

## Electrical Passive Fire Protection for Pharmaceutical Manufacturing 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 and unit MCC rooms serving API block, formulation block, clean room HVAC, and the server / MES room that holds GMP-critical data.

Area	Fire Scenario	Stanvac PFP Product Application	Rating / Priority
Main substation & MCC	Cable + transformer fire	Cable coatings, firestops, panel FP, fire-rated doors	<b>Critical</b>
API reactor block MCC	Solvent fire exposure + cable fire	Panel FP, cable coatings, firestops	<b>Critical</b>
Solvent storage area electrical	Pool fire exposure	Panel FP, firestops	<b>Critical</b>
Solvent recovery column panels	Column fire exposure	Panel FP, cable coatings	<b>Critical</b>
Formulation block MCC	Cable + alcohol-based fluid fire	Panel FP, cable coatings	<b>High</b>
Clean room electrical distribution (per floor)	Compartment breach during fire	Panel FP, firestops	<b>Critical</b>
HVAC AHU / chiller control panels	Cable + duct fire	Firestops, panel FP	<b>Critical</b>
Cable trenches / tunnels	Cable propagation fire	Cable coatings + transverse firestops every 30 m	<b>Critical</b>
CCR / DCS / MES room	Panel + cable fire	Panel FP, firestops, FR doors	<b>Critical</b>

Area	Fire Scenario	Stanvac PFP Product Application	Rating / Priority
Server / QMS / data room	Cable + UPS fire	Firestops, cable coatings, FR doors	<b>Critical</b>
Battery / UPS room	H <sub>2</sub> accumulation	Firestops, FR doors, panel FP	<b>High</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>
F&G / ESD / SIS circuits (API block)	Solvent vapour detection, trip circuits	Fire-survival cable, panel FP	<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 pharmaceutical manufacturing units locations and circuits where they must be specified. Use these tables to build the bill of quantities (BOQ) for any pharmaceutical manufacturing 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	All HT and LT trays	<b>Critical</b>
MCC and panel room cable trenches	Bottom-entry cable bunches	<b>Critical</b>
Cable tunnels between block & utilities	Full-length coating + transverse firestops	<b>Critical</b>

Zone	Specific Application	Priority
API production block cable routes	All reactor and utility cables	Critical
Solvent tank farm cable routing	Trays to MOVs, level tx, detectors	Critical
Formulation block cable routes	Clean room HVAC and process	High
HVAC AHU cable routes	AHU motor and control	High
Warehouse & cold chain cable routes	Warehouse lighting and chiller	High
QC / R&D lab cable routes	Lab power and instrumentation	High
DG / utility block cables	Power and control	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
ESD loops on API reactors	Field SDVs to DCS	Non-negotiable
F&G detection (solvent vapour)	Detector to F&G panel	Non-negotiable
Fire water pump power	Switchgear to motor	Non-negotiable
Deluge / foam / gaseous suppression controls	Solenoid and MOV actuation	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
Clean room pressurization + HVAC trip	Duct integrity during fire	Critical
QMS / EMS monitoring circuits	GMP-critical parameter monitoring	Critical

Circuit Type	Where Applied	Priority
Solvent tank farm ESD / BDV	Emergency blowdown	<b>Non-negotiable</b>

### 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
<b>A</b>	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>B</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.
<b>C</b>	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>
HVAC duct penetrations across clean zones	Fire dampers + collar seals	<b>Critical</b>
API block to utility block boundary	Cable and pipe penetrations	<b>Critical</b>
Solvent storage compartment walls	Cable and ventilation duct penetrations	<b>Critical</b>

Location	Specific Application	Priority
Warehouse compartment walls	Cable and conveyor penetrations	<b>Critical</b>
Main substation cable trench to building	Sand-seal + firestop pillows + mortar	<b>Critical</b>
Cable tunnel transverse barriers	Every 30–50 m	<b>Critical</b>
Server / QMS room boundary	Cable and HVAC penetrations	<b>Critical</b>
Fire water pump house entries	Power and control cable penetrations	<b>Critical</b>
DG room boundary	Fuel line and cable penetrations	<b>Critical</b>
Battery / UPS room boundary	Cable and ventilation duct penetrations	<b>High</b>
QC / R&D lab compartment walls	Cable and duct penetrations	<b>High</b>

*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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