Quality People. Building Solutions.

Comfort Systems USA (Arkansas), Inc.
P.O. Box 16620
Little Rock, AR 72231
Phone 501-834-3320
Fax 501-834-5416

Date: 2/21/2024
Return Request: 3/28/2024
Project: Little Rock West High School
Supplier: Comfort Systems USA (Arkansas), Inc.
Manufacturer: Hilti
Submittal: Plumbing (Firestopping)
Submittal Number: 22 01 00-12
Drawing # and Installation: Plumbing Drawings

ARCHITECT
Lewis Architects Engineers
11225 Huron Lane, Suite 104
Little Rock, AR 72211
501-223-9302

ENGINEER
Lewis Architects Engineers
11225 Huron Lane, Suite 104
Little Rock, AR 72211
501-223-9302

GENERAL CONTRACTOR
Baldwin & Shell
1000 W. Capitol Ave.
Little Rock, AR 72201
501-374-8677

MECHANICAL SUBCONTRACTOR
Comfort Systems USA (Arkansas), Inc.
9924 Landers Rd.
N. Little Rock, AR 72117
501-834-3320

Notes:

chowell@comfortar.com

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

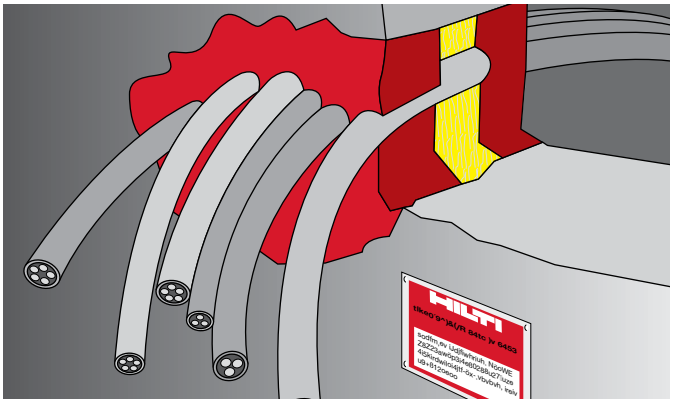
- Steel, copper and EMT pipes
- Insulated steel and copper pipes
- Cable bundles
- Closed or vented plastic pipes
- HVAC penetrations

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*	FS-ONE
Chemical basis	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

CLASSIFIED C UL US — FILL, VOID OR CAVITY MATERIAL FOR USE IN THROUGH-PENETRATION FIRESTOP SYSTEMS SEE UL FIRE RESISTANCE DIRECTORY 66Y7

FM APPROVED

FGG -BM- CZ SYSTEM COMPATIBLE

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

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

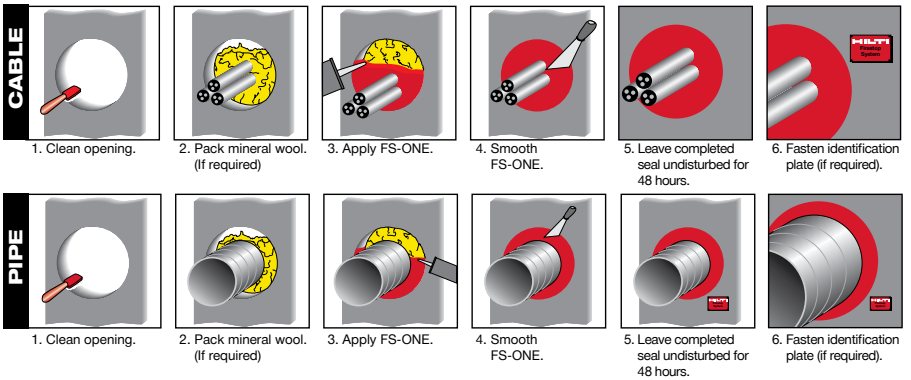
2. Install the prescribed backfilling material type and depth to obtain the desired rating (if required). Leave sufficient depth for applying FS-ONE.
3. Application of firestop sealant: Apply FS-ONE to the required depth in order to obtain the desired fire rating. Make sure FS-ONE contacts all surfaces to provide maximum adhesion. For application of FS-ONE use a standard caulking gun, 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).
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.

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 packag



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Firestop Collar (CP 643N)

Product description
- A ready-to-use firestop collar, made of a galvanized steel housing and intumescent inserts for firestopping combustible pipes

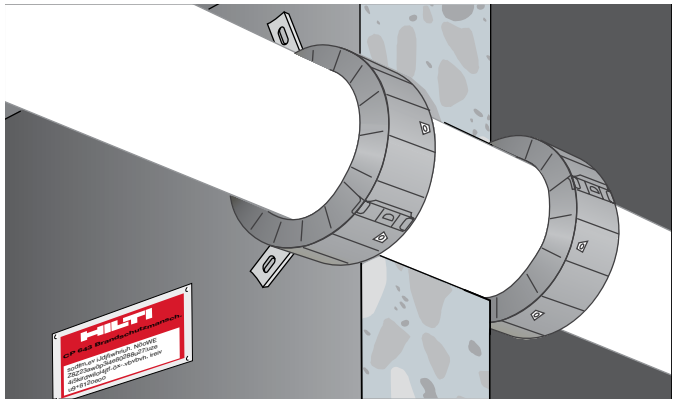
Product features
- Ready-to-use collar
- No construction required
- Fast installation time
- Adjustable mounting tabs
- Low profile for tight installations

Areas of application
- Firestopping combustible pipes up to 6" diameter in penetrations through fire walls and floors
- Suitable for the following pipe materials:
- PVC, CPVC, ABS, PVDF, PP and FRPP

For use with
- Concrete, masonry, wood floor and gypsum wall assemblies
- Wall and floor assemblies rated up to 4 hours

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

Example
- Waste water pipes
- Fresh water pipes



Technical Data	CP 643N		
Description	Pipe outside dia (in.)	Collar outside dia. (in.)	Collar Height (in.)	No. of hooks and fasteners
CP 643-50/1.5"N	1.4–2.0	2.8	0.9	2
CP 643-63/2"N	2.0–2.5	3.4	1.3	2
CP 643-90/3"N	2.6–3.6	4.9	1.7	3
CP 643-110/4"N	3.6–4.5	6.0	1.9	3
CP 643-160/6"N	6.6	9.8	1.9	4
Temperature resistance		-40°F to 140°F (–40°C to 60°C)		
Intumescent activation		Approx. 392°F (200°C)		
Expansion ratio (unrestricted)		Up to 1:10		

Tested in accordance with
• UL 1479 • ASTM E 814 • ASTM G21

FIRESTOP DEVICE
FOR USE IN THROUGH-PENETRATION
FIRESTOP SYSTEMS
SEE UL FIRE RESISTANCE DIRECTORY
5N76

FM APPROVED

FBC SYSTEM COMPATIBLE
Visit fbcsystemcompatible.com.
FBC™ is a trademark of the Lubrizol Corporation.

Installation instructions for CP 643N

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
1. Clean the plastic pipes. Expansion of the intumescent material during a fire acts to close the plastic pipe. Very dirty pipes (ie: with remains of mortar) may lead to a delay in this closing action. Soiled plastic pipes should, therefore, be cleaned in the area where the CP 643N Firestop Collar is to be installed.

Application of firestop system
2. Seal the opening if required. Gaps may be closed with FS-ONE. The approved methods vary and are given in the specific UL system.
3. Close the CP 643N Firestop Collar. Place the CP 643N Firestop Collar around the plastic pipe and lock the closure by applying firm pressure until it latches.
4. 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.
5. Fastening the CP 643N Firestop Collar. Only when fastened properly can CP 643N offer protection against fire.

a. Mark the fastening points.

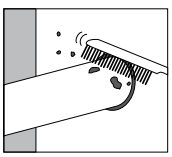
b. Drill holes with a Hilti rotary hammer drill (i.e. TE 4-A18) or, depending on base material, fasten using Hilti powder-actuated tool.

c. To secure the CP 643N Firestop Collar, use Hilti anchors/fasteners.

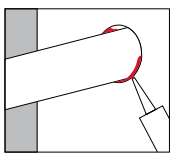
d. For maintenance reasons, a penetration can be permanently marked with an identification plate and fastened in a visible position next to the seal.

Not for use
- With metal pipes
- In highly corrosive surroundings
- With unapproved anchors/fasteners

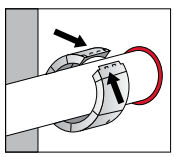
Storage
- Store only in the original packaging in a location protected from moisture



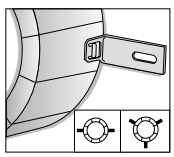
1. Clean plastic pipe.



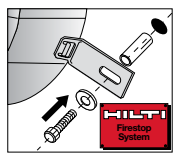
2. Close remaining gap to provide smoke and gas resistant seal.



3. Close collar.



4. Attach fastening hooks.



5. Fasten collar and identification plate (if required).

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Firestop Collar (CP 644)

Product description

- A ready-to-use firestop collar, made of galvanized steel housing and intumescent inserts for firestopping large combustible pipes

Product features

- Ready-to-use collar
- No construction required
- Fast installation time
- Adjustable/moveable fastening tabs

Areas of application

- Sealing of penetrations for combustible pipes from 8" to 10" in diameter
- Vented or closed pipe
- PVC or CPVC pipe

For use with

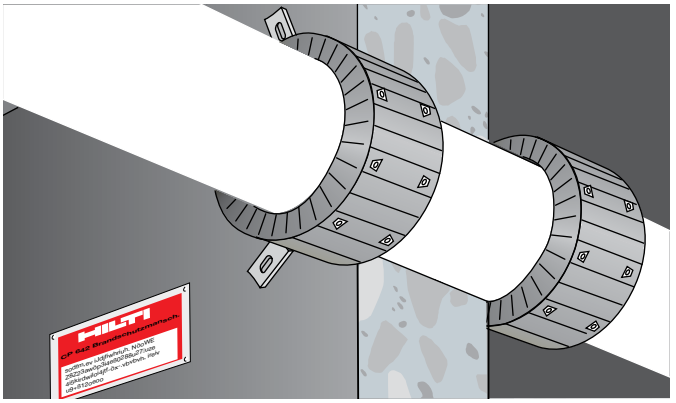
- Concrete, masonry, and gypsum walls
- Wall and floor assemblies rated up to 2 hours

Types of installation

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

Examples

- Waste water pipes
- Fresh water pipes



Technical Data		CP 644		
Description	Pipe outside dia (in.)	Collar outside dia. (in.)	Collar Height (in.)	No. of hooks and fasteners
CP 644-200/8"	8.8	10.0	6.9	10
CP 644-250/10"	10.8	12.4	9.1	12
Temperature resistance		-40°F to 140°F (–40°C to 60°C)		
Intumescent Activation		Approx. 392°F (200°C)		
Expansion ratio (unrestricted)		Up to 1:10		

Tested in accordance with
• UL 1479 • ASTM E 814 • ASTM G21

CLASSIFIED C UL US
FIRESTOP DEVICE
FOR USE IN THROUGH-PENETRATION FIRESTOP SYSTEMS
SEE UL FIRE RESISTANCE DIRECTORY 5N76

Installation instructions for CP 644

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

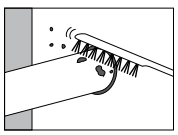
Opening

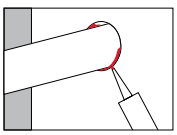
1. Clean the plastic pipes. Expansion of the intumescent material during a fire acts to close the plastic pipe. Very dirty pipes, (ie: with remains of mortar) may lead to a delay in this closing action. Soiled plastic pipes should, therefore, be cleaned in the area where the CP 644 Firestop Collar is to be installed.

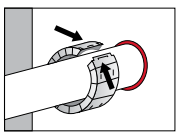
Application of firestop system

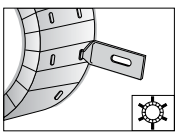
2. Seal the opening. Gaps must be closed with FS-ONE. The approved methods vary and are given in the specific UL system.
3. Close the CP 644 Firestop Collar. Place the CP 644 Firestop Collar around the plastic pipe and lock the closure by applying firm pressure until it latches.
4. Attach fastening hooks. 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.

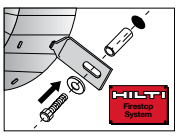
   The hooks must be positioned as symmetrically as possible. The required number of fastening hooks is indicated on the packaging.
5. Fastening the CP 644 Firestop Collar. Only when fastened properly can CP 644 offer protection against fire passing through.
   a. Mark the fastening points.
   b. Drill holes with a Hilti rotary hammer drill (i.e. TE 4-A18) or, depending on base material, fasten using Hilti powder-actuated tool.
   c. To secure the CP 644 Firestop Collar, use Hilti anchors/fasteners.
   d. For maintenance reasons, a penetration can be permanently marked with an identification plate and fastened in a visible position next to the seal.


1. Clean plastic pipe


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


3. Close collar


4. Attach fastening hooks



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

Not for use

- With metal pipes
- In highly corrosive surroundings
- With unapproved anchors/fasteners

Storage

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

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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/m³ (T)	10 mg/m³ (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/m³	NE
Expandable graphite	012777-87-6	5 mg/m³ (T)	2 mg/m³ (T)	NE
Ethylene glycol	000107-21-1	NE	C:100 mg/m³ (A)	NE
Polybutene	009003-29-6	NE	NE	NE
Iron oxide	001309-37-1	10 mg/m³	5 mg/m³	NE
Glass filament	065997-17-3	NE	5 mg/m³ (T)	NE
Silicon dioxide	014808-60-7	0.05 mg/m³ (T)	0.1 mg/m³ (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.

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. Never 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 40o and 77o 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.

Hilti Firestop
Saving Lives
through innovation
and education

Hilti North America
5400 South 122nd East Avenue
Tulsa, OK 74146

P.O. Box 21148 I Tulsa, OK 74121-1148
T 1-800-879-8000 I F 918-252-6742
www.hilti.com

June 27, 2008

To Whom It May Concern:

Re: Hilti FS-ONE Intumescent Firestop

The Hilti FS-ONE Intumescent Firestop is manufactured in Kaufering, Germany.

The FS-ONE pail is made of polyethylene and can be completely recycled. There is no post-consumer or post-industrial content in FS-ONE and it cannot be recycled. The VOC content for FS-ONE is 75 grams/liter.

FS-ONE is not regulated as a hazardous waste by the Federal EPA Standards. The regulations for the disposal of non-regulated industrial waste can vary from state to state and even city to city. For this reason, you should consult your local and state regulatory agencies for direction on disposal.

Please feel free to contact me at (918) 252-6704 if you have questions.

Sincerely,

Jerry Metcalf MPH, CHMM
Safety/Environmental Manager
Hilti Inc
(918) 252 6704
jerry.metcalf@hilti.com