

## I. FIREX EC 43 (FM), HIGH SOLIDS THIN FILM INTUMESCENT WEATHER, WATER IMMERSION RESISTANT FIRESTOP CABLE COATING



**FIREX EC 43 (FM)** is a Fire Suppression Coating especially designed for protecting electric power cables, communication cables, junction boxes – against ignition, propagation of fire, smoke emission... High solids intumescent firestop coating with ultra high density, heat insulation. Expands upto 65 times when exposed to heat/ fire & protects.

**FIREX EC 43 (FM)** is designed to prevent combustion of cables, as well as an integral part of “a cable penetration firestop system”, protection for PVC, bakelite, wood, etc. from propagation of fire, and also to provide a thermal barrier for the protection of cables against heat damage.

### APPROVALS:

- FM 3971 Fire Retardant Coating for “Grouped Electrical Cables”. Approval covers the following tests & approval reflects “On – Line” on the FM website:
  - Vertical fire tests on grouped electrical cables.
  - Scorch tests /self propagation.
  - Leakage current /high potential test at 200% of rated voltage, followed by fire tests.
  - Fire test on electrically heated cables via 150% of rated current.
  - Post fire dielectric tests /fire survivability.
  - All fire tests repeated for confirmation.
  - Accelerated ageing tests followed by repeat fire tests to assess ability to suppress fire post the ageing tests.
  - Ampacity tests /cable de-rating tests.
  - Salt water immersion tests.
  - Manufacturing plant & process audits.
- IEC 332 Covers : Single cable vertical flame propagation / burning tests.
- IEC 331 Covers : Single cable horizontal fire survivability tests.
- IEEE 383 Covers : Single cable vertical flame self propagation test.



### HIGHEST % SOLIDS (68 – 70 %) : BEST IN CLASS INTUMESCENCE

Expands over 65 times by volume for the best in class heat insulation, best in class prevention of coated area ignition, best seal against fire ingress, as well as best in class flame resistance & flame propagation retardance. Technology is superior to ablative cable coatings as the thermal barrier effect is better in high expansion intumescent technology – coated cable survivability is thus superior under conditions of severe fire exposure.

### UNIQUE THIN FILM PROTECTION

Flexible. Will not reduce heat dissipation or cable ampacity unlike older “CEMENTITIOUS” type technologies. Protects cable sheaths against heat ageing with fire suppression at lower DFT’s.



### UNIQUELY TESTED & APPROVED BY LEADING GLOBAL INSTITUTIONS FOR TOTAL RELIABILITY OF PROTECTION.



### VERSATILE

Performs on Rubber, PVC FRP, Paper, Wood... Easy to install “In-Situ” on cables of varying sizes.

### DURABLE

Non ageing performance. Ageing has no influence on the intumescence /protection effect. Excellent rain water resistance. Effectively useable outdoors.

### UNIQUE WEATHERING & WATER IMMERSION RESISTANCE

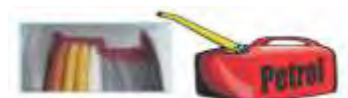
FIREX EC 43 (FM) is a heavy duty, acrylic water based intumescent coating with unique resistance to weatherability & water immersion resistance, encountered in industrial & power utility applications & is tested on these parameters - salt water immersion tests & ageing tests as per FM 3971.

In the event of fire FIREX EC 43 (FM) expands as a result of heat exposure and cures to an insulating char.

- ★ Flame spread on cables and insulation damage are delayed in the case of prolonged exposure to fire or heat.
- ★ Current rating of the coated electrical cables is not reduced.
- ★ Escape routes and power supply can be used for a longer time.
- ★ Significant extension of operative condition of cables.
- ★ Smoke generated from the protected material is significantly minimised.
- ★ Dripping or dropping of burning cable fragments is limited in amount and time depending on kind and intensity of the fire.
- ★ Non – Toxic. Free of asbestos, halogens...

### The Physics of Fire

*Cable are a rich source of FUEL!*  
One FOOT of Loaded Tray = 1500,00 BTUs'



**Equivalent to 4.2 liters of Petrol!**

Fully Loaded 33 cm x 10 cm Tray

## LIST OF KEY TESTS AND APPROVALS

INSTITUTE	TEST	DFT.
Factory mutual, Norwood USA	Report No 3040942 FM 3971 Fire Retardant Cable Coating for Grouped Electrical Cables & reflected as an approved product on the FM website. <b>Significance:</b> Grouped electrical cable test. Product should clear test with DFT >1.6mm. Includes vertical fire tests, scorch tests, leakage current /high potential test post 200% of rated voltage both pre & post fire tests, fire tests on cables electrically heated with 150% of rated current, saltwater test, accelerated ageing test, ampacity test & weather exposure tests.	1.60 mm
Central Building Research Institute, Roorkee, India	Report No FR/0192 IEC 332 Dated 25-27/09/2012 Fire Propagation /Burning test. <b>Significance :</b> Single Vertical cable fire propagation /burning test. Flame should not propagate & cable should not burn after removal of flame source.	0.50 mm
Central Building Research Institute, Roorkee, India	Report No. FR /0029 – IEEE Std. 383 – Part 25 flame test. <b>Significance :</b> Single Vertical cable fire self – extinguishing test. Flame should not propagate & fire travel should be within test limits.	1.50 mm
Central Building Research Institute, Roorkee, India	Report No. FR /0029 IEC 331 Should pass minimum 20 minutes, fire survival test – Single cable, horizontal. <b>Significance :</b> Fire survival test. Product should clear fire test without any damage to cable core /current carrying capacity post 20 minutes fire exposure.	3.00 mm

### TECHNICAL DATA:

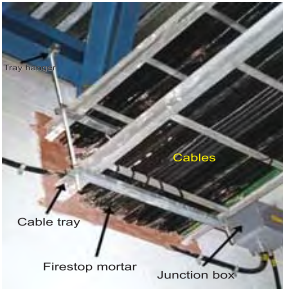
Color	: Off White /Light Grey
Flash Point	: Nil Solids : 68 – 70%
Density	: 1.22 ± 0.05 /Per Kg
Temperature resistance	: >1315°C
Min. Thickness, wet film	: 2.5 mm
Min. Thickness, dry coat	: 1/16 inch (1.60mm) (FM Approval)
Amount of wet coat, approx	: 3.50 - 4kg/m <sup>2</sup>
Cure Time, at 68°F(20°C)	
Coating drying time	: 4-8 hours (After final coat application)
Full cure	: 48-72 hours

### COVERAGE:

3.50 - 4.00 Kgs Per Sq Mtr ± 5% /1.60 – 1.65 mm DFT.



## II. FIRESTOP BARRIERS - MORTAR BASED SYSTEM



### Two Component System

- (A) **Firex FM 71** - Upto 4 Hour Rated Stop Mortar, India's Only CSIR-CBRI Roorkee – Developed, Tested & Certified Firestop Mortar.
- (B) **Firex EC 73 (FM)** High Solids Thin Film Intumescent Firestop Coating for application on cable/trays passing through the firestop mortar based barrier on either side of the barrier /accessible side.



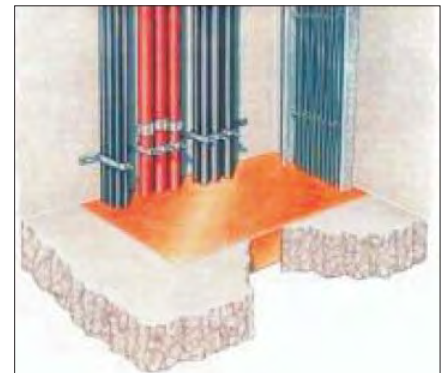
### FIREX FM 71 Upto 4 hour Rated Fire Stop Mortar

Firex FM 71 Mortar is a water based inorganic, expanding type, heat absorbing firestop mortar designed to seal cable & pipe penetrations through walls, floors & ceilings and provide for up to 4 hours firestop protection, in walls and floors around service penetrations – with the technology being uniquely, developed, tested & certified by M/s CSIR-CBRI Roorkee.

M/s CSIR-CBRI Roorkee, has in-house developed this new "state of the art" technology firestop mortar, considering what could be the optimum technology for mortar firestop barriers, based on all their years of experience of testing, both Indian and imported firestop mortars, as well as of course their well established R&D strengths and thus it can safely be said that this CBRI developed firestop mortar is amongst the most advanced firestop mortar's today available in the world and not just in India.

#### Fire Rated Mortar Features:

- 2 & 4 hour rating Firestop Barriers.
- Non Combustible.
- Unique Expanding type. Non Shrinking technology. Warranted seal against smoke, gas leakage etc under fire conditions.
- Superior thermal barrier. Best in class >1000°C. Excellent thermal shock resistance-The properties remain unaltered in extreme temperatures.
- Non-cracking post fire heat exposure.
- Low density–light weighted. Minimum weight on cables.
- Easy to install. Both pourable and pumpable during pot life.
- Suitable for both large & small openings.
- Enables "Retrofitting". Modifiable with retrofit design facility, where cables can be easily inserted or replaced without impairing its fire performance.
- Water resistant (for prolonged water immersion overcoat with CIC 4767 - 2-4 coats).
- Completely resistant to moisture, humidity and chemicals. It remain unaffected by oil /lubrication spillage and is resistant to corrosive gases in the atmosphere.
- Asbestos free.
- All its constituents are odourless, non hazardous and non toxic.
- Does not contain any volatile solvents, is non-combustible and free from fire hazards during application.
- Does not affect current carrying capacity of the cables.
- Resistant to termite and is anti-rodent.



#### Applications

In addition to forming a 4 hour /2hour rated firestop barrier, Firex FM 71 Fire Rated Mortar is particularly suitable for re-instating compartment wall & floors where HVAC ducts, plastic pipes and electrical services have been installed. Small irregular holes and imperfections of fit can easily be repaired using Firex FM 71 Fire Rated Mortar.

#### Technical Specifications

Physical State:	Free flowing powder
Flash Point:	N/A
Thermal Conductivity	0.06 W/M K.
Tested & certified to meet	ASTM E : 814
	UL : 1479
	IS : 12458



Fire Test of FIREX FM 71



Hose Stream Test of FIREX FM 71

### III. FIRESTOP BARRIERS - MINERAL WOOL BASED SYSTEM

#### Three Component System:

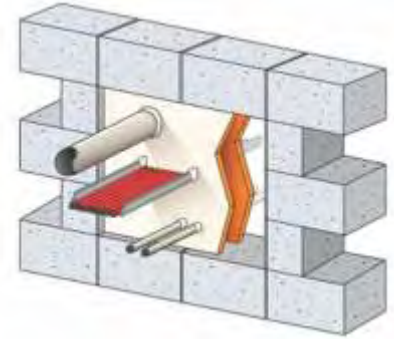
- (A) **Firex FB 250** Mineral Wool Boards pre - coated with firex EC - 43 (FM) firestop coating.
- (B) **Firex EC 43 (FM)** High Solids Thin Film Intumescent Firestop Coating - Minimum 100-300mm cable length on either side of barrier /accessible side.
- (C) **Firex FBS Fire SEAL 73** One component, Elastomeric Intumescent Flexible FirestopSealant for application on joints, penetrations...



#### FIREX CABLE FIRE BARRIER SYSTEM – FB 250

For creating fire stops in cable penetrations, through walls, control panel floors....

- ★ Tested up to 4 hours fire resistance /200 mm (2 hour rating /100 mm)
- ★ Economical
- ★ Halogen free
- ★ Reduced smoke properties
- ★ Chemical resistant Weather resistant Comprises of non-combustible boards top coated with Firex intumescent coating, Firex sealing mortar, anchoring system..
- ★ Easy to retrofit /pass new cables through existing barriers & re-install.



Specifically designed for sealing around cable & service penetrations in walls and floors.

Firex Boards consists of fire & heat resistant mineral wool boards coated on both sides with Firex intumescent coating, affixed with Firex expanding sealant, which transforms into a hard ceramic during a fire to prevent the passage of fire and smoke and the transfer of heat.

#### COMPONENTS

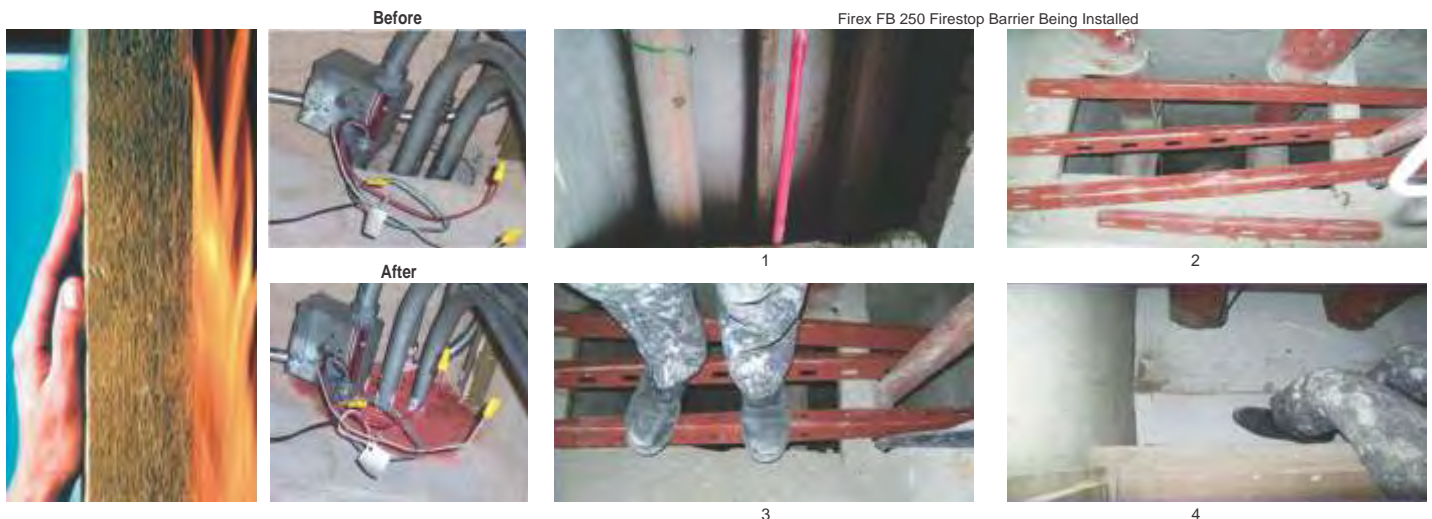
- a). Non Combustible support frame – encasing panel resistant to water & thermal shocks - 24mm. Sturdy will withstand foot traffic & drop loads. Resistant to rodents, termites, alkalies, chemicals...
- b). Infill Insulation: 100mm – 2 Hour rated /200mm – 4 Hour rated. Density >144 Kgs /Cubic meter (Nominal: RT water resistant grade mineral wool topcoated with Firex EC 43 (FM) coating.
- c). Highly Fire retardant Non – Chlorinated Firex FBS Fireseal 73 - One component fire barrier mastic sealant.
- d). Firex EC – 43 (FM) Intumescent Top Coating.
- e). Firex FRP E84 - Fire Retardant One Component Paint.
- f). Fixing channels & slotted angles.
- g). Firex FM71 Fire Stop Mortar (Case to Case).

#### KEY FEATURES

1. Upto 4 Hour rated. Light weighted & easy to install cable Fire Barrier.
2. Fully resistant to moisture, humidity, chemicals, corrosive gases, oil spillage...
3. Will not shrink /crack. Achieves smoke /Gas light sealing.
4. Allows Retrofitting of cables post installation. Can be cut /drilled & resealed using Firex FBS Fireseal 73.
5. Non – Toxic / Non – Hazardous components, Free from asbestos, volatile solvents...
6. Superior load bearing capacity & impact resistance.
7. Will not adversely affect cable current carrying capacity.
8. Resistant to rodents, termites....
9. Compatible with all types of cable Jacketing.
10. Applicable in roof opening, wall opening & floor opening cable penetrations.

#### BOARD DIMENSIONS :

- a). Outer Boards – 2x 595mm x 1195mm x 23mm (Each Board 0.71 Sq mtrs. Size subject to change).
- b). Infill Rockwool Insulation pre – coated with Firestop Intumescent coating > 1mm DFT – 4x 1mtr x 0.50mtr x 50mm (0.50 sq mtr each infill insulation panel).





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## IV. FIREX CIC – 4767 CLEAR INTUMESCENT FIRE SUPPRESSION COATING

**FIREX CIC – 4767** is an intumescent liquid applied, single component, clear, coating that contains highly effective fire retardants to reduce flame spread during the event of fire.

- ★ Passes British standard BS 476, Part 7, with a Class I fire rating, confirmed & certified by M/s CBRI, Roorkee.
- ★ Forms a clear, non-yellowing, water resistant fire retardant finish that protects the substrate from combustion and heat.
- ★ Can be used over painted surfaces, fiber insulation, polyurethane foam, wood, and other combustible surfaces - "Upgrades", fire prone Class 4 Fire rated surfaces, to the highest safety Class I, Fire rated surface.
- ★ Clear coating provides fire suppression without compromising on aesthetic appeal. Coated surface retains its original appearance & is in fact protected by the water & weather resistant properties of Firex CIC – 4767.



Tested & Certified  
BS 476 Part 7



- ★ Very low spread of flame and extremely low smoke emission. Lowers substrate temperature through chemical reaction process.
- ★ Produces a fully adhered, seamless, waterproof membrane.
- ★ Protects substrate against rust, corrosion, UV damage, and salt damage.
- ★ Easy to apply directly out of the container by brush, roller or airless spray. No primers or thinners are required.
- ★ May be used on vertical, pitched and horizontal surfaces without drips and runs.
- ★ Remains flexible, tough and weatherproof at low temperatures and will not flow at high temperatures.
- ★ Single component ready to use. Sets quickly and begins to cure immediately after application.

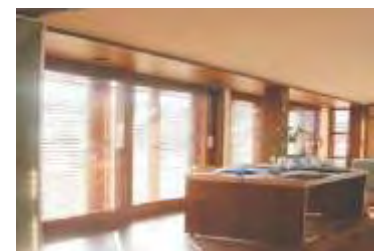
### TECHNICAL SPECIFICATIONS

1. Base	: Clear, Chlorinated water resistant intumescent coating.
2. Drying Time (IS : 101)	: Touch dry – 1 Hour Hard dry – 24 hour
3. Coverage	: 5 sq mtrs /ltr (per coat).(3 - 4 coats are advised)
4. Consistency	: Suitable for brushing /Spraying.
7. Surface flame spread (BS : 476 part 7)	: Class 1 rating
8. Fire propagation index (BS : 476 part 6)	: Pass
9. Primer	: Not required
10. Thinners	: Not required (Add 2-3% Firex TN, if required)
11. Shelf Life	: 12 Months from date of manufacture.



### APPLICATION AREAS : -

Multi-layered paint is a major contributory factor to the cause and rapidity of fire spread. Wooden surfaces are in any case a fire hazard.... Buildings, railway coaches, industrial establishments, hospitals, shopping malls, cinemas, banks, ... can now all be made much safer, simply paint on FIREX CIC 4767 on all combustible surfaces and achieve the highest possible CLASS 1 fire safety rating, currently available worldwide.



Woodwork protected with Firex CIC -4767"