



Quality People. Building Solutions.

Comfort Systems USA (Arkansas), Inc.
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Phone 501-834-3320
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Date: 12/22/2025

Return Request: 1/5/2026

Project: Hot Springs National Park – Rehabilitate Bathhouses – Maurice Bathhouse

Supplier: Hilti

Manufacturer: Hilti

Submittal: Through Penetration Firestopping (Re-Submittal #1)

Submittal Number: 220503.001

Spec Section: 220503

Drawing # and Installation Location: P1.0 through P1.4

ARCHITECT

Strata Architecture
1701 Oak Street, Suite 100
Kansas City, Missouri 64108
(816)474-0900

GENERAL CONTRACTOR

Tepa, LLC
2345 Grand Blvd, Suite 700
Kansas City, Missouri 64108
(816)708-1110

ENGINEER

IMEG Corp.
1600 Baltimore Street, Suite 300
Kansas City, Missouri 64108
(816)842-8437

MECHANICAL SUBCONTRACTOR

Comfort Systems USA (Arkansas), Inc.
9924 Landers Road
North Little Rock, Arkansas 72117
(501)834-3320

Comments:

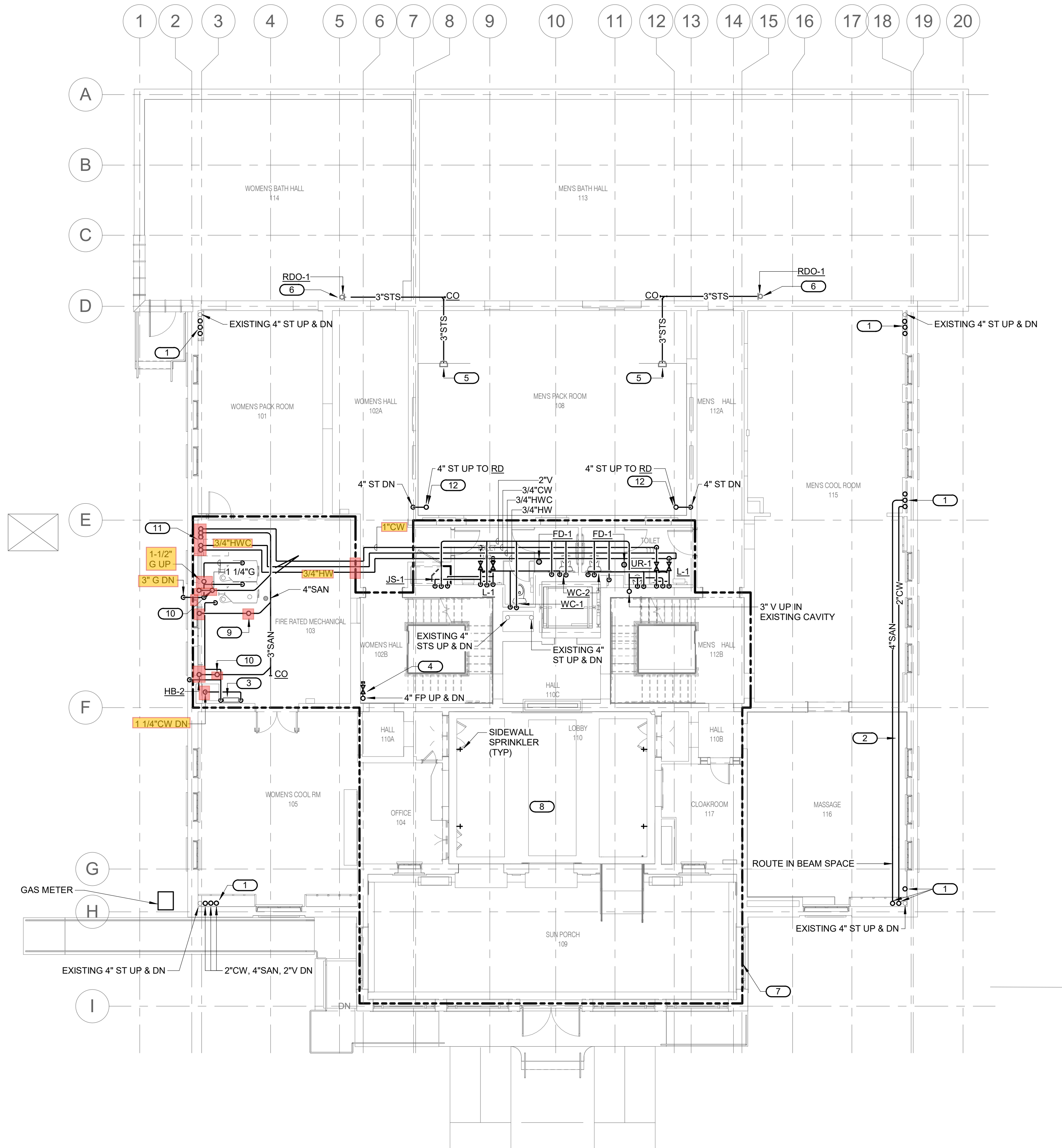
RFI Response shows that only Mechanical Room #103 has a 1-hour fire rating. There are sanitary waste and vent, domestic water, and natural gas piping penetrations into and out of this mechanical room (see plan page P1.1 for penetrations). These will all receive FS-One per Hilti System C-AJ-1155.

CSUSA PROJECT NO.

25-7065

joe@comfortar.com

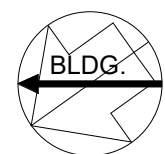
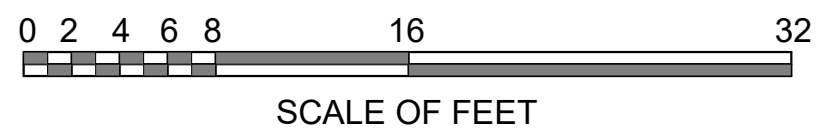
9924 Landers Road
No. LittleRock, AR 72117



- SHEET NOTES:**
- ROUTING OF PLUMBING EQUIPMENT AND PIPING SHALL BE VERY CAREFULLY COORDINATED WITH EXISTING CONDITIONS, PRESERVATION ZONES, AND HISTORIC NATURE OF BUILDING TO CONFORM WITH THE SECRETARY OF THE INTERIOR'S REHABILITATION REQUIREMENTS AND PRESERVATION BRIEFS RELATED TO MEP DESIGN AND INSTALLATION.

- KEYNOTES:** #
- 4" SAN, 2" VENT & 2" CW RISERS UP & DN.
 - ROUTE PIPING AS HIGH AS POSSIBLE.
 - 1 1/4" BACKFLOW PREVENTER FOR BOILER MAKE-UP. CONNECT TO COLD WATER MAIN & HEATING WATER QUICK AND AUTO FILL SYSTEM.
 - PROVIDE CAPPED ISOLATION VALVE WITH TAMPER SWITCH FOR FUTURE CONNECTION TO THE SPRINKLER SYSTEM THIS FLOOR.
 - CONNECT TO SCUPPER OVERFLOW DRAIN IN ROOF ABOVE. ROUTE THROUGH SIDE WALL.
 - TERMINATE STS PIPING WITH LAMB'S TONGUE TO DISCHARGE TO LOWER ROOF.
 - INSTALL FIRE SUPPRESSION SPRINKLER SYSTEM IN THIS AREA. CAP AND FILL WITH NITROGEN. PROVIDE CAPPED BRANCH MAIN(S) TO SERVE REMAINDER OF FLOOR.
 - SUPPLY LOBBY WITH SIDEWALL SPRINKLERS. TWO SPRINKLERS EACH WILL BE LOCATED ON PLAN WEST AND PLAN EAST SIDES OF LOBBY, BEING LOCATED 4.5 FEET AWAY FROM PLAN NORTH AND PLAN SOUTH WALLS AS SHOWN. COORDINATE WITH EXISTING BEAMS & EXACT LOCATION WITH C.O.
 - 4" SAN DN FROM FIXTURE ABOVE
 - 3" SAN DN FROM FIXTURE ABOVE
 - 4" SAN, 2" VENT & 2" CW RISERS UP & DN. 1" HW & 3/4" HWC UP.
 - ROUTE NEW PIPING AND RISERS IN SAME LOCATION AS THE EXISTING.

1
P1.1 FIRST FLOOR PLUMBING PLAN
1/8" = 1'-0"



10.27.2023

A/E FIRMS PRIME/ARCH: STRATA ARCHITECTURE 1701 OAK STREET, SUITE 100 KANSAS CITY, MO T: 816.474.0900 MEP/ENG: IMEG CORP. 1600 BALTIMORE STREET, SUITE 300 KANSAS CITY, MO T: 816.842.8437	DESIGNED: SGB	SUB SHEET NO. 01 P1.1	TITLE OF SHEET MAURICE BATHHOUSE FIRST FLOOR PLUMBING PLAN REHABILITATE BATHHOUSES HOT SPRINGS NATIONAL PARK	DRAWING NO. 626 180065
	CADD: WMM			PMIS/PKG NO. 318674
	TECH. REVIEW: SGB			SHEET 128 OF 286
	DATE: 10.27.2023			

FS-ONE High Performance Intumescent Firestop Sealant

Product description

- Intumescent (expands when exposed to fire) firestop sealant that helps protect combustible and non-combustible penetrations for up to 4 hours fire rating

Product features

- Smoke, gas and water resistant after material has cured
- Contains no halogen, solvents or asbestos
- High fire rating properties
- Water based, easy to clean
- Protects most typical firestop penetration applications
- Paintable
- Single component systems available
- Meets LEED™ requirements for indoor environmental quality credit 4.1 Low Emitting Materials, Sealants and Adhesives and 4.2 Paints and Coatings

Areas of application

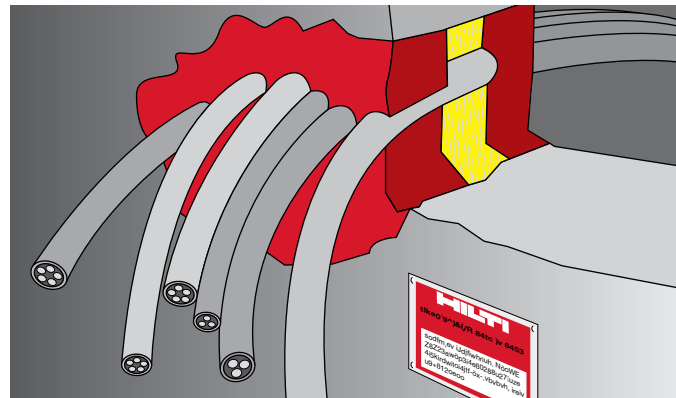
- Steel, copper and EMT pipes
- Insulated steel and copper pipes
- Cable bundles
- Closed or vented plastic pipes
- HVAC penetrations

For use with

- Concrete, masonry, drywall and wood floor assemblies
- Wall and floor assemblies rated up to 4 hours

Examples

- Sealing around combustible pipe penetrations in fire rated construction
- Sealing around non-combustible penetrations in fire rated construction



Technical Data*

Chemical basis

FS-ONE

Water-based intumescent acrylic dispersion

Color

Red

Application temperature

40°F to 104°F (5°C to 40°C)

Skin forming time

Approx. 20-30 min.

Curing time

Approx. 2 mm / 3 days

Movement capability

Approx. 5%

Expansion rate (unrestricted)

Up to 3-5 times original volume

Temperature resistance (cured)

-40°F to 212°F (-40°C to 100°C)

Surface burning characteristics (ASTM E 84-96)

Flame Spread: 0
Smoke Development: 5

Sound transmission classification (ASTM E 90-99)

56 (Relates to specific construction)

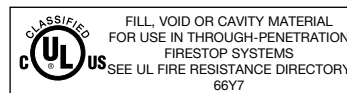
Approvals

- California State Fire Marshal - No. 4485-1200:108
- City of New York - MEA 326-96-M Vol. IV

Tested in accordance with

- UL 1479
- ASTM E 814
- ASTM E 84

*At 73°F (23°C) and 50% relative humidity



Installation instructions for FS-ONE

Notice

- Before handling, read Material Safety Data Sheet and product label for safe usage and health information.
- Instructions below are general guidelines — always refer to the applicable drawing in the UL Fire Resistance Directory or Hilti Firestop Systems Guide for complete installation information

Opening

- Clean the opening. Surfaces to which FS-ONE will be applied should be cleaned of loose debris, dirt, oil, moisture, frost and wax. Structures supporting penetrating items must be installed in compliance with local building and electrical standards.

Application of firestop sealant

- Install the prescribed backfilling material type and depth to obtain the desired rating (if required). Leave sufficient depth for applying FS-ONE.
- Application of firestop sealant: Apply FS-ONE to the required depth in order to obtain the desired fire rating. Make sure FS-ONE contacts all surfaces to provide maximum adhesion. For application of FS-ONE use a standard caulking gun, foil pack gun, bulk loader and bulk gun. With FS-ONE buckets, Graco type sealant pumps may be used. (Contact pump manufacturer for proper selection).

- Smoothing of firestop sealant: To complete the seal, tool immediately to give a smooth appearance. Excess sealant, prior to curing, can be cleaned away from adjacent surfaces and tools with water.
- Leave completed seal undisturbed for 48 hours.
- For maintenance reasons, a penetration seal could be permanently marked with an identification plate. In such a case, mark the identification plate and fasten it in a visible position next to the seal.

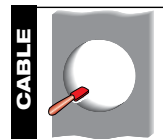
Not for use

- High movement expansion joints
- Underwater

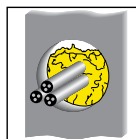
- On materials where oil, plasticizers or solvents may bleed i.e. impregnated wood, oil based seals, green or partially vulcanized rubber
- In any penetration other than those specifically described in this manual or the test reports

Storage

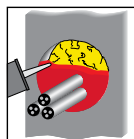
- Store only in the original packaging in a location protected from moisture at temperatures between 40°F (5°C) and 86°F (30°C)
- Observe expiration date on the package



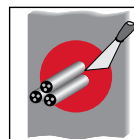
1. Clean opening.



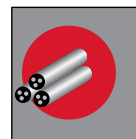
2. Pack mineral wool. (If required)



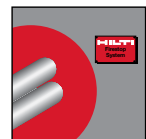
3. Apply FS-ONE.



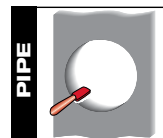
4. Smooth FS-ONE.



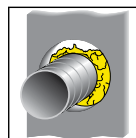
5. Leave completed seal undisturbed for 48 hours.



6. Fasten identification plate (if required).



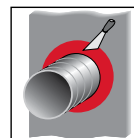
1. Clean opening.



2. Pack mineral wool. (If required)



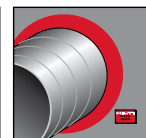
3. Apply FS-ONE.



4. Smooth FS-ONE.



5. Leave completed seal undisturbed for 48 hours.



6. Fasten identification plate (if required).

Hilti. Outperform. Outlast.



MSDS No.: 259
Revision No.: 010
Revision Date: 08/17/04
Page: 1 of 2

MATERIAL SAFETY DATA SHEET

Product name: FS-ONE High Performance Intumescent Firestop Sealant
Description: One-part acrylic-based sealant
Supplier: Hilti, Inc. P.O. Box 21148, Tulsa, OK 74121
Emergency # (Chem-Trec.): 1 800 424 9300 (USA, PR, Virgin Islands, Canada); 001 703 527 3887 (other countries)

INGREDIENTS AND EXPOSURE LIMITS

Ingredients:	CAS Number:	PEL:	TLV:	STEL:
Polyacrylate dispersion	Mixture	NE	NE	NE
Calcium carbonate	001317-65-3	5 mg/m ³ (T)	10 mg/m ³ (T)	NE
Zinc borate	138265-88-0	NE	NE	NE
Ammonium polyphosphate	068333-79-9	NE	NE	NE
Talc	014807-96-6	20 mppcf	2 mg/m ³	NE
Expandable graphite	012777-87-6	5 mg/m ³ (T)	2 mg/m ³ (T)	NE
Ethylene glycol	000107-21-1	NE	C:100 mg/m ³ (A)	NE
Polybutene	009003-29-6	NE	NE	NE
Iron oxide	001309-37-1	10 mg/m ³	5 mg/m ³	NE
Glass filament	065997-17-3	NE	5 mg/m ³ (T)	NE
Silicon dioxide	014808-60-7	0.05 mg/m ³ (T)	0.1 mg/m ³ (T)	NE
Water	007732-18-5	NE	NE	NE

Abbreviations: PEL = OSHA Permissible Exposure Limit. TLV = ACGIH Threshold Limit Value. C = Ceiling. STEL = Short Term Exposure Limit. NE = None Established. NA = Not Applicable. (T) indicates "as total dust". (R) indicates "as respirable fraction". (A) indicates "as an aerosol". mppcf = million particles per cubic foot.

PHYSICAL DATA

Appearance:	Red paste.	Odor:	Odorless.
Vapor Density: (air = 1)	Not determined.	Vapor Pressure:	23mbar @ 20C / 68F
Boiling Point:	Not applicable.	VOC Content:	75.0 g/L.
Evaporation Rate:	Not applicable.	Solubility in Water:	Soluble.
Specific Gravity:	1.5	pH:	Not determined.

FIRE AND EXPLOSION HAZARD DATA

Flash Point:	Non-flammable.	Flammable Limits:	Not applicable.
Extinguishing Media:	Not applicable. Use extinguishing media as appropriate for surrounding fire.		
Special Fire Fighting Procedures:	None known. Use a self-contained breathing apparatus when fighting fires involving chemicals.		
Unusual Fire and Explosion Hazards:	None known. Thermal decomposition products can be formed such as oxides of carbon, sulfur and phosphorous.		

REACTIVITY DATA

Stability:	Stable.	Hazardous Polymerization:	Will not occur.
Incompatibility:	Strong acids, peroxides, and oxidizing agents.		
Decomposition Products:	Thermal decomposition can yield CO and CO ₂ .		
Conditions to Avoid:	None known.		

HEALTH HAZARD DATA

Known Hazards:	None known.
Signs and Symptoms of Exposure:	Possibly irritating upon contact with the eyes or upon repeated contact with the skin.
Medical Conditions Aggravated by Exposure:	Eye and skin conditions.
Routes of Exposure:	Dermal.

Carcinogenicity:	IARC classifies crystalline silica (quartz sand) as Group I based upon evidence among workers in industries where there has been long-term and chronic exposure (via inhalation) to silica dust; e.g. mining, quarry, stone crushing, refractory brick and pottery workers. This product does not pose a dust hazard; therefore, this classification is not relevant. Based upon the nature and intended use of this product, it does not pose an increased cancer risk to workers.
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EMERGENCY AND FIRST AID PROCEDURES

Eyes:	Immediately flush with plenty of water. Call a physician if symptoms occur.
Skin:	Immediately wipe off material and wash with soap and water. Material can adhere to the skin. If material has adhered to the skin, use an abrasive containing hand cleaner. If material does not come off, buff with a pumice stone.
Inhalation:	Move victim to fresh air if discomfort develops. Call a physician if symptoms persist.
Ingestion:	Seek medical attention. Do not induce vomiting unless directed by a physician. If a large quantity was ingested, give 1 to 2 glasses of water to dilute. <u>Never</u> give anything by mouth to an unconscious person.
Other:	Referral to a physician is recommended if there is any question about the seriousness of the injury/exposure.

CONTROL MEASURES AND PERSONAL PROTECTIVE EQUIPMENT

Ventilation:	General (natural or mechanically induced fresh air movements).
Eye Protection:	Not required, however, safety glasses should be worn in most industrial settings.
Skin Protection:	Avoid skin contact. Cloth gloves are suitable for hand protection.
Respiratory Protection:	None normally required. Where ventilation is inadequate to control vapors, use a NIOSH-approved respirator with organic vapor cartridges. Never enter a confined space without an appropriate air-supplied respirator.

PRECAUTIONS FOR SAFE HANDLING AND USE

Handling and Storing Precautions:	Store in a cool, dry area preferably between 40° and 77° F. Keep from freezing. Do not store in direct sunlight. Avoid contact with the eyes or skin. Practice good hygiene; i.e. always wash thoroughly after handling and before eating or smoking. For industrial use only. Keep out of reach of children. Follow label/use instructions.
Spill Procedures:	Immediately wipe away spilled material before it hardens. Place in a container for proper disposal in accordance with all applicable local, state, or federal requirements.

REGULATORY INFORMATION

Hazard Communication:	This MSDS has been prepared in accordance with the federal OSHA Hazard Communication Standard 29 CFR 1910.1200.
HMIS Codes:	Health 1, Flammability 0, Reactivity 0, PPE B
DOT Shipping Name:	Not regulated.
IATA / ICAO Shipping Name:	Not regulated.
TSCA Inventory Status:	Chemical components listed on TSCA inventory.
SARA Title III, Section 313:	This product contains < 3% ethylene glycol (CAS 107-21-1) and < 15% zinc borate (re: zinc compounds) which are subject to reporting under Section 313 of SARA Title III (40 CFR Part 372).
EPA Waste Code(s):	Not regulated by EPA as a hazardous waste.
Waste Disposal Methods:	Consult with regulatory agencies or your corporate personnel for disposal methods that comply with local, state, and federal safety, health and environmental regulations.

CONTACTS

Customer Service:	1 800 879 8000	Technical Service:	1 800 879 8000
Health / Safety:	1 800 879 6000	Jerry Metcalf	(x6704)
Emergency # (Chem-Trec):	1 800 424 9300 (USA, PR, Virgin Islands, Canada); 001 703 527 3887 (other countries)		

The information and recommendations contained herein are based upon data believed to be correct; however, no guarantee or warranty of any kind expressed or implied is made with respect to the information provided.

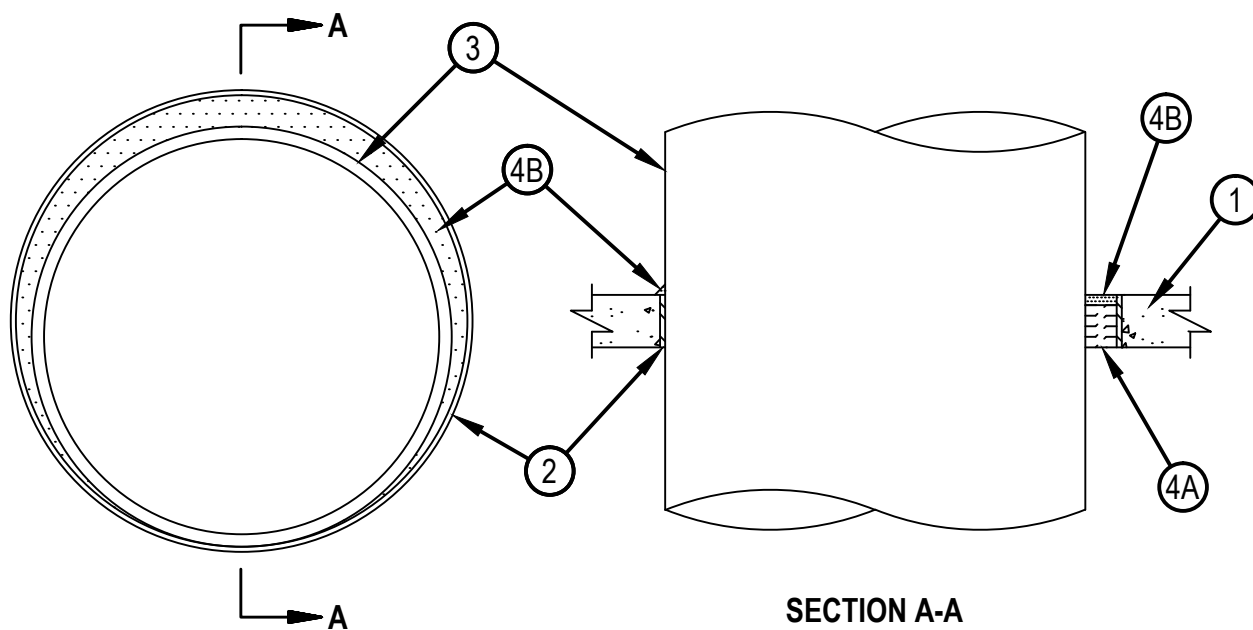


Classified by
Underwriters Laboratories, Inc.
to UL 1479 and CAN/ULC-S115

System No. C-AJ-1155

ANSI/UL 1479 (ASTM E814)	CAN/ULC S115
F Rating — 2 and 3 Hr (See Item 3)	F Rating — 2 and 3 Hr (See Item 3)
T Rating — 0 Hr	FT Rating — 0 Hr
L Rating At Ambient — Less Than 1 CFM/sq ft	FH Rating — 2 and 3 Hr (See Item 3)
L Rating At 400 F — 4 CFM/sq ft	FTH Rating — 0 Hr
W Rating — Class 1 (See Item 4)	L Rating At Ambient — Less Than 1 CFM/sq ft
	L Rating At 400 F — 4 CFM/sq ft

CAJ 1155



Hilti Firestop Systems

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February 20, 2015

1. Floor or Wall Assembly — Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m³) concrete.
Wall may also be constructed of any UL Classified Concrete Blocks*. Max diam of opening is 32 in. (813 mm).
See Concrete Blocks (CAZT) category in Fire Resistance Directory for names of manufacturers.
2. Metallic Sleeve (Optional) — Nom 32 in. (813 mm) diam (or smaller) Schedule 40 (or heavier) steel pipe cast or grouted into floor or wall assembly, flush with floor or wall assembly.
3. Through Penetrants — One metallic pipe or tubing to be installed either concentrically or eccentrically within the firestop system. Pipe or tubing to be rigidly supported on both sides of floor or wall assembly. The annular space shall be min 0 in. (point contact) to max 12 in. (305 mm).
When maximum annular space exceeds 2-1/4 in. (57 mm) the F Rating is 2 hr. The following types and sizes of metallic pipes or tubing may be used:
 - A. Steel Pipe — Nom 20 in. (508 mm) diam (or smaller) Schedule 10 (or heavier) steel pipe.
 - B. Iron Pipe — Nom 20 in. (508 mm) diam (or smaller) cast or ductile iron pipe.
 - C. Conduit — Nom 4 in. (102 mm) diam (or smaller) steel electrical metallic tubing or nom 6 in. (152 mm) diam (or smaller) steel electrical metallic tubing or nom 6 in. (152 mm) diam (or smaller) steel conduit.
 - D. Copper Tubing — Nom 6 in. (152 mm) diam (or smaller) Type L (or heavier) copper tubing.
 - E. Copper Pipe — Nom 6 in. (152 mm) diam (or smaller) Regular (or heavier) copper pipe
4. Firestop System — The firestop system shall consist of the following:
 - A. Packing Material — Min 4 in. (102 mm) thickness of min 4 pcf (64 kg/m³) mineral wool batt insulation firmly packed into opening as a permanent form. Packing material to be recessed from top end of sleeve for floors or from both ends of sleeve for walls to accommodate the required thickness of fill material.
 - B. Fill, Void or Cavity Material* — Sealant — Min 1/2 in. (13 mm) thickness of fill material applied within the annulus, flush with the top end of the sleeve for floors, or with both ends of the sleeve for walls. Min 1/2 in. (13 mm) thick bead of all material to be installed around pipe at interface of sleeve for point contact installations. W Rating applies only when FS-ONE MAX Intumescent Sealant is used. For the W Rating, max annular space is 1-7/8 in. (48 mm) and an additional film of sealant shall be applied over the sleeve (when used) lapping at least 1/2 in. (13 mm) onto top surface of floor or both surfaces of wall.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-ONE Sealant or FS-ONE MAX Intumescent Sealant

* Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.



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