Electrical Passive Fire Protection for Cement Grinding Units

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

Section A | Electrical Zone-Wise Fire Risk Map

A1. Substations, MCC Rooms & Cable Galleries

Main substation, mill and packing MCC rooms, and cable tunnel plus control room.

Area	Fire Scenario	Stanvac PFP Product Application	Rating / Priority
Main 33/11 kV or 11 kV substation	Transformer + cable fire	Cable coatings, firestops, panel FP	**Critical**
Mill MCC (ball / VRM)	Lube oil + arc flash	Panel FP, cable coatings, firestops	**High**
Packing plant MCC	Motor / cable fire	Panel FP, cable coatings	**High**
Bag filter / ESP control room	Pulse-jet solenoid fire, cable fire	Panel FP, firestops	**High**
Cable trenches & tunnels	Propagating cable fire	Cable coatings + transverse firestops every 30 m	**High**
PLC / DCS control room	Panel + cable fire	Panel FP, firestops, FR doors	**Critical**
DG backup room	Fuel + lube oil fire	Panel FP, firestops, cable coatings	**High**
Compressor / utility block	Lube oil + cable fire	Panel FP, cable coatings	**Medium**
Battery / UPS room	H_2 accumulation	Firestops, FR doors, panel FP	**Medium**

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, firestops	**Critical**
Emergency lighting / PA route	Life-safety continuity	240-min fire-survival cable coating	**Critical**

Section B | Product-to-Application Matrix

This section maps each of the four priority Stanvac product lines to the specific cement grinding units locations and circuits where they must be specified. Use these tables to build the bill of quantities (BOQ) for any cement grinding units 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	Incoming + outgoing HT and LT trays	**Critical**
MCC cable trenches	Bottom-entry cable bunches	**High**
Overhead cable racks in grinding mill area	Trays above mill and separator	**High**
Cable tunnel SS to CCR	Full-length coating + transverse firestops	**High**
Conveyor gallery cable routes	Motor and control cables	**Medium**
Packing plant cable routes	Motor and packer controls	**Medium**
Fly ash / gypsum conveying cable routes	Motor + blower cables	**Medium**
DG room cable entries	Start, alternator, control	**High**

Zone	Specific Application	Priority
Bag filter & ESP cable routes	Pulse-jet solenoid cables	**Medium**
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
Fire water pump power	Switchgear to motor (electric + jockey)	**Non-negotiable**
Emergency DG start & transfer	Battery to engine panel	**Critical**
Emergency lighting + PA	Plant-wide egress	**Critical**
UPS feeders to DCS	UPS to marshalling	**Critical**
Critical instrumentation to DCS	Mill load, cement temperature, flow	**High**
F&G detection (if gas-fired heater present)	Detector to panel to CCR	**High**
Safety interlock & e-stop loops	Mill trip, packer trip	**High**
Cement temperature high trip to DCS	Bag filter protection	**High**
Admin evacuation lighting	Multi-storey office block	**Medium**
Compressor emergency trip	Over-pressure protection	**Medium**

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
Main substation cable trench to building	Sand-seal + firestop pillows + mortar	**Critical**
Wall between MCC and switchgear rooms	Cable and cable-tray penetrations	**Critical**
Cable tunnel transverse barriers	Every 30–50 m	**High**
CCR / PLC room external wall cable entries	Marshalling cable bundles	**High**
Floor slab penetrations in multi-storey substation	Cable, tray, conduit openings	**High**
DG room boundary	Fuel and cable penetrations	**Critical**
Fire water pump house entries	Power and control cable penetrations	**Critical**
Battery / UPS room boundary	Cable and vent duct penetrations	**Medium**
HVAC duct penetrations in admin / CCR	Fire dampers + collar seals	**Medium**

Location	Specific Application	Priority
Admin block floor slab penetrations (multi-storey)	Riser and service shaft openings	**Medium**

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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