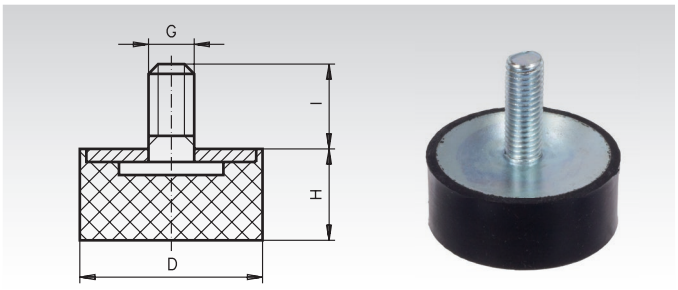
Rubber-Metal Bump Stops MGS with Threaded Stud

Material: Metal parts: Steel, zinc plated.
Elastomer: Natural rubber, hardness 55° Shore.

Metal on one side only.

For elastically mounting of power units, and as bump stop to limit the spring travel in vehicles. Bump stops can also be used for machines that cannot be fixed to the floor or are standing on floors with an easily damaged surface, e.g. office machines.

Temperature resistant up to 80°C.



Ordering Details: z.B.: Product No.. 685 781 00, Bump Stop MGS, 10 mm

Product No.	D Ø mm	H mm	G mm	I mm	Pressure Load Spring Rate CD medium N/mm	Pressure Load Perm. Pressure Load $F_{perm.}$* N	Weight g
685 781 00	10	10	M4	10	38	43	2,6
685 783 00	10	15	M4	10	13	43	2,9
685 786 00	15	7	M4	10	136	95	3,5
685 787 00	15	8	M4	10	122	95	3,6
685 788 00	15	10	M4	10	106	95	3,8
685 790 00	15	15	M4	10	74	95	7,3
685 791 00	20	5	M6	18	340	170	8
685 801 00	20	8	M6	18	330	170	7,9
685 801 11	20	11	M6	18	150	170	9
685 802 00	20	15	M6	18	138	170	10,3
685 802 20	20	20	M6	18	100	170	11
685 802 25	20	25	M6	18	80	170	14
685 803 08	25	8	M6	18	300	280	14
685 803 10	25	10	M6	18	270	280	14
685 803 00	25	15	M6	18	254	280	17,2
685 803 20	25	20	M6	18	128	280	20
685 803 25	25	25	M6	18	100	280	24
685 803 30	25	30	M6	18	80	280	30
685 804 15	30	15	M8	23	290	400	29
685 804 00	30	20	M8	20	200	400	27
685 804 25	30	25	M8	20	180	400	35
685 804 30	30	30	M8	20	120	400	35
685 804 40	30	40	M8	20	90	400	48
685 805 20	40	20	M8	23	340	650	52
685 805 00	40	30	M8	23	234	650	75
685 805 30	40	30	M10	28	240	650	74
685 805 40	40	40	M8	23	200	650	80
685 806 00	50	20	M10	28	680	1000	85
685 806 30	50	30	M10	28	425	1000	100
685 806 40	50	40	M10	28	390	1000	132
685 806 45	50	45	M10	28	350	1000	140
685 806 50	50	50	M10	28	310	1000	152
685 806 60	60	40	M10	28	470	1500	179
685 806 65	60	40	M12	33	460	1500	190
685 806 70	70	25	M10	28	650	1800	198
685 806 75	70	45	M10	28	800	1800	292
685 807 00	75	25	M12	37	2000	2300	241
685 807 40	75	40	M12	37	810	2300	320
685 807 50	75	50	M12	37	620	2300	357
685 807 55	75	55	M12	37	760	2300	384
685 808 00	100	40	M16	41	1578	4200	641
685 808 50	100	50	M16	41	900	4200	669
685 808 55	100	55	M16	41	860	4200	760
685 808 60	100	60	M16	41	800	4200	730
685 808 75	100	75	M16	41	540	4200	874

* $F_{perm.}$: Note page 602 bottom.

Loctite thread locking and bonding products page 811.

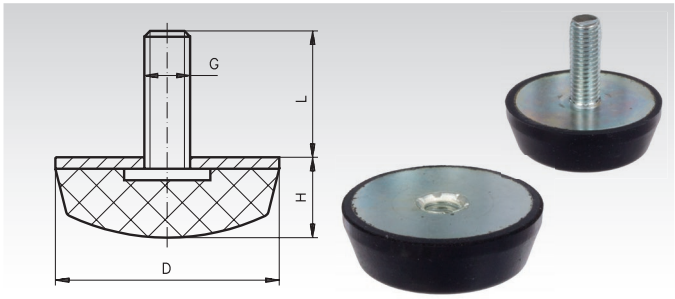
Rubber-Metal Bumpers MGK, Conical Design

Material: Metal parts: Steel, zinc plated.
Elastomer: Natural rubber hardness 55° Shore.

* $F_{perm.}$ is the permissible static permanent load, which may be overlaid by a dynamic, alternating load. With shearing load please take care that no tension load in the rubber occurs at all during mounting. To achieve a sufficient fatigue strength provide some compressive pre-stressing.

The stated permissible loads are only approximate, guideline values for the static load for "medium" rubber hardness.
With particularly high, dynamic, alternating loads or high frequencies, the load figures have to be reduced accordingly.

Temperature resistant up to 80°C.



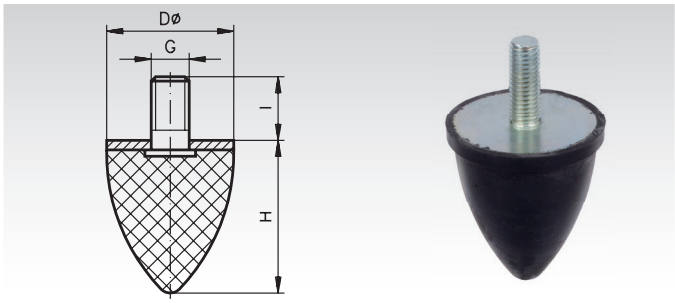
Ordering Details: e.g.: Product No. 685 831 00, Rubber-Metal Bumpers MGK, 25 mm

Product No.	DØ mm	H mm	G x L mm	Spring Rate CD medium N/mm	Load $F_{perm.}$* N	Weight g
685 831 00	25	17	M6 x 18 external thread	119	500	15
685 835 00	50	18	M10 x 28 external thread	670	2000	75
685 841 00	25	17	M6 x 6 internal thread	130	500	15
685 845 00	50	18	M10 x 10 internal thread	735	2000	75

Rubber-Metal Buffers KP

Material: Metal parts: Steel, zinc plated.
Elastomer: Natural rubber hardness 55° Shore.

Simple, reasonably priced standard components used for elastic mounting. When shearing load occurs their load-bearing capacity is considerably lower than with pressure load. This has to be considered when horizontal mass forces or belt traction occur. The grade of rubber used has perfect physical properties.



Ordering Details: e.g.: Product No. 685 031 00, Rubber-Metal Buffers KP 20x24

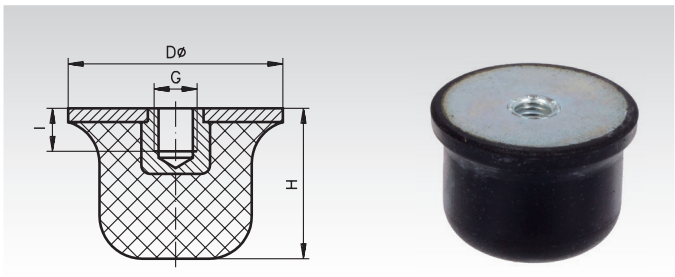
Product No.	D Ø mm	H mm	G mm	I mm	Spring Rate CD medium N/mm	Perm. Pressure Load $F_{perm.}$* N	Weight g
685 031 00	20	24	M6	18	15	60	11
685 035 00	30	36	M8	20	23	140	37
685 041 00	35	40	M8	20	27	150	45
685 045 00	50	58	M10	28	33	320	127
685 051 00	50	67	M8	36	40	400	136
685 055 00	75	89	M12	37	55	900	341
685 061 00	115	136	M16	43	75	1800	1042

* F_{perm}: Note page 492 bottom.

Rubber-Metal Buffers KE

Material: Metal parts: Steel, zinc plated.
Elastomer: Natural rubber Hardness 55° Shore.

Simple, reasonably priced standard components for elastic mounting. When shearing load occurs their load-bearing capacity is considerably lower than with pressure load. This has to be considered when horizontal mass forces or belt traction occur. The grade of rubber used has perfect physical properties.



Ordering Details: e.g.: Product No. 685 131 00, Rubber-Metal Buffers KE 50x35

Product No.	D Ø mm	H mm	G mm	I mm	Spring Rate CD medium N/mm	Perm. Pressure Load $F_{perm.}$* N	Weight g
685 131 00	50	35	M10	10	100	400	88
685 135 00	80	60	M12	12	170	1200	308
685 141 00	125	90	M16	16	260	3000	830

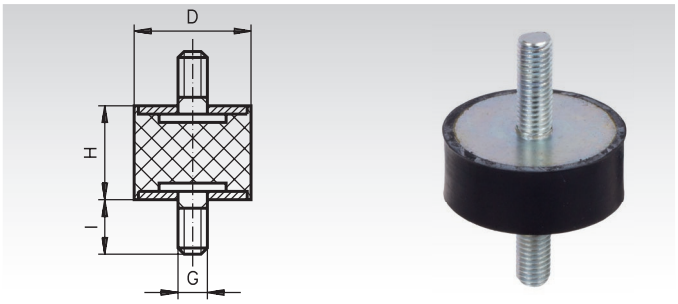
* F_{perm}: Note page 602 bottom.

Rubber-Metal Buffers MGP with Threaded Studs

Material: Metal parts: Steel, zinc plated.
Elastomer: Natural rubber, 55° Shore hardness.

Simple, reasonably priced standard components for elastic mounting. When shearing load occurs their load-bearing capacity is considerably lower than with pressure load. This has to be considered when horizontal mass forces or belt traction occur. The grade of rubber used has perfect physical properties.

Temperature resistant up to 80°C.



Ordering Details: e.g.: **Product No. 685 280 00, Rubber-Metal Buffers MGP, 8 mm**

Product No.	D Ø mm	H mm	G mm	l mm	Pressure Load Spring Load CD medium N/mm	Pressure Load Permiss. Load F perm.* N	Shearing Load Spring Load CS medium N/mm	Shearing Load Permiss. Load $F_{perm.}$* N	Weight g
685 280 00	8	8	M3	6	30	35	9	10	1
685 281 00	10	10	M4	10	44	43	9	15	3,2
685 283 00	10	15	M4	10	29	43	5	15	3,9
685 286 00	15	7	M4	10	174	95	29	35	5,8
685 287 00	15	8	M4	10	160	95	27	35	6
685 288 00	15	10	M4	10	124	95	24	35	6,4
685 289 00	15	20	M4	13	54	95	10	35	7
685 290 00	15	15	M4	10	61	95	13	35	7,8
685 301 00	20	8	M6	18	307	170	36	60	15
685 302 00	20	10	M6	18	150	170	40	60	15
685 304 00	20	15	M6	18	130	170	24	60	20
685 304 20	20	20	M6	18	100	170	20	60	19
685 304 25	20	25	M6	18	70	170	13	60	20
685 305 00	25	20	M6	18	85	170	17	60	30
685 307 00	25	10	M6	18	750	280	74	95	20
685 307 15	25	15	M6	18	140	280	25	95	27,5
685 307 25	25	25	M6	18	600	280	37	95	32
685 307 30	25	30	M6	18	71	280	17	95	40
685 308 00	30	15	M8	20	525	400	58	140	37
685 309 00	30	20	M8	20	204	400	40	140	56
685 309 25	30	25	M8	20	180	400	33	140	58
685 311 00	30	30	M8	20	108	400	25	140	65
685 311 10	30	40	M8	20	85	400	18	140	64
685 311 20	40	15	M8	20	380	650	90	250	79
685 311 23	40	25	M8	23	270	650	60	250	84
685 311 28	40	25	M10	28	270	650	60	250	90
685 312 00	40	30	M8	23	213	650	43	250	102
685 312 30	40	30	M10	28	213	650	40	250	105
685 313 00	40	40	M8	23	140	650	22	250	115
685 315 00	50	20	M10	28	857	1000	110	400	141
685 314 00	50	25	M10	28	583	1000	84	400	155
685 316 00	50	30	M10	28	375	1000	66	400	163
685 317 00	50	40	M10	28	260	1000	53	400	178
685 324 00	50	45	M10	33	215	1000	43	400	208
685 317 50	50	50	M10	28	200	1000	39	400	199
685 317 60	60	40	M10	28	390	1500	60	550	231
685 317 70	70	45	M10	28	450	1800	70	750	401
685 318 00	75	25	M12	37	2710	2300	211	850	369
685 318 40	75	40	M12	37	734	2300	117	850	420
685 319 00	75	50	M12	37	506	2300	91	850	483
685 320 00	75	55	M12	37	417	2300	78	850	514
685 322 00	100	30	M16	41	3800	4200	310	1600	831
685 321 00	100	40	M16	41	1970	4200	257	1600	956
685 321 50	100	50	M16	41	900	4200	160	1600	1033
685 321 55	100	55	M16	41	892	4200	145	1600	980
685 323 00	100	60	M16	41	809	4200	136	1600	1177
685 325 00	100	75	M16	41	750	4200	110	1600	1124

For a linear resilience characteristic the Spring Load C means, for any operating point, the constant relation of load F [N] to jounce travel f [mm].

$$C = \frac{F}{f} \quad [N/mm]$$

In the technical data, these constants are stated as CD for pure pressure load and as CS for pure shear load.

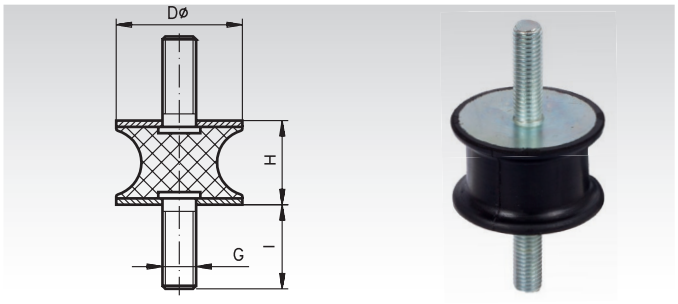
* $F_{perm.}$ is the permissible static permanent load, which may be overlaid by a dynamic, alternating load. With shearing load please take care that no tension load in the rubber occurs at all during mounting. To achieve a sufficient fatigue strength provide some compressive prestressing.

The stated permissible loads are only approximate, guideline values for the static load for "medium" rubber hardness.
With particularly high, dynamic, alternating loads or high frequencies, the load figures have to be accordingly reduced.

Rubber-Metal Buffers AT

Material: Metal parts: Steel, zinc plated.
Elastomer: Natural rubber hardness 55° Shore.

Simple, reasonably priced standard components for elastic mounting. When shearing load occurs their load-bearing capacity is considerably lower than with pressure load. This has to be considered when horizontal mass forces or belt traction occur. The grade of rubber used has perfect physical properties.



Ordering Details: e.g.: Product No. 685 631 00, Rubber-Metal Buffers AT 20x15

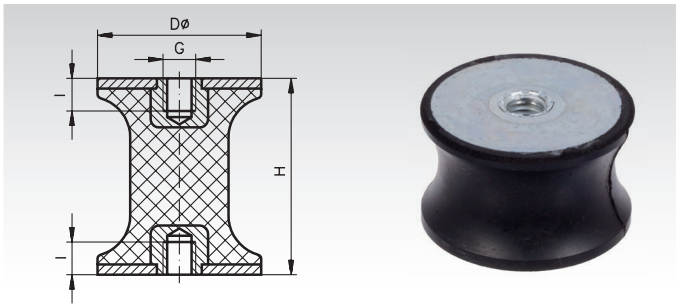
Product No.	D Ø mm	H mm	G mm	I mm	Spring Rate CD medium N/mm	Perm. Pressure Load $F_{perm.}$* N	Weight g
685 631 00	20	15	M6	18	100	300	15
685 635 00	30	20	M8	20	150	700	46
685 641 00	40	48	M8	23	160	900	88
685 645 00	50	30	M10	33	210	1100	140
685 651 00	75	40	M12	37	600	3000	369
685 655 00	100	55	M16	45	850	4100	975

* $F_{perm.}$: Note page 602 bottom.

Rubber-Metal Buffers CT

Material: Metal parts: Steel, zinc plated.
Elastomer: Natural rubber hardness 55° Shore.

Rubber-Metal buffers are simple, reasonably priced standard components used for elastic mounting. When shearing load occurs their load-bearing capacity is considerably lower than with pressure load. This has to be considered when horizontal mass forces or belt traction occur. The grade of rubber used has perfect physical properties.



Ordering Details: e.g.: Product No. 685 721 00, Rubber-Metal Buffers CT 10x10

					Pressure Load		Shearing Load		
Product No.	D Ø mm	H mm	G mm	I mm	Spring Rate CD medium N/mm	Perm. Pressure Load F_{perm}* N	Spring Rate CS medium N/mm	Perm. Shearing Load $F_{perm.}$* N	Weight g
685 721 00	10	10	M4	4	30	35	4	20	2
685 723 00	30	20	M8	8	130	650	25	85	25
685 725 00	40	48	M8	8	145	870	80	130	80
685 727 00	50	30	M10	10	200	1000	63	240	63

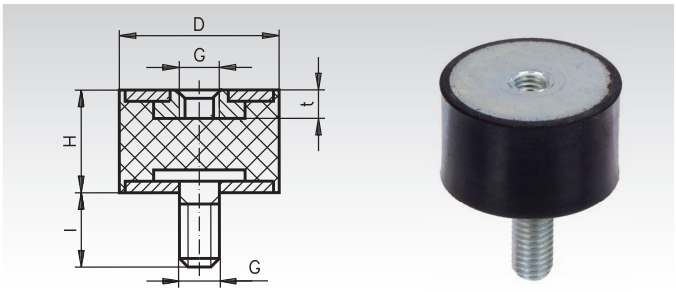
* $F_{perm.}$: Note page 602 bottom.

Rubber-Metal Buffers MGA with Internal Thread and Threaded Stud

Material: Metal parts: Steel, zinc plated.
Elastomer: Natural rubber,
Rubber hardness Shore A medium: about 55°.

For this version the same remarks apply as for the Rubber-Metal buffers MGP page 544.

Temperature resistant up to 80°C.



Ordering Details: e.g.: **Product No. 685 580 00, Rubber-Metal Buffers MGA, 8 mm**

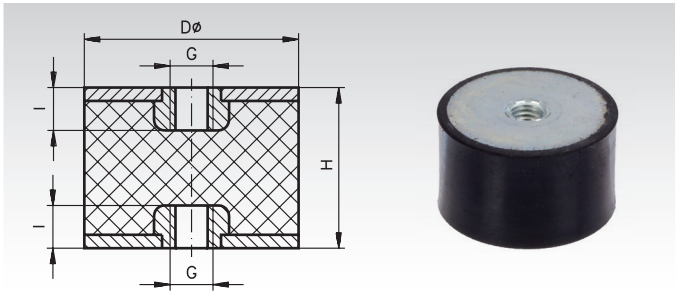
Product No.	D Ø mm	H mm	G mm	l mm	t mm	Pressure Load Spring Load CD medium N/mm	Pressure Load Permiss. Load F perm.* N	Shearing Load Spring Load CS medium N/mm	Shearing Load Permiss. Load $F_{perm.}$* N	Weight g
685 580 00	8	8	M3	6	3	28	35	10	10	1
685 581 00	10	10	M4	10	4	48	43	10	15	2,7
685 583 00	10	15	M4	10	4	29	43	5	15	3,6
685 590 00	15	15	M4	10	6	67	95	15	35	8,3
685 591 15	15	15	M5	8	6	65	95	5	35	5
685 591 20	15	20	M4	10	5	43	95	12	35	6
685 591 30	15	30	M4	15	6	32	95	9	35	9
685 592 15	20	15	M6	18	6	110	170	37	60	14
685 592 20	20	20	M6	18	6	85	170	17	60	16
685 601 00	20	25	M6	18	6	61	170	11	60	17
685 602 15	25	15	M6	18	6	165	280	45	95	25
685 602 00	25	20	M6	18	6	130	280	30	95	28
685 602 25	25	25	M6	18	6	89	280	27	95	30
685 602 30	25	30	M6	18	6	71	280	19	95	30
685 607 15	30	15	M8	20	8	270	400	68	140	38
685 607 00	30	20	M8	20	8	235	400	42	140	51
685 607 25	30	25	M8	20	8	180	400	37	140	48
685 603 00	30	30	M8	20	8	113	400	28	140	47
685 605 00	30	40	M8	20	8	106	400	13	140	60
685 598 00	40	25	M8	23	8	265	650	35	250	77
685 608 00	40	30	M8	23	8	234	650	49	250	91
685 600 00	40	30	M10	28	10	234	650	48	250	92
685 609 00	40	40	M8	23	8	147	650	23	250	103
685 610 20	50	20	M10	28	10	450	1000	95	400	112
685 610 25	50	25	M10	28	10	425	1000	82	400	125
685 610 30	50	30	M10	28	10	395	1000	73	400	135
685 610 00	50	40	M10	28	10	273	1000	58	400	168
685 611 00	50	45	M10	33	10	250	1000	50	400	174
685 613 00	50	50	M10	28	10	210	1000	37	400	183
685 613 60	60	40	M10	28	10	390	1500	63	550	224
685 613 65	60	40	M12	33	12	390	1500	60	550	243
685 613 70	70	45	M10	28	10	450	1800	72	700	348
685 613 75	75	25	M12	37	12	980	2300	270	850	299
685 614 40	75	40	M12	37	12	735	2300	118	850	420
685 614 45	75	45	M12	37	12	690	2300	105	850	417
685 614 00	75	50	M12	37	12	530	2300	101	850	467
685 614 55	75	55	M12	37	12	500	2300	90	850	469
685 615 00	100	40	M16	41	16	2160	4200	283	1600	871
685 615 50	100	50	M16	41	16	950	4200	220	1600	830
685 615 55	100	55	M16	41	16	870	4200	170	1600	870
685 616 00	100	60	M16	41	16	843	4200	142	1600	1097
685 616 75	100	75	M16	41	16	750	4200	110	1600	1064

* $F_{perm.}$: Note page 602 bottom.

Rubber-Metal Buffers MGI

Material: Metal parts: Steel, zinc plated.
Elastomer: Natural rubber hardness 55° Shore.

Simple, reasonably priced standard components for elastic mounting. When shearing load occurs their load-bearing capacity is considerably lower than with pressure load. This has to be considered when horizontal mass forces or belt traction occur. The grade of rubber used has perfect physical properties.



Ordering Details: e.g.: Product No. 685 410 00, Rubber-Metal Buffer 10 mm

Product No.	D Ø mm	H mm	G mm	I mm	Pressure Load Spring Rate CD medium N/mm	Pressure Load Perm. Pressure Load F_{perm}* N	Shearing Load Spring Rate CS medium N/mm	Shearing Load Perm. Shearing Load $F_{perm.}$* N	Weight g
685 410 00	10	10	M4	4	39	43	9	15	2
685 410 15	10	15	M4	4	28	43	4	15	2
685 415 00	15	15	M4	5	62	95	12	35	5
685 420 00	20	25	M6	6	103	170	15	60	17
685 425 00	25	20	M6	6	83	170	16	60	24
685 425 30	25	30	M6	6	67	280	16	95	30
685 430 00	30	20	M8	8	207	400	37	140	35
685 430 30	30	30	M8	8	117	400	24	140	44
685 430 40	30	40	M8	8	67	400	13	140	50
685 440 00	40	30	M8	8	209	650	41	250	78
685 440 40	40	40	M8	8	114	650	20	250	93
685 450 00	50	30	M10	10	352	1000	68	400	126
685 450 40	50	40	M10	10	247	1000	51	400	145
685 450 50	50	50	M10	10	118	1000	37	400	169
685 475 00	75	40	M12	12	720	2300	110	850	366
685 475 50	75	50	M12	12	498	2300	89	850	425
685 500 00	100	40	M16	16	1830	4200	249	1600	733
685 500 60	100	60	M16	16	770	4200	129	1600	863

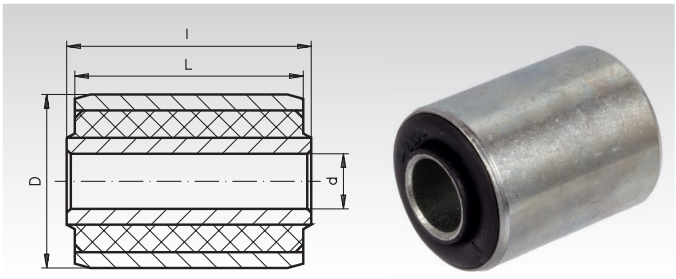
* $F_{perm.}$: Note page 602 bottom.

Heavy-Duty steel rubber Bushes PHO

Material: Metal Parts: Steel.
Elastomer: Natural rubber, Strength 55° Shore.

Fit: Up to external diameter 30mm: mounting hole H11 / H12.
From external diameter 34mm: mounting hole H13.

Temperature resistant up to 80°C.



Ordering Details: e.g.: Product No. 685 001 00, Heavy Duty Bush PHO, 26 mm

Product No.	External Ø D mm	Internal Ø d mm	Length of Internal Bush l mm	Length of External Bush L mm	Radial-Load Perm.Stat. Radial Load F_r N	Radial-Load Radial Spring Rate C_r N/mm	Axial-Load Perm.Stat. Axial Load F_a N	Axial-Load Axial Spring Rate C_a N/mm	Perm.St. Torsion Angle φ degrees	Perm.St. Torque M_d Nm	Torsion Torsion Spring Rate Cf Nm/degree	Perm. Max. Torsion Angle $\varphi_{max.}$ degrees	Perm. Max. Torque Md_{max} Nm	Weight g
685 001 00	$26^{+0,1}$	$12^{+0,15}$	$24,0^{\pm0,1}$	$18,0^{\pm0,3}$	690	1962	680	226	13	4,4	0,338	26	9,0	37
685 002 00	$30^{+0,1}$	$13^{+0,15}$	$40,0^{\pm0,1}$	$40,0^{\pm0,3}$	1670	3335	-	392	15	9,0	0,6	30	18,0	79
685 003 00	$34^{+0,15}$	$18^{+0,3}$	$36,0^{\pm0,1}$	$32,0^{\pm0,3}$	1570	3237	830	417	14	12,0	0,9	28	25,0	94
685 004 00	$45^{+0,15}$	$20^{+0,3}$	$62,5^{\pm0,1}$	$55,0^{\pm0,3}$	3430	3924	1860	540	15	22,0	1,5	30	44,0	255
685 005 00	$45^{+0,15}$	$20^{+0,3}$	$62,5^{\pm0,1}$	$59,5^{\pm0,3}$	3920	4905	910	608	15	30,0	2,0	30	60,0	258
685 006 00	$50^{+0,15}$	$25^{+0,3}$	$67,5^{\pm0,1}$	$65,5^{\pm0,3}$	6380	6082	760	755	15	60,0	3,9	30	120,0	370
685 007 00	$55^{+0,15}$	$25^{+0,3}$	$93,5^{\pm0,1}$	$89,5^{\pm0,3}$	9810	8829	1650	824	15	70,0	4,6	30	140,0	677
685 008 00	$55^{+0,15}$	$30^{+0,4}$	$94,0^{\pm0,1}$	$89,5^{\pm0,3}$	13730	16677	2600	1177	13	100,0	7,6	26	200,0	622
685 009 00	$70^{+0,15}$	$50^{+0,4}$	$60,0^{\pm0,1}$	$60,0^{\pm0,3}$	11770	10620	-	1511	6,5	140,0	21,1	13	370,0	494
685 010 00	$75^{+0,2}$	$40^{+0,4}$	$70,0^{\pm0,1}$	$57,0^{\pm0,3}$	5890	4611	4510	697	14	130,0	9,1	28	260,0	759

General

These Rubber-Metal, heavy-duty bushes feature an especially high permissible load and large permissible deformation. This great performance is achieved because the rubber parts are firmly attached to the metal parts. The bushes withstand radial, axial and torsional load, without the rubber moving in relation to the metal parts. Minimal gimbal offset (tilting) of the axis of the inner tube in relation to the outer tube, or vice versa, is possible. Depending on the strength, hardness, and length of the rubber, the rubber parts are relatively stiff.

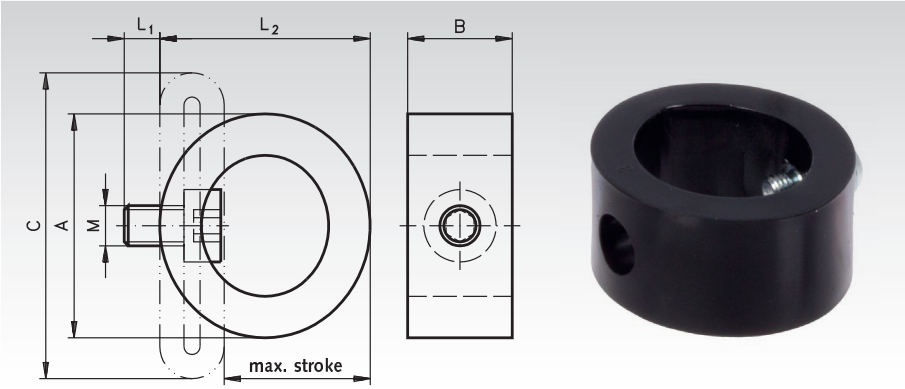
Can be used in machine building or car manufacture as elastic joints, which at permanent operation have to withstand a deflection of approx. ±15° and have to absorb higher radial forces. During deflection a recoiling moment occurs, which is proportional to the torsional angle, as the rubber cannot move in relation to the metal. The bushes are completely maintenance free, silent and vibration isolating along with a high fatigue strength. Spring element and joint are combined in one single element.

The grade of rubber used is not oil proof. An operating temperature of max. 80° must not be exceeded, otherwise the service life is shortened. Hardness about 60 Shore-A-units. The bushes are usually fixed to the outer tube by pressfit.The inner tube can, e.g., be fixed by applying pressure on the front face. In this case the bolt running through the bore of the bush presses the counter bearing against the front face of the inner tube.

Profile Dampers TR Radial Damping

Material: Co-Polyester Elastomer.

Maintenance-free, self-contained damping element. The radial deformation provides a very soft deceleration with a progressive energy absorption towards the end of the stroke. The excellent temperature characteristic of the material provides consistent damping performance over a temperature range of -40°C to +90°C.
The low installed weight, the economic price and the long operating life of up to 1 million cycles makes this an attractive alternative to hydraulic end position damping, if the moving mass does not need to stop in an exact datum position and it is not necessary to absorb 100% of the incoming energy. The space-saving, compact shape has been realized in all sizes ranging from Ø29 mm up to Ø83 mm and is installed very simply and quickly with the supplied, specially shaped mounting bolt. The TR Series has been specially developed to provide maximum stroke at a minimum mounting space in the capacity range from 2 Nm up to 115 Nm.
The life cycle is up to 20 times longer than for urethene dampers, up to ten times longer than for rubber and up to five times longer than for steel springs.



Overload Capacity: For one cycle it is possible to exceed the W_3 rating by 40%.

Environment: Resistant to oil, grease seawater and to microbe or chemical attack. Excellent UV and ozone resistance. Material does not absorb water or swell.

Dynamic Force Range:
300 N to 2100 N.

Temperature Range:
-40°C to +90°C.

Energy Absorption: 17% to 35%.

Material Hardness: Shore 40D

Mounting: in any position

Impact Velocity range: up to max. 5 m/s

Mounting Bolt Torque:
M5: 6 Nm
M6: 10 Nm

On request: special strokes, characteristics, spring rates, sizes and materials.

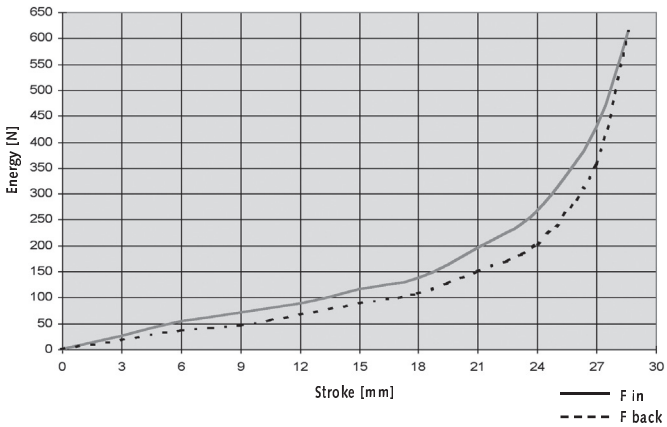
Ordering Details: e.g.:
Product No. 691 229 00, Damper TR, Ø 28 mm

Product No.	Type	W_3* Nm/Stroke	Max. Stroke mm	A** mm	L_1 mm	M Thread	L_2** mm	B** mm	C** mm	Weight g
691 229 00	29-17	2	17	28	5	M5	25	13,5	38	10
691 237 00	37-22	3	22	36	5	M5	32	19,5	50	15
691 243 00	43-25	4	25	43	5	M5	37	19,5	58	20
691 250 00	50-35	6	35	49	5	M5	44	34	68	25
691 263 00	63-43	15	43	64	5	M5	55	43,5	87	55
691 267 00	67-40	25	40	66,5	5	M5	59	46	88	80
691 276 00	76-46	40	46	76	6	M6	67	46	102	105
691 283 00	83-50	45	50	83	6	M6	73	51	109	150

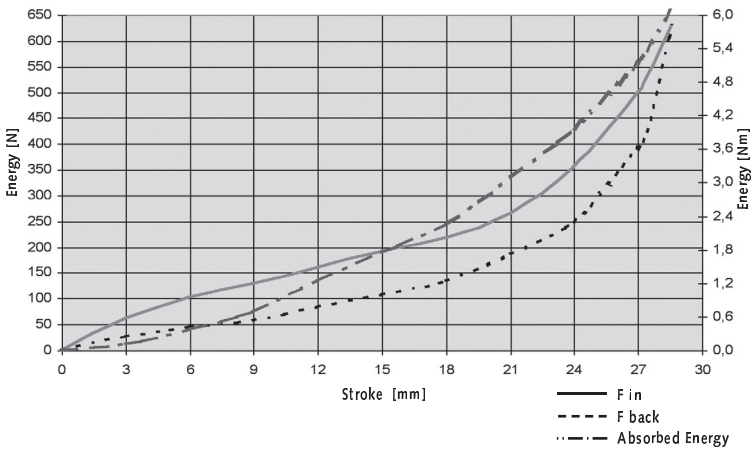
* Max. energy capacity per cycle for continuous use. For a single cycle it is possible to exceed this rating by +40% ** Approx. dimension.

Characteristics of Product No. 691 250 00

Energy-Stroke Characteristics (static)
E_{tot} 4.3 Nm E_{abs}: 0.9 Nm $E_{abs/tot}$: 22%



Force-Stroke and Energy Stroke Characteristic (dynamic)
E_{tot}: 6.1 Nm E_{abs}: 2.1 Nm $E_{abs/tot}$: 35%



With aid of the characteristics curves above you can determine the amount of energy that will be absorbed.
Example: Energy to be absorbed 3 Nm = stroke needed 21 mm see chart energy-stroke characteristic. The energy stroke chart serves to determine the absorbed or rebound energy at a given stroke length.
Dynamic (v>0.5 m/s) and static (v≤0.5 m/s) characteristics for all types available on request.

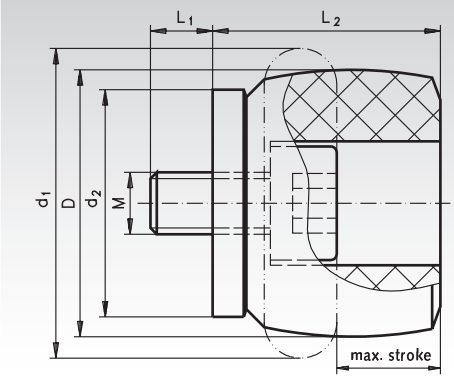
Profile Dampers TA Axial Damping

Material: Co-Polyester Elastomer.

Maintenance-free, self-contained damping elements. Due to the degressive damping characteristics it provides a very high energy absorption at the beginning of the stroke. The excellent temperature characteristic of the material provides consistent damping performance over a temperature range of -40°C to +90°C.

The low installed weight, the economic price and the long operating life of up to 1 million cycles makes this an attractive alternative to hydraulic end position damping, if the moving mass does not need to stop in an exact datum position and it is not necessary to absorb 100% of the incoming energy. The space-saving, compact shape has been realized in all sizes ranging from Ø12 mm up to Ø80 mm and is installed very simply and quickly with the supplied, specially shaped mounting bolt. The TA Series has been specially developed to provide maximum stroke at a minimum mounting space in the capacity range from 2 Nm up to 280 Nm.

The life cycle is up to 20 times longer than for urethene dampers, up to ten times longer than for rubber and up to five times longer than for steel springs.



Overload Capacity: For one cycle it is possible to exceed the W_3 rating by 40%.

Environment: Resistant to oil, grease seawater and to microbe or chemical attack. Excellent UV and ozone resistance. Material does not absorb water or swell.

Dynamic Force Range:
980 N to 23500 N.

Temperature Range:
-40°C to +90°C.

Energy Absorption: 40% to 59%.

Material Hardness: Shore 55D

Mounting: in any position

Impact Velocity range: up to max. 5 m/s

Mounting Bolt Torque:

M3:	2 Nm
M4:	4 Nm
M5:	6 Nm
M6:	10 Nm
M8:	25 Nm
M12:	85 Nm
M16:	210 Nm

On request: special strokes, characteristics, spring rates, sizes and materials.

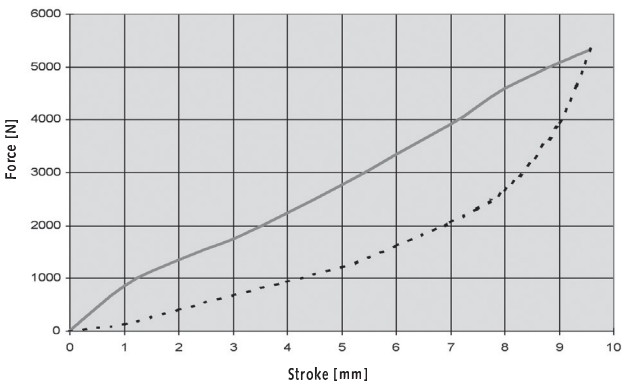
Product No.	Type	W_3* Nm/Stroke	Max. Stroke mm	D** mm	L_1 mm	M Thread	L_2** mm	d_1** mm	d_2** mm	Weight g
691 012 00	12-5	2	5	12	3	M3	10,5	15	11	3
691 017 00	17-7	6	7	17	4	M4	16	22	15	4
691 021 00	21-9	10	9	20	5	M5	18,5	26	18	5
691 022 00	22-10	15	10	20	6	M6	19,5	27	19	5
691 028 00	28-12	30	12	28	6	M6	26	36	25	10
691 034 00	34-14	50	14	34	6	M6	30	43	30	20
691 037 00	37-16	65	16	34	6	M6	33	48	33	25
691 043 00	43-18	100	18	43	8	M8	38	55	38	40
691 047 00	47-20	130	20	45	12	M12	41	60	41	50
691 050 00	50-22	160	22	50	12	M12	45	64	44	60
691 054 00	54-22	190	22	52	12	M12	47	68	47	65
691 057 00	57-24	230	24	57	12	M12	52	73	50	90
691 062 00	62-25	280	25	59	12	M12	54	78	53	105
691 065 00	65-27	350	27	65	12	M12	58	82	57	130
691 080 00	80-32	600	32	80	16	M16	69	100	69	225

* Max. energy capacity per cycle for continuous use. For a single cycle it is possible to exceed this rating by +40% ** Approx. dimensions.

Characteristics of Product No. 691 037 00

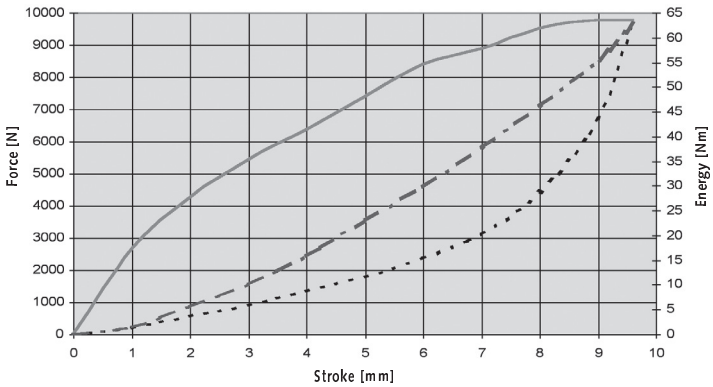
Force-Stroke Characteristics (static)

E_{tot}: 25.9 Nm E_{abs}: 12.0 Nm $E_{abs/tot}$: 46%



Force-Stroke and Energy-Stroke Characteristics (dynamic)

E_{tot}: 62.6 Nm E_{abs}: 40.3 Nm $E_{abs/tot}$: 64%



With aid of the characteristics curves above you can determine the amount of the energy that will be absorbed.
Example: Energy to be absorbed 50 Nm = stroke needed 8.8 mm see chart energy-stroke characteristic. The energy stroke chart serves to determine the absorbed or rebound energy at a given stroke length.
Dynamic (v>0.5 m/s) and static (v≤0.5 m/s) characteristics for all types available on request.

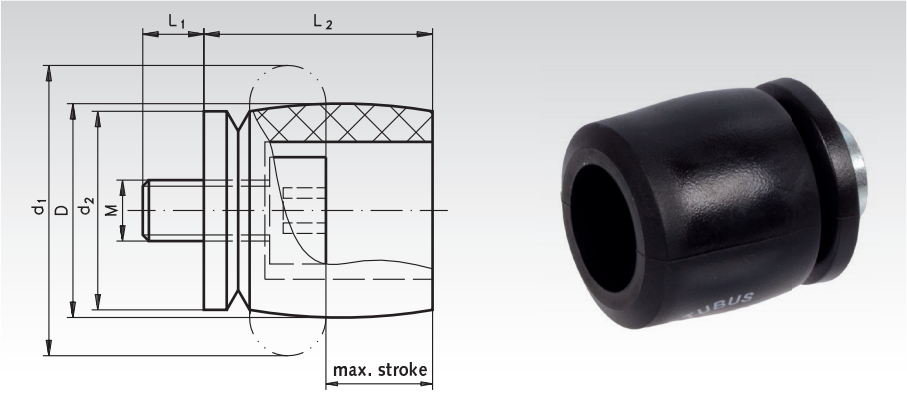
Profile Dampers TS, Axial, Soft Damping

Material: Co-Polyester Elastomer.

Maintenance free, self-contained damping elements. Due to the almost linear damping characteristics it provides very smooth energy absorption along with minimum reaction loads on the machine. The excellent temperature characteristic of the material provides consistent damping performance over a temperature range of -40°C to +90°C.

The low installed weight, the economic price and the long operating life of up to 1 million cycles makes this an attractive alternative to hydraulic end position damping, if the moving mass does not need to stop in an exact datum position and it is not necessary to absorb 100% of the incoming energy. The space-saving compact shape has been realised in all size ranges from Ø14 mm up to Ø64 mm and is very simply and quickly installed with the supplied, specially shaped mounting bolt. The TS Series has been specially developed to provide maximum energy absorption for the minimum overall height in the capacity range from 2 Nm to 65 Nm.

The life cycle is up to 20 times longer than the urethane dampers, up to 10 times longer than for rubber and up to 5 times longer than for steel springs.



Overload Capacity: For one cycle it is possible to exceed the W3 rating by 40%.

Environment: Resistant to microbes, seawater, chemicals and exhibits excellent UV and ozone resistance.
Material does not absorb water and swell.

Dynamic Force Range:
670 N to 5800 N.

Permissible temperature range:
-40°C to +90°C.

Energy absorption: 26% to 45%.

Material hardness: Shore 40D

Mounting position: optional

Impact velocity range: up to max. 5 m/s

Tightening torque:

M4:	4 Nm
M5:	6 Nm
M6:	10 Nm
M12:	85 Nm
M16:	210 Nm

Special strokes, characteristics, spring rates, sizes and materials on request.

Ordering Details: e.g.: Product No. 691 114 00, Damper TS, Ø 14 mm.

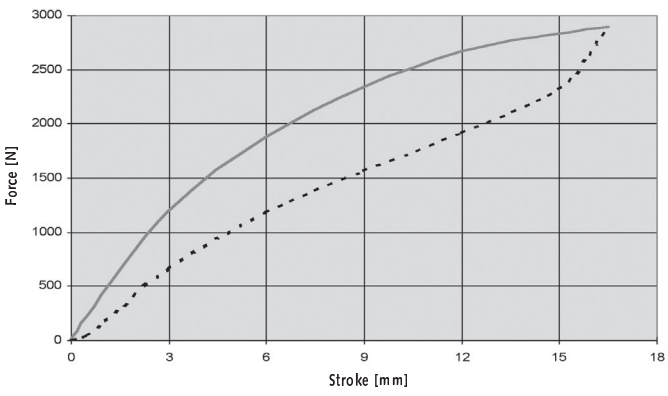
Product No.	Type	W_3* Nm/Stroke	Max. stroke mm	D** mm	L_1 mm	M Thread	L_2** mm	d_1** mm	d_2** mm	Weight g
691 114 00	14-7	2	7	14	4	M4	15	19	13	3
691 118 00	18-9	4	9	17	5	M5	18,5	24	16	4
691 120 00	20-10	6	10	19,5	6	M6	21	27	19	5
691 126 00	26-15	15	15	26	6	M6	28	37	25	10
691 132 00	32-16	25	16	31	6	M6	33	44	30	15
691 135 00	35-19	30	19	33,5	6	M6	36,5	48	33	25
691 140 00	40-19	35	19	36,5	6	M6	37,5	51	34	30
691 141 00	41-21	45	21	39,5	12	M12	41,5	55	38	40
691 144 00	44-23	65	23	42	12	M12	44,5	60	40	45
691 148 00	48-25	80	25	48	12	M12	49	64	44	60
691 151 00	51-27	90	27	51	12	M12	52	69	47	70
691 154 00	54-29	115	29	54	12	M12	55	73	50	80
691 158 00	58-30	135	30	58	12	M12	59	78	53	100
691 161 00	61-32	160	32	61	16	M16	62	83	56	120
691 164 00	64-34	195	34	64	16	M16	66	87	60	145

* Max. energy absorption per stroke for continuous use. For a single cycle it is possible to exceed this rating by +40%. ** Approx. dimensions.

Characteristics for Product No. 691 144 00

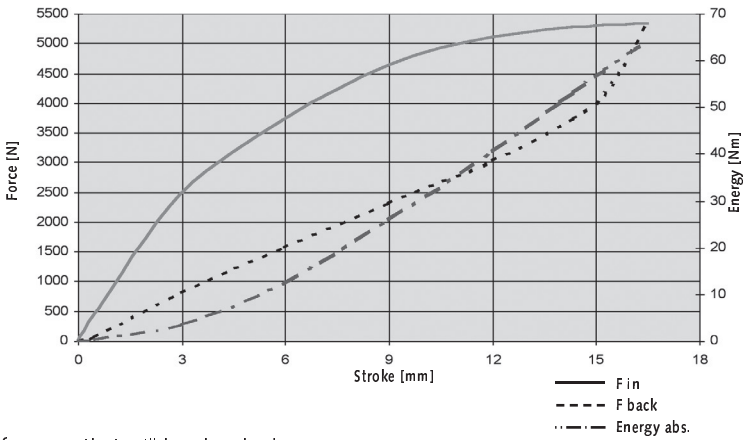
Force-Stroke Characteristics (static)

E_{tot}: 32,7 Nm E_{abs}: 10,1 Nm $E_{abs/tot}$: 31%



Force-Stroke and Energy-Stroke Characteristics (dynamic)

E_{tot}: 64,1 Nm E_{abs}: 29,2 Nm $E_{abs/tot}$: 45%



With aid of the characteristic curves, you can determine the amount of energy that will be absorbed.
For example: Energy to be absorbed 50 Nm = stroke needed 14 mm see chart of energy-stroke characteristic. The energy-stroke chart serves to determine the absorbed or rebound energy at a given stroke length.
Dynamic (v>0.5 m/s) and static (v≤0.5 m/s) characteristics for all types available on request.