

## Electrical Passive Fire Protection for Electronics Manufacturing Plants

*Substations · Cable Galleries · Control Rooms · Safety-Critical Circuits*

### Section A | Electrical Zone-Wise Fire Risk Map

#### A1. Substations, MCC Rooms & Cable Galleries

Main substation, Li-ion assembly MCC (premium PFP niche), clean-room HVAC electrical, SMT line panels, UPS / backup room, and the server / data room.

Area	Fire Scenario	Stanvac PFP Product Application	Rating / Priority
Main substation & MCC	Cable + transformer fire	Cable coatings, firestops, panel FP	<b>Critical</b>
Li-ion assembly MCC & control panels	Thermal runaway, electrolyte fire	Panel FP, firestops, FR doors	<b>Critical</b>
Clean room electrical distribution	Compartment breach during fire	Panel FP, firestops	<b>Critical</b>
SMT / wave solder line panels	Solder + flux fire	Panel FP, cable coatings	<b>High</b>
Chemical / wet process panels	Solvent fire	Panel FP, firestops	<b>Critical</b>
HVAC AHU / chiller control panels	Cable + duct fire	Panel FP, firestops	<b>Critical</b>
UPS & battery room	Thermal runaway, H <sub>2</sub>	Firestops, FR doors, panel FP	<b>Critical</b>
Data / IT room distribution panels	Cable + UPS fire	Panel FP, firestops	<b>Critical</b>
Cable trenches / tunnels	Propagating cable fire	Cable coatings + transverse firestops	<b>Critical</b>
DG room	Fuel + lube oil fire	Panel FP, firestops	<b>Critical</b>

## A2. Safety-Critical Electrical Systems

Area	Fire Scenario	Stanvac PFP Product Application	Rating / Priority
Fire water pump house	Must survive the fire it fights	Fireproofed structure, FR cables	<b>Critical</b>
Li-ion thermal runaway detection + abort	BMS to central panel to discharge	Fire-survival cable, panel FP	<b>Non-negotiable</b>
F&G detection (electrolyte vapour, H <sub>2</sub> )	Detector to F&G panel	Fire-survival cable	<b>Non-negotiable</b>
Clean room pressurization + HVAC continuity	Duct integrity during fire	Fire-survival cable	<b>Critical</b>

## Section B | Product-to-Application Matrix

This section maps each of the four priority Stanvac product lines to the specific electronics manufacturing plants locations and circuits where they must be specified. Use these tables to build the bill of quantities (BOQ) for any electronics manufacturing plants opportunity.

### B1. Cable Coatings — Fire Propagation Prevention

*Minimum 240 minutes protection, thickness ≤ 1.6 mm DFT.*

Purpose: prevent the spread of fire along cable trays, risers and bunches. The "Browns Ferry" scenario — one cable igniting an entire cable gallery — is the design basis.

**Applicable standards:** IEC 60332-3 (FM 3971 has limited use — it provides only short-duration protection against arcs and sparks)

Zone	Specific Application	Priority
Main substation cable gallery	All HT and LT trays	<b>Critical</b>
MCC cable trenches	Bottom-entry cable bunches	<b>Critical</b>
Clean room cable routes	AHU, lighting, process	<b>Critical</b>
Li-ion assembly area cable routes	Cell / pack assembly cables	<b>Critical</b>
Wet process / chemical cable routes	Chemical resistant	<b>High</b>

Zone	Specific Application	Priority
Warehouse perimeter cable routes	Lighting + sprinkler	Critical
HVAC AHU cable routes	AHU motor and control	Critical
Data / IT room cable routes	All IT cabling	Critical
DG room cable entries	Start, alternator, control	Critical
Fire water pump house cables	Incomer + motor	Critical

## B2. Cable Coatings — Fire Survivability

240-minute circuit integrity, thickness  $\leq 1.6$  mm DFT.

Purpose: keep the cable electrically functional while burning, so the safety circuit continues to operate through the fire event. Fire-survival coatings are specified where loss of the circuit would defeat the fire-fighting or shutdown system itself.

**Applicable standards:** IEC 60331-21 and IS 17505-1

Circuit Type	Where Applied	Priority
Li-ion thermal runaway detection + abort	BMS to central panel to discharge	Non-negotiable
Fire water pump power (electric + diesel)	Switchgear to motor	Non-negotiable
Clean room pressurization + HVAC continuity	Duct integrity during fire	Critical
Chemical / solvent ESD	Emergency shut-off	Critical
F&G detection (electrolyte vapour, H <sub>2</sub> )	Detector to F&G panel	Non-negotiable
Emergency DG start & transfer	Battery to engine panel	Critical
Emergency lighting + PA / GA	Plant-wide egress	Critical
UPS feeders to DCS / MES / SCADA	UPS to marshalling	Critical
Sprinkler system supervisory	Flow switch, tamper	Critical
Clean room gas suppression controls	Gas release actuation	Critical

## B3. Electrical Panel Fireproofing

Purpose: protect field control panels, junction boxes, MCC panels and logic cabinets from external fire and internal electrical fire. Stanvac offers three complementary solutions under this product line.

Option	Stanvac Solution	Description & Typical Use
A	Two-hour rated firestop sealant	For sealing cable gland openings, panel cut-outs, conduit entries and small penetrations at the panel boundary. Silicone / acrylic intumescent sealant certified to UL 1479 / IS 12458 at 2-hour rating.
B	Non-combustible intumescent paint	For external coating of panel enclosures, cable glands and junction boxes exposed to radiant heat or hydrocarbon fire. Non-combustible base with intumescent top-coat.
C	Two-hour rated intumescent translucent coating for small-dia. cables (aerosol spray)	Aerosol-delivered translucent intumescent coating for small-diameter instrumentation, control and signal cables entering panels. Clean application in congested panel interiors; 2-hour rated.

#### B4. Two-Hour Rated Firestop Barriers

*Hybrid combination of mineral wool and firestop mortar.*

Purpose: seal every penetration through a fire-rated wall, floor or cable tunnel so compartmentation is maintained. Stanvac's hybrid system combines high-density mineral wool (for bulk void filling and thermal insulation) with firestop mortar (for load-bearing, smoke-tight surface seal). This dual-material approach delivers superior 2-hour rating performance across a wider range of penetration sizes than single-material systems.

**Applicable standards:** UL 1479 · ASTM E814 · IS 12458

Location	Specific Application	Priority
Every clean room wall, floor, ceiling penetration	Cable, duct, pipe, pass-box penetrations	<b>Critical</b>
Li-ion assembly compartment walls	Cable + HVAC penetrations	<b>Critical</b>
Li-ion warehouse perimeter	Every wall, floor, duct penetration	<b>Critical</b>
HVAC duct penetrations across clean zones	Fire dampers + collar seals	<b>Critical</b>
Chemical storage compartment walls	Cable and ventilation duct penetrations	<b>Critical</b>
Main substation cable trench to building	Sand-seal + firestop pillows + mortar	<b>Critical</b>
UPS / battery room boundary	Cable and ventilation duct penetrations	<b>Critical</b>
Data / IT room boundary	Cable and HVAC penetrations	<b>Critical</b>

Location	Specific Application	Priority
Warehouse compartment walls	Cable and conveyor penetrations	Critical
DG room boundary	Fuel line and cable penetrations	Critical

*Detailed product data sheets, certifications, specimen specifications and project BOQ support are available on request.*

**For more information, please connect with us.**

*Stanvac Chemicals India Ltd · Passive Fire Protection Division*