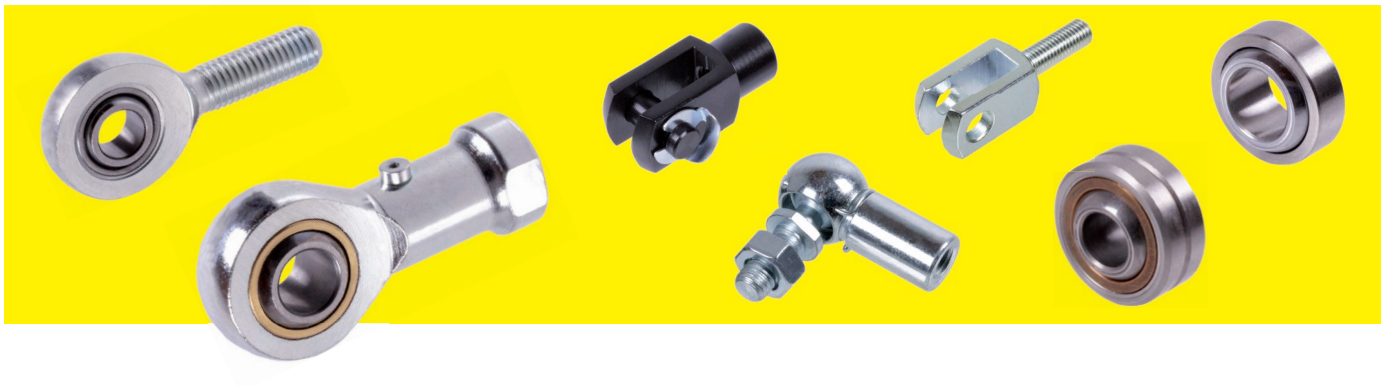

Rod Ends, Series K (wide version), Series E (slim version) and special width Version

Spherical Bearings Series K (wide version) and Series E (slim version)

Clevises, Clevis Joints, Angle Joints

Load Capacity of Rod Ends and Spherical Bearings made from steel

Radial load: The load rating depends on the load case:

Load case I (stationary or static load):
Load rating like table 1.

Load case II (fluctuating or simple dynamic load):
Load rating like table 2. Attention for types GT and GT-R:
Load ratings from table 1 may not be exceeded.

Load case III (alternating or shock load):
The load rating depends highly on the real kind of application and use. We recommend 50% of the load rating from table 2.

Axial load: The axial force may not exceed 20 % of the radial load.

Table 1: Static Load Rating C_o in kN for Load Case I

Bore Diameter of Rod End	Rod Ends with Internal Thread				Rod Ends with External Thread				Spherical bearings Series K				Series E	
mm	GS	GT	GT-R	GEW	GS	GT	GT-R	GAW	S	S...D	G	G...D	GE...DO	GE...UK
2	3	-	-	-	0,6	-	-	-	-	-	-	-	-	-
3	4,1	-	-	-	1,5	-	-	-	-	-	-	-	-	-
4	-	5,2	-	-	-	2,6	-	-	-	-	-	-	-	-
5	9,9	8	11,8	-	4,3	4,3	6,2	-	10	12,5	19,8	12,5	-	-
6	11,9	8,9	13,1	10,3	6	6	8,8	6,9	12,8	15,5	25,8	15,5	17	9
8	17,1	14,1	20,7	15,8	11	11	16,1	12,7	21,6	27,8	42,6	27,8	27,5	14,6
10	21,4	19,3	28,3	23,4	17,4	17,4	25,5	19,9	30	39	60	39	40,5	21,6
12	27	23,5	34,5	31	25,5	23,5	34,5	29	40	53,5	80	53,5	54	28,5
14	24,5	21	39,5	-	24,5	20,8	39,5	-	51,5	70	102,5	70	-	-
15	-	-	-	42,5	-	-	-	39,5	-	-	-	-	85	44
16	37	32	60,5	54,5	36,5	32	60,5	54	64,5	88	128,5	88	106	56
17	-	-	-	54,5	-	-	-	54	-	-	-	-	106	56
18	43	38,6	73	-	43	38,6	73	-	78,5	106,5	157	106,5	-	-
20	49,5	44	83	62,5	49,5	43,8	83	62,5	94,5	130	188,5	130	146	78
22	57	53	100	-	57	52,6	100	-	114	162	229	162	-	-
25	68	62	118	92	68	61,4	118	92	142	204	293	204	240	127
30	82	82	155	124	82	81,6	155	124	416	281	416	281	310	166
35	101	101	191	144	101	101	191	144	480	343	480	343	400	338
40	124	124	235	178	124	124	235	178	693	495	693	495	500	419
45	-	-	-	263	-	-	-	263	-	-	-	-	640	540
50	-	-	-	320	-	-	-	320	-	-	-	-	780	665
60	-	-	-	497	-	-	-	497	-	-	-	-	1220	1030
70	-	-	-	606	-	-	-	566	-		-	-	1560	1320
80	-	-	-	752	-	-	-	752	-	-	-	-	2000	1700

Table 2: Dynamic Load Rating C in kN for Load Case II

Bore Diameter of Rod End	Rod Ends with Internal Thread				Rod Ends with External Thread				Spherical bearings					
mm	GS	GT	GT-R	GEW	GS	GT	GT-R	GAW	S	S...D	G	G...D	GE...DO	GE...UK
2	1,1	-	-	-	1,1	-	-	-	-	-	-	-	-	-
3	1,8	-	-	-	1,8	-	-	-	-	-	-	-	-	-
4	-	0,8	-	-	-	0,8	-	-	-	-	-	-	-	-
5	2,5	7,5	7,5	-	2,5	7,5*	7,5*	-	2,5	7,5	3,3	7,5	-	-
6	3,2	9,3*	9,3	3,6	3,2	9,3*	9,3*	3,6	3,2	9,3	4,3	9,3	3,4	3,6
8	5,4	16,7*	16,7	5,8	5,4	16,7*	16,7*	5,8	5,4	16,7	7,1	16,7	5,5	5,8
10	7,5	23,4*	23,4	8,6	7,5	23,4*	23,4	8,6	7,5	23,4	10	23,4	8,1	8,6
12	10	32*	32	11,5	10	32*	32	11,5	10	32	13,5	32	10,8	11,5
14	13	42*	42*	-	13	42*	42*	-	13	42	17	42	-	-
15	-	-	-	17,5	-	-	-	17,5	-	-	-	-	17	17,5
16	16	52,5*	52,5	22,5	16	52,5*	52,5	22,5	16	62,5	21,5	62,5	21,2	22
17	-	-	-	22,5	-	-	-	22,5	-	-	-	-	21,2	22
18	19,5	64*	64	-	19,5	64*	64*	-	19,5	64	26	64	-	-
20	23,5	78*	78	31,5	23,5	78*	78	31,5	23,5	78	31,5	78	30	31
22	29	97*	97	-	29	97*	97	-	29	97	38	97	-	-
25	35	122*	122*	51	35	122*	122*	51	35	122	47	122	48	51
30	64	168*	168*	66	64	168*	168*	66	64	168	64	168	62	65
35	80	206*	206*	140	80	206*	206*	140	80	206	80	206	80	140
40	116	286*	286*	185	116	286*	286*	185	116	286	116	286	100	185
45	-	-	-	240	-	-	-	240	-	-	-	-	127	240
50	-	-	-	295	-	-	-	295	-	-	-	-	156	295
60	-	-	-	460	-	-	-	460	-	-	-	-	245	460
70	-	-	-	590	-	-	-	590	-	-	-	-	315	590
80	-	-	-	750	-	-	-	750	-	-	-	-	400	750

* Attention: The static load rating is lower. The dynamic load ratings are calculatet for the bearing, to be used for further calculations.
The static load ratings from table 1 may not be exceeded.

Permissible Speed of the Inner Ring for Rod Ends and Spherical Bearings made from steel

The effective determination of the maximum rotational speed depends on various factors and variables which cannot all be predefined by the manufacturer.
a) Load.
b) Loading case (I,II and III).
c) Type of lubrication (central lubrication system etc.).
d) Ambient temperature.
e) Environmental influences (dust etc.).

For the aforementioned reasons the manufacturer cannot determine any explicit, general values for the maximum speed of the inner ring. The values in the table were calculated assuming favourable conditions. Rod ends DIN series E (GEW and GAW) and spherical bearings DIN series E (GE...DO and GE...UK) are not suitable for higher speeds (only for alternating load).

Rod End-Bores	Rod Ends			Spherical Bearings			
	GS min^{-1}	GT** min^{-1}	GT-R** min^{-1}	S min^{-1}	S...D** min^{-1}	G min^{-1}	G...D** min^{-1}
5	1200	600	600	900	600	-	600
6	1500	530	530	760	530	1500	530
8	1200	420	420	620	420	1200	420
10	1000	350	350	500	350	1000	350
12	860	300	300	450	300	860	300
14	750	260	260	360	260	750	260
16	660	230	230	350	230	660	230
18	600	210	210	320	210	600	210
20	540	190	190	280	190	540	190
22	500	170	170	250	170	500	170
25	440	150	150	230	150	440	150
30	370	130	130	370	130	370	130
35	330	110	110	330	110	330	110
40	290	100	100	290	150	290	100

* Sizes 2, 3 and 4 mm and GS external thread 5 mm are not suitable for higher speeds.
** Speeds stated are for short-term rotary operation (not suitable for permanent rotary operation).

Tolerances for Rod Ends and Spherical Bearings

Ball Bores

Series K:
Bore tolerance H7.
Matching shaft: g6 recommended.

Series E:
Bore tolerance 0/-8µ.
Matching shaft: g7 recommended.

Outer diameter of the spherical bearing

Series K: Tolerance h6.
Housing tolerance J7 recommended.

Series E: Tolerance h5.
Housing tolerance JS7 recommended.

Thread Metric thread according to DIN 13. All external thread are rolled for high strength.

Lubrication

All rod ends and spherical bearings, wich are not declared as maintenance-free, must be lubricated. An initial lubrication before use is required. But maintenance-free parts must not be lubricated.

We recommend the following lubrication intervals:
- If the system runs at full speed during the phase of start-up wear, i.e., during the first 5 operating days, running 8 hours per day, and in a dirty operating environment, i.e., under unfavourable ambient conditions, the unit should be lubricated twice a day.
- With oscillating motion once to twice a week.
- With higher temperatures possibly once or twice a day.

We recommend high quality grease with Molykote or graphite ingrediant.

Tilting Angle

Max. tilting angle: the tilting angles stated in the table relate to the maximum permissible misalignment of the shaft axis towards the bearing