Electrical Passive Fire Protection for Educational Institutions

Substations · Laboratories & Workshops · Hostels & Libraries · Auditoriums · Safety-Critical Circuits

Section A | Electrical Zone-Wise Fire Risk Map

A1. Substations, MCC Rooms & Cable Galleries

Schools, colleges, universities and research institutes. Coverage spans the substation, DG and UPS rooms, hostel electrical risers (sleeping occupancy), chemistry / engineering laboratories, computer labs and server rooms, libraries, auditoriums and the fire pump house.

Area	Fire Scenario	Stanvac PFP Product Application	Rating / Priority
Main substation	Transformer + cable fire	Cable coatings, firestops, panel FP	Critical
DG room	Diesel pool fire	Cable coatings, firestops, panel FP	Critical
UPS room	Battery thermal event	Cable coatings, firestops, panel FP, FR doors	Critical
Hostel electrical riser (sleeping occupancy)	Vertical fire propagation	Cable coatings + firestops at every floor	Critical
Chemistry laboratory MCC	Solvent + gas + reagent fire	Panel FP, cable coatings, firestops	Critical
Physics / engineering laboratory MCC	Equipment + cable fire	Cable coatings, panel FP	High
Workshop / fabrication lab MCC	Welding + machining fire	Cable coatings, panel FP	High
Computer lab / server room	Cable + server fire	Cable coatings, firestops, panel FP	Critical
Library electrical (paper fire load)	Class A high-hazard fire load	Cable coatings, firestops, panel FP	Critical
Auditorium electrical	AV + decorative fire load	Cable coatings, panel FP	High
Canteen kitchen MCC	Cooking oil + LPG fire	Panel FP, cable coatings, firestops	Critical
Records / examination office MCC	Class A paper fire load	Cable coatings, panel FP	Critical
HVAC plant room	Motor + filter media fire	Cable coatings, panel FP	High
Cable risers and shafts	Vertical fire propagation	Cable coatings + firestops at every floor	Critical
Fire water pump house electrical	Must survive the fire	Structural intumescent, fire-survival cable	Non-negotiable

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	Non-negotiable

Area	Fire Scenario	Stanvac PFP Product Application	Rating / Priority
Hostel stairwell pressurization fan	NBC-mandated for sleeping occupancy	Fire-survival cable	Non-negotiable
Lab fume-hood exhaust power	Must run during fire to clear vapour	Fire-survival cable	Non-negotiable
Lab gas isolation circuit	Solenoid valve trip on detection	Fire-survival cable	Non-negotiable
PA / Voice evacuation system	Campus-wide announcement	Fire-survival cable, panel FP	Non-negotiable
Sprinkler / hydrant pump power	Switchgear to motor	Fire-survival cable	Non-negotiable
Lift homing circuit (hostel + library)	Fire-floor recall	Fire-survival cable	Critical
Emergency lighting + exit signage	Building-wide egress	Fire-survival cable	Critical
Emergency DG start & transfer	Battery to engine panel	Fire-survival cable	Critical

Section B | Product-to-Application Matrix

This section maps each of the four priority Stanvac product lines to the specific educational institutions locations and circuits where they must be specified. Use these tables to build the bill of quantities (BOQ) for any educational institutions 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
Substation and DG cable galleries	All HT/LT trays + transverse firestops every 30 m	Critical
Hostel electrical riser (every floor)	All floor-to-floor power and data	Critical
Chemistry laboratory cable routes	Fume hood, gas line, instrumentation	Critical
Physics / engineering lab cable routes	Equipment, instrumentation, control	High
Workshop cable routes	Welding, machining, lighting	High
Library cable routes	Lighting, sprinkler, AV	Critical
Computer lab and server room cable routes	Power and data	Critical
Auditorium cable routes	AV, lighting, PA	High
Canteen kitchen cable routes	Hood, oven, refrigeration	Critical
Records office cable routes	Lighting, sprinkler	High
DG room cable entries	Start, alternator, control	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
Fire water pump power (electric + diesel)	Switchgear to motor	Non-negotiable
Sprinkler / hydrant pump power	Switchgear to motor	Non-negotiable
Hostel stairwell pressurization fan	Switchgear to fan motor	Non-negotiable
Lab fume-hood exhaust power	Switchgear to fan motor	Non-negotiable
Lab gas isolation circuit	Detector to solenoid valve	Non-negotiable
PA / Voice evacuation system	Amplifier to speaker circuits	Non-negotiable
Lift homing circuit	Lift control to landing call	Critical
Emergency lighting + exit signage	Building-wide egress	Critical
Fire alarm panel feeders	Panel to repeaters and field devices	Critical
Emergency DG start & transfer	Battery to engine panel	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
Substation room boundary	Cable, pipe, duct penetrations	Critical
DG room boundary	Fuel and cable penetrations	Critical
UPS room boundary	Cable and HVAC penetrations	Critical
Chemistry lab boundary	Fume hood ducting, gas, cable	Critical
Physics / workshop lab boundary	Cable and HVAC penetrations	High
Library compartment walls	Every wall, floor, duct penetration	Critical
Computer lab / server room boundary	Cable and HVAC penetrations	Critical
Hostel riser shafts (every floor)	Floor-to-floor seal	Critical
Auditorium boundary	Cable and HVAC penetrations	High
Canteen kitchen boundary	Hood ducting, gas, cable	Critical
Records office compartment walls	Cable and HVAC penetrations	High
Stairwell and lift shaft penetrations	Cable and pipe penetrations	Critical
Fire water pump house entries	Power and control cable penetrations	Non-negotiable
HVAC duct penetrations through fire walls	Fire dampers + collar seals	Critical

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

For more information, please connect with us.