Rubber expansion joint´s data.

Type 50

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 EG 1935/2004 conform

Specifications for DN 20 - DN 400

Bellow		Bellow design			up to DN	Permissible operating data								Surface resistance Ro	
Colour code	Colour marking	Core (inner)	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	400	-40	10	70	16	100	10	130	8	150	4×10^3	4×10^3
red	■	IIR	Polyamide	EPDM	400	-40	10	50	16	70	12	100	10	120	7×10^6	1×10^3
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	2×10^2	1×10^3
white	□	NBR	Polyamide	CR	400	-20	10	50	16	70	12	90	10	100	7×10^9	1×10^3
green	■	CSM	Polyamide	CSM	400	-20	10	50	16	70	12	100	10	110	7×10^9	7×10^9
orange	■	NBR	Polyamide	CR	200	-20	10	50	25	70	20	90	15	100	3×10^3	1×10^3
black EPDM*	◆	IIR	Polyamide	EPDM	150	-40	10	50	10	70	8	90	6	120	7×10^6	1×10^3
black CR	–	CR	Polyamide	CR	400	-25	10	50	16	70	12	90	10	100	7×10^9	5×10^{10}
yellow LT	■ LT	NBR-LT	Polyamide	CR	300	-40	10	50	16	70	12	90	10	100	1×10^4	4×10^3
yellow St	■■	NBR	Steel cord	CR	400	-20	10	60	16	70	12	90	10	100	2×10^2	5×10^{10}
yellow HNBR	■■■	HNBR	Steel cord	CR	300	-35	10	60	16	70	12	100	10	120	$1{,}5 \times 10^5$	- 10^{10}
BR	●	BR/NR	Polyester cord	BR/NR	300	-50	10	50	16	70	12	-	-	90	- -	-

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

For pressure loss see technical appendix.

Specifications for DN 450 - DN 1000

Bellow		Bellow design			up to DN	Permissible operating data								Surface resistance Ro	
Colour code	Colour marking	Core (inner)	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	1000	-40	8	70	10	100	7,5	130	6	150	4×10^3	4×10^3
red	■	IIR	Polyamide	EPDM	1000	-40	8	50	10	70	8	100	6	120	7×10^6	1×10^3
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	2×10^2	1×10^3
white	□	NBR	Polyamide	CR	600	-20	8	50	10	70	8	90	6	100	7×10^9	1×10^3
green	■	CSM	Polyamide	CSM	1000	-20	8	50	10	70	8	100	6	110	7×10^9	7×10^9
black CR	–	CRN	Polyamide	CR	1000	-25	8	50	10	70	8	90	6	100	7×10^9	5×10^{10}
yellow St	■■	NBR	Steel cord	CR	600	-20	8	60	10	70	8	90	6	100	2×10^2	5×10^{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. ++++

Vacuum resistant

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
- Flame-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.

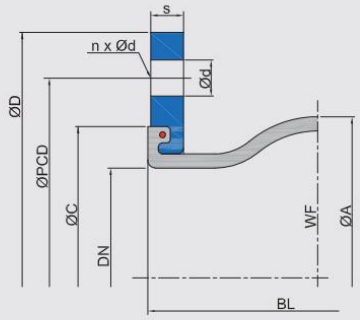
Type 50 BR
Especially for abrasive media such as sludges, dustlike and powdery media, liquids with solids and emulsions. Also suitable for all kinds of water, as well as various chemicals. Not suitable for oil based products and cooling water with oily additives. Electrically dissipative.

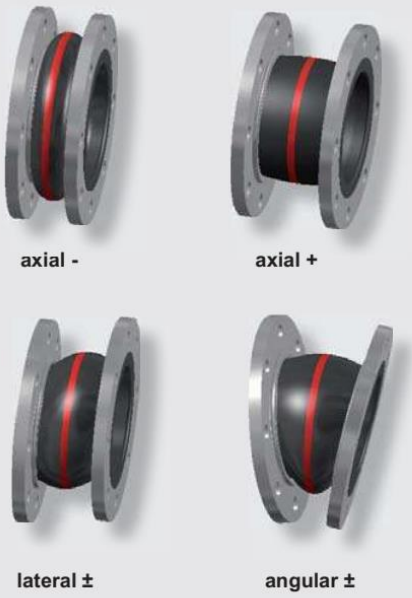
Design A

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 (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

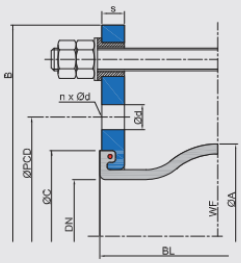
*1 WF = effective area
*2 Other standards/dimensions possible.
*3 Building length 260 mm

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 %

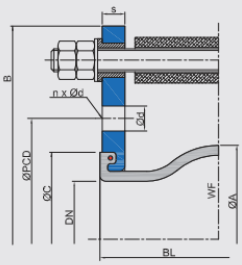
Length limiters

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

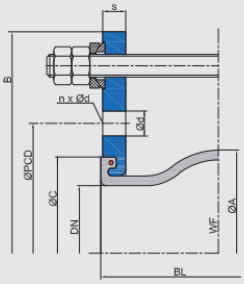
Design B*
with tie rods



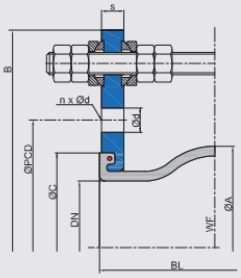
Design C*
with tie rods/thrust limiters



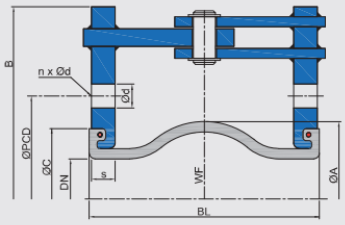
Design E
with tie rods and spherical washers/conical sockets



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



Design F
with hinge

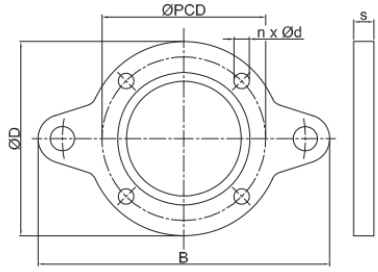


*Note: For Designs B and C
the lateral movement absorption is reduced by around 50 %.

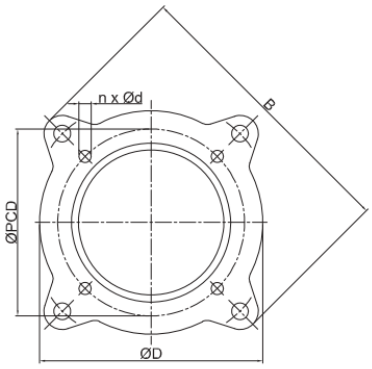
Flange dimensions for Designs with tie rods

DN	Length	Flange PN 10 (example dimensions)						
	BL	B	ØD	ØPCD	Ød	n	s	ØC
	mm	mm	mm	mm	mm		mm	mm
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

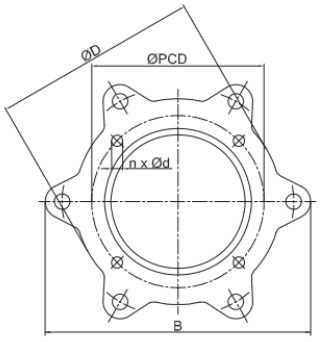
* Building length 260 mm



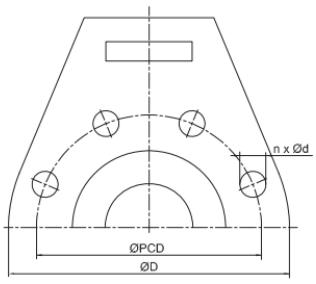
DN 32 - 200



DN 250 - 900



DN 1000



DN 50 - 1000 (Design F)