

# Gasket Material Selection Guide

Klingersil, Klinger Top-Chem, spiral wound (ASME B16.20), ring joint, PTFE, kammprofile & plate-heat-exchanger EPDM / NBR

The right gasket for a joint balances temperature, pressure, media and the flange geometry. Soft (fibre) sheet gaskets suit low-to-medium temperature raised-face flanges and are easy to cut; spiral wound gaskets take higher pressure classes and higher temperatures without cold-flow; ring joints seal the high-pressure classes 900 to 2500 and need grooved flanges; PTFE and PTFE-filler sheets take aggressive chemicals but need bolt-load control against cold flow; plate-heat-exchanger gaskets are model-specific EPDM or NBR moulded profiles. This chart lists the materials most often called out in the marine, offshore, refinery and process industries with their temperature and pressure limits and the service each is best used for.

| Material              | Service                                | T max (°C) | p max (bar / class) | Thickness                 | Notes   |
|-----------------------|--|------------|---------------------|---------------------------|---|
| Klingersil C-4400     | General water, steam, oil, gas         | 200        | 85                  | 0.5 – 3.0 mm              | Aramid + NBR binder. Blue-grey. Non-asbestos general purpose.         |
| Klingersil C-4324     | Steam + oil (higher pressure)          | 250        | 100                 | 0.5 – 3.0 mm              | Aramid + NBR, higher tightness class than C-4400.                     |
| Klinger Top-Chem 2000 | Chemical (aggressive acids + alkalis)  | 250        | 120                 | 1.0 – 3.0 mm              | PTFE + silica filler. Off-white. Standard for chemical duty.          |
| Klinger Top-Chem 2003 | Hot HF, chlorine, oleum                | 260        | 200                 | 1.0 – 3.0 mm              | PTFE + BaSO <sub>4</sub> filler. Grey. High-tightness chemical.       |
| Expanded PTFE tape    | Chemical + flange-face repair          | 260        | 150                 | 1.5 – 6 mm (tape)         | Deformable to seal warped or damaged flange faces.                    |
| Spiral wound (SWG)    | Steam + pressure vessels (ASME B16.20) | 650        | Class 900+          | per ASME B16.20           | 304/316 SS windings + graphite/PTFE filler. Standard for ASME.        |
| SWG + inner ring      | High pressure + hazardous media        | 650        | Class 1500+         | per ASME B16.20           | Inner ring prevents bore buckling; mandatory Class 900+.              |
| Grafoil-filled SWG    | Steam, refinery                        | 450        | Class 900           | per ASME B16.20           | Best for saturated steam; ferritic steel windings for high temp.      |
| Ring joint (RTJ)      | ASME B16.5 Class 900+, refinery        | 540        | Class 2500          | oval/octagonal per B16.20 | Soft-iron / 316 SS / Inconel 625 (RTJ 625)                            |
| Kammprofile           | Steam + gas turbine + heat exchangers  | 800        | Class 900+          | 3 – 5 mm                  | Sealed metal core with graphite/PTFE facing; reusable core.           |
| Aluminium jacketed    | Heat exchanger channel/cover           | 500        | Class 600           | 3 – 6 mm                  | Metal-jacketed with fibre filler; heat-exchanger + shell + tube duty. |
| Alfa Laval EPDM plate | Plate heat exchanger, food + water     | 160        | 25                  | per PHE model             | FPP-fitted EPDM; wrong compound in seawater PHE – look.               |
| Alfa Laval NBR plate  | Oil + fuel PHE                         | 110        | 25                  | per PHE model             | NBR compound; not for phosphate ester or hot ethylene glycol.         |

## Choosing the right family

- Fibre sheet (Klingersil family) — the low-cost general-purpose choice up to ~200 °C on raised-face flanges. Thin sheet (0.5 – 1 mm) gives higher tightness but blows out at lower pressure; thicker sheet (2 – 3 mm) forgives flange-face damage. Never on RTJ groove.
- PTFE + filler (Top-Chem, Gore, Garlock) — for hot aggressive chemistry that attacks NBR binder. Higher creep than fibre sheet; watch bolt relaxation and re-torque after commissioning.
- Spiral wound (SWG, ASME B16.20) — the industry standard for ASME B16.5 raised-face flanges Class 300 and above, and Class 150 above NPS 6. Metal windings of 304/316 SS (default) or Inconel 625 (aggressive) with a graphite or PTFE filler. Add an inner ring above Class 900.
- Ring joint (RTJ) — a soft-iron, stainless or Inconel oval or octagonal ring seating into a matching flange groove. Needed for Class 900+ high-pressure duty in refineries and wellheads. Confirm ring number, cross-section (R vs BX vs RX) and hardness against the flange groove.
- Kammprofile — a corrugated metal core with a soft graphite or PTFE facing. Reusable core (change only the facing at rebuild). Standard for heat-exchanger channel covers and turbine casings.
- Plate heat exchanger (PHE) — EPDM (water, weak acid, glycol) or NBR (oil, fuel). Always order the OEM-marked gasket for the plate model — a wrong-compound gasket looks identical but fails within weeks.

Reference compiled by cBallast from Klinger technical bulletin (current edition), ASME B16.20 (spiral wound + ring joint dimensions), ASME B16.5 (facing type / gasket pairing) and Alfa Laval PHE plate + gasket data. Temperature and pressure limits are for the material family; the actual joint tightness class depends on the flange face, bolt load and media. Confirm against the gasket maker's current technical bulletin and PED / API gasket qualification before final selection. All trademarks are the property of their respective owners.

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