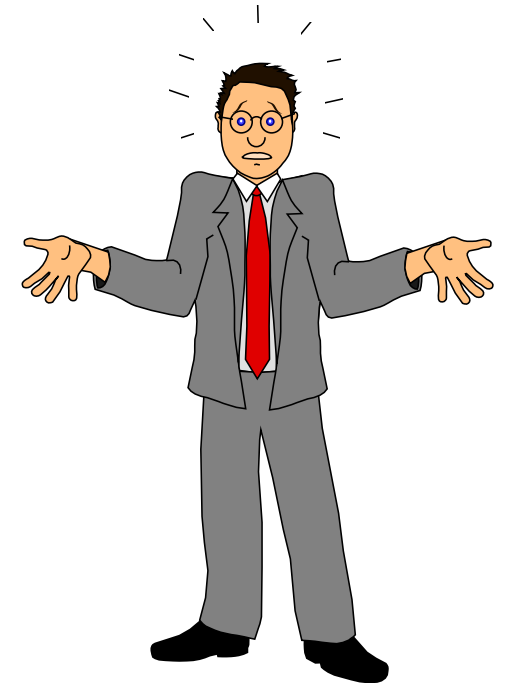


Fireproofing Materials

Bill McHugh, NFCA Technical Director



NFCA FREE Webinar Series
Learn – Network – Grow

Thanks Members...

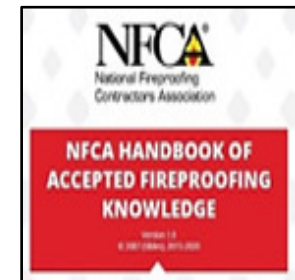
- NFCA Contractors
- NFCA Associates
- NFCA Manufacturers

Thanks 2024/2025 NFCA Board of Directors

President	Mathew Stephenson, Rolling Plains Construction, Dallas, TX
1 st V. P.	Steve Winston, American Coatings Corp., Ashland, VA
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What Does NFCA Provide?

- **Fireproofing Education & Exams**
 - World-Class SFRM & IFRM Fireproofing Instruction
- **NFCA Contractor Accreditation Program for IFRM & SFRM**
 - Educated fireproofing Companies – UL QFCP
- **Week of Learning - Educational Conference**
 - Network with top Fireproofing Contractors, Manufacturers, Associates
 - A forum for suppliers and contractors to learn from one another
- **NFCA 100-400 Standards** for quality and life safety
- **NFCA Handbook of Fireproofing Knowledge**
- **NFCA Website** to find Fireproofing Leaders – www.NFCA-online.org
- **Technical expertise, Standards and Code development....**



What does NFCA Do?

- NFCA @ ICC Codes...
 - 2021/2024 SFRM/IFRM Proposals...
- NFCA @ ASTM Task Groups - Fireproofing
- NFCA @ NFPA Fire Protection Features
- NFCA @ AISC, AISI, CSI/CSC
- NFCA @ National Codes, Canada – NBCC, NFCC
- NFCA @ American Institute of Steel Construction (AISC)
- Industry Articles
- NFCA @ SFPE/ASCE Meetings
- NFCA Committee ACTIONS
- NFCA International Efforts
 - Middle East
 - Mexico
 - India
 - More...





2027 Code Development Process (CDP) IBC, NFPA 2025/2030 CDP – NBCC, NFCC

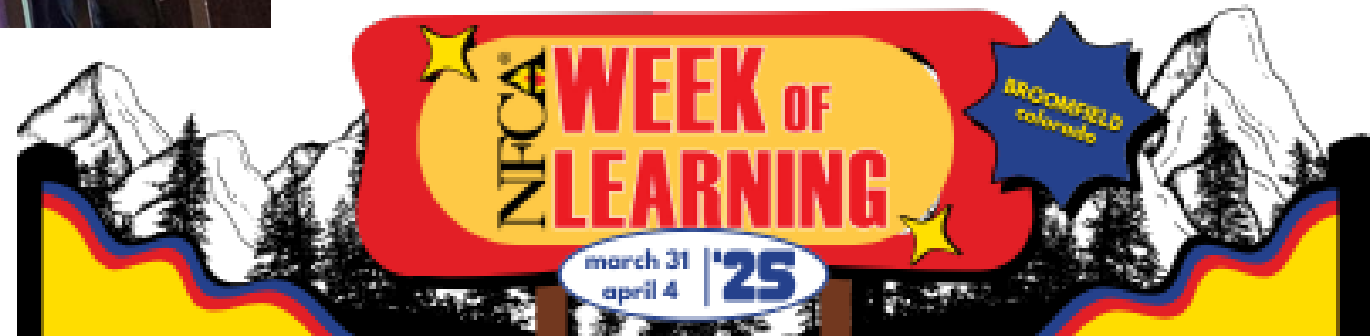
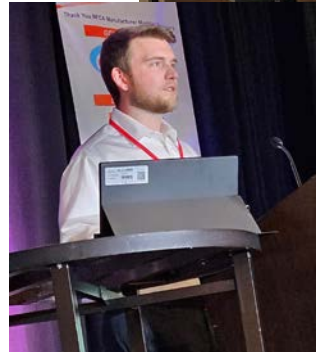
Bill McHugh, Technical Director, NFCA
Rich Walke, Consultant to the NFCA

NFCA FREE Webinar Series
Learn – Network – Grow

NFCA Week of Learning...



- NFCA's Week of Learning
- Weds. Education & Exhibits
- Thursday & Friday Education
- *Monday, Tuesday, Weds., Fireproofing Education & Exams*
- Amazing Speakers
- Committee Action
- ***March 31-April 4 !!***



Contractor Qualifications – NFCA Contractor Accreditation Program (CAP)

- Contractor DRI's
- Inspection Agency Personnel
- Commitment to Fireproofing Installation
- NFCA Accreditation Seal - Registered mark

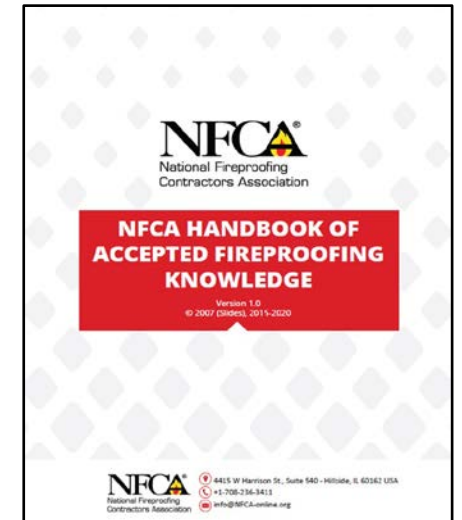
IFRM Accredited Contractor



SFRM Accredited Contractor

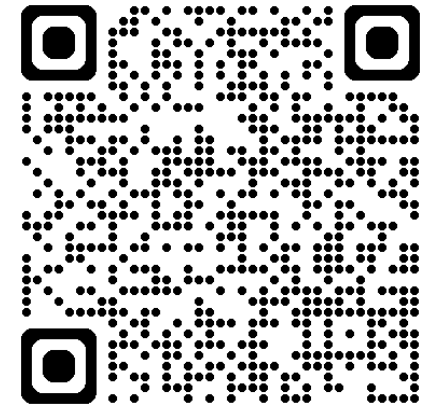


IFRM and SFRM
Accredited Contractor



Contractor Qualifications – UL QFCP

- **UL Qualified SFRM Fireproofing Contractors**
 - **NFCA Education**
 - NFCA HAFK, DRI
 - UL Program Guide, Product iQ
 - **NFCA SFRM Fireproofing Exam**
 - **Management System**
 - **UL Audits –**
 - Office
 - Field



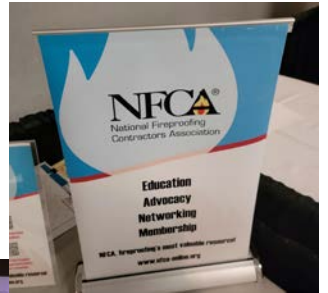
NFCA Educational Events

- NFCA/FCIA PasFiPro Canada Symposium
 - Members
 - Code Officials
- NFCA/FCIA PasFiPro Dubai, Doha
- NFCA @ Mexico LATAM/PCI



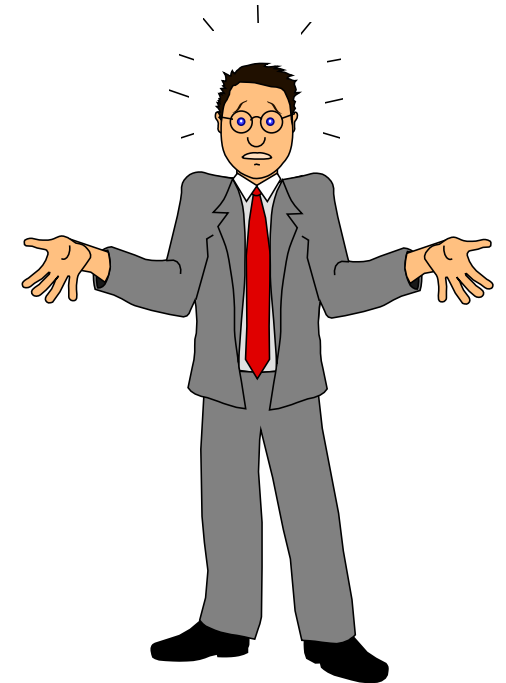
NFCA Speaks, Builds Relationships

- Webinars
- FSBI - Fire Safe Build India
- CSI – Construction Specifications Institute
- CSC – Construction Specifications Canada
- NFPA Expo
- ICC Expo
- Dubai, UAE & Doha, Qatar
& Riyadh, Saudi Arabia,
Australia, New Zealand, more



Fireproofing Materials

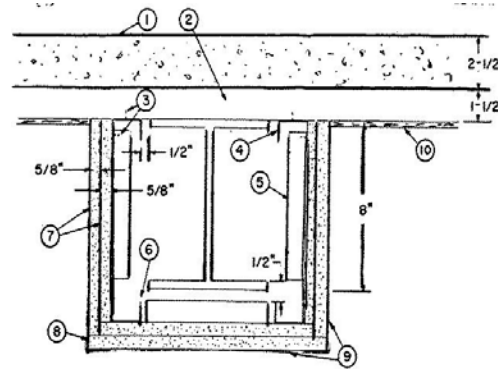
Bill McHugh, NFCA Technical Director



NFCA FREE Webinar Series
Learn – Network – Grow

Fireproofing Materials

- Spray Fire-Resistive Materials
- Intumescent Fire-Resistive Materials
- Fire-Resistive Boards
 - Mineral Wool
 - Gypsum
 - Composite
- Fire-Resistive Wraps
 - Endothermic
 - Insulative



Spray Applied Fire-Resistive Material (SFRM)

- Gypsum
- Portland Cement
 - Aggregates
 - Vermiculite
 - XEPS
 - Perlite
 - Foam
 - Mineral Fiber
- Physical Properties...
 - Interior?
 - Exterior?
 - Exposed?
 - Abrasion?
 - Damage?
 - Humidity?

Gypsum Spray Fire-Resistive Materials (SFRM)

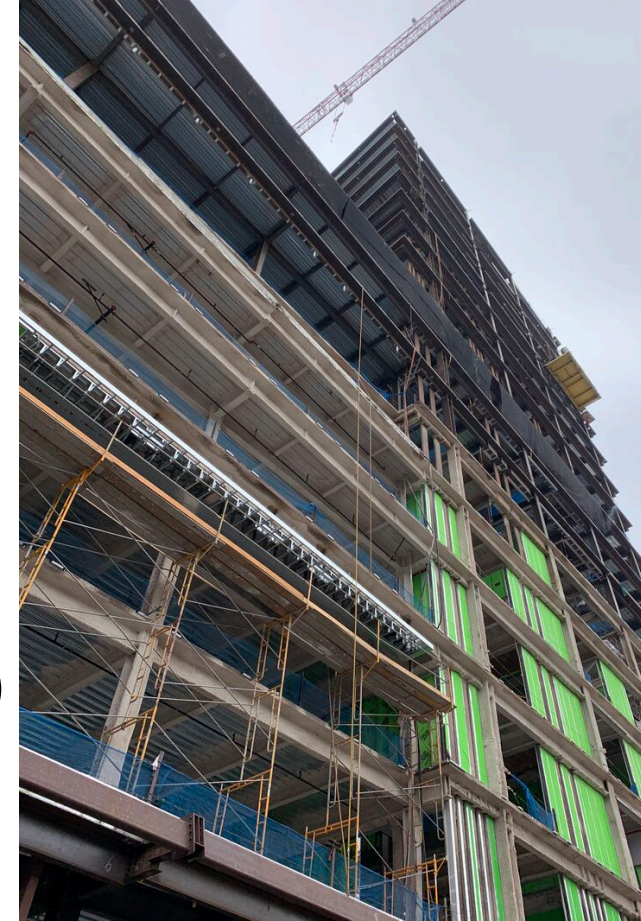
- Interior Use
- Lower Installed Cost
- Some abrasion resistance
- Less Hard
- E605 - Density - 15 pcf, (240kg/m³)
- E736 Cohesion/Adhesion – 1,000PSF (47.9kPa)
- E736 Bond Strength –
 - 200psf (9.6KPa) E736
 - 430psf (75-420') E736
 - 1000psf – (420'++) E736



Portland Cement Based

Spray Fire-Resistive Materials (SFRM)

- Exterior & Interior
 - Abrasion resistance
 - Hard
 - Spray or trowel
 - R - .88
 - E605 Density - 40-44 pcf, (641-705kg/m³)
 - E736 Cohesion/Adhesion – 1,000PSF (47.9kPa)



Spray Fire-Resistive Materials (SFRM)

- Advantages

- Fast Application
- Economical
- Durable
- Protects structural steel, concrete from heat
- Long history...

- Disadvantages

- Pumps
- Messy Application, cleanup required
- Not Pretty
- Dusty?
- Crack?
- Resistance
 - MD/LD Moisture?

Fireproofing SFRM Spray Pumps....



HyFLEX Photos



Graco image



Putzmeister image



Quick Spray image

Fireproofing....

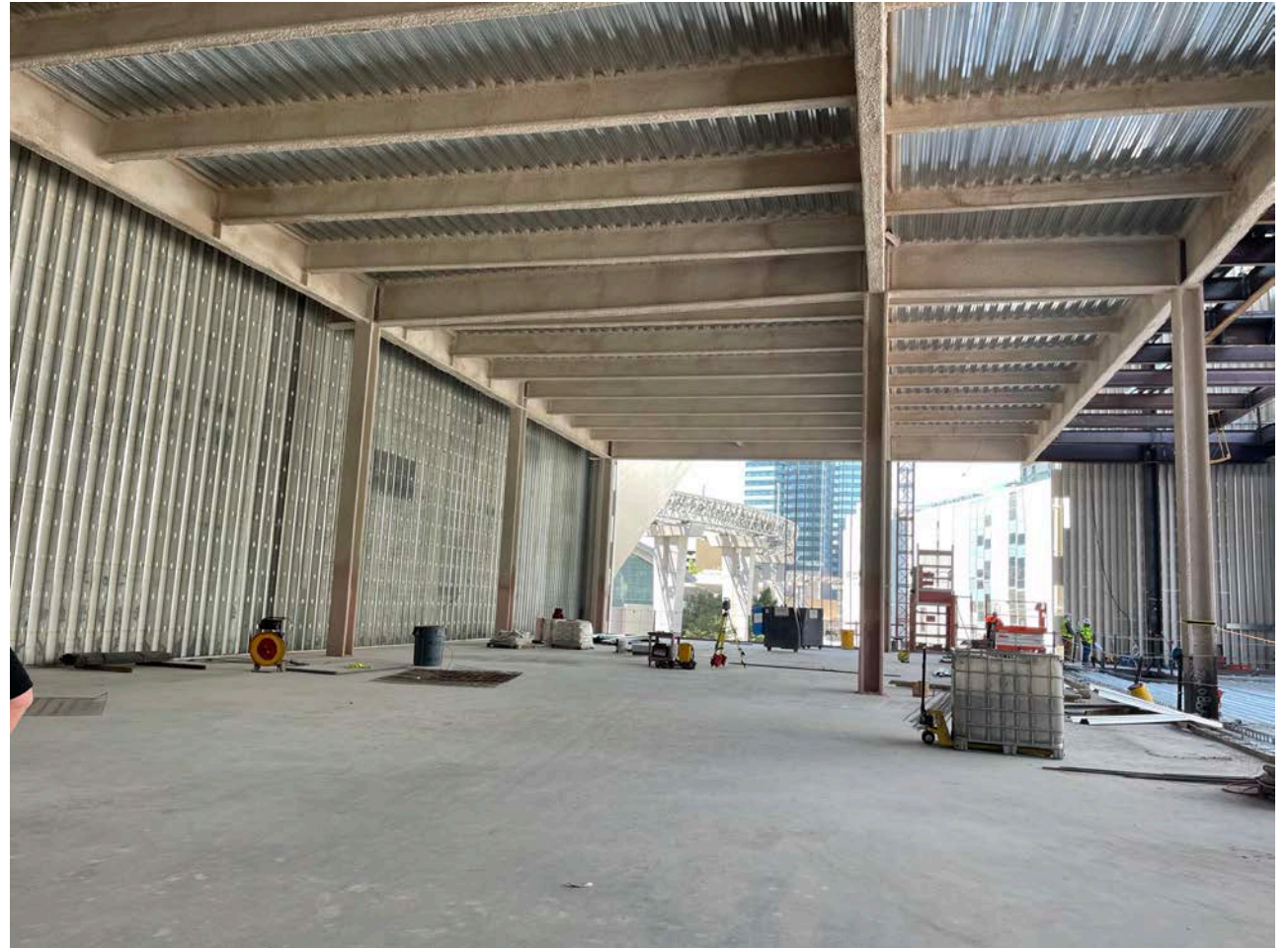


Fireproofing....



East Coast
Fireproofing image

Fireproofing....



Fireproofing....



SFRM Fireproofing IBC

Bond Strength Requirements

Minimum Bond Strength	
HEIGHT OF BUILDING ^(a)	SFRM MINIMUM BOND STRENGTH ^(b)
0 TO 74 Feet	150 psf
Greater than 74 Feet, Up to 420 Feet	430 psf
Greater than 420 Feet	1,000 psf

a) Above the lowest level of fire department vehicle access

b) The minimum bond strength requirement for the SFRM must be installed throughout the building.

SFRM Fireproofing IBC Bond Strength Requirements



Fireproofing....



Installation-Measuring Thickness – ASTM E605



Measuring Bond Strength – ASTM E736



Intumescent Fire-Resistive Material (IFRM)

- Latex
 - General Interior Use
- Solvent
 - Moisture Resistant
- Epoxy
 - Hydrocarbon Fires



Before

After

This photo illustrates how an intumescent coating creates a char when exposed to heat.

Graco image

Intumescent Fire-Resistive Material (IFRM)

- Latex
 - General Interior Use
- Solvent
 - Moisture Resistant
- Epoxy
 - Hydrocarbon Fires



Graco images

Intumescent Fire-Resistive Materials (IFRM)

- Paint like materials
 - High solids, intumescent material
 - Expans 10-100x, insulating char
 - Provide fire-resistive features to structural building elements & assemblies.



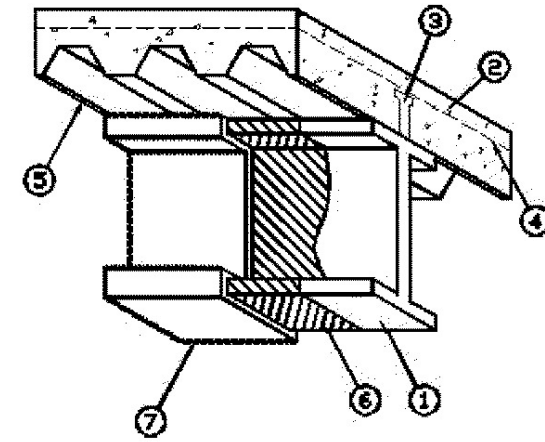
Carboline image

Intumescent Fire-Resistive Materials (IFRM)

- Materials that look like **PAINT**, but are **NOT**
 - Expands, Intumescent Insulating “Char”
 - 60%+ Solids
 - ***LISTING & Manufacturer’s Installation instructions***
 - No Thinning
 - Thickness Matters
 - Shop or Field Applied



Sherwin Williams image



UL Solutions Image



Isolatek image

Intumescent Fire-Resistive Materials (IFRM)

Water/Latex Based

- **Advantages**

- Finish - Pretty
- Resistance Impact
 - **Corrosion**
 - **Chemical**
 - Protects structural steel, concrete from heat
- Low thickness required
- Expands 15-100x
- Low Odor

- **Disadvantages**

- Pumps
- Messy Application
- Room to expand
- Finish
- Water soluble
- Color fade
- Temperature Limitations
- Interior Applications
- No Roof Listings

Solvent Based Intumescent Fire-Resistive Materials (IFRM)

- **Advantages**

- Finish - Pretty
- Resistance (chemistry)
 - Impact
 - **Corrosion**
 - **Chemical**
 - **Water/Moisture**
 - Protects structural steel, concrete from heat
- Offsite Application
- Expands 15-100x

- **Disadvantages**

- Pumps
- Room to expand
- Finish
- Color fade
- Less Temperature Limitations
- No Roof Listings

Epoxy Based Intumescent Fire-Resistive Materials (IFRM)

- **Advantages**

- Finish - Pretty
- Heavy Thickness-100% Solids
- Resistance Impact
 - **Corrosion**
 - **Chemical**
 - **Moisture**
 - Protects structure element - heat
- Offsite Application
- Expands 15-100x
- **Hydrocarbon Fire Resistance**

- **Disadvantages**

- Pumps
- Multi Part Materials
- Room to expand
- Finish
- Color fade
- Less Temperature Limitations
- No Roof Listings

Fireproofing....



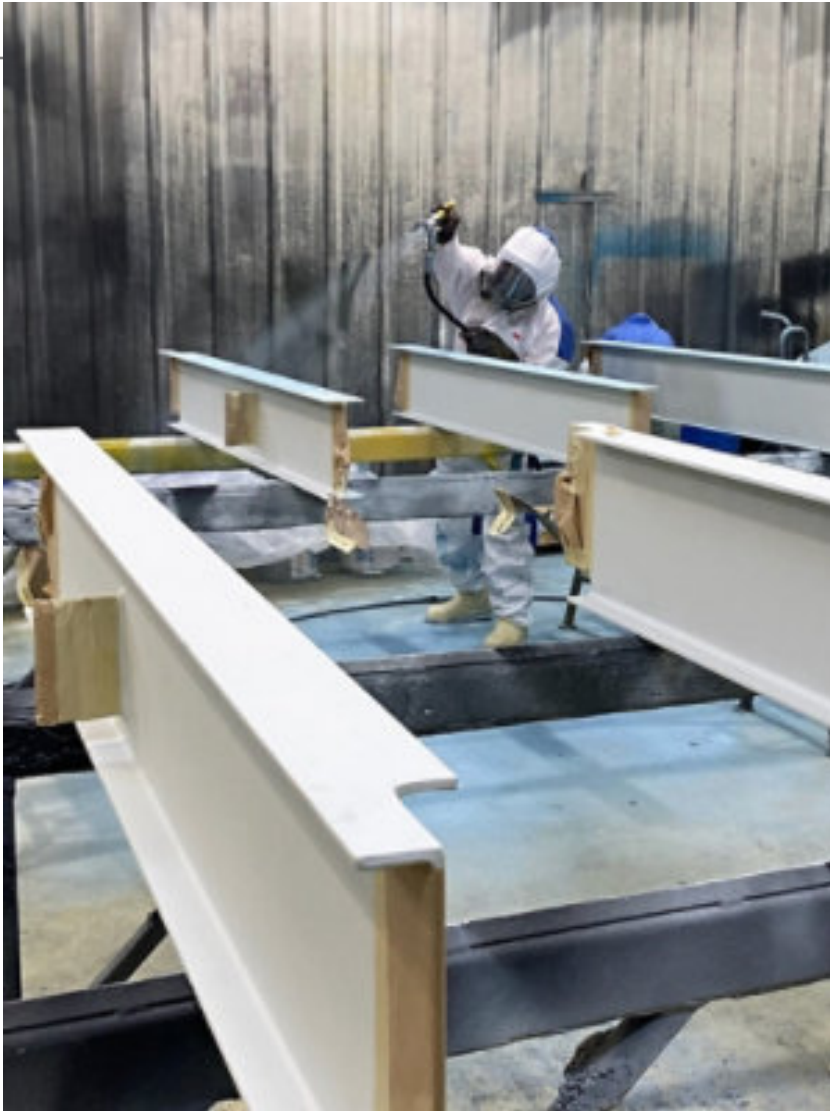
Fireproofing....



Fireproofing....



Fireproofing



Sherwin Williams images



Fireproofing



Hilti (solvent) image

Fireproofing....

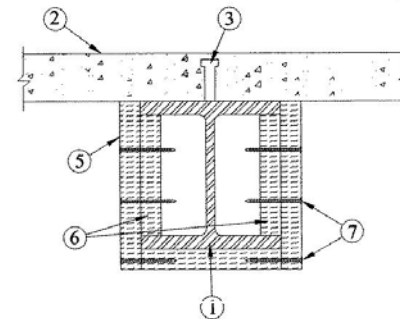


IFRM Thickness Measurements...AWCI 12b



Board Fire Resistive Materials

- Looks like insulation, but NOT just insulation.
- Tested in accordance with ASTM E119, UL 263, fire-resistance rated!!



UL Solutions Image



Albi/Isolatek

Rolling Plains image

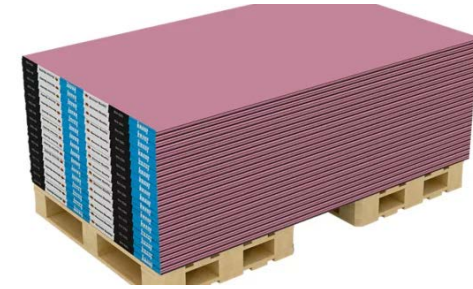
Board Fire Resistive Materials

- Mineral Wool Boards



Albi image

- Gypsum Panels



Knauf image

- Calcium Silicate Board



Promat image

- Composite Boards

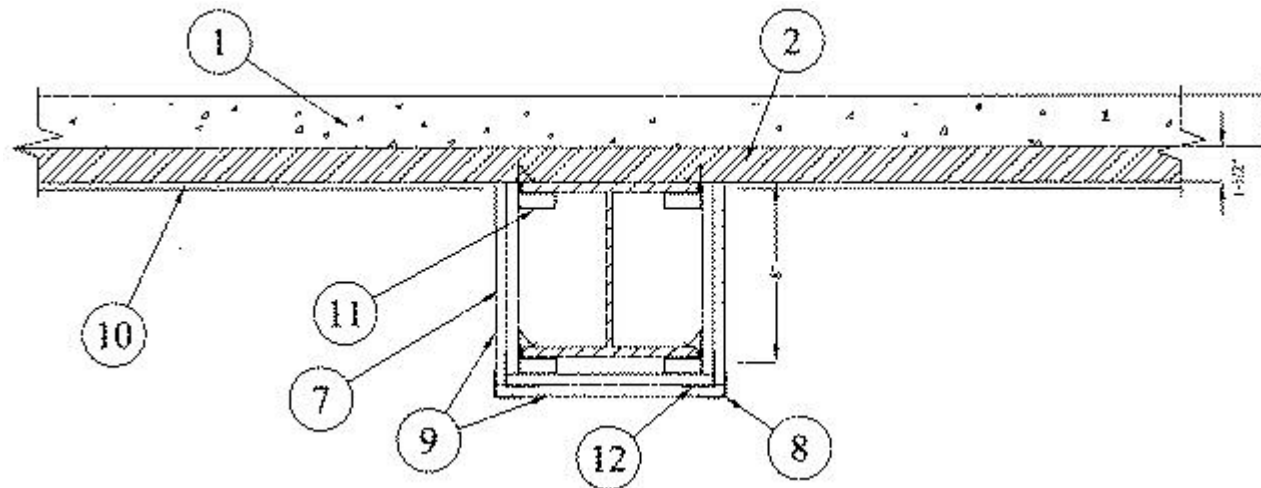
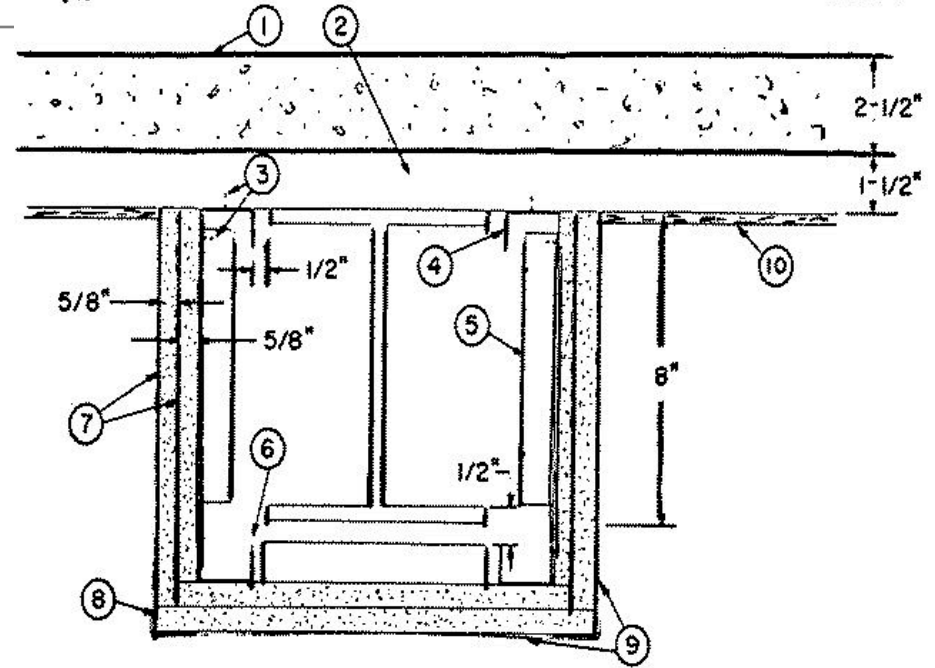
- Cementitious Core/Steel Sheet



Promat image

Gypsum Board Fire-Resistive Materials (BFRM)

- Materials that look like (are) Gypsum Panels....
 - Fire Tested
 - Gypsum Panel, Type X, C
 - Thickness Matters
 - Detailing Matters



UL N502 Image

Gypsum Board Fire-Resistive Materials (GBFRM)

- **Advantages**

- Finish – Can be Pretty
- Resistance
 - Impact
 - Protects structural steel, concrete from heat
- Boards act as Cover
- Won't fall off Roof Decks
- Low Odor
- Damage Resistant

- **Disadvantages**

- Labor Intensive
- Moisture Sensitive
- Damage in rough areas
- Field Knowledge, Listings
- Interior/Protected Use Only
- Damage Resistance?
- Chemical Resistance?

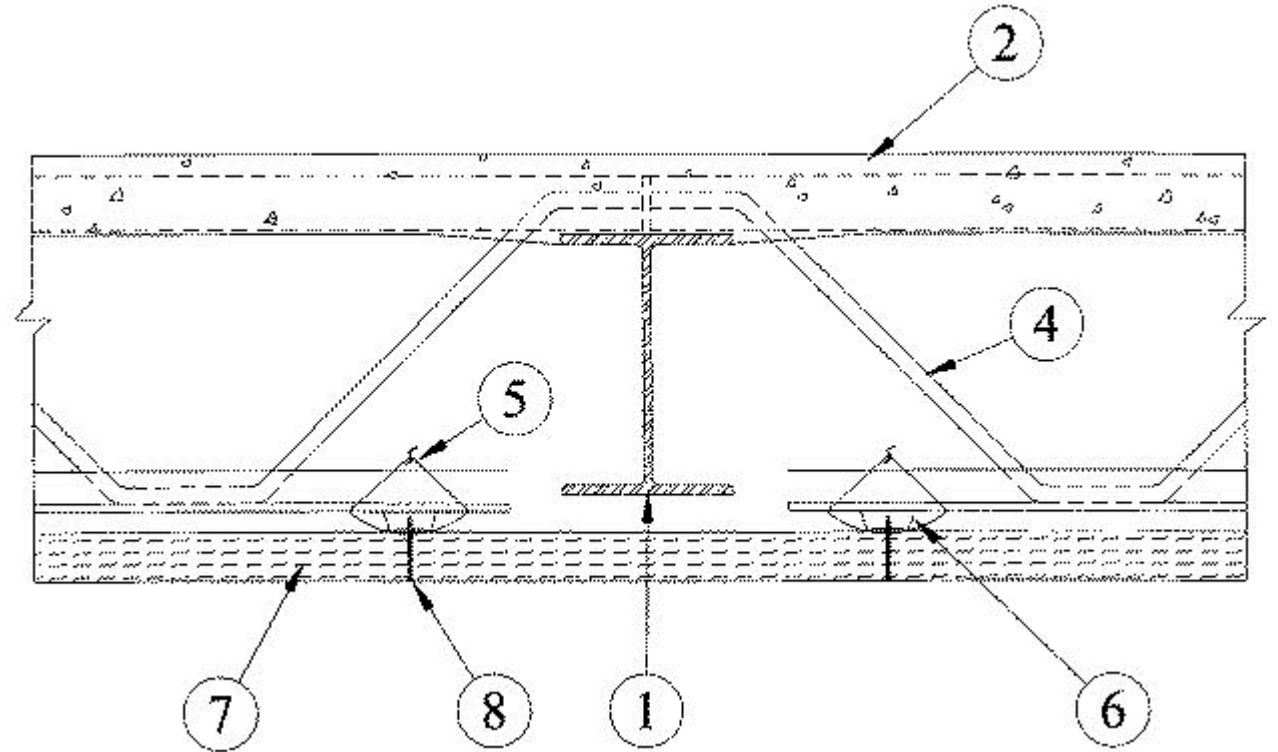
Fireproofing....



Promat Image

Mineral Wool Board Fire-Resistive Materials (MWBFRM)

- Materials that look like Insulation
 - Fire Tested
 - Thickness Matters
 - Detailing Matters
 - Fastening Matters



UL G301 Image

Mineral Wool Board Fire-Resistive Materials (MWBFRM)

- **Advantages**

- Resistance
 - Protects structural steel, concrete from heat
- Will not fall off Roof Decks
- Available
- Low Odor
- R-Value, R4-inch

- **Disadvantages**

- Labor Intensive
- Some Moisture Sensitivity
- Fasteners – LOTS
- Damage Resistant?
- Chemical Resistance?
- Exposure?

Fireproofing....



Albi/ISOLATEK Image

Rolling Plains image

Composite Board Fire-Resistive Materials (CBFRM)

- Materials
 - Fire Tested
 - Thickness Matters
 - Detailing Matters
 - Fastening Matters



Promat Image

Calcium Silicate Board Fire-Resistive Materials (CSBFRM)

- Materials look like White Insulation
 - Fire Tested
 - Thickness Matters
 - Detailing Matters
 - Fastening Matters

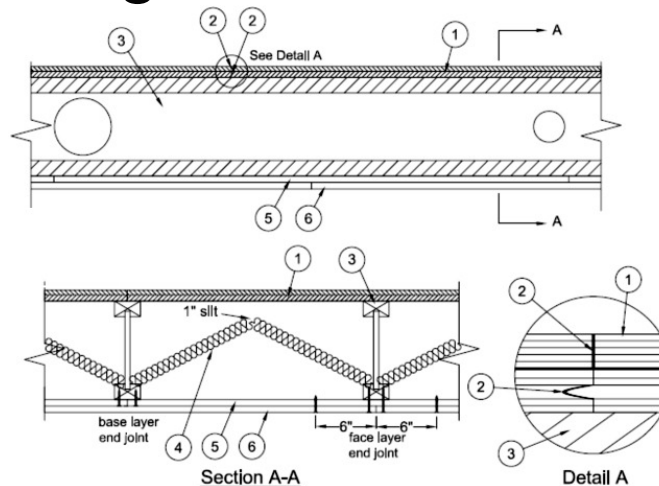


Calcium Silicate Board Fire-Resistive Materials (CSBFRM)

- **Advantages**

- Resistance
 - Protects structural steel, concrete from heat
- Will not fall off Roof Decks, if Listing Allows
- Low Odor

UL L591 Image



- **Disadvantages**

- Labor Intensive
- Some Moisture Sensitivity
- Fasteners – LOTS
- Damage Resistant?
- Chemical Resistance?
- Exposure?



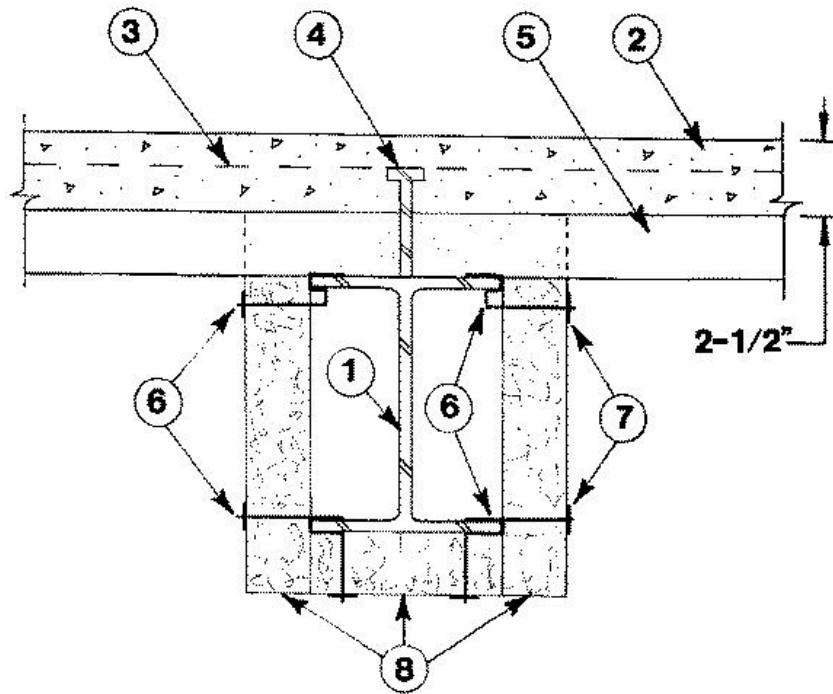
Promat Image

Wrap Fire-Resistive Materials (WFRM)

- Insulative/Insulation
- Endothermic Wrap
 - Fire Tested
 - Thickness Matters
 - Detailing Matters
 - Fastening Matters

Insulative Wrap Fire-Resistive Materials (WFRM)

- Mineral Wool Batts
- Ceramic Fiber Batts



UL Solutions Image
N309 Isolatek CB

Insulative Wrap Fire-Resistive Materials (WFRM)

- **Advantages**

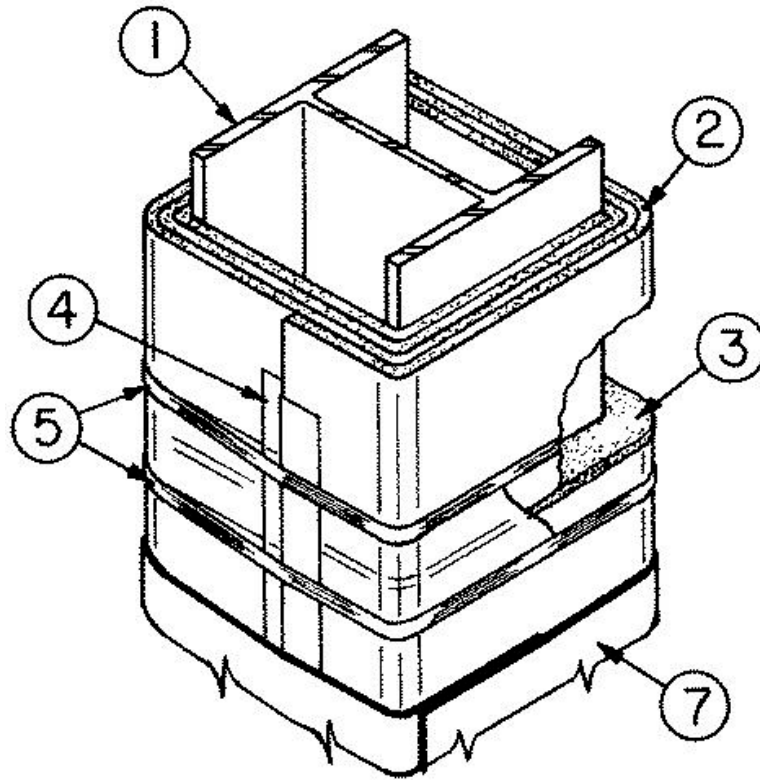
- Resistance
 - Protects structural steel, concrete from heat
- Will not fall off Roof Decks, if Listing Allows
- Low Odor
- Hi Service Temperature

- **Disadvantages**

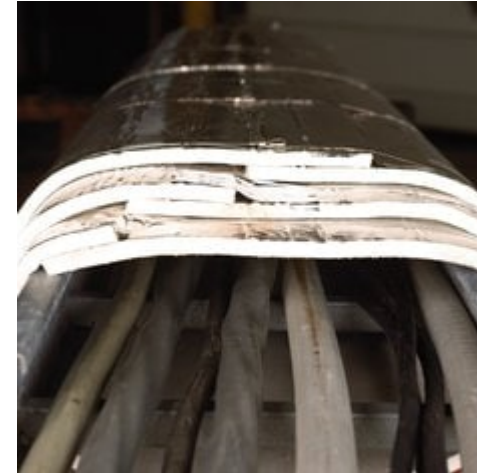
- Labor Intensive
- Some Moisture Sensitivity
- Fasteners – LOTS
- Damage Resistant?
- Chemical Resistance?
- Exposure?
- **Not many listings**

UL L591 Image

Insulative Wrap Fire-Resistive Materials (WFRM)



UL Solutions Image
3M FPP E5a Wrap



3M Fire Protection
Products Image



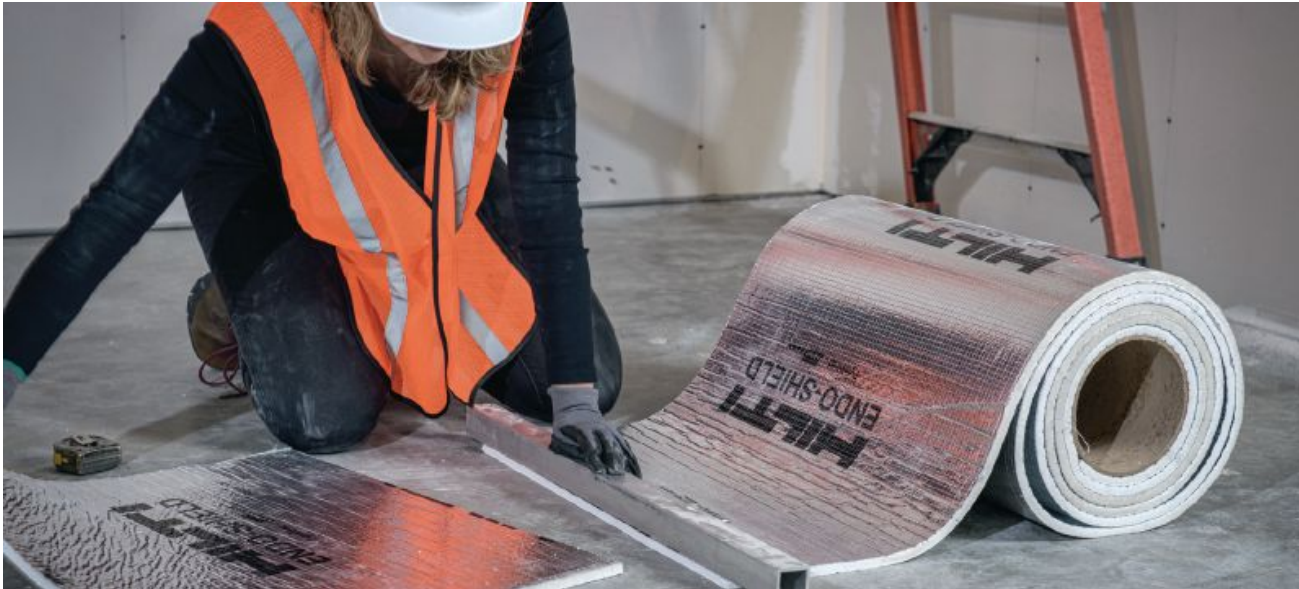
Hilti Image
Endothermic Wrap for
Electric, Fuel Oil
Lines. FP Listings??

Endothermic Wrap Fire-Resistive Materials (EWFRM)

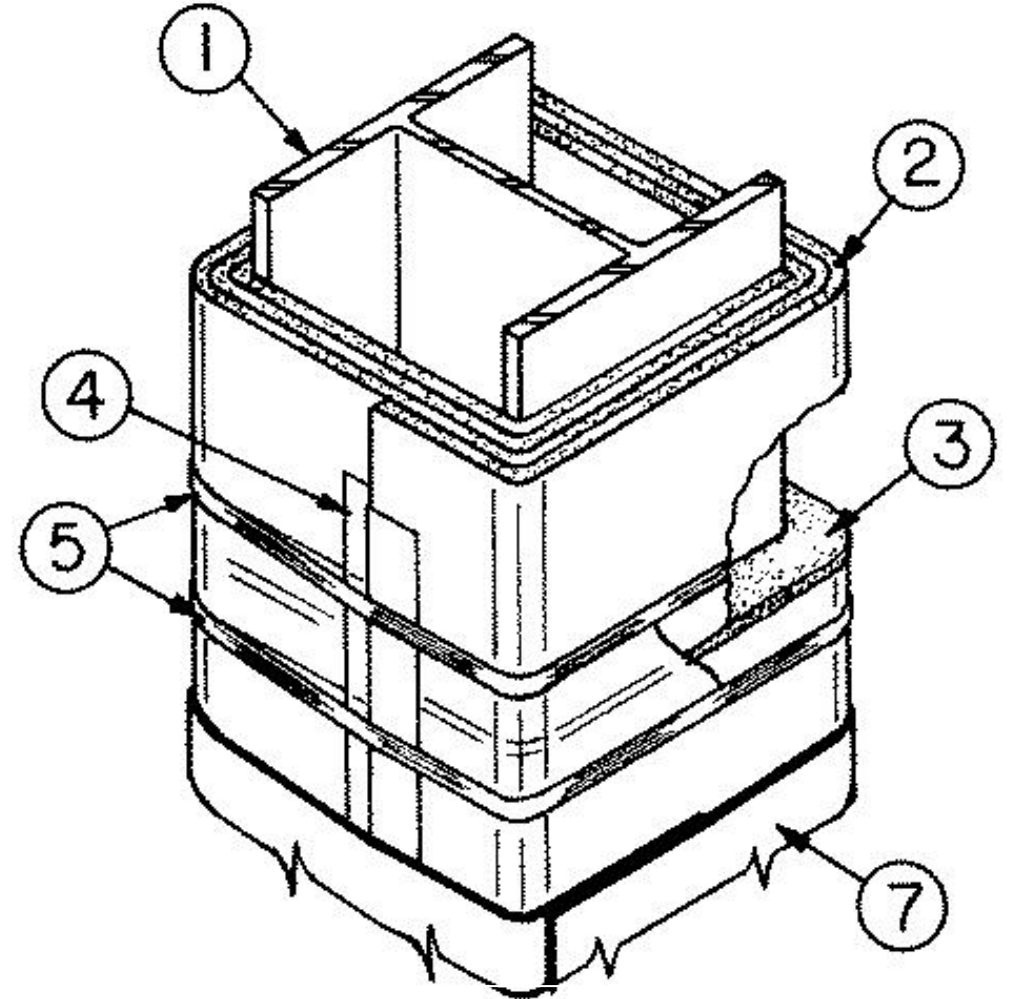
- White material, foil encased
 - Endothermic, uses moisture for fire-resistance
 - LISTING & Manufacturer's Installation instructions
 - Wrapped onto the building element
 - Some listings



Endothermic Wrap Fire-Resistive Materials (EWFRM)



Hilti Image



3M UL X204 image

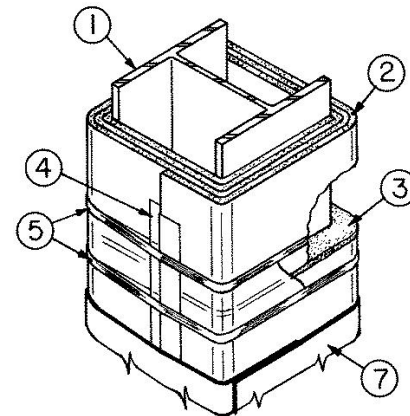
Endothermic Wrap Fire-Resistive Materials (EWFRM)

- **Advantages**

- Resistance
 - Protects structural steel, concrete from heat
- Will not fall off Roof Decks, if Listing Allows
- Low Odor

- **Disadvantages**

- Labor Intensive
- Some Moisture Sensitivity
- Banding, fastening
- Damage Resistant?
- Chemical Resistance?
- Exposure?
- **Not many listings...**



Insulative Wrap Fire-Resistive Materials (IWFRM)

- **Advantages**

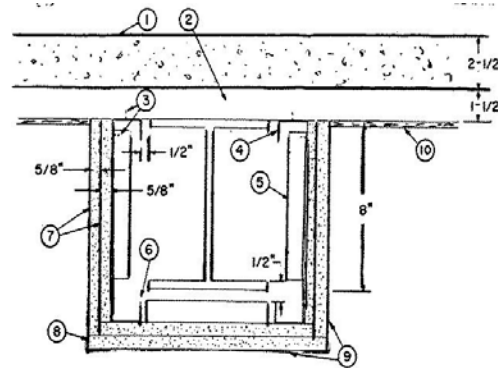
- Resistance
 - Protects structural steel, concrete from heat
- Will not fall off Roof Decks, if Listing Allows
- Low Odor

- **Disadvantages**

- Labor Intensive
- Some Moisture Sensitivity
- Banding, fastening
- Damage Resistant?
- Chemical Resistance?
- Exposure?
- **Not many listings...**

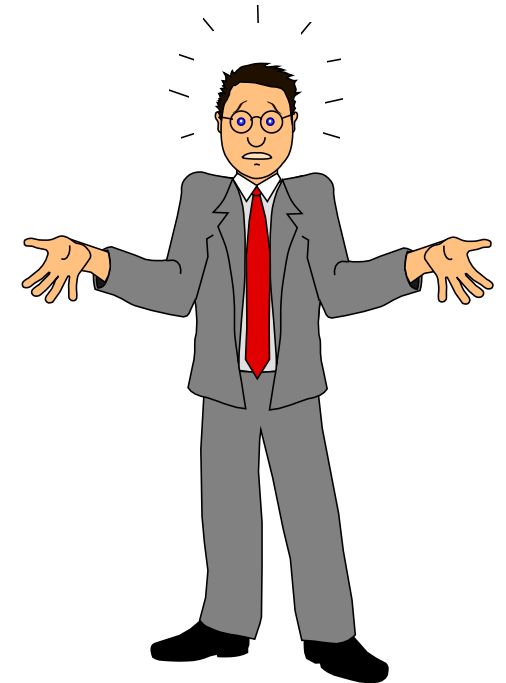
Fireproofing Materials

- Spray Fire-Resistive Materials
- Intumescent Fire-Resistive Materials
- Fire-Resistive Boards
 - Mineral Wool
 - Gypsum
 - Composite
- Fire-Resistive Wraps
 - Endothermic
 - Insulative



Fireproofing Materials

Bill McHugh, NFCA Technical Director



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