WILLBRANDT **PTFE Expansion Joint Type 81**

■ **partly in stock**

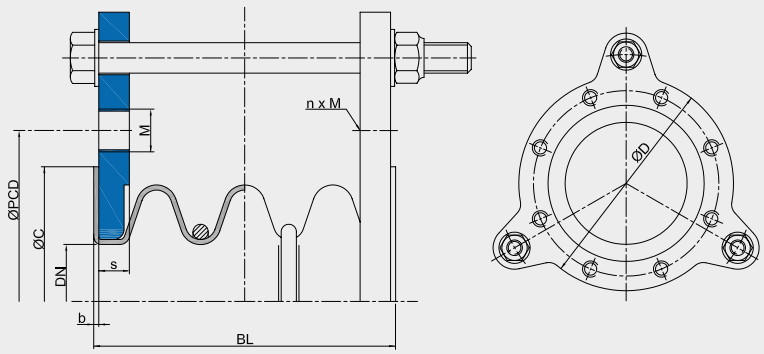
DN 20 to DN 500

Type 81 is a 2 to 7 corrugated PTFE expansion joint that is hot-formed from an extruded PTFE tube under pressure. It is characterised by its large movement absorption (depending on the number of corrugations), high media resistance and good non-stick properties.

Type 81 is mainly used in chemical plants, where it compensates for movements and assembly inaccuracies and dampens noise. Due to its high elasticity and very low adjustment forces, it can also be used in pipework made of fragile materials such as glass, graphite or enamel.

Bellow design	Multi-corrugated, PTFE bellow with external stainless steel supporting rings from 1.4571. PTFE bead on both sides for steel flanges with integrated tie rods. Standard version: white PTFE, electrically insulating. Special version: black PTFE, electrically conductive.
Flange version	With bracing flange on both sides made of primed, galvanised steel, drilled to DIN PN 16 from DN 200 DIN PN 10 (standard). Other materials and dimensions are possible.
Conformity	FDA and EG 1935/2004 conform (Detailed overview on page 5.)
Pressure resistance	Max. 13 bar working pressure (highly dependent on nominal diameter, number of corrugations and temperature → see tables)
Vacuum resistance	With vacuum supporting rings, vacuum-proof
Special accessories	- PTFE guide sleeves - Flame-resistant protective covers - Dust and splash protection covers - Earth cover / sun protection cover Further information on page 99 - 105.

Standard version, 3-corrugated - with tie rods



From to DN 200, a threaded rod is used as a tie rod instead of a hexagon bolt.

Important information

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

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Dimensions

DN	Di	Length BL						Bellow			Flange PN 10*2				
	(bellow)	2-corrugated	3-corrugated	4-corrugated	5-corrugated	6-corrugated	7-corrugated	b	ØC	WF*1	ØD	ØLK	Ød	n	s
	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm²	mm	mm	mm		mm
20	**20**	40	45	55	70	-	100	2.4	68	740	105	75	M12	4	8
25	**25**	40	45	55	70	-	100	2.4	68	740	115	85	M12	4	10
*3**32**	**31**	40	50	65	-	-	105	2.4	78	1280	140	100	M16	4	10
40	**38**	45	50	65	75	-	105	2.4	88	1800	150	110	M16	4	10
50	**47**	45	70	80	100	150	-	2.8	102	2820	165	125	M16	4	12
65	**61**	55	80	90	110	-	150	2.8	122	4530	185	145	18 / M16	8	12
80	**77**	60	95	115	140	175	-	2.8	138	7020	200	160	18 / M16	8	12
100	**95**	70	95	115	140	175	-	3.2	158	10020	220	180	18 / M16	8	14
125	**117**	80	100	140	175	-	-	3.2	188	14290	250	210	18 / M16	8	14
150	**142**	90	120	-	-	-	-	3.6	212	19670	285	240	22	8	16
200	**188**	95	130	150	175	-	200	3.6	268	35450	340	295	22	8	16
250	**238**	100	130	-	-	-	-	4.0	320	54040	395	350	22	12	18
300	**285**	110	145	-	-	-	-	4.0	370	82100	445	400	22	12	18
350	**324**	110	150	-	-	-	-	4.0	430	96320	505	460	22	16	18
400	**374**	115	155	180	225	-	320	4.8	482	130620	565	515	26	16	20
500	**448**	120	160	-	-	-	-	4.4	585	198850	670	620	26	20	30

*1 WF = effective area
*2 In the 2-corrugated version, the nominal sizes DN 65 to DN 125 have a flange with through holes on one side and threaded holes on the other side.
From DN 150, the flanges are equipped with through-holes.
Other dimensions such as DIN PN 6, PN 16, ANSI B16.5 - 150 lbs are possible.
*3 With bellow DN 40

Movement absorption

DN	2-corrugated			3-corrugated			4-corrugated			5-corrugated			6-corrugated			7-corrugated		
	axial +/- mm	lateral +/- mm	angular +/- <°	axial +/- mm	lateral +/- mm	angular +/- <°	axial +/- mm	lateral +/- mm	angular +/- <°	axial +/- mm	lateral +/- mm	angular +/- <°	axial +/- mm	lateral +/- mm	angular +/- <°	axial +/- mm	lateral +/- mm	angular +/- <°
20	6.5	4	4	12.5	10	18	15	10	18	15	12	18	-	-	-	20	20	20
25	6.5	4	4	12.5	10	18	15	10	18	15	12	18	-	-	-	20	20	20
***32**	6.5	4	4	12.5	10	20	15	15	20	-	-	-	-	-	-	20	25	25
40	6.5	5	8	12.5	15	20	15	15	20	15	17	20	-	-	-	20	25	25
50	6.5	6	8	19.0	20	25	20	20	25	20	20	25	25	25	30	-	-	-
65	7.5	9	10	21.0	20	30	22	20	30	22	25	30	-	-	-	25	25	30
80	10.0	10	10	25.0	25	30	25	25	30	27	25	30	30	30	30	-	-	-
100	10.0	12	20	25.0	25	30	25	25	30	27	27	30	30	35	35	-	-	-
125	15.0	14	15	28.5	25	30	28	25	30	27	27	30	-	-	-	-	-	-
150	15.0	10	10	28.5	20	30	-	-	-	-	-	-	-	-	-	-	-	-
200	15.0	10	10	28.5	20	20	30	20	20	35	20	20	-	-	-	40	35	35
250	18.0	10	10	28.5	10	10	-	-	-	-	-	-	-	-	-	-	-	-
300	18.0	8	8	30.0	8	10	-	-	-	-	-	-	-	-	-	-	-	-
350	20.0	5	6	30.0	5	10	-	-	-	-	-	-	-	-	-	-	-	-
400	20.0	5	6	30.0	5	10	30	8	10	40	7	13	-	-	-	40	35	35
500	20.0	5	6	30.0	5	10	-	-	-	-	-	-	-	-	-	-	-	-

* With bellow DN 40

The movement absorption values are maximum values and must not occur in combination. Please refer to the movement diagram in the technical appendix.

Permissible pressure load under temperature

Temp. / DN	Pressure (bar)																	
	2-corrugated			3-corrugated			4-corrugated			5-corrugated			6-corrugated			7-corrugated		
	20 °C	100 °C	200 °C	20 °C	100 °C	200 °C	20 °C	100 °C	200 °C	20 °C	100 °C	200 °C	20 °C	100 °C	200 °C	20 °C	100 °C	200 °C
20 - 50	13.0	9.0	5.0	8.6	5.5	3.2	7.6	5.1	3.2	6.8	4.8	3.2	5.9	3.6	2.0	5.9	3.6	2.0
65 - 150	11.0	7.5	3.8	7.7	4.7	2.7	6.7	4.3	2.6	5.8	3.9	2.5	5.3	3.1	1.6	5.3	3.1	1.6
200 - 400	5.2	4.5	3.0	6.8	4.1	2.3	5.8	3.5	2.0	4.8	3.0	1.8	4.7	2.7	1.4	4.7	2.7	1.4
450 - 500	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.

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Stiffness rates (2 to 4 corrugations)

DN	2-corrugated				3-corrugated				4-corrugated			
	axial compression N/mm	axial elongation N/mm	lateral N/mm	angular Nm/°	axial compression N/mm	axial elongation N/mm	lateral N/mm	angular Nm/°	axial compression N/mm	axial elongation N/mm	lateral N/mm	angular Nm/°
20	36.0	30.0	112.5	2.3	24	20	75	1.5	18.00	15.00	56.25	1.13
25	36.0	30.0	112.5	2.3	24	20	75	1.5	18.00	15.00	56.25	1.13
***32**	67.5	55.5	162.0	3.3	45	37	108	2.2	33.75	27.75	81.00	1.65
40	94.5	75.0	213.0	4.4	63	50	142	2.9	47.25	37.50	106.50	2.18
50	157.5	112.5	247.5	5.0	105	75	165	3.3	78.75	56.25	123.75	2.48
65	184.5	123.0	294.0	5.7	123	82	196	3.8	92.25	61.50	147.00	2.85
80	229.5	147.0	346.5	7.1	153	98	231	4.7	114.75	73.50	173.25	3.53
100	259.5	153.0	390.0	8.1	173	102	260	5.4	129.75	76.50	195.00	4.05
125	292.5	153.0	502.5	10.7	195	102	335	7.1	146.25	76.50	251.25	5.33
150	327.0	159.0	577.5	15.9	218	106	385	10.6	-	-	-	-
200	276.0	138.0	630.0	16.8	184	92	420	11.2	138.00	69.00	315.00	8.40
250	283.5	136.5	762.0	23.7	189	91	508	15.8	-	-	-	-
300	267.0	144.0	915.0	34.7	178	96	610	23.1	-	-	-	-
350	352.5	180.0	1066.5	42.9	235	120	711	28.6	-	-	-	-
400	384.0	153.0	1219.5	53.6	256	102	813	35.7	192.00	76.50	609.75	26.78
500	570.0	363.0	1524.0	70.5	380	242	1016	47.0	-	-	-	-

* With Balg DN 40

The stiffness rates are valid for 20 °C +/- 30 %.
For higher temperatures, please note the correction factors below.

Stiffness rates (5 to 7 corrugations)

DN	5-corrugated				6-corrugated				7-corrugated			
	axial compression N/mm	axial elongation N/mm	lateral N/mm	angular Nm/°	axial compression N/mm	axial elongation N/mm	lateral N/mm	angular Nm/°	axial compression N/mm	axial elongation N/mm	lateral N/mm	angular Nm/°
20	14.4	12.0	45.0	0.9	-	-	-	-	10.3	8.6	32.3	0.6
25	14.4	12.0	45.0	0.9	-	-	-	-	10.3	8.6	32.3	0.6
***32**	-	-	-	-	-	-	-	-	19.4	15.9	46.4	0.9
40	37.8	30.0	85.2	1.7	-	-	-	-	27.1	21.5	61.1	1.2
50	63.0	45.0	99.0	2.0	52.5	37.5	82.5	1.65	-	-	-	-
65	73.8	49.2	117.6	2.3	-	-	-	-	52.9	35.3	84.3	1.6
80	91.8	58.8	138.6	2.8	76.5	49	115.5	2.35	-	-	-	-
100	103.8	61.2	156.0	3.2	86.5	51	130.0	2.70	-	-	-	-
125	117.0	61.2	201.0	4.3	-	-	-	-	-	-	-	-
150	-	-	-	-	-	-	-	-	-	-	-	-
200	110.4	55.2	252.0	6.7	-	-	-	-	79.1	39.6	180.6	4.8
250	-	-	-	-	-	-	-	-	-	-	-	-
300	-	-	-	-	-	-	-	-	-	-	-	-
350	-	-	-	-	-	-	-	-	-	-	-	-
400	153.6	61.2	487.8	21.4	-	-	-	-	110.1	43.9	349.6	15.4
500	-	-	-	-	-	-	-	-	-	-	-	-

* With bellow DN 40

The stiffness rates are valid for 20 °C +/- 30 %.
For higher temperatures, please note the correction factors below.

Correction factor for temperatures

Temperature	80 °C	120 °C	150 °C
Factor	0.65	0.50	0.40

Important information

Please note the appropriate fixed point constructions and plain bearings in your piping system!
For more information please refer to our planning instructions.