# WS 1290

# Stainless Steel-Bellows with PTFE lining (for Block Nozzles, DIN)

## Works Standard

### Main Dimensions and Characteristics

| DN | Neutral Length [mm] | Effective-Area [cm²] | Flange Connection D1 [mm] | LK1 [mm] | d1 [mm] | D2 [mm] | LK2 [mm] | d2 [mm] |
|---|---|---|---|---|---|---|---|---|
| 40 | 130 | 28 | 150 | 110 | 4xØ18 | 150 | 110 | 4xØ18 |
| 50 | 125 | 42 | 165 | 125 | 4xØ18 | 165 | 125 | 4xØ18 |
| 65 | 135 | 59 | 185 | 145 | 8xØ18 | 185 | 145 | 8xØ18 |
| 80 | 130 | 85 | 200 | 160 | 8xØ18 | 200 | 160 | 8xØ18 |
| 100 | 160 | 138 | 220 | 180 | 8xØ18 | 220 | 180 | 8xØ18 |
| 125 | 175 | 201 | 250 | 210 | 8xØ18 | 250 | 210 | 8xØ18 |
| 150 | 165 | 280 | 285 | 240 | 8xØ22 | 285 | 240 | 8xØ22 |
| 200 | 179 | 448 | 340 | 295 | 8xØ22 | 340 | 295 | 8xØ22 |
| 250 | 200 | 677,5 | 395 | 350 | 12xØ22 | 395 | 350 | 12xØ22 |
| 300 | 210 | 939 | 445 | 400 | 12xØ22 | 445 | 400 | 12xØ22 |

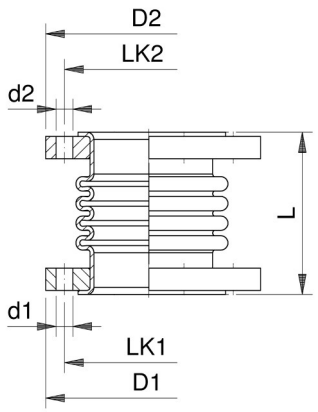
| DN | Full Vacuum Performance [at 180°C] | Movements Length max. [mm] | lateral max. [mm] | angular max. [degree] | Spring Rate (+/- 30% at 20°C) Axial Compress. [N/mm] | Axial Extension [N/mm] | lateral [N/mm] | angular [Nm/degr.] |
|---|---|---|---|---|---|---|---|---|
| 40 | -1 bar | +/-9 | +/-4 | +/-5 | 183 | 183 | 118 | 1,5 |
| 50 | -1 bar | +/-9 | +/-3 | +/-5 | 185 | 185 | 215 | 2,3 |
| 65 | -1 bar | +/-9 | +/-3 | +/-5 | 200 | 200 | 268 | 3,5 |
| 80 | -1 bar | +/-10 | +/-3 | +/-5 | 217 | 217 | 502 | 5,5 |
| 100 | -1 bar | +/-10 | +/-2 | +/-5 | 300 | 300 | 1398 | 12 |
| 125 | -0,95 bar | +/-11 | +/-2 | +/-5 | 390 | 390 | 2059 | 23 |
| 150 | -0,95 bar | +/-11 | +/-2 | +/-5 | 530 | 530 | 5737 | 43 |
| 200 | -0,9 bar | +/-12 | +/-1,5 | +/-5 | 707 | 707 | 9299 | 92 |
| 250 | -0,79 bar | +/-14 | +/-1,5 | +/-5 | 896 | 896 | 14389 | 176 |
| 300 | -0,65 bar | +/-17 | +/-1,5 | +/-5 | 792 | 792 | 15606 | 214 |

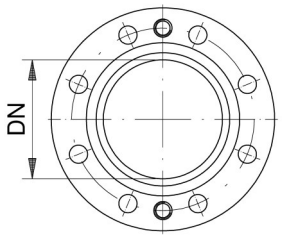
### Combined Movements

- The max. movements (axial, lateral, angular) indicated in the tables are not independent movements. Avoid flexural stresses!
- The combined total of related movements must not exceed 100%.

### Length Limitation

- Do not use limit bolts / sleeves to connect stainless steel-bellows to GAB Neumann heat exchangers.
- During pressure application and / or mechanical movement the extension must not exceed the max. allowed extension (as per data above).
- Please ensure that the heat exchanger and piping are adequately fastened to their bearing.




### Spring Rate Correction Factors

| Temperature [°C] | Factor |
|---|---|
| 20 | 1,0 |
| 200 | 0,94 |

Examples:

- Spring rate at 200°C = spring rate at 20°C x 0,94
- Axial extension at DN 50 and 200°C by 5 mm: Force F = 5 mm x 185 N/mm x 0,94 = 878,75 N

### Materials

Flange: 1.4571
Virginal, paste extruded PTFE, black, antistatic (max. resistance to earth < $10^8$ Ohm

**Approximate load cycles:** 1000

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Graphite and SiC Heat Exchangers and Process Equipment

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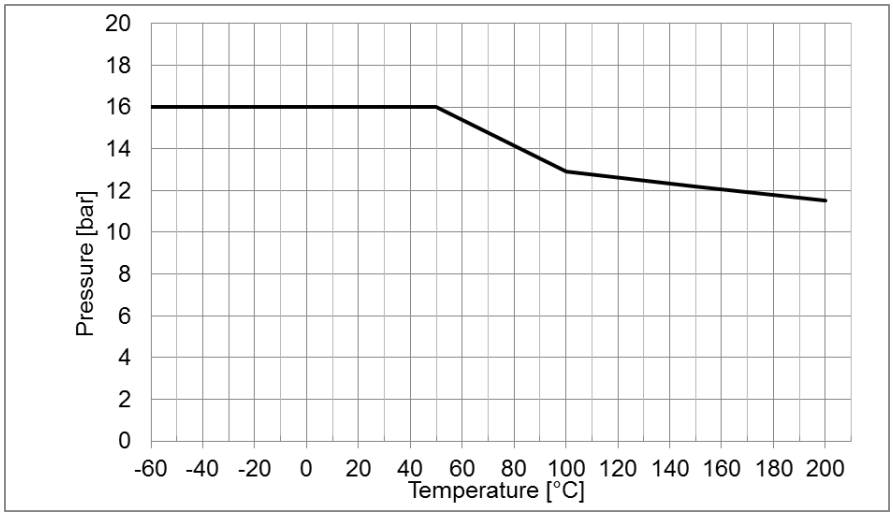
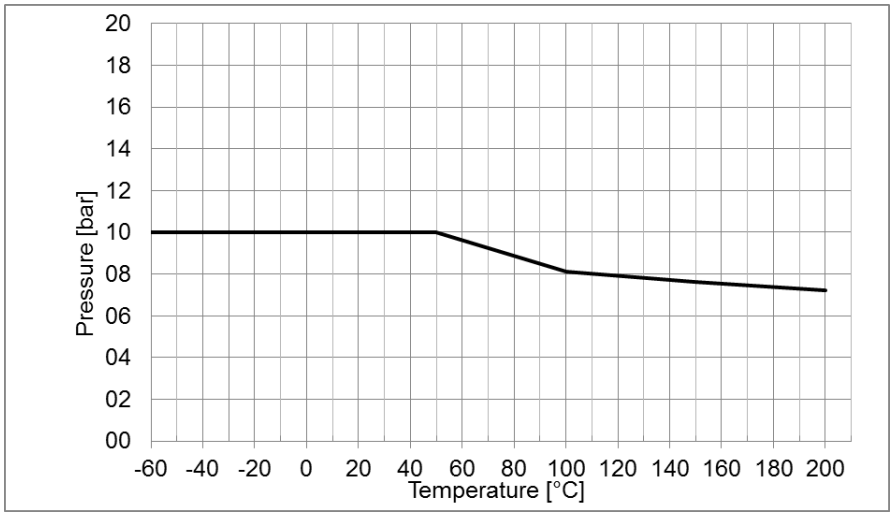
## Pressure / Temperature Chart




**Diameter**

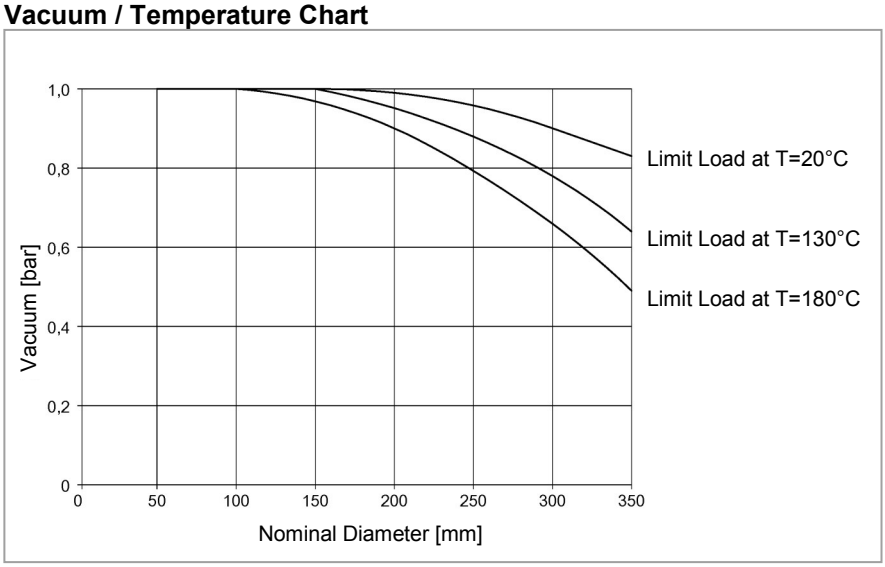
**DN40 - DN 150**




**Diameter**

**DN 200 - DN 300**

## Vacuum / Temperature Chart

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