

GEOFLEX fittings



GEOFLEX[®] is a range of ductile iron flexible fittings, capable of sliding, extending, compressing, rotating.

GEOFLEX[®] fittings are designed to protect water pipe works against stresses caused by occasional but major geological events.

- Landslides, subsidence of loose or unstable ground
- Stress caused by earthquakes, seismic earth movements, tsunamis, tidal waves, etc.

A GEOFLEX[®] fitting comprises:

- a central part (sleeve), allowing an axial slide (compression & expansion), see B on above sketch
- at each extremity, 1 flanged ball-joint, allowing a maximum angular deflection (see A)

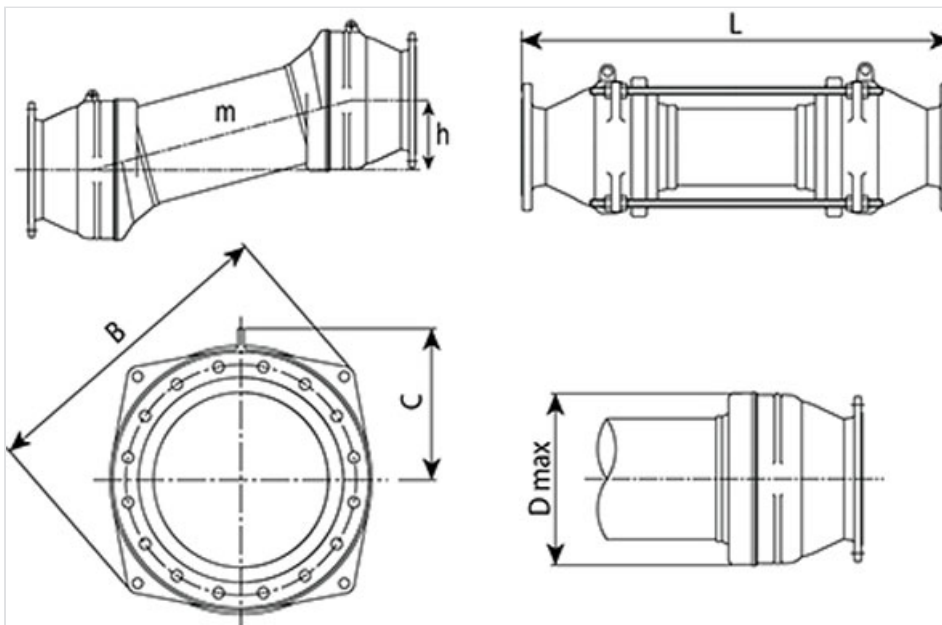
| DN (mm) | Deflection h (mm) | Overall length (mm) | B (mm) | C (mm) | ØD maxi (mm) | Mass (kg) | References |
|---------|-------------------|---------------------|--------|--------|--------------|-----------|-------------|
| 100 | 100 | 630 | 331 | 157 | 247 | 53.00 | BBB10GD2ETT |
| 100 | 200 | 920 | 331 | 157 | 247 | 59.00 | BBB10GD2JTT |
| 100 | 300 | 1210 | 331 | 157 | 247 | 66.00 | BBB10GD2KTT |
| 100 | 400 | 1500 | 331 | 157 | 247 | 72.00 | BBB10GD2LTT |
| 100 | 500 | 1790 | 331 | 157 | 247 | 79.00 | BBB10GD2MTT |
| 100 | 600 | 2620 | 331 | 157 | 247 | 99.00 | BBB10GD2NTT |
| 150 | 100 | 680 | 390 | 185 | 307 | 87.00 | BBB15GD2ETT |
| 150 | 200 | 990 | 390 | 185 | 307 | 98.00 | BBB15GD2JTT |
| 150 | 300 | 1300 | 390 | 185 | 307 | 108.00 | BBB15GD2KTT |
| 150 | 400 | 1610 | 390 | 185 | 307 | 118.00 | BBB15GD2LTT |

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|---------|-------------------|---------------------|--------|--------|--------------|-----------|-------------|
| 150 | 500 | 1910 | 390 | 185 | 307 | 128.00 | BBB15GD2MTT |
| 150 | 600 | 2620 | 390 | 185 | 307 | 152.00 | BBB15GD2NTT |
| 200 | 100 | 790 | 449 | 219 | 367 | 126.00 | BBB20GD2ETT |
| 200 | 200 | 1120 | 449 | 219 | 367 | 144.00 | BBB20GD2JTT |
| 200 | 300 | 1450 | 449 | 219 | 367 | 157.00 | BBB20GD2KTT |
| 200 | 400 | 1770 | 449 | 219 | 367 | 171.00 | BBB20GD2LTT |
| 200 | 500 | 2100 | 449 | 219 | 367 | 185.00 | BBB20GD2MTT |
| 200 | 600 | 2730 | 449 | 219 | 367 | 211.00 | BBB20GD2NTT |
| 250 | 100 | 830 | 516 | 252 | 432 | 179.00 | BBB25GD2ETT |
| 250 | 200 | 1180 | 516 | 252 | 432 | 197.00 | BBB25GD2JTT |
| 250 | 300 | 1530 | 516 | 252 | 432 | 217.00 | BBB25GD2KTT |
| 250 | 400 | 1880 | 516 | 252 | 432 | 235.00 | BBB25GD2LTT |
| 250 | 500 | 2230 | 516 | 252 | 432 | 254.00 | BBB25GD2MTT |
| 250 | 600 | 2730 | 516 | 252 | 432 | 281.00 | BBB25GD2NTT |
| 300 | 100 | 860 | 590 | 280 | 492 | 256.00 | BBB30GD2ETT |
| 300 | 200 | 1230 | 590 | 280 | 492 | 282.00 | BBB30GD2JTT |
| 300 | 300 | 1600 | 590 | 280 | 492 | 307.00 | BBB30GD2KTT |
| 300 | 400 | 1970 | 590 | 280 | 492 | 332.00 | BBB30GD2LTT |
| 300 | 500 | 2350 | 590 | 280 | 492 | 357.00 | BBB30GD2MTT |
| 300 | 600 | 2730 | 590 | 280 | 492 | 382.00 | BBB30GD2NTT |
| 350 | 100 | 1170 | 651 | 313 | 545 | 360.00 | BBB35GD2ETT |
| 350 | 200 | 1490 | 651 | 313 | 545 | 386.00 | BBB35GD2JTT |
| 350 | 300 | 1860 | 651 | 313 | 545 | 418.00 | BBB35GD2KTT |
| 350 | 400 | 2240 | 651 | 313 | 545 | 452.00 | BBB35GD2LTT |
| 350 | 500 | 2610 | 651 | 313 | 545 | 481.00 | BBB35GD2MTT |
| 350 | 600 | 2980 | 651 | 313 | 545 | 510.00 | BBB35GD2NTT |
| 400 | 100 | 1220 | 711 | 345 | 621 | 487.00 | BBB40GD2ETT |
| 400 | 200 | 1500 | 711 | 345 | 621 | 514.00 | BBB40GD2JTT |
| 400 | 300 | 1870 | 711 | 345 | 621 | 550.00 | BBB40GD2KTT |
| 400 | 400 | 2250 | 711 | 345 | 621 | 586.00 | BBB40GD2LTT |
| 400 | 500 | 2620 | 711 | 345 | 621 | 622.00 | BBB40GD2MTT |
| 400 | 600 | 2990 | 711 | 345 | 621 | 658.00 | BBB40GD2NTT |
| 450 | 100 | 1260 | 766 | 372 | 676 | 598.00 | BBB45GD2ETT |
| 450 | 200 | 1530 | 766 | 372 | 676 | 629.00 | BBB45GD2JTT |

| DN (mm) | Deflection h (mm) | Overall length (mm) | B (mm) | C (mm) | ØD maxi (mm) | Mass (kg) | References |
|---------|-------------------|---------------------|--------|--------|--------------|-----------|-------------|
| 450 | 300 | 1910 | 766 | 372 | 676 | 672.00 | BBB45GD2KTT |
| 450 | 400 | 2280 | 766 | 372 | 676 | 715.00 | BBB45GD2LTT |
| 450 | 500 | 2660 | 766 | 372 | 676 | 757.00 | BBB45GD2MTT |
| 450 | 600 | 3020 | 766 | 372 | 676 | 797.00 | BBB45GD2NTT |
| 500 | 100 | 1390 | 844 | 418 | 748 | 781.00 | BBB50GD2ETT |
| 500 | 200 | 1610 | 844 | 418 | 748 | 813.00 | BBB50GD2JTT |
| 500 | 300 | 2000 | 844 | 418 | 748 | 868.00 | BBB50GD2KTT |
| 500 | 400 | 2380 | 844 | 418 | 748 | 923.00 | BBB50GD2LTT |
| 500 | 500 | 2770 | 844 | 418 | 748 | 978.00 | BBB50GD2MTT |
| 500 | 600 | 3120 | 844 | 418 | 748 | 1028.00 | BBB50GD2NTT |
| 600 | 100 | 1530 | 969 | 476 | 880 | 1104.00 | BBB60GD2ETT |
| 600 | 200 | 1740 | 969 | 476 | 880 | 1142.00 | BBB60GD2JTT |
| 600 | 300 | 2120 | 969 | 476 | 880 | 1213.00 | BBB60GD2KTT |
| 600 | 400 | 2510 | 969 | 476 | 880 | 1284.00 | BBB60GD2LTT |
| 600 | 500 | 2890 | 969 | 476 | 880 | 1356.00 | BBB60GD2MTT |
| 600 | 600 | 3250 | 969 | 476 | 880 | 1425.00 | BBB60GD2NTT |
| 700 | 200 | 1850 | 1108 | 535 | 996 | 1429.00 | BBB70GD2JTT |
| 700 | 300 | 2220 | 1108 | 535 | 996 | 1513.00 | BBB70GD2KTT |
| 700 | 400 | 2590 | 1108 | 535 | 996 | 1598.00 | BBB70GD2LTT |
| 700 | 500 | 2970 | 1108 | 535 | 996 | 1682.00 | BBB70GD2MTT |
| 700 | 600 | 3340 | 1108 | 535 | 996 | 1764.00 | BBB70GD2NTT |
| 800 | 200 | 2050 | 1238 | 609 | 1110 | 2000.00 | BBB80GD2JTT |
| 800 | 300 | 2320 | 1238 | 609 | 1110 | 2075.00 | BBB80GD2KTT |
| 800 | 400 | 2700 | 1238 | 609 | 1110 | 2204.00 | BBB80GD2LTT |
| 800 | 500 | 3070 | 1238 | 609 | 1110 | 2282.00 | BBB80GD2MTT |
| 800 | 600 | 3440 | 1238 | 609 | 1110 | 2360.00 | BBB80GD2NTT |
| 900 | 200 | 2160 | 1402 | 686 | 1259 | 2878.00 | BBB90GD2JTT |
| 900 | 300 | 2540 | 1402 | 686 | 1259 | 3006.00 | BBB90GD2KTT |
| 900 | 400 | 2930 | 1402 | 686 | 1259 | 3134.00 | BBB90GD2LTT |
| 900 | 500 | 3320 | 1402 | 686 | 1259 | 3263.00 | BBB90GD2MTT |
| 900 | 600 | 3610 | 1402 | 686 | 1259 | 3359.00 | BBB90GD2NTT |
| 1000 | 200 | 2230 | 1496 | 738 | 1363 | 3425.00 | BBC10GD2JTT |
| 1000 | 300 | 2610 | 1496 | 738 | 1363 | 3585.00 | BBC10GD2KTT |
| 1000 | 400 | 3000 | 1496 | 738 | 1363 | 3727.00 | BBC10GD2LTT |

| DN (mm) | Deflection h (mm) | Overall length (mm) | B (mm) | C (mm) | ØD maxi (mm) | Mass (kg) | References |
|---------|-------------------|---------------------|--------|--------|--------------|-----------|-------------|
| 1000 | 500 | 3390 | 1496 | 738 | 1363 | 3878.00 | BBC10GD2MTT |
| 1000 | 600 | 3680 | 1496 | 738 | 1363 | 3990.00 | BBC10GD2NTT |
| 1100 | 400 | 3160 | 1540 | 748 | 1390 | 4410.00 | BBC11GD2LTT |
| 1200 | 400 | 3310 | 1700 | 837 | 1550 | 5520.00 | BBC12GD2LTT |
| 1400 | 400 | 3410 | 1863 | 935 | 1723 | 7110.00 | BBC14GD2LTT |
| 1500 | 400 | 3460 | | | | 8520.00 | BBC15GD2LTT |
| 1600 | 400 | | | | | 10025.00 | BBC16GD2LTT |
| 1800 | 500 | 3870 | 2415 | 1235 | 2256 | 13730.00 | BBC18GD2MTT |

(* the deflection value (h) mentioned depends on the central part m (sleeve), installed between the two ball-joint flanges. For a same DN, different deflection values are obtained thanks to the installation, during production, of a longer or shorter sleeve, whereas the ball-joint flanges remain identical.



Field of use:

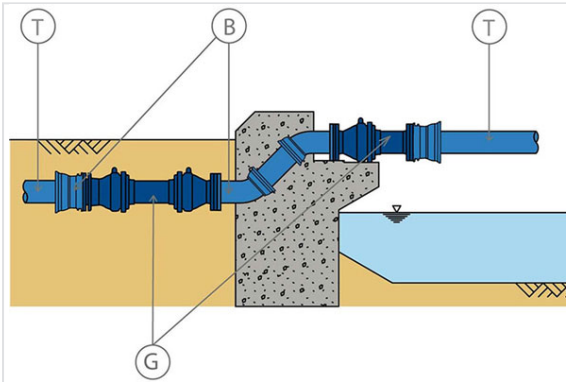


- Mainly water supply pipelines
- Anti-seismic protection of pipelines
- Protection of pipelines against landslides, subsidence of loose or unstable ground
- Stress caused by earthquakes, seismic earth movements, tsunamis, tidal waves, etc.
- PN16 bar

Main characteristics:

- EPDM elastomeric gaskets
- External and internal coating : Blue Epoxy Powder 250µm (PECB)
- Bolts & nuts: stainless steel grade 304
- Performances comply with ISO 16134 standard
- Type test (in part, where relevant) compliant with EN 545 standard

Informative type-installation sketch



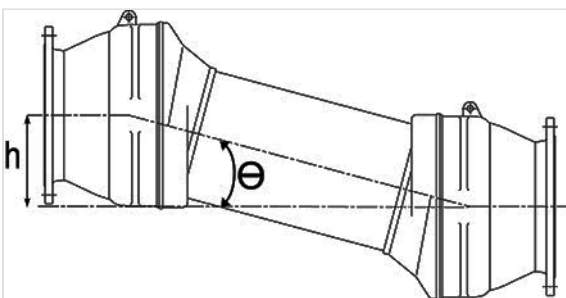
GEOFLEX® fittings (see G on sketch) can be installed on Natural (see T on sketch), Classic or Integral pipes ranges via the use of spigot-flanged fittings and flanged socket fittings (see B on sketch).

The design of the fitting's central part (sleeve), sliding inside the ball-joint flanges at each extremity, allows contraction and expansion movements.

The overall sliding capacity (expansion/contraction) varies from 100 mm (+/- 50mm) up to 600 mm (+ 350mm/-250mm). A table recaps all these values DN per DN.

[Laying procedure](#)

Project design, choice criteria



GEOFLEX®: a wide choice, ranging from DN100 up to DN1800, PN16. The selection of a GEOFLEX® fitting for a given DN, depends on the expected subsidence magnitude, which it may have to withstand.

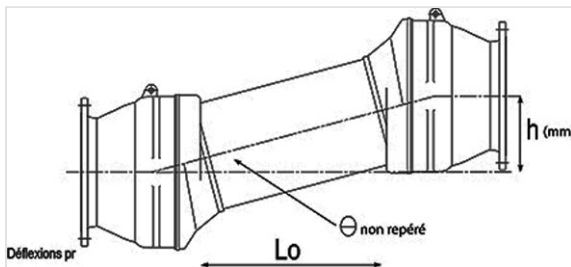
This subsidence is evaluated & assessed depending of geotechnics or seismic stresses, and on the nature of grounds met during the project design.

The selection of the right GEOFLEX® fitting is the responsibility of the consultant, once considered the geotechnics parameters of the project.

Several possible deflection values (h) , ranging from 100 mm up to 600 mm and various deviation angles from +/- 30° up to +/- 38°, address DN by DN the foreseeable stress levels.

Between the 2 flanged extremities, the sliding central part (sleeve) of a GEOFLEX® fitting allows axial compression & expansion, varying from 100 mm (+/- 50mm) up to 600 mm (+ 350mm/-250mm), depending on the DN. A table recaps all values related to each DN.

Main GEOFLEX® fittings performances



GEOFLEX® double ball-joints fittings

| DN | Deflection h | Deflection θ | Extension / Contraction lo | Resistance to dismounting |
|------|--------------|---------------------|----------------------------|---------------------------|
| mm | mm | degree | mm | kN |
| 100 | 100 → 600 | +/- 38° | 100 (+/- 50) ** | 300 |
| 150 | 100 → 600 | +/- 36° | 160 (+/- 80) | 450 |
| 200 | 100 → 600 | +/- 34° | 160 (+/- 80) | 600 |
| 250 | 100 → 600 | +/- 32 | 160 (+/- 80) | 750 |
| 300 | 100 → 600 | +/- 30° | 200 (+/- 100) | 900 |
| 350 | 100 → 600 | +/- 30° | 200 (+/- 100) | 1050 |
| 400 | 100 → 600 | +/- 30° | 240 (+/- 120) | 1200 |
| 450 | 100 → 600 | +/- 30° | 240 (+/- 120) | 1350 |
| 500 | 100 → 600 | +/- 30° | 300 (+/- 150) | 1500 |
| 600 | 100 → 600 | +/- 30° | 300 (+/- 150) | 1800 |
| 700 | 200 → 600 | +/- 30° | 400 (+/- 200) | 2100 |
| 800 | 200 → 600 | +/- 30° | 400 (+/- 200) | 2400 |
| 900 | 200 → 600 | +/- 30° | 440 (+/- 220) | 2700 |
| 1000 | 200 → 600 | +/- 30° | 440 (+/- 220) | 3000 |
| 1100 | 400 | +/- 20° | 600 (+350/-250) | 3000 |

| DN | Deflection h | Deflection θ | Extension / Contraction lo | Resistance to dismounting |
|------|--------------|---------------------|----------------------------|---------------------------|
| 1200 | 400 | +/- 20° | 600 (+350/-250) | 3600 |
| 1400 | 400 | +/- 20° | 600 (+350/-250) | 4200 |
| 1500 | 400 | +/- 20° | 600 (+350/-250) | 4500 |
| 1600 | 400 | +/- 20° | 600 (+350/-250) | 4800 |
| 1800 | 500 | +/- 20° | 600 (+350/-250) | 5400 |

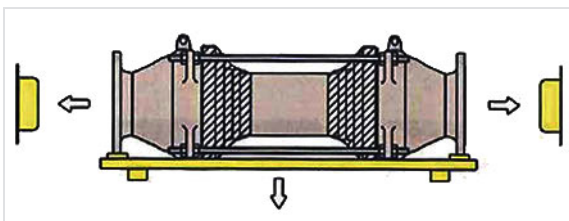
(*) The overall sliding (contraction/expansion) range depends on the length of the central part (sleeve) of the GEOFLEX® fitting. The lo value mentioned is the sum of both contraction and expansion movements, expressed as +/-.

(**) DN100- Expansion / Contraction: +80 mm/ -20 mm in case of a 600 mm deflection (h).

(***) The maximum resistance to dismounting must be equal or superior to 3Xn (in mm) n expressed in kN. This resistance value is based on ISO 16134 standard: "Earthquake and subsidence-resistant design of ductile iron pipelines".

Example: for a DN150 GEOFLEX fitting, the maximum guaranteed value of resistance to dismounting is calculated as follows: R dismounting = 3 x 1500 = 4500 kN

Packaging



GEOFLEX® fittings are individually packed on pallets, which are then shrink-wrapped (transparent plastic film).

The 2 extremities of GEOFLEX® fittings are fitted with PE protective caps. GEOFLEX® fittings feature 4 threaded retaining rods (see installation sheet), aiming:

- To prevent any axial unexpected sliding movement during transport & handling
- To keep the overall distance (between flanges) identical to the factory-settings, until the fitting assembly and the overall pipeline installation is hydraulically tested & approved

Each fitting is fitted with 2 PE sleeve and 2 securing wires, which will be installed on each pipeline extremity, prior to the installation of the GEOFLEX® fitting. See installation sheet.

The information on this sketch is, to the best of our knowledge correct at the time of printing. However Saint-Gobain are constantly looking at ways of improving their products and services therefore reserve the right to change without prior notice, any of the data shown. Any orders placed will be subject to our Standard Conditions of Sale, available on request.