

PTFE-enveloped gaskets

PTFE flange gaskets are being more and more frequently used for flanged joints which are subjected to extreme chemical attacks. PTFE composites and PTFE-enveloped gaskets with increased pressure stability are chiefly used because of the cold-flow tendency of filler-free PTFE.

PTFE-enveloped gaskets have proved themselves because of high resistance to chemicals as well as on account of their excellent sealing properties at changing pressures and temperatures of between -195°C up to +250°C. Glass tubes, metal-sheathed glass tubes and glass apparatuses in laboratory systems or pilot plants can be just as easily connected to each other as enamelled, coated or lined tubes and apparatuses in large-scale plants.

PTFE-enveloped gaskets are particularly used in the chemical industry because of their high resistance to aggressive chemicals. Since PTFE is generally recognised as physiologically safe, it is also used in the food and pharmaceuticals field.

In addition to its high chemical resistance, PTFE stands out for its extremely anti-adhesive behaviour. This anti-adhesive effect causes no material to adhere to the surface of PTFE. PTFE-enveloped gaskets consist of a stable gaskets insert and a PTFE envelope. Various inserts such as corrugated steel plate with cord or soft material layers, rubber, RivaTherm-Super and FA* are covered with a PTFE envelope. Only high-grade, non-porous PTFE is used for the envelope so that the insert is protected against chemical attack. Depending on requirements, the PTFE envelopes are open at the outer or inner diameter or fully envelop the insert. The thickness of the envelope is 0.5 mm and that is the reason for its high stability. Turned envelopes can have a increased thickness from 2 up to 4 mm at the inner diameter so that a greater imperviousness to diffusion is given.

Profile TF2: The insert usually consists of RivaTherm-Super, rubber, reinforced rubber-steel or FA*. This gasket with an insert of RivaTherm-Super or rubber is also suited

for a plastic flange or a glass-fibre-reinforced flange because of its great adaptability and softness. With the surface pressure required for PTFE rubber without a reinforcing insert can more or less be strongly pressed out of the envelope.

Profile TF3: Design as TF2 but with an increasing thickness of the envelope at the inner diameter.

| Profile | | TF2 TF3 TF18 | TWA2 TW3 | TF27 TF29 |
|--|-------------------------------------|--------------------|----------------------|----------------|
| Materials | | PTFE FA* | PTFE Stahl FA* | PTFE 1.4541 |
| Rec. max. surface roughness of the flange surfaces | from to µm | 25 50 | 50 100 | 25 50 |
| Surface pressure limits for 20 °C | N/mm ² σ _s | 15 60 | 20 80 | 15 500 |
| Surface pressure limits for 250 °C | N/mm ² σ _s | 25 45 | 25 60 | 17 450 |

* TA Fiber sheet according to DIN 28091-2

| Profile | Cross section |
|---------|---------------|
| TF2 | |
| TF3 | |
| TWA2 | |
| TW3 | |
| TW4 | |
| TW5 | |
| TW10 | |
| TW21 | |
| TF18 | |
| TF19 | |
| TF20 | |
| TF21 | |
| TF22 | |
| TF23 | |
| TF27 | |
| TF29 | |

** middle-ending corrugated ring only in 1.4571 up to DN 200



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Profile TWA2: With a corrugated ring, a thin plate layer on both sides and a layer of RivaTherm-Super. As a result of the intermediate plate layer the corrugated ring is not filled out by the soft material so that the spring effect of the corrugated reinforcement is less hindered.

Profile TW3: The insert is a corrugated ring with a mineral-fibre cord layer, PTFE cord layer or a rubbercord layer for special applications.

Profile TW4: In this case the insert is made up of a corrugated ring with a layer of RivaTherm-Super on both sides or an FA* layer for up to approx. 150°C.

Profile TW5: Like TW4 but with a PTFE envelope that has been enlarged at the inner diameter to approx. 2.5 mm to improve the imperviousness to diffusion.

Profile TW10: Like TW3 but with an additional RivaTherm-Super or FA* layer on both sides.

Profile TW21: Turned PTFE envelope, enlarged inside with a corrugated ring insert. Up to DN 200 the corrugated ring has a middle ending flat finish.

The **TF18, TF19 and TF20** profiles have envelopes which are cutted without chippings and therefore more favourably priced than gaskets according to **profile TF21, TF22 and TF23** with a turned envelope.

Profile TF25, TF27 and TF29 with a grooved gasket as insert can be used for high pressures with smooth sealing surfaces of metal, ceramics, enamel or glass. The sealing surfaces with ceramics, enamel and glass have to be plane ground so that no punctual stress peaks occur which can result in the destruction of the material.

PTFE-enveloped gaskets are designed for:

Flanges for impeller type mixers of steel, enamelled

- according to DIN 28 148

Flanges with raised face²⁾

- according to DIN 2690 for DIN flanges
- according to ANSI B 16.21 for ANSI B 16.5 flanges
- according to ANSI B 16.21 for ASME B16.47 series A
- according to ANSI B 16.21 for ASME B16.47 series B

Flanges with tongue and groove²⁾

- according to DIN 2691³⁾
- according to ANSI B 16.5³⁾

Flanges with spigot and recess²⁾

- according to DIN 2692
- according to ANSI B 16.5
- according to ASME B16.47 series B

For flat face flanges²⁾

- according to DIN 86071
- according to DIN 86072
- according to ANSI B 16.21 and works standard 132 for ANSI B 16.5 flanges
- according to works standard 142 for ASME B16.47 series A flanges

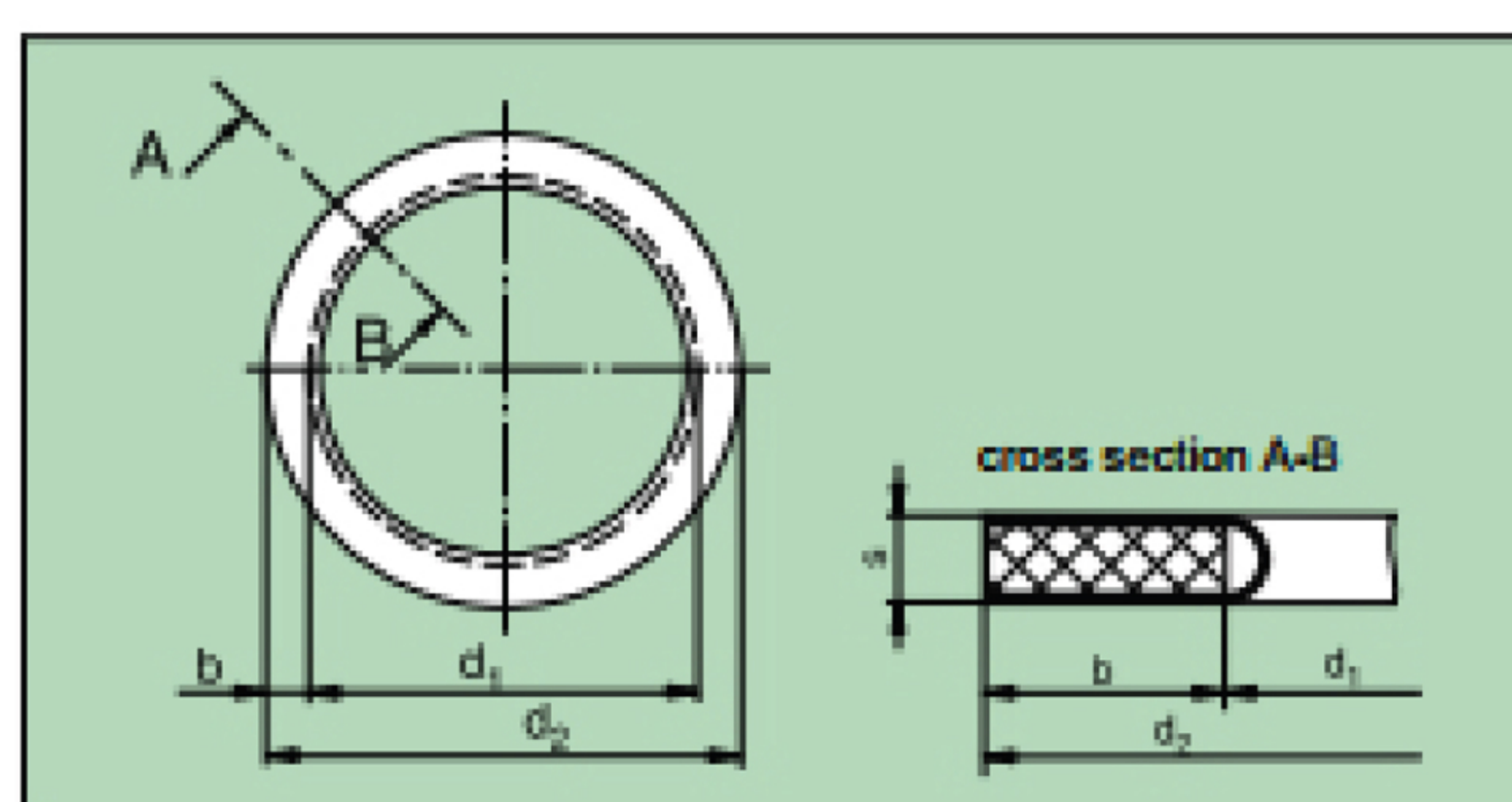
Apparatus-flange connections²⁾

- according to DIN 28040

Flange connections according to DIN 20002, 20003²⁾

- according to DIN 20006

PTFE-enveloped gasket for impeller type mixer of steel, enamelled according to DIN 28 148



Order example for a flat gasket, profile PW4, nominal width 100, of1):

PTFE-enveloped gasket, profile TW4, DN 100, DIN 28 148, 1.4541 / FA* / PTFE

* FA = Fibre sheet according to DIN 28091-2

| Form DN | A | | | | B | | | | b | d ₁ | d ₂ | s |
|------------|------|----------------|----------------|---|------|----------------|----------------|----|---|----------------|----------------|---|
| | b | d ₁ | d ₂ | s | b | d ₁ | d ₂ | s | | | | |
| 25 | - | - | - | - | 14,0 | 42 | 70 | 5 | | | | |
| 32 | - | - | - | - | 16,0 | 50 | 82 | 5 | | | | |
| 40 | - | - | - | - | 16,5 | 59 | 92 | 5 | | | | |
| 50 | 16,5 | 71 | 104 | 5 | 18,0 | 71 | 107 | 5 | | | | |
| 65 | - | - | - | - | 20,5 | 86 | 127 | 5 | | | | |
| 80 | 19,5 | 101 | 140 | 5 | 20,5 | 101 | 142 | 5 | | | | |
| 100 | - | - | - | - | 18,5 | 125 | 162 | 5 | | | | |
| 125 | 20,0 | 150 | 190 | 5 | 21,0 | 150 | 192 | 7 | | | | |
| 150 | 19,5 | 175 | 214 | 5 | 21,5 | 175 | 218 | 7 | | | | |
| 200 | 22,5 | 225 | 270 | 5 | 24,0 | 225 | 273 | 7 | | | | |
| 250 | 21,5 | 262 | 305 | 5 | 26,5 | 275 | 328 | 7 | | | | |
| 300 | 21,5 | 312 | 355 | 5 | 26,5 | 325 | 378 | 10 | | | | |
| 400 | - | - | - | - | 31,5 | 427 | 490 | 10 | | | | |
| 500 | - | - | - | - | - | - | - | - | | | | |
| 600 | - | - | - | - | - | - | - | - | | | | |

- A: For flanges in impeller type mixers according to DIN 28137 - 2
- B: For nozzles with divided loose flanges according to DIN 28139 - 3 and DIN 28140 - 2
- C: For hood flanges according to DIN 28139 - 1 and assembly openings according to DIN 28139 - 2
- D: For manhole and handhole nozzles according to DIN 28139 - 2 and nozzles with loose flanges according to DIN 28139 - 3 and DIN 28140 - 2

| Form DN | C | | | |
|------------|------|----------------|----------------|----|
| | b | d ₁ | d ₂ | s |
| 508 | 25,0 | 515 | 565 | 10 |
| 600 | 25,0 | 605 | 655 | 10 |
| 700 | 32,5 | 710 | 775 | 10 |
| 800 | 32,5 | 810 | 875 | 10 |
| 1000 | 32,5 | 101 | 107 | 10 |
| 1200 | 32,5 | 121 | 127 | 10 |
| 1400 | 37,5 | 141 | 148 | 10 |
| 1600 | 37,5 | 161 | 168 | 10 |
| 1800 | 37,5 | 181 | 188 | 10 |
| 2000 | 37,5 | 201 | 208 | 10 |

¹⁾ State material with order
²⁾ For the dimensions see our brochure entitled "General dimensional tables for flange gaskets to DIN, ANSI, BS ". Please request if and when required.
³⁾ For flanges with tongue and groove PTFE-enveloped gaskets are from a sealing point of view not suited and/or only profiles with an angular envelope can be used because of the narrow width of the gasket, depending on the nominal diameter.

