approved cement board at all joint interfaces. Through our extensive in house and independent UL lab testing, it is our observation that while FR Expansion Joint sealants pass the required hose stream component of UL 2079, there is an additional margin of safety in bonding to cement board over bonding to the paper covered gypsum interface.

Fireproofing & UL Listing Information

Following these installation instructions will ensure that the FR Expansion Joint is installed as tested and meets UL 2079 Standards. Failure to follow these installation instructions as described may result in the installed joint not complying with the UL Listing, as designed and tested, and therefore, has potential life safety risks.
SECTION 1 – PRODUCT IDENTIFICATION

<table>
<thead>
<tr>
<th>Trade Name</th>
<th>WILLSEAL FR-V &amp; FR-H</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product Code</td>
<td>FR Expansion Joint</td>
</tr>
<tr>
<td>Company</td>
<td>Willseal LLC</td>
</tr>
<tr>
<td></td>
<td>34 Executive Drive</td>
</tr>
<tr>
<td></td>
<td>Hudson, NH 03051</td>
</tr>
<tr>
<td>Telephone</td>
<td>(800) 274-2813 8:00 – 5:00 EST</td>
</tr>
<tr>
<td>Emergency Phone</td>
<td>(800) 848-1120 8:00 – 5:00 EST</td>
</tr>
</tbody>
</table>

SECTION 2 – HAZARDOUS IDENTIFICATION

Classification: Not Hazardous

SECTION 3 – COMPOSITION

Polyurethane foam impregnated with acrylic polymers.

Dow® Corning/Pecora silicone used on both faces. See Dow® Corning/Pecora MSDS

SECTION 4 – FIRST AID MEASURES

Flush eyes with water

Use soap and water to remove any residue left on skin. After prolonged exposure, residue left on skin may cause irritation

Do not ingest

SECTION 5 – FIRE FIGHTING MEASURES

Extinguishing Media: water

Special Hazards: Toxic gases form when foam is burned: Nitrogen Oxides (NOx), Hydrogen Cyanide (hydrocyanic acid)

Advice for firefighters: Self-contained respirator (breathing apparatus)

SECTION 6 – ACCIDENTAL RELEASE MEASURE

Dispose of in accordance with local regulations. All components are non-toxic and should be accepted in landfills
**SECTION 7 – HANDLING AND STORAGE**

<table>
<thead>
<tr>
<th>Safe Handling Precautions</th>
<th>No special measures are required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fire &amp; Explosion Precautions</td>
<td>No special measures are required</td>
</tr>
</tbody>
</table>

Conditions for safe storage, including any incompatibilities
Requirements for storerooms and containers
- Store in a dry place. Do not store at temperatures over 40°C

**SECTION 8 – EXPOSURE CONTROLS / PERSONAL PROTECTION**

<table>
<thead>
<tr>
<th>Respiratory protection</th>
<th>Not Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eye Protection</td>
<td>Not Required</td>
</tr>
<tr>
<td>Skin Protection</td>
<td>Gloves are suggested, but not required.</td>
</tr>
</tbody>
</table>

**SECTION 9 – PHYSICAL AND CHEMICAL PROPERTIES**

<table>
<thead>
<tr>
<th>Physical State</th>
<th>Solid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color</td>
<td>Grey</td>
</tr>
<tr>
<td>Odor</td>
<td>Odorless</td>
</tr>
<tr>
<td>Flammability</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Explosivity</td>
<td>Not Explosive</td>
</tr>
<tr>
<td>Density</td>
<td>0.4g/cm³</td>
</tr>
<tr>
<td>Water Solubility</td>
<td>None</td>
</tr>
</tbody>
</table>

**SECTION 10 – STABILITY AND REACTIVITY**

<table>
<thead>
<tr>
<th>Conditions to avoid</th>
<th>Thermal decomposition (at temperature in °C) &gt; 150°C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incompatible Materials</td>
<td>No special measures are required</td>
</tr>
<tr>
<td>Hazardous decomposition products</td>
<td>Carbon Monoxide, Hydrogen Cyanide (hydrocyanic acid), Nitrogen Oxides (NOx)</td>
</tr>
<tr>
<td>Additional Information</td>
<td>Does not contain dangerous substances or preparation intended to be released under normal or reasonably foreseeable conditions of use</td>
</tr>
</tbody>
</table>
SECTION 11 – TOXOLOGICAL INFORMATION

- Irritant and corrosive effects: Not an irritant
- Sensitization: Not Sensitizing
- Repeated Dose Toxicity: Not Sensitizing
- Sensation: None

SECTION 12 – ECOLOGICAL INFORMATION

Unknown

SECTION 13 – DISPOSAL CONSIDERATIONS

Disposable in a landfill, double check with local regulations

SECTION 14 – TRANSPORT INFORMATION

Safe for non-hazardous shipping

SECTION 15 – REGULATORY INFORMATION

Safety, health and environmental regulations/legislation specific for the substance or mixture

SECTION 16 – OTHER INFORMATION

Data Sources: According to EC directives or the corresponding national regulations the product does not have to be labeled.

The above information describes exclusively the safety requirements of the product and is based on our present-day knowledge. The information is intended to give you advice about the safe handling of the product named in this safety data sheet, for storage, processing, transport, and disposal. The information cannot be transferred to other products. In the case of mixing the product with other products or in the case of processing, the information on this safety data sheet is not necessarily valid for the new made-up material.

The information contained herein is furnished without warranty, representation or license of any kind, except that it is accurate to the best knowledge of Willseal LLC or obtained from sources believed by Willseal LLC to be accurate, Willseal LLC does not assume any legal responsibility for use of or reliance upon such information. Before using Willseal LLC products, read all labels, product data sheets and applicable Material Safety Data Sheets © 2013 Willseal LLC
System No. WW-D-0134

Nominal Joint Width - 1/2 to 1-7/8 in. (13-48 mm)

Configuration A:
(Nominal 1/2 in. joint)

1A. Studs
1B. Gypsum Board
2A. Fire Rated Foam
2B. Epoxy Adhesive

Configuration B: (Not Shown)
(Nominal 1/2 to 1-7/8 in. joint)

1A. Studs
1B. Gypsum Board
2A. Fire Rated Foam
2B. Epoxy Adhesive
System No. WW-D-1127

Nominal Joint Width — 2 - 3-3/8 in.

Configuration A:

1. Concrete
2A. Fire Rated Foam
2B. Epoxy Adhesive

Configuration B:

1. Concrete
2A. Epoxy Adhesive
2B. Fire Rated Foam
2C. Packing Material (Optional)
2D. Sealant Band
System No. WW-D-1126

Nominal Joint Width — 2 to 4-1/2 in.

1A. Studs
1B. Gypsum Board
1C. Cementitious Backer Units
2A. Epoxy Adhesive
2B. Fire Rated Foam
System No. WW-D-1125

Nominal Joint Width - 2 - 2-1/2 in. (51-64 mm)

1. Concrete
2. Fire Rated Foam
2B. Epoxy Adhesive
System No. WW-D-1124

Nominal Joint Width — 2 - 4-1/2 in. (51-114 mm)

1. Concrete
2A. Fire Rated Foam
2B. Epoxy Adhesive
System No. WW-D-1123

Nominal Joint Width - 2 to 4-1/2 in.

1A. Studs
1B. Gypsum Board
2A. Fire Rated Foam
2B. Epoxy Adhesive
2C. Joint Cover
System No. WW-D-1122

Nominal Joint Width — 2 - 4-1/2 in. (51-114 mm)

1A. Studs
1B. Gypsum Board
1C. Cementitious Backer Units
2A. Fire Rated Foam
2B. Epoxy Adhesive
System No. WW-D-1121

Nominal Joint Width - 2 - 2-1/2 in. (51-64 mm)

1A. **Studs**
1B. **Gypsum Board**
2A. **Fire Rated Foam**
2B. **Epoxy Adhesive**
System No. WW-D-0139

Nominal Joint Width - 1/2 to 1-7/8 in.

**Configuration A:**  
(Nominal 1/2 to 1-7/8 in. joint)

1. Concrete
2A. Epoxy Adhesive
2B. Fire Rated Foam

**Configuration B:**  
(Nominal 1/2 to 1-7/8 in. joint)

1. Concrete
2A. Epoxy Adhesive
2B. Fire Rated Foam
2C. Packing Material (Optional)
2D. Sealant Band
System No. WW-D-0138

Nominal Joint Width - 1/2 to 1-7/8in.

1A. Studs
1B. Gypsum Board
2A. Epoxy Adhesive
2B. Fire Rated Foam
2C. Sealant Band (Optional)
System No. WW-D-0137

Nominal Joint Width - 1/2 to 1 in.

1A. Studs
1B. Gypsum Board
2A. Epoxy Adhesive
2B. Fire Rated Foam
2C. Sealant Band (Optional)
System No. WW-D-0136
Nominal Joint Width - 1/2 to 1-7/8 in. (13-48 mm)

Configuration A:
(Nominal 1/2 in. joint)

1. Concrete
2A. Fire Rated Foam
2B. Epoxy Adhesive

Configuration B: (Not Shown)
(Nominal 1/2 to 1-7/8 in. joint)

1. Concrete
2A. Fire Rated Foam
2B. Epoxy Adhesive
System No. WW-D-0135

Nominal Joint Width -1/2 to 1-7/8 in.

1A. **Studs**
1B. **Gypsum Board**
2A. **Fire Rated Foam**
2B. **Epoxy Adhesive**
2C. **Joint Cover**
System No. HW-D-1101

Nominal Joint Width - 2 to 3-3/8 in.

1. Concrete
2. Concrete
3A. Fire Rated Foam
3B. Epoxy Adhesive
System No. HW-D-0700

Nominal Joint Width - 1/2 to 1-7/8 in.

1. Concrete
2. Concrete
3A. Fire Rated Foam
3B. Epoxy Adhesive
SPECIFICATION
Sections 07 90 00 / 07 95 00

Willseal FR-2V / Willseal FR-3V by WILLSEAL

Pre-Compressed, Self-Expanding, Tensionless, UL2079 FR Sealant System with Silicone Coated Surface, Watertight, Traffic Rated, 2 or 3 Hour Rated, +/-25% or 50% Expansion, Primary Seal for Interior and Exterior Joints.

****NOTE to specifier: Select FR-2V for two-hour applications and FR-3V for three-hour applications and delete the other. If using both systems, make reference to respective locations in the spec and on the drawings. Select FR-2V +25 for joints rated (+/-25%) or FR-2V +50 for joints rated (+/-50%) ****

PART 1 – GENERAL

1.01 Work Included

A. The work shall consist of furnishing and installing waterproof, fire rated expansion joints in accordance with the details shown on the plans and the requirements of the specifications. Preformed sealant shall be silicone pre-coated, preformed, pre-compressed, self-expanding, tensionless, FR sealant system.

B. Related Work
   • Division 3 - Cast-in-Place Concrete
   • Division 7 - Thermal & Moisture Protection
   • Division 7 - Sealants, Caulking and Waterproofing
   • Division 7 - Joint Firestopping

1.02 Submittals

A. General – Submit the following according to Division 1 Specification Section.

B. Standard Submittal Package – Submit typical expansion joint drawing(s) indicating pertinent dimensions, general construction, expansion joint opening dimensions and product information.

C. Sample of material is required at time of submittal.

D. Life Safety/Quality Control: Manufacturer shall be ISO-9001:2008, certified and shall provide written confirmation that a formal Quality management System and Quality Processes have been adopted in the areas of, (but not limited to) Manufacturing, Quality Control and Customer Service for all processes, products and their components. Alternate manufacturers will be considered provided they submit written proof that they are ISO 9001:2008, certified prior to the project bid date.

E. All products must be identified by a UL listing number and must be listed in the UL and ULC Online Certification Directories as proof that they have been tested according to UL 2079 and manufactured under UL’s “Follow Up” service.

F. Submit UL-issued Certificate of Compliance as proof product has been tested by UL and passed ANSI/UL 2079.

G. All products must be certified by independent laboratory tests that they are not comprised of un-bonded vertical laminations and do not rely on a water based intumescent surface coating as part of the FR sealant system. Manufacturer must have proof that the FR expansion joint will perform as UL Listed even if the surface bellows are vandalized or damaged.
H. All products must be certified by independent laboratory test report to exceed the requirements of curtain wall performance tests ASTM E330, E283-04, E331 and TAS 202/203 (+/- 200mph).

I. All products shall be certified in writing to be: a) capable of being expanded from the mean joint size at 40°F to the stated maximum dimension without exerting any tension on the attached substrate; and b) capable of withstanding 150°F (65°C) for 3 hours while compressed down to the minimum of movement capability dimension of the basis of design product (-50% of nominal material size) then extended to the stated extension (+50%) without evidence of foam delamination or sealant face de-bonding from the material; and that the same material after the heat stability test and after first being cooled to room temperature will subsequently self-expand to the maximum of movement capability dimension of the basis-of-design product (+50% of nominal material size) within 24 hours at room temperature 68°F (20°C).

1.03 Product Delivery, Storage and Handling
A. Deliver products to site in Manufacturer’s original, intact, labeled containers. All materials must have the WILLSEAL logo and the corresponding UL classification logo. Handle and protect as necessary to prevent damage or deterioration during shipment, handling and storage. Store in accordance with manufacturer’s installation instructions.

1.04 Basis-of-Design
A. All joints shall be designed to meet the specified performance criteria of the project as manufactured by: Willseal LLC, 34 Executive Drive, Hudson, NH 03051, 800-274-2813. Willseal.com, custserv@willseal.com.
B. Alternate manufacturers must demonstrate that their products meet or exceed the design criteria and must submit certified performance test reports performed by nationally recognized independent laboratories as called for in section 1.02 Submittals. Submittal of alternates must be made three weeks prior to bid opening to allow proper evaluation time.

1.05 Quality Assurance
A. The General Contractor will conduct a pre-construction meeting with all parties and trades involved in the treatment of work at and around expansion joints including, but not limited to, concrete, mechanical, electrical, HVAC, landscaping, masonry, curtain wall, waterproofing, fire-stopping, caulking, flooring and other finish trade subcontractors. All superintendents and foremen with responsibility for oversight and setting of the joint gap must attend this meeting. The General Contractor is responsible to coordinate and schedule all trades and ensure that all subcontractors understand their responsibilities in relation to expansion joints and that their work cannot impede anticipated structural movement at the expansion joints, or compromise the achievement of water-tightness or life safety at expansion joints in any way.
B. Warranty – Manufacturer’s standard warranty shall apply.
C. LEED Building Performance Requirements:
   1) The VOC of the silicone must not exceed 40 grams/liter.
   2) Products must be proved to be certified by independent test report to exceed the requirements of curtain wall performance tests ASTM E330, E283-04, E331.
   3) Products must be proved to have been certified by independent test report in accordance with ASTM C518-04 and demonstrate an R-Value per 1-inch (25mm) of depth of not less than 1.03 at as-installed nominal joint size compression.
4) Products must be proved to have been certified by independent test report to ASTM E90-09 and to meet or exceed the STC and OITC rating for the project.
5) Additional credits may be available for projects within 500 miles of Hudson, NH.
6) Product must be proved by independent test report to have air permeability not to exceed 0.02 L/(s.m2) at 75 Pascals as required by the Air Barrier Association of America (ABAA) and in accordance with ASTM E283-04.

PART 2 – PRODUCT

2.01 General

A. Provide watertight, tensionless, energy-efficient, 2 or 3 hour fire rated, exterior and interior joints in vertical-plane walls (above-grade). Typical locations include applications for exterior wall joints and interior wall joints where a 2 or 3 hour fire rating is required or desired. System shall perform waterproofing, fire-rating, expansion control functions as well as contribute to thermal insulation and sound attenuation as the result of a single installation and without the addition of ancillary fire-blankets, mineral wool, coverplates, etc.

B. Provide Willseal FR-2H / Willseal FR-3H as manufactured by WILLSEAL and as indicated on drawings for horizontal-plane expansion joint locations.

C. Sealant system shall be comprised of the following components: 1) fire-retardant-impregnated foam proven not to vertically delaminate and will fully extend without putting tension on the substrate, 2) pre-coated on the traffic surface with highway-grade, fuel resistant silicone proven not to de-bond or separate if exposed to thermal shock cycling, 3) field-applied epoxy or UL listed adhesive, 4) Silicone fillet beads may be used where appropriate to prove a uniform seal with the substrate. Impregnated foam material must be proven not to take a compression set over time and the FR joint sealant must not rely on “injected sealant bands” along the substrate for its sealing properties.

D. Material shall be capable of movements of -25%, +25% (50% total) or -50%, +50% (100% total) of nominal material size depending on the anticipated movement of the joint design. Standard sizes from 1/2” (25mm) to 4-1/2” (112mm). Depth of seal is 3” (76.2 mm) or 4” (100 mm) depending on UL listing.

E. Silicone external color facings to be low-modulus, waterproof silicone factory-applied to the foam while it is partially pre-compressed to a width greater than maximum joint extension and cured before final compression. When compressed to final supplied dimension, a bellow(s) to handle movement must be created in the silicone coating. Silicone coatings to be available in a range of not less than 26 standard colors for coordination with typical building materials. Separate colors may be chosen for each coated surface.

F. The Fire rated system must be field repairable to comply and to restore it to its associated UL listing while allowing for unrestricted joint movement.

G. When compressed to final supplied dimension, a bellow(s) to handle movement must be created in the silicone coating such that the joint is never under tension within its rated movement range.

H. Willseal FR-2V / Willseal FR-3V to be installed into manufacturer’s standard field-applied epoxy or UL approved adhesive. The Willseal FR-2V / Willseal FR-3V is to be installed slightly recessed from the surface, such that when the bead of silicone is installed between the substrates and the foam-and-silicone-bellow(s), the system will be essentially flush with the substrate surface.
I. Select the sealant system model appropriate to the movement (+/-25% or +/-50%) and design requirements at each joint location that meet the project specification or as defined by the structural engineer of record.

J. Manufacturer’s Checklist must be completed by expansion joint subcontractor and returned to manufacturer at time of ordering material.

2.02 Fabrication

A. Willseal FR-2V / Willseal FR-3V by WILLSEAL must be supplied pre-compressed to less than the joint size, packaged in shrink-wrapped lengths (sticks). If stick lengths are required in lengths other than 6.56LF (2M) add at least 10 working days to the lead time.

B. Directional changes and terminations into horizontal plane surfaces can be provided by factory supplied 90-degree angles containing minimum 12-inch long leg and 6-inch long leg, or custom leg on each side of the direction change, or through field fabrication in strict accordance with published installation instructions. In most cases field conditions are such that the restrictive nature of the factory supplied corners do not conform with as built conditions and may outweigh the benefits. Consult manufacturer for proven field transition methods.

PART 3 – EXECUTION

3.01 Installation

A. Preparation of the Work Area

1. The contractor shall provide properly formed and prepared expansion joint openings constructed to the exact dimensions and elevations shown on manufacturer’s standard system drawings or as shown on the contract drawings. Deviations from these dimensions will not be allowed without the written consent of the engineer of record.

2. The contractor shall clean the joint opening of all contaminants immediately prior to installation of expansion joint system. Repair spalled, irregular or unsound joint surfaces using accepted industry practices for repair of the substrates in question. Remove protruding roughness to ensure joint sides are smooth. Ensure that there is sufficient depth to receive the full depth (typically 3-4") of the size of the Willseal FR-2H / Willseal FR-3H being installed. Refer to Manufacturer’s Installation Guide for detailed step-by-step instructions.

3. No drilling, or screwing, or fasteners of any type are permitted to anchor the sealant system into the substrate.

4. System to be installed by qualified sub-contractors only according to detailed published installation procedures and/or in accordance with job-specific installation instructions of manufacturer’s field technician.

3.02 Clean and Protect

A. Protect the system and its components during construction. Subsequent damage to the expansion joint system will be repaired at the general contractor’s expense. After work is complete, clean exposed surfaces with a suitable cleaner that will not harm or attack the finish.

END OF SECTION