Electrical Passive Fire Protection for Automobile Plants (4-Wheeler & 2-Wheeler)

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

Section A | Electrical Zone-Wise Fire Risk Map

A1. Substations, MCC Rooms & Cable Galleries

Main substation, paint-shop MCC (single largest PFP spend block), body / press / engine shop MCCs, EV battery assembly electrical, and the plant CCR.

Area	Fire Scenario	Stanvac PFP Product Application	Rating / Priority
Main substation	Transformer + cable fire	Cable coatings, firestops, panel FP	**Critical**
Paint shop MCC	Solvent fire + oven overheat	Panel FP, cable coatings, firestops (jet-fire rated)	**Critical**
Paint kitchen electrical	Solvent pool fire	Panel FP, firestops	**Critical**
Spray booth control panels	Vapour fire exposure	Panel FP, cable coatings	**Critical**
ED / oven control panels	High-temp + vapour fire	Panel FP, cable coatings	**Critical**
Body shop weld-robot MCC	Hot work + cable fire	Panel FP, cable coatings	**High**
Press shop hydraulic panels	Hydraulic oil fire	Panel FP, cable coatings	**High**
EV battery assembly electrical	Li-ion thermal runaway exposure	Panel FP, firestops, FR doors	**Critical**
Cable tunnels	Propagating cable fire	Cable coatings + transverse firestops	**Critical**
CCR / DCS	Panel + cable fire	Panel FP, firestops, FR doors	**Critical**
DG room	Fuel + lube oil fire	Panel FP, firestops	**Critical**

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**
Paint shop ESD + deluge / foam system	Solvent supply + oven trip, deluge actuation	Fire-survival cable, panel FP	**Non-negotiable**
EV battery thermal runaway detection + suppression	BMS to central panel to discharge	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 automobile plants (4-wheeler & 2-wheeler) locations and circuits where they must be specified. Use these tables to build the bill of quantities (BOQ) for any automobile plants (4-wheeler & 2-wheeler) 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
Paint shop cable routes	All paint shop cables	**Critical**
Solvent mix / storage cable routes	All solvent handling cables	**Critical**
Main substation cable gallery	Incoming and outgoing	**Critical**
Cable tunnels (SS to CCR, SS to shops)	Full-length coating + transverse firestops every 30 m	**Critical**
Body shop cable routes	Weld robot and control	**High**
Press shop cable routes	Hydraulic and motor	**High**
Engine shop cable routes	Machining and test	**High**

Zone	Specific Application	Priority
EV battery assembly cable routes	Li-ion assembly cables	**Critical**
Utility block cable trays	Motor and instrumentation	**High**
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
Paint shop ESD / emergency stop	Solvent supply + oven trip	**Non-negotiable**
Paint shop deluge / foam system	Deluge valve actuation	**Non-negotiable**
F&G detection (solvent vapour)	Detector to F&G panel	**Non-negotiable**
Fire water pump power (electric + diesel)	Switchgear to motor	**Non-negotiable**
Emergency DG start & transfer	Battery to engine panel	**Critical**
Emergency lighting + PA / GA	Plant-wide egress	**Critical**
EV battery thermal runaway detection	BMS to central panel	**Critical**
Paint oven trip circuits	Temperature + flame scanner	**Critical**
UPS feeders to DCS / SIS	UPS to marshalling	**Critical**
Solvent tank ESD / BDV	Emergency blowdown	**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
Paint shop compartment walls	Every cable, duct, pipe penetration	**Critical**
Spray booth & oven duct penetrations	Fire dampers + collar seals	**Critical**
Paint kitchen boundary	Cable and pipe penetrations	**Critical**
Solvent storage boundary	Cable and ventilation duct penetrations	**Critical**
Main substation cable trench to building	Sand-seal + firestop pillows + mortar	**Critical**
Cable tunnel transverse barriers	Every 30–50 m	**Critical**
Body shop to paint shop boundary	Cable and conveyor penetrations	**Critical**
EV battery assembly compartment walls	Cable + HVAC penetrations	**Critical**
DG room boundary	Fuel and cable penetrations	**Critical**
Fire water pump house entries	Power and control cable penetrations	**Non-negotiable**

Location	Specific Application	Priority
HVAC duct penetrations	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.

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