

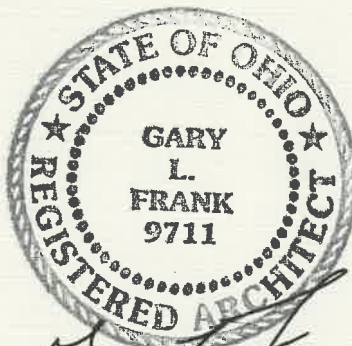
1290 Independence

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ARCHITECTURAL GROUP III

Best Western
Napoleon, OH

FIRE SPECIFICATION NO. 07250



Gary L. Frank

June 25, 2003

SECTION 07250 P.1
FIRE PROOFING

- 1.0 GENERAL:**
- 1.1 Provide all labor, materials, tools and equipment necessary to furnish and install fire stop system as indicated on drawings and specified herein:**
- 1.2 Provide fire stopping for the following applications:**
- 1.2.1 Penetrations through fire rated floors, walls and ceilings.**
- 1.3 Acceptable Manufacturers:**
- 1.3.1 Dow Corning Fire Stop System or Equal**
- 1.3.1.1 Dow Corning Fire Stop Sealant (2000)**
- 1.3.1.2 Dow Corning Fire Stop Foam (2001)**
- 1.3.1.3 Dow Corning Primer 1200 RTV**
- 1.4 Compliances: Comply with the provisions of the following codes, specifications and standards, except as otherwise shown or specified.**
- 1.4.1 UL Classification as Fill, Void or Cavity.**
- 1.4.2 ASTM E814-83 Standard Test of Through-Penetration Fire Stops.**
- 1.4.3 UL 1479**
- 2.0 MATERIALS:**
- 2.1 Sealant: Provide ready-to-use silicone penetration seal that will stop passage of fire, smoke and water through fire rated wall and floor penetrations and will cure in the presence of atmospheric moisture to produce durable and flexible seal against air and water.**
- 2.2 Foam: Provide 14 to 18 pounds/cubic foot "Free Foam" density, two-part silicone elastomer, supplied in liquid "A" and "B" components colored off-white respectively.**
- 2.3 Primer: Apply primer to any surface demonstrating poor adhesion.**

**SECTION 07250 P.2
FIRE PROOFING**

3.0 EXECUTION:

3.1 Surfaces to receive sealant or foam must be structurally sound, dry, clean, free of dirt, moisture, frost, loose particles, oil, grease, rust and any and all other foreign substances.

3.1.2 Sealant shall be self-priming, that is, with appropriate surface preparation, it shall bond to concrete, masonry, aluminum, wood and glass. Apply primer to any surface showing poor adhesion.

3.2 Installation: Sealant

3.2.1 Install sealant in strict accordance with manufacturers recommendations.

3.2.2 Support: Where required, support sealant with 3" thickness of mineral wool.

3.2.3 Minimum sealant joint depth shall be 1/2" or as required by manufacturer's recommendations, to obtain a 2-hour rated seal.

3.2.4 Tool sealant joints as required to create a smooth even joint.

3.3 Installation: Foam

3.3.1 Install foam in strict accordance with manufacturer recommendations.

3.3.2 Support: Where required, provide damming of penetration opening in accordance with manufacturer's recommendations.

3.3.3 Immediately after mixing, pour or inject liquid foam into penetration opening, not more than 1/3 full to compensate for expansion during curing. Follow manufacturer's instructions explicitly.

END SECTION 07250

Wood Frame Structures

APPLICATION	UL System	Firestop Product
PVC/CPVC Systems		
4" max. PVC/CPVC in rated wall through 1 hour floor/ceiling assembly (Caulk only)	FC2127	FS-One Sealant
4" max PVC/CPVC in rated wall next to floor joist through 1 hour floor/ceiling assembly (Retainer collar and caulk)	FC2051	FS-One Sealant with retainer collar
4" max PVC vent in rated wall, with 3" max PVC branch through floor through 1 hour floor/ceiling assembly (Caulk only)	FC2126	FS-One Sealant
4" max PVC vent in rated wall, with 3" max PVC branch through floor through 1 hour floor/ceiling assembly (Caulk and Collar)	FC2050	FS-One Sealant and CP-643 Collar
2" max PVC/CPVC through 1 hr or 2 hr gypsum wall assembly (Caulk only)	WL2128	FS-One Sealant
6" max PVC/CPVC through 1 hr or 2 hr gypsum wall assembly (Caulk and Collar)	WL2078	FS-One Sealant and CP-643 Collar
2" max PVC/CPVC through 1 hr or 2 hr floor/ceiling assembly (Caulk Only)	FC2160	FS-One Sealant
4" max PVC/CPVC through 2 hour floor/ceiling assembly (Caulk and Collar)	FC2029	FS-One Sealant and CP-643 Collar
Metal Pipe Systems		
4" max Steel / Copper in rated wall through 1 hr or 2 hour floor/ceiling assembly (Caulk Only)	FC-1009	FS-One Sealant
30" max steel, 6" max copper through 1 hr or 2 hr gypsum wall (caulk only)	WL1054	FS-One Sealant
6" max steel through 1 hr or 2 hr floor ceiling assembly (Caulk Only)	FC1059	FS-One Sealant
Insulated Metal Pipe Systems		
2" max copper with 3/4" AB/PVC through 1 hr or 2 hr gypsum wall assembly (Caulk only)	WL5028	FS-One Sealant
2" max copper with 3/4" AB/PVC through 1 hour floor/ceiling assembly (Caulk Only)	FC5037	FS-One Sealant



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

Areas of application

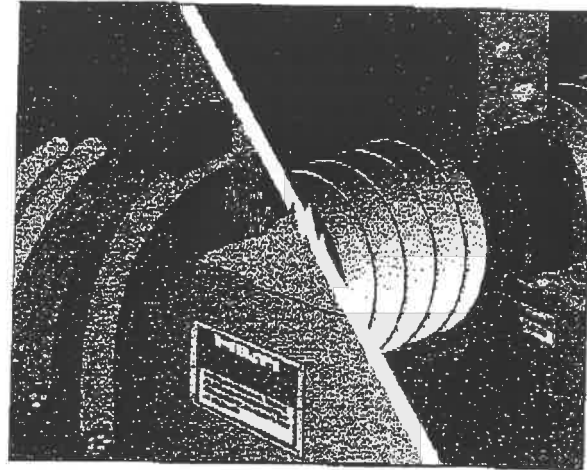
- Steel, copper and EMT pipes
- Insulated steel and copper pipes
- Cable bundles
- Closed or vented plastic pipes
- HVAC penetrations

For use with

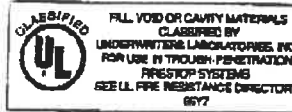
- Concrete, masonry, drywall and wood floor assemblies
- Wall and floor assemblies rated up to 4 hours

Examples

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



Internationally tested and approved



System advantage/Customer benefits

- Protects most typical firestop penetration applications
- Easy to work with and fast cleanup
- Can be re-penetrated when building new cables
- Can be painted

FS-ONE Intumescent Firestop Sealant

Ordering Description	Color	Package contents	Volume	Item No.
FS-ONE, tube	red	10.3 oz. (290 ml)	12 in.	04239575
FS-ONE, foil	red	(Qty 20) 20.2 oz. (600 ml)	36 in.	00311387
FS-ONE, pail	red	5 Gallons (19.0 liter)	116 in.	00259578
CS-210 FS-ONE 10.3 oz. Dispenser				00655205
600 ml Foil Dispenser				00024690





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

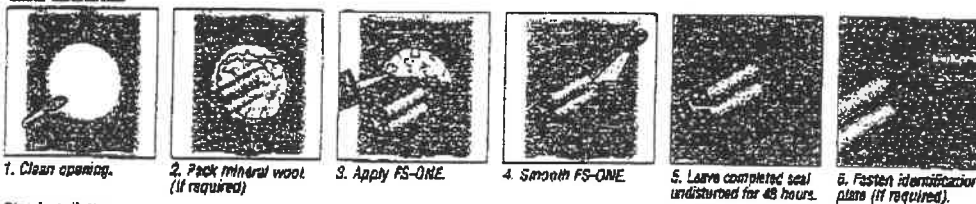
- Smoke, gas and water resistant
- Contains no halogen, solvents or asbestos
- High fire rating properties
- Water based, easy to clean

Tested in accordance with

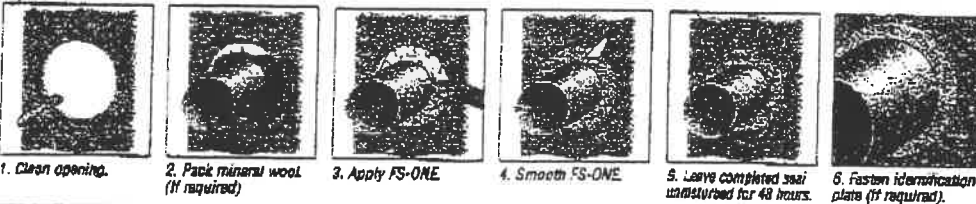
- UL 1479
- ASTM E 814
- ASTM E 84

Installation Instructions for FS-ONE

Cable Installation



Pipe Installation



Technical Data

FS-ONE Intumescent Firestop

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

Chemical basis:	Water-based intumescent acrylic dispersion
Density:	Approx. 1.5 g/cm ³
Color:	Red
Working time:	Approx. 20-30 min
Curing time:	Approx. 14-21 days
Shore A Hardness:	Approx. 35
Movement capability:	Approx. 5%
Intumescent Activation:	Approx 250°F (121°C)
Expansion rate (unrestricted):	Up to 3-5 times original volume
Temperature resistance (cured):	-40°F (-40°C) to 212°F (100°C)
Application temperature:	35°F (2°C) to 100°F (38°C)
Surface burning characteristics:	Flame Spread: 0
(ASTM E 84-96)	Smoke Development: 5
Sound transmission classification:	50
ASTM E 90-97	

Approvals

ICBO Evaluation Service, Inc.	Report No. 5071
California State Fire Marshal	Listing No. 1200/108
City of New York	MEA 326-96-M Vol II



Opening

1. 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

2. Install the prescribed backfilling material type and depth to obtain the desired rating (if required). Leave sufficient depth for applying FS-ONE.
3. 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, tool pack gun, bulk loader and bulk gun. With FS-ONE buckets, Graco type sealant pumps may be used. (Contact pump manufacturer for proper selection).
4. 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.
5. Leave completed seal undisturbed for 48 hours.
6. 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.

Notice about approvals

- Check that the penetration has been sealed according to the specified drawing in the UL Fire Resistance Directory or Hilti Firestop Manual. For further advice, please contact Hilti customer service. Refer to Hilti product literature and UL fire resistance directory for specific application details.

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

Safety precautions

- Before handling, read the product and Material Safety Data Sheet for detailed use and health information
- Keep out of reach of children
- Wear suitable gloves and eye protection

Storage

- Store only in the original packaging in a location protected from moisture at temperatures between 40°F (5°C) and 96°F (30°C)
- Observe expiration data on the packaging

**Material Safety Data Sheet****HILTI, INC.:** P.O. Box 21148, Tulsa, OK 74121; Ph: 1 800 879 6000; Emergency No.: 1 800 879 4444**PRODUCT NAME:** FS-ONE High Performance Intumescent Firestop SealantMSDS No.: 259
Revision No.: 002
Date: 06/25/96
Page: PAGE 1 of 2**DESCRIPTION:** One-part acrylic-based sealant**INGREDIENTS AND EXPOSURE LIMITS**

INGREDIENTS:	CAS NUMBER:	PEL:	TLV:	STEL:
Calcium carbonate	000471-34-1	NA	NA	NA
Ammonium polyphosphate	007722-76-1	NE	NE	NE
Zinc borate	138265-88-0	NE	NE	NE
Talc	014807-96-6	NA	NA	NA
Expandable graphite	012689-13-3	NA	NA	NA
Alkyd resin	899990-13-6	NE	NE	NE
Polyisobutylene	009003-27-4	NE	NE	NE
1,2-Benzenedicarboxylic acid, diisononyl ester	028553-12-0	NE	NE	NE
Iron oxide	001309-37-1	NA	NA	NE
Ethylene glycol	000107-21-1	C:50 ppm	C:50 ppm	NE
Glass fiber	065997-17-3	NE	NE	NE
Ammonium hydroxide	001336-21-6	NE	NE	NE
Water	007732-18-5	NE	NE	NE

PEL = OSHA Permissible Exposure Limit. **TLV** = ACGIH Threshold Limit Value. These are 8 hour time-weighted averages unless otherwise indicated by "C" (Ceiling) or "STEL" (Short Term Exposure Limit). **NA** = Not Applicable. **NE** = None Established. **ND** = Not Determined.

PHYSICAL DATA**APPEARANCE AND ODOR:** Red paste. Odorless.**pH:** Not Determined**BOILING POINT:** Approx. 212°F**MELTING POINT:** Not Determined**VOC CONTENT:** None**VAPOR PRESSURE:** Not Determined**EVAPORATION RATE:** Not Determined**VAPOR DENSITY:** Not Determined**SOLUBILITY IN WATER:** Slightly soluble (prior to curing)**SPECIFIC GRAVITY:** 1.5**FIRE AND EXPLOSION HAZARD DATA****FLASH POINT:** Non-Flammable**FLAMMABLE LIMITS:** Not Applicable**EXTINGUISHING MEDIA:** This product is non-combustible. Use extinguishing agent suitable for type of surrounding fire.**SPECIAL FIRE FIGHTING PROCEDURES:** A self-contained breathing apparatus should be worn when fighting fires involving chemicals.**UNUSUAL FIRE AND EXPLOSION HAZARDS:** None Known**REACTIVITY DATA****STABILITY:** Stable.**CONDITIONS TO AVOID:** None Known**INCOMPATIBILITY:** Strong acids, peroxides and other oxidizing agents**HAZARDOUS DECOMPOSITION PRODUCTS:** Thermal decomposition can yield carbon dioxide and/or carbon monoxide.**HAZARDOUS POLYMERIZATION:** Will not occur.**HEALTH HAZARD DATA****KNOWN HAZARDS:** None known. Possibly irritating upon contact with the eyes or repeated contact with and skin.*Simplicity**Confidence**Value*



CARCINOGENICITY: No ingredients are considered by IARC, NTP, or OSHA to be carcinogens.

PRIMARY ROUTES OF EXPOSURE: Dermal.

SIGNS AND SYMPTOMS OF EXPOSURE: None expected.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Eye and skin conditions.

EMERGENCY AND FIRST AID PROCEDURES

EYES: Immediately flush with plenty of water while holding eyelids apart. Contact a physician if any effects occur.

SKIN: Wipe off material and wash with soap and water. Always launder contaminated clothing before reuse.

INHALATION: Move victim to fresh air if discomfort develops. If symptoms persist, consult a physician.

INGESTION: Give plenty of water to drink. Never give anything by mouth to an unconscious person. Do not induce vomiting unless directed to by a physician. Call a physician immediately.

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: Safety glasses or goggles are recommended in most work environments.

SKIN PROTECTION: None required; however, gloves are recommended (cotton are sufficient).

RESPIRATORY PROTECTION: None normally required. Use a NIOSH-approved organic vapor respirator when vapor concentrations exceed recommended exposure limits. Never enter a confined space without an appropriate air-supplied respirator (e.g. SCBA or airline with escape pack).

PRECAUTIONS FOR SAFE HANDLING AND USE

HANDLING AND STORING PRECAUTIONS: Observe good hygiene practices. Do not eat, drink, or smoke while using. Wash hands during breaks and before eating. Keep container closed when not in use. Store between 50 and 100° F. Keep from freezing.

SPILL PROCEDURES: Allow to cure. Scrape up spilled material and place in a closed container for disposal.

REGULATORY INFORMATION

HAZARD COMMUNICATION: This MSDS has been prepared in accordance with the federal OSHA Hazard Communication Standard.

HMS CODES: Health 1, Flammability 0, Reactivity 0, PPE B

DOT SHIPPING INFO: Non-regulated.

TSCA INVENTORY STATUS: Chemical components listed on TSCA inventory.

SARA TITLE III, SECTION 313: This product contains 1 - 4% ethylene glycol (CAS 107-21-1) which is subject to reporting under Section 313 of SARA Title III (40 CFR Part 372).

WASTE DISPOSAL METHODS: Consult with regulatory agencies or corporate personnel for disposal methods that comply with local, state, and federal health and environmental regulations.

CONTACTS:

TECHNICAL:	Jim Taite	(x6772)
HEALTH/SAFETY:	Steve Gerrard	(x9309)

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.

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Value



Underwriters Laboratories Inc.

Northbrook, Illinois • (708) 272-8800
 Mahwah, New York • (516) 271-8200
 Santa Clara, California • (408) 985-2400
 Research Triangle Park,
 North Carolina • (919) 549-1400

CERTIFICATE OF COMPLIANCE

CERTIFICATE NUMBER: 211097 - R13240A
ISSUE DATE: October 21, 1997

Issued to: Hilti Construction Chemicals Inc.
 5400 S. 122nd East Avenue
 Tulsa, OK 74146 USA

Report Reference: R13240, February 14, 1997

This is to Certify that representative samples of: Fill, Void or Cavity Materials, one part Sealant designated as FS One (also identified as CP 612)

Have been investigated by Underwriters Laboratories Inc. in accordance with the Standard(s) indicated on this Certificate.

Standard(s) for Safety: UL 1479, Fire Tests of Through-Penetration Firestops;
 UL 2079, Tests for Fire Resistance of Building Joint Systems.

Additional Information:

This material is a one part intumescent firestop sealant for use in through-penetration firestop systems. These sealants are Classified as "Fill, Void or Cavity Materials" for use in various Through-Penetration Firestop Systems as specified in Volume 2 of UL's Fire Resistance Directory.

Only those products bearing the UL Classification Marking should be considered as being covered by UL's Classification and Follow-Up Service.

The UL Classification Marking includes: the name "Underwriters Laboratories Inc."; the word "Classified"; a control number (may be alphanumeric) assigned by UL; a statement to indicate the extent of UL's evaluation of the product; and, the product category name (product identity) as indicated in the appropriate UL Directory.

LOOK FOR THE UL CLASSIFICATION MARKING ON THE PRODUCT

Engineer: *Nikola Momicilovic*
 Underwriters Laboratories Inc.
 Nikola Momicilovic

Review Engineer: *A. M. Ramirez*
 Underwriters Laboratories Inc.
 A. M. Ramirez

2000-44C (5/92)



CP 642 Firestop Collar

Product description

- Galvanized sheet steel containing sections of intumescent material (designed to expand when exposed to fire)
- For firestopping large combustible pipes

Areas of application

- Sealing combustible pipes from 6" to 10" in diameter.
- Suitable for:
 - Vented or closed pipe
 - PVC, CPVC, ABS, FRPP, PVDF
 - Pneumatic tube conveyors with two lines (mail)
 - Plastic pipes with acoustic insulation

For use with

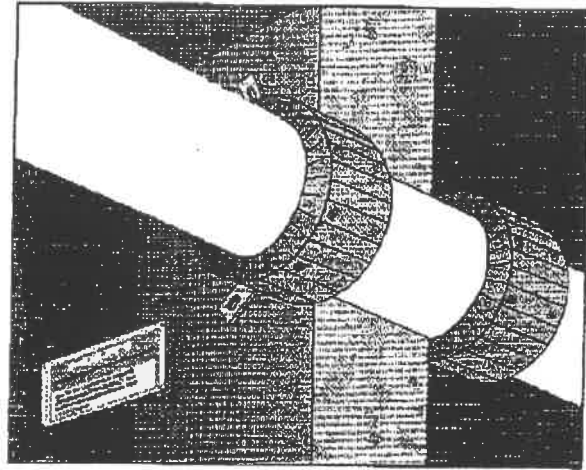
- Concrete, masonry, wood floor assemblies and gypsum walls
- Wall and floor assemblies rated up to 3 hours

Types of installation

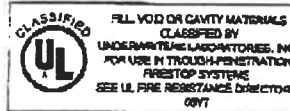
- Wall: two collars, one on each side
- Floor: one collar on underside (bottom)

Examples

- Waste water pipes
- Fresh water pipes



Internationally tested and approved



System/Product advantages

- Snap connection for quick and easy closure without use of a tool
- Adjustable position tabs for convenient fastening
- Ready to use out of the package

CP 642 Firestop Collar*

Description	Package Quantity (PCS)	Ordering Designation	ITEM NO.
CP 642 Firestop Collar	1	CP 642-160F	00236708
CP 642 Firestop Collar	1	CP 642-200F	00310084
CP 642 Firestop Collar	1	CP 642-250-10F	00310084

* Incl. fastening hooks

Fastening hook	10	CP 642 hook	00236711
Spare part			



CP 642

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CP 642 Firestop Collar

Product description

- Galvanized sheet steel containing sections of intumescent material (designed to expand when exposed to fire)
- For firestopping large combustible pipes

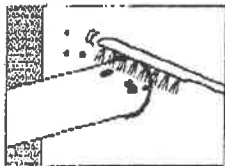
Product features

- Ready-to-use collar, no construction required, therefore fast installation time
- Adjustable/moveable fastening tabs

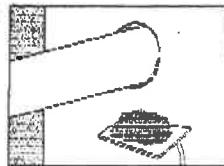
Tested in accordance with

- UL 1479
- ASTM E 814

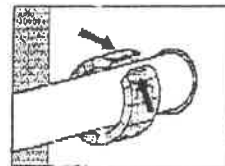
Installation instructions for CP 642



1. Clean plastic pipe.



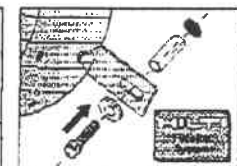
2. Close remaining gap to provide smoke and gas tight seal.



3. Close collar.



4. Attach fastening hooks.



5. Fasten collar and installation plate. (If required)

Dimensions

CP 642 Collar/plastic pipes

Designation	Pipe outside dia. (in.)	Collar outside dia. (in.)	Collar Height (in.)	No. of hooks and fasteners
CP 642-160/6"	5.3-6.3	8.2	4.4	6
CP 642-200/8"	7.9	10.0	6.9	7
CP 642-250/10"	9.8	12.4	9.1	9

Approvals

ICBO Evaluation Service, Inc.	Report No. 5071
California State Fire Marshal	Listing No. 1200-106
City of New York	Report No. MEA 113-96-M
City of Los Angeles	Research Report 25188

Opening

- Clean the plastic pipes. Expansion of the intumescent material during a fire acts to close the plastic pipe. Very dirty pipes with, for example, remains of mortar, may lead to a delay in this closing action. Badly soiled plastic pipes should, therefore, be cleaned in the area where the CP 642 firestop collar is to be installed.

Application of firestop system

- Seal the opening. Gaps must be closed with FS-ONE. The approved methods vary and are given in the specific UL system.
- Close the CP 642 firestop collar. Place the CP 642 firestop collar around the plastic pipe and lock the closure with firm pressure until it latches.
- Attach fastening hooks. The fastening hooks can be attached to various points on the metal housing. This allows the fastening points to be made to suit the space available in each case. The hooks must be positioned as symmetrically as possible. The required number of fastening hooks is indicated on the packaging.
- Fastening the CP 642 firestop collar. Only when fastened properly can CP 642 protect against fire passing through.
 - Mark the fastening points.
 - Drill holes with a Hilti rotary hammer drill (i.e. TE 5) or, depending on base material, fasten using Hilti power actuated tool (e.g. DXA 40).

- To secure the CP 642 firestop collar, use Hilti anchors/fasteners. 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.

Notice about approvals

- When making a pipe seal using Hilti CP 642 Intumescent Firestop Collar, please refer to the UL directory or Hilti Firestop Manual for restrictions as to opening size, type and thickness of wall or floor, maximum pipe diameter, etc.

Not to be used...

- With folded and coiled sheet-metal and cast-iron pipes (not tested)
- In highly corrosive surroundings
- With unapproved anchors/fasteners

Safety precautions

- Keep out of the reach of children.
- Read the material safety data sheet.

Storage

- Store only in the original packaging in a location protected from moisture.



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Santa Clara, California • (408) 985-2400
Research Triangle Park,
North Carolina • (919) 549-1400
Carnas, Washington • (360) 817-5500

CERTIFICATE OF COMPLIANCE

CERTIFICATE NUMBER: 240798 - R15431
ISSUE DATE: July 24, 1998

Issued to: Hilti Construction Chemicals Inc.
5400 S. 122nd East Avenue
Tulsa, OK 74146 USA

Report Reference: R13240, March 23, 1998

This is to Certify that
representative samples of:

Firestop Collar, designated CP 643 50/1.5,
CP 643 63/2, CP 643 90/3 and CP 643 110/4.
The various suffixes for the designations
indicates nominal outside diameter of the pipe
(mm/in.) on which the device is intended to be
installed.

Have been investigated by Underwriters Laboratories Inc. in accordance with the Standard(s)
indicated on this Certificate.

Standard(s) for Safety: UL 1479, Fire Tests of Through-Penetration
Firestops.

Additional Information:

*This material is intended to be used in various Through-Penetration
Firestop Systems as specified in Volume 2 of UL's Fire Resistance
Directory.*

Only those products bearing the UL Classification Marking should be considered as being covered by UL's
Classification and Follow-Up Service.

The UL Classification Marking includes: the name "Underwriters Laboratories Inc." the word "Classified"; a control
number (may be alphanumeric) assigned by UL; a statement to indicate the extent of UL's evaluation of the product;
and, the product category name (product identity) as indicated in the appropriate UL Directory.

LOOK FOR THE UL CLASSIFICATION MARKING ON THE PRODUCT

Engineer:
Underwriters Laboratories Inc.
Nikola Momicilovic

Review Engineer:
Underwriters Laboratories Inc.
A. M. Ramirez

2000-44C (4/98)



Material Safety Data Sheet

HILTI, INC.: P.O. Box 21148, Tulsa, OK 74121; Ph: 1 800 879 8000; Emergency No.: 1 800 879 4444

PRODUCT NAME: CP 642 Firestop Collar

MSDS No.: 236
Revision No.: 002
Date: 03/11/95
Page: 1 of 2

DESCRIPTION: Intumescent material in metal case

INGREDIENTS AND EXPOSURE LIMITS

INGREDIENTS:

Epoxy resin based intumescent material containing graphite

CAS NUMBER:

NE

PEL:

NE

TLV:

NE

STEL:

NE

PHYSICAL DATA

APPEARANCE AND ODOR: Dark grey to black rubbery tape enclosed in galvanized metal jacket, no odor.

BOILING POINT: Not Applicable

VOC CONTENT: Not Applicable

MELTING POINT: Not Determined

pH: 6.1 (110 g/l @ 20° C)

VAPOR PRESSURE: Not Applicable

VAPOR DENSITY: Not Applicable

SPECIFIC GRAVITY: 1.06

SOLUBILITY IN WATER: Insoluble

FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: Non-flammable

FLAMMABLE LIMITS: Not Applicable

EXTINGUISHING MEDIA: Water, Water Fog, CO2, Dry Chemical, Foam

SPECIAL FIRE FIGHTING PROCEDURES: None known, however, a self-contained breathing apparatus (SCBA) and protective clothing should be worn when fighting fires involving chemicals.

UNUSUAL FIRE AND EXPLOSION HAZARDS: None known. Expands to 10 times the original volume at temperatures >120°C/250°F.

REACTIVITY DATA

STABILITY: Stable.

INCOMPATIBILITY: None known.

HAZARDOUS DECOMPOSITION PRODUCTS: None known.

HAZARDOUS POLYMERIZATION: Will not occur.

CONDITIONS TO AVOID: None known.

HEALTH HAZARD DATA

KNOWN HAZARDS: None anticipated.

CARCINOGENICITY: No ingredients are listed by IARC, NTP, or OSHA as carcinogens.

PRIMARY ROUTES OF EXPOSURE: Dermal, Inhalation.

SIGNS AND SYMPTOMS OF EXPOSURE: None expected from routine use/installation according to manufacturer's specifications and technical guides.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: None known or anticipated.

Simplicity

Confidence

Value

EMERGENCY AND FIRST AID PROCEDURES

EYES: Flush with water if dust, debris, etc. from work overhead gets into the eyes. Do not rub the eyes as this can cause corneal abrasions. Call a physician if irritation continues or if redness, swelling, or similar symptoms occur.

SKIN: Practice good hygiene; i.e. wash hands during breaks, before eating or smoking, and after work.

INHALATION: No first aid should be needed. If ill effects occur, move to fresh air. If symptoms persist, seek medical attention.

INGESTION: Not a likely route of exposure.

OTHER: Referral to a physician is recommended if there is any question about the seriousness of the injury or exposure.

CONTROL MEASURES AND PERSONAL PROTECTIVE EQUIPMENT

VENTILATION: General (i.e. natural or mechanically induced fresh air movements that maintain vapor concentrations below recommended exposure limits).

EYE PROTECTION: Safety glasses recommended in most industrial settings.

SKIN PROTECTION: None required; however, (cotton) gloves recommended.

RESPIRATORY PROTECTION: No respiratory protection is needed for normal application of this product. If any dust is generated during use or during any cutting or grinding operations, use a NIOSH-approved dust mask.

PRECAUTIONS FOR SAFE HANDLING AND USE

HANDLING AND STORING PRECAUTIONS: Store in a cool dry place.

SPILL PROCEDURES: No special requirements.

REGULATORY INFORMATION

OSHA HAZARD COMMUNICATION: This Material Safety Data Sheet has been prepared in accordance with the federal OSHA Hazard Communication Standard. This product is considered to be an "article" under that standard.

DOT PROPER SHIPPING NAME: Non-regulated

TSCA INVENTORY STATUS: Chemical components listed on TSCA Inventory.

SARA TITLE III, SECTION 313: This product does not contain any ingredients subject to reporting under requirements of Section 313 of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.

WASTE DISPOSAL METHODS: Consult with regulatory agencies or corporate personnel for disposal methods that comply with local, state, and federal health and environmental regulations.

CONTACTS:

TECHNICAL:	Jim Taite	(x6772)
HEALTH/SAFETY:	Steve Gerrard	(x6309)

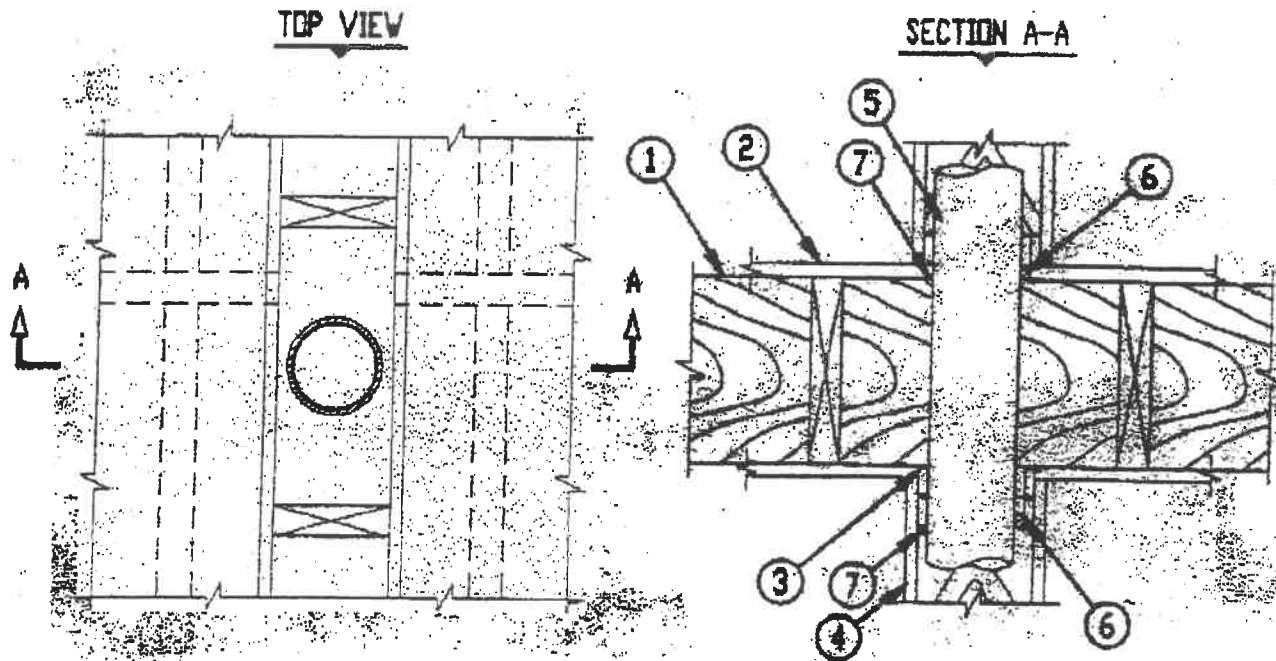
The information and recommendations contained herein are based upon data believed to be correct; however, no guarantee or warranty of any kind expressed or implied is made with respect to the information provided.

*Simplicity**Confidence**Value*

U.L. SYSTEM NO. FC2127
 PLASTIC PIPE THROUGH 1-HR. WOOD FLOOR ASSEMBLY

F RATING = 1-HR.

T RATING = 0-HR.



1. WOOD FLOOR/CEILING ASSEMBLY (U.L. CLASSIFIED L500 SERIES) (1-HR. FIRE-RATING)
2. LUMBER OR PLYWOOD SUBFLOOR WITH FINISH FLOOR OF LUMBER, PLYWOOD, OR FLOOR TOPPING MIXTURE.
3. TOP PLATE.
4. GYPSUM WALL ASSEMBLY (1-HR. FIRE-RATING).
5. PENETRATING ITEM TO BE ONE OF THE FOLLOWING (ALSO SEE NOTE NO. 3 BELOW):
 - A. MAXIMUM 4" NOMINAL DIAMETER PVC PLASTIC PIPE (CELLULAR AND SOLID CORE).
 - B. MAXIMUM 4" NOMINAL DIAMETER ABS PLASTIC PIPE (CELLULAR AND SOLID CORE).
 - C. MAXIMUM 4" NOMINAL DIAMETER CPVC PLASTIC PIPE.
6. MINIMUM 3/4" DEPTH HILTI FS-DNE INTUMESCENT FIRESTOP SEALANT.
7. MINIMUM 1/2" CROWN FS-DNE INTUMESCENT FIRESTOP SEALANT AT POINT OF CONTACT.

NOTES : 1. MAXIMUM DIAMETER OF OPENING = 5-1/2".
 2. ANNULAR SPACE = MINIMUM 0", MAXIMUM 1".
 3. CLOSED OR VENTED PIPING SYSTEMS. (PVC & ABS = SCHEDULE 40, CPVC = SDR17).

HILTI
 FIRESTOP SYSTEMS

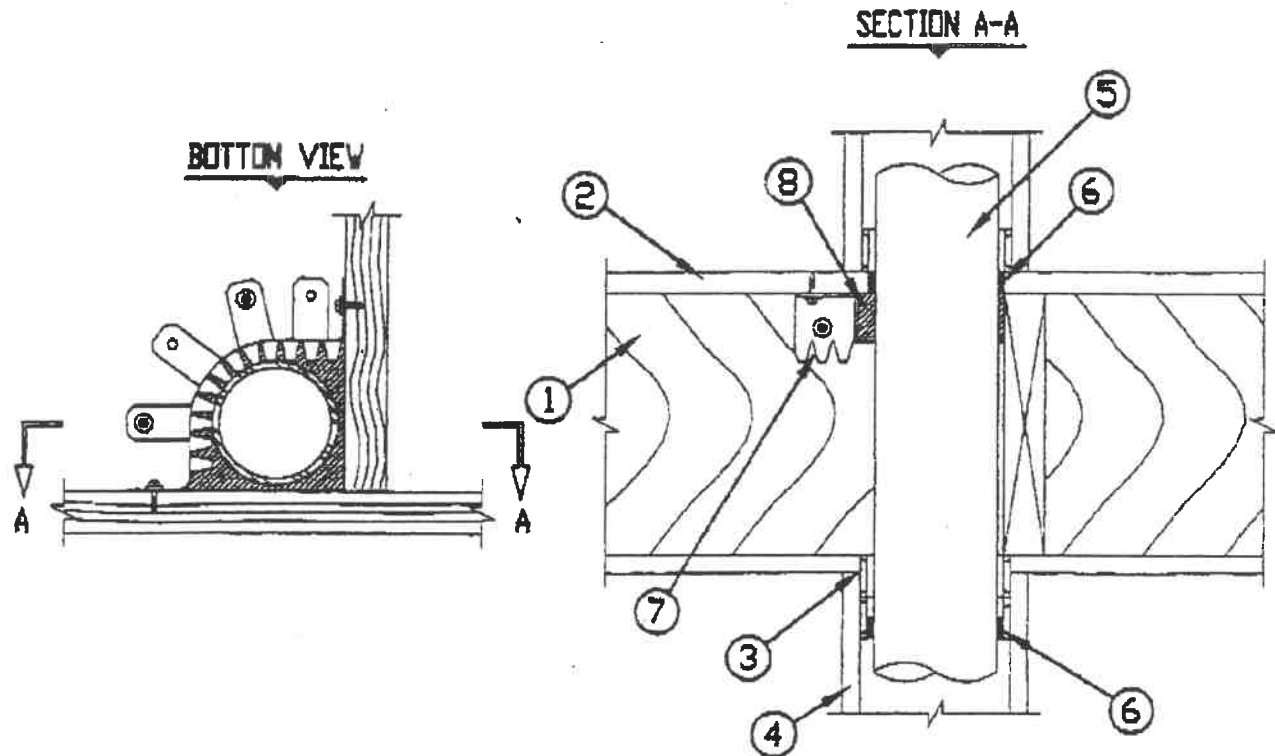
HILTI, Inc.
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Sheet	1 of 1	Drawing No.
Scale	7/64" = 1"	FC
Date	APRIL 20, 2000	2127d

U.L. SYSTEM NO. FC2051
PLASTIC PIPE THROUGH 1-HR. WOOD FLOOR ASSEMBLY

F RATING = 1-HR.
 T RATING = 1-HR.

FC2051B11798



1. WOOD FLOOR/CEILING ASSEMBLY (U.L. CLASSIFIED L500 SERIES) (1-HR. FIRE-RATING).
2. LUMBER OR PLYWOOD SUBFLOOR WITH FINISH FLOOR OF LUMBER, PLYWOOD, OR FLOOR TOPPING MIXTURE.
3. TOP PLATE.
4. GYPSUM WALL ASSEMBLY (1-HR. FIRE-RATING).
5. MAXIMUM 4" NOMINAL DIAMETER PVC OR CPVC PLASTIC PIPE.
6. MINIMUM 3/4" DEPTH HILTI FS-ONE INTUMESCENT FIRESTOP SEALANT.
7. HILTI RETAINING COLLAR FASTENED TO WOOD JOIST AND SURFACE OF FLOOR WITH WOOD SCREWS AND WASHERS AT EVERY OTHER TAB.
8. COMPLETELY FILL HILTI RETAINING COLLAR WITH HILTI FS-ONE INTUMESCENT FIRESTOP SEALANT.

NOTES : 1. MAXIMUM DIAMETER OF OPENING = 4-3/4".
 2. ANNULAR SPACE = MINIMUM 0", MAXIMUM 1/4".
 3. PLASTIC PIPE MAY TOUCH MAXIMUM TWO SIDES OF WOOD TRUSSES.

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 FIRESTOP SYSTEMS

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Sheet 1 of 1
 Scale 3/32" = 1"
 Date NOV. 17, 1998

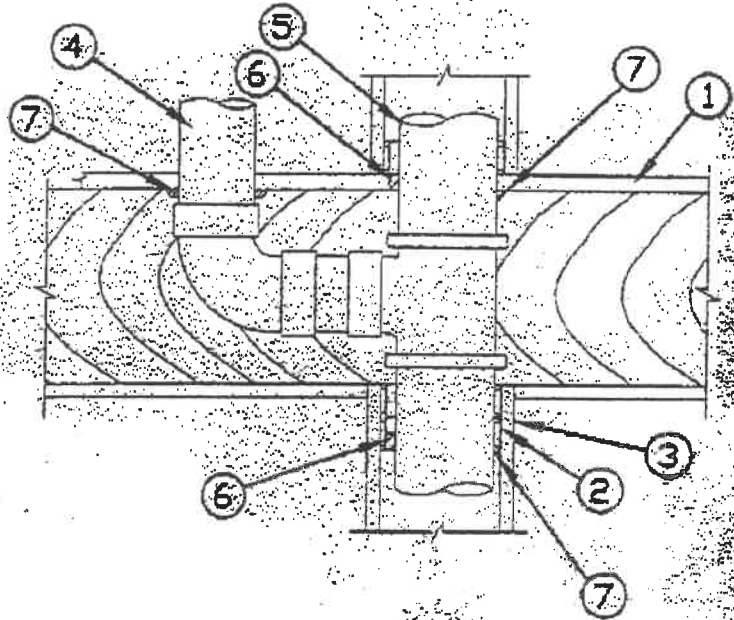
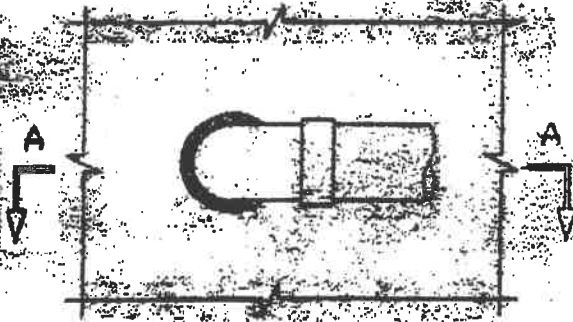
Drawing No.
FC
2051b

U.L. SYSTEM NO. FC2126
**PLASTIC PIPE STACK WITH BRANCH LINE THROUGH 1-HR WOOD
 FLOOR ASSEMBLY**

F RATING = 1-HR
 T RATING = 0-HR

SECTION A-A

BOTTOM VIEW



1. WOOD FLOOR/CEILING ASSEMBLY (U.L. CLASSIFIED L500 SERIES) (1-HR FIRE-RATING)
2. TOP PLATE
3. GYPSUM WALL ASSEMBLY (1-HR. FIRE-RATING)
4. MAXIMUM 3" NOMINAL DIAMETER ABS, PVC, OR CPVC PLASTIC BRANCH PIPE (VENTED SYSTEM)
(MAXIMUM DIAMETER OF OPENING = 3-1/2").
5. MAXIMUM 4" NOMINAL DIAMETER ABS, PVC, OR CPVC PLASTIC VENT PIPE (VENTED SYSTEM)
(MAXIMUM DIAMETER OF OPENING = 5-1/2").
6. MINIMUM 3/4" DEPTH HILTI FS-DNE INTUMESCENT FIRESTOP SEALANT.
7. MINIMUM 1/2" CROWN HILTI FS-DNE INTUMESCENT FIRESTOP SEALANT AT POINT OF CONTACT.

NOTES : 1. ANNULAR SPACE FOR BRANCH PIPE = 0".
 2. ANNULAR SPACE FOR VENT PIPE = MINIMUM 0", MAXIMUM 1"
 3. ABS AND PVC MAY BE EITHER CELLULAR OR SOLID CORE.

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 FIRESTOP SYSTEMS

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Sheet 1 of 1

Scale 1/8" = 1"

Date APRIL 20, 1999

Drawing No.

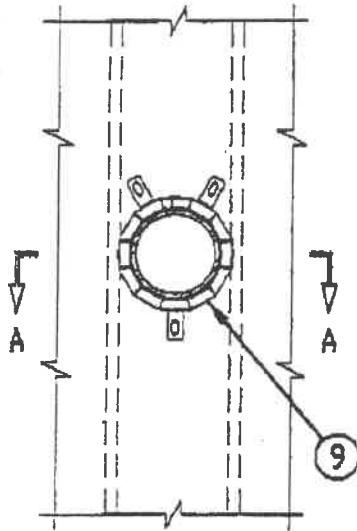
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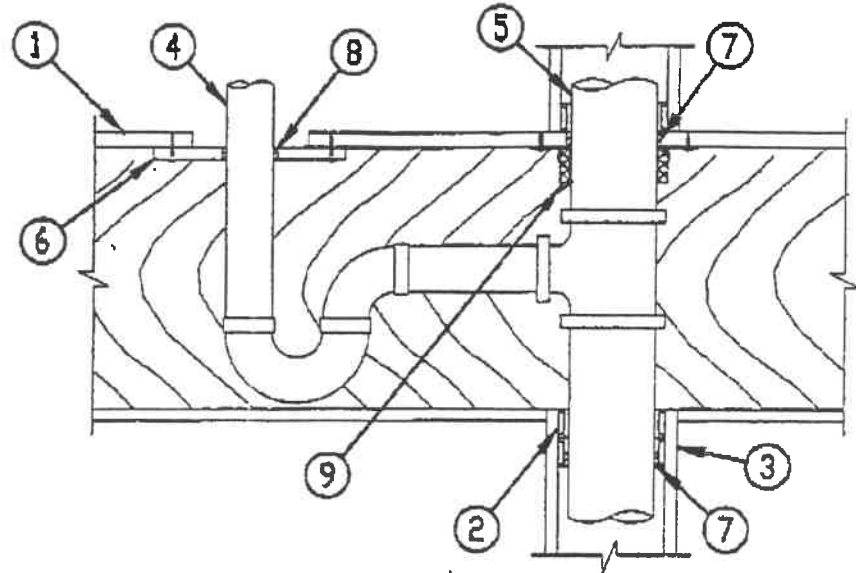
U.L. SYSTEM NO. FC2050
PLASTIC PIPE STACK WITH BRANCH LINE THROUGH 1-HR. WOOD FLOOR ASSEMBLY

F RATING = 1-HR.
 T RATING = 1-HR.

BOTTOM VIEW



SECTION A-A



FC2050g.042400

1. WOOD FLOOR/CEILING ASSEMBLY (U.L. CLASSIFIED L500 SERIES) (1-HR. FIRE-RATING).
2. WOOD TOP PLATE.
3. GYPSUM WALL ASSEMBLY (1-HR FIRE-RATING).
4. MAXIMUM 2' NOMINAL DIAMETER VENTED PVC/CPVC PLASTIC BRANCH PIPE (MAXIMUM DIAMETER OF OPENING = 2-1/2').
5. MAXIMUM 4' NOMINAL DIAMETER PVC/CPVC PLASTIC VENT PIPE (MAXIMUM DIAMETER OF OPENING = 4-3/4').
6. 3/4" THICK PLYWOOD COVERING OPENING, OVERLAPPING EXISTING PLYWOOD BY MIN. 1-1/2" OR AS REQUIRED BY LOCAL BUILDING CODE AND FASTENED IN PLACE WITH 1-1/4" WOOD SCREWS, MINIMUM 6" C/C WITH PRE-DRILLED HOLES IN PLYWOOD COVERING. (SEE NOTE #2)
7. MINIMUM 3/4" DEPTH HILTI FS-ONE INTUMESCENT FIRESTOP SEALANT.
8. MINIMUM 3/4" DEPTH HILTI FS-ONE INTUMESCENT FIRESTOP SEALANT WITH 1/4" CROWN.
9. HILTI CP 643 FIRESTOP COLLAR WITH TABS FASTENED TO FLOOR WITH WOOD SCREWS.

NOTES : 1. ANNULAR SPACE = MINIMUM 0", MAXIMUM 1/4".
 2. MAXIMUM SIZE OF OPENING FOR BRANCH PIPE = 6' x 9'.
 3. AS AN ALTERNATE TO HILTI CP 643 FIRESTOP COLLAR, YOU MAY USE A HILTI RETAINING COLLAR COMPLETELY FILLED WITH HILTI FS-ONE HIGH PERFORMANCE INTUMESCENT FIRESTOP SEALANT.

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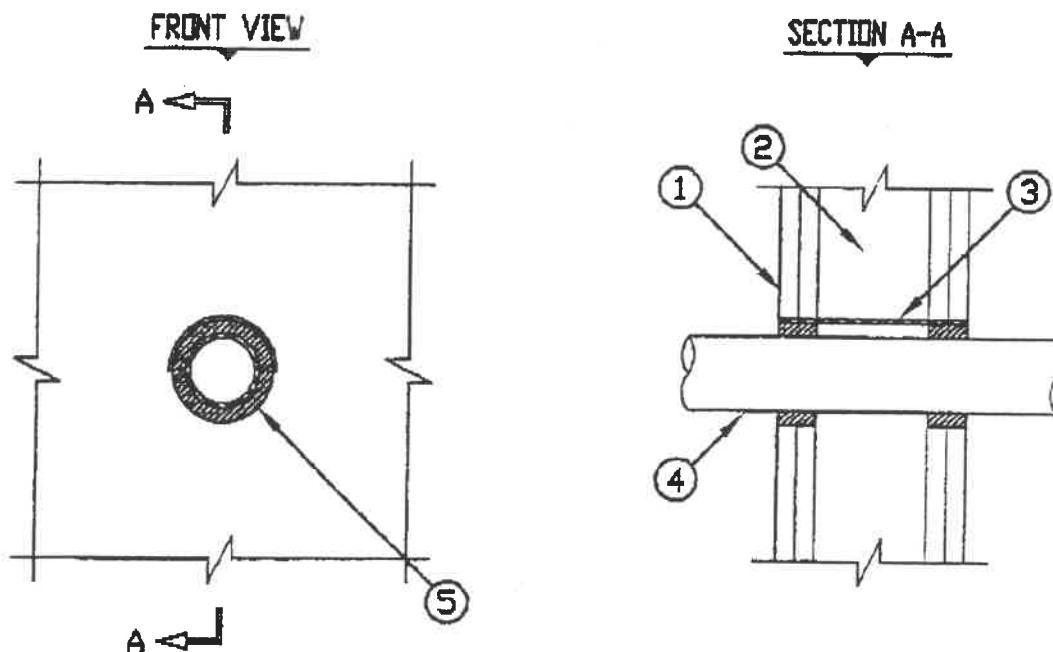
Sheet 1 of 1
 Scale 7/64" = 1"
 Date April 24, 2000

Drawing No.
FC
2050g

UL SYSTEM NO. W-L-2128
PLASTIC PIPE THROUGH GYPSUM WALL ASSEMBLY

F-RATING = 1-HR. AND 2-HR.
 T-RATING = 0-HR.

WL2128c-101300



1. GYPSUM WALL ASSEMBLY (UL CLASSIFIED U300 OR U400 SERIES) (1-HR. OR 2-HR. FIRE-RATING) (2-HR. SHOWN).
2. (NOT SHOWN) WOOD STUDS TO CONSIST OF NOMINAL 2" x 4" LUMBER. STEEL STUDS TO BE MINIMUM 2-1/2" WIDE.
3. OPTIONAL: SHEET METAL PIPE SLEEVE (MAXIMUM 3-1/2" DIAMETER, MINIMUM 28 GA. THICKNESS).
4. MAX. 2" NOMINAL DIAMETER PVC OR CPVC PLASTIC PIPE (CLOSED OR VENTED PIPING SYSTEM).
5. HILTI FS-CONE INTUMESCENT FIRESTOP SEALANT:
 - A. MINIMUM 5/8" DEPTH, FOR 1-HR. FIRE-RATING.
 - B. MINIMUM 1-1/4" DEPTH, FOR A 2-HR. FIRE-RATING.

NOTE: ANNULAR SPACE = MINIMUM 1/4", MAXIMUM 11/16".



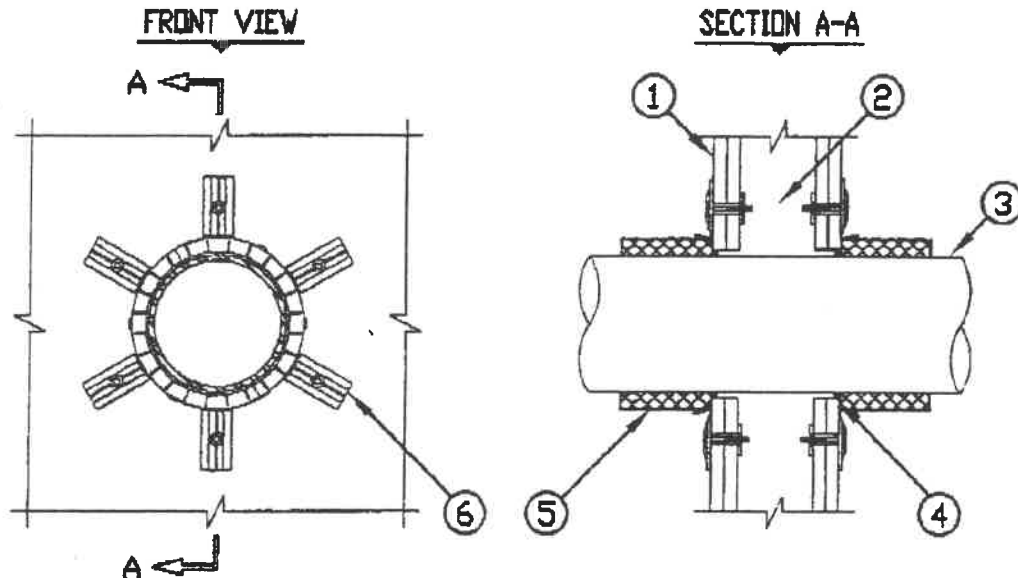
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Sheet	1 of 1
Scale	3/16" = 1"
Date	Oct 13, 2000

Drawing No.
WL
2128c

UL SYSTEM NO. W-L-2078
PLASTIC PIPE THROUGH 1-HR. OR 2-HR. GYPSUM WALL ASSEMBLY

F-RATING = 1-HR. OR 2-HR.
 T-RATING = 1-HR. OR 2-HR.



WL2078g.092000

1. GYPSUM WALL ASSEMBLY (UL CLASSIFIED U300 OR U400 SERIES) (1-HR. OR 2-HR. FIRE-RATING) (2-HR. SHOWN).
2. (NOT SHOWN). WOOD STUDS TO CONSIST OF NOMINAL 2" x 4" LUMBER. STEEL STUDS TO BE MINIMUM 2-1/2" WIDE.
3. PENETRATING ITEM TO BE ONE OF THE FOLLOWING (SEE NOTE NO. 3 BELOW):
 - A. MAXIMUM 6" NOMINAL DIAMETER PVC PLASTIC PIPE (CELLULAR OR SOLID CORE).
 - B. MAXIMUM 6" NOMINAL DIAMETER ABS PLASTIC PIPE (CELLULAR OR SOLID CORE).
 - C. MAXIMUM 6" NOMINAL DIAMETER FRPP PLASTIC PIPE.
 - D. MAXIMUM 6" NOMINAL DIAMETER CPVC PLASTIC PIPE.
4. SEE NOTE NO. 1 BELOW.
5. HILTI CP 642 OR HILTI CP 643 FIRESTOP COLLAR (SEE TABLE BELOW).
6. FASTEN EACH MOUNTING TAB TO WALL ASSEMBLY WITH APPROPRIATE HILTI ANCHORS.

NOM. PIPE DIA.	PRODUCT DESCRIPTION	NO. OF MOUNTING TABS	MAX. HOLE SIZE
1-1/2"	CP 643 50/15'	2	2-1/8"
2"	CP 643 63/2'	2	2-5/8"
3"	CP 643 90/3'	3	4"
4"	CP 643 110/4'	3	5"
6"	CP 642 160/6'	6	7"

NOTES : 1. TO IMPEDE COLD SMOKE, PROVIDE 1/4" DEPTH HILTI FS-ONE INTUMESCENT FIRE-STOP SEALANT IN ANNULAR SPACE AROUND PLASTIC PIPE.
 2. ANNULAR SPACE = MINIMUM 0", MAXIMUM 1/2".
 3. CLOSED OR VENTED PIPING SYSTEMS. (PVC, ABS, FRPP = SCH. 40, CPVC= SDR 17).



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Sheet 1 of 1
 Scale 1/8" = 1"
 Date Sept. 20, 2000

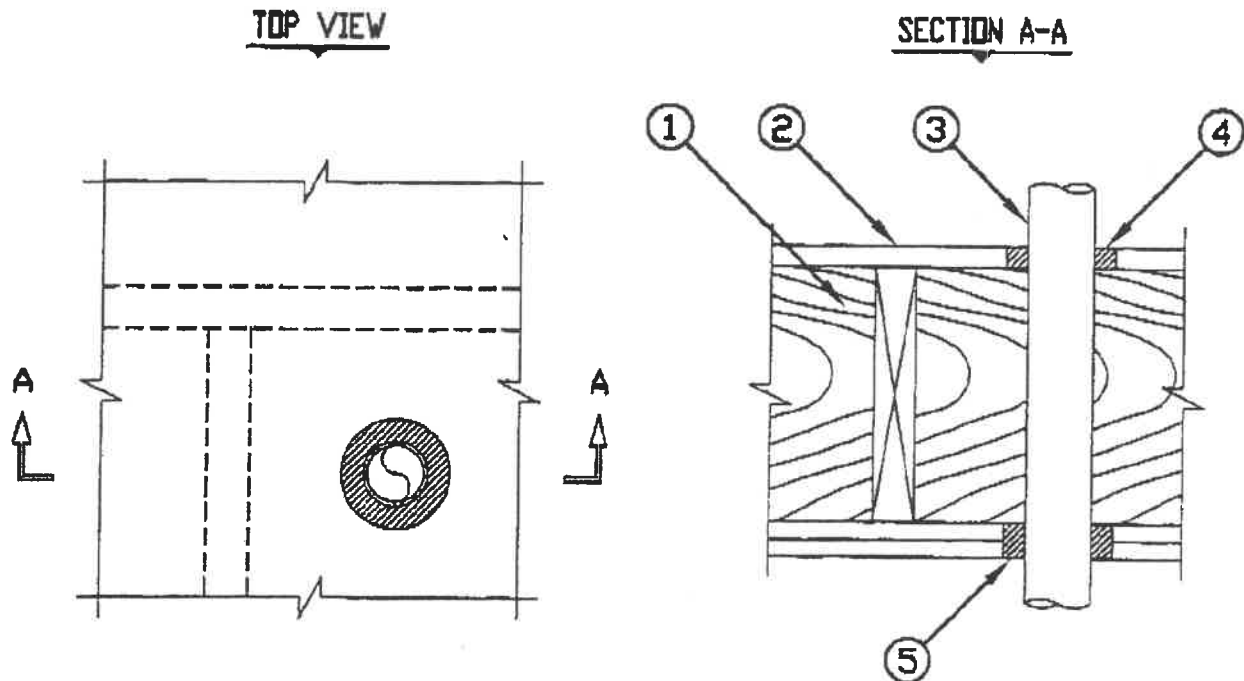
Drawing No.
WL
2078g

UL SYSTEM NO. F-C-2160

PLASTIC PIPE THROUGH 1-HR. OR 2-HR. WOOD FLOOR ASSEMBLY

F-RATING = 1-HR. OR 2-HR.

T-RATING = 1-HR. OR 2-HR.



FC2160c.031401

1. WOOD FLOOR/CEILING ASSEMBLY (UL CLASSIFIED L500 SERIES) (1-HR. OR 2-HR. FIRE-RATING) (2-HR. SHOWN).
2. LUMBER OR PLYWOOD SUB FLOOR WITH FINISH FLOOR OF LUMBER, PLYWOOD, OR FLOOR TOPPING MIXTURE.
3. PENETRATING ITEM TO BE ONE OF THE FOLLOWING (ALSO SEE NOTE NO. 3 BELOW) :
 - A. MAXIMUM 2" NOMINAL DIAMETER PVC PLASTIC PIPE (SCHEDULE 40) (CELLULAR OR SOLID CORE) (CLOSED OR VENTED PIPING SYSTEM).
 - B. MAXIMUM 2" NOMINAL DIAMETER CPVC PLASTIC PIPE (SDR 13.5) (CLOSED PIPING SYSTEM ONLY).
4. MINIMUM 3/4" DEPTH HILTI FS-ONE INTUMESCENT FIRESTOP SEALANT.
5. HILTI FS-ONE INTUMESCENT FIRESTOP SEALANT INSTALLED INTO ANNULAR SPACE TO FILL VOID TO MAXIMUM EXTENT POSSIBLE.

NOTES : 1. MAXIMUM DIAMETER OF OPENING = 4".
 2. ANNULAR SPACE = MINIMUM 1/2", MAXIMUM 1-1/8".
 3. CHASE WALL (NOT SHOWN, OPTIONAL) - THE THROUGH PENETRANT MAY BE ROUTED THROUGH A 1-HR. OR 2-HR. FIRE-RATED GYPSUM CHASE WALL ASSEMBLY.

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Sheet 1 of 1

Scale 5/32" = 1"

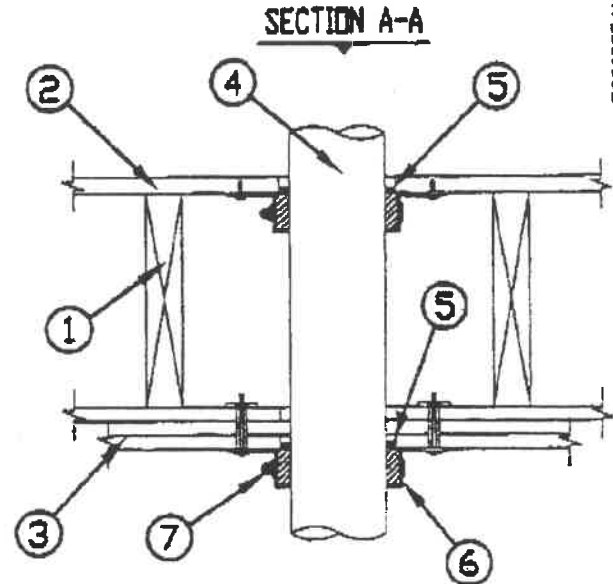
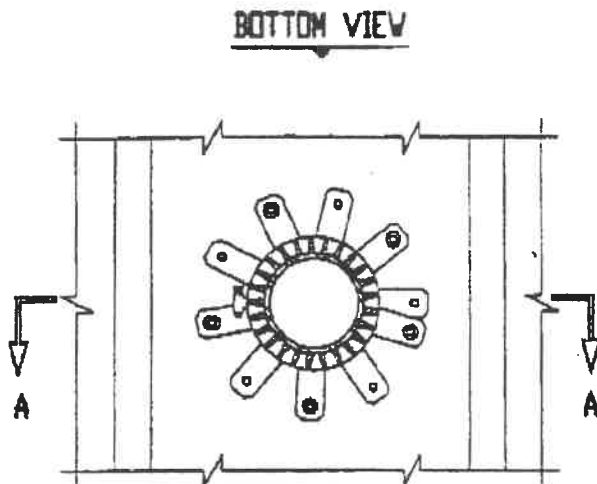
Date March 14, 2001

Drawing No.

FC
 2160c

U.L. SYSTEM NO. FC2029
PLASTIC PIPE THROUGH 2-HR. WOOD FLOOR ASSEMBLY

F RATING = 2-HR.
 T RATING = 2-HR.



FC2029E.110998

1. WOOD FLOOR/CEILING ASSEMBLY (U.L. CLASSIFIED L500 SERIES) (2-HR. FIRE-RATING).
2. LUMBER OR PLYWOOD SUBFLOOR WITH FINISH FLOOR OF LUMBER, PLYWOOD, OR FLOOR TOPPING MIXTURE.
3. 5/8" THICK FIRE-RATED GYPSUM WALLBOARD.
4. MAXIMUM 4" NOMINAL DIAMETER PVC OR CPVC PLASTIC PIPE.
5. MINIMUM 1/4" DEPTH HILTI FS-ONE INTUMESCENT FIRESTOP SEALANT.
6. HILTI RETAINING COLLAR FILLED WITH HILTI FS-ONE INTUMESCENT FIRESTOP SEALANT AND FASTENED TO THE SUBFLOOR WITH WOOD SCREWS AND FASTENED TO GYPSUM WALLBOARD WITH HILTI TOGGLER BOLTS WITH WASHERS (EVERY OTHER TAB).
7. HILTI RETAINING COLLAR CLAMPS FASTENED AT MID-HEIGHT OF COLLAR.

NOTES : 1. ANNULAR SPACE = MINIMUM 0", MAXIMUM 1/2".
 2. CLOSED OR VENTED PIPING SYSTEM (PVC = SCHEDULE 40, CPVC SDR 17).

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Sheet	1 of 1
Scale	1/8" = 1"
Date	NOV. 09, 1998

Drawing No.
FC
2029e

UL/CUL SYSTEM NO. F-C-1009

METAL PIPE THROUGH 1-HR. OR 2-HR. WOOD FLOOR ASSEMBLY

F-RATING = 1-HR. OR 2-HR.

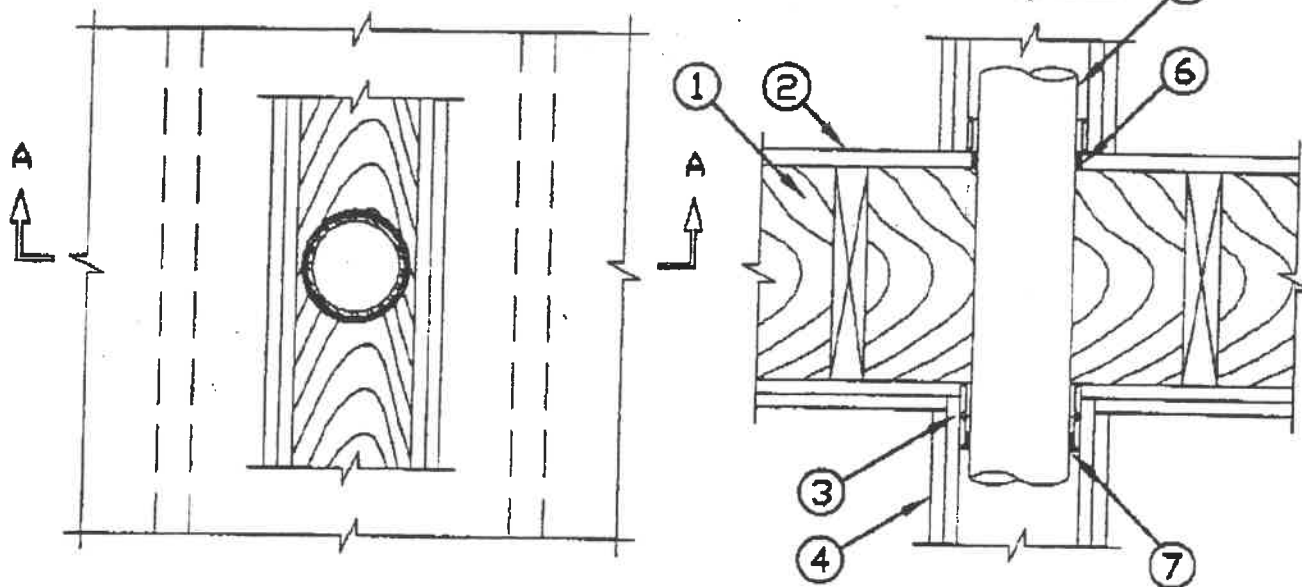
L-RATING AT AMBIENT = LESS THAN 1 CFM/SQ. FT.

T-RATING = 1-HR. OR 2-HR.

L-RATING AT 400°F = 4 CFM/SQ. FT.

TOP VIEW

SECTION A-A



FC1009k-011201

1. WOOD FLOOR/CEILING ASSEMBLY (UL/ULC CLASSIFIED L500 SERIES) (1-HR. OR 2-HR. FIRE-RATING) (2-HR. SHOWN).

LUMBER OR PLYWOOD SUBFLOOR WITH FINISH FLOOR OF LUMBER, PLYWOOD OR FLOOR TOPPING MIXTURE.

3. TOP PLATE.

4. GYPSUM WALL ASSEMBLY (1-HR. OR 2-HR. FIRE-RATING) (2-HR. SHOWN).

5. PENETRATING ITEM TO BE ONE OF THE FOLLOWING :

- A. MAXIMUM 4" NOMINAL DIAMETER STEEL PIPE (SCHEDULE 10 OR HEAVIER).
- B. MAXIMUM 4" NOMINAL DIAMETER CAST IRON PIPE.
- C. MAXIMUM 4" NOMINAL DIAMETER COPPER PIPE.
- D. MAXIMUM 4" NOMINAL DIAMETER STEEL CONDUIT.
- E. MAXIMUM 4" NOMINAL DIAMETER EMT.

6. MINIMUM 3/4" DEPTH HILTI FS-ONE INTUMESCENT FIRESTOP SEALANT, CP 601S ELASTOMERIC FIRESTOP SEALANT, OR CP 606 FLEXIBLE FIRESTOP SEALANT.

7. GENEROUS BEAD OF HILTI FS-ONE INTUMESCENT FIRESTOP SEALANT, CP 601S ELASTOMERIC FIRESTOP SEALANT, OR CP 606 FLEXIBLE FIRESTOP SEALANT FLUSH WITH BOTTOM SURFACE OF TOP PLATE.

NOTES : 1. MAXIMUM DIAMETER OF OPENING = 5".
 2. ANNULAR SPACE = MINIMUM 1/8", MAXIMUM 3/4".
 3. L RATINGS APPLY ONLY WHEN HILTI FS-ONE INTUMESCENT FIRESTOP SEALANT IS USED.

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 FIRESTOP SYSTEMS

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Sheet 1 of 1

Scale 1/8" = 1"

Date Jan. 12, 2001

Drawing No.

FC
 1009k

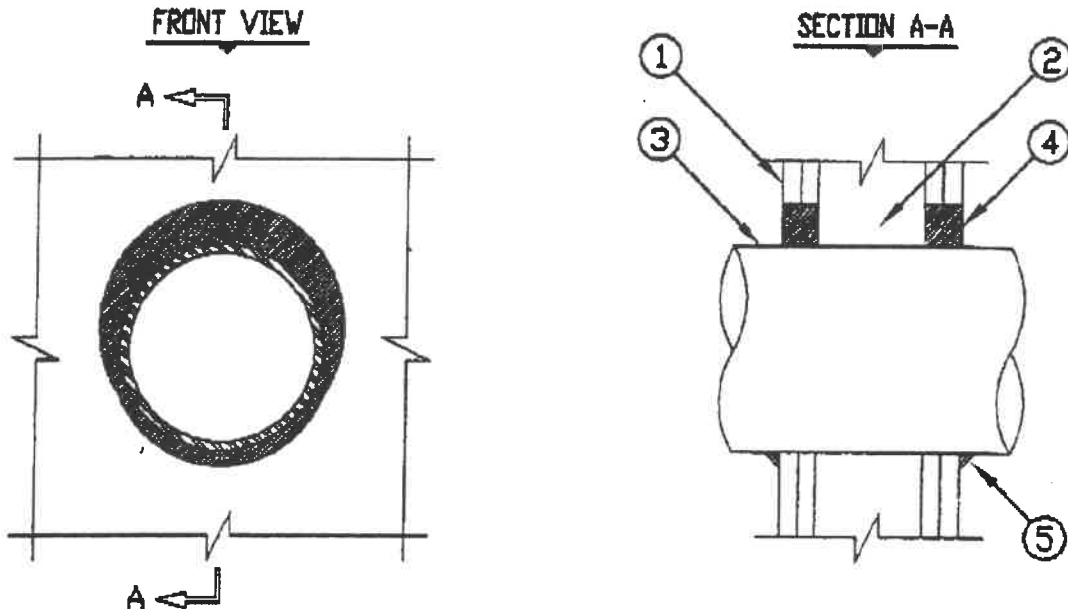
UL/cUL SYSTEM NO. V-L-1054
METAL PIPE THROUGH 1-HR. OR 2-HR. GYPSUM WALL ASSEMBLY

F-RATING = 1-HR. OR 2-HR.

T-RATING = 0-HR.

L-RATING AT AMBIENT = LESS THAN 1 CFM/SQ. FT.

L-RATING AT 400°F = 4 CFM/SQ. FT.



006150m452011A

1. GYPSUM WALL ASSEMBLY (UL/ULC CLASSIFIED U300 OR U400 SERIES) (1-HR. OR 2-HR. FIRE-RATING) (2-HR. SHOWN).
2. (NOT SHOWN). WOOD STUDS TO CONSIST OF NOMINAL 2" x 4" LUMBER. STEEL STUDS TO BE MINIMUM 2-1/2" WIDE.
3. PENETRATING ITEM TO BE ONE OF THE FOLLOWING :
 - A. MAXIMUM 30" DIAMETER STEEL PIPE (SCHEDULE 10 OR HEAVIER).
 - B. MAXIMUM 30" DIAMETER CAST IRON PIPE.
 - C. MAXIMUM 6" NOMINAL DIAMETER COPPER PIPE.
 - D. MAXIMUM 6" NOMINAL DIAMETER STEEL CONDUIT.
 - E. MAXIMUM 4" NOMINAL DIAMETER EMT.
4. HILTI FS-ONE HIGH PERFORMANCE INTUMESCENT FIRESTOP SEALANT :
 - A. MINIMUM 5/8", FOR A 1-HR. FIRE-RATING.
 - B. MINIMUM 1-1/4" DEPTH, FOR A 2-HR. FIRE-RATING.
5. MINIMUM 1/2" BEAD HILTI FS-ONE HIGH PERFORMANCE INTUMESCENT FIRESTOP SEALANT AT POINT OF CONTACT.

NOTES : 1. MAXIMUM DIAMETER OF OPENING :
 A. 32-1/4" FOR STEEL STUD WALLS.
 B. 14-1/2" FOR WOOD STUD WALLS.
 2. ANNULAR SPACE = MINIMUM 0", MAXIMUM 2-1/2".

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 FIRESTOP SYSTEMS

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Sheet 1 of 1

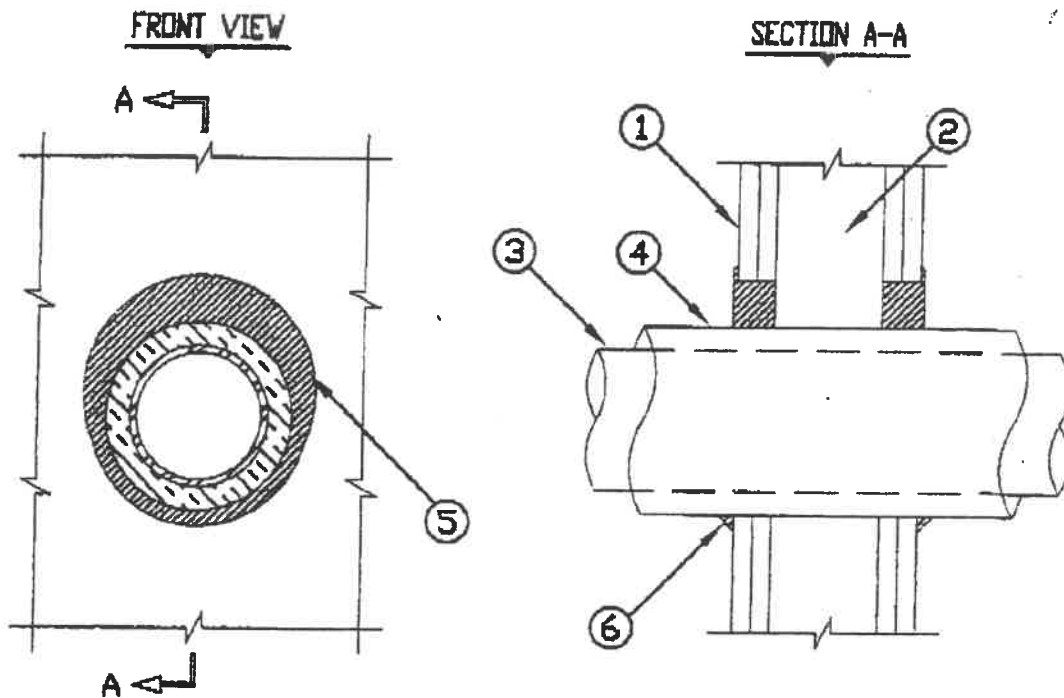
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Date Sept. 19, 2000

Drawing No.

WL
 1054m

UL/CUL SYSTEM NO. W-L-5028
INSULATED METAL PIPE THROUGH 1-HR. OR 2-HR. GYPSUM WALL ASSEMBLY
 F-RATING = 1-HR. OR 2-HR.
 T-RATING = 1/2-HR OR 3/4-HR.



WL-5028g.092100

1. GYPSUM WALL ASSEMBLY (UL/ULC CLASSIFIED U300 OR U400 SERIES) (1-HR. OR 2-HR. FIRE-RATING) (2-HR. SHOWN).
2. (NOT SHOWN). WOOD STUDS TO CONSIST OF NOMINAL 2" x 4" LUMBER. STEEL STUDS TO BE MINIMUM 2-1/2" WIDE.
3. PENETRATING ITEM TO BE ONE OF THE FOLLOWING :
 - A. MAXIMUM 4" NOMINAL DIAMETER STEEL PIPE (SCHEDULE 40 OR HEAVIER).
 - B. MAXIMUM 2" NOMINAL DIAMETER COPPER PIPE.
 - C. MAXIMUM 4" NOMINAL DIAMETER EMT.
 - D. MAXIMUM 4" NOMINAL DIAMETER STEEL CONDUIT.
4. MAXIMUM 3/4" THICK AB/PVC FLEXIBLE FOAM PIPE INSULATION.
5. HILTI FS-ONE HIGH PERFORMANCE INTUMESCENT FIRESTOP SEALANT :
 - A. MINIMUM 5/8" DEPTH, FOR A 1-HR. FIRE-RATING.
 - B. MINIMUM 1-1/4" DEPTH, FOR A 2-HR. FIRE-RATING.
6. MINIMUM 1/2" CROWN HILTI FS-ONE FIRESTOP SEALANT AT POINT OF CONTACT.

NOTES : 1. MAXIMUM DIAMETER OF OPENING = 7-1/2".
 2. ANNULAR SPACE = MINIMUM 0", MAXIMUM 1-1/2".

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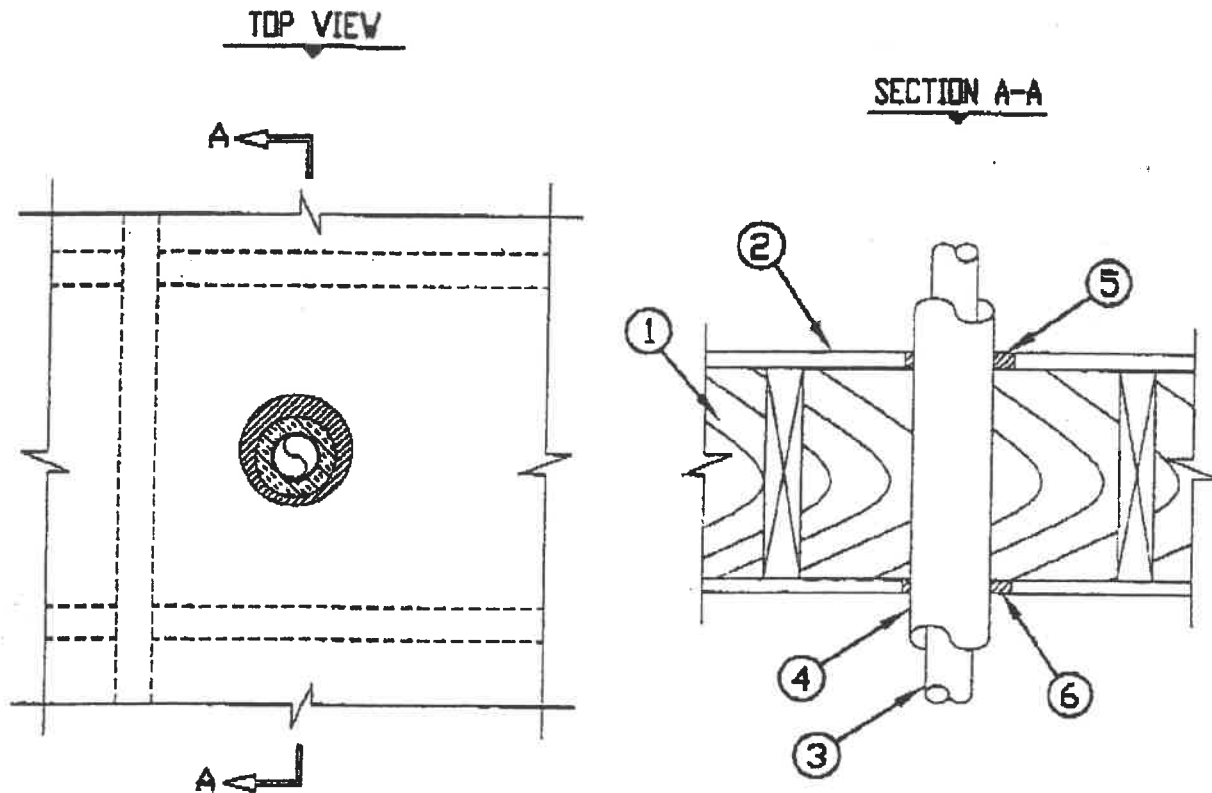
Sheet 1 of 1
 Scale 3/16" = 1"
 Date Sept. 21, 2000

Drawing No.
 WL
 5028g

UL/cUL SYSTEM NO. FC5037
INSULATED METAL PIPE THROUGH 1-HR. WOOD FLOOR ASSEMBLY

F RATING = 1-HR.
 T RATING = 0-HR.

FC5037c.122099



1. WOOD FLOOR/CEILING ASSEMBLY (UL/ULC CLASSIFIED L500 SERIES) (1-HR. FIRE-RATING).
2. LUMBER OR PLYWOOD SUBFLOOR WITH FINISH FLOOR OF LUMBER, PLYWOOD, OR FLOOR TOPPING MIXTURE.
3. PENETRATING ITEM TO BE ONE OF THE FOLLOWING:
 - A. MAXIMUM 2" NOMINAL DIAMETER STEEL PIPE (SCHEDULE 10 OR HEAVIER).
 - B. MAXIMUM 2" NOMINAL DIAMETER COPPER PIPE.
4. MAXIMUM 3/4" THICK AB/PVC FLEXIBLE FOAM INSULATION.
5. MINIMUM 3/4" DEPTH HILTI FS-ONE INTUMESCENT FIRESTOP SEALANT.
6. MINIMUM 5/8" DEPTH HILTI FS-ONE INTUMESCENT FIRESTOP SEALANT.

NOTES : 1. MAXIMUM DIAMETER OF OPENING = 5".
 2. ANNULAR SPACE = MINIMUM 3/8", MAXIMUM 1".
 3. CHASE WALL (NOT SHOWN, OPTIONAL)-THE THROUGH PENETRANT MAY BE ROUTED THROUGH A 1-HR. FIRE-RATED GYPSUM CHASE WALL.

HILTI[®]
 FIRESTOP SYSTEMS

HILTI, Inc.
 Tulsa, Oklahoma USA (918) 252-6000

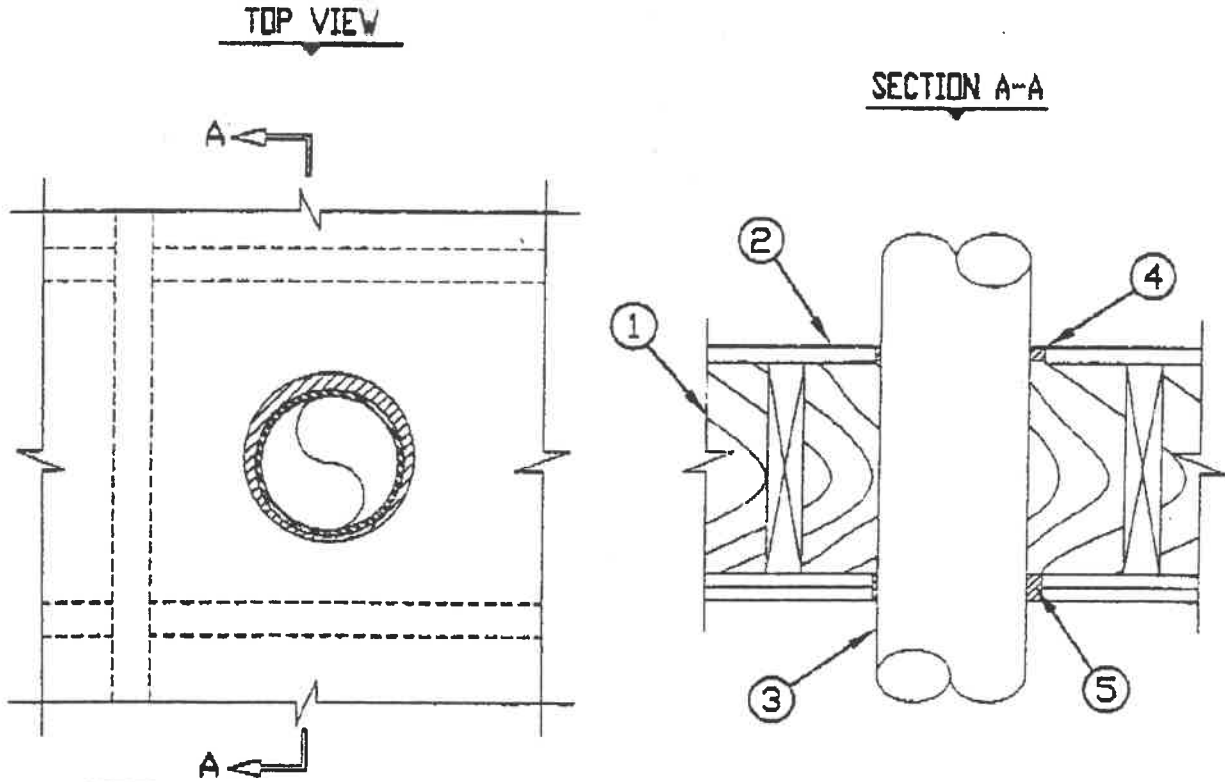
Sheet	1 of 1
Scale	1/8" = 1"
Date	Dec. 20, 1999

Drawing No.
FC
5037c

UL/cUL SYSTEM NO. FC1059
METAL PIPE THROUGH 1-HR. OR 2-HR. WOOD FLOOR ASSEMBLY

F RATING = 1-HR. OR 2-HR.
 T RATING = 0-HR. OR 1/2-HR.

FC1059e-012400



1. WOOD FLOOR/CEILING ASSEMBLY (UL/ULC CLASSIFIED L500 SERIES) (1-HR. OR 2-HR. FIRE-RATING) (2-HR. SHOWN).
2. LUMBER OR PLYWOOD SUBFLOOR WITH FINISH FLOOR OF LUMBER, PLYWOOD, OR FLOOR TOPPING MIXTURE.
3. PENETRATING ITEM TO BE ONE OF THE FOLLOWING:
 - A. MAXIMUM 6' NOMINAL DIAMETER STEEL PIPE (SCHEDULE 40 OR HEAVIER).
 - B. MAXIMUM 6' NOMINAL DIAMETER STEEL CONDUIT.
 - C. MAXIMUM 4' NOMINAL DIAMETER EMT.
4. MINIMUM 3/4' DEPTH HILTI FS-ONE INTUMESCENT FIRESTOP SEALANT.
5. HILTI FS-ONE INTUMESCENT FIRESTOP SEALANT:
 - A. MINIMUM 5/8' DEPTH, FOR A 1-HR. FIRE-RATING.
 - B. MINIMUM 1-1/4' DEPTH, FOR A 2-HR. FIRE-RATING.

NOTES : 1. MAXIMUM DIAMETER OF OPENING = 7-5/8'.
 2. ANNULAR SPACE = MINIMUM 1/4', MAXIMUM 3/4'.
 3. CHASE WALL (NOT SHOWN, OPTIONAL) - THE THROUGH PENETRANT MAY BE ROUTED THROUGH A 1-HR. OR 2-HR. FIRE-RATED GYPSUM CHASE WALL.



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Sheet	1 of 1
Scale	1/8" = 1'
Date	APRIL 24, 2000

Drawing No.
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