# Electrical Passive Fire Protection for Airports

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

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

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

Main airport substation, distributed substations per terminal, BHS MCC, ATC / CNS / radar equipment rooms, hangar electrical buildings, and the AOCC.

| Area | Fire Scenario | Stanvac PFP Product Application | Rating / Priority |
|---|---|---|---|
| Main 33/11 kV airport substation | Transformer + cable fire | Cable coatings, firestops, panel FP | **Critical** |
| Distributed substations (DSS per terminal) | Transformer + cable fire | Cable coatings, firestops, panel FP | **Critical** |
| BHS (Baggage Handling System) MCC | Conveyor / motor fire | Panel FP, cable coatings, firestops | **Critical** |
| ATC tower cab + equipment rooms | Cable + panel fire | Panel FP, firestops, FR doors | **Critical** |
| CNS / radar equipment rooms | Cable + electronic fire | Panel FP, firestops | **Critical** |
| Cable tunnels (SS to terminal, SS to AGL) | Propagating cable fire | Cable coatings + transverse firestops | **Critical** |
| Aviation fuel depot electrical | JP-A1 pool fire, loading fire | Panel FP (jet-fire rated), firestops | **Critical** |
| Hangar electrical building | Aircraft fuel + solvent fire | Panel FP, firestops, FR doors | **Critical** |
| Airport operations control centre (AOCC) | Panel + cable fire | Panel FP, firestops, FR doors | **Critical** |

| Area | Fire Scenario | Stanvac PFP Product Application | Rating / Priority |
|---|---|---|---|
| UPS / battery rooms (ATC, radar, CNS) | Thermal runaway, $H_2$ | Firestops, FR doors, panel FP | **Critical** |

### A2. Safety-Critical Electrical Systems

| Area | Fire Scenario | Stanvac PFP Product Application | Rating / Priority |
|---|---|---|---|
| Fire water pump house (airport-wide) | Must survive the fire it fights | Fireproofed structure, FR cables | **Non-negotiable** |
| Emergency lighting + PA (terminal-wide) | Egress routes + BHS halls | Fire-survival cable | **Non-negotiable** |
| Lift power (firemen's lift) | Must operate during fire | Fire-survival cable | **Non-negotiable** |
| ATC / radar / CNS continuity power | UPS to critical systems | Fire-survival cable | **Non-negotiable** |
| Fuel depot ESD / BDV | Emergency shut-off | Fire-survival cable | **Non-negotiable** |

## Section B | Product-to-Application Matrix

This section maps each of the four priority Stanvac product lines to the specific airports locations and circuits where they must be specified. Use these tables to build the bill of quantities (BOQ) for any airports 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 galleries | All HT and LT trays | **Critical** |
| BHS cable routes (terminal-wide) | All conveyor motor and control | **Critical** |

| Zone | Specific Application | Priority |
|---|---|---|
| Cable tunnels (SS to terminal, to airside) | Full-length coating + transverse firestops every 30 m | **Critical** |
| AGL cable routes (runway / taxiway lighting) | Underground cable trenches | **Critical** |
| ATC tower cable risers | Vertical trays floor-to-floor | **Critical** |
| AOCC cable routes | Marshalling and SCADA | **Critical** |
| Hangar cable routes | All process and lighting | **Critical** |
| Fuel depot cable routes | MOVs, level tx, pump power | **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 ≤ 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 |
|---|---|---|
| Emergency lighting throughout terminal | Egress routes + BHS halls | **Non-negotiable** |
| PA / evacuation voice communication | Terminal-wide | **Non-negotiable** |
| Lift power (firemen's lift) | Must operate during fire | **Non-negotiable** |
| Fire water pump power (electric + diesel) | Switchgear to motor | **Non-negotiable** |
| Smoke extraction / stairwell pressurization fan | HVAC fans during fire | **Non-negotiable** |
| ATC / radar / CNS continuity power | UPS to critical systems | **Non-negotiable** |
| Emergency DG start & transfer | Battery to engine panel | **Non-negotiable** |
| Fuel depot ESD / BDV | Emergency shut-off | **Non-negotiable** |

| Circuit Type | Where Applied | Priority |
|---|---|---|
| BHS emergency stop | Pull-cord + jam trip | **Critical** |
| Hangar foam / deluge system controls | Solenoid + MOV actuation | **Non-negotiable** |

## 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 |
|---|---|---|
| Terminal compartment walls (NBC 2016 Part 4) | Every cable, pipe, duct penetration | **Critical** |
| BHS hall boundary | Conveyor, cable, duct penetrations | **Critical** |
| Retail / F&B kitchen compartments | Cable and exhaust duct penetrations | **Critical** |

| Location | Specific Application | Priority |
|---|---|---|
| Every floor slab in service risers | Slab firestops at each floor | **Critical** |
| Main substation cable trench to building | Sand-seal + firestop pillows + mortar | **Critical** |
| Cable tunnel transverse barriers | Every 30–50 m | **Critical** |
| ATC tower floor-to-floor penetrations | Cable and HVAC | **Critical** |
| Fuel depot bund area penetrations | Pump and instrumentation | **Critical** |
| Hangar door and wall boundary | Cable and fuel-pipe penetrations | **Critical** |
| UPS / battery room boundary | Cable and ventilation duct 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.**

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