Flange Isolation Kits — Type E/F/D, G10/PTFE Materials and Testing the Break

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Why cathodic-protected and mixed-metal pipelines need electrical breaks at flanges, what an isolation kit contains (gasket, sleeves, washers) and the Type E/F/D gasket geometries, material grades from phenolic to G10 epoxy glass, installation discipline and how to prove isolation actually works.

Why pipelines break their own continuity

Cathodic protection current flows wherever metal conducts — so a protected buried line electrically touching an unprotected plant drains its anodes into the plant's earthing grid, and a stainless manifold bolted to carbon steel sets up a galvanic cell at the joint. The cure is a deliberate electrical break at a flange: an isolation kit. The stocked line covers big-bore utility piping — DN250 PN16 Type E in G10/PTFE, DN300 and DN350 — each kit a complete set: central gasket, one full-length sleeve per bolt, two insulating washers per bolt plus steel backing washers.

Gasket type letters and materials

Element | Options | Choosing |

Gasket geometry | Type E = full-face (covers the whole flange face, bolt holes included); Type F = raised-face only (sits inside the bolt circle); Type D = ring for RTJ grooves | Match the flange facing: full-face E on flat-face and general PN flanges (the stocked pattern), F on raised-face where a smaller gasket is wanted, D only in ring-joint territory (RTJ dimensions) |

Gasket body | Phenolic (economy) !’ G10/G11 epoxy glass (the stocked grade) with a PTFE or elastomer seal element | G10 carries higher compressive strength, temperature and moisture resistance — the default for anything that matters; the seal element's compound follows the medium |

Sleeves & washers | Mylar/phenolic/G10 sleeves; G10 washers + steel over-washers | Sleeves must be full bolt length through both flanges — half-sleeves defeat the kit |

Installation and proof

Alignment before insertion: isolation kits tolerate zero flange misalignment — a cocked bolt cuts its sleeve and shorts the joint invisibly.

Torque to the kit maker's figures (lower than bare-steel values — the gasket body sets the limit) in the standard cross pattern (torque chart, bolt lengths — remember sleeves add diameter: drilled holes must accept them).

Prove it: resistance across the assembled joint (isolated flange testers or a simple megger at modest voltage) before backfill/insulation — and periodically, since one conductive scratch, a tool left bridging, or waterlogged phenolic re-connects the circuits. CP context lives in the cathodic-protection guide.

Monolithic isolation joints (factory-welded units) answer buried/critical locations where a bolted kit's maintainability is a liability — specify by line size and class.

Kits quote within 24 hours by DN, pressure class, flange facing, gasket type letter and medium; around 25 kit line items are stocked with the big-bore G10/PTFE builds above, sleeves and washers counted per bolt circle.

Frequently asked questions
What is inside a flange isolation kit?One insulating gasket (E, F or D geometry), a full-length insulating sleeve for every bolt, two insulating washers per bolt and steel backing washers — everything needed so no metal path crosses the joint. Missing any element shorts the break.Type E or Type F gasket — how do I choose?By flange facing: Type E is full-face for flat-face flanges and the general PN-flange pattern (the stocked kits), Type F covers only the raised face inside the bolt circle, Type D serves ring-type-joint flanges exclusively.How do I verify a flange isolation kit works after installation?Measure resistance across the joint before the line is buried or insulated — a dedicated isolation tester (or careful megger use at low voltage on a dead line) should show effectively open circuit. Re-test periodically; single scratches and trapped debris re-bridge joints silently.Why G10 instead of phenolic gaskets?Compressive strength, temperature tolerance and water resistance — phenolic absorbs moisture and creeps under bolt load, losing both seal and isolation with time. G10 epoxy-glass with a PTFE seal element is the grade that survives re-torquing and weather.Do isolation kits affect the flange's pressure rating?The kit's own rating governs — quality G10 kits match PN16/Class 150-300 duty when torqued to the kit's (lower) figures. The real risk is not pressure but installation: cut sleeves and over-torque, not the materials, cause failures.

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