Belman

TYPE 55

TYPE 55
RUBBER EXPANSION JOINT



DN 20 to DN 1000
Type 55 is a low corrugated, highly elastic Rubber Expansion Joint that achieves minimal flow resistance due to its flat corrugation. It reduces structure-borne noise to a high degree and is characterised by its high movement absorption in all directions. Due to the wide variety of rubber qualities, a suitable rubber compound is available for every application (see material descriptions on the following page).

Type 55 is used in building technology, plant engineering, water and wastewater technology, engine construction, shipbuilding and solar and wind energy plant construction. Here it is used specifically to absorb movement and vibrations and to dampen noise.

Bellow design
Low corrugated Rubber Bellow with reinforcement and shaped sealing bead with core ring, self-sealing (no additional seals required). Suitable for swiveling flanges.

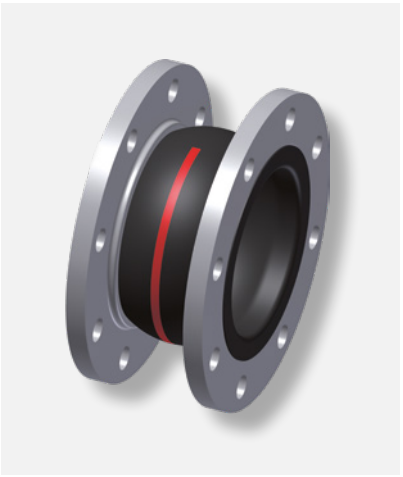
Flange Version
Both sides with swiveling flange made of galvanized steel, drilled according to DIN PN 10 (standard). Other materials and dimensions are possible.

Approvals/conformity
CE, drinking water approval, shipbuilding approvals, TÜV tested in accordance with DIN 4809 (detailed overview is available on request).

Vacuum resistance
- DN 20 to 50 vakuum-proof
- DN 65 to 250 up to -200 mbar
- DN 300 to 1000 not vacuum-proof
- With vacuum supporting spiral/ring from DN 65 to DN 1000 vacuum-proof

Accessories
- Tie rods
- Vacuum supporting spiral/rings
- Guide sleeves
- PTFE lining (see Type 55 PTFE)
- Potential equalisation
- Flame-resistant protective covers
- Dust and splash protection covers
- Earth cover / sun protection cover

Further information is available on request.



Belman

TYPE 55

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	Cover
Red Sp		EPDM	PEEK	EPDM	-40	10	70	16	100	10	130	8	150	Dissipative	Dissipative
Red		IIR	Polyamide	EPDM	-40	10	50	16	70	12	100	10	120	Dissipative	Dissipative
Yellow		NBR	Polyamide	CR	-20	10	50	16	70	12	90	10	100	Conductive	Conductive
Green		CSM	Polyamide	CSM	-20	10	50	16	70	12	100	10	110	Insulating	Insulating
Yellow St		NBR	Steel cord	CR	-20	10	60	16	70	12	90	10	100	Conductive	Insulating

Bursting pressure DN 20 - DN 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	Cover
Red Sp		EPDM	PEEK	EPDM	-40	8	70	10	100	7.5	130	6	150	Dissipative	Dissipative
Red		IIR	Polyamide	EPDM	-40	8	50	10	70	8.0	100	6	120	Dissipative	Dissipative
Yellow		NBR	Polyamide	CR	-20	8	50	10	70	8.0	90	6	100	Conductive	Conductive
Green		CSM	Polyamide	CSM	-20	8	50	10	70	8.0	100	6	110	Insulating	Insulating

Bursting pressure for DN 450 - 1000: > 30 bar
DN 450 only available in red or yellow.

TYPE 55

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 dissipative surface. Not suitable for media with additives containing oil.

Type 55 Red
For drinking water, hot water, sea water, cooling water with glycol or other chemical additives for treating water, weak acids and weak alkalis, salt solutions, technical alcohols, esters and ketones. Electrically dissipative 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 surface.

Type 55 Green
For chemicals, aggressive chemical waste water and compressor air containing oil. Electrically insulating surface.

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



Important information:
For aggressive media, please have the material resistance checked by our engineers. The Bellows must not be painted or insulated at media temperatures >50°C. Please also note the installation instructions, which is avialable on request.

TYPE
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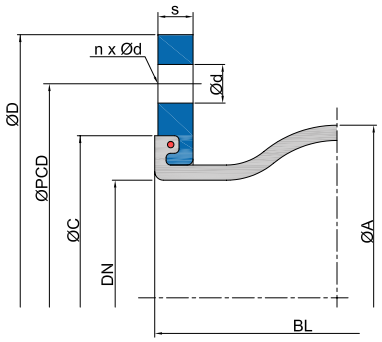
DESIGN A
WITHOUT TIE RODS

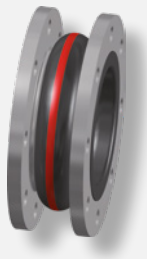


DESIGN A - WITHOUT TIE RODS

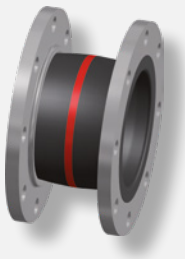
Can be used to absorb movements in all directions (for combined movements, refer to the movement diagram in the technical appendix which is available on request), for vibration and noise damping.

The Expansion Joints reaction force must be absorbed through appropriate pipeline guidance (see installation instructions in the appendix, which is available on request).

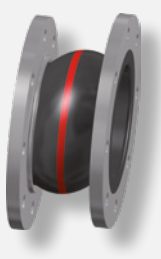




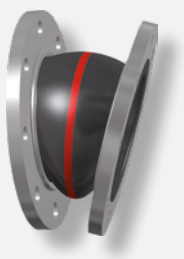
axial -



axial +



lateral +/-



angular +/-

Belman

TYPE 55

DIMENSIONS FOR **DESIGN A**

DN	LENGTH	BELLOW		FLANGE PN 10*2						MOVEMENT ABSORPTION*3 (Polyamide cord)				MOVEMENT ABSORPTION*3 (Steel cord)				WEIGHT*4
										AX		LA	AN	AX		LA	AN	
	BL mm	ØA mm	WF*1 mm²	ØD mm	ØPCD mm	Ød mm	n	s mm	ØC mm	+ mm	- mm	+/- mm	+/- ∠°	+ mm	- mm	+/- mm	+/- ∠°	kg
*5**20**	*6**125**	81	1700	105	75	M12	4	14	66	35	25	30	30	15	30	15	20	1.6
25	*6**125**	81	1700	115	85	14	4	14	66	35	25	30	30	15	30	15	20	1.8
32	*6**125**	81	1700	140	100	18	4	15	66	35	25	30	30	15	30	15	20	2.9
40	*6**125**	86	1800	150	110	18	4	15	74	35	25	30	30	15	30	15	20	3.4
50	*6**125**/*7**150**	96	3200	165	125	18	4	16	86	35/30	25/35	30	30/15	15	30	15	20	4.5
65	*6**125**/*7**150**	111	5300	185	145	18	8	16	106	35/30	25/35	30	30/15	15	30	15	20	5.2
80	**150**	122	8500	200	160	18	8	18	118	30	35	30	30	20	35	15	15	6.7
100	**150**	142	12800	220	180	18	8	18	138	30	35	30	20	20	35	15	15	7.7
125	**150**	168	18700	250	210	18	8	18	166	30	35	30	20	20	35	15	15	9.4
150	**150**	192	25900	285	240	22	8	18	192	30	35	30	20	20	35	15	15	11.7
200	**150**/*7**175**	252	41000	340	295	22	8	20	252	30/35	15	30/15	15/5	20	25	15	15	16.2
250	**175**	302	59600	395	350	22	12	20	304	35	15	15	5	20	25	15	15	22.8
300	**200**	354	82200	445	400	22	12	22	354	35	40	30	10	30	30	25	10	27.7
350	**200**	420	117600	505	460	22	16	24	412	35	40	30	8	30	30	25	10	40.0
400	**200**	480	154700	565	515	26	16	25	470	35	40	30	8	30	40	25	15	45.6
450	**250**	530	204200	615	565	26	20	25	520	35	40	35	10	-	-	-	-	57.9
*8**500**	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
*8**600**	**-**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
700	*9**275**	800	434200	895	840	30	24	35	780	15	55	30	5	-	-	-	-	121.8
800	**250**	880	527400	1015	950	33	24	40	887	35	40	35	5	-	-	-	-	159.7
900	**300**	1038	737900	1115	1050	33	28	40	987	40	40	40	5	-	-	-	-	197.0
1000	**300**	1138	889400	1230	1160	36	28	40	1087	40	40	40	5	-	-	-	-	237.0

*1: WF = effective area

*2: Other standards/dimensions possible.

*3: Utilisation rate of movement absorption decreases at higher temperatures (see technical appendix which is available on request).

*4: Approx. weights with reinforcement from polyamide cord, with steel cord approx. + 3 - 7%.

*5: Flange with threaded holes

*6: Building length 130 mm

*7: BL 150: only in red (IIR) or yellow (NBR) available.

*8: See Type 39 and Type 52

*9: Building length 260 mm

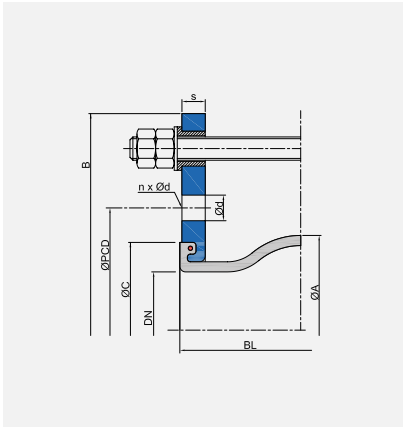
Important information
Please note the appropriate fix point constructions and plain bearings in your piping system!
Information on this can be found in our installation instructions.

Regarding the bracing, please refer to the information in the technical appendix (which is available on request).

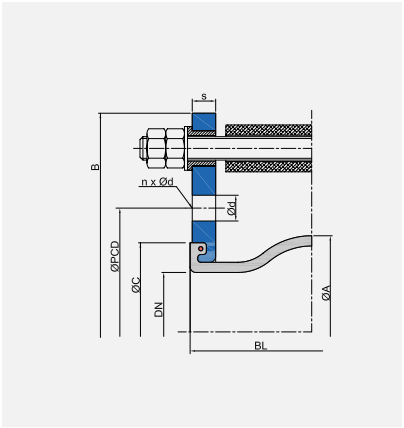
TYPE 55

BRACINGS
DESIGN B / C / E / M / S / F

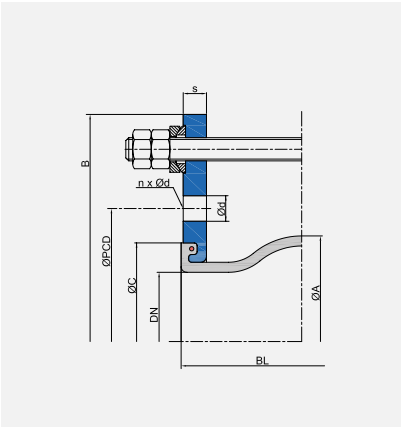
A selection of different bracings are available to absorb the reaction force and to protect the Bellows from overstretching or excessive compression (detailed description is available on request):



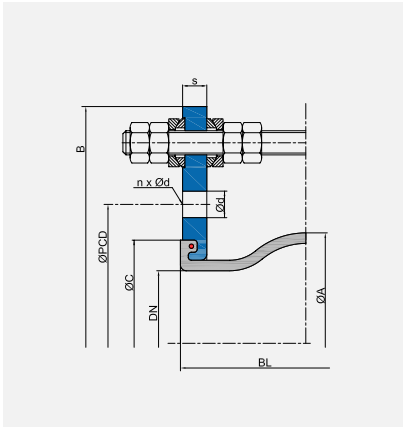
Design B*
Tie rods, mounted in rubber bushing



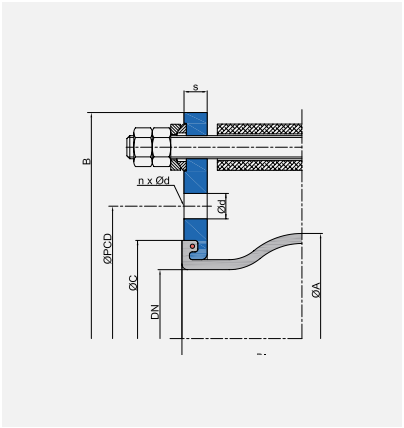
Design C*
Tie rods, mounted in rubber bushing, inside with thrust limiter (plastic bushing)



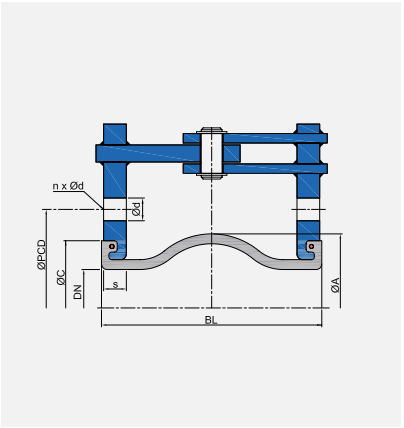
Design E
Tie rods, outside with spherical washers/conical sockets



Design M
Tie rods, inside and outside with spherical washers/conical sockets



Design S
Tie rods, outside with limiters spherical washers/conical sockets, inside with thrust limiters (plastic bushing)



Design F
Hinge

*__Note:__ Design B and C only up to DN 200 PN 10. The lateral movement absorption is reduced by around 50%.

TYPE 55

FLANGE DIMENSIONS
FOR DESIGNS WITH TIE RODS*

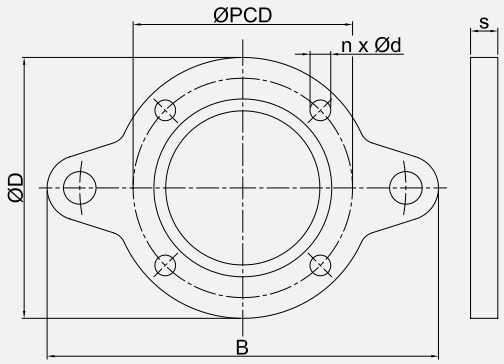
DN	LENGTH BL mm	FLANGE PN 10 (EXAMPLE DIMENSIONS) B mm	QD mm	ØPCD mm	Ød mm	n	s mm	ØC mm
20	***1125**	189	105	75	M12	4	14	66
25	***1125**	205	115	85	14	4	14	66
32	***1125**	230	140	100	18	4	15	66
40	***1125**	240	150	110	18	4	15	74
50	***1125/150**	255	165	125	18	4	16	86
65	***1125/150**	275	185	145	18	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	**175/150**	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	***2275**	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

*Please refer to the drawings on the next page

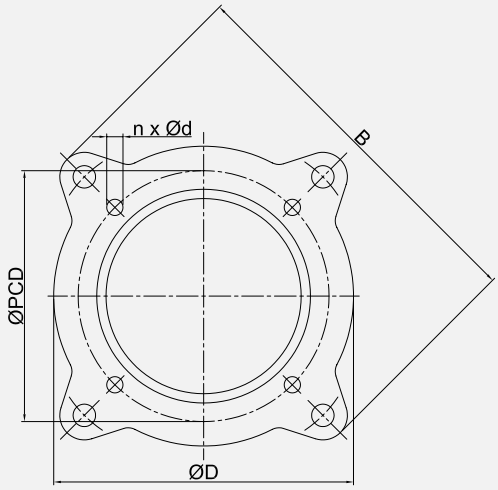
*1: Building length 130 mm
*2: Building length 260 mm

TYPE
55

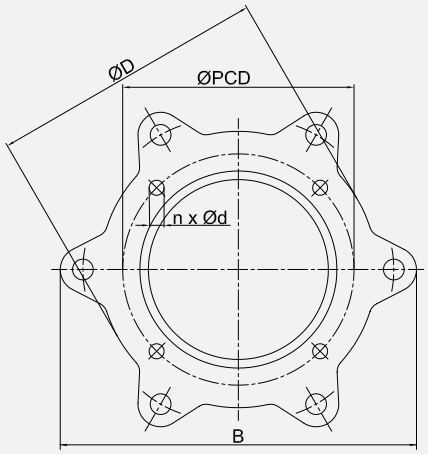
FLANGE DIMENSIONS
FOR DESIGNS WITH TIE RODS



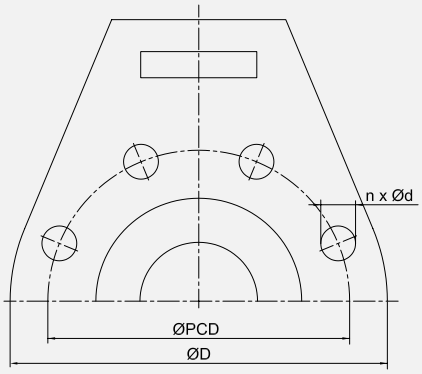
DN 20 - 200



DN 250 - 900



DN 1000



DN 50 - 1000 (Design F)

TYPE 55

AXIAL
STIFFNESS RATES

DN	LENGTH BL mm	STIFFNESS RATES (AVERAGES 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	***1125**	31	56	68	88	128	160	192	192	243	252	270
25	***1125**	31	56	68	88	128	160	192	192	243	252	270
32	***1125**	31	56	68	88	128	160	192	192	243	252	270
40	***1125**	30	54	66	85	124	155	186	186	236	244	261
50	***1125/150**	25	42	51	67	98	116	134	134	173	179	192
65	***1125/150**	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	**175/150**	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	-	-
700	***2275**	140	179	198	372	721	718	714	715	954	-	-
800	**250**	180	240	270	378	594	785	975	976	1258	-	-
900	**300**	200	320	380	483	690	885	1080	1081	1395	-	-
1000	**300**	225	355	420	527	742	995	1248	1249	1568	-	-

*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.

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TYPE 55

LATERAL
STIFFNESS RATES

DN	LENGTH BL mm	STIFFNESS RATES (AVERAGES 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	***1125**	64	105	125	145	184	212	240	249	259	260	264
25	***1125**	64	105	125	145	184	212	240	249	259	260	264
32	***1125**	64	105	125	145	184	212	240	249	259	260	264
40	***1125**	62	101	121	140	178	205	233	242	251	252	256
50	***1125/150**	50	60	65	70	80	93	105	124	142	143	145
65	***1125/150**	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	**175/150**	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	-	-
700	***2275**	516	798	939	1023	1191	1320	1449	1594	1740	-	-
800	**250**	558	826	960	992	1055	1306	1557	1640	1723	-	-
900	**300**	800	1253	1480	1648	1984	2116	2248	2378	2509	-	-
1000	**300**	960	1536	1824	2003	2361	2549	2736	2826	2916	-	-

*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.

TYPE 55

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	***1125**	0.2	0.5	0.9	1.3	1.7	1.9
25	***1125**	0.2	0.5	0.9	1.3	1.7	1.9
32	***1125**	0.2	0.5	0.9	1.3	1.7	1.9
40	***1125**	0.3	0.6	1.1	1.6	2.0	2.3
50	***1125**	0.3	0.6	1.1	1.6	2.0	2.2
65	***1125**	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	-
700	***2275**	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	-

*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.

TYPE 55

FRICTIONAL **FORCE**

DN	OVERALL LENGTH mm	FOR DESIGN E AND M Frictional force N/bar	FOR DESIGN F Frictional moment Nm/bar
20	***1125**	7	0.2
25	***1125**	7	0.2
32	***1125**	7	0.2
40	***1125**	8	0.2
50	***1125**	12	0.3
65	***1125**	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	***2275**	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.