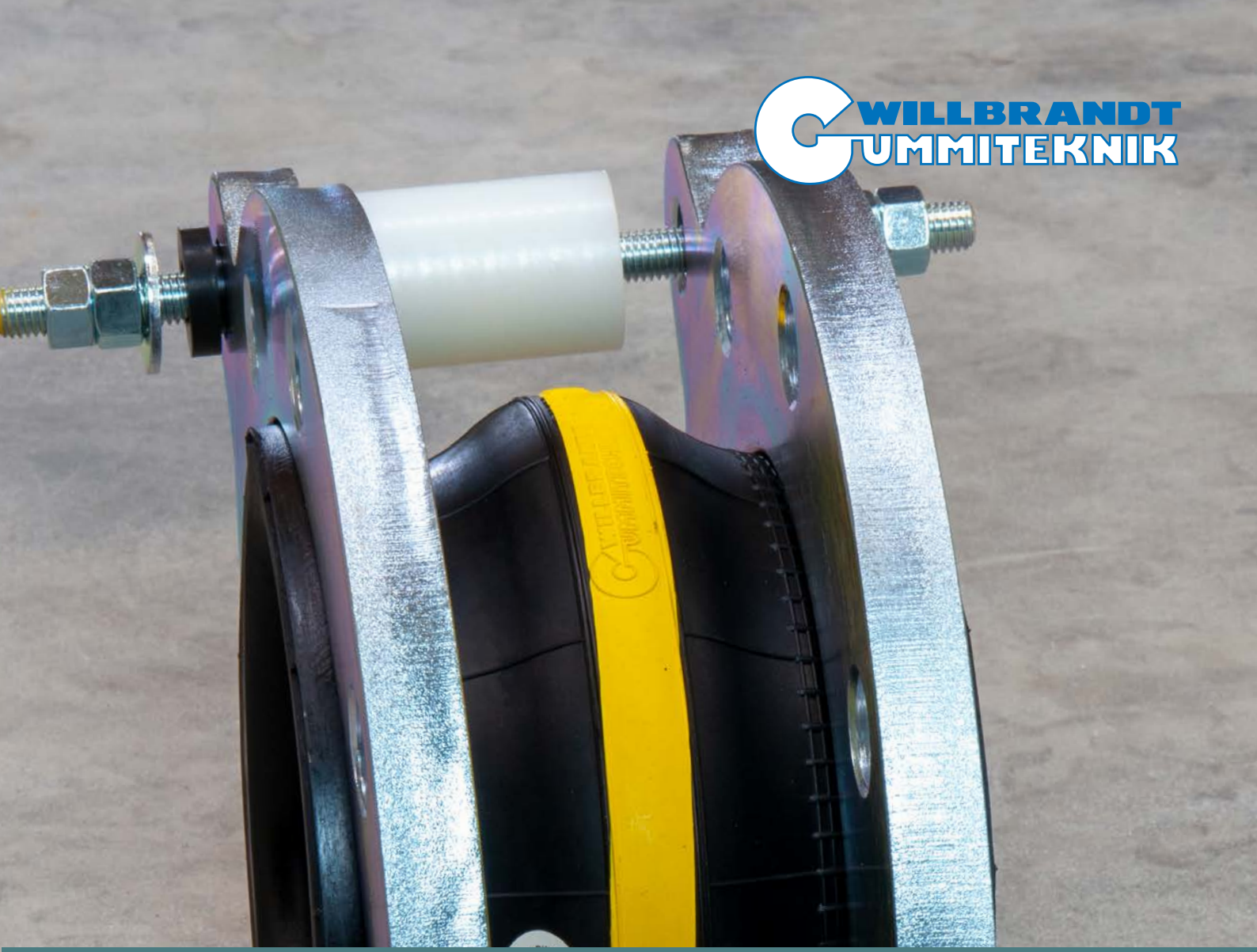
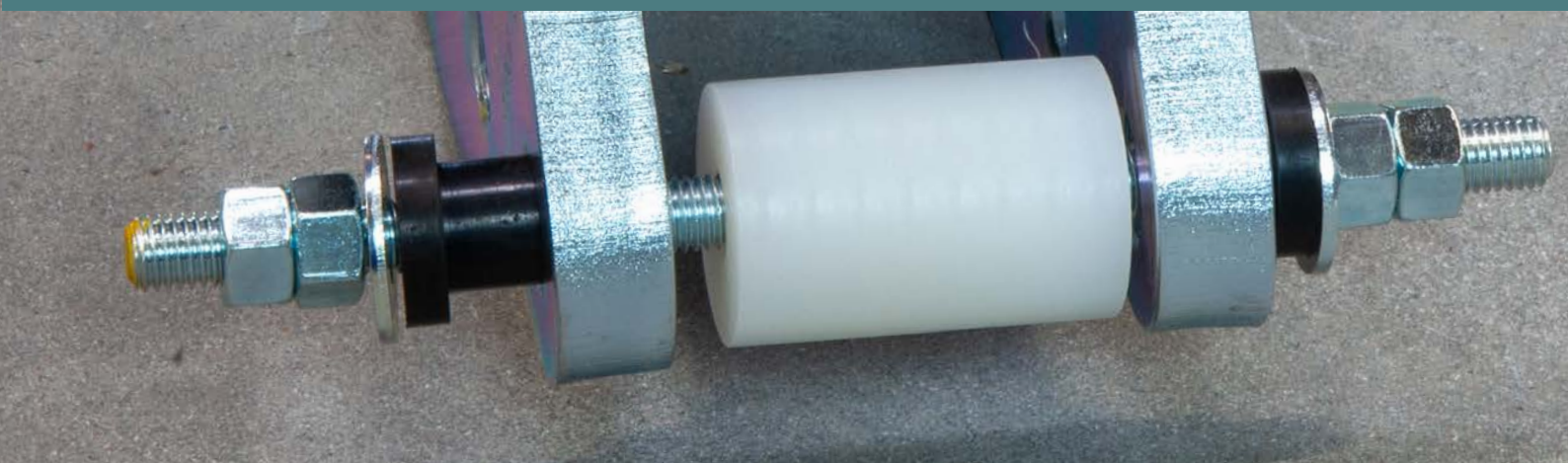


WILLBRANDT

Expansion Joints

THE HIGH RUNNERS



WILLBRANDT

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

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

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

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

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

Scan the code and
read more about WILLBRANDT

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

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

CONTENTS

WILLBRANDT **Rubber Expansion Joint Type 49**

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 accories, full vacuum possible with vacuum supporting spiral/ring.	**Approvals/Conformity**	Similar to DIN 4809 / TÜV approved, drinking water and shipbuilding approval, FDA and EU 1935/2004 conform

Specifications

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

*black EPDM max. DN 200

Bursting pressure: 75 bar
black EPDM 30 bar

Important information

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

WILLBRANDT **Rubber Expansion Joint Type 49**

Application

Type 49 A-red
For heating installations according to DIN 4809. For many years of operation under constant loading with hot water and heating water at 100 °C/110 °C at 10 bar/6 bar operating pressure. Electrically conductive surface. Not suitable for media with additives containing oil.

Type 49 blue
For drinking water, hot water, sea water, cooling water with chemical additives for treating water, saline solutions, weak acids and weak alkaline solutions. Not suitable for oil products or cooling water with additives containing oil. Electrially dissipative inner surface and electrically conductive outer surface.

Type 49 yellow
For oils, lubricants, fuels, gases, city and natural gas (not liquefied). Electrically conductive surface.

Type 49 white
For foodstuffs containing oil and fat (rubber in food-grade). Electrically insulating inner surface, electrically conductive outer surface. Not suitable for drinking water.

Type 49 green
For chemicals, aggressive chemical wastewater and compressor air containing oil. Electrically insulating sufrace.

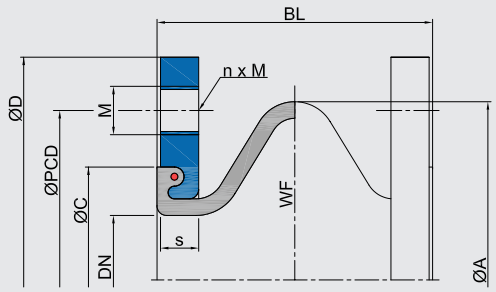
Type 49 black EPDM
For hot and cold water, sea water, cooling water, weak acids and alkali solutions, technical alcohols, esters and ketones. Electrically dissipative inner surface, conductive outer surface.
Max. pressure 10 bar.

Note!
Detailed material descriptions on pages 5 - 7.

Design A - without tie rods

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

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



Dimensions for Design A

DN	Length	Bellow		Flange PN 10*2						Movement absorption				Weight
	BL	ØA	WF*1	ØD	ØPCD	M	n	s	ØC	axial +	axial -	lateral ±	angular ±	
	mm	mm	mm²	mm	mm			mm	mm	mm	mm	mm	∠°	kg
32	**100**	110	1800	140	100	M16	4	16	79	20	30	30	7	3.0
40	**100**	110	1800	150	110	M16	4	16	79	20	30	30	7	3.6
50	**100**	120	3500	165	125	M16	4	16	89	20	30	30	7	4.4
65	**100**	135	5600	185	145	M16	8	16	104	20	30	30	7	5.3
80	**100**	150	8700	200	160	M16	8	18	119	20	30	30	7	6.5
100	**100**	170	13000	220	180	M16	8	18	142	20	30	30	7	7.3
125	**100**	195	19000	250	210	M16	8	18	169	20	30	30	7	8.9
150	**100**	260	26300	285	240	M20	8	20	195	20	30	30	7	12.3
200	**100**	310	41600	340	295	M20	8	20	245	20	30	30	7	16.2
250	**100**	360	60700	395	350	M20	12	20	295	20	30	30	7	20.3
300	**100**	410	83000	445	400	M20	12	20	345	20	30	30	7	23.1
350	**100**	460	110000	505	460	M20	16	20	396	20	30	30	7	30.1
400	**110**	515	138500	565	515	M24	16	25	450	20	30	30	7	43.2
500	**110**	615	209100	670	620	M24	20	25	550	20	30	30	7	53.8

*1 WF = effective area
*2 Other standards/dimensions possible.

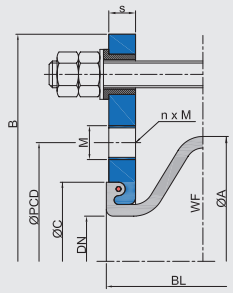
Permissible degree of utilisation for movement areas:
- up to 50 °C: Utilisation ~ 100 %
- up to 70 °C: Utilisation ~ 75 %
- up to 90 °C: Utilisation ~ 60 %

WILLBRANDT **Rubber Expansion Joint Type 49**

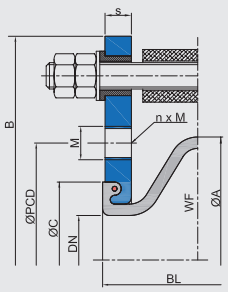
Length limiters

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

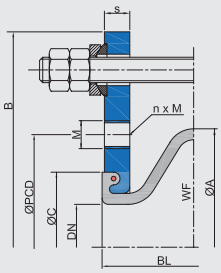
Design B*
with tie rods



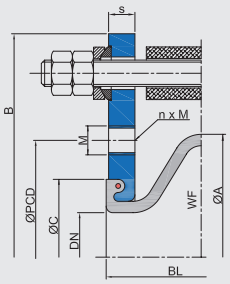
Design C*
with tie rods/thrust limiters



Design E
with tie rods and spherical washers/conical sockets



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



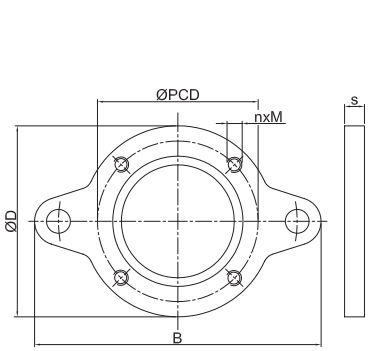
*Note: In Designs B and C the lateral movement absorption is reduced by around 50 %.

Accessories

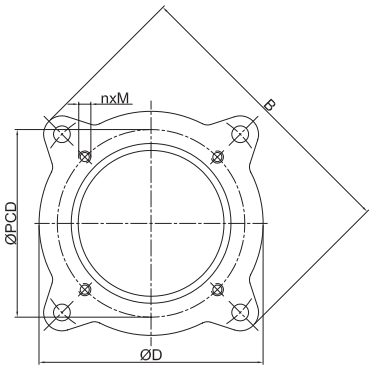
- Vacuum supporting spirals / rings
- Guide sleeves
- Potential equalisation
- Flame-resistant protective covers
- Dust and splash protection covers
- Earth cover hoods

Flange dimensions for designs with tie rods

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



DN 32 - 200



DN 250 - 500

Important information

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

WILLBRANDT **Rubber Expansion Joint Type 49**

Axial stiffness rates

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

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

Lateral stiffness rates

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

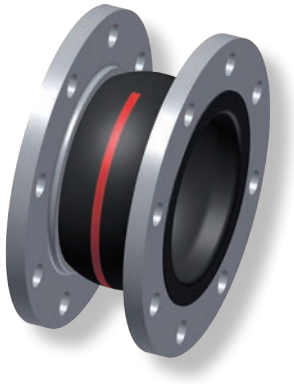
Warning: Deviations (+/-25 %) in the stiffness rates may occur due to use of different materials and manufacturing processes.

Angular stiffness torque

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

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

WILLBRANDT **Rubber Expansion Joint Type 50**



DN 20 - DN 1000

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

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

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

Specifications for DN 20 - DN 400

Bellow		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	Short-term °C	Core Ohm x cm	Cover Ohm x cm
red Sp		EPDM	PEEK	EPDM	400	-40	10	70	16	100	10	130	8	150	4 x 10^3	4 x 10^3
red		IIR	Polyamide	EPDM	400	-40	10	50	16	70	12	100	10	120	7 x 10^6	1 x 10^3
red EPDM		EPDM	Polyamide	EPDM	400	-30	10	50	16	70	12	90	10	100	- -	- -
yellow		NBR	Polyamide	CR	400	-20	10	50	16	70	12	90	10	100	2 x 10^2	1 x 10^3
white		NBR	Polyamide	CR	400	-20	10	50	16	70	12	90	10	100	7 x 10^9	1 x 10^3
green		CSM	Polyamide	CSM	400	-20	10	50	16	70	12	100	10	110	7 x 10^9	7 x 10^9
orange		NBR	Polyamide	CR	200	-20	10	50	25	70	20	90	15	100	3 x 10^3	1 x 10^3
black EPDM*		IIR	Polyamide	EPDM	150	-40	10	50	10	70	8	90	6	120	7 x 10^6	1 x 10^3
black CR	–	CR	Polyamide	CR	400	-25	10	50	16	70	12	90	10	100	7 x 10^9	5 x 10^{10}
yellow LT	**LT**	NBR-LT	Polyamide	CR	300	-40	10	50	16	70	12	90	10	100	1 x 10^4	4 x 10^3
yellow St		NBR	Steel cord	CR	400	-20	10	60	16	70	12	90	10	100	2 x 10^2	5 x 10^{10}
yellow HNBR		HNBR	Steel cord	CR	300	-35	10	60	16	70	12	100	10	120	1,5 x 10^5	- 10^{10}

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

For pressure loss see technical appendix.

Specifications for DN 450 - DN 1000

Bellow		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	Short-term °C	Core Ohm x cm	Cover Ohm x cm
red Sp		EPDM	PEEK	EPDM	1000	-40	8	70	10	100	7,5	130	6	150	4 x 10^3	4 x 10^3
red		IIR	Polyamide	EPDM	1000	-40	8	50	10	70	8	100	6	120	7 x 10^6	1 x 10^3
red EPDM		EPDM	Polyamide	EPDM	600	-30	8	50	10	70	8	90	6	100	- -	- -
yellow		NBR	Polyamide	CR	1000	-20	8	50	10	70	8	90	6	100	2 x 10^2	1 x 10^3
white		NBR	Polyamide	CR	600	-20	8	50	10	70	8	90	6	100	7 x 10^9	1 x 10^3
green		CSM	Polyamide	CSM	1000	-20	8	50	10	70	8	100	6	110	7 x 10^9	7 x 10^9
black CR	–	CRN	Polyamide	CR	1000	-25	8	50	10	70	8	90	6	100	7 x 10^9	5 x 10^{10}
yellow St		NBR	Steel cord	CR	600	-20	8	60	10	70	8	90	6	100	2 x 10^2	5 x 10^{10}

Bursting pressure DN 450 - 1000 > 30 bar

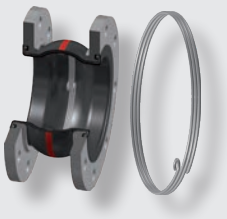
For pressure loss see technical appendix.

Important information

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

WILLBRANDT **Rubber Expansion Joint Type 50**

Vacuum resistance



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

Accessories

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

Application

Type 50 red Sp
For heating installations according to DIN 4809. For many years of operation under constant loading with hot water and heating water at 100 °C/110 °C at 10 bar/6 bar operating pressure. Electrically conductive surface. Not suitable for media with additives containing oil.

Type 50 red
For drinking water, hot water, sea water, cooling water with chemical additives for treating water, saline solutions, weak acids and weak alkaline solutions. Electrically dissipative inner surface and electrically conductive outer surface. Not suitable for oil products or cooling water with additives containing oil.

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

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

Type 50 white
For foodstuffs containing oil and fat (rubber in food-grade). Not approved for drinking water. Electrically insulating inner surface and electrically conductive outer surface.

Type 50 green
For chemicals, aggressive chemical wastewater and compressor air containing oil. Electrically insulating.

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

Type 50 black EPDM
For drinking water, sea water, cooling water, weak acids and alkali solutions, technical alcohols, esters and ketones. Max. pressure 10 bar. Electrically dissipative inner surface and electrically conductive outer surface.

Type 50 black CR
For hot and cold water, wastewater, swimming pool water, salt water, wastewater, cooling water with anti-corrosive products containing oil, oil mixtures and compressed air containing oil. Electrically insulating.

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

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

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

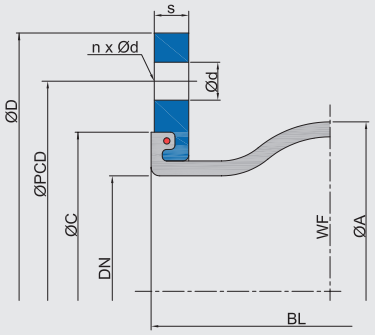
Type 50 yellow HNBR
Like Type 50 yellow St, but for temperatures up to +100 °C. Electrically dissipative inner surface, electrically insulating outer surface.

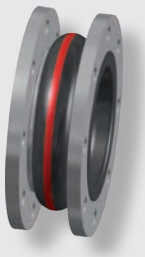
WILLBRANDT **Rubber Expansion Joint Type 50**

Design A - without tie rods

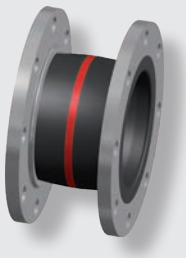
Can be used for movement absorption in any direction (for combined movements, see the movement diagram in the technical appendix), noise and vibration insulation.

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

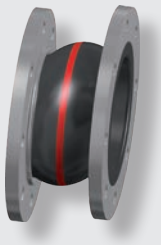




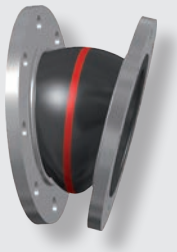
axial -



axial +



lateral ±



angular ±

Dimensions for Design A

DN	Length	Bellow		Flange PN 10*2						Movement absorption (polyamide cord)				Movement absorption (steel cord)				Weight
	BL	ØA	WF*1	ØD	ØPCD	Ød	n	s	ØC	axial +	axial -	lateral ±	angular ±	axial +	axial -	lateral ±	angular ±	
	mm	mm	mm²	mm	mm	mm		mm	mm	mm	mm	mm	∠°	mm	mm	mm	∠°	kg
20	**130**	81	1700	105	75	12	4	14	66	30	30	30	30	15	30	15	20	1.5
25	**130**	81	1700	115	85	14	4	14	66	30	30	30	30	15	30	15	20	1.9
32	**130**	81	1700	140	100	18	4	15	66	30	30	30	30	15	30	15	20	3.1
40	**130**	86	1800	150	110	18	4	15	74	30	30	30	30	15	30	15	20	3.5
50	**130**	96	3200	165	125	18	4	16	86	30	30	30	30	15	30	15	20	3.7
65	**130**	111	5300	185	145	18	8	16	106	30	30	30	30	15	30	15	20	5.3
80	**130**	122	8500	200	160	18	8	18	118	30	30	30	30	15	30	15	20	6.8
100	**130**	142	12800	220	180	18	8	18	138	30	30	30	20	15	30	15	15	7.9
125	**130**	168	18700	250	210	18	8	18	166	30	30	30	20	15	30	15	15	9.6
150	**130**	192	25900	285	240	22	8	18	192	30	30	30	20	15	30	15	15	12.9
200	**130**	252	41000	340	295	22	8	20	252	30	30	30	12	20	15	10	5	16.2
250	**130**	302	59600	395	350	22	12	20	304	30	30	30	12	20	15	10	5	21.5
300	**130**	354	82200	445	400	22	12	22	354	30	30	30	12	20	15	10	5	24.5
350	**200**	420	117600	505	460	22	16	24	412	30	50	30	8	30	30	25	10	38.3
400	**200**	480	154700	565	515	26	16	25	470	30	50	30	8	30	40	25	5	38.0
450	**200**	530	204200	615	565	26	20	28	520	30	50	30	8	-	-	-	-	47.2
500	**200**	580	227900	670	620	26	20	30	570	30	50	30	8	-	-	-	-	56.5
600	**200**	680	311500	780	725	30	20	30	675	30	50	30	8	-	-	-	-	75.2
700	***3250**	800	434200	895	840	30	24	35	780	30	50	30	8	-	-	-	-	127.8
800	**250**	880	527400	1015	950	33	24	40	887	30	50	30	6	-	-	-	-	161.0
900	**300**	1038	737900	1115	1050	33	28	40	987	30	50	30	5	-	-	-	-	196.7
1000	**300**	1138	889400	1230	1160	36	28	40	1087	30	50	30	5	-	-	-	-	234.5

*1 WF = effective area
*2 Other standards/dimensions possible.
*3 Building length 260 mm

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

Important information

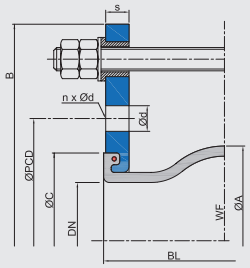
Please note the appropriate fixed point constructions and plain bearings in your piping system!
For more information please refer to our installation instructions.
For information on the tie rods, please see the technical appendix (p. 93 - 96)!
++++ We will be happy to send you further information on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

WILLBRANDT **Rubber Expansion Joint Type 50**

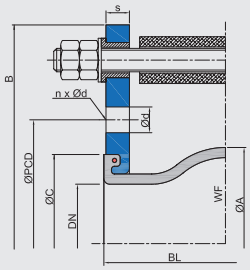
Length limiters

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

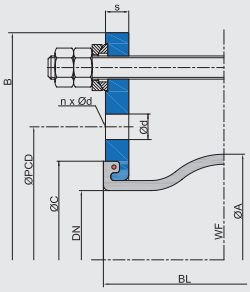
Design B*
with tie rods



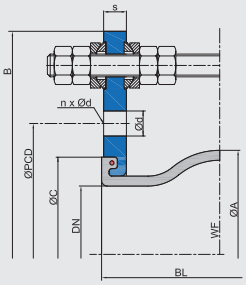
Design C*
with tie rods/thrust limiters



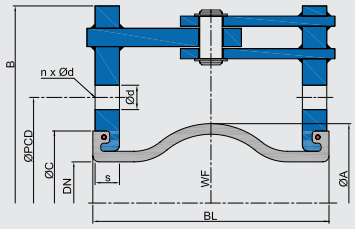
Design E
with tie rods and spherical washers/conical sockets



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



Design F
with hinge

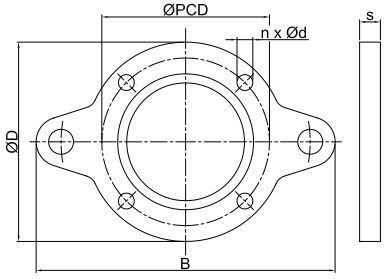


*Note: For Designs B and C
the lateral movement absorption is reduced by around 50 %.

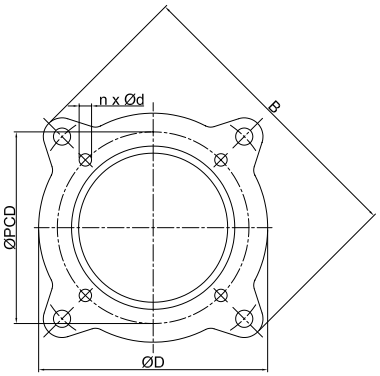
Flange dimensions for Designs with tie rods

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

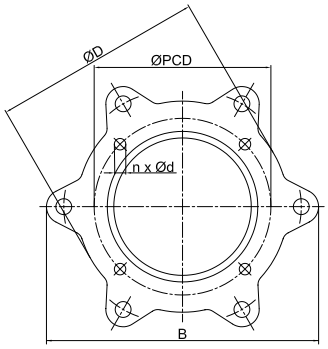
*Building length 260 mm



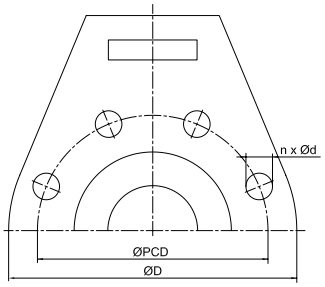
DN 32 - 200



DN 250 - 900



DN 1000



DN 50 - 1000 (Design F)

WILLBRANDT **Rubber Expansion Joint Type 50**

Axial stiffness rates

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

*Building length 260 mm

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

Lateral stiffness rates

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

*Building length 260 mm

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

WILLBRANDT **Rubber Expansion Joint Type 50**

Angular stiffness torque

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

*Building length 260 m

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

Frictional force

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

*Building length 260 m

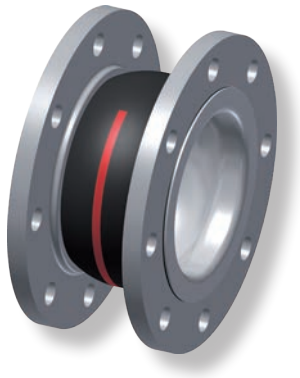
Warning: Deviations (+/- 25 %) in the frictional force may occur due to use of different materials and manufacturing processes.

WILLBRANDT **Chemical Expansion Joint Type 50 PTFE**

DN 25 - DN 500

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

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



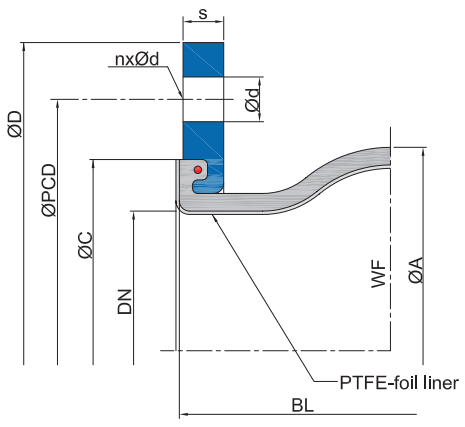
Dimensions for Design A

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

* WF = effective area

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

Pressure resistance	Max. 6 bar operating pressure with polyamide cord reinforcement, max. 9 bar operating pressure with aramid or steel cord reinforcement.
Conformity	FDA and EU 1935/2004
Vacuum resistance	Only limited suitable for vacuum operation. A PTFE vacuum supporting ring, which allows full vacuum for small nominal diameters, can be used from DN 50. The PTFE supporting ring can only be used up to 50 °C. DN 25, DN 32, DN 40 and DN 350 expansion joints are not suitable for vacuum operation.



Important information

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

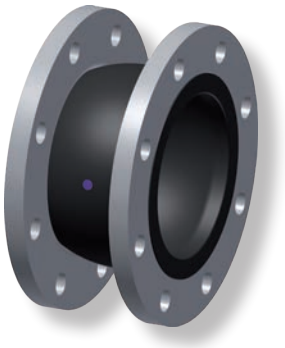

WILLBRANDT
GUMMITEKNIK

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.

Vacuum resistance

- DN 32 to 50 vacuum-resistant without additional accessories
- DN 65 to 250 up to -200 mbar without additional accessories
- DN 300 to 600 not vacuum-resistant without additional accessories
- DN 65 to 600 vacuum-resistant with vacuum supporting spiral/ring

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.

Accessories

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

Bursting pressure: 75 bar

Application

Type 51 red-blue
For hot water, sea water, cooling water with chemical additives for treating water, saline solutions, weak acids and weak alkali solutions. Not suitable for oil products or cooling water with additives containing oil, hot air or steam.

Type 51 green-blue
For chemicals, aggressive chemical wastewater and compressor air containing oil.

Type 51 lilac
For flue gas desulphurisation systems and bio-diesel. Good resistance to benzene, xylene, toluene, fuels with an aromatic content of more than 50 %, aromatic/chlorinated hydrocarbons and mineral acids. Not suitable for water or steam.

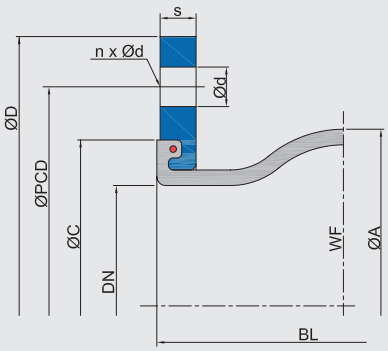
Type 51 yellow-blue
For oils, lubricants, fuels, gases, city and natural gas (not liquefied).

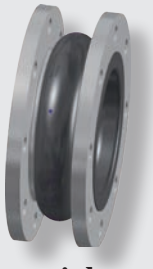
WILLBRANDT **Rubber Expansion Joint Type 51**

Design A - without tie rods

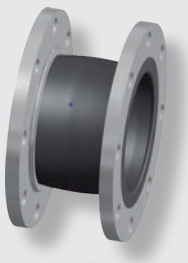
Can be used for movement absorption in any direction (for combined movements, see the movement diagram in the technical appendix), noise and vibration insulation.

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

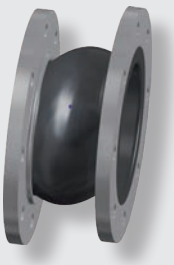




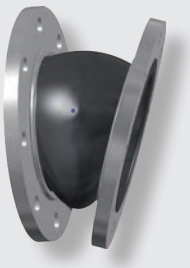
axial -



axial +



lateral ±



angular ±

Dimensions for Design A

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

*1 WF = effective area
*2 Other standards/dimensions possible.

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

Important information

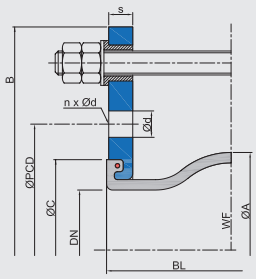
Please note the appropriate fixed point constructions and plain bearings in your piping system! For more information please refer to our installation instructions.
For information on the tie rods, please see the technical appendix (p. 93 - 96)!
++++ We will be happy to send you further information on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

WILLBRANDT **Rubber Expansion Joint Type 51**

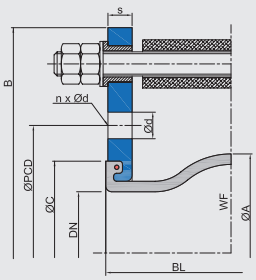
Length limiters

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

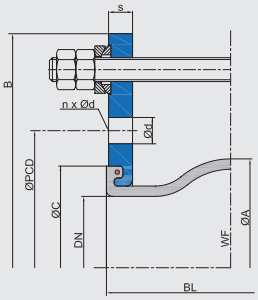
Design B*
with tie rods



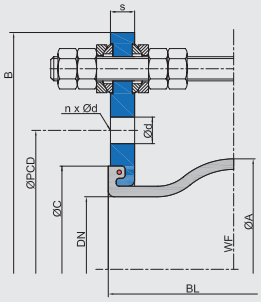
Design C*
with tie rods/thrust limiters



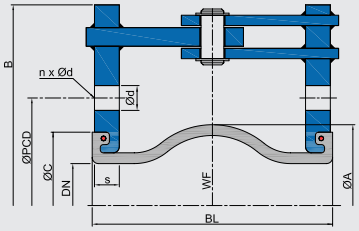
Design E
with tie rods and spherical washers/conical sockets



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



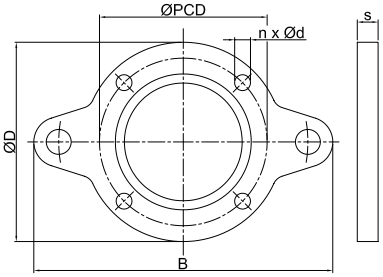
Design F
with hinge



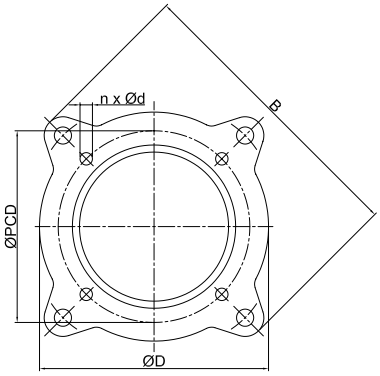
*Note: For Designs B and C
the lateral movement absorption is reduced by around 50 %.

Flange dimensions for designs with tie rods

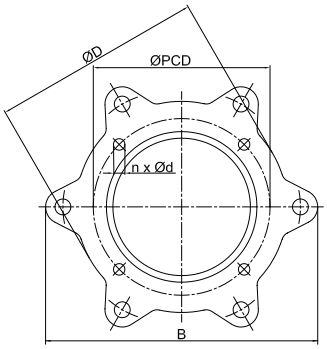
DN	Length	Flange PN 10 (example dimensions)						
	BL	B	ØD	ØPCD	Ød	n	s	ØC
	mm	mm	mm	mm	mm		mm	mm
32	**130**	230	140	100	18	4	15	79
40	**130**	240	150	110	18	4	15	79
50	**130**	255	165	125	18	4	16	88
65	**130**	275	185	145	18	8	16	104
80	**130**	290	200	160	18	8	18	119
100	**130**	310	220	180	18	8	18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



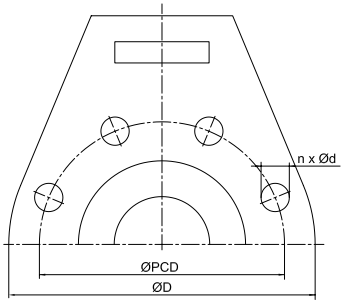
DN 32 - 200



DN 250 - 900



DN 1000



DN 50 - 1000 (Design F)

WILLBRANDT **Rubber Expansion Joint Type 51**

Axial stiffness rates

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

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

Lateral stiffness rates

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

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

Important information

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

WILLBRANDT **Rubber Expansion Joint Type 51**

Angular stiffness torque

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

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

Frictional force

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

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

Important information

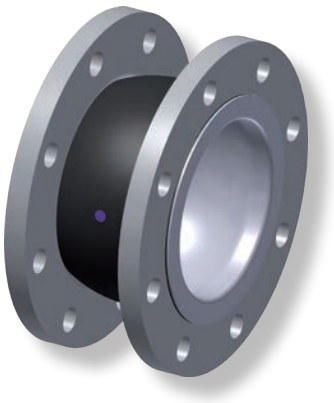
Please note the appropriate fixed point constructions and plain bearings in your piping system!
For more information please refer to our installation instructions.
For information on the tie rods, please see the technical appendix (p. 93 - 96)!
++++ We will be happy to send you further information on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

WILLBRANDT **Rubber Expansion Joint Type 51 PTFE**

DN 32 - DN 300

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

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



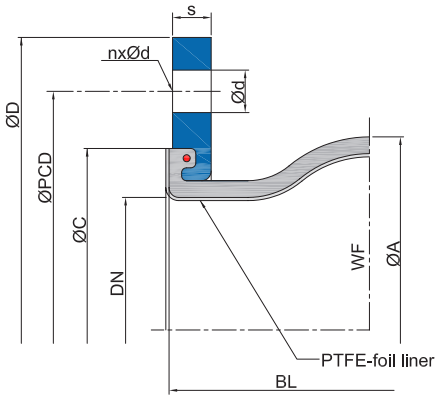
Dimensions

DN	Length	Bellow		Flange PN 10*2						Movement absorption			
	BL	ØA	WF*1	ØD	ØPCD	Ød	n	s	ØC	axial +	axial -	lateral ±	angular ±
	mm	mm	mm²	mm	mm	mm		mm	mm	mm	mm	mm	∠°
32	**130**	81	2700	140	100	18	4	15	79	15	15	15	10
40	**130**	86	2700	150	110	18	4	15	79	15	15	15	10
50	**130**	96	3200	165	125	18	4	15	88	15	15	15	10
65	**130**	110	5300	185	145	18	8	15	104	15	15	15	10
80	**130**	122	8500	200	160	18	8	15	119	15	15	15	10
100	**130**	142	12800	220	180	18	8	15	142	15	15	15	10
125	**130**	170	18700	250	210	18	8	18	169	15	15	15	10
150	**130**	196	25900	285	240	23	8	18	195	15	15	15	10
200	**130**	256	40900	340	295	23	8	20	244	15	15	15	4
250	**130**	306	59900	395	350	23	12	20	295	15	15	15	4
300	**130**	356	82200	445	400	23	12	22	351	15	15	15	4

*1 WF = effective area
*2 Other standards/dimensions possible.

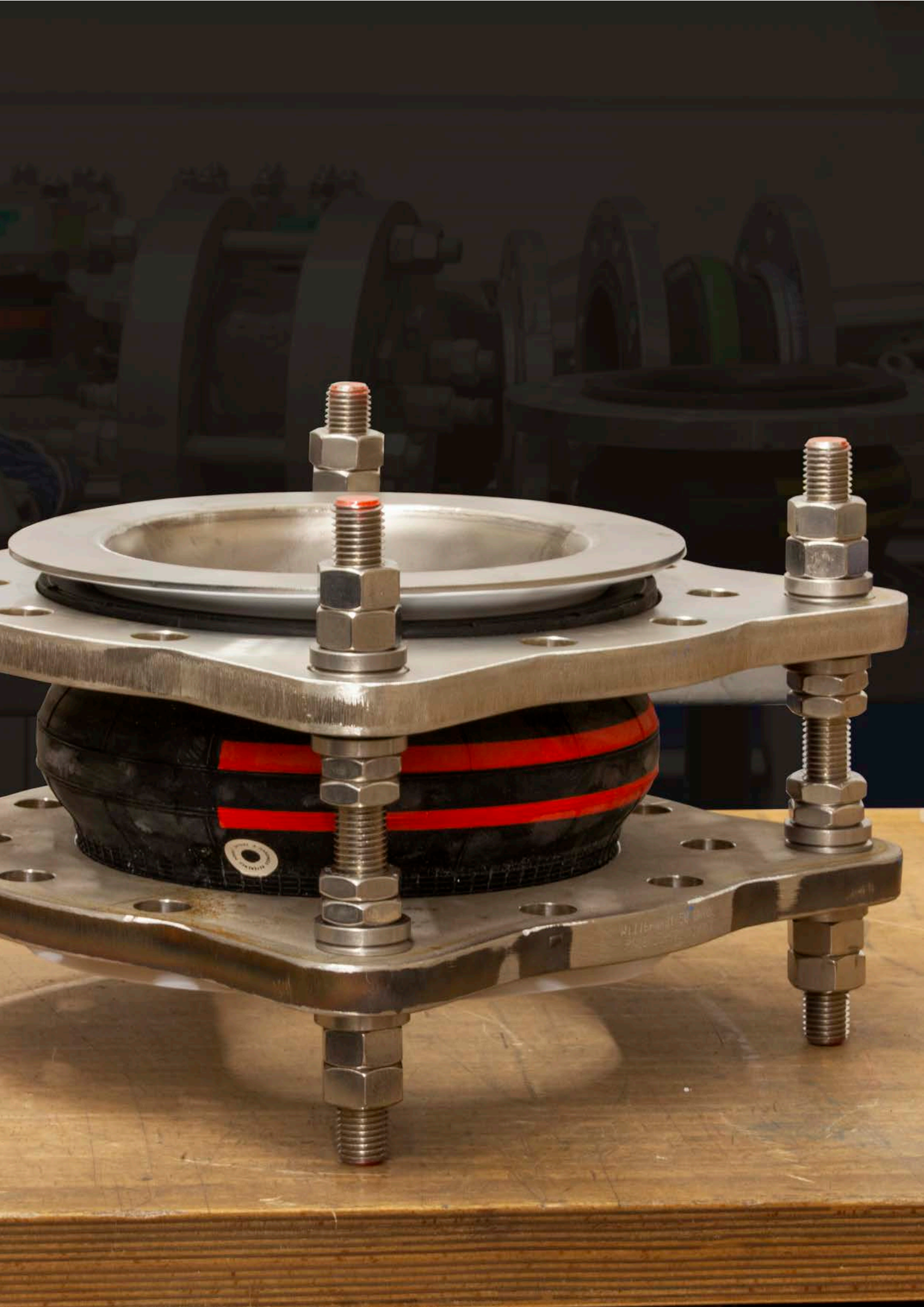
Permissible degree of utilisation for movement areas:
- up to 50 °C: Utilisation ~ 100 %
- up to 70 °C: Utilisation ~ 75 %
- up to 90 °C: Utilisation ~ 60 %

Pressure resistance	Max. 9 bar operating pressure
Conformity	FDA and EU 1935/2004
Vacuum resistance	Only limited suitable for vacuum operation. A PTFE vacuum supporting ring, which allows full vacuum for small nominal diameters, can be used from DN 50. The PTFE supporting ring can only be used up to 50 °C. DN 32 and DN 40 expansion joints are not suitable for vacuum operation.

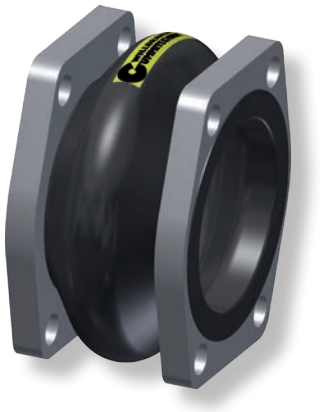


Important information

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



WILLBRANDT **Rubber Expansion Joint Type 54**



DN 25 - DN 100

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

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

Bellow design	High-corrugated rubber bellow with reinforcement and shaped sealing bead with core ring, self-sealing (no additional seals required). Suitable for accommodating swiveling flanges.
Vacuum resistance	- DN 25 to 40 up to -200 mbar without additional accessories - DN 50 to DN 100 vacuum-resistant with vacuum supporting spiral/ring - To reach higher vacuum for diameter DN 25 to DN 40, Type 50 yellow has to be used (installation length 130 mm)
Flange version	Both sides with swiveling flange made of galvanized steel, with clearance holes (drilled according to SAE 3000).
Accessories	- Guide sleeves - Potential equalisation - Flame-resistant protective covers - Dust and splash protection covers - Earth cover / sun protection hoods

Specifications

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

Application

Type 54 yellow NBR
Good resistance to heat and ageing, particularly in the absence of air (e.g. in oil). Excellent resistance to swelling (weak- and non-polar media, e.g. mineral oils, lubricating greases, animal and vegetable fats or oils). No resistance to esters, ketones, aromatic or chlorinated hydrocarbons or lead-free fuels.

Note!
Detailed material descriptions on pages 5 - 7.

Important information

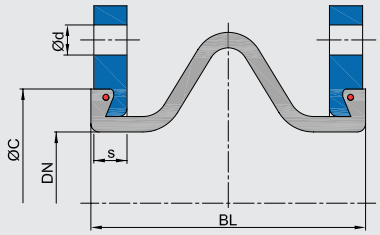
Use only flat head DIN 7984 hexagon head screws to screw the expansion joints into place.
The bellows should not be painted or insulated.
Please refer to the installation instructions.
++++ We will be happy to send you further information on the individual types and designs. ++++

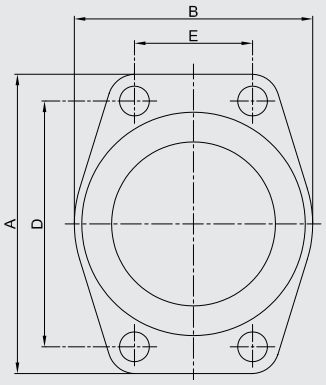
WILLBRANDT **Rubber Expansion Joint Type 54**

Design A - without tie rods

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

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





Dimensions for Design A

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

Important information

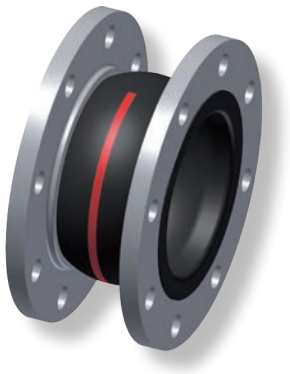
Use only flat head DIN 7984 hexagon head screws to screw the expansion joints into place.
Please note the appropriate fixed point constructions and plain bearings in your piping system! You can find information on this in our installation instructions.
For information on the tie rods, please see the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

WILLBRANDT **Rubber Expansion Joint Type 55**

DN 20 - DN 1000

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

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



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

Specifications for DN 20 - DN 400

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

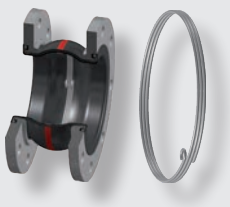
- Bursting pressure for DN 450 - 1000: > 30 bar

Important information

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

WILLBRANDT **Rubber Expansion Joint Type 55**

Vacuum resistance



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

Accessories

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

Application

Type 55 red Sp
For heating installations according to DIN 4809. For many years of operation under constant loading with hot water and heating water at 100 °C/110 °C at 10 bar/6 bar operating pressure. Electrically conductive surface. Not suitable for media with additives containing oil.

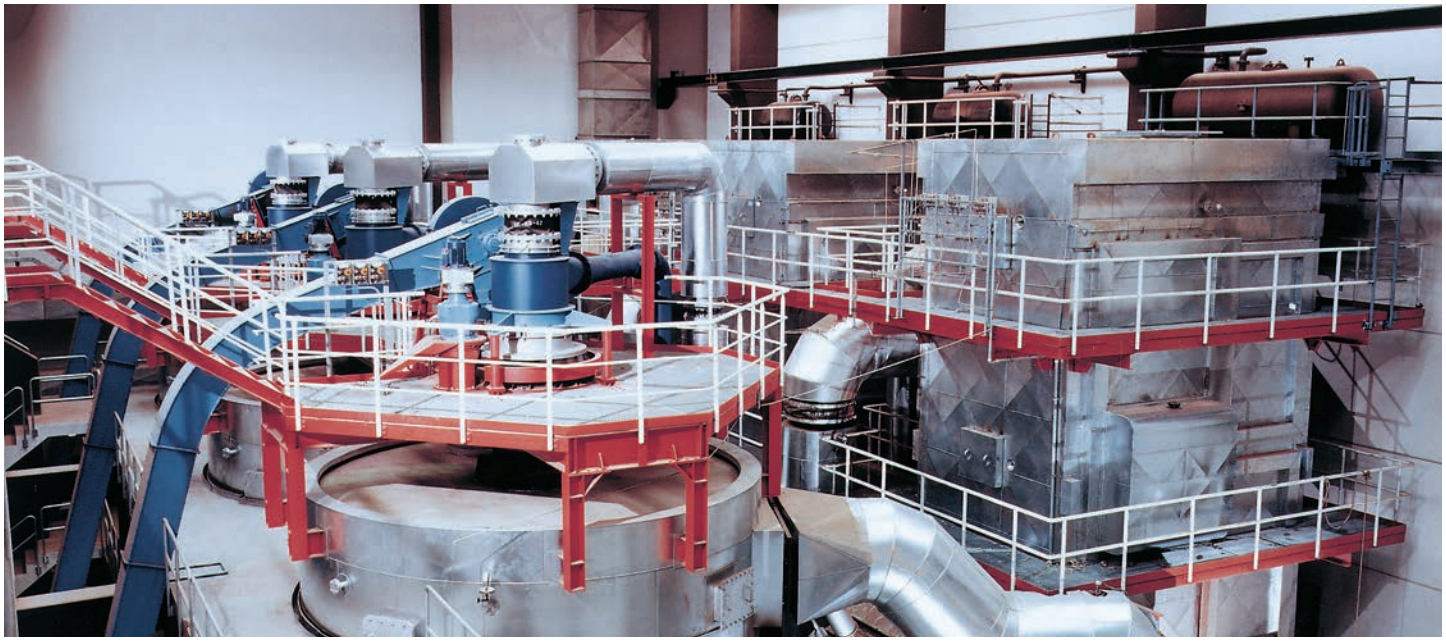
Type 55 red
For drinking water, hot water, sea water, cooling water with chemical additives for treating water, saline solutions, weak acids and weak alkaline solutions. Electrically dissipative inner surface and electrically conductive outer surface. Not suitable for oil products or cooling water with additives containing oil.

Type 55 yellow
For oils, lubricants, fuels, gases, city and natural gas (not liquefied) and DIN EN fuels with an aromatic content up to 50 %. Electrically conductive.

Type 55 green
For chemicals, aggressive chemical wastewater and compressor air containing oil. Electrically insulating.

Type 55 yellow St
Like Type 50 yellow with additional flame-resistance for up to 30 minutes at 800 °C. Electrically conductive inner surface, electrically insulating outer surface.

Note!
Detailed material descriptions on pages 5 - 7.

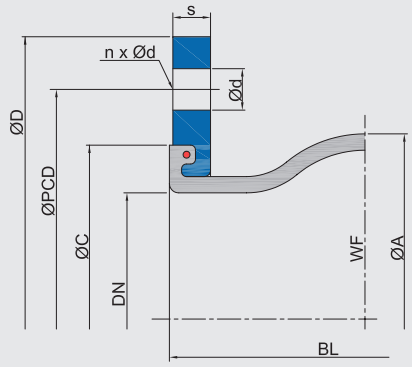


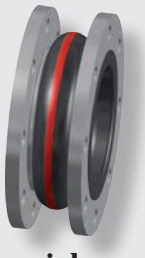
WILLBRANDT **Rubber Expansion Joint Type 55**

Design A - without tie rods

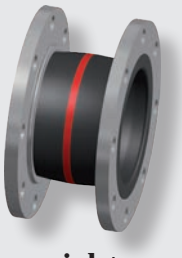
Can be used for movement absorption in any direction (for combined movements, see the movement diagram in the technical appendix), noise and vibration insulation.

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



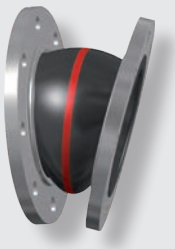


axial -



axial +

lateral ±



angular ±

Dimensions for Design A

DN	Length	Bellow		Flange PN 10*2						Movement absorption				Weight
	BL	ØA	WF*1	ØD	ØPCD	Ød	n	s	ØC	axial +	axial -	lateral ±	angular ±	
	mm	mm	mm²	mm	mm	mm		mm	mm	mm	mm	mm	∠°	kg
20	*3**125**	81	1700	105	75	12	4	14	66	30	30	30	30	1.5
25	*3**125**	81	1700	115	85	14	4	14	66	30	30	30	30	1.9
32	*3**125**	81	1700	140	100	18	4	15	66	30	30	30	30	3.1
40	*3**125**	86	1800	150	110	18	4	15	74	30	30	30	30	3.5
50	*3**125**	96	3200	165	125	18	4	16	86	30	30	30	30	3.7
65	*3**125**	111	5300	185	145	18	8	16	106	30	30	30	30	5.3
80	**150**	122	8500	200	160	18	8	18	118	30	30	30	30	6.9
100	**150**	142	12800	220	180	18	8	18	138	30	30	30	20	8.0
125	**150**	168	18700	250	210	18	8	18	166	30	30	30	20	9.8
150	**150**	192	25900	285	240	22	8	18	192	30	30	30	20	13.2
200	**175**	252	41000	340	295	22	8	20	252	30	30	30	12	17.9
250	**175**	302	59600	395	350	22	12	20	304	30	30	30	12	23.8
300	**200**	354	82200	445	400	22	12	22	354	30	30	30	12	25.0
350	**200**	420	117600	505	460	22	16	24	412	30	50	30	8	38.3
400	**200**	480	154700	565	515	26	16	25	470	30	50	30	8	38.0
450	**250**	530	204200	615	565	26	20	25	520	30	50	30	8	53.7
*4**500**	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-
*4**600**	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-
700	*5**275**	800	434200	895	840	30	24	35	780	30	50	30	8	127.3
800	**250**	880	527400	1015	950	33	24	40	887	30	50	30	6	161.0
900	**300**	1038	737900	1115	1050	33	28	40	987	30	50	30	5	196.7
1000	**300**	1138	889400	1230	1160	36	28	40	1087	30	50	30	5	234.5

*1 WF = effective area
*2 Other standards/dimensions possible.
*3 Building length 130 mm
*4 see type 52
*5 Building length 260 mm

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

Important information

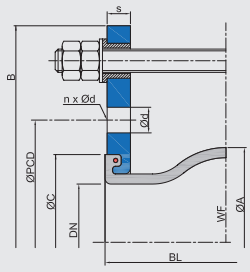
Please note the appropriate fixed point constructions and plain bearings in your piping system! You can find information on this in our installation instructions.
For information on the tie rods, please see the technical appendix (p. 93 - 96)!
++++ We will be happy to send you further information on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

WILLBRANDT **Rubber Expansion Joint Type 55**

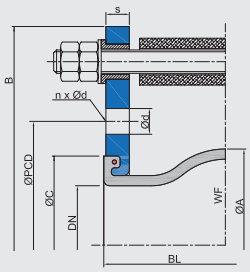
Length limiters

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

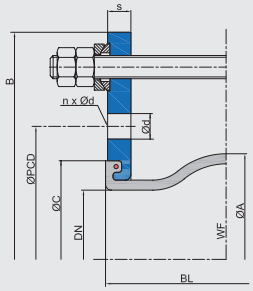
Design B*
with tie rods



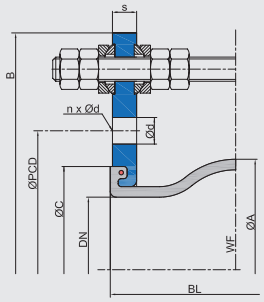
Design C*
with tie rod/thrust limiters



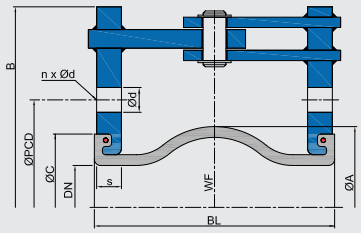
Design E
with tie rods and spherical washers/conical sockets



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



Design F
with hinge

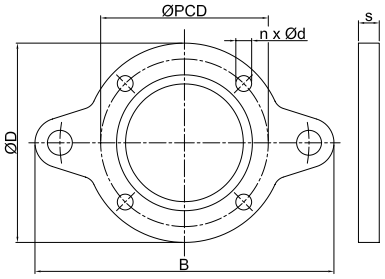


*Note: For Designs B and C
the lateral movement absorption is reduced by around 50 %.

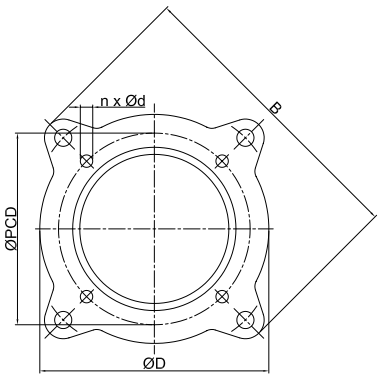
Flange dimensions for designs with tie rods

DN	Length BL	Flange PN 10 (example dimensions) B	ØD	ØPCD	Ød	n	s	ØC
	mm	mm	mm	mm	mm		mm	mm
20	*1 **125**	189	105	75	12	4	14	66
25	*1 **125**	205	115	85	14	4	14	66
32	*1 **125**	230	140	100	18	4	15	66
40	*1 **125**	240	150	110	18	4	15	74
50	*1 **125**	255	165	125	18	4	16	86
65	*1 **125**	275	185	145	18	8	16	106
80	**150**	290	200	160	18	8	18	118
100	**150**	310	220	180	18	8	18	138
125	**150**	340	250	210	18	8	18	166
150	**150**	375	285	240	22	8	18	192
200	**175**	440	340	295	22	8	20	252
250	**175**	509	395	350	22	12	20	304
300	**200**	559	445	400	22	12	22	354
350	**200**	619	505	460	22	16	24	412
400	**200**	700	565	515	26	16	25	470
450	**250**	760	615	565	26	20	30	520
700	*2 **275**	1045	895	840	30	24	35	780
800	**250**	1175	1015	950	33	24	40	887
900	**300**	1285	1115	1050	33	28	40	987
1000	**300**	1400	1230	1160	36	28	40	1087

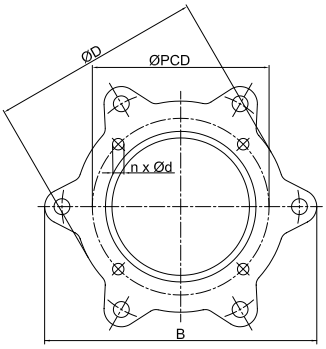
*1 Building length 130 mm
*2 Building length 260 mm



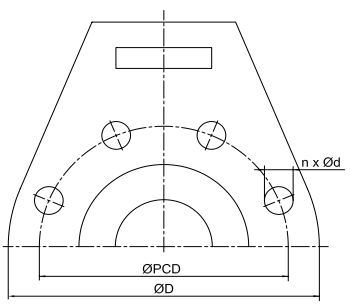
DN 32 - 200



DN 250 - 900



DN 1000



DN 50 - 1000 (Design F)

WILLBRANDT **Rubber Expansion Joint Type 55**

Axial stiffness rates

DN	Length BL mm	Stiffness rates (average value from full way) 0 bar N/mm	1 bar N/mm	2.5 bar N/mm	3 bar N/mm	4 bar N/mm	5 bar N/mm	6 bar N/mm	8 bar N/mm	10 bar N/mm	12 bar N/mm	16 bar N/mm
20	*1**125**	31	56	68	88	128	160	192	192	243	252	270
25	*1**125**	31	56	68	88	128	160	192	192	243	252	270
32	*1**125**	31	56	68	88	128	160	192	192	243	252	270
40	*1**125**	30	54	66	85	124	155	186	186	236	244	261
50	*1**125**	25	42	51	67	98	116	134	134	173	179	192
65	*1**125**	24	43	53	69	100	125	150	150	190	197	211
80	**150**	28	48	58	73	104	126	148	148	185	192	205
100	**150**	35	59	71	86	116	161	206	206	274	284	304
125	**150**	36	59	71	93	137	176	214	214	282	292	313
150	**150**	49	84	102	131	189	241	293	293	390	404	433
200	**175**	100	153	180	242	365	467	568	568	735	762	816
250	**175**	105	173	207	267	388	499	609	609	778	807	864
300	**200**	123	206	248	315	448	553	658	659	883	915	980
350	**200**	105	153	177	234	349	458	567	567	753	781	836
400	**200**	154	225	261	346	516	526	535	536	1090	1130	1210
450	**250**	167	269	320	407	581	742	903	904	1162	1205	1290
700	*2**275**	140	179	198	372	721	718	714	715	954	636	-
800	**250**	180	240	270	378	594	785	975	976	1258	839	-
900	**300**	200	320	380	483	690	885	1080	1081	1395	930	-
1000	**300**	225	355	420	527	742	995	1248	1249	1568	1045	-

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

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

Lateral stiffness rates

DN	Length BL mm	Stiffness rates (average value from full way) 0 bar N/mm	1 bar N/mm	2.5 bar N/mm	3 bar N/mm	4 bar N/mm	5 bar N/mm	6 bar N/mm	8 bar N/mm	10 bar N/mm	12 bar N/mm	16 bar N/mm
20	*1**125**	64	105	125	145	184	212	240	249	259	260	264
25	*1**125**	64	105	125	145	184	212	240	249	259	260	264
32	*1**125**	64	105	125	145	184	212	240	249	259	260	264
40	*1**125**	62	101	121	140	178	205	233	242	251	252	256
50	*1**125**	50	60	65	70	80	93	105	124	142	143	145
65	*1**125**	40	65	78	90	115	133	150	156	162	163	165
80	**150**	34	59	72	92	132	141	151	158	165	166	168
100	**150**	53	74	85	102	138	150	162	172	181	183	185
125	**150**	97	162	194	214	253	269	284	324	364	367	372
150	**150**	116	206	251	267	299	326	354	398	441	444	450
200	**175**	304	555	680	716	787	840	893	1009	1124	1132	1147
250	**175**	356	624	758	826	961	1032	1103	1233	1363	1373	1391
300	**200**	368	647	786	858	1003	1072	1142	1280	1419	1428	1448
350	**200**	305	508	610	661	762	819	875	976	1076	1083	1098
400	**200**	338	541	642	700	817	882	946	1061	1175	1183	1199
450	**250**	342	540	639	700	821	896	971	1074	1176	1184	1200
700	*2**275**	516	798	939	1023	1191	1320	1449	1594	1740	1160	-
800	**250**	558	826	960	992	1055	1306	1557	1640	1723	1149	-
900	**300**	800	1253	1480	1648	1984	2116	2248	2378	2509	1673	-
1000	**300**	960	1536	1824	2003	2361	2549	2736	2826	2916	1944	-

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

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

WILLBRANDT **Rubber Expansion Joint Type 55**

Angular stiffness torque

DN	Overall length BL mm	Stiffness torque (average value from full way) 0 bar Nm/°	2.5 bar Nm/°	4 bar Nm/°	6 bar Nm/°	10 bar Nm/°	16 bar Nm/°
20	*1 **125**	0.2	0.5	0.9	1.3	1.7	1.9
25	*1 **125**	0.2	0.5	0.9	1.3	1.7	1.9
32	*1 **125**	0.2	0.5	0.9	1.3	1.7	1.9
40	*1 **125**	0.3	0.6	1.1	1.6	2.0	2.3
50	*1 **125**	0.3	0.6	1.1	1.6	2.0	2.2
65	*1 **125**	0.4	0.9	1.7	2.5	3.2	3.6
80	**150**	0.6	1.3	2.3	3.3	4.1	4.6
100	**150**	1.0	2.0	4.0	7.0	9.0	10.0
125	**150**	2.0	3.0	6.0	10.0	13.0	15.0
150	**150**	3.0	7.0	12.0	19.0	25.0	28.0
200	**175**	11.0	20.0	41.0	63.0	82.0	91.0
250	**175**	18.0	35.0	65.0	102.0	130.0	144.0
300	**200**	29.0	58.0	105.0	154.0	206.0	229.0
350	**200**	34.0	57.0	113.0	183.0	244.0	270.0
400	**200**	65.0	110.0	218.0	226.0	460.0	511.0
450	**250**	114.0	218.0	396.0	615.0	792.0	676.0
700	*2 **275**	167.0	237.0	861.0	853.0	1140.0	1265.0
800	**250**	277.0	416.0	914.0	1501.0	1937.0	2150.0
900	**300**	386.0	733.0	1330.0	2082.0	2689.0	2985.0
1000	**300**	531.0	991.0	1751.0	2945.0	3700.0	4107.0

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

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

Frictional force

DN	Overall length mm	for Designs E and M Frictional force N/bar	for Design F Frictional moment Nm/bar
20	*1 **125**	7	0.2
25	*1 **125**	7	0.2
32	*1 **125**	7	0.2
40	*1 **125**	8	0.2
50	*1 **125**	12	0.3
65	*1 **125**	20	0.5
80	**150**	30	1.0
100	**150**	44	1.4
125	**150**	65	2.1
150	**150**	102	4.4
200	**175**	124	6.2
250	**175**	180	11.2
300	**200**	218	15.4
350	**200**	120	17.0
400	**200**	160	22.9
450	**250**	226	40.5
700	*2 **275**	602	180.9
800	**250**	814	326.2
900	**300**	921	402.4
1000	**300**	1130	617.3

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

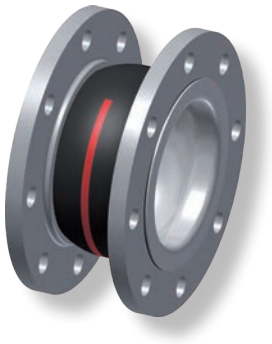
Warning: Deviations (+/-25 %) in the frictional force may occur due to use of different materials and manufacturing processes.

WILLBRANDT **Rubber Expansion Joint Type 55 PTFE**

DN 25 - DN 500

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

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



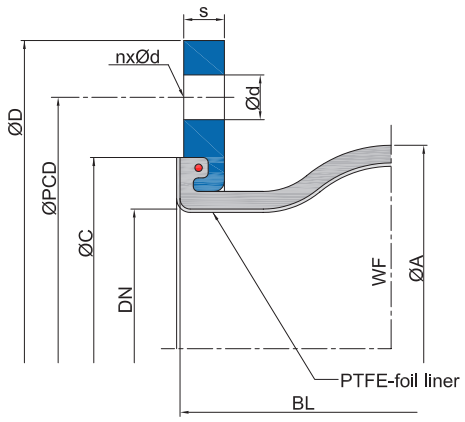
Dimensions for Design A

DN	Overall length BL	Bellow		Flange PN 10*2						Movement absorption			
		ØA	WF*1	ØD	ØPCD	Ød	n	s	ØC	axial +	axial -	lateral ±	angular ±
	mm	mm	mm²	mm	mm	mm		mm	mm	mm	mm	mm	
25	*3**125**	81	1700	115	85	14	4	14	65	15	15	15	15.0
32	*3**125**	81	1700	140	100	18	4	15	65	15	15	15	15.0
40	*3**125**	86	1800	150	110	18	4	15	74	15	15	15	15.0
50	*3**125**	96	3200	165	125	18	4	16	86	15	15	15	15.0
65	*3**125**	111	5300	185	145	18	8	16	105	15	15	15	15.0
80	**150**	122	8500	200	160	18	8	18	118	15	15	15	15.0
100	**150**	142	12800	220	180	18	8	18	137	15	15	15	10.0
125	**150**	168	18700	250	210	18	8	18	166	15	15	15	10.0
150	**150**	192	25900	285	240	22	8	20	192	15	15	15	10.0
200	**175**	252	41000	340	295	22	8	20	252	15	15	15	6.0
250	**175**	302	59600	395	350	22	12	20	304	15	15	15	6.0
300	**200**	354	82200	445	400	22	12	20	354	15	15	15	6.0
350	**200**	420	117600	505	460	22	16	24	412	15	15	15	4.0
400	**200**	480	154700	565	515	26	16	25	470	15	15	15	4.0
450	**250**	530	204200	615	565	26	20	25	520	15	15	15	4.0

*1 WF = Building length 130 mm
*2 WF = effective area
*3 Other standards/dimensions possible.

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

Pressure resistance	Max. 6 bar operating pressure with polyamide cord reinforcement, max. 9 bar operating pressure with aramid or steel cord reinforcement.
Conformity	FDA and EU 1935/2004
Vacuum resistance	Only limited suitable for vacuum operation. A PTFE vacuum supporting ring, which allows full vacuum for small nominal diameters, can be used from DN 50. The PTFE supporting ring can only be used up to 50 °C. DN 25, DN 32, DN 40 and DN 350 expansion joints are not suitable for vacuum operation.



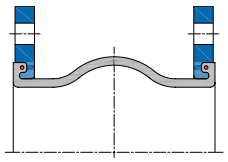
Important information

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

WILLBRANDT **Expansion Joints - Overview**

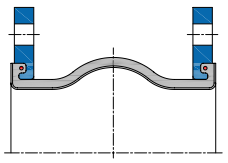
Type 39 DN range 50 - 1000
Overall length (mm) variable

Applications
Industrial plants,
repairs/replacements
Page 9 onwards



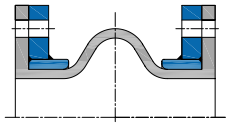
Type 39 PTFE DN range 50 - 500
Overall length (mm) variable

Applications
Chemical plants
Page 13 onwards



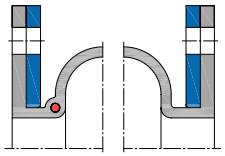
Type 40 DN range 200 - 5000
Overall length (mm) 250 - 800

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



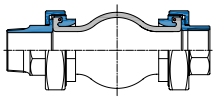
Type 42 DN range 50 - 3000
Overall length (mm) 150 - 450

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



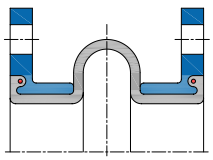
Type 46 DN range 20 - 50
Overall length (mm) 130

Applications
Building technology, engine
technology
Page 26 onwards



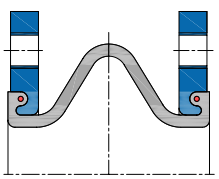
Type 48 DN range 50 - 250
Overall length (mm) 150 - 160

Applications
Steelworks, plant engineering
Page 28 onwards



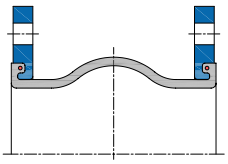
Type 49 DN range 32 - 500
Overall length (mm) 100 - 110

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



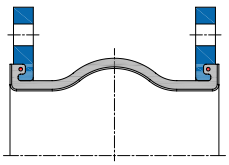
Type 50 DN range 20 - 1000
Overall length (mm) 130 - 300

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



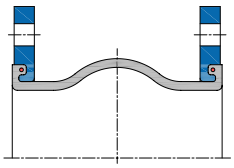
Type 50 PTFE DN range 25 - 500
Overall length (mm) 130 - 200

Applications
Chemical plants
Page 40 onwards



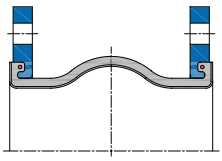
Type 51 DN range 32 - 600
Overall length (mm) 130 - 250

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



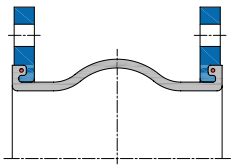
Type 51 PTFE DN range 32 - 300
Overall length (mm) 130

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



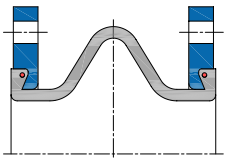
Type 52 DN range 32 - 600
Overall length (mm) 150 - 300

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



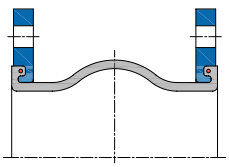
Type 54 DN range 25 - 100
Overall length (mm) 65 - 100

Applications
Hydraulic systems (SAE flanges)
Page 51 onwards



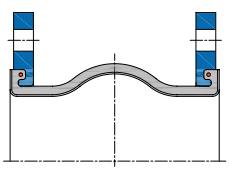
Type 55 DN range 20 - 1000
Overall length (mm) 125 - 300

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



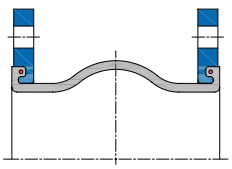
Type 55 PTFE DN range 25 - 500
Overall length (mm) 125 - 250

Applications
Chemical plants
Page 59 onwards



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

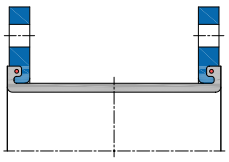
Applications
Shipbuilding, building technology,
water plants, treatment plants
Page 60 onwards



WILLBRANDT **Expansion Joints - Overview**

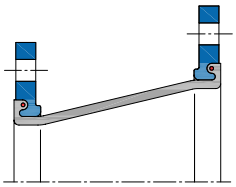
Type 56 DN range 50 - 1000
Overall length (mm) 150 - 1000

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



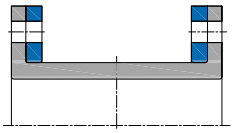
Type 57 DN range 50 - 300
Overall length (mm) 250 - 400

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



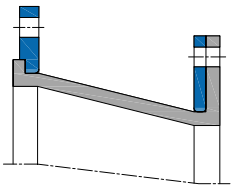
Type 58 DN range 50 - 3000
Overall length (mm) 200 - 1000

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



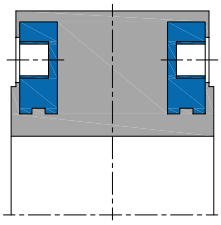
Type 59 DN range 350 - 1500
Overall length (mm) variable

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



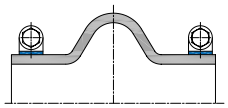
Type 60 DN range 20 - 200
Overall length (mm) 70 - 90

Applications
Building technology, industrial plants
Page 75 onwards



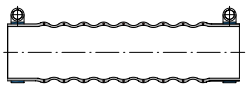
Type 61 DN range 50 - 1500
Overall length (mm) 250 - 730

Applications
Industrial plants, wastewater technology, engine technology
Page 76 onwards



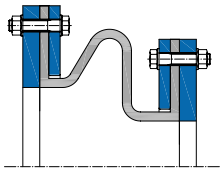
Type 62 DN range 50 - 600
Overall length (mm) variable

Applications
Drainage systems for bridges, halls, buildings
Page 79 onwards



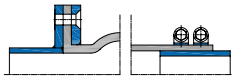
Type 63 DN range all
Overall length (mm) variable

Applications
Plant engineering, production based on customer drawings
Page 80 onwards



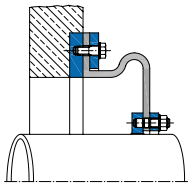
Type 64 DN range all
Overall length max. 500 mm

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



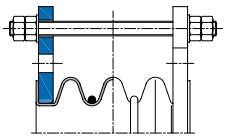
Type 65 DN range 80 - 5000
Overall length (mm) variable

Applications
Wall sealing, ground water sealing
Page 85 onwards



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

Applications
Chemical plants
Page 87 onwards



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

Applications
Chemical plants
Page 92 onwards