WILLBRANDT **Rubber Expansion Joint Type 39**

DN 50 - DN 1000

Type 39 is a handmade, low-corrugated rubber expansion joint. Its low corrugation helps to achieve very low flow 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 on the following pages).

Type 39 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 and vibrations.

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.
Pressure resistance	Design according to customer specification, max. 16 bar operating pressure.
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 - PTFE lining
Conformity	FDA and EG 1935/2004

Specifications

Bellow		Bellow design			Permissible operating data									
Colour code	Colour marking	Core (inner)	Reinforce-ment	Cover (outer)	Max. temperature °C	°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	Expansion joints will designed according to your operating parameters.									
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										

WILLBRANDT **Rubber Expansion Joint Type 39**

Application

Type 39 red (EPDM)
For water, sea water, cooling water with glycol or other chemical additives for treating water, saline solutions, weak acids and weak alkaline solutions. Unsuitable for aliphatic, aromatic and chlorinated hydrocarbons, oil or oily media.

Type 39 blue (EPDM TW)
Like Type 39 red, but approved for drinking water.

Type 39 white-red (EPDM beige)
Like Type 39 red, but with light-coloured internal rubber in food-grade.

Type 39 red AF (EPDM AF)
Like Type 39 red, but with abrasion-resistant EPDM rubber compound.

Type 39 green (CSM)
For chemicals, aggressive, chemical wastewater and compressor air containing oil.

Type 39 yellow-grey (NBR)
For oils, fats, gases, diesel fuels, kerosene and crude oil. Not suitable for aromatic and chlorinated hydrocarbons, esters and ketones.

Type 39 white-grey (NBR white)
Like Type 39 yellow-grey, but with light-coloured internal rubber in food-grade. Not approved for drinking water!

Type 39 grey (CR)
For water, wastewater, swimming pool water, salt water, cooling water with anti-corrosive products containing oil, oil mixtures and compressed air containing oil.

Type 39 red-blue-red (EPDM/aramid)
Like Type 39 red, but with aramid fabric.

Type 39 blue-blue-blue (EPDM TW/aramid)
Like Type 39 blue, but with aramid fabric.

Type 39 white-blue-red (EPDM beige/aramid)
Like Type 39 white-red, but with aramid fabric.

Type 39 orange-blue-orange (EPDM HT/aramid)
Like Type 39 red, but with aramid fabric and for temperatures up to +125 °C.

Type 39 red-blue-red AF (EPDM AF/aramid)
Like Type 39 red AF, but but with aramid fabric.

Type 39 green-blue-green (CSM/aramid)
Like Type 39 green, but with aramid fabric.

Type 39 yellow-blue-grey (NBR/aramid)
Like Type 39 yellow-grey, but with aramid fabric.

Type 39 white-blue-grey (NBR white/aramid)
Like Type 39 white-grey, but with aramid fabric.

Type 39 grey-blue-grey (CR/aramid)
Like Type 39 grey, but with aramid fabric.

Type 39 lilac-blue-lilac (FPM/aramid)
For flue gas desulphurisation systems and bio-diesel. High chemical resistance to benzene, xylene, toluene, aromatic, chlorinated hydrocarbons, mineral acids and fuels with an aromatic content of more than 50 %. Temperatures of up to +180 °C.

Type 39 silicone (Silicone/glass fabric or aramid)
Suitable for hot air, acetic acid. Satisfactory resistance to aliphatic engine and gear oils. Also available in foodstuff quality. Excellent resistance to ageing, UV, ozone and weather. Very good resistance to radiation. No resistance for steam above 120 °C.
No resistance to fuels.

Note!
Detailed material descriptions on pages 5 - 7.

Important information

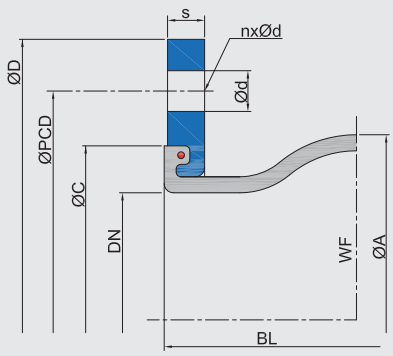
For aggressive media, please see the resistance table (can be requested separately).
The bellow should not be painted or insulated. Please refer to the installation instructions.
++++ We will be happy to send you further information on the individual types and designs. ++++

WILLBRANDT **Rubber Expansion Joint Type 39**

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 absorption.

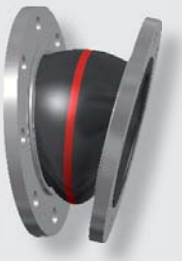
The expansion joint's reaction force must be absorbed via suitable piping (see fitting instructions in the appendix).



axial -

axial +

lateral ±



angular ±

Dimensions - Design A

DN	Overall length	Bellow		Flange PN 10*3						Movement absorption				Weight*5
	BL*1	ØA	WF*2	ØD	ØPCD	Ød	n	s	ØC	axial +	axial -	lateral*4 ±	angular ±	
	mm	mm	mm²	mm	mm	mm		mm	mm	mm	mm	mm	∠°	kg
50	**200 - 500**	96	3200	165	125.0	18.0	4	16	86	10	20	15	35	4.1
65	**200 - 500**	110	5300	185	145.0	18.0	8	16	106	10	20	15	30	5.7
80	**200 - 500**	122	8500	200	160.0	18.0	8	18	118	15	20	15	30	7.2
100	**200 - 500**	142	12800	220	180.0	18.0	8	18	138	15	20	15	25	8.3
125	**200 - 500**	170	18700	250	210.0	18.0	8	18	166	15	20	15	25	10.0
150	**200 - 500**	196	25900	285	240.0	23.0	8	20	192	15	20	15	20	13.4
200	**200 - 500**	256	40900	340	295.0	23.0	8	20	252	15	20	15	15	16.7
250	**200 - 500**	306	59900	395	350.0	23.0	12	20	304	15	20	15	10	21.9
300	**200 - 500**	352	82200	445	400.0	23.0	12	20	354	15	20	15	10	25.0
350	**200 - 500**	442	108000	505	460.0	22.0	16	20	412	15	20	15	10	38.8
400	**200 - 500**	495	137900	565	515.0	26.0	16	25	470	20	25	20	8	38.5
450	**200 - 500**	545	180100	615	565.0	26.0	20	25	512	20	25	20	8	47.7
500	**200 - 500**	595	203800	670	620.0	26.0	20	30	570	20	25	20	6	57.2
600	**200 - 500**	695	328600	780	725.0	30.0	20	30	675	20	25	20	6	75.9
700	**200 - 500**	832	418300	895	840.0	30.0	24	35	780	20	25	20	5	128.6
750*6	**200 - 500**	882	475100	927	914.4	34.4	28	35	830	20	25	20	4	154.0
800	**200 - 500**	932	540700	1015	950.0	33.0	24	40	887	20	25	20	4	163.7
900	**200 - 500**	1032	670600	1115	1050.0	33.0	28	40	985	20	25	20	4	198.7
1000	**200 - 500**	1134	823100	1230	1160.0	36.0	28	40	1085	20	25	20	4	236.0

*1 For shorter installation lengths, please refer to types 49, 50 and 55.
*2 WF = effective area
*3 Other standards/dimensions possible.
*4 The greater the installation length, the greater the movement absorption.
*5 For the shortest installation length.
*6 Dimensions according to ANSI B16.47 Class 150 lbs

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

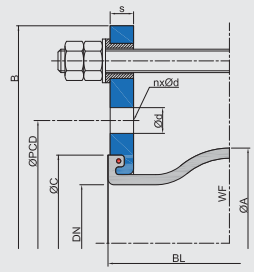
Please note the appropriate fixed point constructions and plain bearings in your piping system, as well as the tolerances as per the FSA Handbook (see the technical appendix on page 118)!
For more information please refer to our installation instructions (p. 97 - 116).
++++ We will be happy to send you further information on the individual types and designs. ++++

WILLBRANDT **Rubber Expansion Joint Type 39**

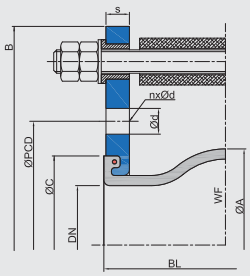
Length limiters

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

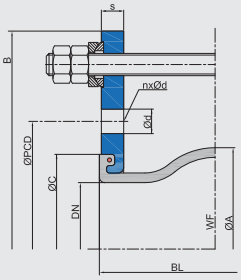
Design B*
with tie rods



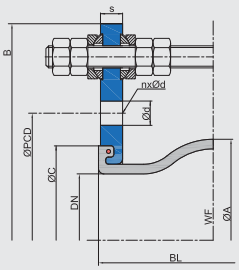
Design C*
with tie rods/thrust limiters



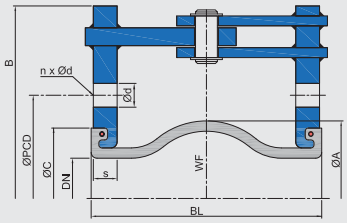
Design E
with tie rods and spherical washers/conical sockets



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



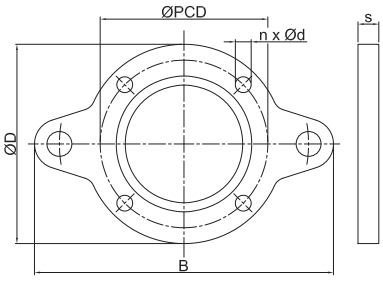
Design F
with hinge



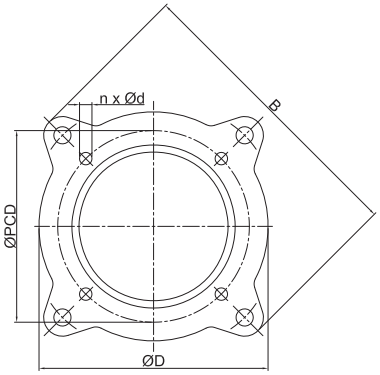
*Note: for design B and C
the lateral movement absorption is reduced by around 50 %.

Flange dimensions for designs with tie rods

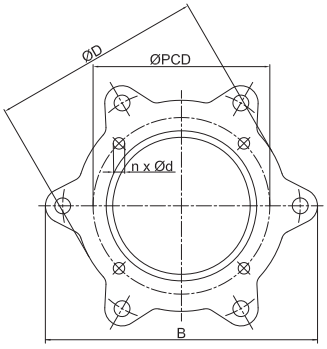
DN	Length BL	Flange PN 10 (example dimensions) B	ØD	ØPCD	Ød	n	s	ØC
	mm	mm	mm	mm	mm		mm	mm
50	**200 - 500**	255	165	125	18	4	16	86
65	**200 - 500**	275	185	145	18	8	16	106
80	**200 - 500**	290	200	160	18	8	18	118
100	**200 - 500**	310	220	180	18	8	18	138
125	**200 - 500**	340	250	210	18	8	18	166
150	**200 - 500**	375	285	240	23	8	20	192
200	**200 - 500**	440	340	295	23	8	20	252
250	**200 - 500**	509	395	350	23	12	20	304
300	**200 - 500**	559	445	400	23	12	20	354
350	**200 - 500**	619	505	460	22	16	20	412
400	**200 - 500**	700	565	515	26	16	25	470
450	**200 - 500**	760	615	565	26	20	25	512
500	**200 - 500**	810	670	620	26	20	30	570
600	**200 - 500**	930	780	725	30	20	30	675
700	**200 - 500**	1045	895	840	30	24	35	780
800	**200 - 500**	1175	1015	950	33	24	40	887
900	**200 - 500**	1285	1115	1050	33	28	40	985
1000	**200 - 500**	1400	1230	1160	36	28	40	1085



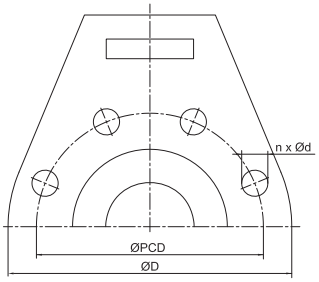
DN 32 - 200



DN 250 - 900



DN 1000



DN 50 - 1000 (Design F)

Important information

For information on the tie rods, please see the technical appendix (p. 89 - 92)!
++++ We will be happy to send you further information on the individual types and designs. ++++

WILLBRANDT **Chemical Expansion Joint Type 39 PTFE**

DN 50 - DN 500

Type 39 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 poperty.

The PTFE lining can be used for any rubber compound on Type 39. 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.

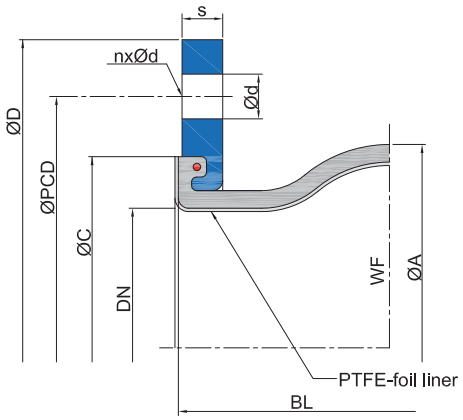
Dimensions - Design A

DN	Length	Bellow		Flange PN 10						Movement absorption			
	BL	ØA	WF*	ØD	ØPCD	Ød	n	s	ØC	axial +	axial -	lateral ±	angular ±
	mm	mm	mm²	mm	mm	mm		mm	mm	mm	mm	mm	∠°
50	**200 - 500**	96	3200	165	125.0	18.0	4	16	86	15	15	15	15.0
65	**200 - 500**	110	5300	185	145.0	18.0	8	16	106	15	15	15	15.0
80	**200 - 500**	122	8500	200	160.0	18.0	8	18	118	15	15	15	15.0
100	**200 - 500**	142	12800	220	180.0	18.0	8	18	138	15	15	15	10.0
125	**200 - 500**	170	18700	250	210.0	18.0	8	18	166	15	15	15	10.0
150	**200 - 500**	196	25900	285	240.0	23.0	8	20	192	15	15	15	10.0
200	**200 - 500**	256	40900	340	295.0	23.0	8	20	252	15	15	15	6.0
250	**200 - 500**	306	59900	395	350.0	23.0	12	20	304	15	15	15	6.0
300	**200 - 500**	352	82200	445	400.0	23.0	12	20	354	15	15	15	6.0
350	**200 - 500**	442	108000	505	460.0	22.0	16	20	412	15	15	15	4.0
400	**200 - 500**	495	137900	565	515.0	26.0	16	25	470	15	15	15	4.0
450	**200 - 500**	545	180100	615	565.0	26.0	20	25	512	15	15	15	4.0
500	**200 - 500**	595	203800	670	620.0	26.0	20	30	570	15	15	15	4.0

* 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 suitability 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 350 expansion joints are not suitable for vacuum operation.



Important information

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