

## Electrical Passive Fire Protection for Automobile Manufacturing (4 & 2 Wheelers)

Substations · Body & Paint Shops · EV Battery Lines · Final Assembly · Safety-Critical Circuits

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

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

Vehicle assembly plants for 4-wheelers and 2-wheelers — main substations, captive utilities, press shop, body / weld shop, paint shop and paint kitchen (e-coat, primer, basecoat, clearcoat), trim and final assembly, engine assembly, plastic injection moulding, EV battery test and pack assembly, vehicle fueling, finished vehicle yard and compressor house. Paint shop and paint kitchen are the dominant hydrocarbon-fire risk; EV battery lines introduce high-energy-density thermal-runaway scenarios.

Area	Fire Scenario	Stanvac PFP Product Application	Rating / Priority
Main substation	Transformer + cable fire	Cable coatings, firestops, panel FP	4 hr / Critical
CPP / utility electrical	Fuel + oil fire exposure	Cable coatings, firestops, panel FP	3 hr / Critical
Press shop MCC	Hydraulic oil mist + drive motor	Cable coatings, panel FP	H60 / High
Body shop / weld shop MCC	Spark + robot drive + cable fire	Cable coatings, panel FP	2 hr / Critical
Paint shop MCC (e-coat / primer / base / clear)	Solvent vapour ignition + pool fire	Panel FP (Zone 1 spec), cable coatings, firestops	H60 + 2 hr / Critical
Paint kitchen / mix room	Bulk solvent inventory fire	Structural intumescent, cable wraps, panel FP	H120 + 2 hr / Critical
Trim & final assembly MCC	Cable + plastic interior fire	Cable coatings, panel FP	2 hr / High
Engine assembly MCC	Drive + lubricant fire	Cable coatings, panel FP	2 hr / High
Plastic injection moulding MCC	Heater + molten plastic fire	Cable coatings, panel FP	2 hr / Critical
EV battery test / pack assembly MCC	Cell thermal-runaway + propagation	Cable coatings, panel FP, firestops	2-3 hr / Critical
EV battery storage / staging area	Cascading thermal-runaway fire	Cable coatings, fire-survival cabling, firestops	3 hr / Critical
Vehicle fueling / final fill area	Fuel vapour + electrical	Panel FP (Zone 1 spec), cable coatings	H60 + 2 hr / Critical
Solvent storage electrical	Hydrocarbon vapour explosion + pool fire	Structural intumescent, cable wraps, panel FP	H120 + 2 hr / Critical
Finished vehicle yard electrical	Vehicle fire load	Cable coatings, fire-survival cabling for jet fans	2 hr / High
Compressor house	Lube oil mist fire	Panel FP, cable coatings	2 hr / High
Cable galleries (utility → shops)	Propagating cable fire	Cable coatings + transverse firestops every 30 m	3 hr / Critical
DG room (multiple sets)	Diesel pool fire	Cable coatings, firestops, panel FP	2-3 hr / Critical

Area	Fire Scenario	Stanvac PFP Product Application	Rating / Priority
CCR / DCS	Panel + cable fire	Panel FP, firestops, FR doors	2 hr / Critical

## A2. Safety-Critical Electrical Systems

These systems must remain operational throughout the fire event in order to control or extinguish it. Fire-survival cable integrity is mandatory under IEC 60331-21 and BS 6387 CWZ; failure to specify is a non-compliance under NBC Part 4 — Fire and Life Safety, and where paint shop / solvent / fueling zones are involved, OISD-STD-117 hydrocarbon-fire ratings apply. EV battery handling areas require the same rating because of the thermal-runaway energy density.

Area	Fire Scenario	Stanvac PFP Product Application	Rating / Priority
Fire water pump house (high-duty)	Must survive the fire it fights	Fireproofed structure, FR cables	3 hr / Critical
Paint booth fire suppression release	CO <sub>2</sub> / IG release on detection	Fire-survival cable, panel FP	IEC 60331 / BS 6387 CWZ / Non-negotiable
Paint kitchen F&G + ESD	Vapour detection + ESD trip	Fire-survival cable, panel FP	IEC 60331 / BS 6387 CWZ / Non-negotiable
Solvent storage F&G detection	Vapour detection + ESD trip	Fire-survival cable, panel FP	IEC 60331 / BS 6387 CWZ / Non-negotiable
EV battery cell isolation + cooling	Thermal-runaway response circuit	Fire-survival cable, panel FP	IEC 60331 / BS 6387 CWZ / Non-negotiable
Vehicle fueling area F&G	Fuel vapour detection + ESD	Fire-survival cable, panel FP	IEC 60331 / BS 6387 CWZ / Non-negotiable
Warehouse sprinkler pump power	Switchgear to motor	Fire-survival cable	IEC 60331 / BS 6387 CWZ / Non-negotiable
Emergency DG start & transfer	Battery to engine panel	Fire-survival cable	BS 6387 CWZ / Critical
Emergency lighting + PA / GA	Plant-wide egress	Fire-survival cable	BS 6387 CWZ / Critical
UPS feeders to DCS / SCADA	UPS to marshalling	Fire-survival cable	BS 6387 CWZ / Critical

## Section B | Product-to-Application Matrix

This section maps each of the four priority Stanvac product lines to the specific automobile manufacturing (4 & 2 wheelers) locations and circuits where they must be specified. Use these tables to build the bill of quantities (BOQ) for any automobile manufacturing (4 & 2 wheelers) 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
Press shop cable trays	All hydraulic and drive cables	Critical
Body shop / weld shop cable routes	Robot drive, weld controller, lighting	Critical
Paint shop cable routes (all booths)	All cables crossing classified zones	Critical
Paint kitchen cable routes	All cables in bulk solvent area	Critical
Trim & final assembly cable routes	Drive, lighting, AV	High
Engine assembly cable routes	Drive, dyno, lighting	High
Plastic injection moulding cable routes	Heater, drive, robot	Critical
EV battery line cable routes	Charger, BMS, monitoring, isolation	Critical
EV battery storage cable routes	Lighting + sprinkler + monitoring	Critical
Vehicle fueling area cable routes	All cables crossing classified zones	Critical
Solvent storage cable entries	All cables crossing classified zones	Critical
Finished vehicle yard cable routes	Lighting + jet-fan + sprinkler	Critical
Compressor house cable routes	HP air compressor + dryer	High
Main substation cable gallery	Incoming and outgoing	Critical
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
Paint booth fire suppression release	Detector to suppression actuator	Non-negotiable
Paint kitchen F&G + ESD	Detector to ESD logic	Non-negotiable
Solvent storage F&G detection	Detector to F&G panel	Non-negotiable
EV battery cell isolation + cooling	ESD logic to isolation contactor	Non-negotiable
Vehicle fueling area F&G	Detector to ESD logic	Non-negotiable
Warehouse sprinkler pump power	Switchgear to motor	Non-negotiable

Circuit Type	Where Applied	Priority
Emergency lighting + PA / GA	Plant-wide egress	Critical
UPS feeders to DCS / SCADA	UPS to marshalling	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
Body shop / weld shop boundary	Cable, pipe, duct penetrations	Critical
Paint shop boundary (all booths)	Cable, duct, pipe penetrations	Critical
Paint kitchen compartment walls	All wall, floor, duct penetrations	Critical
Plastic injection moulding boundary	Cable and pipe penetrations	Critical
EV battery test / pack assembly boundary	Cable and exhaust penetrations	Critical
EV battery storage / staging perimeter	Every wall, floor, duct penetration	Critical
Vehicle fueling area compartment walls	Cable, duct, pipe penetrations	Critical
Solvent storage compartment walls	All wall, floor, duct penetrations	Critical
Main substation cable trench to building	Sand-seal + firestop pillows + mortar	Critical
Cable tunnel transverse barriers	Every 30–50 m	Critical
DG room boundary	Fuel and cable penetrations	Critical
Fire water pump house entries	Power and control cable penetrations	Non-negotiable
HVAC duct penetrations	Fire dampers + collar seals	High

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

**For more information, please connect with us.**