

EXPANSION JOINTS

THE HIGH RUNNERS

WILLBRANDT

Whenever thermal or mechanical alterations cannot be absorbed in a pipe system, expansion joints must be used to compensate for these changes. When these are not considered, overload can occur in the pipe system which, in extreme cases, can cause deformation, destruction or system error.

Rubber and stainless-steel expansion joints are used in pipe systems to compensate for expansion, movement due to settlement and fitting inaccuracies. Choice of type depends on the application and the working conditions e.g., pressure, temperature, and media.

WILLBRANDT is one of the leading suppliers in Europe, we deliver to a wide range of industries and purposes. We have working partners around the world and can therefore also serve our customers outside Europe with high quality deliverances.

Typical applications are heating systems, water pipes, pipes in power stations and the chemical industry. Various qualities that are adapted for specific media are also available (for drinking water, oil and district heating and wastewater).

We offer nominal sizes from DN 20 to DN 5000. In addition to a comprehensive product standard range, we produce expansion joints customized to specifications – with and without tie rods.

Scan the code and
read more about WILLBRANDT



WILLBRANDT Gummitechnik has been ISO 9001:2015 and ISO 14001:2015 certified since April 2015.

Our products are, among others, certified and type approved according to Bureau Veritas, China Classification Society, DNV-GL, TÜV SÜD and Rina Service S.p.A.



CONTENTS

| | |
|--|----|
| WILLBRANDT Rubber Expansion Joint Type 49 | 4 |
| WILLBRANDT Rubber Expansion Joint Type 50 | 8 |
| WILLBRANDT Chemical Expansion Joint Type 50 PTFE | 14 |
| WILLBRANDT Rubber Expansion Joint Type 51 | 16 |
| WILLBRANDT Rubber Expansion Joint Type 51 PTFE | 21 |
| WILLBRANDT Rubber Expansion Joint Type 54 | 23 |
| WILLBRANDT Rubber Expansion Joint Type 55 | 25 |
| WILLBRANDT Expansion Joints - Overview | 32 |

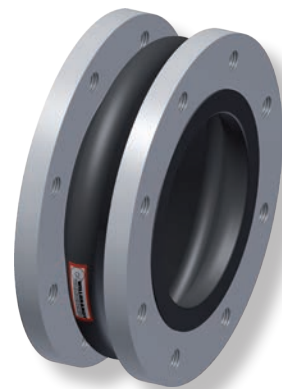


WILLBRANDT Rubber Expansion Joint Type 49

DN 32 - DN 500

Type 49 is a high-corrugated, highly elastic rubber expansion joint. Its high corrugation means that it has very low inherent resistance. It reduces up to 98 % of structure-borne noise. It is also characterised by very high movement absorption for a short installation length and variety of rubber qualities, which means that a suitable rubber compound is available for every application (see material descriptions).

Type 49 is primarily used in building technology, where it is used to absorb expansion, vibration and to insulate sound. It is also used in industrial applications, particularly in the field of weighing technology. Its very low inherent resistance makes it very suitable for decoupling scales / load cells.



| | | | |
|--------------------------|---|-----------------------------|--|
| Bellow design | High-corrugated rubber bellow with reinforcement and shaped sealing bead with core ring, self-sealing (no additional seals required). Suitable for swiveling flanges. | Flange version | Both sides with swiveling flange made of galvanized steel with threaded holes, drilled according to DIN PN 10 (standard). Other materials and dimensions are possible. |
| Vacuum resistance | Can be used up to -200 mbar without additional accessories, full vacuum possible with vacuum supporting spiral/ring. | Approvals/Conformity | Similar to DIN 4809 / TÜV approved, drinking water and shipbuilding approval, FDA and EU 1935/2004 conform |

Specifications

| Bellow | | Bellow design | | | Permissible operating data | | | | | | | | Surface resistance Ro | | |
|-------------|----------------|---------------|---------------|---------------|----------------------------|-----|----|-----|-----|-----|-----|-----|-----------------------|---------------------|---------------------|
| Colour code | Colour marking | Core (inner) | Reinforcement | Cover (outer) | °C | | °C | | °C | | °C | | Short-term °C | Core | Cover |
| | | | | | °C | bar | °C | bar | °C | bar | °C | bar | °C | Ohm x cm | Ohm x cm |
| A-red | ■ | EPDM | PEEK | EPDM | -40 | 16 | 70 | 25 | 100 | 18 | 130 | 12 | 150 | 4 x 10 ³ | 4 x 10 ³ |
| blue | ■ | IIR | Polyamide | EPDM | -40 | 16 | 50 | 25 | 70 | 18 | 100 | 12 | 120 | 7 x 10 ⁶ | 1 x 10 ³ |
| yellow | ■ | NBR | Polyamide | CR | -20 | 16 | 50 | 25 | 70 | 18 | 90 | 12 | 100 | 2 x 10 ² | 1 x 10 ³ |
| white | □ | NBR | Polyamide | CR | -20 | 16 | 50 | 25 | 70 | 18 | 90 | 12 | 100 | 7 x 10 ⁹ | 1 x 10 ³ |
| green | ■ | CSM | Polyamide | CSM | -20 | 16 | 50 | 25 | 70 | 18 | 100 | 12 | 110 | 7 x 10 ⁹ | 7 x 10 ⁹ |
| black EPDM* | ● | IIR | Polyamide | EPDM | -40 | 10 | 50 | 10 | 70 | 8 | 90 | 6 | 120 | 7 x 10 ⁶ | 1 x 10 ³ |

*black EPDM max. DN 200

Bursting pressure: 75 bar
black EPDM 30 bar

Important information

**For aggressive media, please see the resistance table (can be requested separately).
The bellows should not be painted or insulated. Please refer to the installation instructions.
++++ We will be happy to send you further information on the individual types and designs. +++++**

WILLBRANDT Rubber Expansion Joint Type 49

Application

Type 49 A-red

For heating installations according to DIN 4809. For many years of operation under constant loading with hot water and heating water at 100 °C/110 °C at 10 bar/6 bar operating pressure. Electrically conductive surface. Not suitable for media with additives containing oil.

Type 49 blue

For drinking water, hot water, sea water, cooling water with chemical additives for treating water, saline solutions, weak acids and weak alkaline solutions. Not suitable for oil products or cooling water with additives containing oil. Electrically dissipative inner surface and electrically conductive outer surface.

Type 49 yellow

For oils, lubricants, fuels, gases, city and natural gas (not liquefied). Electrically conductive surface.

Type 49 white

For foodstuffs containing oil and fat (rubber in food-grade). Electrically insulating inner surface, electrically conductive outer surface. Not suitable for drinking water.

Type 49 green

For chemicals, aggressive chemical wastewater and compressor air containing oil. Electrically insulating surface.

Type 49 black EPDM

For hot and cold water, sea water, cooling water, weak acids and alkali solutions, technical alcohols, esters and ketones. Electrically dissipative inner surface, conductive outer surface. Max. pressure 10 bar.

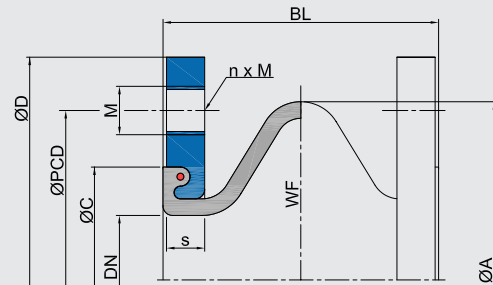
Note!

Detailed material descriptions on pages 5 - 7.

Design A - without tie rods

Can be used for movement absorption in any direction (for combined movements, see the movement diagram in the technical appendix), noise and vibration insulation.

The expansion joint's reaction force must be absorbed via suitable piping.



Dimensions for Design A

| DN | Length BL | Bellow | | ØD | | Flange PN 10 ^{*2} | | s | ØC | Movement absorption | | | | Weight kg | |
|-----|--------------|--------|------------------|-----|-----|----------------------------|----|----|-----|---------------------|------------|--------------|--------------------|--------------|--|
| | | ØA | WF ^{*1} | mm | mm | M | n | | | axial + | axial - | lateral ± | angular ± ∠° | | |
| | mm | mm | mm ² | mm | mm | | | mm | mm | mm | mm | mm | mm | mm | |
| 32 | 100 | 110 | 1800 | 140 | 100 | M16 | 4 | 16 | 79 | 20 | 30 | 30 | 7 | 3.0 | |
| 40 | 100 | 110 | 1800 | 150 | 110 | M16 | 4 | 16 | 79 | 20 | 30 | 30 | 7 | 3.6 | |
| 50 | 100 | 120 | 3500 | 165 | 125 | M16 | 4 | 16 | 89 | 20 | 30 | 30 | 7 | 4.4 | |
| 65 | 100 | 135 | 5600 | 185 | 145 | M16 | 8 | 16 | 104 | 20 | 30 | 30 | 7 | 5.3 | |
| 80 | 100 | 150 | 8700 | 200 | 160 | M16 | 8 | 18 | 119 | 20 | 30 | 30 | 7 | 6.5 | |
| 100 | 100 | 170 | 13000 | 220 | 180 | M16 | 8 | 18 | 142 | 20 | 30 | 30 | 7 | 7.3 | |
| 125 | 100 | 195 | 19000 | 250 | 210 | M16 | 8 | 18 | 169 | 20 | 30 | 30 | 7 | 8.9 | |
| 150 | 100 | 260 | 26300 | 285 | 240 | M20 | 8 | 20 | 195 | 20 | 30 | 30 | 7 | 12.3 | |
| 200 | 100 | 310 | 41600 | 340 | 295 | M20 | 8 | 20 | 245 | 20 | 30 | 30 | 7 | 16.2 | |
| 250 | 100 | 360 | 60700 | 395 | 350 | M20 | 12 | 20 | 295 | 20 | 30 | 30 | 7 | 20.3 | |
| 300 | 100 | 410 | 83000 | 445 | 400 | M20 | 12 | 20 | 345 | 20 | 30 | 30 | 7 | 23.1 | |
| 350 | 100 | 460 | 110000 | 505 | 460 | M20 | 16 | 20 | 396 | 20 | 30 | 30 | 7 | 30.1 | |
| 400 | 110 | 515 | 138500 | 565 | 515 | M24 | 16 | 25 | 450 | 20 | 30 | 30 | 7 | 43.2 | |
| 500 | 110 | 615 | 209100 | 670 | 620 | M24 | 20 | 25 | 550 | 20 | 30 | 30 | 7 | 53.8 | |

*1 WF = effective area

*2 Other standards/dimensions possible.

Permissible degree of utilisation for movement areas:

- up to 50 °C: Utilisation ~ 100 %

- up to 70 °C: Utilisation ~ 75 %

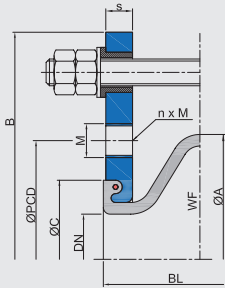
- up to 90 °C: Utilisation ~ 60 %

WILLBRANDT Rubber Expansion Joint Type 49

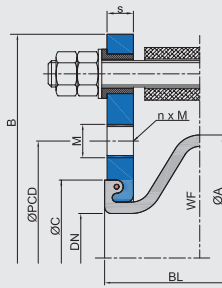
Length limiters

There is a selection of various length limiters / tie rods to absorb the reaction force and to protect the bellow from overstretching or collapsing:

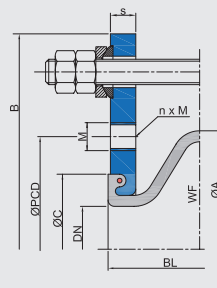
Design B*
with tie rods



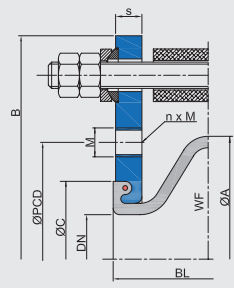
Design C*
with tie rods/thrust limiters



Design E
with tie rods and spherical washers/conical sockets



Design S
with tie rods/thrust limiters and spherical washers/conical sockets



*Note: In Designs B and C the lateral movement absorption is reduced by around 50 %.

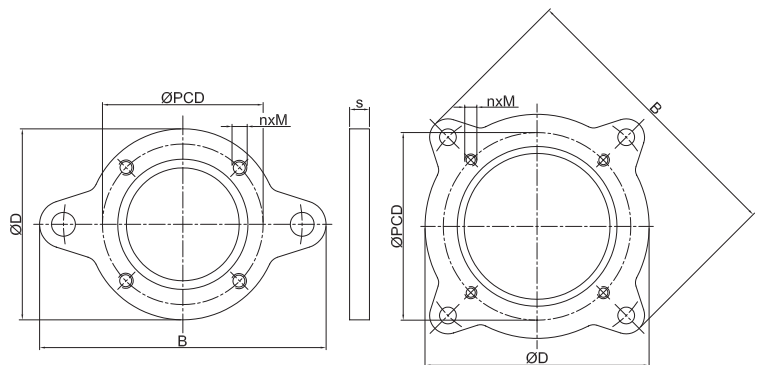
Accessories

- Vacuum supporting spirals / rings
- Guide sleeves
- Potential equalisation

- Flame-resistant protective covers
- Dust and splash protection covers
- Earth cover hoods

Flange dimensions for designs with tie rods

| DN | Length BL | Flange PN 10 (example dimensions) | | | | | | | ØC |
|-----|--------------|-----------------------------------|-----|------|-----|----|----|-----|----|
| | | B | ØD | ØPCD | M | n | s | | |
| | mm | mm | mm | mm | mm | mm | mm | mm | |
| 32 | 100 | 230 | 140 | 100 | M16 | 4 | 16 | 79 | |
| 40 | 100 | 240 | 150 | 110 | M16 | 4 | 16 | 79 | |
| 50 | 100 | 255 | 165 | 125 | M16 | 4 | 16 | 89 | |
| 65 | 100 | 275 | 185 | 145 | M16 | 8 | 16 | 104 | |
| 80 | 100 | 290 | 200 | 160 | M16 | 8 | 18 | 119 | |
| 100 | 100 | 310 | 220 | 180 | M16 | 8 | 18 | 142 | |
| 125 | 100 | 340 | 250 | 210 | M16 | 8 | 18 | 169 | |
| 150 | 100 | 375 | 285 | 240 | M20 | 8 | 20 | 195 | |
| 200 | 100 | 440 | 340 | 295 | M20 | 8 | 20 | 245 | |
| 250 | 100 | 509 | 395 | 350 | M20 | 12 | 20 | 295 | |
| 300 | 100 | 559 | 445 | 400 | M20 | 12 | 20 | 345 | |
| 350 | 100 | 619 | 505 | 460 | M20 | 16 | 20 | 396 | |
| 400 | 110 | 700 | 565 | 515 | M24 | 16 | 25 | 450 | |
| 500 | 110 | 810 | 670 | 620 | M24 | 20 | 25 | 550 | |



DN 32 - 200

DN 250 - 500

Important information

Various bolt packs (SU) are available for the standard design.

Please note the appropriate fixed point constructions and plain bearings in your piping system! For more information please refer to our installation instructions.

For information on the tie rods, please see the technical appendix (p. 93 - 96)!

++++ We will be happy to send you further information on the individual types and designs. +++++

WILLBRANDT Rubber Expansion Joint Type 49

Axial stiffness rates

| DN | Length BL mm | Stiffness rates (average value form full way) | | | | | | | | |
|-----|--------------------|---|---------------|-----------------|---------------|---------------|----------------|----------------|----------------|----------------|
| | | 0 bar N/mm | 1 bar N/mm | 2.5 bar N/mm | 3 bar N/mm | 6 bar N/mm | 10 bar N/mm | 12 bar N/mm | 16 bar N/mm | 25 bar N/mm |
| 32 | 100 | 14 | 30 | 56 | 62 | 116 | 180 | 210 | 264 | 390 |
| 40 | 100 | 14 | 30 | 56 | 62 | 116 | 180 | 210 | 264 | 390 |
| 50 | 100 | 12 | 30 | 66 | 76 | 142 | 220 | 260 | 332 | 512 |
| 65 | 100 | 14 | 45 | 87 | 99 | 189 | 286 | 346 | 414 | 621 |
| 80 | 100 | 33 | 75 | 135 | 150 | 258 | 396 | 460 | 555 | 796 |
| 100 | 100 | 28 | 80 | 156 | 176 | 320 | 480 | 563 | 684 | 998 |
| 125 | 100 | 30 | 95 | 186 | 218 | 374 | 580 | 672 | 819 | 1216 |
| 150 | 100 | 35 | 68 | 144 | 248 | 320 | 528 | 626 | 792 | 1192 |
| 200 | 100 | 42 | 90 | 178 | 204 | 370 | 594 | 702 | 908 | 1385 |
| 250 | 100 | 20 | 112 | 224 | 256 | 480 | 768 | 906 | 1136 | 1680 |
| 300 | 100 | 22 | 108 | 236 | 277 | 520 | 854 | 1019 | 1338 | 2071 |
| 350 | 100 | 28 | 128 | 270 | 310 | 570 | 940 | 1136 | 1510 | 2369 |
| 400 | 110 | 44 | 140 | 296 | 342 | 646 | 1052 | 1296 | 1660 | 2587 |
| 500 | 110 | 46 | 172 | 354 | 416 | 792 | 1264 | 1524 | 2000 | 3116 |

Warning: Deviations (+/-25 %) in the stiffness rates may occur due to use of different materials and manufacturing processes.

Lateral stiffness rates

| DN | Length BL mm | Stiffness rates (average value form full way) | | | | | | | | |
|-----|--------------------|---|---------------|-----------------|---------------|---------------|----------------|----------------|----------------|----------------|
| | | 0 bar N/mm | 1 bar N/mm | 2.5 bar N/mm | 3 bar N/mm | 6 bar N/mm | 10 bar N/mm | 12 bar N/mm | 16 bar N/mm | 25 bar N/mm |
| 32 | 100 | 11 | 17 | 27 | 30 | 45 | 63 | 68 | 79 | 109 |
| 40 | 100 | 11 | 17 | 27 | 30 | 45 | 63 | 68 | 79 | 109 |
| 50 | 100 | 17 | 35 | 47 | 54 | 79 | 107 | 117 | 138 | 191 |
| 65 | 100 | 21 | 37 | 61 | 61 | 96 | 136 | 150 | 177 | 250 |
| 80 | 100 | 32 | 56 | 92 | 94 | 144 | 204 | 225 | 266 | 376 |
| 100 | 100 | 38 | 77 | 112 | 123 | 180 | 243 | 266 | 312 | 430 |
| 125 | 100 | 45 | 88 | 133 | 150 | 225 | 315 | 348 | 415 | 586 |
| 150 | 100 | 48 | 80 | 116 | 123 | 188 | 265 | 292 | 347 | 489 |
| 200 | 100 | 103 | 155 | 221 | 238 | 343 | 473 | 526 | 633 | 894 |
| 250 | 100 | 126 | 208 | 179 | 308 | 442 | 603 | 659 | 771 | 1067 |
| 300 | 100 | 167 | 267 | 337 | 400 | 550 | 750 | 836 | 1008 | 1421 |
| 350 | 100 | 137 | 263 | 385 | 418 | 587 | 833 | 922 | 1100 | 1562 |
| 400 | 110 | 187 | 293 | 423 | 457 | 633 | 900 | 996 | 1187 | 1686 |
| 500 | 110 | 203 | 380 | 536 | 573 | 840 | 1140 | 1249 | 1466 | 2029 |

Warning: Deviations (+/-25 %) in the stiffness rates may occur due to use of different materials and manufacturing processes.

Angular stiffness torque

| DN | Length mm | Stiffness torque (averages value from full way) | | | | | | | | |
|-----|--------------|---|---------------|-----------------|---------------|---------------|----------------|----------------|----------------|----------------|
| | | 0 bar Nm/° | 1 bar Nm/° | 2.5 bar Nm/° | 3 bar Nm/° | 6 bar Nm/° | 10 bar Nm/° | 12 bar Nm/° | 16 bar Nm/° | 25 bar Nm/° |
| 32 | 100 | 0.1 | 0.3 | 0.6 | 0.6 | 1.2 | 1.8 | 1.6 | 1.7 | 1.8 |
| 40 | 100 | 0.1 | 0.3 | 0.6 | 0.6 | 1.2 | 1.8 | 1.6 | 1.7 | 1.8 |
| 50 | 100 | 0.2 | 0.4 | 0.9 | 1.0 | 1.9 | 2.9 | 2.1 | 2.3 | 2.4 |
| 65 | 100 | 0.3 | 0.8 | 1.6 | 1.8 | 3.5 | 5.3 | 3.5 | 3.7 | 3.9 |
| 80 | 100 | 0.8 | 1.9 | 3.4 | 3.8 | 6.5 | 10.0 | 4.3 | 4.6 | 4.9 |
| 100 | 100 | 1.0 | 2.9 | 5.7 | 6.4 | 11.6 | 17.4 | 8.8 | 9.5 | 10.1 |
| 125 | 100 | 1.6 | 5.0 | 9.8 | 11.4 | 19.6 | 30.4 | 14.0 | 15.0 | 16.0 |
| 150 | 100 | 0.7 | 5.9 | 12.5 | 21.5 | 27.8 | 45.9 | 25.3 | 27.1 | 28.9 |
| 200 | 100 | 5.7 | 12.1 | 24.0 | 27.5 | 49.9 | 80.0 | 51.3 | 55.0 | 58.6 |
| 250 | 100 | 4.0 | 22.1 | 44.3 | 50.6 | 94.9 | 151.8 | 83.5 | 89.4 | 95.3 |
| 300 | 100 | 5.9 | 28.8 | 62.9 | 73.8 | 138.6 | 227.6 | 119.0 | 127.4 | 135.8 |
| 350 | 100 | 9.9 | 45.1 | 95.2 | 109.3 | 201.0 | 331.4 | 209.7 | 224.5 | 239.4 |
| 400 | 110 | 19.7 | 62.8 | 132.8 | 153.5 | 289.9 | 472.1 | 329.3 | 352.5 | 375.8 |
| 500 | 110 | 30.9 | 115.4 | 237.5 | 279.1 | 531.3 | 848.0 | 580.8 | 624.9 | 662.9 |

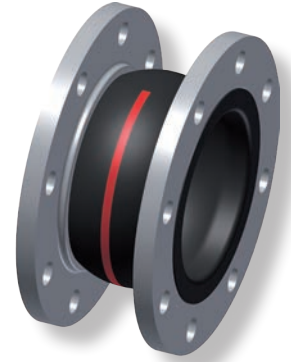
Warning: Deviations (+/-25 %) in the stiffness torque may occur due to use of different materials and manufacturing processes.

WILLBRANDT Rubber Expansion Joint Type 50

DN 20 - DN 1000

Type 50 is a low-corrugated, highly elastic rubber expansion joint. Its low corrugation helps to achieve very low flow resistance. It reduces up to 70 % of the incoming energy. It is also characterise by very high movement absorption in all directions and variety of rubber qualities, which means that a suitable rubber compound is available for every application.

Type 50 is used in building technology, plant engineering, water and wastewater technology, engine construction, shipbuilding and in solar and wind plant engineering. It especially used where it is specifically used to absorb expansion and vibration and to insulate sound.



Bellow design

Low-corrugated rubber bellow with reinforcement and shaped sealing bead with core ring, self-sealing (no additional seals required). Suitable for accommodating swiveling flanges.

Flange version

Both sides with swiveling flange made of galvanized steel with clearance holes, drilled according to DIN PN 10 (standard). Other materials and dimensions are possible.

Approvals/Conformity

Similar to DIN 4809 / TÜV approved, drinking water and shipbuilding approval, FDA and EU 1935/2004 conform

Specifications for DN 20 - DN 400

| Bellow | | Core (inner) | Bellow design | | up to DN | Permissible operating data | | | | | | | | Surface resistance Ro | | |
|-------------|----------------|--------------|---------------|---------------|----------|----------------------------|----|--------|----|--------|----|--------|----|-----------------------|-----------------------|----------------------|
| Colour code | Colour marking | | Reinforcement | Cover (outer) | | °C bar | | °C bar | | °C bar | | °C bar | | Core | Cover | |
| red Sp | ■ ■ | EPDM | PEEK | EPDM | 400 | -40 | 10 | 70 | 16 | 100 | 10 | 130 | 8 | 150 | 4 x 10 ³ | 4 x 10 ³ |
| red | ■ | IIR | Polyamide | EPDM | 400 | -40 | 10 | 50 | 16 | 70 | 12 | 100 | 10 | 120 | 7 x 10 ⁶ | 1 x 10 ³ |
| red EPDM | ■ | EPDM | Polyamide | EPDM | 400 | -30 | 10 | 50 | 16 | 70 | 12 | 90 | 10 | 100 | - | - |
| yellow | ■ | NBR | Polyamide | CR | 400 | -20 | 10 | 50 | 16 | 70 | 12 | 90 | 10 | 100 | 2 x 10 ² | 1 x 10 ³ |
| white | □ | NBR | Polyamide | CR | 400 | -20 | 10 | 50 | 16 | 70 | 12 | 90 | 10 | 100 | 7 x 10 ⁹ | 1 x 10 ³ |
| green | ■ | CSM | Polyamide | CSM | 400 | -20 | 10 | 50 | 16 | 70 | 12 | 100 | 10 | 110 | 7 x 10 ⁹ | 7 x 10 ⁹ |
| orange | ■ | NBR | Polyamide | CR | 200 | -20 | 10 | 50 | 25 | 70 | 20 | 90 | 15 | 100 | 3 x 10 ³ | 1 x 10 ³ |
| black EPDM* | ◆ | IIR | Polyamide | EPDM | 150 | -40 | 10 | 50 | 10 | 70 | 8 | 90 | 6 | 120 | 7 x 10 ⁶ | 1 x 10 ³ |
| black CR | - | CR | Polyamide | CR | 400 | -25 | 10 | 50 | 16 | 70 | 12 | 90 | 10 | 100 | 7 x 10 ⁹ | 5 x 10 ¹⁰ |
| yellow LT | ■ LT | NBR-LT | Polyamide | CR | 300 | -40 | 10 | 50 | 16 | 70 | 12 | 90 | 10 | 100 | 1 x 10 ⁴ | 4 x 10 ³ |
| yellow St | ■ ■ | NBR | Steel cord | CR | 400 | -20 | 10 | 60 | 16 | 70 | 12 | 90 | 10 | 100 | 2 x 10 ² | 5 x 10 ¹⁰ |
| yellow HNBR | ■ ■ ■ | HNBR | Steel cord | CR | 300 | -35 | 10 | 60 | 16 | 70 | 12 | 100 | 10 | 120 | 1,5 x 10 ⁵ | - 10 ¹⁰ |

Bursting pressure DN 20 - 400 > 48 bar
 * Bursting pressure max. 30 bar, max. DN 150

For pressure loss see technical appendix.

Specifications for DN 450 - DN 1000

| Bellow | | Core (inner) | Bellow design | | up to DN | Permissible operating data | | | | | | | | Surface resistance Ro | | |
|-------------|----------------|--------------|---------------|---------------|----------|----------------------------|---|--------|----|--------|-----|--------|---|-----------------------|---------------------|----------------------|
| Colour code | Colour marking | | Reinforcement | Cover (outer) | | °C bar | | °C bar | | °C bar | | °C bar | | Core | Cover | |
| red Sp | ■ ■ | EPDM | PEEK | EPDM | 1000 | -40 | 8 | 70 | 10 | 100 | 7,5 | 130 | 6 | 150 | 4 x 10 ³ | 4 x 10 ³ |
| red | ■ | IIR | Polyamide | EPDM | 1000 | -40 | 8 | 50 | 10 | 70 | 8 | 100 | 6 | 120 | 7 x 10 ⁶ | 1 x 10 ³ |
| red EPDM | ■ | EPDM | Polyamide | EPDM | 600 | -30 | 8 | 50 | 10 | 70 | 8 | 90 | 6 | 100 | - | - |
| yellow | ■ | NBR | Polyamide | CR | 1000 | -20 | 8 | 50 | 10 | 70 | 8 | 90 | 6 | 100 | 2 x 10 ² | 1 x 10 ³ |
| white | □ | NBR | Polyamide | CR | 600 | -20 | 8 | 50 | 10 | 70 | 8 | 90 | 6 | 100 | 7 x 10 ⁹ | 1 x 10 ³ |
| green | ■ | CSM | Polyamide | CSM | 1000 | -20 | 8 | 50 | 10 | 70 | 8 | 100 | 6 | 110 | 7 x 10 ⁹ | 7 x 10 ⁹ |
| black CR | - | CRN | Polyamide | CR | 1000 | -25 | 8 | 50 | 10 | 70 | 8 | 90 | 6 | 100 | 7 x 10 ⁹ | 5 x 10 ¹⁰ |
| yellow St | ■ ■ | NBR | Steel cord | CR | 600 | -20 | 8 | 60 | 10 | 70 | 8 | 90 | 6 | 100 | 2 x 10 ² | 5 x 10 ¹⁰ |

Bursting pressure DN 450 - 1000 > 30 bar

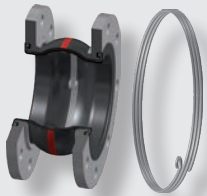
For pressure loss see technical appendix.

Important information

For aggressive media, please see the resistance table (can be requested separately).
 The bellows should not be painted or insulated. Please refer to the installation instructions.
 ++++ We will be happy to send you further information on the individual types and designs. ++++

WILLBRANDT Rubber Expansion Joint Type 50

Vacuum resistance



- DN 20 to 50 vacuum-resistant without additional accessories
- DN 65 to 250 without additional accessories to -300 mbar and with vacuum supporting spiral for full vacuum
- DN 300 to DN 1000 only vacuum-resistant with vacuum supporting ring
- Type 50 black EPDM DN 20 to DN 40 without additional accessories

to -300 mbar and with vacuum supporting spiral for full vacuum

Accessories

- Guide sleeves
- Potential equalisation
- Fire resistant protective covers
- Dust and splash protection covers
- Earth cover / sun protection hoods
- Segment tie rods

Application

Type 50 red Sp

For heating installations according to DIN 4809. For many years of operation under constant loading with hot water and heating water at 100 °C/110 °C at 10 bar/6 bar operating pressure. Electrically conductive surface. Not suitable for media with additives containing oil.

Type 50 red

For drinking water, hot water, sea water, cooling water with chemical additives for treating water, saline solutions, weak acids and weak alkaline solutions. Electrically dissipative inner surface and electrically conductive outer surface. Not suitable for oil products or cooling water with additives containing oil.

Type 50 red EPDM

Like Type 50 red, but not for drinking water, shipbuilding and offshore applications. Temperature range max. 90 °C at 10 bar.

Type 50 yellow

For oils, lubricants, fuels, gases, city and natural gas (not liquefied) and DIN EN fuels with an aromatic content up to 50 %. Electrically conductive.

Type 50 white

For foodstuffs containing oil and fat (rubber in food-grade). Not approved for drinking water. Electrically insulating inner surface and electrically conductive outer surface.

Type 50 green

For chemicals, aggressive chemical wastewater and compressor air containing oil. Electrically insulating.

Type 50 orange

Like Type 50 yellow, but also for liquid petroleum gas acc. to DIN EN 589. Electrically dissipative.

Type 50 black EPDM

For drinking water, sea water, cooling water, weak acids and alkali solutions, technical alcohols, esters and ketones. Max. pressure 10 bar. Electrically dissipative inner surface and electrically conductive outer surface.

Type 50 black CR

For hot and cold water, wastewater, swimming pool water, salt water, wastewater, cooling water with anti-corrosive products containing oil, oil mixtures and compressed air containing oil. Electrically insulating.

Type 50 yellow LT

Like Type 50 yellow, but also for liquid gas. Electrically dissipative.

Type 50 lilac

For flue gas desulphurisation systems and bio-diesel. Good resistance to benzene, xylene, toluene, fuels with an aromatic content of more than 50 %, aromatic/chlorinated hydrocarbons and mineral acids. Electrically insulating inner surface and electrically conductive outer surface.

Type 50 yellow St

Like Type 50 yellow with additional flame-resistance for up to 30 minutes at 800 °C. Electrically conductive inner surface, electrically insulating outer surface.

Type 50 yellow HNBR

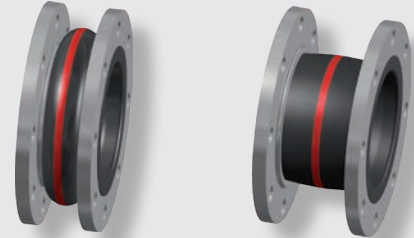
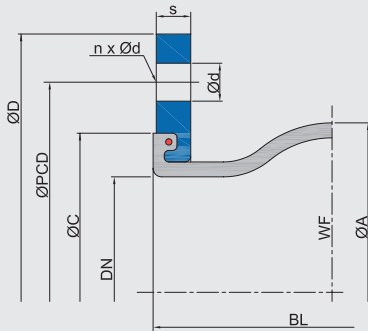
Like Type 50 yellow St, but for temperatures up to +100 °C. Electrically dissipative inner surface, electrically insulating outer surface.

WILLBRANDT Rubber Expansion Joint Type 50

Design A - without tie rods

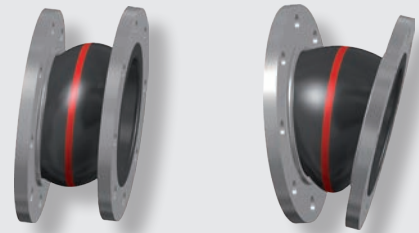
Can be used for movement absorption in any direction (for combined movements, see the movement diagram in the technical appendix), noise and vibration insulation.

The expansion joint's reaction force must be absorbed via suitable piping.



axial -

axial +



lateral ±

angular ±

Dimensions for Design A

| DN | Length BL mm | Bellow | | Flange PN 10 ² | | | | | | Movement absorption (polyamide cord) | | | | Movement absorption (steel cord) | | | | Weight kg |
|------|--------------------|----------|-------------------------------------|---------------------------|------------|----------|----|---------|----------|---|------------------|--------------------|--------------------|-------------------------------------|------------------|--------------------|--------------------|--------------|
| | | ØA mm | WF* ₁ mm ² | ØD mm | ØPCD mm | Ød mm | n | s mm | ØC mm | axial + mm | axial - mm | lateral ± mm | angular ± ∠° | axial + mm | axial - mm | lateral ± mm | angular ± ∠° | |
| 20 | 130 | 81 | 1700 | 105 | 75 | 12 | 4 | 14 | 66 | 30 | 30 | 30 | 30 | 15 | 30 | 15 | 20 | 1.5 |
| 25 | 130 | 81 | 1700 | 115 | 85 | 14 | 4 | 14 | 66 | 30 | 30 | 30 | 30 | 15 | 30 | 15 | 20 | 1.9 |
| 32 | 130 | 81 | 1700 | 140 | 100 | 18 | 4 | 15 | 66 | 30 | 30 | 30 | 30 | 15 | 30 | 15 | 20 | 3.1 |
| 40 | 130 | 86 | 1800 | 150 | 110 | 18 | 4 | 15 | 74 | 30 | 30 | 30 | 30 | 15 | 30 | 15 | 20 | 3.5 |
| 50 | 130 | 96 | 3200 | 165 | 125 | 18 | 4 | 16 | 86 | 30 | 30 | 30 | 30 | 15 | 30 | 15 | 20 | 3.7 |
| 65 | 130 | 111 | 5300 | 185 | 145 | 18 | 8 | 16 | 106 | 30 | 30 | 30 | 30 | 15 | 30 | 15 | 20 | 5.3 |
| 80 | 130 | 122 | 8500 | 200 | 160 | 18 | 8 | 18 | 118 | 30 | 30 | 30 | 30 | 15 | 30 | 15 | 20 | 6.8 |
| 100 | 130 | 142 | 12800 | 220 | 180 | 18 | 8 | 18 | 138 | 30 | 30 | 30 | 20 | 15 | 30 | 15 | 15 | 7.9 |
| 125 | 130 | 168 | 18700 | 250 | 210 | 18 | 8 | 18 | 166 | 30 | 30 | 30 | 20 | 15 | 30 | 15 | 15 | 9.6 |
| 150 | 130 | 192 | 25900 | 285 | 240 | 22 | 8 | 18 | 192 | 30 | 30 | 30 | 20 | 15 | 30 | 15 | 15 | 12.9 |
| 200 | 130 | 252 | 41000 | 340 | 295 | 22 | 8 | 20 | 252 | 30 | 30 | 30 | 12 | 20 | 15 | 10 | 5 | 16.2 |
| 250 | 130 | 302 | 59600 | 395 | 350 | 22 | 12 | 20 | 304 | 30 | 30 | 30 | 12 | 20 | 15 | 10 | 5 | 21.5 |
| 300 | 130 | 354 | 82200 | 445 | 400 | 22 | 12 | 22 | 354 | 30 | 30 | 30 | 12 | 20 | 15 | 10 | 5 | 24.5 |
| 350 | 200 | 420 | 117600 | 505 | 460 | 22 | 16 | 24 | 412 | 30 | 50 | 30 | 8 | 30 | 30 | 25 | 10 | 38.3 |
| 400 | 200 | 480 | 154700 | 565 | 515 | 26 | 16 | 25 | 470 | 30 | 50 | 30 | 8 | 30 | 40 | 25 | 5 | 38.0 |
| 450 | 200 | 530 | 204200 | 615 | 565 | 26 | 20 | 28 | 520 | 30 | 50 | 30 | 8 | - | - | - | - | 47.2 |
| 500 | 200 | 580 | 227900 | 670 | 620 | 26 | 20 | 30 | 570 | 30 | 50 | 30 | 8 | - | - | - | - | 56.5 |
| 600 | 200 | 680 | 311500 | 780 | 725 | 30 | 20 | 30 | 675 | 30 | 50 | 30 | 8 | - | - | - | - | 75.2 |
| 700 | *250 | 800 | 434200 | 895 | 840 | 30 | 24 | 35 | 780 | 30 | 50 | 30 | 8 | - | - | - | - | 127.8 |
| 800 | 250 | 880 | 527400 | 1015 | 950 | 33 | 24 | 40 | 887 | 30 | 50 | 30 | 6 | - | - | - | - | 161.0 |
| 900 | 300 | 1038 | 737900 | 1115 | 1050 | 33 | 28 | 40 | 987 | 30 | 50 | 30 | 5 | - | - | - | - | 196.7 |
| 1000 | 300 | 1138 | 889400 | 1230 | 1160 | 36 | 28 | 40 | 1087 | 30 | 50 | 30 | 5 | - | - | - | - | 234.5 |

*₁ WF = effective area

*₂ Other standards/dimensions possible.

*₃ Building length 260 mm

Permissible degree of utilisation for movement areas:

- up to 50 °C: Utilisation ~ 100 %

- up to 70 °C: Utilisation ~ 75 %

- up to 90 °C: Utilisation ~ 60 %

Important information

Please note the appropriate fixed point constructions and plain bearings in your piping system!

For more information please refer to our installation instructions.

For information on the tie rods, please see the technical appendix (p. 93 - 96)!

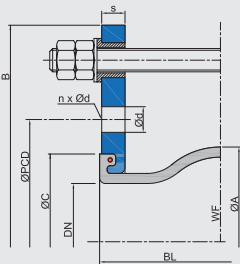
++++ We will be happy to send you further information on the individual types and designs. +++++

WILLBRANDT Rubber Expansion Joint Type 50

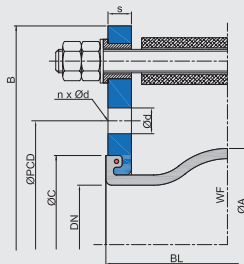
Length limiters

There is a selection of various length limiters / tie rods to absorb the reaction force and to protect the bellow from overstretching or collapsing:

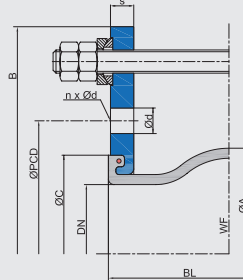
Design B*
with tie rods



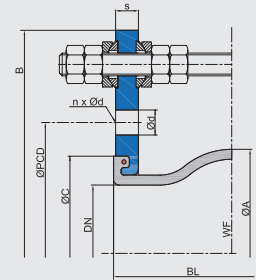
Design C*
with tie rods/thrust limiters



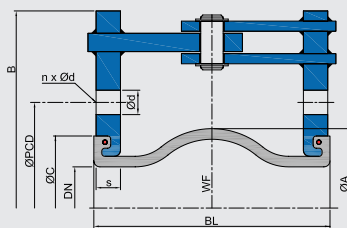
Design E
with tie rods and spherical washers/conical sockets



Design M
with tie rods/thrust limiters and spherical washers/conical sockets



Design F
with hinge

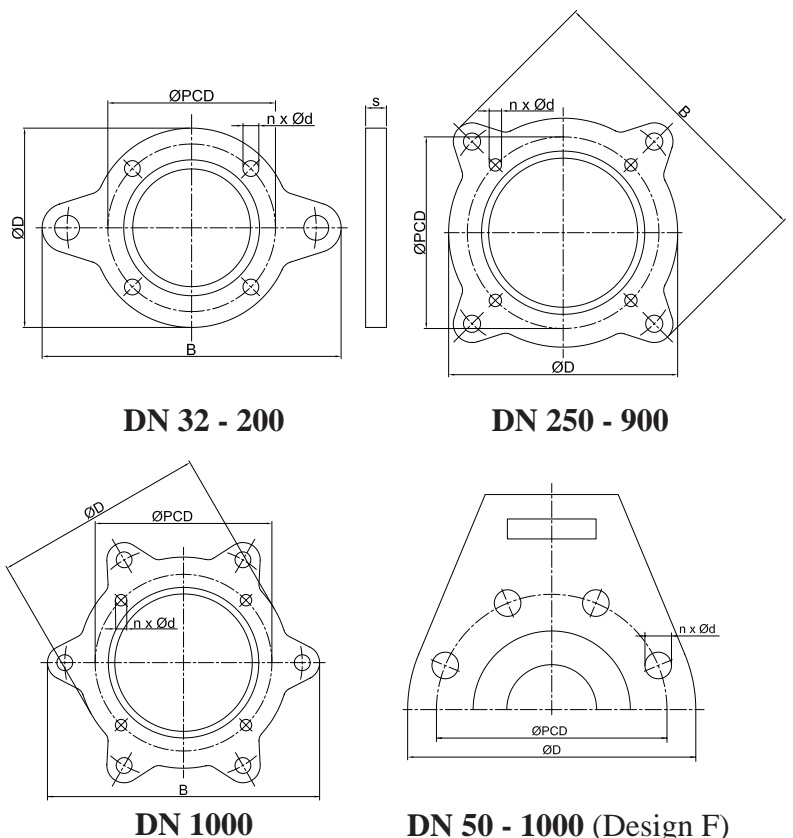


*Note: For Designs B and C the lateral movement absorption is reduced by around 50 %.

Flange dimensions for Designs with tie rods

| DN | Length BL | Flange PN 10 (example dimensions) | | | | | | |
|------|--------------|-----------------------------------|------|------|----|----|----|------|
| | | B | ØD | ØPCD | Ød | n | s | ØC |
| | mm | mm | mm | mm | mm | | mm | mm |
| 20 | 130 | 189 | 105 | 75 | 12 | 4 | 14 | 66 |
| 25 | 130 | 205 | 115 | 85 | 14 | 4 | 14 | 66 |
| 32 | 130 | 230 | 140 | 100 | 18 | 4 | 15 | 66 |
| 40 | 130 | 240 | 150 | 110 | 18 | 4 | 15 | 74 |
| 50 | 130 | 255 | 165 | 125 | 18 | 4 | 16 | 86 |
| 65 | 130 | 275 | 185 | 145 | 18 | 8 | 16 | 106 |
| 80 | 130 | 290 | 200 | 160 | 18 | 8 | 18 | 118 |
| 100 | 130 | 310 | 220 | 180 | 18 | 8 | 18 | 138 |
| 125 | 130 | 340 | 250 | 210 | 18 | 8 | 18 | 166 |
| 150 | 130 | 375 | 285 | 240 | 22 | 8 | 18 | 192 |
| 200 | 130 | 440 | 340 | 295 | 22 | 8 | 20 | 252 |
| 250 | 130 | 509 | 395 | 350 | 22 | 12 | 20 | 304 |
| 300 | 130 | 559 | 445 | 400 | 22 | 12 | 22 | 354 |
| 350 | 200 | 619 | 505 | 460 | 22 | 16 | 24 | 412 |
| 400 | 200 | 700 | 565 | 515 | 26 | 16 | 25 | 470 |
| 450 | 200 | 760 | 615 | 565 | 26 | 20 | 30 | 520 |
| 500 | 200 | 810 | 670 | 620 | 26 | 20 | 30 | 570 |
| 600 | 200 | 930 | 780 | 725 | 30 | 20 | 30 | 675 |
| 700 | *250 | 1045 | 895 | 840 | 30 | 24 | 35 | 780 |
| 800 | 250 | 1175 | 1015 | 950 | 33 | 24 | 40 | 887 |
| 900 | 300 | 1285 | 1115 | 1050 | 33 | 28 | 40 | 987 |
| 1000 | 300 | 1400 | 1230 | 1160 | 36 | 28 | 40 | 1087 |

*Building length 260 mm



WILLBRANDT Rubber Expansion Joint Type 50

Axial stiffness rates

| DN | Overall length BL mm | Stiffness rates (averages value from full way) | | | | | |
|------|----------------------------|--|------------------|----------------|----------------|-----------------|-----------------|
| | | 0 bar Nm/mm | 2,5 bar Nm/mm | 4 bar Nm/mm | 6 bar Nm/mm | 10 bar Nm/mm | 16 bar Nm/mm |
| 20 | 130 | 31 | 68 | 128 | 192 | 243 | 270 |
| 25 | 130 | 31 | 68 | 128 | 192 | 243 | 270 |
| 32 | 130 | 31 | 68 | 128 | 192 | 243 | 270 |
| 40 | 130 | 30 | 66 | 124 | 186 | 236 | 261 |
| 50 | 130 | 25 | 51 | 98 | 134 | 173 | 192 |
| 65 | 130 | 24 | 53 | 100 | 150 | 190 | 211 |
| 80 | 130 | 28 | 58 | 104 | 148 | 185 | 205 |
| 100 | 130 | 35 | 71 | 116 | 206 | 274 | 304 |
| 125 | 130 | 36 | 71 | 137 | 214 | 282 | 313 |
| 150 | 130 | 49 | 102 | 189 | 293 | 390 | 433 |
| 200 | 130 | 100 | 180 | 365 | 568 | 735 | 816 |
| 250 | 130 | 105 | 207 | 388 | 609 | 778 | 864 |
| 300 | 130 | 123 | 248 | 448 | 658 | 883 | 980 |
| 350 | 200 | 105 | 177 | 349 | 567 | 753 | 836 |
| 400 | 200 | 154 | 261 | 516 | 535 | 1090 | 1210 |
| 450 | 250 | 167 | 320 | 581 | 903 | 1162 | 1290 |
| 500 | 200 | 196 | 376 | 686 | 1060 | 1364 | 1514 |
| 600 | 200 | 208 | 292 | 692 | 1123 | 1441 | 1600 |
| 700 | *250 | 140 | 198 | 521 | 714 | 954 | - |
| 800 | 250 | 180 | 270 | 594 | 975 | 1258 | - |
| 900 | 300 | 200 | 380 | 690 | 1080 | 1395 | - |
| 1000 | 300 | 225 | 420 | 742 | 1248 | 1568 | - |

*Building length 260 mm

Warning: Deviations (+/- 25 %) in the stiffness rates may occur due to use of different materials and manufacturing processes.

Lateral stiffness rates

| DN | Overall length BL mm | Stiffness rates (averages value from full way) | | | | | |
|------|----------------------------|--|------------------|----------------|----------------|-----------------|-----------------|
| | | 0 bar Nm/mm | 2,5 bar Nm/mm | 4 bar Nm/mm | 6 bar Nm/mm | 10 bar Nm/mm | 16 bar Nm/mm |
| 20 | 130 | 64 | 125 | 184 | 240 | 240 | 300 |
| 25 | 130 | 64 | 125 | 184 | 240 | 240 | 300 |
| 32 | 130 | 64 | 125 | 184 | 240 | 240 | 300 |
| 40 | 130 | 62 | 121 | 178 | 233 | 256 | 291 |
| 50 | 130 | 50 | 65 | 80 | 105 | 145 | 205 |
| 65 | 130 | 40 | 78 | 115 | 150 | 165 | 188 |
| 80 | 130 | 35 | 74 | 136 | 155 | 173 | 200 |
| 100 | 130 | 55 | 88 | 143 | 168 | 192 | 228 |
| 125 | 130 | 100 | 200 | 261 | 293 | 383 | 518 |
| 150 | 130 | 120 | 260 | 309 | 366 | 466 | 616 |
| 200 | 130 | 323 | 723 | 836 | 949 | 1219 | 1624 |
| 250 | 130 | 379 | 806 | 1022 | 1173 | 1479 | 1938 |
| 300 | 130 | 392 | 837 | 1068 | 1216 | 1542 | 2031 |
| 350 | 200 | 305 | 610 | 762 | 875 | 1098 | 1433 |
| 400 | 200 | 338 | 642 | 817 | 946 | 1199 | 1579 |
| 450 | 250 | 342 | 639 | 821 | 971 | 1200 | 1544 |
| 500 | 200 | 426 | 818 | 1048 | 1204 | 1495 | 1932 |
| 600 | 200 | 456 | 834 | 1062 | 1295 | 1586 | 2023 |
| 700 | *250 | 516 | 939 | 1191 | 1449 | 1775 | - |
| 800 | 250 | 558 | 960 | 1055 | 1557 | 1758 | - |
| 900 | 300 | 800 | 1480 | 1984 | 2248 | 2560 | - |
| 1000 | 300 | 960 | 1824 | 2361 | 2736 | 2976 | - |

*Building length 260 mm

Warning: Deviations (+/- 25 %) in the stiffness rates may occur due to use of different materials and manufacturing processes.

WILLBRANDT Rubber Expansion Joint Type 50

Angular stiffness torque

| DN | Overall length BL mm | Stiffness torque (averages value from full way) | | | | | |
|------|----------------------------|---|-----------------|---------------|---------------|----------------|----------------|
| | | 0 bar Nm/° | 2,5 bar Nm/° | 4 bar Nm/° | 6 bar Nm/° | 10 bar Nm/° | 16 bar Nm/° |
| 20 | 130 | 0.2 | 0.5 | 0.9 | 1.3 | 1.7 | 1.9 |
| 25 | 130 | 0.2 | 0.5 | 0.9 | 1.3 | 1.7 | 1.9 |
| 32 | 130 | 0.2 | 0.5 | 0.9 | 1.3 | 1.7 | 1.9 |
| 40 | 130 | 0.3 | 0.6 | 1.1 | 1.6 | 2.0 | 2.3 |
| 50 | 130 | 0.3 | 0.6 | 1.1 | 1.6 | 2.0 | 2.2 |
| 65 | 130 | 0.4 | 0.9 | 1.7 | 2.5 | 3.2 | 3.6 |
| 80 | 130 | 1.0 | 1.0 | 2.0 | 3.0 | 4.0 | 5.0 |
| 100 | 130 | 1.0 | 2.0 | 4.0 | 7.0 | 9.0 | 10.0 |
| 125 | 130 | 2.0 | 3.0 | 6.0 | 10.0 | 13.0 | 15.0 |
| 150 | 130 | 3.0 | 7.0 | 12.0 | 19.0 | 25.0 | 28.0 |
| 200 | 130 | 11.0 | 20.0 | 41.0 | 63.0 | 82.0 | 91.0 |
| 250 | 130 | 18.0 | 35.0 | 65.0 | 102.0 | 130.0 | 144.0 |
| 300 | 130 | 29.0 | 58.0 | 105.0 | 154.0 | 206.0 | 229.0 |
| 350 | 200 | 34.0 | 57.0 | 113.0 | 183.0 | 244.0 | 270.0 |
| 400 | 200 | 65.0 | 110.0 | 218.0 | 226.0 | 460.0 | 511.0 |
| 450 | 250 | 87.0 | 168.0 | 304.0 | 473.0 | 609.0 | 676.0 |
| 500 | 200 | 125.0 | 239.0 | 436.0 | 674.0 | 868.0 | 963.0 |
| 600 | 200 | 186.0 | 261.0 | 618.0 | 1004.0 | 1288.0 | 1429.0 |
| 700 | *250 | 167.0 | 237.0 | 861.0 | 853.0 | 1140.0 | - |
| 800 | 250 | 277.0 | 416.0 | 914.0 | 1501.0 | 1937.0 | - |
| 900 | 300 | 386.0 | 733.0 | 1330.0 | 2082.0 | 2689.0 | - |
| 1000 | 300 | 531.0 | 991.0 | 1751.0 | 2945.0 | 3700.0 | - |

*Building length 260 m

Warning: Deviations (+/- 25 %) in the stiffness torque may occur due to use of different materials and manufacturing processes.

Frictional force

| DN | Overall length BL mm | For designs E and M | for design F |
|------|----------------------------|---------------------------|-----------------------------|
| | | Frictional force N/bar | frictional moment Nm/bar |
| 20 | 130 | 7 | 0.2 |
| 25 | 130 | 7 | 0.2 |
| 32 | 130 | 7 | 0.2 |
| 40 | 130 | 7 | 0.2 |
| 50 | 130 | 12 | 0.3 |
| 65 | 130 | 20 | 0.5 |
| 80 | 130 | 35 | 1.0 |
| 100 | 130 | 51 | 1.4 |
| 125 | 130 | 75 | 2.1 |
| 150 | 130 | 118 | 4.4 |
| 200 | 130 | 167 | 6.2 |
| 250 | 130 | 243 | 11.2 |
| 300 | 130 | 335 | 15.4 |
| 350 | 200 | 120 | 17.0 |
| 400 | 200 | 160 | 22.9 |
| 450 | 250 | 171 | 40.5 |
| 500 | 200 | 266 | 63.5 |
| 600 | 200 | 634 | 138.5 |
| 700 | *250 | 662 | 180.9 |
| 800 | 250 | 896 | 326.2 |
| 900 | 250 | 1105 | 402.4 |
| 1000 | 250 | 1357 | 617.3 |

*Building length 260 m

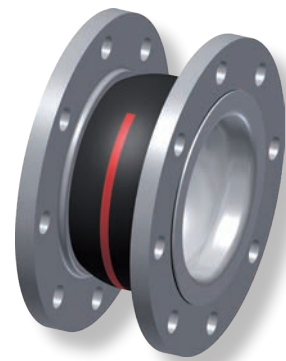
Warning: Deviations (+/- 25 %) in the frictional force may occur due to use of different materials and manufacturing processes.

WILLBRANDT Chemical Expansion Joint Type 50 PTFE

DN 25 - DN 500

Type 50 PTFE is a low-corrugated, PTFE-lined rubber expansion joint. Its low corrugation helps to achieve very low flow resistance. The PTFE lining gives the expansion joint high chemical resistance or an anti-adhesive property.

The PTFE lining can be used for any rubber compound on Type 50. It is however necessary to ensure that the selected rubber compound achieves the highest possible media resistance, as this is the only way to achieve optimum service life.



Dimensions for Design A

| DN | Length BL mm | Bellows | | ØD mm | ØPCD mm | Flange PN 10 | | | ØC mm | Movement absorption | | | | Weight kg |
|-----|--------------------|----------|------------|----------|------------|--------------|----|---------|----------|---------------------|------------------|--------------------|--------------------|--------------|
| | | ØA mm | WF* mm² | | | Ød mm | n | s mm | | axial + mm | axial - mm | lateral ± mm | angular ± ∠° | |
| 25 | 130 | 81 | 1700 | 115 | 85 | 14 | 4 | 14 | 66 | 15 | 15 | 15 | 15.0 | 1.9 |
| 32 | 130 | 81 | 1700 | 140 | 100 | 18 | 4 | 15 | 66 | 15 | 15 | 15 | 15.0 | 3.1 |
| 40 | 130 | 86 | 1800 | 150 | 110 | 18 | 4 | 15 | 74 | 15 | 15 | 15 | 15.0 | 3.5 |
| 50 | 130 | 96 | 3200 | 165 | 125 | 18 | 4 | 16 | 86 | 15 | 15 | 15 | 15.0 | 3.8 |
| 65 | 130 | 111 | 5300 | 185 | 145 | 18 | 8 | 16 | 106 | 15 | 15 | 15 | 15.0 | 5.4 |
| 80 | 130 | 122 | 8500 | 200 | 160 | 18 | 8 | 18 | 118 | 15 | 15 | 15 | 15.0 | 6.9 |
| 100 | 130 | 142 | 12800 | 220 | 180 | 18 | 8 | 18 | 138 | 15 | 15 | 15 | 10.0 | 8.0 |
| 125 | 130 | 168 | 18700 | 250 | 210 | 18 | 8 | 18 | 166 | 15 | 15 | 15 | 10.0 | 9.7 |
| 150 | 130 | 192 | 25900 | 285 | 240 | 22 | 8 | 20 | 192 | 15 | 15 | 15 | 10.0 | 13.1 |
| 200 | 130 | 252 | 41000 | 340 | 295 | 22 | 8 | 20 | 252 | 15 | 15 | 15 | 6.0 | 16.4 |
| 250 | 130 | 302 | 59600 | 395 | 350 | 22 | 12 | 20 | 304 | 15 | 15 | 15 | 6.0 | 21.7 |
| 300 | 130 | 354 | 82200 | 445 | 400 | 22 | 12 | 20 | 354 | 15 | 15 | 15 | 6.0 | 24.8 |
| 350 | 200 | 420 | 117600 | 505 | 460 | 22 | 16 | 24 | 412 | 15 | 15 | 15 | 4.0 | 38.8 |
| 400 | 200 | 480 | 154700 | 565 | 515 | 26 | 16 | 25 | 470 | 15 | 15 | 15 | 4.0 | 38.6 |
| 450 | 200 | 530 | 204200 | 615 | 565 | 26 | 20 | 28 | 520 | 15 | 15 | 15 | 4.0 | 49.3 |
| 500 | 200 | 580 | 227900 | 670 | 620 | 26 | 20 | 30 | 570 | 15 | 15 | 15 | 4.0 | 57.2 |

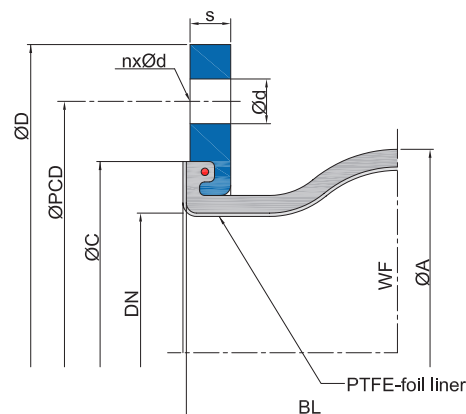
* WF = effective area

Permissible degree of utilisation for movement areas:
 - up to 50 °C: Utilisation ~ 100 %
 - up to 70 °C: Utilisation ~ 75 %
 - up to 90 °C: Utilisation ~ 60 %

Pressure resistance Max. 6 bar operating pressure with polyamide cord reinforcement, max. 9 bar operating pressure with aramid or steel cord reinforcement.

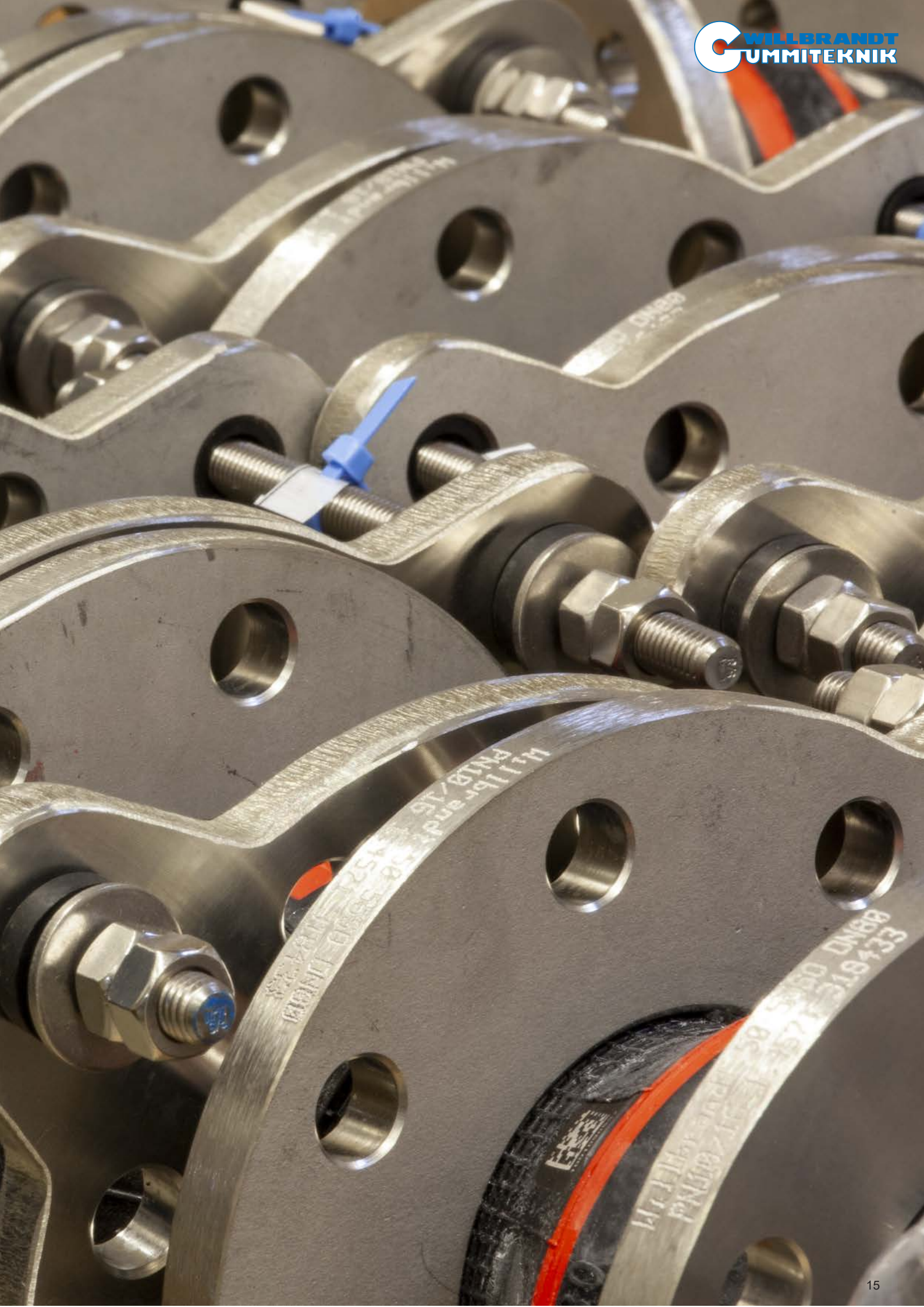
Conformity FDA and EU 1935/2004

Vacuum resistance Only limited suitable for vacuum operation. A PTFE vacuum supporting ring, which allows full vacuum for small nominal diameters, can be used from DN 50. The PTFE supporting ring can only be used up to 50 °C. DN 25, DN 32, DN 40 and DN 350 expansion joints are not suitable for vacuum operation.



Important information

**For aggressive media, please see the resistance table (can be requested separately).
 The bellows should not be painted or insulated. Please refer to the installation instructions.
 ++++ We will be happy to send you further information on the individual types and designs. ++++**

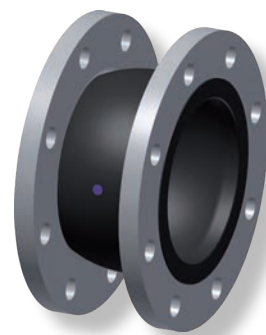


WILLBRANDT Rubber Expansion Joint Type 51

DN 32 - DN 600





Type 51 is a low-corrugated rubber expansion joint. Its low corrugation helps to achieve very low flow resistance. It reduces up to 70 % incoming energy. It is also characterised by its high level of pressure resistance. Type 51 is produced in four rubber qualities, which means that a suitable rubber compound is available for almost every application (see material descriptions on the following pages).

Type 51 is primarily used in industrial plants to absorb expansion, vibration and to insulate sound.



| | | | |
|--------------------------|---|-----------------------|---|
| Bellow design | Low-corrugated rubber bellow with reinforcement and shaped sealing bead with core ring, self-sealing (no additional seals required). Suitable for swiveling flanges. | Flange version | Both sides with swiveling flange made of galvanized steel with clearance holes, drilled according to DIN PN 10 (standard). Other materials and dimensions are possible. |
| Vacuum resistance | <ul style="list-style-type: none"> - DN 32 to 50 vacuum-resistant without additional accessories - DN 65 to 250 up to -200 mbar without additional accessories - DN 300 to 600 not vacuum-resistant without additional accessories - DN 65 to 600 vacuum-resistant with vacuum supporting spiral/ring | Accessories | <ul style="list-style-type: none"> - Guide sleeves - Potential equalisation - Flame-resistant protective covers - Dust and splash protection covers - Earth cover / sun protection hoods - Segment tie rods |

Specifications

| Bellow | | Core (inner) | Bellow design Reinforcement | Cover (outer) | Permissible operating data | | | | | | |
|-------------|---|--------------|-----------------------------|---------------|----------------------------|-----|-----|-----|-----|-----|---------------|
| Colour code | Colour marking | | | | °C | bar | °C | bar | °C | bar | Short-term °C |
| red-blue |  | IIR-D | Aramid | EPDM | 80 | 25 | 120 | 16 | 130 | 10 | 140 |
| green-blue |  | CSM | Aramid | CSM | 50 | 25 | 90 | 16 | 120 | 10 | 130 |
| lilac |  | FPM | Aramid | ECO | 50 | 25 | 120 | 16 | 150 | 4 | 160 |
| yellow-blue |  | NBR | Aramid | CR | 50 | 25 | 90 | 16 | 120 | 10 | 130 |

Bursting pressure: 75 bar

Application

Type 51 red-blue

For hot water, sea water, cooling water with chemical additives for treating water, saline solutions, weak acids and weak alkali solutions. Not suitable for oil products or cooling water with additives containing oil, hot air or steam.

Type 51 green-blue

For chemicals, aggressive chemical wastewater and compressor air containing oil.

Type 51 lilac

For flue gas desulphurisation systems and bio-diesel. Good resistance to benzene, xylene, toluene, fuels with an aromatic content of more than 50 %, aromatic/chlorinated hydrocarbons and mineral acids. Not suitable for water or steam.

Type 51 yellow-blue

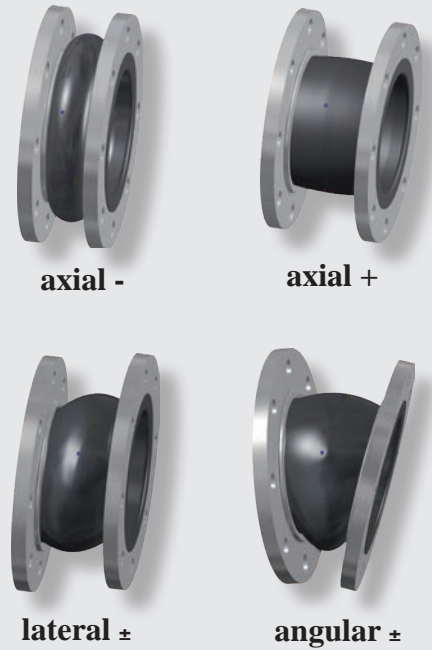
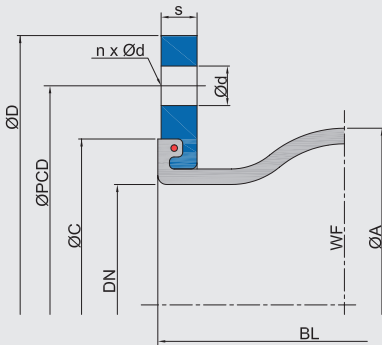
For oils, lubricants, fuels, gases, city and natural gas (not liquefied).

WILLBRANDT Rubber Expansion Joint Type 51

Design A - without tie rods

Can be used for movement absorption in any direction (for combined movements, see the movement diagram in the technical appendix), noise and vibration insulation.

The expansion joints reaction force must be absorbed via suitable piping.



Dimensions for Design A

| DN | Length BL mm | Bellow | | ØD mm | ØPCD mm | Flange PN 10*2 | | s mm | ØC mm | Movement absorption | | | | Weight kg |
|-----|--------------------|----------|-------------|----------|------------|----------------|----|---------|----------|---------------------|---------------|-----------------|-----------------|--------------|
| | | ØA mm | WF*1 mm² | | | Ød mm | n | | | axial + mm | axial - mm | lateral ± mm | angular ± ∠° | |
| 32 | 130 | 81 | 2700 | 140 | 100 | 18 | 4 | 15 | 79 | 10 | 20 | 15 | 20 | 3.2 |
| 40 | 130 | 86 | 2700 | 150 | 110 | 18 | 4 | 15 | 79 | 10 | 20 | 15 | 20 | 3.6 |
| 50 | 130 | 96 | 3200 | 165 | 125 | 18 | 4 | 15 | 88 | 10 | 20 | 15 | 20 | 3.8 |
| 65 | 130 | 110 | 5300 | 185 | 145 | 18 | 8 | 15 | 104 | 10 | 20 | 15 | 20 | 5.4 |
| 80 | 130 | 122 | 8500 | 200 | 160 | 18 | 8 | 15 | 119 | 15 | 20 | 15 | 20 | 7.0 |
| 100 | 130 | 142 | 12800 | 220 | 180 | 18 | 8 | 15 | 142 | 15 | 20 | 15 | 20 | 8.0 |
| 125 | 130 | 170 | 18700 | 250 | 210 | 18 | 8 | 18 | 169 | 15 | 20 | 15 | 20 | 9.7 |
| 150 | 130 | 196 | 25900 | 285 | 240 | 23 | 8 | 18 | 195 | 15 | 20 | 15 | 20 | 13.0 |
| 200 | 130 | 256 | 40900 | 340 | 295 | 23 | 8 | 20 | 244 | 15 | 20 | 15 | 15 | 16.6 |
| 250 | 130 | 306 | 59900 | 395 | 350 | 23 | 12 | 20 | 295 | 15 | 20 | 15 | 10 | 21.9 |
| 300 | 130 | 356 | 82200 | 445 | 400 | 23 | 12 | 22 | 351 | 15 | 20 | 15 | 10 | 25.2 |
| 350 | 200 | 442 | 117600 | 505 | 460 | 22 | 16 | 24 | 400 | 15 | 20 | 15 | 10 | 39.2 |
| 400 | 200 | 495 | 154700 | 565 | 515 | 26 | 16 | 25 | 450 | 20 | 25 | 20 | 8 | 38.8 |
| 450 | 250 | 545 | 227900 | 615 | 565 | 26 | 20 | 25 | 512 | 20 | 25 | 20 | 6 | 54.0 |
| 500 | 250 | 595 | 227900 | 670 | 620 | 26 | 20 | 30 | 563 | 20 | 25 | 20 | 6 | 57.3 |
| 600 | 250 | 695 | 311500 | 780 | 725 | 30 | 20 | 30 | 675 | 20 | 25 | 20 | 6 | 77.1 |

*1: WF = effective area

*2: Other standards/dimensions possible.

Permissible degree of utilisation for movement areas:

- up to 50 °C: Utilisation ~ 100 %

- up to 70 °C: Utilisation ~ 75 %

- up to 90 °C: Utilisation ~ 60 %

Important information

Please note the appropriate fixed point constructions and plain bearings in your piping system! For more information please refer to our installation instructions.

For information on the tie rods, please see the technical appendix (p. 93 - 96)!

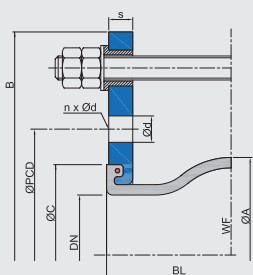
++++ We will be happy to send you further information on the individual types and designs. +++++

WILLBRANDT Rubber Expansion Joint Type 51

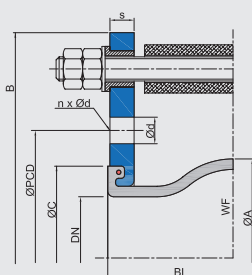
Length limiters

There is a selection of various length limiters / tie rods to absorb the reaction force and to protect the bellow from overstretching or collapsing:

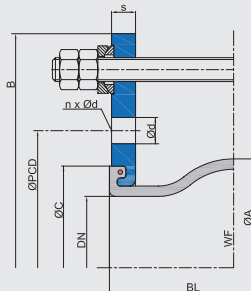
Design B*
with tie rods



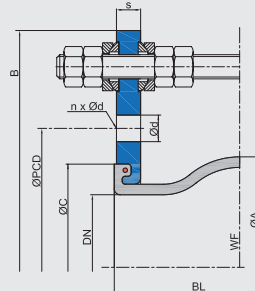
Design C*
with tie rods/thrust limiters



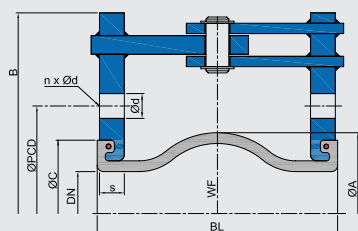
Design E
with tie rods and spherical washers/conical sockets



Design M
with tie rods/thrust limiters and spherical washers/conical sockets



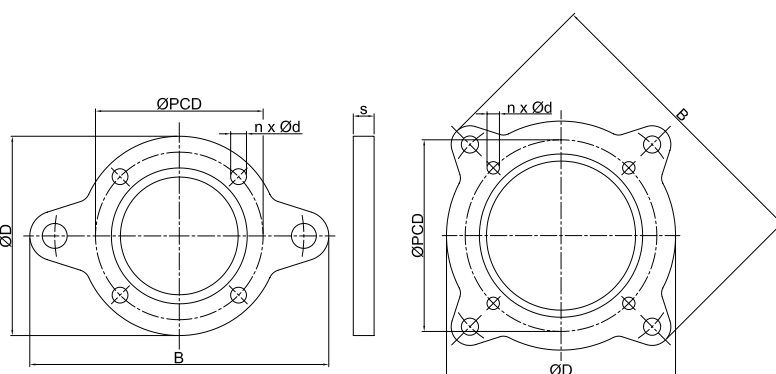
Design F
with hinge



*Note: For Designs B and C the lateral movement absorption is reduced by around 50 %.

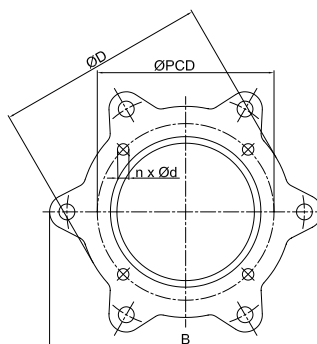
Flange dimensions for designs with tie rods

| DN | Length BL | Flange PN 10 (example dimensions) | | | | | | | ØC |
|-----|--------------|-----------------------------------|-----|------|----|----|----|-----|----|
| | | B | ØD | ØPCD | Ød | n | s | | |
| | mm | mm | mm | mm | mm | | mm | mm | |
| 32 | 130 | 230 | 140 | 100 | 18 | 4 | 15 | 79 | |
| 40 | 130 | 240 | 150 | 110 | 18 | 4 | 15 | 79 | |
| 50 | 130 | 255 | 165 | 125 | 18 | 4 | 16 | 88 | |
| 65 | 130 | 275 | 185 | 145 | 18 | 8 | 16 | 104 | |
| 80 | 130 | 290 | 200 | 160 | 18 | 8 | 18 | 119 | |
| 100 | 130 | 310 | 220 | 180 | 18 | 8 | 18 | 142 | |
| 125 | 130 | 340 | 250 | 210 | 18 | 8 | 18 | 169 | |
| 150 | 130 | 375 | 285 | 240 | 23 | 8 | 18 | 195 | |
| 200 | 130 | 440 | 340 | 295 | 23 | 8 | 20 | 244 | |
| 250 | 130 | 509 | 395 | 350 | 23 | 12 | 20 | 295 | |
| 300 | 130 | 559 | 445 | 400 | 23 | 12 | 22 | 351 | |
| 350 | 200 | 619 | 505 | 460 | 22 | 16 | 24 | 400 | |
| 400 | 200 | 700 | 565 | 515 | 26 | 16 | 25 | 450 | |
| 450 | 250 | 760 | 615 | 565 | 26 | 20 | 30 | 512 | |
| 500 | 250 | 810 | 670 | 620 | 26 | 20 | 30 | 563 | |
| 600 | 250 | 930 | 780 | 725 | 30 | 20 | 30 | 675 | |

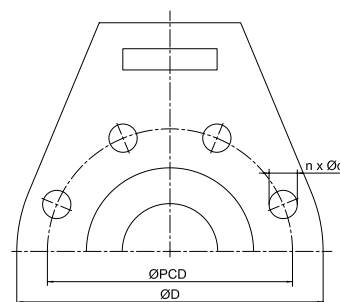


DN 32 - 200

DN 250 - 900



DN 1000



DN 50 - 1000 (Design F)

WILLBRANDT Rubber Expansion Joint Type 51

Axial stiffness rates

| DN | Overall length BL mm | Stiffness rates (averages value from full way) | | | | | | |
|-----|----------------------------|--|-----------------|---------------|---------------|----------------|----------------|----------------|
| | | 0 bar N/mm | 2.5 bar N/mm | 4 bar N/mm | 6 bar N/mm | 10 bar N/mm | 16 bar N/mm | 25 bar N/mm |
| 50 | 130 | 47 | 97 | 187 | 256 | 330 | 430 | 558 |
| 65 | 130 | 61 | 134 | 252 | 379 | 480 | 624 | 811 |
| 80 | 130 | 82 | 170 | 305 | 434 | 543 | 706 | 918 |
| 100 | 130 | 95 | 191 | 315 | 559 | 743 | 966 | 1256 |
| 125 | 130 | 111 | 216 | 419 | 655 | 863 | 1122 | 1459 |
| 150 | 130 | 127 | 268 | 496 | 770 | 1024 | 1332 | 1731 |
| 200 | 130 | 148 | 267 | 541 | 842 | 1089 | 1416 | 1841 |
| 250 | 130 | 160 | 315 | 591 | 927 | 1185 | 1540 | 2002 |
| 300 | 130 | 182 | 367 | 663 | 974 | 1307 | 1699 | 2208 |
| 350 | 200 | 189 | 318 | 627 | 1018 | 1352 | 1757 | 2285 |
| 400 | 200 | 200 | 339 | 671 | 696 | 1417 | 1842 | 2395 |
| 450 | 250 | 217 | 416 | 755 | 1174 | 1511 | 1964 | 2553 |
| 500 | 250 | 255 | 489 | 892 | 1378 | 1773 | 2305 | 2997 |
| 600 | 250 | 270 | 380 | 900 | 1460 | 1873 | 2435 | 3166 |

Warning: Deviations (+/-25 %) in the stiffness rates may occur due to use of different materials and manufacturing processes.

Lateral stiffness rates

| DN | Overall length BL mm | Stiffness rates (averages value from full way) | | | | | | |
|-----|----------------------------|--|-----------------|---------------|---------------|----------------|----------------|----------------|
| | | 0 bar N/mm | 2.5 bar N/mm | 4 bar N/mm | 6 bar N/mm | 10 bar N/mm | 16 bar N/mm | 25 bar N/mm |
| 50 | 130 | 65 | 85 | 104 | 137 | 189 | 245 | 319 |
| 65 | 130 | 52 | 101 | 150 | 195 | 215 | 279 | 363 |
| 80 | 130 | 46 | 96 | 177 | 202 | 225 | 292 | 380 |
| 100 | 130 | 72 | 114 | 186 | 218 | 250 | 324 | 422 |
| 125 | 130 | 130 | 260 | 339 | 381 | 498 | 647 | 841 |
| 150 | 130 | 156 | 338 | 402 | 476 | 606 | 788 | 1024 |
| 200 | 130 | 420 | 940 | 1087 | 1234 | 1585 | 2060 | 2678 |
| 250 | 130 | 492 | 1048 | 1329 | 1525 | 1923 | 2500 | 3249 |
| 300 | 130 | 510 | 1088 | 1388 | 1581 | 2005 | 2606 | 3388 |
| 350 | 200 | 397 | 793 | 991 | 1138 | 1427 | 1856 | 2412 |
| 400 | 200 | 439 | 835 | 1062 | 1230 | 1559 | 2026 | 2634 |
| 450 | 250 | 445 | 831 | 1067 | 1262 | 1560 | 2028 | 2636 |
| 500 | 250 | 554 | 1063 | 1362 | 1565 | 1944 | 2527 | 3285 |
| 600 | 250 | 593 | 1084 | 1381 | 1684 | 2062 | 2680 | 3484 |

Warning: Deviations (+/-25 %) in the stiffness rates may occur due to use of different materials and manufacturing processes.

Important information

Please note the appropriate fixed point constructions and plain bearings in your piping system! For more information please refer to our installation instructions.
For information on the tie rods, please see the technical appendix (p. 93-96)!
++++ We will be happy to send you further information on the individual types and designs. +++++

WILLBRANDT Rubber Expansion Joint Type 51

Angular stiffness torque

| DN | Overall length BL mm | Stiffness torque (averages value from full way) | | | | | | |
|-----|----------------------------|---|-----------------|---------------|---------------|----------------|----------------|----------------|
| | | 0 bar Nm/° | 2.5 bar Nm/° | 4 bar Nm/° | 6 bar Nm/° | 10 bar N/mm | 16 bar Nm/° | 25 bar Nm/° |
| 50 | 130 | 1 | 1 | 2 | 3 | 4 | 5 | 6 |
| 65 | 130 | 1 | 2 | 4 | 6 | 7 | 9 | 12 |
| 80 | 130 | 2 | 4 | 6 | 9 | 11 | 15 | 19 |
| 100 | 130 | 3 | 6 | 10 | 17 | 23 | 30 | 38 |
| 125 | 130 | 5 | 10 | 19 | 30 | 39 | 51 | 66 |
| 150 | 130 | 8 | 17 | 31 | 48 | 63 | 83 | 107 |
| 200 | 130 | 16 | 29 | 59 | 92 | 119 | 154 | 201 |
| 250 | 130 | 26 | 51 | 96 | 151 | 193 | 251 | 327 |
| 300 | 130 | 42 | 84 | 152 | 224 | 300 | 390 | 507 |
| 350 | 200 | 60 | 101 | 200 | 325 | 432 | 561 | 729 |
| 400 | 200 | 85 | 143 | 283 | 294 | 599 | 778 | 1012 |
| 450 | 250 | 114 | 218 | 396 | 615 | 791 | 1029 | 1337 |
| 500 | 250 | 162 | 311 | 567 | 877 | 1128 | 1467 | 1907 |
| 600 | 250 | 242 | 339 | 804 | 1305 | 1674 | 2176 | 2829 |

Warning: Deviations (+/-25 %) in the stiffness torque may occur due to use of different materials and manufacturing processes.

Frictional force

| DN | Overall length BL mm | for Designs E and M | for Design F |
|-----|----------------------------|---------------------------|-----------------------------|
| | | Frictional force N/bar | Frictional moment Nm/bar |
| 32 | 130 | 7 | 0.3 |
| 40 | 130 | 7 | 0.3 |
| 50 | 130 | 12 | 0.3 |
| 65 | 130 | 20 | 0.5 |
| 80 | 130 | 35 | 1.0 |
| 100 | 130 | 51 | 1.4 |
| 125 | 130 | 75 | 2.1 |
| 150 | 130 | 118 | 4.4 |
| 200 | 130 | 167 | 6.2 |
| 250 | 130 | 243 | 11.2 |
| 300 | 130 | 335 | 15.4 |
| 350 | 200 | 120 | 17.0 |
| 400 | 200 | 160 | 22.9 |
| 450 | 250 | 226 | 40.5 |
| 500 | 250 | 266 | 63.5 |
| 600 | 250 | 634 | 138.5 |

Warning: Deviations (+/-25 %) in the frictional force may occur due to use of different materials and manufacturing processes.

Important information

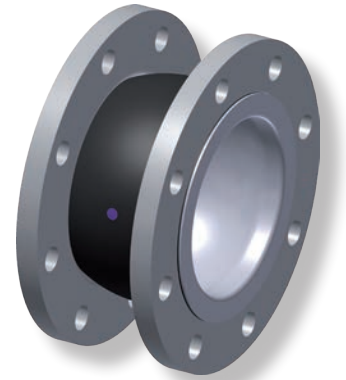
Please note the appropriate fixed point constructions and plain bearings in your piping system!
For more information please refer to our installation instructions.
For information on the tie rods, please see the technical appendix (p. 93 - 96)!
++++ We will be happy to send you further information on the individual types and designs. ++++

WILLBRANDT Rubber Expansion Joint Type 51 PTFE

DN 32 - DN 300

Type 51 PTFE is a low-corrugated, PTFE-lined rubber expansion joint. Its low corrugation helps it to achieve very low flow resistance. The PTFE lining gives the expansion joint high chemical resistance or an anti-adhesive property.

The PTFE lining can be used for any rubber compound on Type 51. It is however necessary to ensure that the selected rubber compound achieves the highest possible media resistance, as this is the only way to achieve optimum service life.



Dimensions

| DN | Length BL mm | Bellows | | ØD mm | ØPCD mm | Flange PN 10 ^{*2} | | s mm | ØC mm | Movement absorption | | | |
|-----|--------------------|----------|-------------------------------------|----------|------------|----------------------------|----|---------|----------|---------------------|------------------|--------------------|--------------------|
| | | ØA mm | WF ^{*1} mm ² | | | Ød mm | n | | | axial + mm | axial - mm | lateral ± mm | angular ± ∠° |
| 32 | 130 | 81 | 2700 | 140 | 100 | 18 | 4 | 15 | 79 | 15 | 15 | 15 | 10 |
| 40 | 130 | 86 | 2700 | 150 | 110 | 18 | 4 | 15 | 79 | 15 | 15 | 15 | 10 |
| 50 | 130 | 96 | 3200 | 165 | 125 | 18 | 4 | 15 | 88 | 15 | 15 | 15 | 10 |
| 65 | 130 | 110 | 5300 | 185 | 145 | 18 | 8 | 15 | 104 | 15 | 15 | 15 | 10 |
| 80 | 130 | 122 | 8500 | 200 | 160 | 18 | 8 | 15 | 119 | 15 | 15 | 15 | 10 |
| 100 | 130 | 142 | 12800 | 220 | 180 | 18 | 8 | 15 | 142 | 15 | 15 | 15 | 10 |
| 125 | 130 | 170 | 18700 | 250 | 210 | 18 | 8 | 18 | 169 | 15 | 15 | 15 | 10 |
| 150 | 130 | 196 | 25900 | 285 | 240 | 23 | 8 | 18 | 195 | 15 | 15 | 15 | 10 |
| 200 | 130 | 256 | 40900 | 340 | 295 | 23 | 8 | 20 | 244 | 15 | 15 | 15 | 4 |
| 250 | 130 | 306 | 59900 | 395 | 350 | 23 | 12 | 20 | 295 | 15 | 15 | 15 | 4 |
| 300 | 130 | 356 | 82200 | 445 | 400 | 23 | 12 | 22 | 351 | 15 | 15 | 15 | 4 |

*1 WF = effective area

*2 Other standards/dimensions possible.

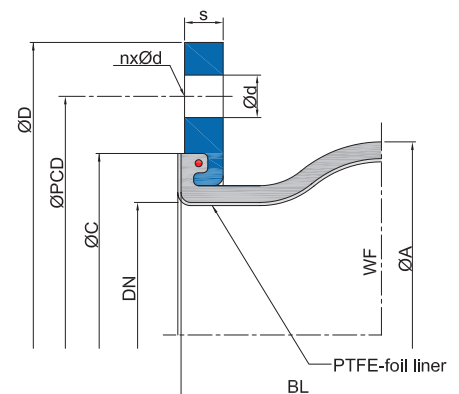
Permissible degree of utilisation for movement areas:

- up to 50 °C: Utilisation ~ 100 %
- up to 70 °C: Utilisation ~ 75 %
- up to 90 °C: Utilisation ~ 60 %

Pressure resistance Max. 9 bar operating pressure

Conformity FDA and EU 1935/2004

Vacuum resistance Only limited suitable for vacuum operation. A PTFE vacuum supporting ring, which allows full vacuum for small nominal diameters, can be used from DN 50. The PTFE supporting ring can only be used up to 50 °C. DN 32 and DN 40 expansion joints are not suitable for vacuum operation.

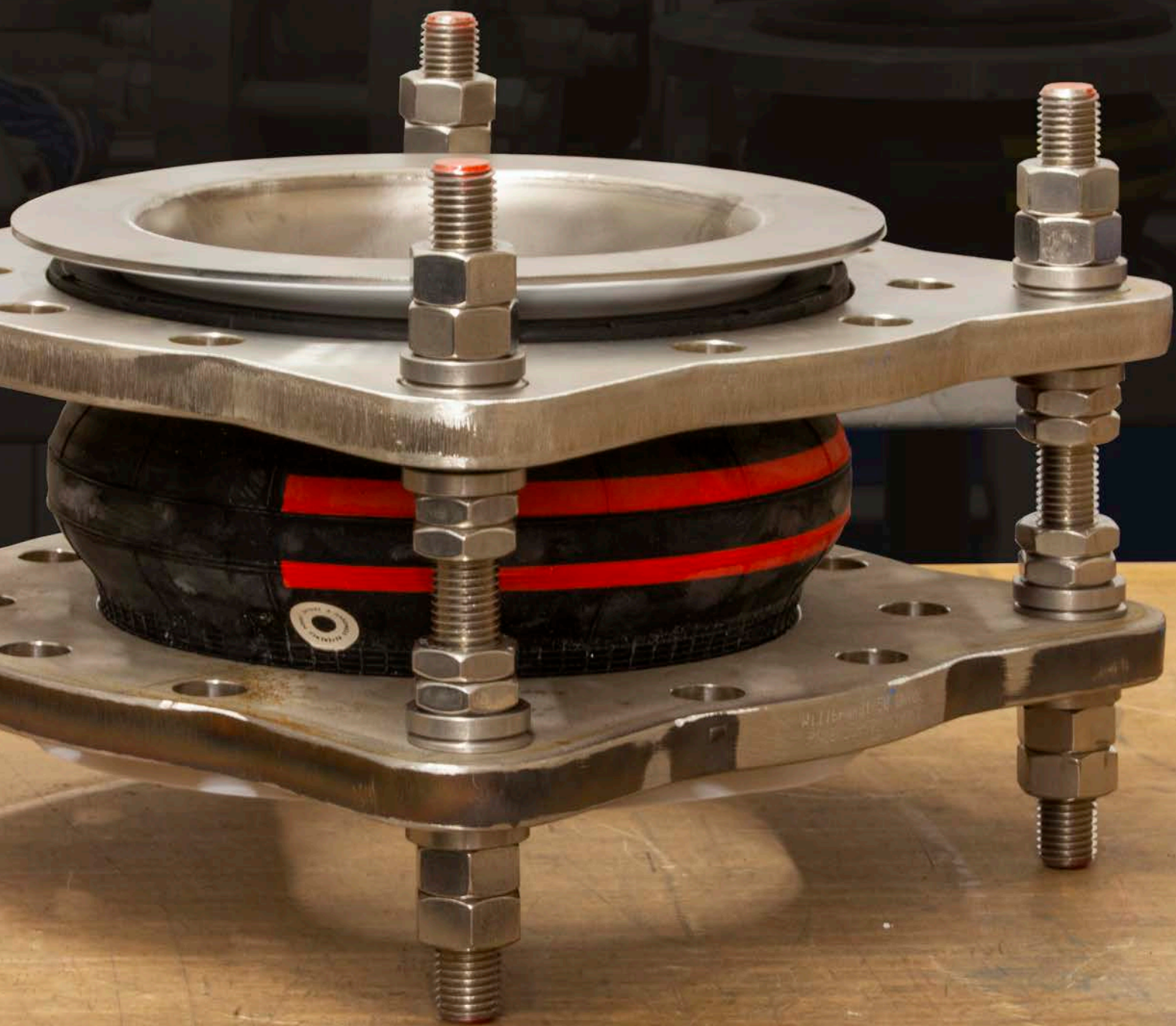


Important information

For aggressive media, please see the resistance table (can be requested separately).

The bellows should not be painted or insulated. Please refer to the installation instructions.

++++ We will be happy to send you further information on the individual types and designs. ++++

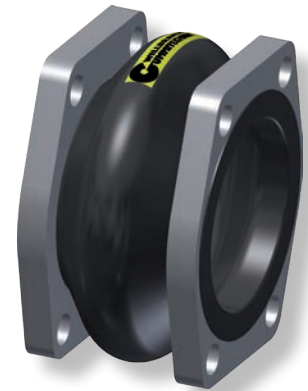


WILLBRANDT Rubber Expansion Joint Type 54

DN 25 - DN 100


Type 54 is a high-corrugated rubber expansion joint for hydraulic systems. In combination with flanges according to SAE 3000 it is characterised by its large opening and considerable movement absorption. It is only available in an oil-resistable rubber compound.

Type 54 is almost exclusively used in the hydraulics and oil industries to absorb expansion and vibration, and to insulate sound.



| | | | |
|--------------------------|---|-----------------------|---|
| Bellow design | High-corrugated rubber bellow with reinforcement and shaped sealing bead with core ring, self-sealing (no additional seals required). Suitable for accommodating swiveling flanges. | Flange version | Both sides with swiveling flange made of galvanized steel, with clearance holes (drilled according to SAE 3000). |
| Vacuum resistance | <ul style="list-style-type: none"> - DN 25 to 40 up to -200 mbar without additional accessories - DN 50 to DN 100 vacuum-resistant with vacuum supporting spiral/ring - To reach higher vacuum for diameter DN 25 to DN 40, Type 50 yellow has to be used (installation length 130 mm) | Accessories | <ul style="list-style-type: none"> - Guide sleeves - Potential equalisation - Flame-resistant protective covers - Dust and splash protection covers - Earth cover / sun protection hoods |

Specifications

| Bellow | | Core (inner) | Bellow design Reinforcement | Cover (outer) | Permissible operating data | |
|-------------|---|--------------|-----------------------------|---------------|----------------------------|-----|
| Colour code | Colour marking | | | | °C | bar |
| yellow |  | NBR | Polyamide | CR | 80 | 2 |

Application

Type 54 yellow NBR

Good resistance to heat and ageing, particularly in the absence of air (e.g. in oil). Excellent resistance to swelling (weak- and non-polar media, e.g. mineral oils, lubricating greases, animal and vegetable fats or oils). No resistance to esters, ketones, aromatic or chlorinated hydrocarbons or lead-free fuels.

Note!

Detailed material descriptions on pages 5 - 7.

Important information

Use only flat head DIN 7984 hexagon head screws to screw the expansion joints into place.

The bellows should not be painted or insulated.

Please refer to the installation instructions.

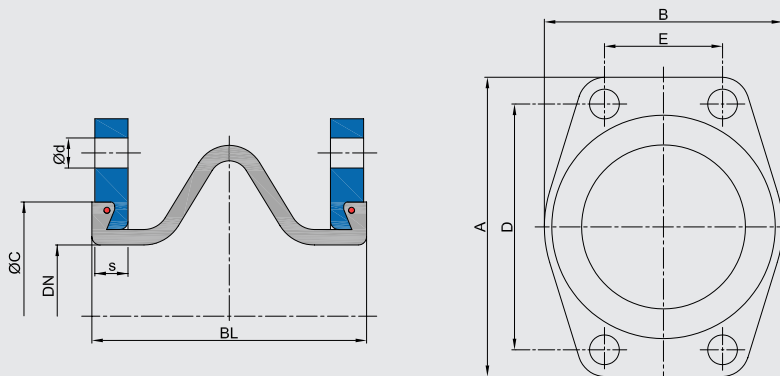
++++ We will be happy to send you further information on the individual types and designs. +++++

WILLBRANDT Rubber Expansion Joint Type 54

Design A - without tie rods

Can be used for movement absorption in any direction (for combined movements, see the movement diagram in the technical appendix), noise and vibration insulation.

The expansion joint's reaction force must be absorbed via suitable piping.



Dimensions for Design A

| DN | Length BL mm | Bellow | | Flange SAE 3000 | | | | | | | | Movement absorption | | | | Weight kg |
|-----|--------------------|-----------|----------|-----------------|---------|---------|---------|----------|---|---------|------------------|---------------------|--------------------|--------------------|-----|--------------|
| | | Ødi mm | ØC mm | A mm | B mm | D mm | E mm | Ød mm | n | s mm | axial + mm | axial - mm | lateral ± mm | angular ± ∠° | | |
| 25 | 65 | 25 | 43 | 70 | 59 | 52.4 | 26.2 | 11 | 4 | 11 | 5 | 5 | 5 | 7.5 | 0.4 | |
| 32 | 65 | 32 | 50 | 81 | 73 | 58.7 | 30.2 | 13 | 4 | 11 | 5 | 5 | 5 | 7.5 | 0.5 | |
| 40 | 100 | 40 | 62 | 95 | 83 | 70.0 | 35.7 | 13 | 4 | 13 | 10 | 10 | 10 | 10.0 | 0.8 | |
| 50 | 100 | 48 | 72 | 103 | 97 | 77.8 | 42.9 | 13 | 4 | 13 | 10 | 10 | 10 | 10.0 | 1.0 | |
| 65 | 100 | 63 | 87 | 115 | 109 | 89.0 | 50.8 | 13 | 4 | 14 | 10 | 10 | 10 | 10.0 | 1.2 | |
| 80 | 100 | 80 | 104 | 136 | 131 | 106.4 | 62.0 | 17 | 4 | 14 | 10 | 10 | 10 | 10.0 | 1.8 | |
| 90 | 100 | 80 | 104 | 152 | 140 | 120.6 | 70.0 | 17 | 4 | 14 | 10 | 10 | 10 | 10.0 | 1.9 | |
| 100 | 100 | 100 | 130 | 162 | 152 | 130.2 | 77.8 | 17 | 4 | 16 | 10 | 10 | 10 | 10.0 | 2.5 | |

Important information

Use only flat head DIN 7984 hexagon head screws to screw the expansion joints into place. Please note the appropriate fixed point constructions and plain bearings in your piping system! You can find information on this in our installation instructions. For information on the tie rods, please see the technical appendix (p. 93 - 96)!
++++ We will be happy to send you further information on the individual types and designs. +++++

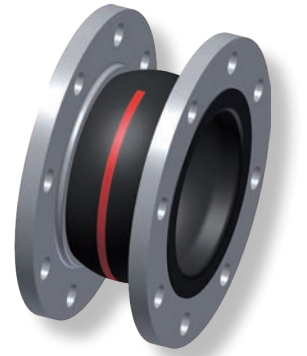


WILLBRANDT Rubber Expansion Joint Type 55

DN 20 - DN 1000






Type 55 is a low-corrugated, highly elastic rubber expansion joint. Its low corrugation helps to achieve very low flow resistance. It reduces up to 70 % of the incoming energy. It is also characterised by very high movement absorption in all directions and its variety of rubber qualities, which means that a suitable rubber compound is available for almost every application (see material descriptions on the following pages).

Type 55 is used in building technology, plant engineering, water and wastewater technology, engine construction, shipbuilding and in solar and wind plant engineering. It is especially used to absorb expansion and vibration and to insulate sound.







| | | | |
|-----------------------------|--|-----------------------|--|
| Bellow design | Low-corrugated rubber bellow with reinforcement and shaped sealing bead with core ring, self-sealing (no additional seals required). Suitable for accommodating swiveling flanges. | Flange version | Both sides with swiveling flange made of galvanized steel, with clearance holes, drilled according to DIN PN 10 (standard). Other materials and dimensions are possible. |
| Approvals/Conformity | Similar to DIN 4809 / TÜV approved, drinking water, shipbuilding approval FDA and EU 1935/2004 conform | | |

Specifications for DN 20 - DN 400

| Bellow | | Bellow design | | | Permissible operating data | | | | | | | | Surface resistance Ro | | |
|-------------|---|---------------|---------------|---------------|----------------------------|----|----|----|-----|----|-----|----|-----------------------|---------------------|----------------------|
| Colour-code | Colour marking | Core (inner) | Reinforcement | Cover (outer) | °C | | °C | | °C | | °C | | Short-term °C | Core Ohm x cm | Cover Ohm x cm |
| red Sp |  | EPDM | PEEK | EPDM | -40 | 10 | 70 | 16 | 100 | 10 | 130 | 8 | 150 | 4 x 10 ³ | 4 x 10 ³ |
| red |  | IIR | Polyamide | EPDM | -40 | 10 | 50 | 16 | 70 | 12 | 100 | 10 | 120 | 7 x 10 ⁶ | 1 x 10 ³ |
| yellow |  | NBR | Polyamide | CR | -20 | 10 | 50 | 16 | 70 | 12 | 90 | 10 | 100 | 2 x 10 ² | 1 x 10 ³ |
| green |  | CSM | Polyamide | CSM | -20 | 10 | 50 | 16 | 70 | 12 | 100 | 10 | 110 | 7 x 10 ⁹ | 7 x 10 ⁹ |
| yellow St |  | NBR | Steel cord | CR | -20 | 10 | 60 | 16 | 70 | 12 | 90 | 10 | 100 | 2 x 10 ² | 5 x 10 ¹⁰ |

- Bursting pressure for DN 20 - 400: > 48 bar
- DN 300 max. 10 bar working pressure / Bursting pressure >30 bar

Specifications for DN 450 - DN 1000

| Bellow | | Bellow design | | | Permissible operating data | | | | | | | | Surface resistance Ro | | |
|-------------|---|---------------|---------------|---------------|----------------------------|---|----|----|-----|-----|-----|---|-----------------------|---------------------|---------------------|
| Colour-code | Colour marking | Core (inner) | Reinforcement | Cover (outer) | °C | | °C | | °C | | °C | | Short-term °C | Core Ohm x cm | Cover Ohm x cm |
| red Sp |  | EPDM | PEEK | EPDM | -40 | 8 | 70 | 10 | 100 | 7.5 | 130 | 6 | 150 | 4 x 10 ³ | 4 x 10 ³ |
| red |  | IIR | Polyamide | EPDM | -40 | 8 | 50 | 10 | 70 | 8.0 | 100 | 6 | 120 | 7 x 10 ⁶ | 1 x 10 ³ |
| yellow |  | NBR | Polyamide | CR | -20 | 8 | 50 | 10 | 70 | 8.0 | 90 | 6 | 100 | 2 x 10 ² | 1 x 10 ³ |
| green |  | CSM | Polyamide | CSM | -20 | 8 | 50 | 10 | 70 | 8.0 | 100 | 6 | 110 | 7 x 10 ⁹ | 7 x 10 ⁹ |

- Bursting pressure for DN 450 - 1000: > 30 bar

Important information

**For aggressive media, please see the resistance table (can be requested separately).
The bellows should not be painted or insulated. Please refer to the installation instructions.
++++ We will be happy to send you further information on the individual types and designs. +++++**

WILLBRANDT Rubber Expansion Joint Type 55

Vacuum resistance



- DN 20 to 50 vacuum-resistant without additional accessories
- DN 65 to 250 up to -200 mbar without additional accessories
- DN 300 to 1000 not vacuum-resistant without additional accessories
- DN 65 to 1000 vacuum-resistant with vacuum supporting spiral/ring

Accessories

- Guide sleeves
- Potential equalisation
- Flame-resistant protective covers
- Dust and splash protection covers
- Earth cover / sun protection hoods
- Segment tie rods

Application

Type 55 red Sp

For heating installations according to DIN 4809. For many years of operation under constant loading with hot water and heating water at 100 °C/110 °C at 10 bar/6 bar operating pressure. Electrically conductive surface. Not suitable for media with additives containing oil.

Type 55 red

For drinking water, hot water, sea water, cooling water with chemical additives for treating water, saline solutions, weak acids and weak alkaline solutions. Electrically dissipative inner surface and electrically conductive outer surface. Not suitable for oil products or cooling water with additives containing oil.

Type 55 yellow

For oils, lubricants, fuels, gases, city and natural gas (not liquefied) and DIN EN fuels with an aromatic content up to 50 %. Electrically conductive.

Type 55 green

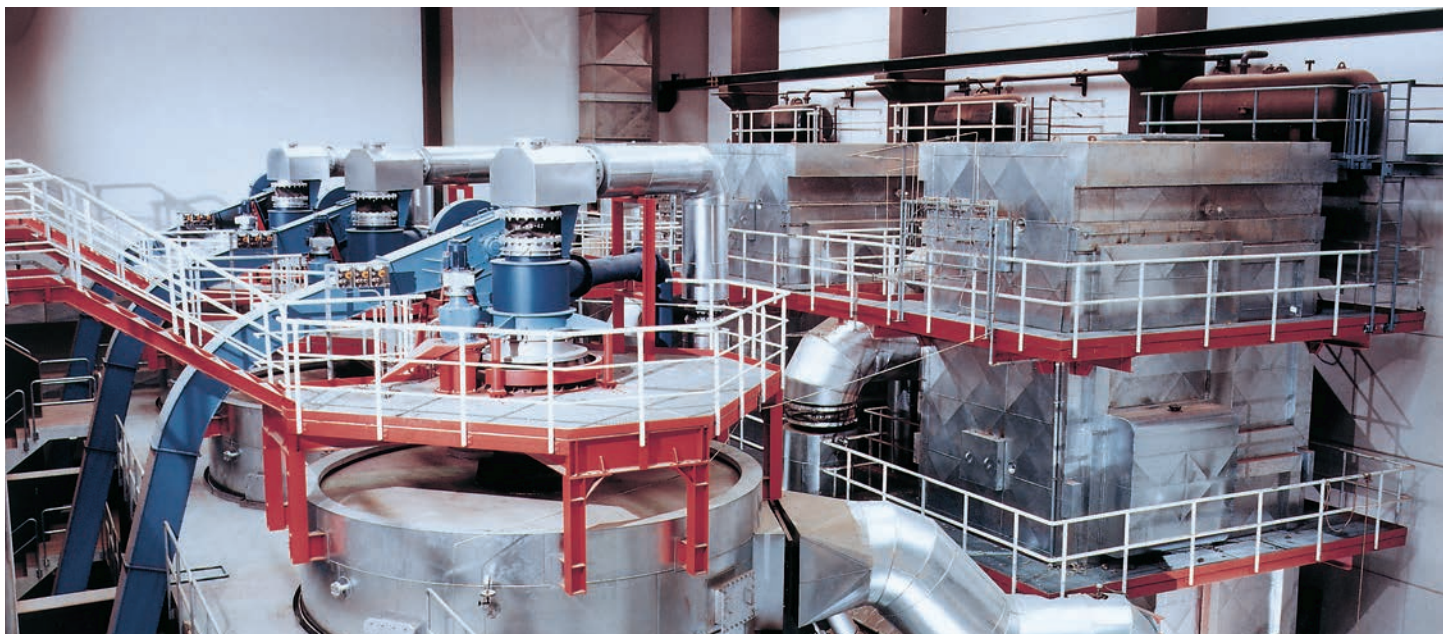
For chemicals, aggressive chemical wastewater and compressor air containing oil. Electrically insulating.

Type 55 yellow St

Like Type 50 yellow with additional flame-resistance for up to 30 minutes at 800 °C. Electrically conductive inner surface, electrically insulating outer surface.

Note!

Detailed material descriptions on pages 5 - 7.

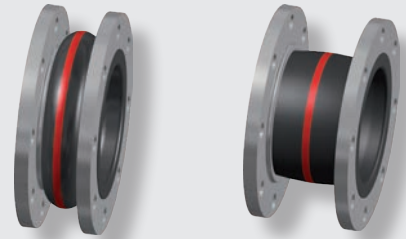
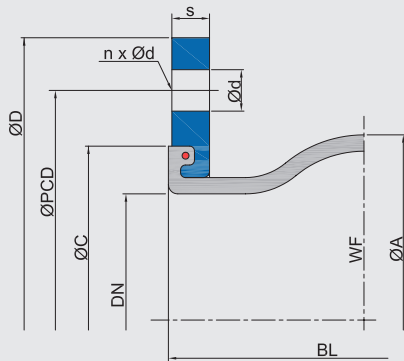


WILLBRANDT Rubber Expansion Joint Type 55

Design A - without tie rods

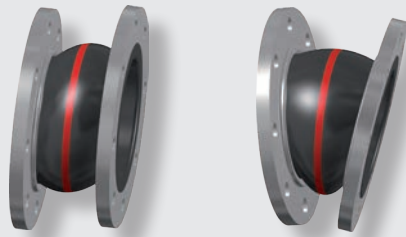
Can be used for movement absorption in any direction (for combined movements, see the movement diagram in the technical appendix), noise and vibration insulation.

The expansion joint's reaction force must be absorbed via suitable piping.



axial -

axial +



lateral ±

angular ±

Dimensions for Design A

| DN | Length BL | Bellow | | Flange PN 10 ^{*2} | | | | | | Movement absorption | | | | Weight kg |
|--------------------|--------------------|--------|------------------|----------------------------|------|----|----|----|------|---------------------|------------------|--------------------|--------------------|--------------|
| | | ØA | WF ^{*1} | ØD | ØPCD | Ød | n | s | ØC | axial + mm | axial - mm | lateral ± mm | angular ± ∠° | |
| 20 | * ₃ 125 | 81 | 1700 | 105 | 75 | 12 | 4 | 14 | 66 | 30 | 30 | 30 | 30 | 1.5 |
| 25 | * ₃ 125 | 81 | 1700 | 115 | 85 | 14 | 4 | 14 | 66 | 30 | 30 | 30 | 30 | 1.9 |
| 32 | * ₃ 125 | 81 | 1700 | 140 | 100 | 18 | 4 | 15 | 66 | 30 | 30 | 30 | 30 | 3.1 |
| 40 | * ₃ 125 | 86 | 1800 | 150 | 110 | 18 | 4 | 15 | 74 | 30 | 30 | 30 | 30 | 3.5 |
| 50 | * ₃ 125 | 96 | 3200 | 165 | 125 | 18 | 4 | 16 | 86 | 30 | 30 | 30 | 30 | 3.7 |
| 65 | * ₃ 125 | 111 | 5300 | 185 | 145 | 18 | 8 | 16 | 106 | 30 | 30 | 30 | 30 | 5.3 |
| 80 | 150 | 122 | 8500 | 200 | 160 | 18 | 8 | 18 | 118 | 30 | 30 | 30 | 30 | 6.9 |
| 100 | 150 | 142 | 12800 | 220 | 180 | 18 | 8 | 18 | 138 | 30 | 30 | 30 | 20 | 8.0 |
| 125 | 150 | 168 | 18700 | 250 | 210 | 18 | 8 | 18 | 166 | 30 | 30 | 30 | 20 | 9.8 |
| 150 | 150 | 192 | 25900 | 285 | 240 | 22 | 8 | 18 | 192 | 30 | 30 | 30 | 20 | 13.2 |
| 200 | 175 | 252 | 41000 | 340 | 295 | 22 | 8 | 20 | 252 | 30 | 30 | 30 | 12 | 17.9 |
| 250 | 175 | 302 | 59600 | 395 | 350 | 22 | 12 | 20 | 304 | 30 | 30 | 30 | 12 | 23.8 |
| 300 | 200 | 354 | 82200 | 445 | 400 | 22 | 12 | 22 | 354 | 30 | 30 | 30 | 12 | 25.0 |
| 350 | 200 | 420 | 117600 | 505 | 460 | 22 | 16 | 24 | 412 | 30 | 50 | 30 | 8 | 38.3 |
| 400 | 200 | 480 | 154700 | 565 | 515 | 26 | 16 | 25 | 470 | 30 | 50 | 30 | 8 | 38.0 |
| 450 | 250 | 530 | 204200 | 615 | 565 | 26 | 20 | 25 | 520 | 30 | 50 | 30 | 8 | 53.7 |
| * ₃ 500 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| * ₃ 600 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 700 | * ₃ 275 | 800 | 434200 | 895 | 840 | 30 | 24 | 35 | 780 | 30 | 50 | 30 | 8 | 127.3 |
| 800 | 250 | 880 | 527400 | 1015 | 950 | 33 | 24 | 40 | 887 | 30 | 50 | 30 | 6 | 161.0 |
| 900 | 300 | 1038 | 737900 | 1115 | 1050 | 33 | 28 | 40 | 987 | 30 | 50 | 30 | 5 | 196.7 |
| 1000 | 300 | 1138 | 889400 | 1230 | 1160 | 36 | 28 | 40 | 1087 | 30 | 50 | 30 | 5 | 234.5 |

*₁ WF = effective area

*₂ Other standards/dimensions possible.

*₃ Building length 130 mm

* see type 52

*₃ Building length 260 mm

Permissible degree of utilisation for movement areas:

- up to 50 °C: Utilisation ~ 100 %

- up to 70 °C: Utilisation ~ 75 %

- up to 90 °C: Utilisation ~ 60 %

Important information

Please note the appropriate fixed point constructions and plain bearings in your piping system! You can find information on this in our installation instructions.

For information on the tie rods, please see the technical appendix (p. 93 - 96)!

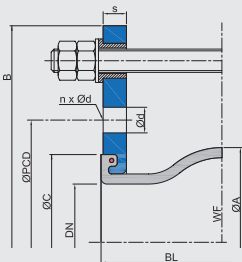
++++ We will be happy to send you further information on the individual types and designs. ++++

WILLBRANDT Rubber Expansion Joint Type 55

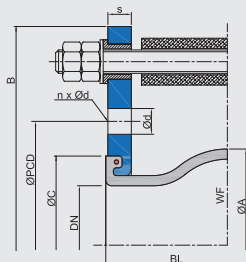
Length limiters

There is a selection of various length limiters / tie rods to absorb the reaction force and to protect the bellow from overstretching or collapsing:

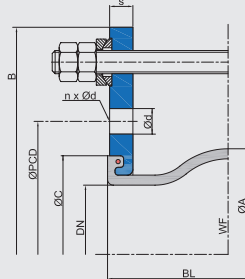
Design B*
with tie rods



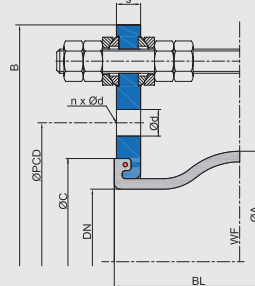
Design C*
with tie rod/thrust limiters



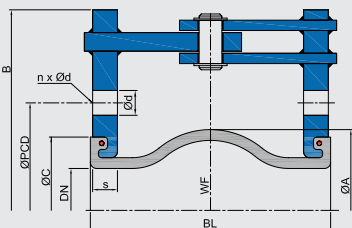
Design E
with tie rods and spherical washers/conical sockets



Design M
with tie rods/thrust limiters with spherical washers/conical sockets



Design F
with hinge

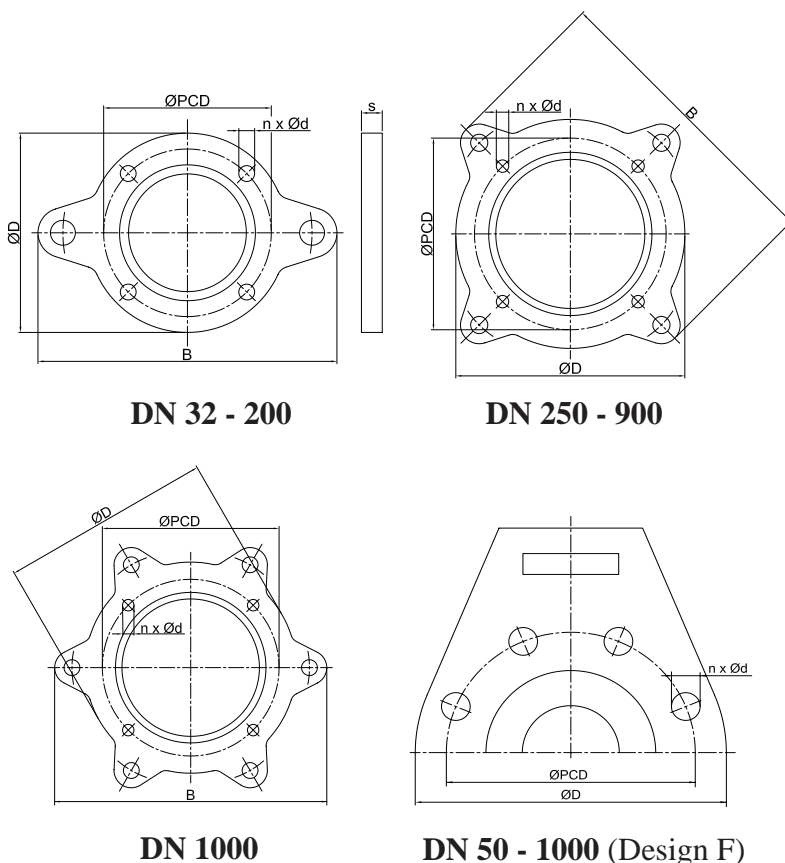


*Note: For Designs B and C the lateral movement absorption is reduced by around 50 %.

Flange dimensions for designs with tie rods

| DN | Length BL | Flange PN 10 (example dimensions) | | | | | | |
|------|-----------|-----------------------------------|------|------|----|----|----|------|
| | | B | ØD | ØPCD | Ød | n | s | ØC |
| | mm | mm | mm | mm | mm | | mm | mm |
| 20 | *125 | 189 | 105 | 75 | 12 | 4 | 14 | 66 |
| 25 | *125 | 205 | 115 | 85 | 14 | 4 | 14 | 66 |
| 32 | *125 | 230 | 140 | 100 | 18 | 4 | 15 | 66 |
| 40 | *125 | 240 | 150 | 110 | 18 | 4 | 15 | 74 |
| 50 | *125 | 255 | 165 | 125 | 18 | 4 | 16 | 86 |
| 65 | *125 | 275 | 185 | 145 | 18 | 8 | 16 | 106 |
| 80 | 150 | 290 | 200 | 160 | 18 | 8 | 18 | 118 |
| 100 | 150 | 310 | 220 | 180 | 18 | 8 | 18 | 138 |
| 125 | 150 | 340 | 250 | 210 | 18 | 8 | 18 | 166 |
| 150 | 150 | 375 | 285 | 240 | 22 | 8 | 18 | 192 |
| 200 | 175 | 440 | 340 | 295 | 22 | 8 | 20 | 252 |
| 250 | 175 | 509 | 395 | 350 | 22 | 12 | 20 | 304 |
| 300 | 200 | 559 | 445 | 400 | 22 | 12 | 22 | 354 |
| 350 | 200 | 619 | 505 | 460 | 22 | 16 | 24 | 412 |
| 400 | 200 | 700 | 565 | 515 | 26 | 16 | 25 | 470 |
| 450 | 250 | 760 | 615 | 565 | 26 | 20 | 30 | 520 |
| 700 | *275 | 1045 | 895 | 840 | 30 | 24 | 35 | 780 |
| 800 | 250 | 1175 | 1015 | 950 | 33 | 24 | 40 | 887 |
| 900 | 300 | 1285 | 1115 | 1050 | 33 | 28 | 40 | 987 |
| 1000 | 300 | 1400 | 1230 | 1160 | 36 | 28 | 40 | 1087 |

*1: Building length 130 mm
*2: Building length 260 mm



WILLBRANDT Rubber Expansion Joint Type 55

Axial stiffness rates

| DN | Length BL mm | Stiffness rates (average value from full way) | | | | | | | | | | |
|------|--------------------|---|---------------|-----------------|---------------|---------------|---------------|---------------|---------------|----------------|----------------|----------------|
| | | 0 bar N/mm | 1 bar N/mm | 2.5 bar N/mm | 3 bar N/mm | 4 bar N/mm | 5 bar N/mm | 6 bar N/mm | 8 bar N/mm | 10 bar N/mm | 12 bar N/mm | 16 bar N/mm |
| 20 | *125 | 31 | 56 | 68 | 88 | 128 | 160 | 192 | 192 | 243 | 252 | 270 |
| 25 | *125 | 31 | 56 | 68 | 88 | 128 | 160 | 192 | 192 | 243 | 252 | 270 |
| 32 | *125 | 31 | 56 | 68 | 88 | 128 | 160 | 192 | 192 | 243 | 252 | 270 |
| 40 | *125 | 30 | 54 | 66 | 85 | 124 | 155 | 186 | 186 | 236 | 244 | 261 |
| 50 | *125 | 25 | 42 | 51 | 67 | 98 | 116 | 134 | 134 | 173 | 179 | 192 |
| 65 | *125 | 24 | 43 | 53 | 69 | 100 | 125 | 150 | 150 | 190 | 197 | 211 |
| 80 | 150 | 28 | 48 | 58 | 73 | 104 | 126 | 148 | 148 | 185 | 192 | 205 |
| 100 | 150 | 35 | 59 | 71 | 86 | 116 | 161 | 206 | 206 | 274 | 284 | 304 |
| 125 | 150 | 36 | 59 | 71 | 93 | 137 | 176 | 214 | 214 | 282 | 292 | 313 |
| 150 | 150 | 49 | 84 | 102 | 131 | 189 | 241 | 293 | 293 | 390 | 404 | 433 |
| 200 | 175 | 100 | 153 | 180 | 242 | 365 | 467 | 568 | 568 | 735 | 762 | 816 |
| 250 | 175 | 105 | 173 | 207 | 267 | 388 | 499 | 609 | 609 | 778 | 807 | 864 |
| 300 | 200 | 123 | 206 | 248 | 315 | 448 | 553 | 658 | 659 | 883 | 915 | 980 |
| 350 | 200 | 105 | 153 | 177 | 234 | 349 | 458 | 567 | 567 | 753 | 781 | 836 |
| 400 | 200 | 154 | 225 | 261 | 346 | 516 | 526 | 535 | 536 | 1090 | 1130 | 1210 |
| 450 | 250 | 167 | 269 | 320 | 407 | 581 | 742 | 903 | 904 | 1162 | 1205 | 1290 |
| 700 | *275 | 140 | 179 | 198 | 372 | 721 | 718 | 714 | 715 | 954 | 636 | - |
| 800 | 250 | 180 | 240 | 270 | 378 | 594 | 785 | 975 | 976 | 1258 | 839 | - |
| 900 | 300 | 200 | 320 | 380 | 483 | 690 | 885 | 1080 | 1081 | 1395 | 930 | - |
| 1000 | 300 | 225 | 355 | 420 | 527 | 742 | 995 | 1248 | 1249 | 1568 | 1045 | - |

*1 Building length 130 mm
*2 Building length 260 mm

Warning: Deviations (+/-25 %) in the stiffness rates may occur due to use of different materials and manufacturing processes.

Lateral stiffness rates

| DN | Length BL mm | Stiffness rates (average value from full way) | | | | | | | | | | |
|------|--------------------|---|---------------|-----------------|---------------|---------------|---------------|---------------|---------------|----------------|----------------|----------------|
| | | 0 bar N/mm | 1 bar N/mm | 2.5 bar N/mm | 3 bar N/mm | 4 bar N/mm | 5 bar N/mm | 6 bar N/mm | 8 bar N/mm | 10 bar N/mm | 12 bar N/mm | 16 bar N/mm |
| 20 | *125 | 64 | 105 | 125 | 145 | 184 | 212 | 240 | 249 | 259 | 260 | 264 |
| 25 | *125 | 64 | 105 | 125 | 145 | 184 | 212 | 240 | 249 | 259 | 260 | 264 |
| 32 | *125 | 64 | 105 | 125 | 145 | 184 | 212 | 240 | 249 | 259 | 260 | 264 |
| 40 | *125 | 62 | 101 | 121 | 140 | 178 | 205 | 233 | 242 | 251 | 252 | 256 |
| 50 | *125 | 50 | 60 | 65 | 70 | 80 | 93 | 105 | 124 | 142 | 143 | 145 |
| 65 | *125 | 40 | 65 | 78 | 90 | 115 | 133 | 150 | 156 | 162 | 163 | 165 |
| 80 | 150 | 34 | 59 | 72 | 92 | 132 | 141 | 151 | 158 | 165 | 166 | 168 |
| 100 | 150 | 53 | 74 | 85 | 102 | 138 | 150 | 162 | 172 | 181 | 183 | 185 |
| 125 | 150 | 97 | 162 | 194 | 214 | 253 | 269 | 284 | 324 | 364 | 367 | 372 |
| 150 | 150 | 116 | 206 | 251 | 267 | 299 | 326 | 354 | 398 | 441 | 444 | 450 |
| 200 | 175 | 304 | 555 | 680 | 716 | 787 | 840 | 893 | 1009 | 1124 | 1132 | 1147 |
| 250 | 175 | 356 | 624 | 758 | 826 | 961 | 1032 | 1103 | 1233 | 1363 | 1373 | 1391 |
| 300 | 200 | 368 | 647 | 786 | 858 | 1003 | 1072 | 1142 | 1280 | 1419 | 1428 | 1448 |
| 350 | 200 | 305 | 508 | 610 | 661 | 762 | 819 | 875 | 976 | 1076 | 1083 | 1098 |
| 400 | 200 | 338 | 541 | 642 | 700 | 817 | 882 | 946 | 1061 | 1175 | 1183 | 1199 |
| 450 | 250 | 342 | 540 | 639 | 700 | 821 | 896 | 971 | 1074 | 1176 | 1184 | 1200 |
| 700 | *275 | 516 | 798 | 939 | 1023 | 1191 | 1320 | 1449 | 1594 | 1740 | 1160 | - |
| 800 | 250 | 558 | 826 | 960 | 992 | 1055 | 1306 | 1557 | 1640 | 1723 | 1149 | - |
| 900 | 300 | 800 | 1253 | 1480 | 1648 | 1984 | 2116 | 2248 | 2378 | 2509 | 1673 | - |
| 1000 | 300 | 960 | 1536 | 1824 | 2003 | 2361 | 2549 | 2736 | 2826 | 2916 | 1944 | - |

*1 Building length 130 mm
*2 Building length 260 mm

Warning: Deviations (+/-25 %) in the stiffness rates may occur due to use of different materials and manufacturing processes.

WILLBRANDT Rubber Expansion Joint Type 55

Angular stiffness torque

| DN | Overall length BL mm | Stiffness torque (average value from full way) | | | | | |
|------|----------------------------|--|-----------------|---------------|---------------|----------------|----------------|
| | | 0 bar Nm/° | 2.5 bar Nm/° | 4 bar Nm/° | 6 bar Nm/° | 10 bar Nm/° | 16 bar Nm/° |
| 20 | *125 | 0.2 | 0.5 | 0.9 | 1.3 | 1.7 | 1.9 |
| 25 | *125 | 0.2 | 0.5 | 0.9 | 1.3 | 1.7 | 1.9 |
| 32 | *125 | 0.2 | 0.5 | 0.9 | 1.3 | 1.7 | 1.9 |
| 40 | *125 | 0.3 | 0.6 | 1.1 | 1.6 | 2.0 | 2.3 |
| 50 | *125 | 0.3 | 0.6 | 1.1 | 1.6 | 2.0 | 2.2 |
| 65 | *125 | 0.4 | 0.9 | 1.7 | 2.5 | 3.2 | 3.6 |
| 80 | 150 | 0.6 | 1.3 | 2.3 | 3.3 | 4.1 | 4.6 |
| 100 | 150 | 1.0 | 2.0 | 4.0 | 7.0 | 9.0 | 10.0 |
| 125 | 150 | 2.0 | 3.0 | 6.0 | 10.0 | 13.0 | 15.0 |
| 150 | 150 | 3.0 | 7.0 | 12.0 | 19.0 | 25.0 | 28.0 |
| 200 | 175 | 11.0 | 20.0 | 41.0 | 63.0 | 82.0 | 91.0 |
| 250 | 175 | 18.0 | 35.0 | 65.0 | 102.0 | 130.0 | 144.0 |
| 300 | 200 | 29.0 | 58.0 | 105.0 | 154.0 | 206.0 | 229.0 |
| 350 | 200 | 34.0 | 57.0 | 113.0 | 183.0 | 244.0 | 270.0 |
| 400 | 200 | 65.0 | 110.0 | 218.0 | 226.0 | 460.0 | 511.0 |
| 450 | 250 | 114.0 | 218.0 | 396.0 | 615.0 | 792.0 | 676.0 |
| 700 | *275 | 167.0 | 237.0 | 861.0 | 853.0 | 1140.0 | 1265.0 |
| 800 | 250 | 277.0 | 416.0 | 914.0 | 1501.0 | 1937.0 | 2150.0 |
| 900 | 300 | 386.0 | 733.0 | 1330.0 | 2082.0 | 2689.0 | 2985.0 |
| 1000 | 300 | 531.0 | 991.0 | 1751.0 | 2945.0 | 3700.0 | 4107.0 |

*1: Building length 130 mm
*2: Building length 260 mm

Warning: Deviations (+/-25 %) in the stiffness torque may occur due to use of different materials and manufacturing processes.

Frictional force

| DN | Overall length mm | for Designs E and M | for Design F |
|------|----------------------|---------------------------|-----------------------------|
| | | Frictional force N/bar | Frictional moment Nm/bar |
| 20 | *125 | 7 | 0.2 |
| 25 | *125 | 7 | 0.2 |
| 32 | *125 | 7 | 0.2 |
| 40 | *125 | 8 | 0.2 |
| 50 | *125 | 12 | 0.3 |
| 65 | *125 | 20 | 0.5 |
| 80 | 150 | 30 | 1.0 |
| 100 | 150 | 44 | 1.4 |
| 125 | 150 | 65 | 2.1 |
| 150 | 150 | 102 | 4.4 |
| 200 | 175 | 124 | 6.2 |
| 250 | 175 | 180 | 11.2 |
| 300 | 200 | 218 | 15.4 |
| 350 | 200 | 120 | 17.0 |
| 400 | 200 | 160 | 22.9 |
| 450 | 250 | 226 | 40.5 |
| 700 | *275 | 602 | 180.9 |
| 800 | 250 | 814 | 326.2 |
| 900 | 300 | 921 | 402.4 |
| 1000 | 300 | 1130 | 617.3 |

*1: Building length 130 mm
*2: Building length 260 mm

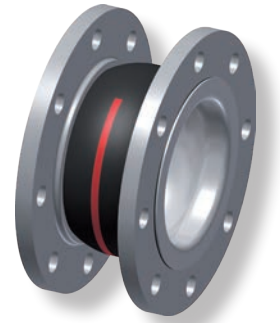
Warning: Deviations (+/-25 %) in the frictional force may occur due to use of different materials and manufacturing processes.

WILLBRANDT Rubber Expansion Joint Type 55 PTFE

DN 25 - DN 500

Type 55 PTFE is a low-corrugated, PTFE-lined rubber expansion joint. Its shallow corrugation helps to achieve very low flow resistance. The PTFE lining gives the expansion joint high chemical resistance or an anti-adhesive property.

The PTFE lining can be used for any rubber compound on Type 55. It is however necessary to ensure that the selected rubber compound achieves the highest possible media resistance, as this is the only way to achieve optimum service life.



Dimensions for Design A

| DN | Overall length BL mm | Bellow | | ØD | | Flange PN 10 ^{*2} | | s mm | ØC mm | Movement absorption | | | |
|-----|-------------------------|----------|-------------------------------------|-----|-----|----------------------------|----|---------|----------|---------------------|---------------|-----------------|-----------|
| | | ØA mm | WF ^{*1} mm ² | mm | mm | Ød mm | n | | | axial + mm | axial - mm | lateral ± mm | angular ± |
| 25 | *3-125 | 81 | 1700 | 115 | 85 | 14 | 4 | 14 | 65 | 15 | 15 | 15 | 15.0 |
| 32 | *3-125 | 81 | 1700 | 140 | 100 | 18 | 4 | 15 | 65 | 15 | 15 | 15 | 15.0 |
| 40 | *3-125 | 86 | 1800 | 150 | 110 | 18 | 4 | 15 | 74 | 15 | 15 | 15 | 15.0 |
| 50 | *3-125 | 96 | 3200 | 165 | 125 | 18 | 4 | 16 | 86 | 15 | 15 | 15 | 15.0 |
| 65 | *3-125 | 111 | 5300 | 185 | 145 | 18 | 8 | 16 | 105 | 15 | 15 | 15 | 15.0 |
| 80 | 150 | 122 | 8500 | 200 | 160 | 18 | 8 | 18 | 118 | 15 | 15 | 15 | 15.0 |
| 100 | 150 | 142 | 12800 | 220 | 180 | 18 | 8 | 18 | 137 | 15 | 15 | 15 | 10.0 |
| 125 | 150 | 168 | 18700 | 250 | 210 | 18 | 8 | 18 | 166 | 15 | 15 | 15 | 10.0 |
| 150 | 150 | 192 | 25900 | 285 | 240 | 22 | 8 | 20 | 192 | 15 | 15 | 15 | 10.0 |
| 200 | 175 | 252 | 41000 | 340 | 295 | 22 | 8 | 20 | 252 | 15 | 15 | 15 | 6.0 |
| 250 | 175 | 302 | 59600 | 395 | 350 | 22 | 12 | 20 | 304 | 15 | 15 | 15 | 6.0 |
| 300 | 200 | 354 | 82200 | 445 | 400 | 22 | 12 | 20 | 354 | 15 | 15 | 15 | 6.0 |
| 350 | 200 | 420 | 117600 | 505 | 460 | 22 | 16 | 24 | 412 | 15 | 15 | 15 | 4.0 |
| 400 | 200 | 480 | 154700 | 565 | 515 | 26 | 16 | 25 | 470 | 15 | 15 | 15 | 4.0 |
| 450 | 250 | 530 | 204200 | 615 | 565 | 26 | 20 | 25 | 520 | 15 | 15 | 15 | 4.0 |

*1 WF = Building length 130 mm

*2 WF = effective area

*3 Other standards/dimensions possible.

Permissible degree of utilisation for movement areas:

- up to 50 °C: Utilisation ~ 100 %

- up to 70 °C: Utilisation ~ 75 %

- up to 90 °C: Utilisation ~ 60 %

Pressure resistance

Max. 6 bar operating pressure with polyamide cord reinforcement, max. 9 bar operating pressure with aramid or steel cord reinforcement.

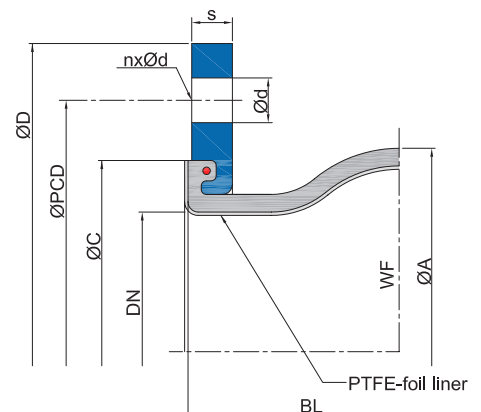
Conformity

FDA and EU 1935/2004

Vacuum resistance

Only limited suitable for vacuum operation. A PTFE vacuum supporting ring, which allows full vacuum for small nominal diameters, can be used from DN 50.

The PTFE supporting ring can only be used up to 50 °C. DN 25, DN 32, DN 40 and DN 350 expansion joints are not suitable for vacuum operation.



Important information

For aggressive media, please see the resistance table (can be requested separately).

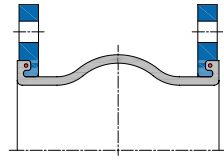
The bellows should not be painted or insulated. Please refer to the installation instructions.

++++ We will be happy to send you further information on the individual types and designs. +++++

WILLBRANDT Expansion Joints - Overview

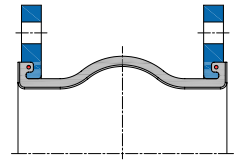
Type 39 DN range 50 - 1000
Overall length (mm) variable

Applications
Industrial plants,
repairs/replacements
Page 9 onwards



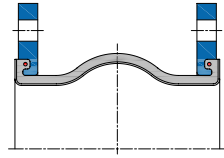
Type 50 DN range 25 - 500
PTFE Overall length (mm) 130 - 200

Applications
Chemical plants
Page 40 onwards



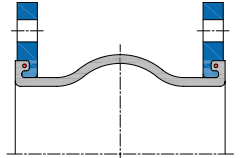
Type 39 DN range 50 - 500
PTFE Overall length (mm) variable

Applications
Chemical plants
Page 13 onwards



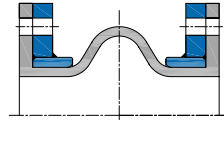
Type 51 DN range 32 - 600
Overall length (mm) 130 - 250

Applications
Chemical plants, plant engineering,
pressure pipes (25 bar)
Page 41 onwards



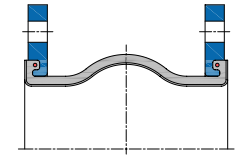
Type 40 DN range 200 - 5000
Overall length (mm) 250 - 800

Applications
Power stations, large-scale plants,
treatment plants, pipelines
Page 14 onwards



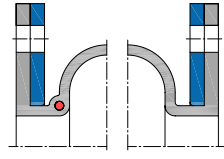
Type 51 DN range 32 - 300
PTFE Overall length (mm) 130

Applications
Chemical plants, plant engineering,
pressure pipes (10 bar)
Page 46 onwards



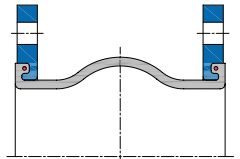
Type 42 DN range 50 - 3000
Overall length (mm) 150 - 450

Applications
Paper industry, power stations,
repairs/replacements up to 100 bar
Page 21 onwards



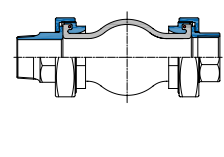
Type 52 DN range 32 - 600
Overall length (mm) 150 - 300

Applications
Chemical plants, water plants, plant
engineering, treatment plants
Page 47 onwards



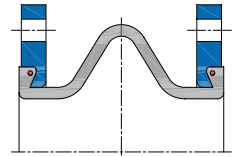
Type 46 DN range 20 - 50
Overall length (mm) 130

Applications
Building technology, engine
technology
Page 26 onwards



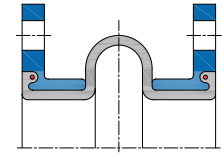
Type 54 DN range 25 - 100
Overall length (mm) 65 - 100

Applications
Hydraulic systems (SAE flanges)
Page 51 onwards



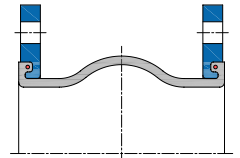
Type 48 DN range 50 - 250
Overall length (mm) 150 - 160

Applications
Steelworks, plant engineering
Page 28 onwards



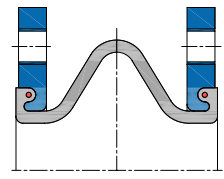
Type 55 DN range 20 - 1000
Overall length (mm) 125 - 300

Applications
Shipbuilding, building technology,
water plants, plant engineering,
treatment plants
Page 53 onwards



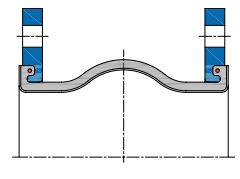
Type 49 DN range 32 - 500
Overall length (mm) 100 - 110

Applications
Building technology, shipbuilding,
plant engineering, weighing
technology, gas plants
Page 30 onwards



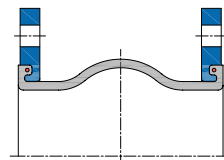
Type 55 DN range 25 - 500
PTFE Overall length (mm) 125 - 250

Applications
Chemical plants
Page 59 onwards



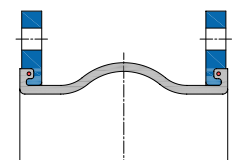
Type 50 DN range 20 - 1000
Overall length (mm) 130 - 300

Applications
Building technology, gas plants,
plant construction, power stations
Page 34 onwards



Type 55 DN range 20 - 300
SO Overall length (mm) 160 - 200

Applications
Shipbuilding, building technology,
water plants, treatment plants
Page 60 onwards

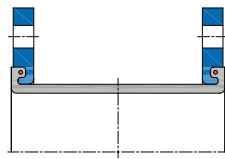


WILLBRANDT Expansion Joints - Overview

Type 56 DN range 50 - 1000
Overall length (mm) 150 - 1000

Applications

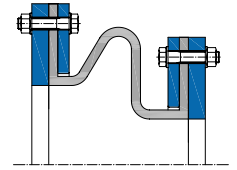
Paper industry, conveyor technology,
media containing solids
Page 62 onwards



Type 63 DN range all
Overall length (mm) variable

Applications

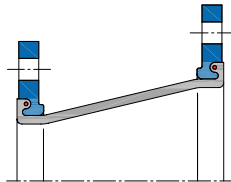
Plant engineering, production
based on customer drawings
Page 80 onwards



Type 57 DN range 50 - 300
Overall length (mm) 250 - 400

Applications

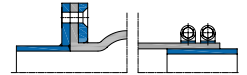
Paper industry, conveyor technology,
media containing solids
Page 65 onwards



Type 64 DN range all
Overall length max. 500 mm

Applications

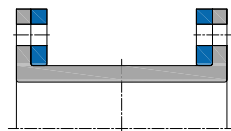
Duct sealing, building technology,
power station construction;
low pressure range: max. 0.5 bar
Page 83 onwards



Type 58 DN range 50 - 3000
Overall length (mm) 200 - 1000

Applications

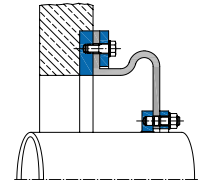
Paper industry, conveyor technology,
media containing solids
Page 68 onwards



Type 65 DN range 80 - 5000
Overall length (mm) variable

Applications

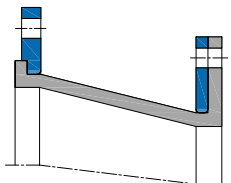
Wall sealing, ground water sealing
Page 85 onwards



Type 59 DN range 350 - 1500
Overall length (mm) variable

Applications

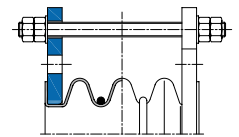
Paper industry, conveyor technology,
media containing solids
Page 71 onwards



Type 80 DN range 20 - 1200
Overall length (mm) 45 - 250

Applications

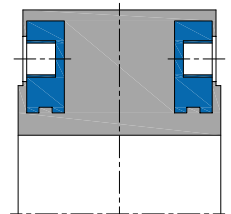
Chemical plants
Page 87 onwards



Type 60 DN range 20 - 200
Overall length (mm) 70 - 90

Applications

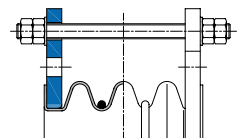
Building technology,
industrial plants
Page 75 onwards



Type 80 HD DN range 25 - 600
Overall length (mm) 55 - 322

Applications

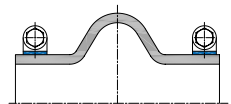
Chemical plants
Page 92 onwards



Type 61 DN range 50 - 1500
Overall length (mm) 250 - 730

Applications

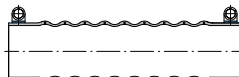
Industrial plants, wastewater
technology, engine technology
Page 76 onwards



Type 62 DN range 50 - 600
Overall length (mm) variable

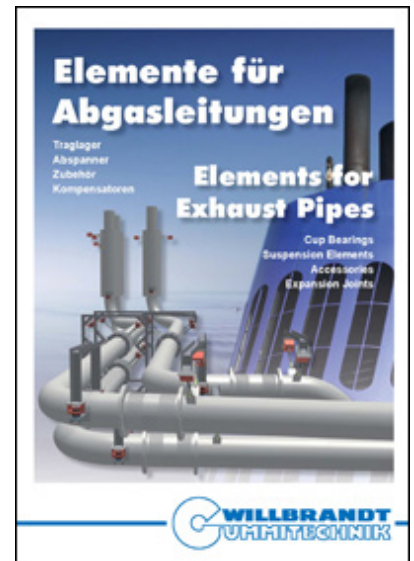
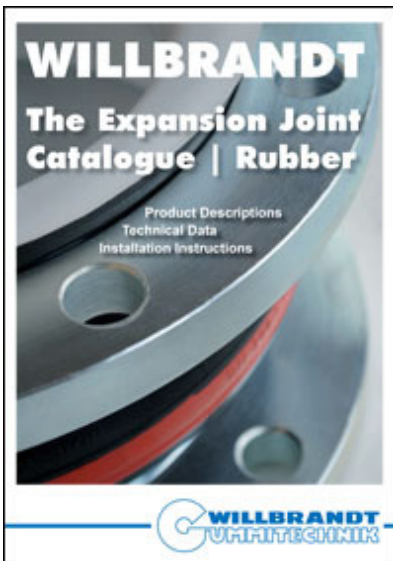
Applications

Drainage systems for
bridges, halls, buildings
Page 79 onwards



EXPANSION JOINTS FROM WILLBRANDT

Apart from rubber expansion joints WILLBRANDT can also supply you with expansion joints in steel, PTFE and fabric. Read more about our solutions below.

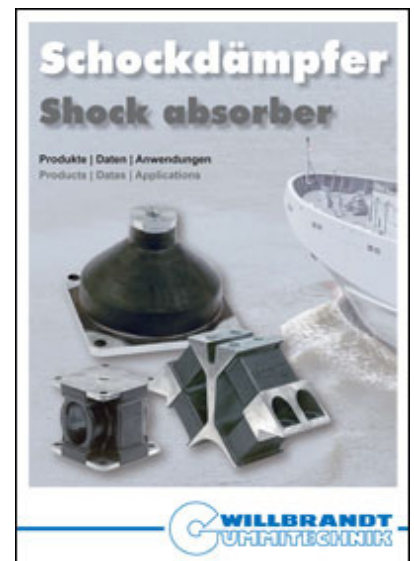
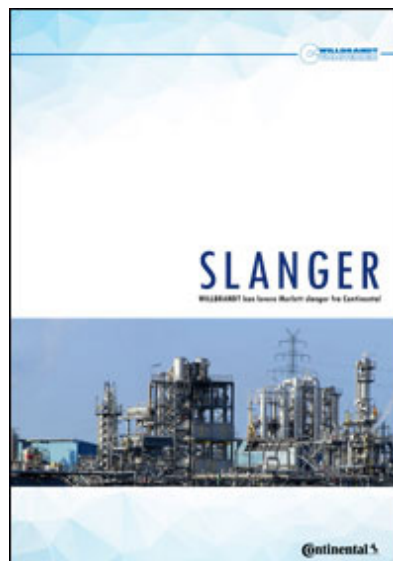
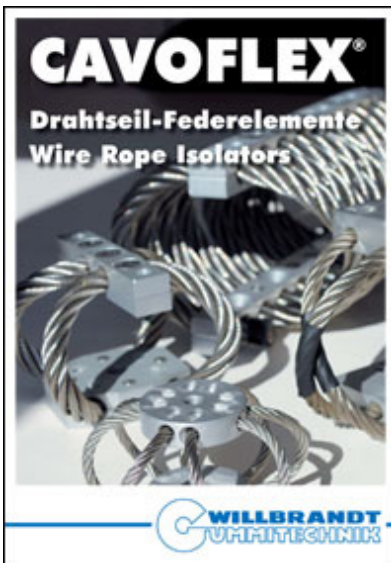


If you want to know more
Do not hesitate to contact us

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info@willbrandt.dk

OTHER PRODUCTS FROM WILLBRANDT

At WILLBRANDT we have a wide range of products. Spanning from common on the shelf products to highly advanced customized solutions. If you have special requests, our technical staff is always ready to assist you finding the optimal solution.



WILLBRANDT Gummiteknik A/S are experts within rubber and polyurethane products. We deliver expansion joints absorbing movements in piping systems. We furthermore deliver dampers to reduction of oscillation, vibration, and shock waves. We focus on a holistic approach ensuring our customers products maintain their high quality.

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Together we are stronger

At WILLBRANDT we value our customers and it is important to us that our customers get the best products in the market.



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