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WEL COME

PASSIVE FIRE PROTECTION
COMPARTMENTATION & RETARDATION

About Us : A heritage of 60 years

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Corporate Office - Mumbai, INDIA

Manufacturing Plant I - Silvassa, INDIA

Manufacturing Plant II - Umbergaon, INDIA

- Expertise in customized engineering, design and world class manufacturing & service
- 215,000 sq. ft. of quality manufacturing & testing facilities at:
  - **Silvassa** for PPE manufacturing, Specialized Products for Indian Defense & Passive fire
  - **Umbergaon** for manufacturing of Fire Retardant Products, Fire Vehicles & Latex Examination and Surgical
- An Inherent Intellectual Capital
- All Companies are ISO – 9001 (2015)certified.

Hospital Fires :

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- AMRI KOLKARA

- BHANDARA, MAHARASHTRA

- ESIC, MUMBAI

Hospital Fires : Unsealed openings propagate smoke and fire

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VERY CRITICAL DUE TO

- Occupants with physical limitations creating challenge for safe & quick evacuation
- Occupants of all age groups from infants to very old
- Accompanying attendants are mentally stressed with different literacy level.
- Huge combustible material like linens, beds, curtains, cotton, plastics, electrical equipment's, creating a huge fire load.
- More services like cables, pipes, ducts passing across the sections of buildings due to modern facilities.
- Highly flammable Fire loads of clinical spirits, medicines, oxygen cylinders.
- Occupants are untrained with mock drills
- Mostly being located within cities, response time of fire fighters may be high due to traffic congestions
- Disruption of healthcare services to community due to defunct hospitals

Smoke more deadlier in Fire Accidents :

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- It is claimed that 75% of fire victims die due to smoke and toxic gases.
- 50% of survivors experience loss of visibility during escape due to smoke
- Furthermore, 50-60% of fire victims were not present near the source of the fire.

IN VIEW OF THESE CRITICALITIES, IT IS NECESSARY TO :

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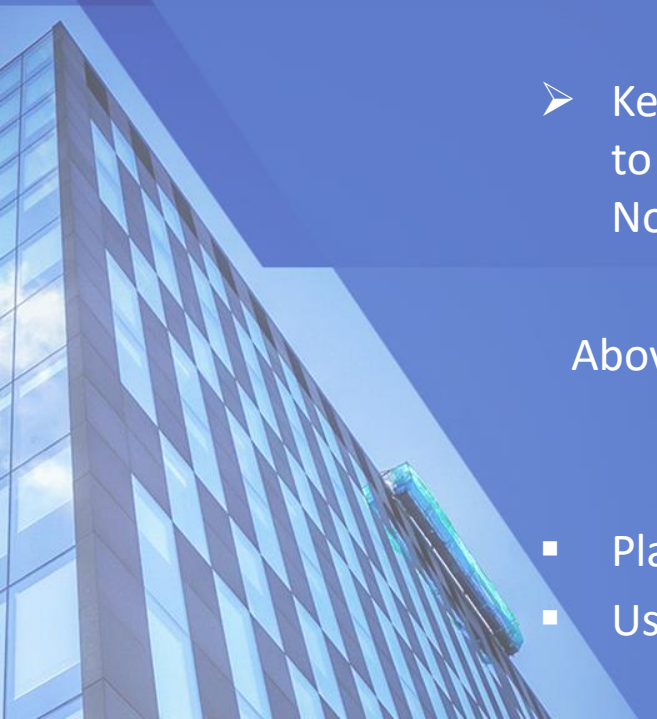

- Get more time for rescue operations for evacuation and Fire Fighting.

- Keep Fire and Smoke confined to the source for maximum time to reduce damage and provide safe passage of occupants in Non Fire Zones.

Above is possible with Passive Fire Protection using the following techniques.

- Plan **COMPARTMENTATION** Of the entire building.
- Use **RETARDATION** Techniques to reduce spread of fire.

Statutory Codes & Guidelines :

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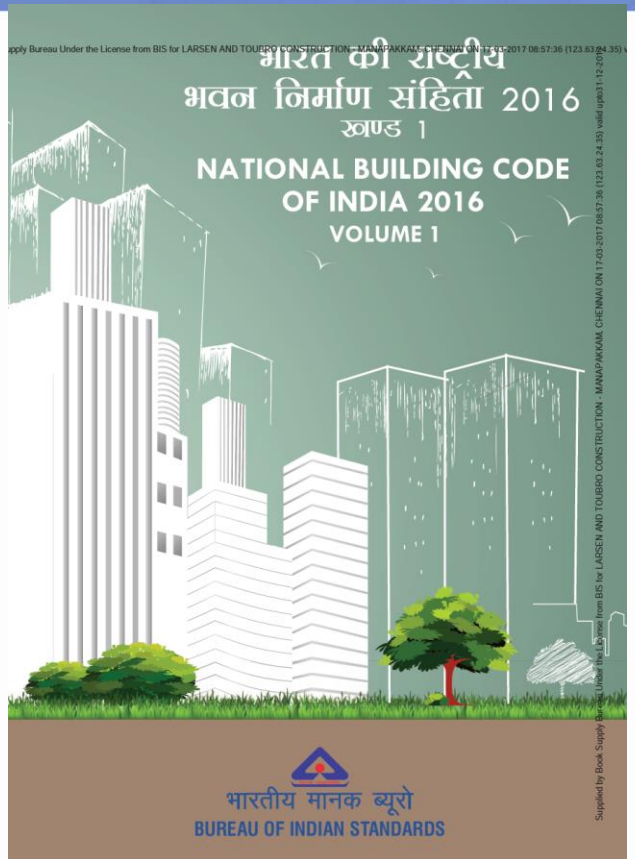

NATIONAL BUILDING CODE 2016

PART 4 FIRE & LIFE SAFETY

- Hospitals buildings are classified as building Type C1
- Occupancy wise additional requirements given in 6.3
- Fire Compartment defined in 2.21
- Fire Barrier defined in 2.20
- Fire stops defined in 2.32

Statutory Codes & Guidelines :

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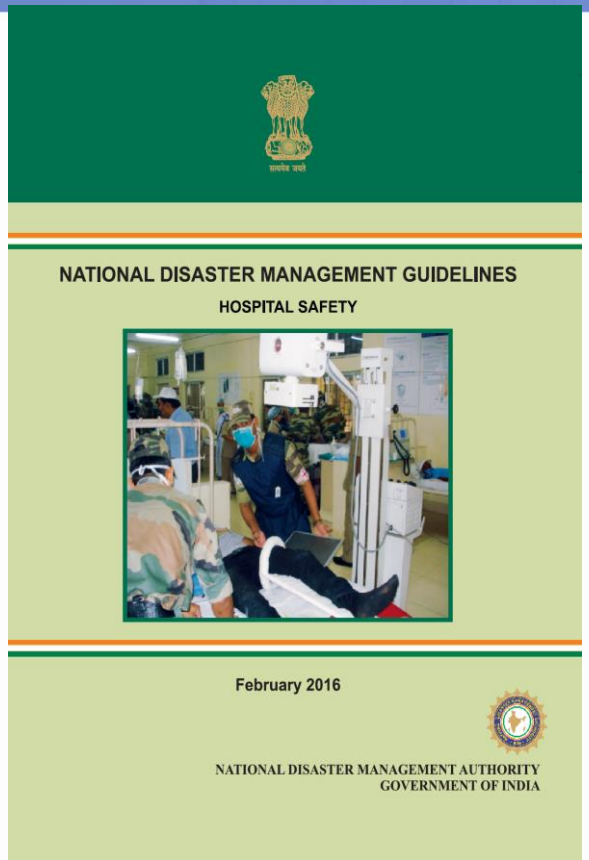

NATIONAL DISASTER MANAGEMENT GUIDELINES 2016
HOSPITAL SAFETY

6.3.10 Compartmentation :

1) In buildings or sections occupied by bed ridden patients where the floor area is over 280 Sq.mtr. Facilities shall move patients in Hospitals beds to the other side of a smoke barrier from any part of such a building or section not directly served by approved horizontal exits from the floor of a building to outside.
2) Any section of the building more than 500 Sq.mtr shall be suitably compartmented with fire resistance of not less than 2 hrs.
3) Every storey used by inpatients for sleeping or treatment shall be divided into not less than two smoke compartments.
4) Every storey having an occupant load 50 or more persons, regardless of use, shall be divided into two smoke compartments.
5) The size of each smoke compartment shall not exceed 500 Sq. mtrs.

Statutory Codes & Guidelines :

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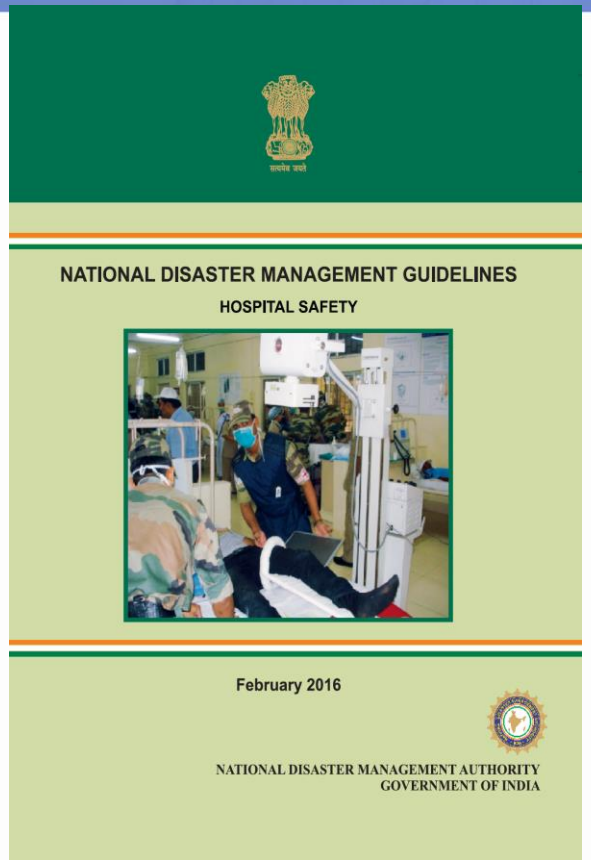

6.3.14 Fire Stop or Enclosure for Openings :

1) Where openings are permitted for external walls they shall not exceed 3/4th the area of the wall and shall be protected with fire resisting assemblies or enclosures with a fire resistance equivalent to that of the wall in which these are situated. Such assembles and enclosures shall also be capable of preventing the spread of smoke and fumes through the openings so as to facilitate the safe evacuation of building in case of a fire.

Statutory Codes & Guidelines :

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NABH
ALSO RECOMMENDS PROVISIONS FOR
CONTAINMENT OF FIRE (COMPARTMENTATION)
UNDER FCILITY MANAGEMENT & SAFETY
GUIDELINES

COMPARTMENTATION :

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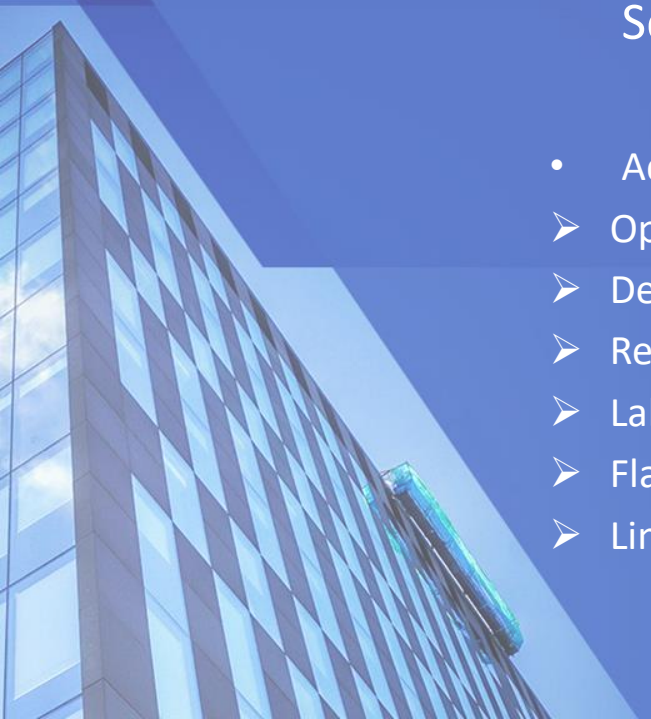

- As per NBC, the Floor should be divided in areas of 750 Sq.mtrs.

- Additionally following areas should form separate compartments

- Operation Theatres
- Delivery Rooms
- Recovery Rooms
- Laboratories
- Flammable Storages
- Linnen Rooms
- Infant wards
- Critical Patient wards
- Pantry / Kitchen
- Electrical Rooms / Shafts
- Lift Lobbies
- Exit Staircases & passages

TYPICAL COMPARTMENTATION PLAN

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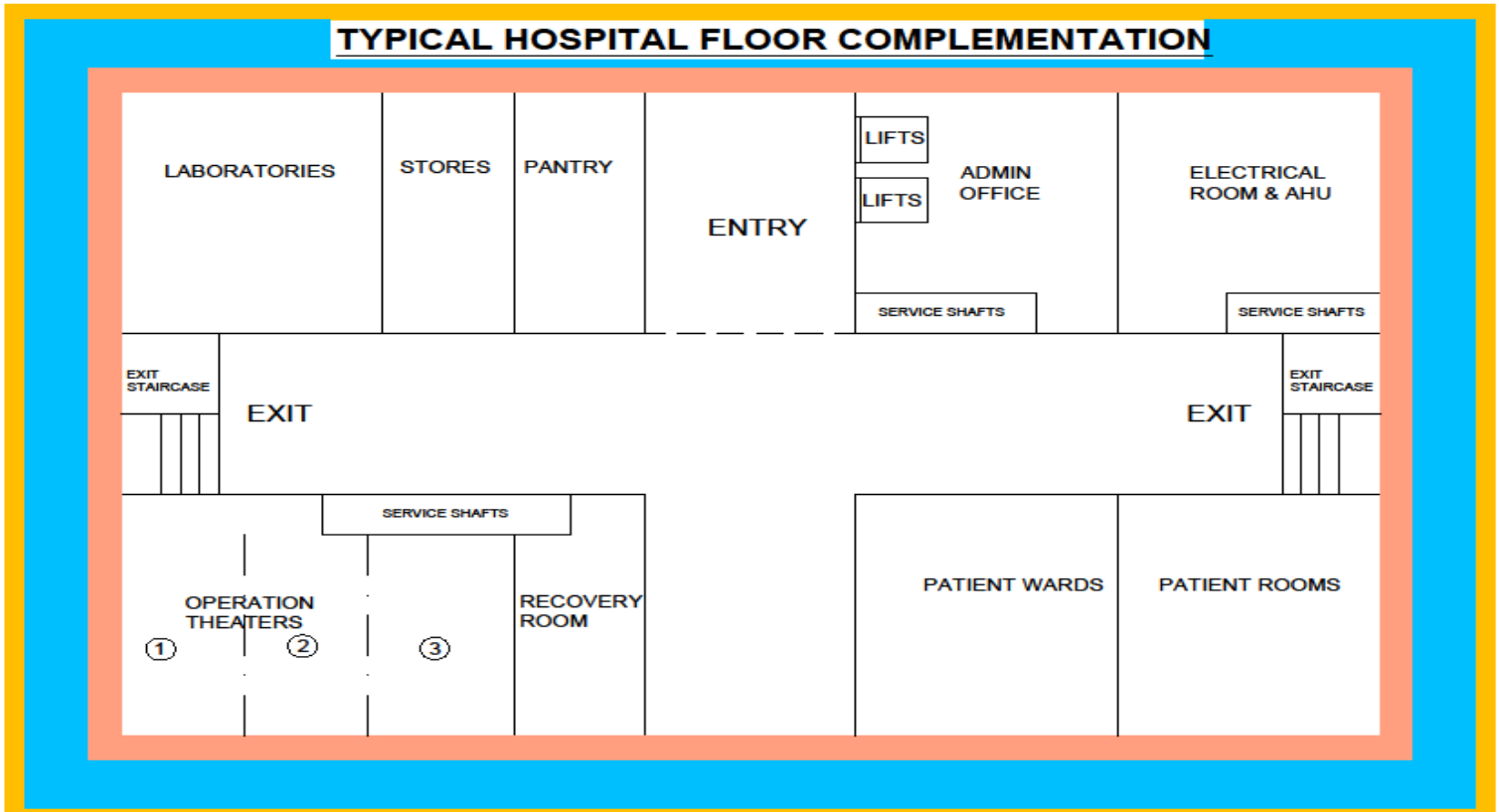

TO ACHIEVE COMPARTMENTATION :

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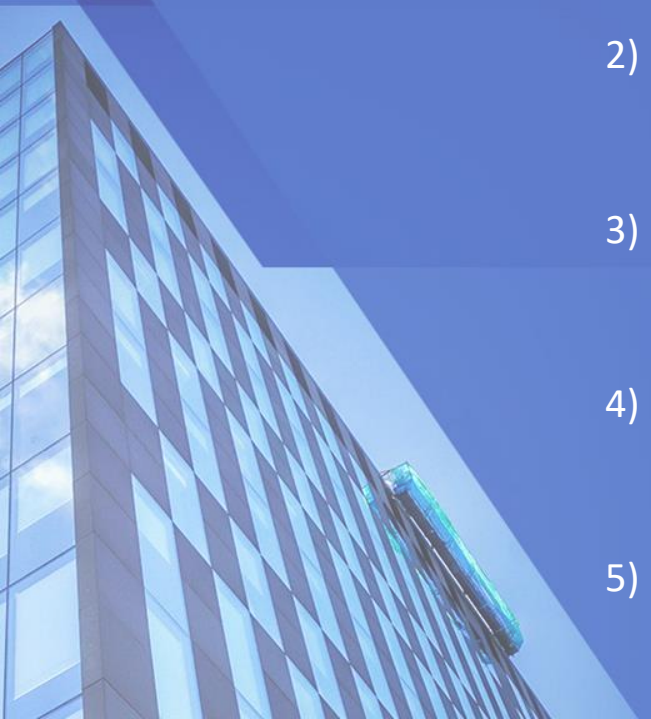

1) Use Fire Doors for entry and exit of each compartment.

2) Seal all service openings in walls and Floors with Fire Penetration seals / Fire Stops.

3) Use Fire Rated Glass Doors and Partition where visibility is required.

4) Seal all vertical service shaft opening cut outs on every floor by Fire Stops so that every floor is a separate compartment.

5) Use Fire Curtains where open spaces are required in normal conditions to facilitate stretched movements like lift lobbies.

Fire Penetration Sealing System:

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- **Mortar Seal** is a mixture of cement and other fire retardant chemicals capable of controlled swelling. Ace Mortar Seal is a light-weight, low density product which expands ensuring a tight seal against the passage of fire, toxic gases and smoke.
- This type of fire stop can be adopted for openings in the walls as well as cut-outs in floors, providing a high rating of upto 4 hrs.

Fire Penetration Sealing System:

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- **Panel Seal** is a fire sealing system which consists of two special types of panel boards, placed parallel to each other with an air gap maintained and the exposed surface of boards are coated with fire-retardant paint providing a fire rating of 2 to 4 hours.
- It provides a tight seal against the spread of fire, toxic gases and smoke.
- The complete system is Factory Mutual, USA approved and tested as per ASTME-814 Standards.

Fire Sealant:

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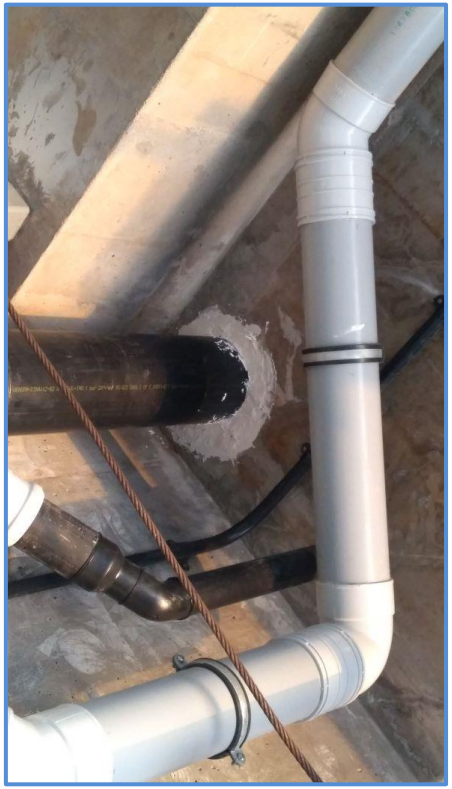

Mastik Sealant is a joint filler and sealant for penetration seals and fire separating walls such as curtain wall, top of wall joints, high movement expansion joint and joints in either walls or floors, sealing upto 50 mm around pipes etc.

Fire Penetration Sealing System:

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- **Plastic Pipe Wrap** is a dry, flexible intumescent film wrap used around plastic service pipes penetrating through openings in a wall and / or floor in a building structure.
- In the event of fire, the wrap expands multiple times to seal the plastic pipe opening as well as the opening between the pipe and the wall/floor structure.
- Wraps prevents the passage of flames & hot gases and restricts the temperature rise on the non-fire side of a wall or floor.
- Wrap are UL tested Ref ETA 14/0298 & CE 0843 and have a fire rating of 1 hour to 4 hours.

Fire Penetration Sealing System:

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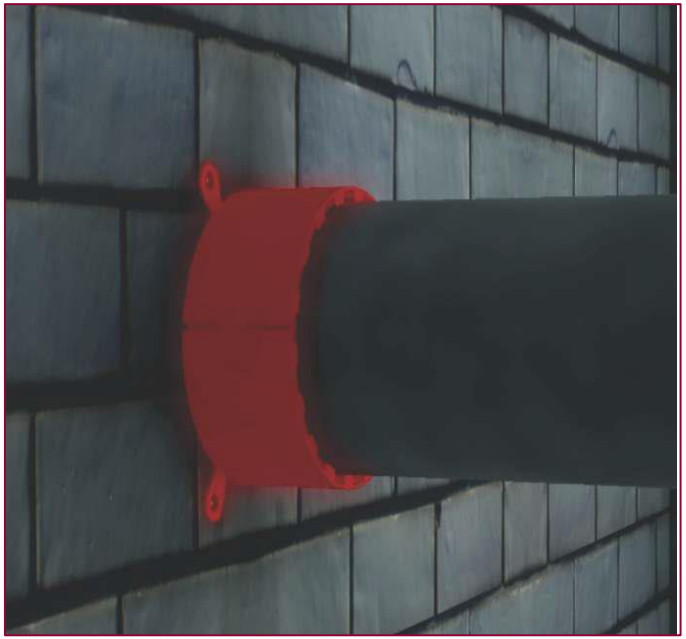

- **Plastic Pipe Collar** are made of non-corrosive powder coated steel and lined with VS Plastic Pipe wraps that are used to cover plastic pipes where they penetrate through a wall or floor.
- In the event of a fire or exposer to high heat, plastic pipes can melt quickly and permit fire, smoke and fumes to pass through the pipes and travel beyond the barrier.
- In a fire, the intumescent wraps expand multiple times and cause the plastic pipes to collapse internally and close the through passage in order to create a tight seal and prevent fire, smoke and fumes from travelling further.
- The Collars are UL tested Ref ETA 14/0298 & CE 0843.

Fire Doors :

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Fire Doors : High rise buildings & industrial establishments are divided into smaller compartments to keep fire & smoke confined within the compartment and to keep escape routes/lobbies/refuge areas free from smoke, heat & fire for safety of the occupants and assets.

Steel Fire Doors provide such protection when installed as access doors to such compartments.

Fire Doors :

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FEATURES :

- Available in Standard as well as customized sizes
- Available in single and double leaf configurations
- Sleek, fully flush and sturdy design with good aesthetics.
- No visible welds
- Available in customized color shades
- Totally asbestos free
- Prefabricated ready to install at site
- Provision of hardware as per customer requirement
- Available with smoke seals & thresholds
- Available with Fire rated Vision panel glass as required
- Fire rating up to 120 minutes

Fire Rated Glass Doors and Partitions:

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- The compartmentation of fire in high-rise, commercial and industrial buildings is essential to keep smoke, heat & fire confined with a compartment. The partitions and access doors of some of the compartments require visibility during normal conditions due to operational needs.

- Fire Rated Glazed partition used in conjunction with fire rated glass provide a solution for this requirement.

FIRE CURTAINS :

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Automatic Fire & smoke curtains of specially designed fire resistant fabric which operate with fire alarm and form a fire and smoke barrier. Provide open space in normal conditions

Fire Retardation

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- Propagation of fire and generation of thick toxic black smoke is maximum due to electrical cables
- There is a main electrical incomer room and transformer at ground floor or basements.
- The distribution power cables are run through electrical ducts to each floors.
- The fire propagation is very rapid through vertical cables.

HENCE THE ELETRICAL CABLES CAN BE COATED WITH FIRE RETARDANT CABLE COATING VERTICALLY AND AT STRATEGIC LOCATIONS WHERE DENSITY OF CABLES IS HIGH. THEREBY USING ANOTHER PRINCIPLE OF PASSIVE FIRE PROTECTION I.E. RETARDATION, ONE CAN GET MORE TIME FOR FIRE FIGHTING AND THE DEADLY HAZARDS OF SMOKE INHALATION CAN BE CONTROLLED

Fire Retardant Coating Compound :

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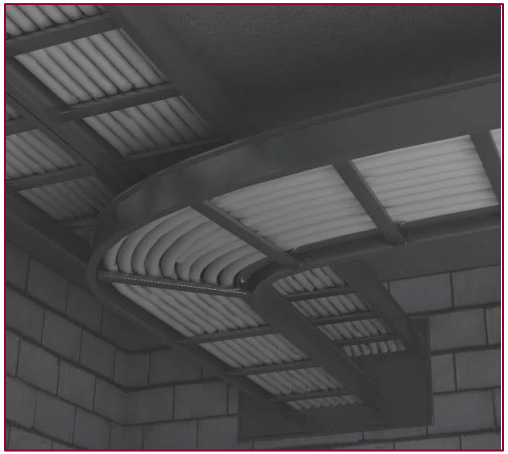

- **Mastik Coating** is a water-based and solvent-free coating comprising of thermoplastic resins, flame-retardant chemicals, inorganic incombustible fibers, fillers, and pigments
- It is an ablative product which prevents flame propagation along vertical and horizontal cable outstays. In case of fire , undergoes an endothermic reaction which reduces the burning rate and spread of fire.
- It is also free of asbestos and halogen. It prevents flame propagation on cables, thus keeping a cable fire confined to its source.


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THANK YOU
WHEN FIRE STRIKES, GET TIME ON YOUR SIDE