

A close-up photograph of a metal expansion joint. The joint consists of several concentric rings. The outermost ring is dark grey with a fine, radial ribbed texture. A red rubber seal is visible between the rings. Two circular openings are visible on the rings. The background is a soft, out-of-focus grey.

WILLBRANDT

The Expansion Joint Catalogue | Rubber

Product Descriptions
Technical Data
Installation Instructions



WILLBRANDT Gummitechnik is specialised in shock and vibration isolation systems for decades and is recognised as an efficient problem solver and reliable partner in many areas of industry throughout the world.

Some of the reasons for the exceptional reputation of WILLBRANDT Gummitechnik are quick and prompt delivery from a fully stocked warehouse, professional on-site advice, application-orientated solutions from a team of experienced engineers, proprietary developments and patents, and a modern testing laboratory.

Information about this publication

The contents of this publication are the result of extensive development and application experience. All information and instructions are provided to the best of our knowledge; they do not constitute a guarantee with respect to characteristics and do not exempt the user from testing the suitability of products or from ensuring that the industrial property rights of third parties are not violated. No liability whatsoever shall be accepted for damage arising from advice given in this publication regardless of its nature or legal basis. We reserve the right to make technical modifications to the products.

WILLBRANDT Expansion Joints

Expansion joints are used in pipelines, on armatures and on pumps to compensate:

- thermal expansion
- mechanical vibrations
- acoustic oscillations
- tensions

They are also used:

- for sound insulation
- as dismantling joints on pipeline armatures
- to assimilate assembly tolerances
- to seal pipeline wall penetrations

Typical applications are heating systems, water pipes, pipes in power stations and the chemical industry. Available are various qualities that are suitable for specific media (e.g. drinking water, oil, food).

Our qualified engineers design a suitable expansion joint according to your technical data. A wide range of different types are carried in stock. Special types can be manufactured at short notice.

A tight network of sales partners worldwide ensures that competent advice and servicing is provided to our customers over a wide area locally.

We offer expansion joints for various applications. Nominal sizes from DN 20 to DN 5000 are available.

In addition to a comprehensive standard range of products, additional expansion joints can be manufactured according to customers' specifications - with and without tie rods.

It is also possible to provide expansion joints with special accessories in order to fully exploit the advantages of the expansion joints for almost all applications.

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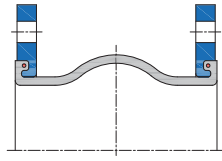
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WILLBRANDT Expansion Joints - Overview

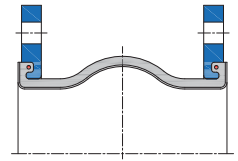
Type 39 DN range 50 - 1000
Overall length (mm) variable

Applications
Industrial plants,
repairs/replacements
Page 9 onwards



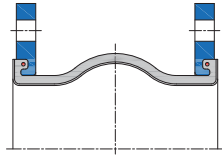
Type 50 DN range 25 - 500
PTFE Overall length (mm) 130 - 200

Applications
Chemical plants
Page 40 onwards



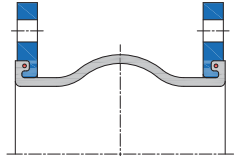
Type 39 DN range 50 - 500
PTFE Overall length (mm) variable

Applications
Chemical plants
Page 13 onwards



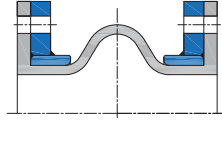
Type 51 DN range 32 - 600
Overall length (mm) 130 - 250

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



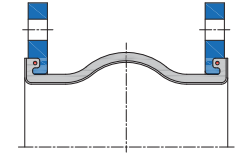
Type 40 DN range 200 - 5000
Overall length (mm) 250 - 800

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



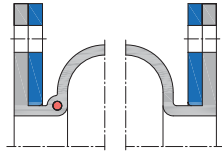
Type 51 DN range 32 - 300
PTFE Overall length (mm) 130

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



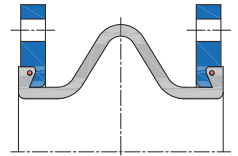
Type 42 DN range 50 - 3000
Overall length (mm) 150 - 450

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



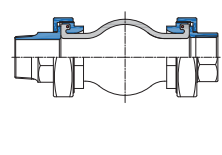
Type 54 DN range 25 - 100
Overall length (mm) 65 - 100

Applications
Hydraulic systems (SAE flanges)
Page 47 onwards



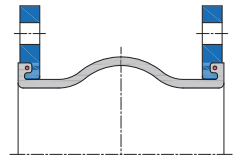
Type 46 DN range 20 - 50
Overall length (mm) 130

Applications
Building technology, engine
technology
Page 26 onwards



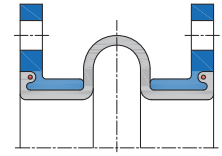
Type 55 DN range 20 - 1000
Overall length (mm) 125 - 300

Applications
Shipbuilding, building technology,
water plants, plant engineering,
treatment plants
Page 49 onwards



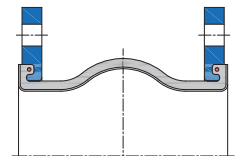
Type 48 DN range 50 - 250
Overall length (mm) 150 - 160

Applications
Steelworks, plant engineering
Page 28 onwards



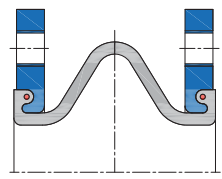
Type 55 DN range 25 - 500
PTFE Overall length (mm) 125 - 250

Applications
Chemical plants
Page 55 onwards



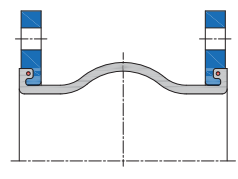
Type 49 DN range 32 - 500
Overall length (mm) 100 - 110

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



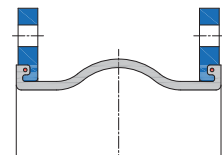
Type 55 DN range 20 - 300
SO Overall length (mm) 160 - 200

Applications
Shipbuilding, building technology,
water plants, treatment plants
Page 56 onwards



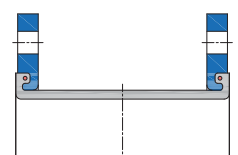
Type 50 DN range 20 - 1000
Overall length (mm) 130 - 300

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



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

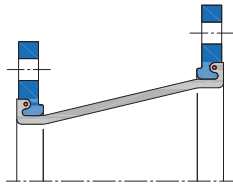
Applications
Paper industry, conveyor technology,
media containing solids
Page 58 onwards



WILLBRANDT Expansion Joints - Overview

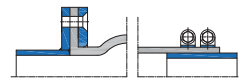
Type 57 DN range 50 - 300
Overall length (mm) 250 - 400

Applications
Paper industry, conveyor technology,
media containing solids
Page 61 onwards



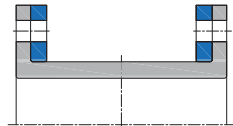
Type 64 DN range all
Overall length max. 500 mm

Applications
Duct sealing, building technology,
power station construction;
low pressure range: max. 0.5 bar
Page 79 onwards



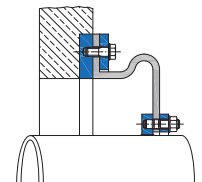
Type 58 DN range 50 - 3000
Overall length (mm) 200 - 1000

Applications
Paper industry, conveyor technology,
media containing solids
Page 64 onwards



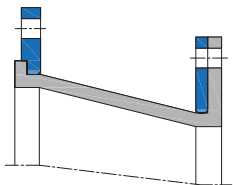
Type 65 DN range 80 - 5000
Overall length (mm) variable

Applications
Wall sealing, ground water sealing
Page 81 onwards



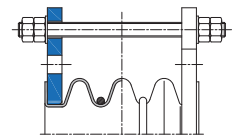
Type 59 DN range 350 - 1500
Overall length (mm) variable

Applications
Paper industry, conveyor technology,
media containing solids
Page 67 onwards



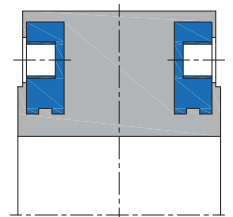
Type 80 DN range 20 - 1200
Overall length (mm) 45 - 250

Applications
Chemical plants
Page 83 onwards



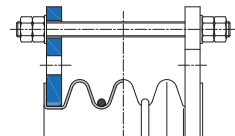
Type 60 DN range 20 - 200
Overall length (mm) 70 - 90

Applications
Building technology,
industrial plants
Page 71 onwards



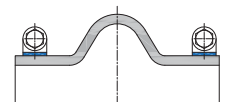
Type 80 HD DN range 25 - 600
Overall length (mm) 55 - 322

Applications
Chemical plants
Page 86 onwards



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

Applications
Industrial plants, wastewater
technology, engine technology
Page 72 onwards



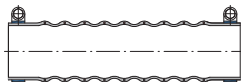
We will be happy to send you further information on

- Stainless steel expansion joints
- Stainless steel corrugated hoses
- Fabric expansion joints

You can find PDF files at
www.willbrandt.com/Catalogue.

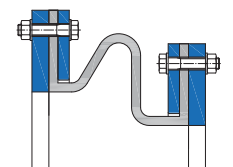
Type 62 DN range 50 - 600
Overall length (mm) variable

Applications
Drainage systems for
bridges, halls, buildings
Page 75 onwards



Type 63 DN range all
Overall length (mm) variable

Applications
Plant engineering, production
based on customer drawings
Page 76 onwards



WILLBRANDT Max. Operating Temperature

During continuous operation, the maximum temperatures stipulated in the table may be exceeded by 10 % in the short term.

Because the permissible operating pressure falls when the temperature rises, please pay attention to the pressure/temperature specifications for the respective expansion joint type.

Type	Bellow Colour code	Core	Reinforcement	Temperature								
				80 °C	90 °C	100 °C	110 °C	130 °C	150 °C	200 °C	230 °C	
39 40 42	orange blue orange	EPDM ht	Aramid	■	■	■	■	■				
39 40 42	red blue red	EPDM	Aramid	■	■	■	■	■				
39 40 42	red	EPDM	Polyamide	■	■	■	■	■				
39 40 42	yellow grey	NBR	Polyamide	■	■	■	■	■				
39 40 42	green	CSM	Polyamide	■	■	■	■	■				
39 40 42	lilac blue lilac	FPM	Aramid	■	■	■	■	■	■	■		
39 40 42	grey	CR	Polyamide	■	■	■	■	■				
39 40 42	white grey	NBR (beige)	Polyamide	■	■	■	■	■				
39 40 42	-	Si	Glass fabric	■	■	■	■	■	■	■	■	■
48	red	EPDM	Polyamide	■	■	■	■	■				
49	red	EPDM	Aramid	■	■	■	■	■				
49	blue	IIR	Polyamide	■	■	■	■	■				
49	yellow	NBR	Polyamide	■	■	■	■	■				
49	white	NBR	Polyamide	■	■	■	■	■				
49	green	CSM	Polyamide	■	■	■	■	■				
54	yellow	NBR	Polyamide	■	■	■	■	■				
46 50 55	red red	EPDM	Aramid	■	■	■	■	■				
46 50 55	red	IIR	Polyamide	■	■	■	■	■				
46 50 55	yellow	NBR	Polyamide	■	■	■	■	■				
46 50 55	orange	NBR	Polyamide	■	■	■	■	■				
46 50 55	white	NBR	Polyamide	■	■	■	■	■				
46 50 55	green	CSM	Polyamide	■	■	■	■	■				
46 50 55	lilac	FPM	Polyamide	■	■	■	■	■				
46 50 55	yellow yellow	NBR	Steel cord	■	■	■	■	■				
46 50 55	yellow LT	NBR	Steel cord	■	■	■	■	■				
46 50 55	yellow blue yellow	HNBR	Steel cord	■	■	■	■	■				
46 50 55	black	CR	Polyamide	■	■	■	■	■				
42 51	red blue	IIR	Aramid	■	■	■	■	■				
42 51	yellow blue	NBR	Aramid	■	■	■	■	■				
42 51	green blue	CSM	Aramid	■	■	■	■	■				
42 51	lilac	FPM	Aramid	■	■	■	■	■	■	■		
56 to 59 61 63 65	orange blue orange	EPDM ht	Aramid	■	■	■	■	■				
56 to 59 61 63 65	red blue red	EPDM	Aramid	■	■	■	■	■				
56 to 59 61 63 65	red	EPDM	Polyamide	■	■	■	■	■				
56 to 59 61 63 65	yellow grey	NBR	Polyamide	■	■	■	■	■				
56 to 59 61 63 65	green	CSM	Polyamide	■	■	■	■	■				
56 to 59 61 63 65	lilac blue lilac	FPM	Aramid	■	■	■	■	■	■	■		
56 to 59 61 63 65	grey	CR	Polyamide	■	■	■	■	■				
56 to 59 61 63 65	white grey	NBR (beige)	Polyamide	■	■	■	■	■				
56 to 59 61 63 65	-	Si	Glass fabric	■	■	■	■	■	■	■	■	■
60	-	EPDM	-	■	■	■	■	■				
62	-	CR	Polyamide	■	■	■	■	■				
64	rot	EPDM	Polyamide	■	■	■	■	■				
64	lilac	FPM	Glasfabric	■	■	■	■	■	■	■		
64	yellow	NBR	Polyamide	■	■	■	■	■				
64	-	CR	Polyamide	■	■	■	■	■				
80	PTFE	PTFE	-	■	■	■	■	■	■	■	■	■
80 HD	PTFE	PTFE	-	■	■	■	■	■	■	■	■	■

WILLBRANDT Rubber Expansion Joint Type 40

DN 200 - DN 5000

Type 40 is a high-corrugated, highly elastic rubber expansion joint. Due to its corrugation it has very low inherent resistance. It is characterised by its ability to absorb a large amount of movement in any direction. The type and amount of corrugation, installation length and material strength of this type can all be tailored to your requirements. There are also a large number of rubber qualities available, which means that you can select a suitable rubber compound for any application (see the material descriptions on the following pages).

Type 40 is mainly used in large industrial plants and power plants, where it compensates of fsetting and compression, insulates vibration and absorbs pipe movement.



Bellow design	High corrugated rubber bellow with reinforcement and shaped solid rubber flanges, self-sealing (no additional seals required). Suitable for backing flanges with a supporting shoulder.	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 - PTFE lining
Flange version	Both sides with backing flange made of galvanized steel with clearance holes, drilled according to DIN PN 10 (standard). Other materials and dimensions are possible.	Movement absorption	Very large axial, lateral and angular movement absorption possible. Different corrugation geometries and bellow designs (single- and multi-corrugated) available.
Pressure resistance	Design according to customer specification, max 40 bar operating pressure.	Approvals/conformity	Approved for drinking water, FDA and EG 1935/2004 conform
Vacuum resistance	Only vacuum-resistant with a vacuum supporting ring.		

Specifications

Bellow		Bellow design			Max. temperature °C	Permissible operating data							
Colour code	Colour marking	Core (Inner)	Reinforcement	Cover (outer)		°C	bar	°C	bar	°C	bar	°C	bar
red		EPDM	Polyamide	EPDM	100								
blue		EPDM TW	Polyamide	EPDM	100								
white/red		EPDM beige	Polyamide	EPDM	100								
red		EPDM AF	Polyamide	EPDM	100								
green		CSM	Polyamide	CSM	100								
yellow-grey		NBR	Polyamide	CR	100								
white-grey		NBR beige	Polyamide	CR	100								
grey		CR	Polyamide	CR	90								
red-blue-red		EPDM	Aramid	EPDM	100								
blue-blue-blue		EPDM TW	Aramid	EPDM	100								
white-blue-red		EPDM beige	Aramid	EPDM	100								
orange-blue-orange		EPDM HT	Aramid	EPDM HT	125								
red-blue-red		EPDM AF	Aramid	EPDM	100								
green-blue-green		CSM	Aramid	CSM	100								
yellow-blue-grey		NBR	Aramid	CR	100								
white-blue-grey		NBR beige	Aramid	CR	100								
grey-blue-grey		CR	Aramid	CR	90								
lilac-blue-lilac		FPM	Aramid	FPM	180								
-	-	Silicone	Aramid	Silicone	180								
-	-	Silicone	Glass fabric	Silicone	200								

Expansion joints will be designed according to your operating parameters.

WILLBRANDT Rubber Expansion Joint Type 42

DN 50 - DN 3000

Type 42 is a handmade, high-corrugated rubber expansion joint. Its high corrugation helps to achieve very low inherent resistance. It is characterised by its flexible installation length and variety of rubber qualities, which means that a suitable rubber compound is available for every application (see material descriptions). The expansion joint can also be produced in high-pressure versions up to 100 bar .

Type 42 is used in plant engineering, water technology and wastewater technology , where it is mainly used in the event of repairs if the existing gap does not correspond to any standard installation length. This avoids expensive full renovation on the piping system. It absorbs noise, vibration and pipe movement.



Bellow design	High corrugated rubber bellow with reinforcement and pressure-resistant shaped solid rubber flanges, self-sealing (no additional seals required). Suitable for backing flanges or vulcanised steel flanges (for high-pressure applications).	Pressure resistance	Design according to customer specification, max 100 bar operating pressure.
Flange version	Both sides with backing or vulcanised flange made of galvanized steel with clearance holes, drilled according to DIN PN 10 (standard). Other materials and dimensions are possible.	Vacuum resistance	Only vacuum-resistant with a vacuum supporting ring. Also available as a special version with a vulcanised vacuum supporting ring on the corrugation foot.
		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		Bellow design			Max. temperature °C	Permissible operating data									
Colour code	Colour marking	Core (inner)	Reinforcement	Cover (outer)		°C	bar	°C	bar	°C	bar	°C	bar	°C	bar
red		EPDM	Polyamide	EPDM	100										
blue		EPDM TW	Polyamide	EPDM	100										
white/red		EPDM beige	Polyamide	EPDM	100										
red		EPDM AF	Polyamide	EPDM	100										
green		CSM	Polyamide	CSM	100										
yellow-grey		NBR	Polyamide	CR	100										
white-grey		NBR beige	Polyamide	CR	100										
grey		CR	Polyamide	CR	90										
red-blue-red		EPDM	Aramid	EPDM	100										
blue-blue-blue		EPDM TW	Aramid	EPDM	100										
white-blue-red		EPDM beige	Aramid	EPDM	100										
orange-blue-orange		EPDM HT	Aramid	EPDM HT	125										
red-blue-red		EPDM AF	Aramid	EPDM	100										
green-blue-green		CSM	Aramid	CSM	100										
yellow-blue-grey		NBR	Aramid	CR	100										
white-blue-grey		NBR beige	Aramid	CR	100										
grey-blue-grey		CR	Aramid	CR	90										
lilac-blue-lilac		FPM	Aramid	FPM	180										
-	-	Silicone	Aramid	Silicone	180										
-	-	Silicone	Glass fabric	Silicone	200										

Expansion joints will be designed according to your operating parameters.

Important information

For aggressive media, please see the resistance table (can be requested separately).
 The bellow 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 48

DN 50 - DN 250

Type 48 is a high-corrugated rubber expansion joint. Its high corrugation means that it has very low inherent resistance. It reduces up to 90 % incoming energy . It continues to be characterised by its considerably movement absorption in all directions.

Type 48 is primarily used in industrial applications to absorb expansion and vibration.



Bellow design	High-corrugated rubber bellow with reinforcement and shaped sealing bead, self-sealing (no additional seals required). Suitable for swiveling flanges.	Accessories	<ul style="list-style-type: none"> - Guide sleeves - Potential equalisation - Flame-resistant protective covers - Dust and splash protection covers - Segment tie rods
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	Can be used up to -200 mbar without additional measures, full vacuum possible with vacuum supporting spiral/ring.
		Approvals	There are no approvals available.

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	Surface resistance Ro Ohm x cm
red		EPDM	Sp. Cord	EPDM	50	16	70	10	100	6	110	7 x 10 ⁴

Bursting pressure DN 50 - 250 > 48 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

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 EG 1935/2004 conform

Specifications for DN 32 - DN 500

Bellow		Bellow design			Permissible operating data								Surface resistance Ro		
Colour code	Colour marking	Core (inner)	Reinforcement	Cover (outer)	°C		°C		°C		°C		Core	Cover	
					°C	bar	°C	bar	°C	bar	°C	bar	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 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 EG 1935/2004 conform

Specifications for DN 20 - DN 400

Bellow		Bellow design			up to DN	Permissible operating data								Surface resistance Ro		
Colour code	Colour marking	Core (inner)	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
BR	●	BR/NR	Polyester cord	BR/NR	300	-50	10	50	16	70	12	-	-	90	-	-

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		Bellow design			up to DN	Permissible operating data								Surface resistance Ro		
Colour code	Colour marking	Core (inner)	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 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* mm ²			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

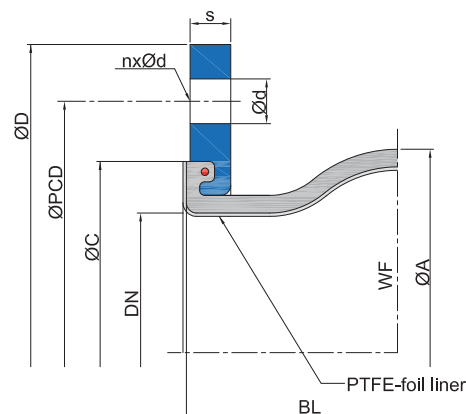
* WF = effective area

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 EG 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 1000 not vacuum-resistant without additional accessories - DN 65 to 1000 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 for DN 32 - DN 600

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).

Note!

Detailed material descriptions on pages 5 - 7.

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.

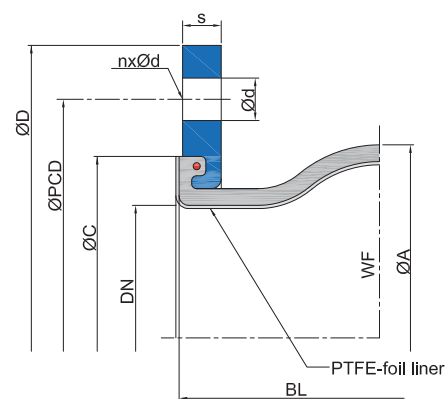
Permissible degree of utilisation for movement areas:

- 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 EG 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 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 EG 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
- The inner core of type 55 red DN 500 and DN 600 is made of EPDM

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 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	*3125	81	1700	115	85	14	4	14	65	15	15	15	15.0
32	*3125	81	1700	140	100	18	4	15	65	15	15	15	15.0
40	*3125	86	1800	150	110	18	4	15	74	15	15	15	15.0
50	*3125	96	3200	165	125	18	4	16	86	15	15	15	15.0
65	*3125	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
500	250	580	227900	670	620	26	20	30	570	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 %

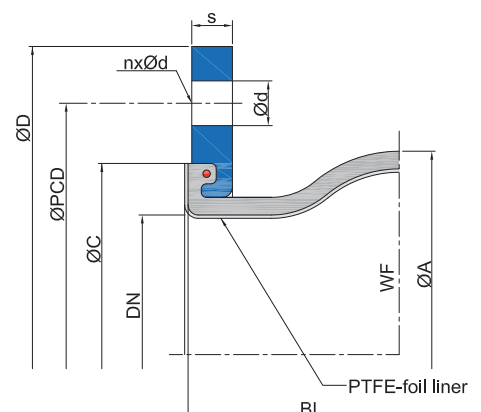
- up to 70 °C: Utilisation ~ 75 %

- 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 EG 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.

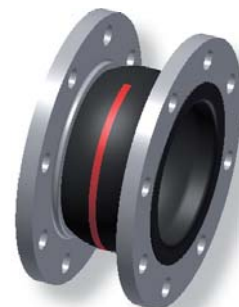
++++ We will be happy to send you further information on the individual types and designs. ++++

WILLBRANDT Rubber Expansion Joint for Shock Design Type 55 SO

DN 20 - DN 300

Type 55 SO is a low-corrugated, highly elastic rubber expansion joint. Its low corrugation helps to achieve very low flow resistance. It has been specially designed for the shipbuilding industry and is characterised by its high level of shock absorption.

Type 55 SO is primarily used in marine shipbuilding to absorb expansion and vibration as well as to insulate sound and protect the connected fans in the event of shock.



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.
Vacuum resistance	<ul style="list-style-type: none"> - 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 with vacuum supporting spiral/ring vacuum-resistant 	Approvals	Drinking water and shipbuilding approval
		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 for DN 20 - DN 300

Bellow		Bellow design			Permissible operating data								Surface resistance Ro		
Colour code	Colour marking	Core (inner)	Reinforcement	Cover (outer)	°C		bar		°C		bar		Short-term °C	Core Ohm x cm	Cover Ohm x cm
red		IIR	Polyamide	EPDM	-40	10	50	16	70	12	100	10	120	7×10^6	1×10^3
yellow		NBR	Polyamide	CR	-20	10	50	16	70	12	90	10	100	2×10^2	1×10^3

- Bursting pressure for DN 20 - DN 300: > 48 bar
 - DN 250 and DN 300 max. 10 bar working pressure

Use

Type 55 SO 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 SO 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.

Note!

Detailed material descriptions on pages 5 - 7.

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 56

DN 50 - DN 1000

Type 56 is a cylindrical rubber expansion joint that achieves very low flow resistance because of its uncorrugated bellow geometry. It is suitable for conveying media that contain solids, even at high flow rates. It is also characterised by its flexible installation length and variety of rubber qualities, which means that a suitable rubber compound is available for every application (see material descriptions on the following pages). Depending on its design, it may only be able to absorb minimal axial movement!

Type 56 is used in plant engineering, water technology and wastewater technology absorb lateral movement and vibration and to insulate sound.



Bellow design	Smooth cylindrical rubber bellow with reinforcement and shaped sealing bead with core ring, self-sealing (no additional seals required). Suitable for accommodating swiveling flanges.	Vacuum resistance	Vacuum resistance only for short installation lengths, longer versions should be fitted with a vulcanized vacuum supporting spiral.
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	Drinking water approval, FDA and EG 1935/2004 conform
		Accessories	<ul style="list-style-type: none"> - 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		Max. temperature °C	Permissible operating data				
Colour code	Colour marking		Reinforcement	Cover (outer)		°C	bar	°C	bar	°C
red		EPDM	Polyamide	EPDM	100					
blue		EPDM TW	Polyamide	EPDM	100					
white/red		EPDM beige	Polyamide	EPDM	100					
red		EPDM AF	Polyamide	EPDM	100					
green		CSM	Polyamide	CSM	100					
yellow-grey		NBR	Polyamide	CR	100					
white-grey		NBR beige	Polyamide	CR	100					
grey		CR	Polyamide	CR	90					
red-blue-red		EPDM	Aramid	EPDM	100					
blue-blue-blue		EPDM TW	Aramid	EPDM	100					
white-blue-red		EPDM beige	Aramid	EPDM	100					
orange-blue-orange		EPDM HT	Aramid	EPDM HT	125					
red-blue-red		EPDM AF	Aramid	EPDM	100					
green-blue-green		CSM	Aramid	CSM	100					
yellow-blue-grey		NBR	Aramid	CR	100					
white-blue-grey		NBR beige	Aramid	CR	100					
grey-blue-grey		CR	Aramid	CR	90					
lilac-blue-lilac		FPM	Aramid	FPM	180					
-	-	Silicone	Aramid	Silicone	180					
-	-	Silicone	Glass fabric	Silicone	200					

Expansion joints will be designed according to your operating parameters.

Important information

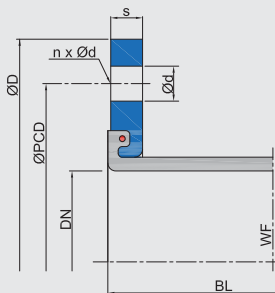
For aggressive media, please see the resistance table (can be requested separately).
 The bellows should not be painted or insulated. Please refer to the installation instructions.
 ++++ We will be happy to send you further information on the individual types and designs. ++++

WILLBRANDT Rubber Expansion Joint Type 56

Design A - without tie rods

Can be used to absorb compression and lateral movement, as well as to insulate vibration and sound.

Can only absorb minimal expansion.



Dimensions for Design A

DN*1	Overall length BL*2 mm	Bellow WF*3 mm ²	B mm	ØD mm	Flange PN 10*4				Movement absorption			Weight*6 kg
					ØPCD mm	Ød mm	n	s mm	axial + mm	axial - mm	lateral*5 ± mm	
50	150 - 1000	1963	255	165	125	18	4	16	3	5	12	4.3
65	150 - 1000	3317	275	185	145	18	8	16	3	5	11	5.2
80	150 - 1000	5024	290	200	160	18	8	18	3	5	10	7.0
100	150 - 1000	7850	310	220	180	18	8	18	3	5	10	7.9
125	150 - 1000	12266	340	250	210	18	8	18	3	5	9	10.0
150	150 - 1000	17663	375	285	240	22	8	18	3	5	12	12.0
200	200 - 1000	31400	440	340	295	22	8	20	6	10	11	17.0
250	200 - 1000	49063	509	395	350	22	12	20	6	10	11	20.0
300	200 - 1000	70650	559	445	400	22	12	20	6	10	10	25.0
350	200 - 1000	96163	619	505	460	22	16	25	6	10	10	38.0
400	200 - 1000	125600	700	565	515	26	16	25	6	10	10	38.0
450	200 - 1000	158963	760	615	565	26	20	30	6	10	10	52.0
500	200 - 1000	196250	810	670	620	26	20	30	6	10	10	57.0
600	200 - 1000	282600	930	780	725	30	20	30	6	10	9	75.0
700	200 - 1000	384650	1045	895	840	30	24	35	6	10	9	128.0
800	200 - 1000	502400	1175	1015	950	33	24	40	6	10	9	161.0
900	200 - 1000	635850	1285	1115	1050	33	28	40	6	10	9	197.0
1000	200 - 1000	785000	1400	1230	1160	36	28	40	6	10	8	235.0

*1 Intermediate diameters for other standards (e.g. ANSI) are also possible.

*2 Overall lengths available from 150/200 mm to 1000 mm.

*3 WF = effective area

*4 Other standards/dimensions possible.

*5 The lateral movement absorption applies to short overall length. The lateral movement absorption increases by 6 mm every 100 mm.

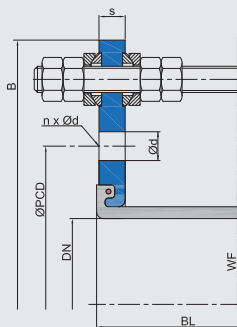
*6 For short installation lengths.

Movement absorption is for a bellow design with 6 bar operating pressure.

Design M - with tie rods/shear limiters

For absorbing compression while also absorbing lateral movement.

The use of PTFE-coated spherical washers and conical sockets reduces the frictional force considerably during lateral movement. Can be used for vibration insulation and absorbing lateral movement.



Important information

Please note the appropriate fixed point constructions and plain bearings in your piping system, as well as the tolerances as per the FSA Handbook (see the technical appendix on page 118)!

For more information please refer to our installation instructions (p. 97 - 116).

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

WILLBRANDT Rubber Expansion Joint Type 57

DN 50 - DN 300

Type 57 is a conical or eccentric rubber expansion joint that achieves very low flow resistance because of its uncorrugated bellow geometry. It is suitable for conveying media that contain solids, even at high flow rates. It is also characterised by its variety of rubber qualities, which means that a suitable rubber compound is available for every application (see material descriptions on the following pages). Its design means that it can only absorb minimal (axial) compression! Alternative production lengths are possible in individual cases and subject to agreement.

Type 57 is used in plant engineering, water technology and wastewater technology to absorb lateral movement, as well as to absorb vibration and insulate sound.



Bellow design	Smooth conical/eccentric rubber bellow with reinforcement and moulded 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.
Vacuum resistance	Only vacuum-resistant with a vulcanised vacuum supporting spiral.	Accessories	<ul style="list-style-type: none"> - Potential equalisation - Flame-resistant protective covers - Dust and splash protection covers - Earth cover / sun protection hoods - Segment tie rods
Approvals/Conformity	Drinking water approval, FDA and EG 1935/2004 conform		

Specifications

Bellow		Bellow design			Max. temperature °C	Permissible operating data									
Colour code	Colour marking	Core (inner)	Reinforcement	Cover (outer)		°C	bar	°C	bar	°C	bar	°C	bar	°C	bar
red		EPDM	Polyamide	EPDM	100										
blue		EPDM TW	Polyamide	EPDM	100										
white/red		EPDM beige	Polyamide	EPDM	100										
red		EPDM AF	Polyamide	EPDM	100										
green		CSM	Polyamide	CSM	100										
yellow-grey		NBR	Polyamide	CR	100										
white-grey		NBR beige	Polyamide	CR	100										
grey		CR	Polyamide	CR	90										
red-blue-red		EPDM	Aramid	EPDM	100										
blue-blue-blue		EPDM TW	Aramid	EPDM	100										
white-blue-red		EPDM beige	Aramid	EPDM	100										
orange-blue-orange		EPDM HT	Aramid	EPDM HT	125										
red-blue-red		EPDM AF	Aramid	EPDM	100										
green-blue-green		CSM	Aramid	CSM	100										
yellow-blue-grey		NBR	Aramid	CR	100										
white-blue-grey		NBR beige	Aramid	CR	100										
grey-blue-grey		CR	Aramid	CR	90										
lilac-blue-lilac		FPM	Aramid	FPM	180										
-	-	Silicone	Aramid	Silicone	180										
-	-	Silicone	Glass fabric	Silicone	200										

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 58

DN 50 - DN 3000

Type 58 is a cylindrical rubber expansion joint that achieves very low flow resistance because of its uncorrugated bellow geometry. It is suitable for conveying media that contain solids, even at high flow rates. It is also characterised by its flexible installation length and variety of rubber qualities, which means that a suitable rubber compound is available for every application (see material descriptions on the following pages). Its design means that it can only absorb minimal axial movement!

Type 58 is used in plant engineering, water technology and wastewater technology to absorb lateral movement and vibration and to insulate sound.



Bellow design	Smooth cylindrical rubber bellow with reinforcement and moulded, pressure-resistant solid rubber flanges (self-sealing - no additional seals required). Suitable for accommodating backing flanges.	Flange version	Both sides with backing flange made of galvanized steel, with clearance holes, drilled according to DIN PN 10 (standard). Other materials and dimensions are possible.
Vacuum resistance	Vacuum resistance only short installation lengths. Longer versions should be fitted with a vulcanised vacuum supporting spiral.	Accessories	<ul style="list-style-type: none"> - Potential equalisation - Flame-resistant protective covers - Dust and splash protection covers - Earth cover / sun protection hoods - Segment tie rods
Approvals/Conformity	Drinking water approval, FDA and EG 1935/2004 conform		

Specifications

Bellow		Bellow design			Max. temperature °C	Permissible operating data									
Colour code	Colour marking	Core (inner)	Reinforcement	Cover (outer)		°C	bar	°C	bar	°C	bar	°C	bar	°C	bar
red		EPDM	Polyamide	EPDM	100										
blue		EPDM TW	Polyamide	EPDM	100										
white/red		EPDM beige	Polyamide	EPDM	100										
red		EPDM AF	Polyamide	EPDM	100										
green		CSM	Polyamide	CSM	100										
yellow-grey		NBR	Polyamide	CR	100										
white-grey		NBR beige	Polyamide	CR	100										
grey		CR	Polyamide	CR	90										
red-blue-red		EPDM	Aramid	EPDM	100										
blue-blue-blue		EPDM TW	Aramid	EPDM	100										
white-blue-red		EPDM beige	Aramid	EPDM	100										
orange-blue-orange		EPDM HT	Aramid	EPDM HT	125										
red-blue-red		EPDM AF	Aramid	EPDM	100										
green-blue-green		CSM	Aramid	CSM	100										
yellow-blue-grey		NBR	Aramid	CR	100										
white-blue-grey		NBR beige	Aramid	CR	100										
grey-blue-grey		CR	Aramid	CR	90										
lilac-blue-lilac		FPM	Aramid	FPM	180										
-	-	Silicone	Aramid	Silicone	180										
-	-	Silicone	Glass fabric	Silicone	200										

Expansion joints will be designed according to your operating parameters.

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 59

DN 350 - DN 1500

Type 59 is a conical or eccentric-conical rubber expansion joint that achieves very low flow resistance because of its uncorrugated bellow geometry. It is suitable for conveying media that contain solids, even at high flow rates. It is also characterised by its variety of rubber qualities, which means that a suitable rubber compound is available for every application (see material descriptions on the following pages). Its design means that it can only absorb minimal expansion! Alternate installation lengths are possible in individual cases after prior examination.

Type 59 is used in plant engineering, water technology and wastewater technology, where it is used to absorb lateral movement and vibration and to insulate sound.



Bellow design	Smooth conical or eccentric rubber bellow with reinforcement with a moulded, pressure-resistant solid rubber flange on the small side and moulded sealing bead with a core ring on the other side (self-sealing - no additional seals required). Can also be constructed with both sides full faced rubber flange depending on the size and pressure. Suitable for backing/swiveling flanges.	Flange version	On one side a galvanized steel backing flange, on the other, a swiveling galvanized steel flange with clearance holes, drilled according to DIN PN 10 (standard) or with both sides galvanized steel backing flange. Other materials and dimensions are possible.
Accessories	<ul style="list-style-type: none"> - Potential equalisation - Flame-resistant protective covers - Dust and splash protection covers - Earth cover / sun protection hoods - Segment tie rods 	Vacuum resistance	Only vacuum-resistant with a vulcanised vacuum supporting spiral.
		Approvals/Conformity	Drinking water approval, FDA and EG 1935/2004 conform

Specifications

Bellow		Bellow design			Max. temperature °C	Permissible operating data									
Colour code	Colour marking	Core (inner)	Reinforcement	Cover (outer)		°C	bar	°C	bar	°C	bar	°C	bar	°C	bar
red		EPDM	Polyamide	EPDM	100										
blue		EPDM TW	Polyamide	EPDM	100										
white/red		EPDM beige	Polyamide	EPDM	100										
red		EPDM AF	Polyamide	EPDM	100										
green		CSM	Polyamide	CSM	100										
yellow-grey		NBR	Polyamide	CR	100										
white-grey		NBR beige	Polyamide	CR	100										
grey		CR	Polyamide	CR	90										
red-blue-red		EPDM	Aramid	EPDM	100										
blue-blue-blue		EPDM TW	Aramid	EPDM	100										
white-blue-red		EPDM beige	Aramid	EPDM	100										
orange-blue-orange		EPDM HT	Aramid	EPDM HT	125										
red-blue-red		EPDM AF	Aramid	EPDM	100										
green-blue-green		CSM	Aramid	CSM	100										
yellow-blue-grey		NBR	Aramid	CR	100										
white-blue-grey		NBR beige	Aramid	CR	100										
grey-blue-grey		CR	Aramid	CR	90										
lilac-blue-lilac		FPM	Aramid	FPM	180										
-	-	Silicone	Aramid	Silicone	180										
-	-	Silicone	Glass fabric	Silicone	200										

Expansion joints will be designed according to your operating parameters.

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 Pipe Connector WRG Type 60

DN 20 - DN 200

Type 60 is an uncorrugated solid rubber pipe connector with vulcanised steel flanges. Its straight, uncorrugated passage means that it achieves very low flow resistance. Due to its design, it can only absorb slight surface vibration and insulate sound, but cannot be used as an expansion joint to absorb movement. It is made from EPDM rubber.

Type 60 is mainly used on pumps, machines and apparatus in building technology in order to absorb surface vibration and insulate sound. It can also be used to for a galvanic separation and to prevent damage to pipes made from different materials.



Bellow design	Smooth, cylindrical rubber body with vulcanised flange rings. The rubber-metal pipe connector is self-sealing (no additional seals required).	Flange version	Vulcanised steel flanges with threaded blind holes (drilled according to DIN PN 6 or PN 10).
Temperature/Pressure	100/110 °C at 10/6 bar	Approvals	TÜV certification according to DIN 4809 standard for heating systems.

Dimensions

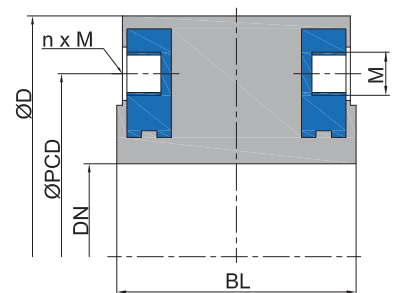
DN	Length mm	Bellow WF* mm ²	Flange PN 6				Flange PN 10			
			ØD mm	ØPCD mm	Screw dimensions	Weight kg	ØD mm	ØPCD mm	Screw dimensions	Weight kg
20	70	300	90	65	4 x M10 x 25	1.0	105	75	4 x M12 x 30	1.8
25	70	300	100	75	4 x M10 x 25	1.5	115	85	4 x M12 x 30	2.2
32	70	800	120	90	4 x M12 x 30	2.2	140	100	4 x M16 x 30	3.3
40	70	1300	130	100	4 x M12 x 30	2.6	150	110	4 x M16 x 30	3.7
50	70	2000	140	110	4 x M12 x 30	2.8	165	125	4 x M16 x 30	4.2
65	70	3300	160	130	4 x M12 x 30	3.7	185	145	4 x M16 x 30	5.2
80	70	5000	190	150	4 x M16 x 35	5.2	200	160	8 x M16 x 35	5.7
100	70	7900	210	170	4 x M16 x 35	5.8	220	180	8 x M16 x 35	6.5
125	70	12300	240	200	8 x M16 x 35	6.9	250	210	8 x M20 x 40	8.1
150	70	17700	265	225	8 x M16 x 35	8.3	295	240	8 x M20 x 40	10.0
200	70 / 90	31400	-	-	-	-	340	295	8 x M20 x 45	14.7

* WF = effective area

Important planning and installation instructions

Type 60 CANNOT absorb any axial, lateral or angular movement. It is only suitable for insulating against high-frequency vibration and for a galvanic separation of two pipes.

It must be installed completely stress-free in the pipe. To do this, it is necessary to include the appropriate fixed points and plain bearings. When tightening the flange bolts, ensure that you use the criss-cross tightening sequence. The maximum tightening torque is 30 N/m. It should only be fitted using hexagon head bolts according to ISO 4017 and a washer. The correct bolt length must be used (see installation instructions).



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.
 Please note the appropriate fixed point constructions and plain bearings in your piping system!
 For more information please refer to our installation instructions.
 ++++ We will be happy to send you further information on the individual types and designs. ++++

WILLBRANDT Rubber Expansion Joint Type 61

DN 50 - DN 1500

Type 61 is a handmade low-corrugated rubber expansion joint that achieves very low flow resistance because of its low-corrugated bellow geometry. Both ends of the bellow are cylindrical for fixing clamps. 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 61 is used in plant engineering, engine construction, ventilation technology and wastewater technology, where it is specifically used to absorb movement and vibration and to insulate sound.



Bellow design	Low-corrugated rubber bellow with reinforcement. Both ends cylindrical for fixing clamps. The standard bellow is corrugated. Uncorrugated and multi-corrugated versions for greater movement absorption are possible.	Connections	Sleeve ends for ISO pipes (standard) for fixing clamps. The clamp width should be at least 20 mm (up to 3 bar: one clamp per side; above 3 bar: two clamps per side).
Vacuum resistance	Can only be used for vacuum applications with a vacuum supporting spiral/ring.	Approvals/Conformity	Drinking water, FDA and EG 1935/2004 conform
		Accessories	<ul style="list-style-type: none"> - Fixing clamps - Potential equalisation (vulcanised braid) - Flame-resistant protective covers - Dust and splash protection covers

Specifications

Bellow		Bellow design			Max. temperature °C	Permissible operating data									
Colour code	Colour marking	Core (inner)	Reinforcement	Cover (outer)		°C	bar	°C	bar	°C	bar	°C	bar	°C	bar
red		EPDM	Polyamide	EPDM	100										
blue		EPDM TW	Polyamide	EPDM	100										
white/red		EPDM beige	Polyamide	EPDM	100										
red		EPDM AF	Polyamide	EPDM	100										
green		CSM	Polyamide	CSM	100										
yellow-grey		NBR	Polyamide	CR	100										
white-grey		NBR beige	Polyamide	CR	100										
grey		CR	Polyamide	CR	90										
red-blue-red		EPDM	Aramid	EPDM	100										
blue-blue-blue		EPDM TW	Aramid	EPDM	100										
white-blue-red		EPDM beige	Aramid	EPDM	100										
orange-blue-orange		EPDM HT	Aramid	EPDM HT	125										
red-blue-red		EPDM AF	Aramid	EPDM	100										
green-blue-green		CSM	Aramid	CSM	100										
yellow-blue-grey		NBR	Aramid	CR	100										
white-blue-grey		NBR beige	Aramid	CR	100										
grey-blue-grey		CR	Aramid	CR	90										
lilac-blue-lilac		FPM	Aramid	FPM	180										
-	-	Silicone	Aramid	Silicone	180										
-	-	Silicone	Glass fabric	Silicone	200										

Expansion joints will be designed according to your operating parameters.

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 Drainage Hose Type 62

DN 50 - DN 600

Type 62 is a handmade, low multi-corrugated rubber hose. Its multiple corrugation makes it very flexible and results in very low inherent resistance. Its installation length is also very flexible. Both ends of the hose are cylindrical for fixing clamps.

Type 62 is used to absorb movement and vibration in bridge and building drainage. It is designed for the high temperature fluctuations and wide variety of media in these applications.



Construction	Continuous low-corrugated rubber hose with reinforcement; integrated, covered steel wire spiral and spiral-free cylindrical sleeve ends for fixing clamps.	Pressure resistance	Max. operating pressure: 0.5 bar; or: 0.3 bar vacuum.
Material	Chloroprene (CR) with polyamide cord reinforcement	Connections	Sleeve ends for ISO pipes (standard) for fixing clamps. Other connection standards (e.g. SML pipe or special dimensions) are possible.
Temperature	Max. 70 °C (depressurized), or max. 50 °C (0,5 bar)	Accessories	- Fixing clamps - Potential equalisation (vulcanised braid)

Dimensions

DN	Bellow		H mm	Dimensions		Installation length
	Li ISO pipe mm	Li SML pipe mm		S mm		
50	60.3	58	50	5 - 6	300 - 3000	
65	76.1	-	50	5 - 6	300 - 3000	
70	-	78	50	5 - 6	300 - 3000	
80	88.9	83	50	5 - 6	300 - 3000	
100	114.3	110	50	5 - 6	300 - 3000	
125	139.7	135	50	5 - 6	300 - 3000	
150	168.3	160	50	5 - 6	300 - 3000	
200	219.1	210	50	5 - 6	300 - 3000	
250	273.0	274	50	5 - 6	300 - 3000	
300	323.9	326	75	5 - 6	300 - 3000	
350	355.6	429	75	5 - 6	300 - 3000	
400	406.4	-	75	5 - 6	300 - 3000	
500	508.0	532	100	5 - 6	300 - 3000	
600	610.0	635	100	5 - 6	300 - 3000	

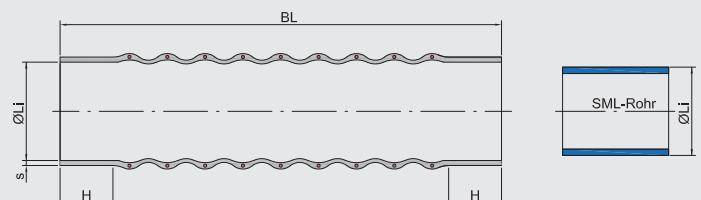
Permissible movement absorption (not in combination):

Max. axial - = (installation length - 2 x H) x 0.3 [mm]

Max axial + = only possible with pre-compressed installation length

lateral +/- = (installation length - 2 x H) x 0.15 [mm] = perm. lateral +/-

Special connection dimensions available upon request.



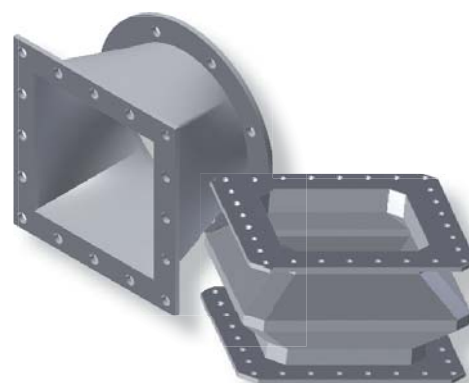
Important information

During installation, make a note of the existing temperatures and pre-stress accordingly .
Clamp torque for GBS clamps: 25 Nm. When ordering, specify the pipe diameter for the sleeve extension.
The bellows should not be painted or insulated.
Please note the installation instructions and tolerances as per the FSA Handbook (page 118) in the technical appendix!
++++ We will be happy to send you further information on the individual types and designs. ++++

WILLBRANDT Rubber Expansion Joint Type 63

Type 63 is a freely moulded rubber expansion joint that is designed and manufactured according to your specifications and construction dimensions. The cross-section can be round, square, oval or a combination of these. The multi-corrugated bellow option allows greater movement absorption. There are also a large number of rubber qualities available, which means that you can select a suitable rubber compound for almost any application (see the material descriptions on the following pages).

Type 63 is used to compensate movement, offsets and vibration in air, water and chemical plants.



Bellow design	Reinforced rubber bellow. Choice of cylindrical ends for fixing clamps/tension bands, clamping bars, or a moulded, pressure-resistant solid rubber flange, self-sealing (no additional seal necessary), suitable for backing flanges. The bellow can be uncorrugated, single-/multi-corrugated or pleated.	Fixing	The type of clamp / tension bands and the type of holes for the backing flange can be freely selected.
Pressure resistance	Max. operating pressure: 10 bar → As this is a free-form item, the max. permissible pressure is very dependent on the precise form!	Approvals/Conformity	Drinking water approval FDA and EG 1935/2004 conform
Vacuum resistance	Only vacuum-resistant with a vacuum supporting ring.	Accessories	<ul style="list-style-type: none"> - Potential equalisation (vulcanised braid) - Guided sleeves - Flame-resistant protective covers - Dust and splash protection covers - Earth cover / sun protection hoods - Tie rods

Specifications

Bellow		Bellow design			Max. temperature °C	Permissible operating data									
Colour code	Colour marking	Core (inner)	Reinforcement	Cover (outer)		°C	bar	°C	bar	°C	bar	°C	bar	°C	bar
red		EPDM	Polyamide	EPDM	100										
blue		EPDM TW	Polyamide	EPDM	100										
white/red		EPDM beige	Polyamide	EPDM	100										
red		EPDM AF	Polyamide	EPDM	100										
green		CSM	Polyamide	CSM	100										
yellow-grey		NBR	Polyamide	CR	100										
white-grey		NBR beige	Polyamide	CR	100										
grey		CR	Polyamide	CR	90										
red-blue-red		EPDM	Aramid	EPDM	100										
blue-blue-blue		EPDM TW	Aramid	EPDM	100										
white-blue-red		EPDM beige	Aramid	EPDM	100										
orange-blue-orange		EPDM HT	Aramid	EPDM HT	125										
red-blue-red		EPDM AF	Aramid	EPDM	100										
green-blue-green		CSM	Aramid	CSM	100										
yellow-blue-grey		NBR	Aramid	CR	100										
white-blue-grey		NBR beige	Aramid	CR	100										
grey-blue-grey		CR	Aramid	CR	90										
lilac-blue-lilac		FPM	Aramid	FPM	180										
-	-	Silicone	Aramid	Silicone	180										
-	-	Silicone	Glass fabric	Silicone	200										

Expansion joints will be designed according to your operating parameters.

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 PTFE Expansion Joint Type 80 HD

DN 25 - DN 600

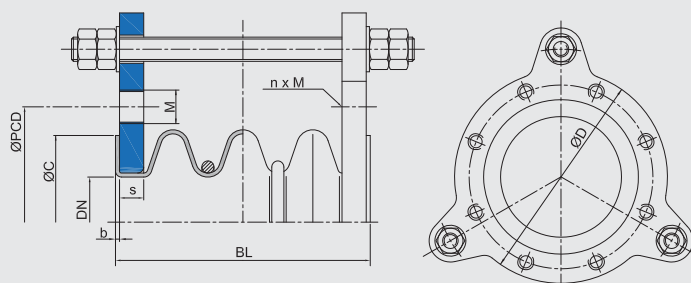
Type 80 is a 2- to 10-corrugated PTFE expansion joint that is hot-formed from wound foil piping under pressure. The material is homogeneous, has no pores and the forming process ensures a redirection of the material fibers without interruption. It is characterised by its high level of pressure resistance, media resistance and movement absorption.

Type 80 HD is primarily used in chemical plants to absorb movement, insulate sound and compensate offsets. Its high level of elasticity and low stiffness rates means that it can also be used in pipes made from fragile materials such as glass, graphite or enamel.

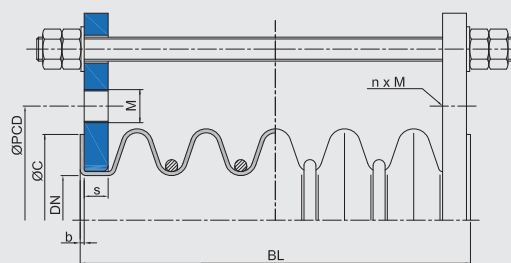


Bellow design	Multi-corrugated, pure PTFE bellow with stainless-steel external stainless-steel supporting rings from 1.4301. PTFE bead on both sides for steel flanges with integrated tie rods. Standard version: white PTFE, electrically insulating. Special version: black PTFE, electrically conductive.	Pressure resistance	Max. operating pressure: 16 bar (depending on the temperature → see tables)
Flange version	Spheroidal graphite iron GGG40, primed. Standard version delivered with flange and tie rods and threaded bolt holes (drilled according to DIN PN 10). Other flange versions and materials are possible.	Special accessories	<ul style="list-style-type: none"> - PTFE guide sleeves - Potential equalisation - Flame-resistant protective covers - Dust and splash protection covers - Earth cover/sun protection hoods
		Conformity	FDA and EG 1935/2004

Standard version, 3-corrugated - with tie rods



Standard version, 5-corrugated - with tie rods



Important information

No additional seals are required for normal, flat flange connections up to DN 300. From DN 350 and in the case of glass components or other connecting parts it is necessary to use elastic seals made of TFM with reinforcement (please refer to the required surface pressure). PTFE expansion joints may not be subject to torsion or vibration. Please refer to the installation instructions.

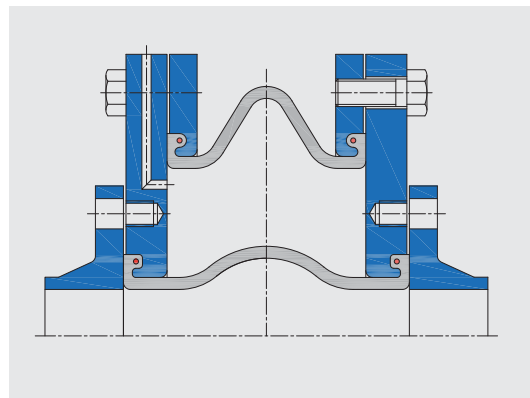
++++ We will be happy to send you further information on the individual types and designs. +++++

WILLBRANDT Special Designs

Safety expansion joint

Safety expansion joints are used wherever very aggressive media are transported and human lives or production plants are in danger if the expansion joint fails. A safety expansion joint comprises two pressure-resistant expansion joints selected according to the medium. The bellows are mounted so that there is a sealed intermediate space that can be monitored by manometer, pressure gauges or pressure sensor. This expansion joint can be produced with or without length limiters and for axial, lateral or angular movement absorption.

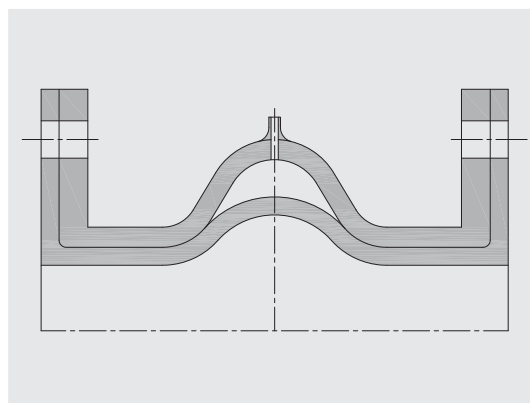
Both expansion joints are designed for full operating pressure. If the inner expansion joint is damaged, the outer expansion joint cover is still fully operational.



Safety bellow

Rubber expansion joints with a safety bellow are used wherever very aggressive media are transported and human lives or production plants are in danger if the expansion joint fails.

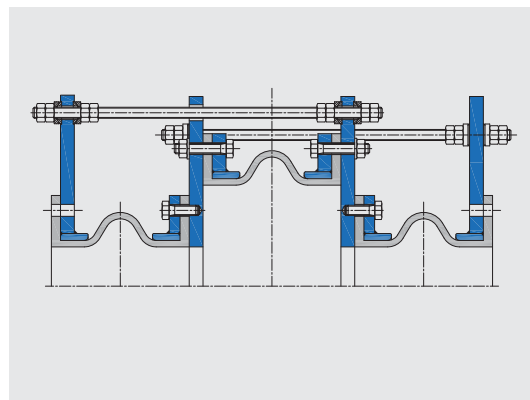
The safety bellow is a two-stage bellow with an intermediate layer and an outlet integrated into the external bellow. This outlet can be fitted with a probe, pressure gauge or drainage point so that the appropriate alarm can be sounded in the event of wear to the inner layer.



Axial balanced expansion joint

The axial balanced rubber expansion joint is used if axial movement occurs in the pipe system and cannot be absorbed by fixed points, e.g. turbine nozzle, pump housing and container nozzles.

The principle of this expansion joint is to neutralise any reaction expansion forces that occur as a result of the two small work expansion joints (DN pipes) using a expansion joint that is twice as large. This means it is only necessary to take account into the axial stiffness rate when the nozzles are loaded.

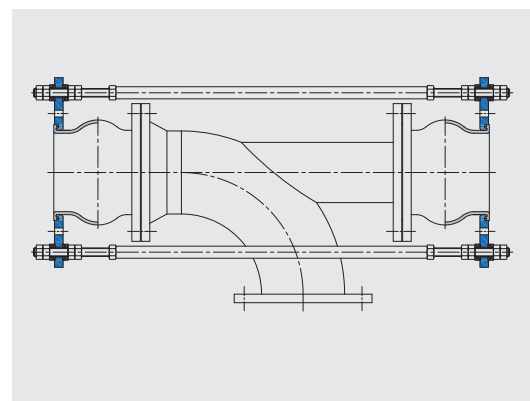


Pressure-balanced expansion joint

This expansion joint is used wherever there is axial movement but high loading is not permitted on the nozzles, e.g. nozzles for turbines or containers, which are very sensitive to axial shear forces.

The function of the pressure-balanced expansion joint is to deflect the medium at a 90° angle between the bellows, while a expansion joint with a blind flange absorbs the reaction force of the expansion joint that absorbs the movement.

The connecting rod between the two expansion joints should be regarded as a cardan cage that absorbs the reaction force. The stiffness rates from axial and lateral movement will continue to be transmitted to the fixed points or nozzles.



WILLBRANDT Movement Diagram for Combined Movement Absorption (axial and lateral)

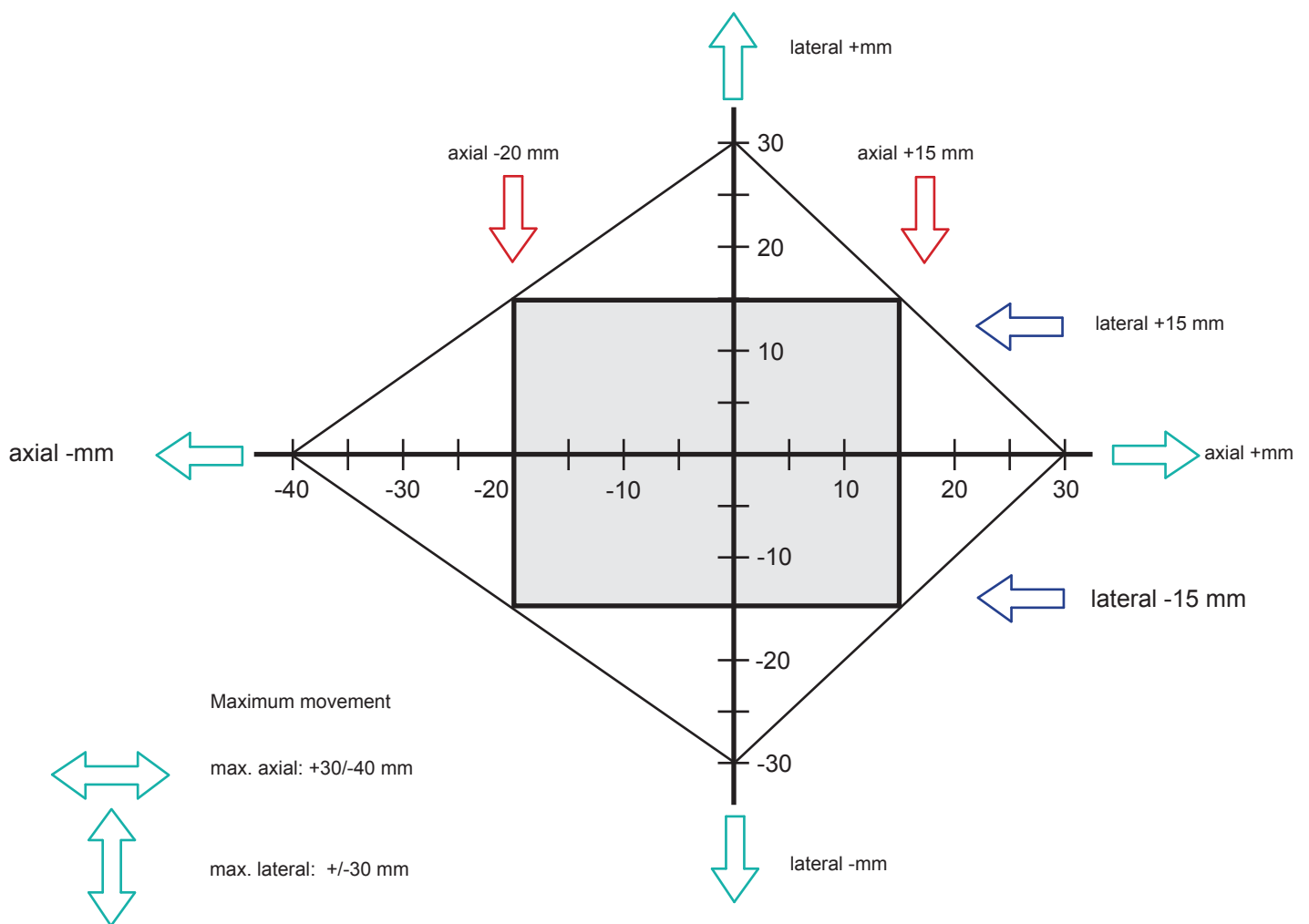
The rhombus below illustrates how a permissible combination of movement absorption can be represented for expansion joints.

The combination of lateral and axial movement may result in a maximum of 100 % utilisation for the expansion joint as a whole. The combined movements must fit into the rhombus as a rectangle.

Example:

For movement of -20 mm and +15 mm axially, the expansion joint can absorb another +/-15 mm laterally.

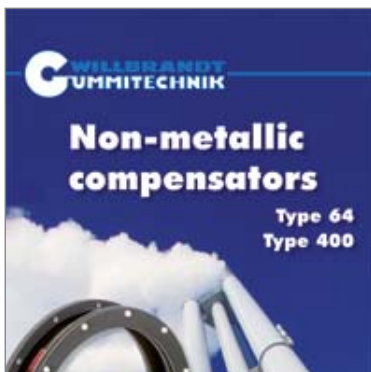
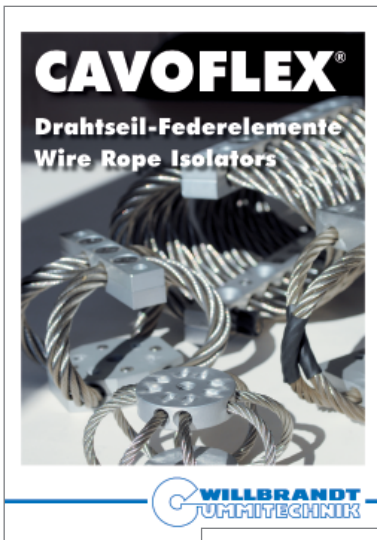
This rhombus can be used for all nominal diameters and sizes if the corresponding permissible maximum values for the expansion joint are plotted in the rhombus.



Any combination of movements can be found in this diagram.

The combined current movements must fit into the rhombus as a rectangle.





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