Electrical Passive Fire Protection for Beverage Bottling Plants

Substations · Syrup & Carbonation · PET Blow-Moulding · Bottle / Crate Warehouses · Safety-Critical Circuits

Section A | Electrical Zone-Wise Fire Risk Map

A1. Substations, MCC Rooms & Cable Galleries

Main substation, boiler / utility MCC, sugar syrup preparation, CO_2 dosing and carbonation, bottle washing (caustic), filling lines, PET preform / blow-moulding, pasteuriser, cold storage / chilled water plant, shrink-wrap and palletiser, CIP chemical dosing, compressor house and finished-goods warehouse. Sugar dust deflagration, caustic + electrical exposure, CO_2 / NH_3 asphyxiation, and Class A high-hazard fire load drive the design basis.

Area	Fire Scenario	Stanvac PFP Product Application	Rating / Priority
Main substation	Transformer + cable fire	Cable coatings, firestops, panel FP	3 hr / Critical
Boiler / utility electrical	Fuel + lagging fire exposure	Cable coatings, firestops, panel FP	2-3 hr / Critical
Sugar syrup preparation MCC	Sugar dust deflagration + heated processing	Cable coatings, panel FP, firestops	2 hr / Critical
CO_2 dosing / carbonation MCC	Pressurised gas leak + electrical	Panel FP, cable coatings	2 hr / High
Bottle washing / caustic dosing MCC	Caustic spray + electrical	Panel FP (corrosion-resistant), cable coatings	2 hr / High
Filling line MCC	High-speed conveyor + cable fire	Cable coatings, panel FP	2 hr / High
PET preform / blow-moulding MCC	Heater + molten plastic + HP air	Cable coatings, panel FP, firestops	2 hr / Critical
Pasteuriser / homogeniser MCC	Hot-fluid and motor fire	Cable coatings, panel FP	2 hr / High
Cold storage / chilled water plant electrical	NH_3 / freon leak + electrical ignition	Panel FP (corrosion-resistant), cable coatings	2 hr / Critical
Shrink-wrap / palletiser MCC	Heater + film fire	Panel FP, cable coatings	2 hr / High
CIP chemical dosing MCC	Caustic / acid + electrical	Panel FP (corrosion-resistant), cable coatings	2 hr / High
Compressor house (HP air for PET blow)	Lube oil mist fire	Panel FP, cable coatings	2 hr / High
Finished goods / carton warehouse	Class A high-hazard fire load	Cable coatings, fire-survival cabling, firestops	3 hr / Critical
Crate / glass storage MCC	Lighting + ventilation	Cable coatings, panel FP	2 hr / High
Cable galleries (utility → process)	Propagating cable fire	Cable coatings + transverse firestops every 30 m	3 hr / Critical
DG room	Diesel pool fire	Cable coatings, firestops, panel FP	2-3 hr / Critical
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 under FSSAI Schedule 4 operating-discipline requirements.

Area	Fire Scenario	Stanvac PFP Product Application	Rating / Priority
Fire water pump house	Must survive the fire it fights	Fireproofed structure, FR cables	3 hr / Critical
CO_2 leak detection + emergency vent	Asphyxiation hazard mitigation	Fire-survival cable, panel FP	IEC 60331 / BS 6387 CWZ / Non-negotiable
Ammonia leak detection + emergency vent	NH_3 detector to vent fan (refrigeration)	Fire-survival cable, panel FP	IEC 60331 / BS 6387 CWZ / Non-negotiable
Sugar dust suppression release	Deflagration suppression on event	Fire-survival cable	IEC 60331 / BS 6387 CWZ / Non-negotiable
Caustic spill emergency wash + isolation	Operator safety circuit	Fire-survival cable	IEC 60331 / BS 6387 CWZ / Non-negotiable
Warehouse sprinkler pump power	Switchgear to motor	Fire-survival cable	IEC 60331 / BS 6387 CWZ / Non-negotiable
Cold store emergency lighting + man-trap	Trapped-person egress	Fire-survival cable	BS 6387 CWZ / Critical
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 beverage bottling plants locations and circuits where they must be specified. Use these tables to build the bill of quantities (BOQ) for any beverage bottling plants 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
Sugar syrup hall cable trays	All HT/LT trays + transverse firestops every 30 m	Critical

Zone	Specific Application	Priority
PET blow-moulding cable routes	Heater, HP air, drive	Critical
Filling and capping line cable routes	Drive, sensor, lighting	High
Pasteuriser / homogeniser cable routes	Hot-fluid loop instrumentation	High
Cold-storage and chilled-water plant cable routes	Compressor, condenser, pump	Critical
Bottle washing / caustic area cable routes	Cables in chemical zones (corrosion-resistant)	High
CIP / chemical dosing cable routes	All cables in chemical zones	High
Compressor house cable routes	HP air compressor + dryer	High
Finished goods warehouse cable routes	Lighting + sprinkler	Critical
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
Warehouse sprinkler pump power	Switchgear to motor	Non-negotiable
CO_2 leak detection + vent fan	Detector to vent fan motor	Non-negotiable
Ammonia leak detection + vent fan	Detector to vent fan motor	Non-negotiable
Sugar dust suppression release	Detector to suppression actuator	Non-negotiable
Caustic emergency wash + isolation	Operator station to isolation valve	Critical
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
Cold-store door release & emergency lighting	Trapped-person egress	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
Sugar syrup hall boundary	Cable, pipe, duct penetrations	Critical
PET blow-moulding hall boundary	Cable and pipe penetrations	Critical
Cold-storage envelope	Cable and pipe penetrations through PUF	Critical
Bottle washing / caustic compartment walls	Corrosion-resistant firestops	Critical
Finished goods warehouse perimeter	Every wall, floor, duct penetration	Critical
Compressor house boundary	Cable and pipe penetrations	High
CIP / chemical room compartment walls	Corrosion-resistant firestops	High
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.