

CEMENTITIOUS SYSTEM (CABLE FIRE BARRIER)

FIRE PROTECTION TO CABLES

The need to protect cables from fire needs no emphasis.

Power and control Cables, are used extensively in all kinds of construction, are probably the only medium connecting all areas in a plant or building, and are also the most common sources of fire. Electrical cables are usually insulated with Polyvinyl Chloride (PVC), which not only contributes to the extremely fast propagation of fire, but also releases dense black smoke and highly toxic gases.

The fire in cable runs can spread as fast as 20 metres per minute causing wide spread damage across the entire plant or building.

This can effectively be checked by a relatively simple method - sealing the openings through walls, floors, under control panels, trenches, pipe sleeves etc. for protection from the severest of fire for upto 4 hours, using the new advanced "LEXUS" Fire Barrier System.

INTRODUCTION TO THE SYSTEM

Navfair offers an improved "LEXUS" Fire Barrier system available as a single pack, and can be easily cast into any cable opening to provide a fully integrated, light weight block resulting in a highly efficient insulating barrier.

EASY USABILITY

The dry mix powder of "LEXUS" consists basically of highly insulating compounds, premixed with cementitious binders and foaming compounds in factory fixed proportions. It is then mixed with water at site to make it a workable mix and cast into the cavity opening with suitable shuttering. It can be cast into any shape or size, and when set, is mechanically strong.

The design is retrofit in nature, and cables can be easily removed or added, without affecting its life or performance.

Similar material is in use in most of the Heavy Water Plants including NPC, Kaiga and Kota, and various Steel and Aluminum Plants with proven performance.

HIGH FIRE RESISTANCE

"LEXUS" Fire Barrier System is non-combustible and has low thermal conductivity, due to which heat migration takes place at very slow rate, giving it excellent fire resistance property. The trapped moisture additionally provides an effective heat sink.

Specialists In: *Fully Insulated Steel Fire Proof Doors (Hinged & Sliding-upto 4hrs Fire Rating); Fire Rated Panic Bars Briton/Econ/Dorma etc); Cylindrical Lock; Fire Rated Hardwares; Fully Insulated Wooden Fire Doors; Sliding Doors (Steel & Wooden); Four Point Latching System; Structural Steel Fire Coating-upto 2hrs Fire Rating; Fire Retardant Paint/Polish; Fire Retardant Antibacterial Paint; Fire & Corrosion Resistant Paint; Fire Protection Systems; Cable Fire Resistant Coatings; Cable Fire Barrier (Conventional & Cementitious); Clear Solution for Flame Proofing of Fabrics; Ordinary and Fire Proof Rolling Shutters; Fire Rated Pilkington/Central/Schott/Promat/Glaverable Glass-upto 2hrs Fire Rating; Industrial Coatings for Boilers & Chimneys; Heat Resistant Paint 300/600/900/1200 Deg.C; Fire Sealants-upto 6hrs Fire Rating; Flame Proof Hessain/ Tents/Tarpaulene/Canvas; Rust Converter; Paint Removers, Modular Panels etc.*

SALIENT FEATURES

- Uniform and homogenous material
- Low thermal conductivity
- Thermally stable – operating temperature exceed 1000⁰c.
- Low shrinkage.
- Excellent thermal shock resistance- the properties remain unaltered in extreme temperatures.
- High compressive strength
- Light weight
- Asbestos free
- Completely resistant to moisture, humidity and chemicals. It remains unaffected by oil/lubricant spillage and is resistant to corrosive gases in the atmosphere.
- Modifiable with retrofit design facility, where cables can be easily inserted or replaced without impairing its fire performance.
- All its constituents are odourless, non hazardous and toxic.
- Does not contain any volatile solvents, is non-combustible and free from fire hazards during application.
- Excellent impact resistance properties to protect it against impact/foot traffic loads.
- Does not affect current carrying capacity of the cables.
- Resistant to termite and is anti-rodent.

CERTIFICATION

“LEXUS” Fire Barrier system has been extensively tested as per various technical parameters at Government approved laboratories including India’s premier Fire Research Laboratory, Central Building Research Institute, Roorkee for upto 3 hours fire rating to IS:12458-1988 and UL:1479. The evaluation includes sequential tests comprising of Accelerated Aging test, Water Immersion test, Impact and Vibration test followed by Fire Resistance and Hose Stream test.

APPROVED BY:

“LEXUS” Cable Fire Barrier system is adopted and approved by the Heavy Water Plant Kota; IOCL Gujarat Refinery; PWD M-331 Sanjay Gandhi Hospital, Mangolpuri; MTNL Nehru Place, Exchange Building; DMRC Metro Rail Project through KSHI-JV, etc.

EXTENSIVE TESTING FACILITIES AT NAVFAIR WORK

The best of our knowledge Lexus is the only company to have modern in- house testing facilities, including a furnace similar to the one at CBRI, Roorkee to test fire rating, conforming to BS:476 Part, UL:1479 and other relevant National and International standards.

The customer now enjoys the advantage of testing the material to the relevant National and International standards at the factory itself.

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CABLE FIRE BARRIER CONVENTIONAL SYSTEM TYPE & FIRE SEALANT IN CONVENTIONAL SYSTEM

SYSTEM EVALUATION

Before selecting a system, it must be evaluated properly & the following important points must be considered.

1. It must be easy to install.
2. The system should be suitable for both wall & floor openings. It should provide full 4 hrs, fire rating, even when floor RCC Slab thickness is only 100mm. For this a system should have been tested with insulation material thickness of not more than 100mm, to suit even 100mm RCC slab thickness.
3. **INFILL INSULATION (INFILL PANEL)**
 - ❖ The cavity 'Infill insulation' material should be of uniform thickness & must be factory made. The packing density of insulation material should not depend upon the site conditions or the skill of the technician installing the system.
 - ❖ It should be possible to inspect the quality of system materials & density of infill insulation before, during & after installation.
 - ❖ The system materials, particularly the infill insulation materials, should be tested for resistance to water/moisture or the corrosive atmosphere of the site, if any. The insulation material like mineral wool should be avoided, as this, when in contact with water forms lumps thus creating "Hot Spots."
4. **SUPPORT FRAME (ENCASING PANEL)**
 - ❖ The support frame (Encasing panel) should be a single panel of uniform density & not bonded together with adhesive, which get affected by water. Further no paper lamination should be used as paper lamination peels off/deteriorates by water/moisture in 2/3 years & also gets damaged during installation or while drilling holes through it.
 - ❖ In case the paper laminated gypsum boards are used as encasing panel, careful study should be made to assess its suitability, in view of factors enumerated above. Reliability of the system or its life is not established by a simple type test as a specimen for type test can be easily protected from adverse effects of water absorption by epoxy coatings.
 - ❖ It may be noted that a paper laminated Gypsum board is totally unsuitable for use as support frame (encasing panel) as can be verified at site by simply immersing the same in water for a few hours.
5. **FIRE SEAL (SEALING PUTTY)**
 - ❖ Fire seal (Sealing Putty) used for final sealing must not be Chlorinated Rubber based as this emits chlorine gas & toxic fumes during fire conditions
 - ❖ The Fire Seal further should not harden at all even at low temperature, as otherwise the retrofit properties are seriously effected.

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6. SEALING OF OPENINGS FOR CABLES

For up to 2 hours of Fire rating, the Fire barrier sheet 7.62mm thick (Min) with specific gravity of 1.56gm per cm³ should be cut as per the profile of the penetrants and the opening. Then the individual cut piece should be directly fixed, on the walls or floor around the penetrants with M6 anchor bolts and washers. The small gaps left around the penetrants should be closed, with Fire Rated Putty which should be soft & moldable to any shape, to give complete 2 Hour Fire Rating.

7. COMPONENTS OF FIRE STOPS/SEALING SYSTEM

The Fire Barrier sheet will be designed on the intumescent technology and must be a composite construction with the qualities incorporated with organic/inorganic fire-resistive elastomeric sheet with specific gravity of 1.56gm/cm³. One side it should be bonded with 28gauge galvanized sheet. The other side it should be reinforced with hexagonal shaped steel wire meshes and covered with aluminum foil. The Putty shall be one part intumescent elastomeric. When exposed to flame or heat it shall be capable of expanding and it should be in the form of pads/clots. The putty should allow the re-entry of cables through it whenever needed during the service period. The system should be UL approved.

- a) Encasing panels and supporting frames – The supporting frames shall be non-combustible, water resistant, rot/vermin resistant, constructed from rigid asbestos free material with adequate mechanical strength. It will cover the openings on both sides in the case of wall and floor openings and on one side in case of openings under control panels.
- b) Penetration seals – Inside encasing panels, in-fill material of specified thickness shall be provided. In-fill material shall be coated with intumescent mix designed to give suitable fire rating. In-fill material shall not allow passage of smoke/hot gases under intense fire conditions thus providing full integrity for the rated period.
- c) Fire seals- These are used to close the openings around the cables and the joints of support frames. Under fire condition they should not smell and should carbonize into a hard crust and augment the integrity.
- d) Anchor fasteners – Shall be used for fixing the encasing panels mechanically on the openings.

Material shall be such that it will not create too much heat to affect rating of the cables, heat dissipation and cables performance under barrier condition.

Specialists In: Fully Insulated Steel Fire Proof Doors (Hinged & Sliding-up to 4hrs Fire Rating); Fire Rated Panic Bars Briton/Econ/Dorma etc); Cylindrical Lock; Fire Rated Hardware; Fully Insulated Wooden Fire Doors; Sliding Doors (Steel & Wooden); Four Point Latching System; Structural Steel Fire Coating-up to 2hrs Fire Rating; Fire Retardant Paint/Polish; Fire Retardant Antibacterial Paint; Fire & Corrosion Resistant Paint; Fire Protection Systems; Cable Fire Resistant Coatings; Cable Fire Barrier (Conventional & Cementitious); Clear Solution for Flame Proofing of Fabrics; Ordinary and Fire Proof Rolling Shutters; Fire Rated Pilkington/Central/Schott/Promat/Glaverable Glass-up to 2hrs Fire Rating; Industrial Coatings for Boilers & Chimneys; Heat Resistant Paint 300/600/900/1200 Deg.C; Fire Sealants-up to 6hrs Fire Rating; Flame Proof Hessain/ Tents/Tarpaulene/Canvas; Rust Converter; Paint Removers, Modular Panels etc.

CONSTRUCTION

The unique “LEXUS” Cable Fire Barrier System has been designed keeping in view all factors enumerated in ‘System Evaluation’. It comprises of:

(A) NON-COMBUSTIBLE SUPPORT FRAME (ENCASING PANEL)

- Single 20 mm thick glass reinforced panel, without paper lamination.
- Virtually indestructible by fire.
- Very strong, sturdy and with equal strength in both directions. Can effectively withstand Foot Traffic & Drop loads.
- Resistant to Rodent termite, white ants, alkalies and other chemicals.
- Can be easily worked upon with normal Carpentry tools.

(B) INFILL INSULATION (INFILL PANEL)

- Homogenous slabs 100 mm thick of uniform density of 144 Kgs/Cu.Mtr. (nominal) R.T. grade ceramic wool impregnated and coated with Intumescent Compound.
- Unaffected even on prolonged submersion in water.
- Factory made, thus independent of site conditions or cavity thickness.

(C) FIRE SEAL (SEALING PUTTY)

- Non-chlorinated rubber based highly fire retardant and pliable even at temperature below 25⁰C.

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CABLE FIRE BARRIER

ITEM / SCHEDULE DESCRIPTION

❖ Providing & fixing of “LEXUS” Conventional Type cable Fire Barrier on wall /floor/under control panel as per proto type sample duly tested & certified at CBRI, Roorkee/Government of Industries, Haryana for 3 hours fire rating as per BS-476 Part-8, vertical & horizontal opening having constituents such as treated ceramic wool/Vermiculite Insulation 100mm thick, Fire seal, 20mm thick GRGB/Calcium Silicate Board, Fire retardant paint along with other fixing accessories.

RATE – PER SQ.MTR

OR

ITEM / SCHEDULE DESCRIPTION

❖ Providing and fixing of “LEXUS” or equivalent Bulkhead Sealing system to seal the openings required for the passage of cables through walls and sealing two layers of Fire Resistant Cementitious material and cable entry points are to be sealed with Fire Sealant to achieve 3 hours fire rating as per BS: 476 Part -20.

Rate – PER SQ.MTR

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