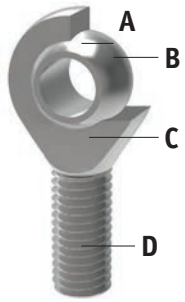
All of our rod ends incorporate either a plain spherical bearing, ball bearing, or roller bearing. Below is an overview of each type.

Plain spherical bearings



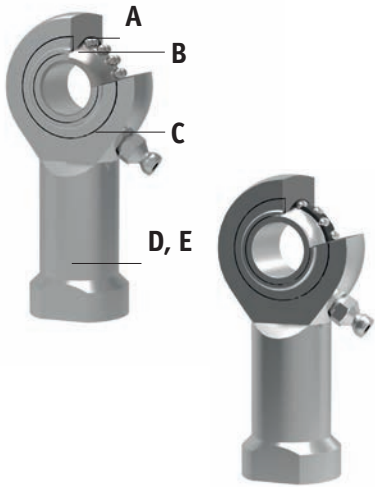
A Made from Polyamid-PTFE-fibreglass-compound, maintenance free, absorbs any foreign particles

B Ball made of bearing steel, hardened, ground, polished and hard chromium plated, ensures reliable corrosion wwprotection

C No clearance - radial clearance 0-10µm

D All rod ends housings made of forged steel, tempered, extremely high loads resistant

Ball and roller bearings



A Radial clearance: 10-30µm, low friction

B Inner ring made of bearing steel, hardened ball grooves polished

C Shields on both sides protect against rough dirt penetration

D All rod ends housings are made of forged steel, case hardened bearing race

E Low maintenance due to long-term greasing, especially suitable for high speed large swiveling angles or rotating movements

Rod ends and water

Stainless steel versions

Most of our rod ends are available in stainless steel as standard

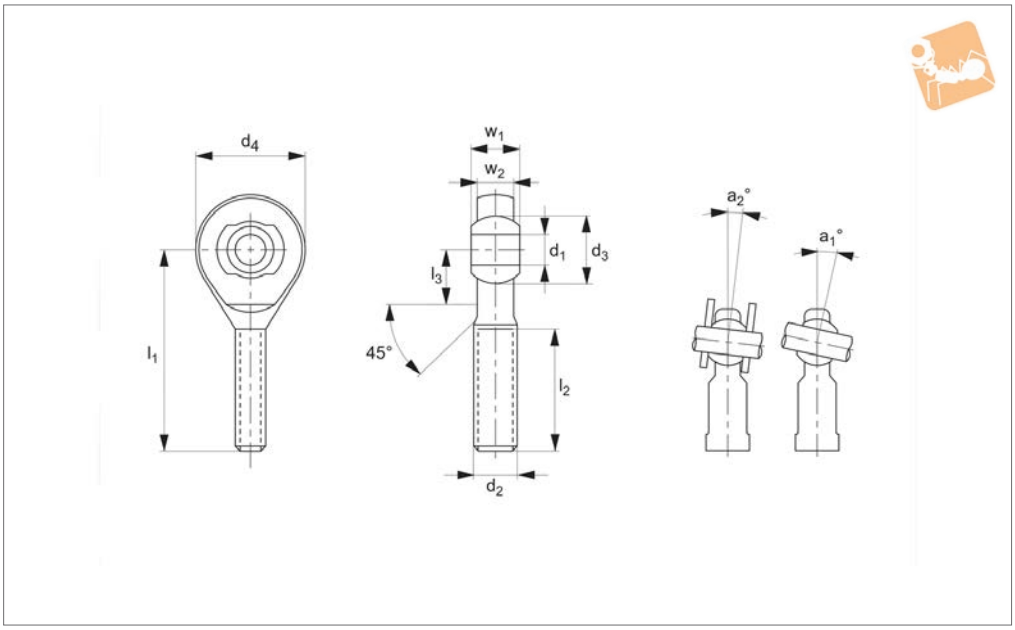
High grade AISI 316 stainless steel available on request

Rod Ends from Automotion Components

ROD ENDS

Heavy-Duty Rod Ends - Male
with integral spherical plain bearing

R3550



Material
Housing - forged steel, tempered, rolled thread, surface galvanized.
Joint ball - ball bearing steel, hardened and ground.
Race - nylon/teflon/glass compound.

Technical Notes
Maintenance free, sizes according to DIN ISO 12240-4, series K, for tolerances see technical pages.

Tips
Standard thread is right hand thread.

Important Notes
*Denotes fine pitch thread.

Order No.	Thread hand	d_1	l_1	d_2	d_3	l_2	d_4	a_1 °	Weight g
R3550.R005	Right	5	33	M5	11.11	20	18	13.0	14
R3550.R006	Right	6	36	M6	12.70	22	20	13.0	20
R3550.R008	Right	8	42	M8	15.87	25	24	14.5	38
R3550.R010	Right	10	48	M10	19.05	29	28	13.5	60
R3550.R012	Right	12	54	M12	22.22	33	32	13.0	92
R3550.R014	Right	14	60	M14	25.40	36	36	16.0	127
R3550.R016	Right	16	66	M16	28.57	40	42	15.5	202
R3550.R018	Right	18	72	M18x1,5*	31.75	44	46	15.0	250
R3550.R020	Right	20	78	M20x1,5*	34.92	47	50	14.5	327
R3550.R022	Right	22	84	M22x1,5*	38.10	51	54	15.5	440
R3550.R025	Right	25	94	M24x2*	42.85	57	60	15.0	630
R3550.R030	Right	30	110	M30x2*	50.75	66	70	17.0	1015
R3550.L005	Left	5	33	M5	11.11	20	18	13.0	14
R3550.L006	Left	6	36	M6	12.70	22	20	13.0	20
R3550.L008	Left	8	42	M8	15.87	25	24	14.5	38
R3550.L010	Left	10	48	M10	19.05	29	28	13.5	60
R3550.L012	Left	12	54	M12	22.22	33	32	13.0	92
R3550.L014	Left	14	60	M14	25.40	36	36	16.0	127
R3550.L016	Left	16	66	M16	28.57	40	42	15.5	202
R3550.L018	Left	18	72	M18x1,5*	31.75	44	46	15.0	250
R3550.L020	Left	20	78	M20x1,5*	34.92	47	50	14.5	327
R3550.L022	Left	22	84	M22x1,5*	38.10	51	54	15.5	440
R3550.L025	Left	25	94	M24x2*	42.85	57	60	15.0	630
R3550.L030	Left	30	110	M30x2*	50.80	66	70	17.0	1015

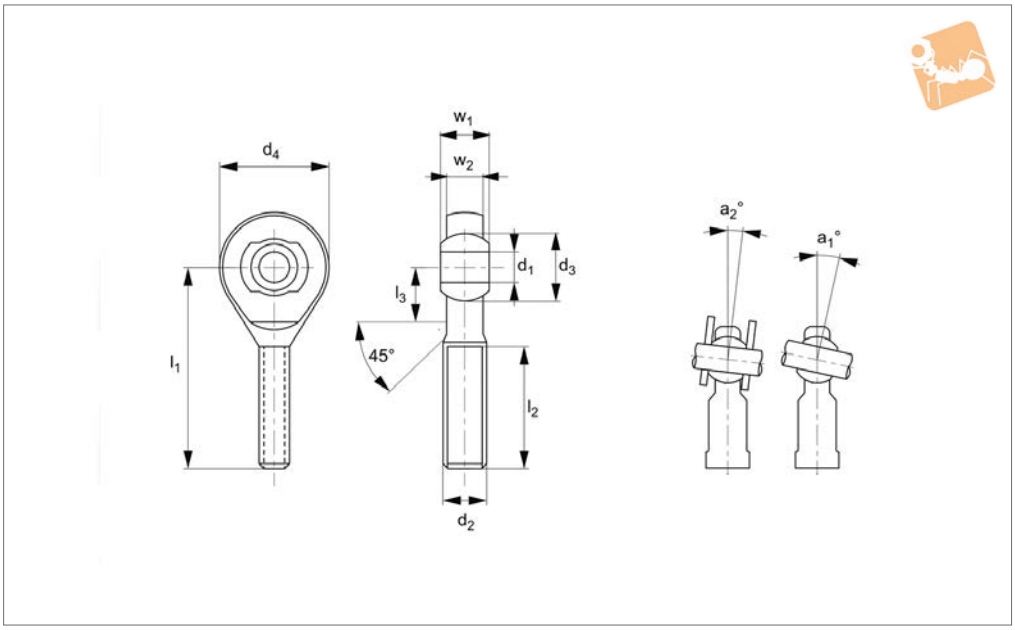
Order No.	a_2 °	l_3	w_1	w_2	Dyn. load C kN max.	Static load C_0 kN max.
R3550.R005	7.5	9	8	6.00	3.9	5.6
R3550.R006	6.5	12	9	6.75	4.6	7.8
R3550.R008	7.5	15	12	9.00	7.0	14.3
R3550.R010	8.0	15	14	10.50	10.4	22.6

Order No.	a_2 °	l_3	w_1	w_2	Dyn. load C kN max.	Static load C_0 kN max.
R3550.R012	8.0	19	16	12.00	12.4	32.8
R3550.R014	9.5	20	19	13.50	15.4	41.3
R3550.R016	8.5	22	21	15.00	22.4	56.6
R3550.R018	9.5	25	23	16.50	26.3	69.7
R3550.R020	9.0	28	25	18.00	30.8	82.2
R3550.R022	10.0	26	28	20.00	38.2	95.6
R3550.R025	10.0	30	31	22.00	45.3	118.6
R3550.R030	10.5	35	37	25.00	55.0	145.6
R3550.L005	7.5	9	8	6.00	3.9	5.6
R3550.L006	6.5	12	9	6.75	4.6	7.8
R3550.L008	7.5	15	12	9.00	7.0	14.3
R3550.L010	8.0	15	14	10.50	10.4	22.6
R3550.L012	8.0	19	16	12.00	12.4	32.8
R3550.L014	9.5	20	19	13.50	15.4	41.3
R3550.L016	8.5	22	21	15.00	22.4	56.6
R3550.L018	9.5	25	23	16.50	26.325	69.700
R3550.L020	9.0	28	25	18.00	30.805	82.200
R3550.L022	10.0	26	28	20.00	38.2	95.6
R3550.L025	10.0	30	31	22.00	45.3	118.6
R3550.L030	10.5	35	37	25.00	55.0	145.6

Heavy-Duty Rod Ends - Male

Imperial, with integral spherical plain bearing

R3550.i



Material

Rod end housing - forged steel, tempered, rolled thread, surface galvanized.
Joint ball - ball bearing steel, hardened and ground.
Race - nylon/teflon/glass compound.

Technical Notes

Male thread maintenance free adapter sizes according to DIN ISO 12240-4, series K.

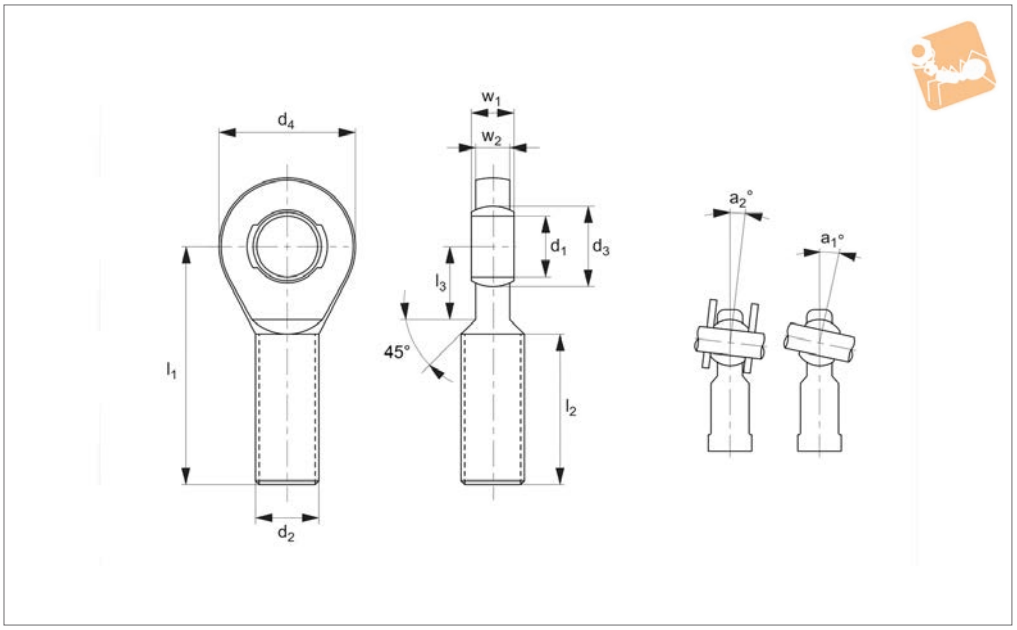
Tips

Standard thread is Right hand thread.

Important Notes

*Denotes fine pitch thread.

Order No.	Thread hand	d_1	l_1	d_2	d_3	l_2	d_4	a °	l_3	w_1	w_2	Dyn. load C kN max.	Static load C_0 kN max.	Weight g
R3550.I250	Right	0.250	1.594	1/4-28	0.516	1.000	0.750	13.0	0.511	0.374	0.283	3.6	13.5	22
R3550.I375	Right	0.375	1.948	3/8-24	0.719	1.240	1.000	9.5	0.629	0.499	0.405	7.7	21.0	49
R3550.I500	Right	0.500	2.460	1/2-20	0.876	1.500	1.311	13.0	0.846	0.624	0.472	14.7	40.3	109
R3550.I625	Right	0.625	2.618	5/8-18	1.125	1.574	1.654	15.5	0.944	0.827	0.590	22.4	56.0	202
R3550.I750	Right	0.750	2.893	3/4-16	1.249	1.750	1.750	11.0	1.023	0.874	0.688	24.9	62.2	249
R3550.I1000	Right	1.000	3.720	1-12	1.688	2.244	2.362	15.5	1.200	1.220	0.866	45.4	113.4	562
R3550.I1001	Right	1.000	3.720	1-14	1.688	2.244	2.362	15.5	1.200	1.220	0.866	45.4	113.4	562
R3550.IL250	Left	0.250	1.594	1/4-28	0.516	1.000	0.750	13.0	0.511	0.374	0.283	3.6	13.5	22
R3550.IL375	Left	0.375	1.948	3/8-24	0.719	1.240	1.000	9.5	0.629	0.499	0.405	7.7	21.0	49
R3550.IL500	Left	0.500	2.460	1/2-20	0.876	1.500	1.311	13.0	0.846	0.624	0.472	14.7	40.3	109
R3550.IL625	Left	0.625	2.618	5/8-18	1.125	1.574	1.654	15.5	0.944	0.827	0.590	22.4	56.0	202
R3550.IL750	Left	0.750	2.893	3/4-16	1.249	1.750	1.750	11.0	1.023	0.874	0.688	24.9	62.2	249
R3550.IL1000	Left	1.000	3.720	1-12	1.688	2.244	2.362	15.5	1.200	1.220	0.866	45.4	113.4	562
R3550.IL1001	Left	1.000	3.720	1-14	1.688	2.244	2.362	15.5	1.200	1.220	0.866	45.4	113.4	562



R3553

Material
Housing - forged steel, tempered, rolled thread, surface galvanized.
Joint ball - ball bearing steel, hardened and ground, surface superfinished and chromium plated.
Race - nylon/teflon/glass compound.

Technical Notes
Maintenance free, sizes according to DIN ISO 12240-4, series E, for tolerances technical pages.

Tips
Standard thread is right hand thread.

Important Notes
*Denotes fine pitch thread.

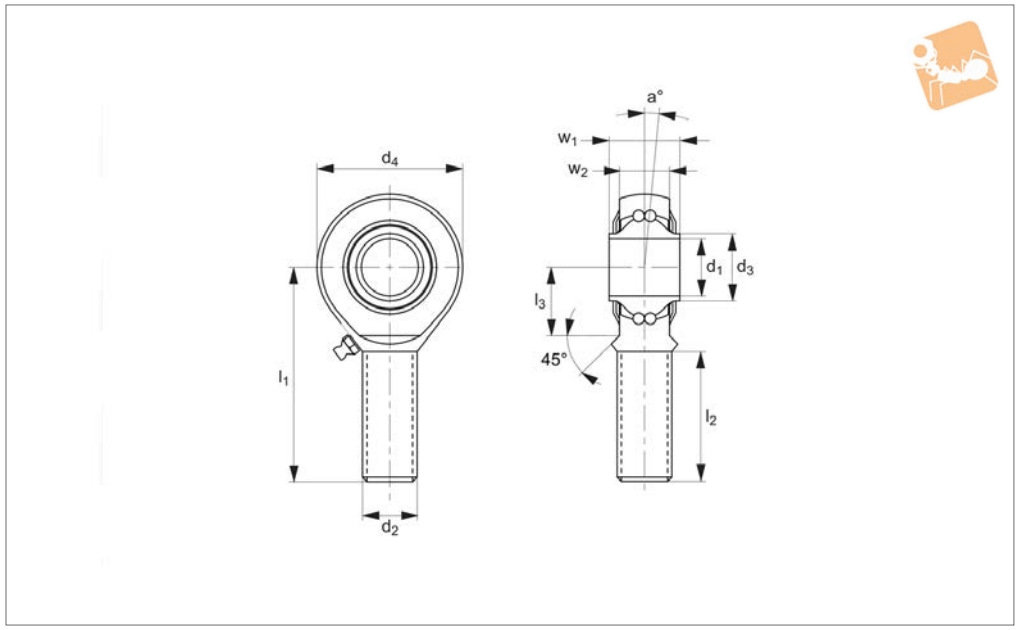
Order No.	Thread hand	d_1	l_1	d_2	d_3	l_2	d_4	a_1 °	Weight g
R3553.R006	Right	6	36	M6	10.0	22	20	13.0	14
R3553.R008	Right	8	42	M8	13.0	25	23	15.0	24
R3553.R010	Right	10	48	M10	16.0	29	28	12.0	41
R3553.R012	Right	12	54	M12	18.0	33	32	10.5	67
R3553.R015	Right	15	63	M14	22.0	33	38	8.5	110
R3553.R017	Right	17	69	M16	25.0	40	44	10.0	163
R3553.R020	Right	20	78	M20x1,5*	29.0	47	51	9.0	270
R3553.R025	Right	25	94	M24x2*	35.5	57	62	7.5	508
R3553.R030	Right	30	110	M30x2*	40.7	66	70	6.0	785
R3553.R035	Right	35	140	M36x3*	47.0	92	82	6.5	1330
R3553.R040	Right	40	145	M42x3*	53.0	94	92	7.0	1890
R3553.R041	Right	40	150	M39x3*	53.0	99	92	7.0	1785
R3553.R045	Right	45	165	M45x3*	60.0	100	102	7.5	2620
R3553.R046	Right	45	163	M42x3*	60.0	98	102	7.5	2430
R3553.R050	Right	50	195	M52x3*	66.0	120	112	6.5	3865
R3553.R051	Right	50	185	M45x3*	66.0	110	112	6.5	3225
R3553.R060	Right	60	225	M60x4*	80.0	140	135	6.5	6400
R3553.R061	Right	60	210	M60x4*	80.0	125	-	6.5	5430
R3553.L006	Left	6	36	M6	10.0	22	20	13.0	14
R3553.L008	Left	8	42	M8	13.0	25	23	15.0	24
R3553.L010	Left	10	48	M10	16.0	29	28	12.0	41
R3553.L012	Left	12	54	M12	18.0	33	32	10.5	67
R3553.L015	Left	15	63	M14	22.0	33	38	8.5	110
R3553.L017	Left	17	69	M16	25.0	40	44	10.0	163
R3553.L020	Left	20	78	M20x1,5*	29.0	47	51	9.0	270
R3553.L025	Left	25	94	M24x2*	35.5	57	62	7.5	508
R3553.L030	Left	30	110	M30x2*	40.7	66	70	6.0	785
R3553.L035	Left	35	140	M36x3*	47.0	92	82	6.5	1330
R3553.L040	Left	40	145	M42x3*	53.0	94	92	7.0	1890
R3553.L041	Left	40	150	M39x3*	53.0	99	92	7.0	1785
R3553.L045	Left	45	165	M45x3*	60.0	100	102	7.5	2620
R3553.L046	Left	45	163	M42x3*	60.0	98	102	7.5	2430

Heavy-Duty Rod Ends - Male

with integral spherical plain bearing

Order No.	Thread hand	d_1	l_1	d_2	d_3	l_2	d_4	a_1 °	Weight g
R3553.L050	Left	50	195	M52x3,0*	66.0	120	112	6.5	3865
R3553.L051	Left	50	185	M45x3,0*	66.0	110	112	6.5	3225
R3553.L060	Left	60	225	M60x4,0*	80.0	140	135	6.5	6400
R3553.L061	Left	60	210	M52x3,0*	80.0	125	135	6.5	5430

Order No.	a_2 °	l_3	w_1	w_2	Dyn. load C kN max.	Static load C_0 kN max.
R3553.R006	6.5	11	6	4	2.5	6.4
R3553.R008	8.0	12	8	5	4.2	11.0
R3553.R010	6.0	15	9	6	6.4	16.8
R3553.R012	5.0	15	10	7	9.2	23.0
R3553.R015	4.5	18	12	9	13.4	39.6
R3553.R017	5.5	23	14	10	19.2	54.1
R3553.R020	4.5	25	16	12	25.2	76.7
R3553.R025	3.5	32	20	16	42.4	119.1
R3553.R030	3.0	35	22	18	54.0	141.8
R3553.R035	3.5	38	25	20	70.4	180.8
R3553.R040	3.5	42	28	22	86.0	222.6
R3553.R041	3.5	42	28	22	86.0	222.6
R3553.R045	4.0	50	32	25	107.0	276.2
R3553.R046	4.0	50	32	25	107.0	276.2
R3553.R050	3.0	60	35	28	132.0	339.2
R3553.R051	3.0	60	35	28	132.0	339.2
R3553.R060	3.5	70	44	36	208.0	532.1
R3553.R061	3.5	70	44	36	208.0	532.1
R3553.L006	6.5	11	6	4	2.5	6.4
R3553.L008	8.0	12	8	5	4.2	11.0
R3553.L010	6.0	15	9	6	6.4	16.8
R3553.L012	5.0	15	10	7	9.2	23.0
R3553.L015	4.5	18	12	9	13.4	39.6
R3553.L017	5.5	23	14	10	19.2	54.1
R3553.L020	4.5	25	16	12	25.2	76.7
R3553.L025	3.5	32	20	16	42.4	119.1
R3553.L030	3.0	35	22	18	54.0	141.8
R3553.L035	3.5	38	25	20	70.4	180.8
R3553.L040	3.5	42	28	22	86.0	222.6
R3553.L041	3.5	42	28	22	86.0	222.6
R3553.L045	4.0	50	32	25	107.0	276.2
R3553.L046	4.0	50	32	25	107.0	276.2
R3553.L050	3.0	60	35	28	132.0	339.2
R3553.L051	3.0	60	35	28	132.0	339.2
R3553.L060	3.5	70	44	36	208.0	532.1
R3553.L061	3.5	70	44	36	208.0	532.1



R3556

Material
Housing - forged steel, tempered, case hardened bearing race, ground and lapped, rolled thread, surface galvanized. Inner ring - ball bearing steel, hardened, superfine ground, lubrication - calcium-complex-soap-grease, temp range -20°C to +120°C.

Lubrication nipple - DIN 3405 D1/A (sizes 6 to 10) DIN 71412 H1 (sizes 12 to 30).

Technical Notes
Low maintenance. Sizes according to DIN ISO 12240-4 series K, for tolerances see technical pages.

Tips
Standard thread is right hand thread.

Important Notes
*Denotes fine pitch thread.

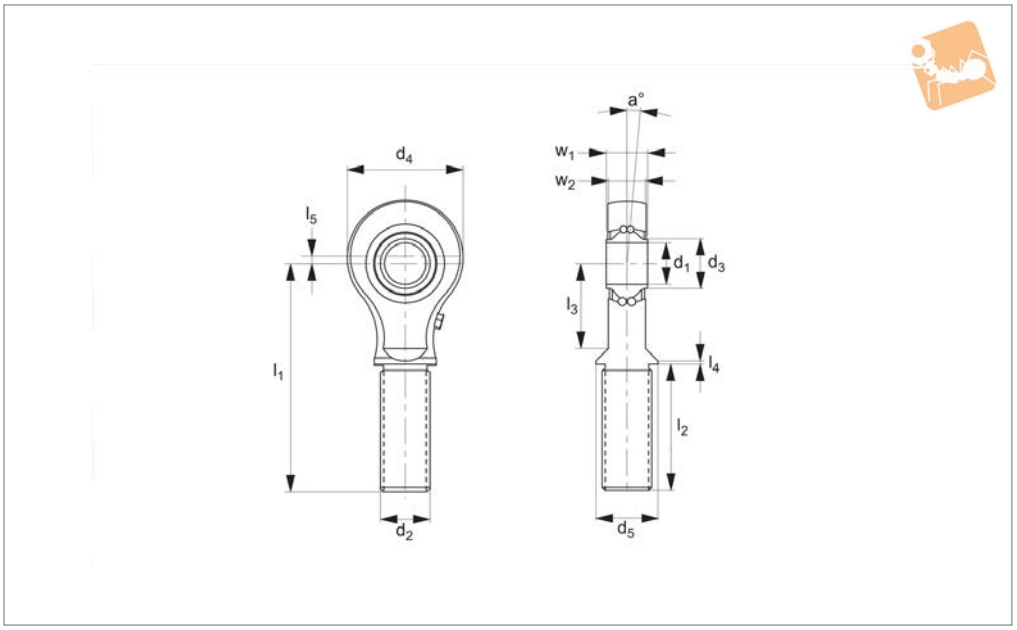
Order No.	Thread hand	d_1	l_1	d_2	d_3	l_2	d_4	a °	l_3	w_1	Weight g
R3556.R006	Right	6	36	M6	9.0	22	20	8.0	12	9	19
R3556.R008	Right	8	42	M8	10.5	25	24	8.5	15	12	36
R3556.R010	Right	10	48	M10	12.0	29	28	8.0	15	14	60
R3556.R012	Right	12	54	M12	14.5	33	32	7.5	19	16	87
R3556.R014	Right	14	60	M14	17.0	36	36	6.0	20	19	135
R3556.R016	Right	16	66	M16	19.0	40	42	8.0	22	21	190
R3556.R018	Right	18	72	M18x1,5*	21.5	44	46	8.5	25	23	270
R3556.R020	Right	20	78	M20x1,5*	24.5	47	50	7.0	28	25	338
R3556.R022	Right	22	84	M22x1,5*	26.0	51	54	8.0	26	28	450
R3556.R025	Right	25	94	M24x2*	29.5	57	64	5.0	30	31	602
R3556.R030	Right	30	110	M30x2*	34.5	66	70	7.5	35	37	922
R3556.L006	Left	6	36	M6	9.0	22	20	8.0	12	9	19
R3556.L008	Left	8	42	M8	10.5	25	24	8.5	15	12	36
R3556.L010	Left	10	48	M10	12.0	29	28	8.0	15	14	60
R3556.L012	Left	12	54	M12	14.5	33	32	7.5	19	16	87
R3556.L014	Left	14	60	M14	17.0	36	36	6.0	20	19	135
R3556.L016	Left	16	66	M16	19.0	40	42	8.0	22	21	190
R3556.L018	Left	18	72	M18x1,5*	21.5	44	46	8.5	25	23	270
R3556.L020	Left	20	78	M20x1,5*	24.5	47	50	7.0	28	25	338
R3556.L022	Left	22	84	M22x1,5*	26.0	51	54	8.0	26	28	450
R3556.L025	Left	25	94	M24x2*	29.5	57	64	5.0	30	31	602
R3556.L030	Left	30	110	M30x2*	34.5	66	70	7.5	35	37	922

Order No.	w_2	Calc. factor Y	Calc. factor Y_0	Dyn. load C kN max.	Speed rpm max.	Static load C_0 kN max.
R3556.R006	6.75	2.19	2.09	2.75	1350	0.65
R3556.R008	9.00	1.89	1.80	4.00	1300	1.00
R3556.R010	10.50	1.81	1.90	4.45	1225	1.45

Heavy-Duty Rod Ends - Male

with integral ball bearing

Order No.	w_2	Calc. factor Y	Calc. factor Y_0	Dyn. load C kN max.	Speed rpm max.	Static load C_0 kN max.
R3556.R012	12.00	1.82	1.74	4.95	1125	1.80
R3556.R014	13.50	2.48	2.36	5.60	1025	2.00
R3556.R016	15.00	2.35	2.24	6.25	975	2.35
R3556.R018	16.50	2.31	2.21	7.10	900	2.90
R3556.R020	18.00	2.58	2.46	7.90	825	3.45
R3556.R022	20.00	2.24	2.35	9.30	725	3.98
R3556.R025	22.00	2.12	2.02	11.03	600	5.68
R3556.R030	25.00	2.35	2.24	14.15	450	7.45
R3556.L006	6.75	2.19	2.09	2.75	1350	0.65
R3556.L008	9.00	1.89	1.80	4.00	1300	1.00
R3556.L010	10.50	1.81	1.90	4.45	1225	1.45
R3556.L012	12.00	1.82	1.74	4.95	1125	1.80
R3556.L014	13.50	2.48	2.36	5.60	1025	2.00
R3556.L016	15.00	2.35	2.24	6.25	975	2.35
R3556.L018	16.50	2.31	2.21	7.10	900	2.90
R3556.L020	18.00	2.58	2.46	7.90	825	3.45
R3556.L022	20.00	2.24	2.35	9.30	725	3.98
R3556.L025	22.00	2.12	2.02	11.03	600	5.68
R3556.L030	25.00	2.35	2.24	14.15	450	7.45



R3559

Material
Housing - forged steel, tempered, case hardened bearing race, ground and lapped, surface galvanized.
Inner ring - ball bearing steel, hardened, superfine ground.
Lubrication - calcium-complex-soap-grease, temp range -20°C to +120°C, lubrication nipple - DIN 3405 D1/A.

Technical Notes
Low maintenance, for tolerances see technical pages.

Tips
Standard thread is right hand thread.

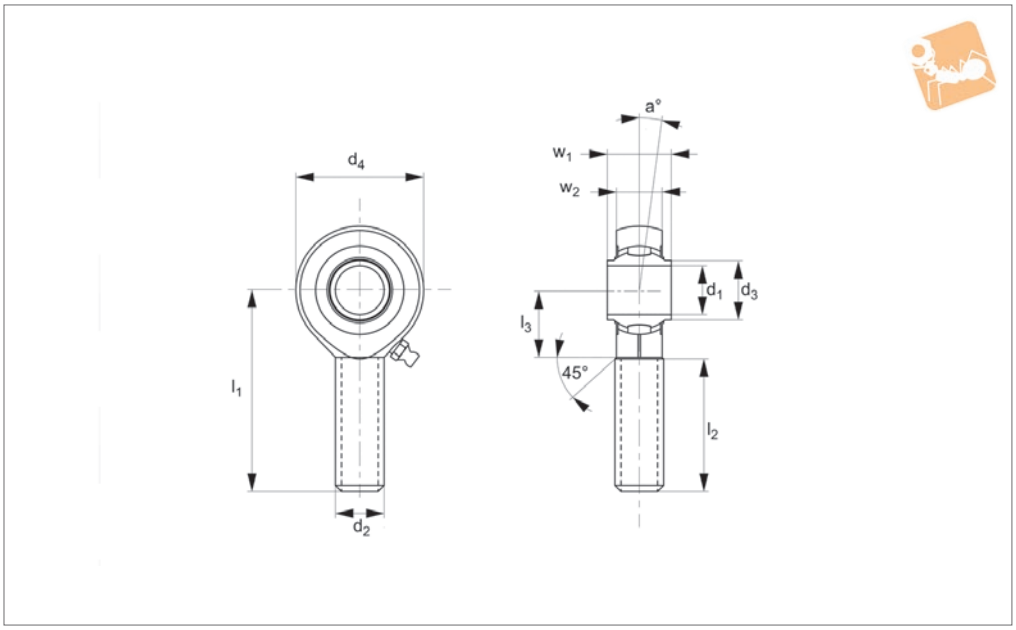
Important Notes
*Denotes fine pitch thread.

Order No.	Thread hand	d_1	l_1	d_2	d_3	l_2	d_4	d_5	a °	l_3	Weight g
R3559.R006	Right	6	64.0	M10x1	8.5	42.5	24	14	10.5	17	62
R3559.R007	Right	6	40.5	M10x1	8.5	19	24	14	10.5	17	57
R3559.R008	Right	8	72.0	M12x1,5	11.0	46.5	30	17	8.5	20	97
R3559.R009	Right	8	48.5	M12x1,5	11.0	23	30	17	8.5	20	88
R3559.R010	Right	10	82.0	M14x1,5	13.5	49.5	36	19	9.5	28	168
R3559.R011	Right	10	58.5	M14x1,5	13.5	26	36	19	9.5	28	154
R3559.R012	Right	12	90.0	M16x1,5	15.0	53.5	40	21	7.5	31	226
R3559.R013	Right	12	65.5	M16x1,5	15.0	29	40	21	7.5	31	204
R3559.R015	Right	15	100.0	M20x1,5	18.5	62.5	42	26	6.5	30	310
R3559.R016	Right	15	73.5	M20x1,5	18.5	36	42	26	6.5	30	273
R3559.R017	Right	17	105.0	M20x1,5	21.0	62.5	48	26	7.0	36	401
R3559.R018	Right	17	78.5	M20x1,5	21.0	36	48	26	7.0	36	354
R3559.R020	Right	20	117.0	M24x1,5	24.0	68.5	56	30	5.5	41	587
R3559.R021	Right	20	89.5	M24x1,5	24.0	41	56	30	5.5	41	519
R3559.L006	Left	6	64.0	M10x1	8.5	42.5	24	14	10.5	17	62
R3559.L007	Left	6	40.5	M10x1	8.5	19	24	14	10.5	17	57
R3559.L008	Left	8	72.0	M12x1,5	11.0	46.5	30	17	8.5	20	97
R3559.L009	Left	8	48.5	M12x1,5	11.0	23	30	17	8.5	20	88
R3559.L010	Left	10	82.0	M14x1,5	13.5	49.5	36	19	9.5	28	168
R3559.L011	Left	10	58.5	M14x1,5	13.5	26	36	19	9.5	28	154
R3559.L012	Left	12	90.0	M16x1,5	15.0	53.5	40	21	7.5	31	226
R3559.L013	Left	12	65.5	M16x1,5	15.0	29	40	21	7.5	31	204
R3559.L015	Left	15	100.0	M20x1,5	18.5	62.5	42	26	6.5	30	310
R3559.L016	Left	15	73.5	M20x1,5	18.5	36	42	26	6.5	30	273
R3559.L017	Left	17	105.0	M20x1,5	21.0	62.5	48	26	7.0	36	401
R3559.L018	Left	17	78.5	M20x1,5	21.0	36	48	26	7.0	36	354
R3559.L020	Left	20	117.0	M24x1,5	24.0	68.5	56	30	5.5	41	587
R3559.L021	Left	20	89.5	M24x1,5	24.0	41	56	30	5.5	41	519

Heavy-Duty Rod Ends - Male

with integral ball bearing

Order No.	l_4	l_5	w_1	w_2	Calc. factor Y	Calc. factor Y_0	Dyn. load C kN max.	Speed rpm max.	Static load C_0 kN max.
R3559.R006	2.5	1.5	14	10	1.28	1.34	2.44	1300	0.76
R3559.R007	2.5	1.5	14	10	1.28	1.34	2.44	1300	0.76
R3559.R008	2.5	2.0	15	10	1.9	1.81	2.60	1225	0.98
R3559.R009	2.5	2.0	15	10	1.9	1.81	2.60	1225	0.98
R3559.R010	2.5	2.5	20	14	1.69	1.77	5.12	1100	1.90
R3559.R011	2.5	2.5	20	14	1.69	1.77	5.12	1100	1.90
R3559.R012	2.5	3.0	20	14	1.81	1.90	5.34	1050	2.06
R3559.R013	2.5	3.0	20	14	1.81	1.90	5.34	1050	2.06
R3559.R015	2.5	3.0	20	14	2.07	2.17	5.48	975	3.27
R3559.R016	2.5	3.0	20	14	2.07	2.17	5.48	975	3.27
R3559.R017	2.5	3.5	22	16	2.35	2.46	5.57	875	2.68
R3559.R018	2.5	3.5	22	16	2.35	2.46	5.57	875	2.68
R3559.R020	3.0	3.5	24	18	2.76	2.90	6.16	775	3.14
R3559.R021	3.0	3.5	24	18	2.76	2.90	6.16	775	3.14
R3559.L006	2.5	1.5	14	10	1.28	1.34	2.44	1300	0.76
R3559.L007	2.5	1.5	14	10	1.28	1.34	2.44	1300	0.76
R3559.L008	2.5	2.0	15	10	1.9	1.81	2.60	1225	0.98
R3559.L009	2.5	2.0	15	10	1.9	1.81	2.60	1225	0.98
R3559.L010	2.5	2.5	20	14	1.69	1.77	5.12	1100	1.90
R3559.L011	2.5	2.5	20	14	1.69	1.77	5.12	1100	1.90
R3559.L012	2.5	3.0	20	14	1.81	1.90	5.34	1050	2.06
R3559.L013	2.5	3.0	20	14	1.81	1.90	5.34	1050	2.06
R3559.L015	2.5	3.0	20	14	2.07	2.17	5.48	975	3.27
R3559.L016	2.5	3.0	20	14	2.07	2.17	5.48	975	2.68
R3559.L017	2.5	3.5	22	16	2.35	2.46	5.57	875	2.68
R3559.L018	2.5	3.5	22	16	2.35	2.46	5.57	875	2.68
R3559.L020	3.0	3.5	24	18	2.76	2.90	6.16	775	3.14
R3559.L021	3.0	3.5	24	18	2.76	2.90	6.16	775	3.14



R3561

Material
Rod end housing - forged steel, tempered, case hardened bearing race, ground and lapped, surface galvanized.
Inner ring - ball bearing steel, hardened, superfine ground.
Lubrication - calcium-complex-soap-grease, temp. range -20°C to +120°C, lubrication nipple - DIN 71412 HZ.

Technical Notes
Low maintenance. Sizes according to DIN ISO 12240-4, series K, for tolerances see technical pages.

Tips
Standard thread is right hand thread.

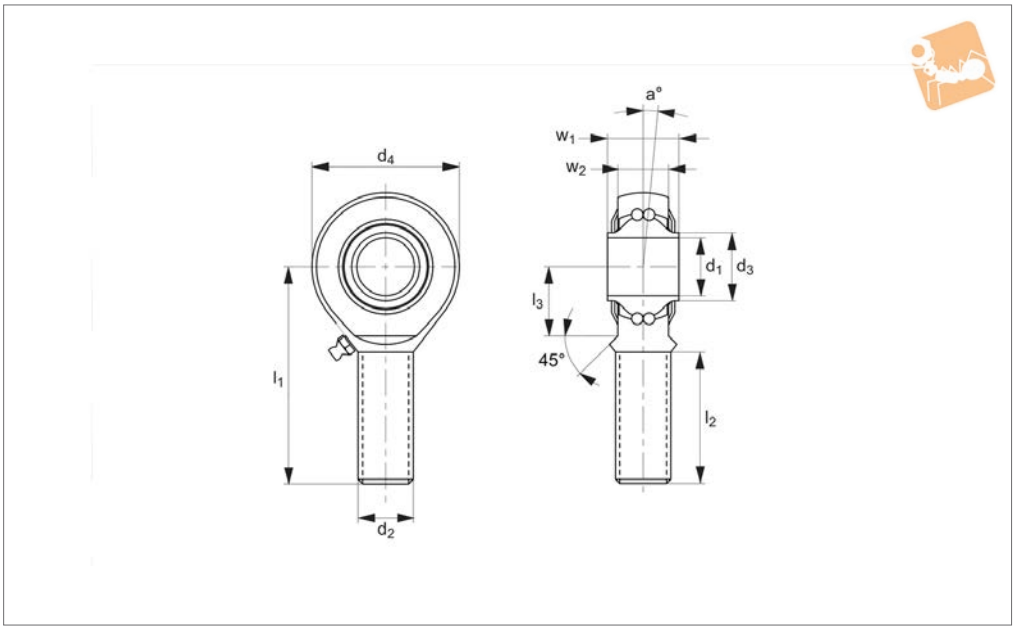
Important Notes
*Denotes fine pitch thread.

Order No.	Thread hand	d_1	l_1	d_2	d_3	l_2	d_4	a °	Weight g
R3561.R012	Right	12	54	M12	14.5	33	32	7.5	88
R3561.R016	Right	16	66	M16	19.0	40	42	7.0	185
R3561.R020	Right	20	78	M20x1,5*	24.5	47	50	7.0	340
R3561.R025	Right	25	94	M24x2*	29.5	57	64	5.0	596
R3561.R030	Right	30	110	M30x2*	34.5	66	70	7.5	912
R3561.L012	Left	12	54	M12	14.5	33	32	7.5	88
R3561.L016	Left	16	66	M16	19.0	40	42	7.0	185
R3561.L020	Left	20	78	M20x1,5*	24.5	47	50	7.0	340
R3561.L025	Left	25	94	M24x2*	29.5	57	64	5.0	596
R3561.L030	Left	30	110	M30x2*	34.5	66	70	7.5	912

Order No.	l_3	w_1	w_2	Dyn. load C kN max.	Speed rpm max.	Static load C_0 kN max.
R3561.R012	19	16	12	10.25	1125	6.6
R3561.R016	22	21	15	13.3	975	8.9
R3561.R020	28	25	18	17.0	825	11.7
R3561.R025	30	31	22	24.90	600	18.5
R3561.R030	35	37	25	32.5	450	24.8
R3561.L012	19	16	12	10.25	1125	6.6
R3561.L016	22	21	15	13.3	975	8.9
R3561.L020	28	25	18	17.0	825	11.7
R3561.L025	30	31	22	24.9	600	18.5
R3561.L030	35	37	25	32.5	450	24.8

Stainless Heavy-Duty Rod Ends - Male
with integral ball bearing

R3563



Material
Housing - stainless steel (AISI 304), forged, hardened bearing race, superfinished, rolled thread.
Inner ring - stainless steel (AISI 304), hardened, superfine finish.
Lubrication - aluminium-complex-soap-grease, temp range -45°C to +120°C.

Lubrication nipple - DIN 3405 D1/A (until size 10) DIN 71412 H1 (from size 12).

Technical Notes
Low maintenance, sizes according to DIN ISO 12240-4 series K, for tolerances see technical pages.

Tips
Standard thread is right hand thread.

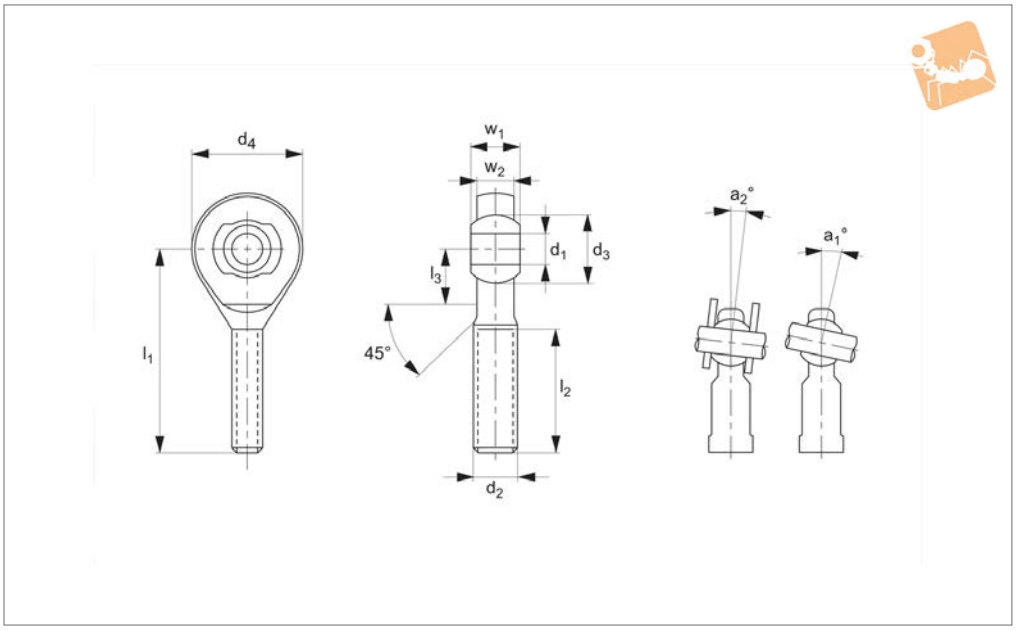
Important Notes
*Denotes fine pitch thread.

Order No.	Thread hand	d_1	l_1	d_2	d_3	l_2	d_4	a °	l_3	w_1	Weight g
R3563.R008	Right	8	42	M8	10.5	25	24	8.5	15	12	36
R3563.R010	Right	10	48	M10	12.0	29	28	8.0	15	14	60
R3563.R012	Right	12	54	M12	14.5	33	32	7.5	19	16	87
R3563.R016	Right	16	66	M16	19.0	40	42	8.0	22	21	190
R3563.R020	Right	20	78	M20x1,5*	24.5	47	50	7.0	28	25	338
R3563.L008	Left	8	42	M8	10.5	25	24	8.5	15	12	36
R3563.L010	Left	10	48	M10	12.0	29	28	8.0	15	14	60
R3563.L012	Left	12	54	M12	14.5	33	32	7.5	19	16	87
R3563.L016	Left	16	66	M16	19.0	40	42	8.0	22	21	190
R3563.L020	Left	20	78	M20x1,5*	24.5	47	50	7.0	28	25	338

Order No.	w_2	Calc. factor Y	Calc. factor Y_0	Dyn. load C kN max.	Speed rpm max.	Static load C_0 kN max.
R3563.R008	9.00	1.89	1.80	0.7	1300	2.8
R3563.R010	10.50	1.81	1.90	1.0	1225	3.1
R3563.R012	12.00	1.82	1.74	1.3	1125	3.5
R3563.R016	15.00	2.35	2.24	1.6	975	4.3
R3563.R020	18.00	2.58	2.46	2.3	825	5.4
R3563.L008	9.00	1.89	1.80	0.7	1300	2.8
R3563.L010	10.50	1.81	1.90	1.0	1225	3.1
R3563.L012	12.00	1.82	1.74	1.3	1125	3.5
R3563.L016	15.00	2.35	2.24	1.6	975	4.3
R3563.L020	18.00	2.58	2.46	2.3	825	5.4

Stainless Heavy-Duty Rod Ends - Male

with integral spherical plain bearing



R3565

Material

Rod end housing: Stainless steel DIN 1.4301 (AISI 304), forged, rolled thread
Joint ball: Stainless steel 1.4412, hardened and ground, surface polished.
Race: Nylon/Teflon/glass compound.

Technical Notes

Maintenance free, for tolerances see technical page 123, standard thread is right hand thread.

Tips

A2 stainless steel provides good corrosion resistance to a wide range of atmospheric conditions and corrosive media.
It is considered resistant to potable water.

Important Notes

*Denotes fine pitch thread.

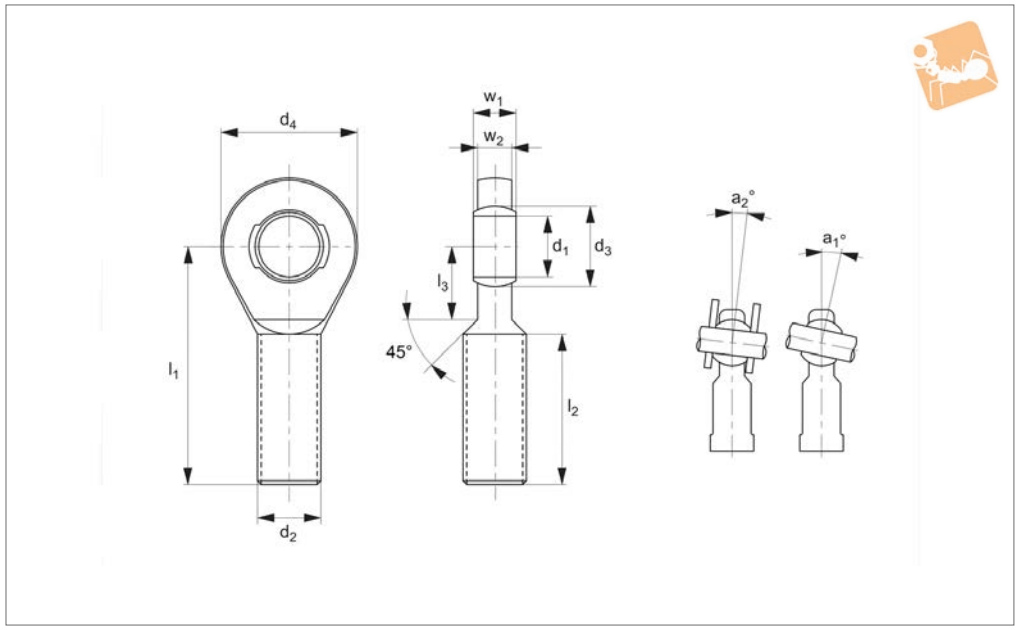
Order No.	Thread hand	d_1	l_1	d_2	d_3	l_2	d_4	a_1 °	Weight g
R3565.R005	Right	5	33	M5	11.11	20	18	13.0	14
R3565.R006	Right	6	36	M6	12.70	22	20	13.0	20
R3565.R008	Right	8	42	M8	15.87	25	24	14.5	38
R3565.R010	Right	10	48	M10	19.05	29	28	13.5	60
R3565.R012	Right	12	54	M12	22.22	33	32	13.0	92
R3565.R014	Right	14	60	M14	25.40	36	36	16.0	127
R3565.R016	Right	16	66	M16	28.57	40	42	15.5	202
R3565.R018	Right	18	72	M18x1,5*	31.75	44	46	15.0	250
R3565.R020	Right	20	78	M20x1,5*	34.92	47	50	14.5	327
R3565.R022	Right	22	84	M22x1,5*	38.10	51	54	15.5	440
R3565.R025	Right	25	94	M24x2*	42.85	57	60	15.0	630
R3565.R030	Right	30	110	M30x2*	50.80	66	70	17.0	1015
R3565.L005	Left	5	33	M5	11.11	20	18	13.0	14
R3565.L006	Left	6	36	M6	12.70	22	20	13.0	20
R3565.L008	Left	8	42	M8	15.87	25	24	14.5	38
R3565.L010	Left	10	48	M10	19.05	29	28	13.5	60
R3565.L012	Left	12	54	M12	22.22	33	32	13.0	92
R3565.L014	Left	14	60	M14	25.40	36	36	16.0	127
R3565.L016	Left	16	66	M16	28.57	40	42	15.5	202
R3565.L018	Left	18	72	M18x1,5*	31.75	44	46	15.0	250
R3565.L020	Left	20	78	M20x1,5*	34.92	47	50	14.5	327
R3565.L022	Left	22	84	M22x1,5*	38.10	51	54	15.5	440
R3565.L025	Left	25	94	M24x2*	42.85	57	60	15.0	630
R3565.L030	Left	30	110	M30x2*	50.80	66	70	17.0	1015

Order No.	a_2 °	l_3	w_1	w_2	Dyn. load C kN max.	Static load C_0 kN max.
R3565.R005	7.5	9	8	6.00	3.9	3.9

Stainless Heavy-Duty Rod Ends - Male

with integral spherical plain bearing

Order No.	a_2 °	l_3	w_1	w_2	Dyn. load C kN max.	Static load C_0 kN max.
R3565.R006	6.5	12	9	6.75	4.6	5.4
R3565.R008	7.5	15	12	9.00	7.0	9.7
R3565.R010	8.0	15	14	10.50	10.4	15.4
R3565.R012	8.0	19	16	12.00	12.4	22.3
R3565.R014	9.5	20	19	13.50	15.4	30.4
R3565.R016	8.5	22	21	15.00	22.4	41.5
R3565.R018	9.5	25	23	16.50	26.3	51.2
R3565.R020	9.0	28	25	18.00	30.8	60.3
R3565.R022	10.0	26	28	20.00	38.2	70.0
R3565.R025	10.0	30	31	22.00	45.4	87.0
R3565.R030	10.5	35	37	25.00	55.0	106.8
R3565.L005	7.5	9	8	6.00	3.9	3.9
R3565.L006	6.5	12	9	6.75	4.6	5.4
R3565.L008	7.5	15	12	9.00	7.0	9.7
R3565.L010	8.0	15	14	10.50	10.4	15.4
R3565.L012	8.0	19	16	12.00	12.4	22.3
R3565.L014	9.5	20	19	13.50	15.4	30.4
R3565.L016	8.5	22	21	15.00	22.4	41.5
R3565.L018	9.5	25	23	16.50	26.3	51.2
R3565.L020	9.0	28	25	18.00	30.8	60.3
R3565.L022	10.0	26	28	20.00	38.2	70.0
R3565.L025	10.0	30	31	22.00	45.4	87.0
R3565.L030	10.5	35	37	25.00	55.0	106.8



R3567

Material
Housing - stainless steel DIN 1.4301 (AISI 304), forged, rolled thread.
Joint ball - stainless steel DIN 1.4125 (AISI 440C), hardened and ground, polished
Race - polyamid-PTFE-fibreglass-compound.

Technical Notes
Maintenance free, sizes according to DIN ISO 12240-4, series E, for tolerances technical pages.

Tips
Standard thread is right hand thread.

Important Notes
*denotes fine pitch thread.

Order No.	Thread hand	d_1	l_1	d_2	d_3	l_2	d_4	Weight g
R3567.R006	Right	6	36	M6	10.0	22	20	14
R3567.R008	Right	8	42	M8	13.0	25	23	24
R3567.R010	Right	10	48	M10	16.0	29	28	41
R3567.R012	Right	12	54	M12	18.0	33	32	67
R3567.R015	Right	15	63	M14	22.0	33	38	110
R3567.R017	Right	17	69	M16	25.0	40	44	163
R3567.R020	Right	24	78	M20x1,5*	29.0	47	51	270
R3567.R025	Right	25	94	M24x2*	35.5	57	62	508
R3567.R030	Right	30	110	M30x2*	40.7	66	70	785
R3567.R035	Right	35	140	M36x3*	47.0	92	82	1330
R3567.R040	Right	40	145	M42x3*	53.0	94	92	1890
R3567.R041	Right	40	150	M39x3*	53.0	99	92	1785
R3567.R045	Right	45	165	M45x3*	60.0	100	102	2620
R3567.R046	Right	45	163	M42x3*	60.0	98	102	2430
R3567.R050	Right	50	195	M52x3*	66.0	120	112	3865
R3567.R051	Right	50	185	M45x3*	66.0	110	112	3225
R3567.R060	Right	60	225	M60x4*	80.0	140	135	6400
R3567.R061	Right	60	210	M52x3*	80.0	125	135	5430
R3567.L006	Left	6	36	M6	10.0	22	20	14
R3567.L008	Left	8	42	M8	13.0	25	23	24
R3567.L010	Left	10	48	M10	16.0	29	28	41
R3567.L012	Left	12	54	M12	18.0	33	32	67
R3567.L015	Left	15	63	M14	22.0	33	38	110
R3567.L017	Left	17	69	M16	25.0	40	44	163
R3567.L020	Left	20	78	M20x1,5*	29.0	47	51	270
R3567.L025	Left	25	94	M24x2*	35.5	57	62	508
R3567.L030	Left	30	110	M30x2*	40.7	66	70	785
R3567.L035	Left	35	140	M36x3*	47.0	92	82	1330
R3567.L040	Left	40	145	M42x3*	53.0	94	92	1890
R3567.L041	Left	40	150	M39x3*	53.0	99	92	1785
R3567.L045	Left	45	165	M45x3*	60.0	100	102	2620
R3567.L046	Left	45	163	M42x3*	60.0	98	102	2430

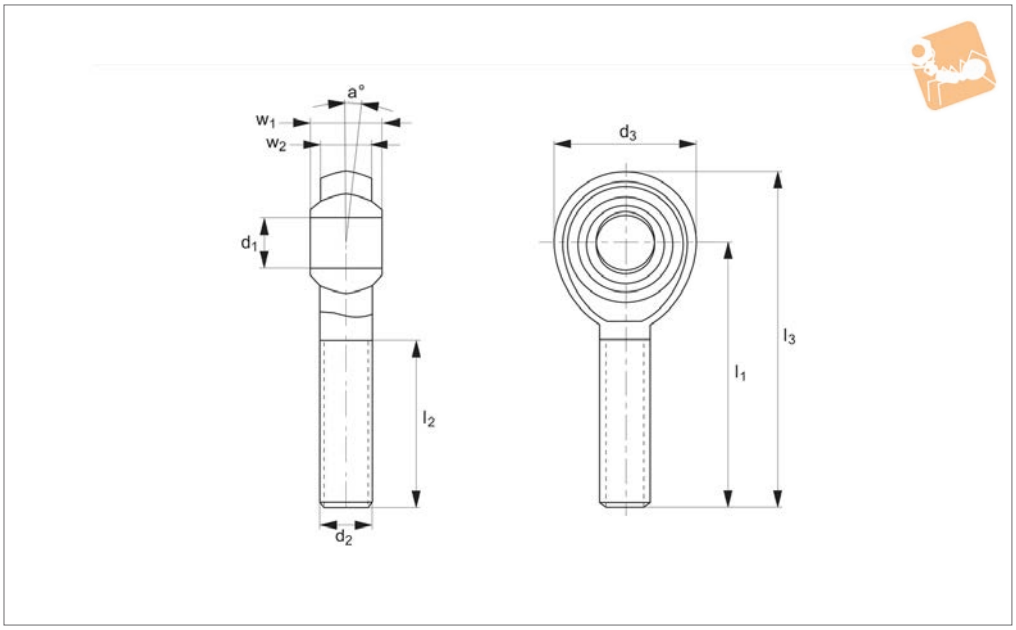
Stainless Heavy-Duty Rod Ends - Male

with integral spherical plain bearing

Order No.	Thread hand	d_1	l_1	d_2	d_3	l_2	d_4	Weight g
R3567.L050	Left	50	195	M52x3*	66.0	120	112	3865
R3567.L051	Left	50	185	M45x3*	66.0	110	112	3225
R3567.L060	Left	60	225	M60x4*	80.0	140	135	6400
R3567.L061	Left	60	210	M52x3*	80.0	125	135	5430

Order No.	a °	l_3	w_1	w_2	Dyn. load C kN max.	Static load C_0 kN max.
R3567.R006	13.0	11	6	4	2.5	3.0
R3567.R008	15.0	12	8	5	4.2	5.0
R3567.R010	12.0	15	9	6	6.4	7.6
R3567.R012	10.5	15	10	7	9.2	10.4
R3567.R015	8.5	18	12	9	13.4	17.6
R3567.R017	10.0	23	14	10	19.2	24.3
R3567.R020	9.0	25	16	12	25.2	34.5
R3567.R025	7.5	32	20	16	42.4	53.6
R3567.R030	6.0	35	22	18	54.0	63.8
R3567.R035	6.5	38	25	20	70.4	81.4
R3567.R040	7.0	42	28	22	86.0	100.2
R3567.R041	7.0	42	28	22	86.0	100.2
R3567.R045	7.5	50	32	25	107.0	124.3
R3567.R046	7.5	50	32	25	107.0	124.3
R3567.R050	6.5	60	35	28	132.0	152.6
R3567.R051	6.5	60	35	28	132.0	152.6
R3567.R060	6.5	70	44	36	208.0	239.5
R3567.R061	6.5	70	44	36	208.0	239.5
R3567.L006	13.0	11	6	4	2.5	3.0
R3567.L008	15.0	12	8	5	4.2	5.0
R3567.L010	12.0	15	9	6	6.4	7.6
R3567.L012	10.5	15	10	7	9.2	10.4
R3567.L015	8.5	18	12	9	13.4	17.8
R3567.L017	10.0	23	14	10	19.2	24.3
R3567.L020	9.0	25	16	12	25.2	34.5
R3567.L025	7.5	32	20	16	42.4	53.6
R3567.L030	6.0	35	22	18	54.0	63.8
R3567.L035	6.5	38	25	20	70.4	81.4
R3567.L040	7.0	42	28	22	86.0	100.2
R3567.L041	7.0	42	28	22	86.0	100.2
R3567.L045	7.5	50	32	25	107.0	124.3
R3567.L046	7.5	50	32	25	107.0	124.3
R3567.L050	6.5	60	35	28	132.0	152.6
R3567.L051	6.5	60	35	28	132.0	152.6
R3567.L060	6.5	70	44	36	208.0	239.5
R3567.L061	6.5	70	44	36	208.0	239.5

Low Cost Rod End - Male
with teflon bearing race



R3571

Material
Ball: low carbon steel, surface hardened. Silver zinc plated.
Housing: low carbon steel, zinc plated for corrosion resistance.
Bearing race: teflon.
Brass bearing with PTFE composite lining.

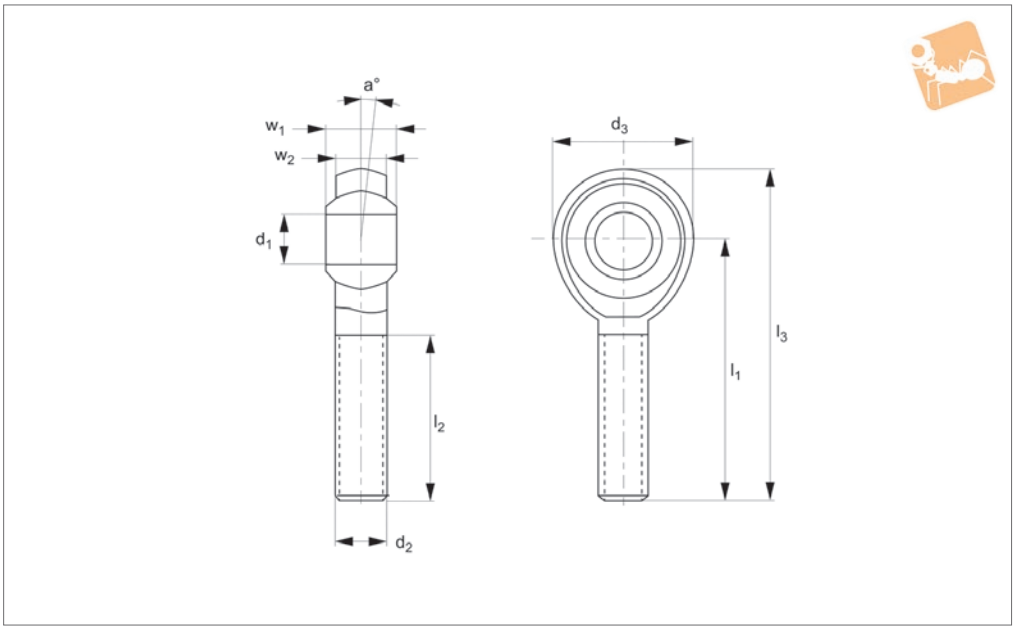
Technical Notes
Standard thread is right hand thread.

Order No.	Thread hand	d_1 tol. H7	l_1	d_2	d_3	l_2	a °	l_3	w_1	w_2	Static load C_0 kN max.
R3571.R005	Right	5	33	M5	18	19	13	42	8	6.00	4.8
R3571.R006	Right	6	36	M6	20	21	13	46	9	6.75	6.2
R3571.R008	Right	8	42	M8	24	25	14	54	12	9.00	10.3
R3571.R010	Right	10	48	M10	28	28	13	62	14	10.50	14.4
R3571.R012	Right	12	54	M12	32	32	13	70	16	12.00	19.2
R3571.R016	Right	16	66	M16	42	37	15	87	21	15.00	31.2
R3571.L005	Left	5	33	M5	18	19	13	42	8	6.00	3.9
R3571.L006	Left	6	36	M6	20	21	13	46	9	6.75	6.0
R3571.L008	Left	8	42	M8	24	25	14	54	12	9.00	10.0
R3571.L010	Left	10	48	M10	28	28	13	62	14	10.50	16.0
R3571.L012	Left	12	54	M12	32	32	13	70	16	12.00	23.0
R3571.L016	Left	16	66	M16	42	37	15	87	21	15.00	44.0

Low Cost Rod End - Male

with teflon bearing race

R3572.M



Material

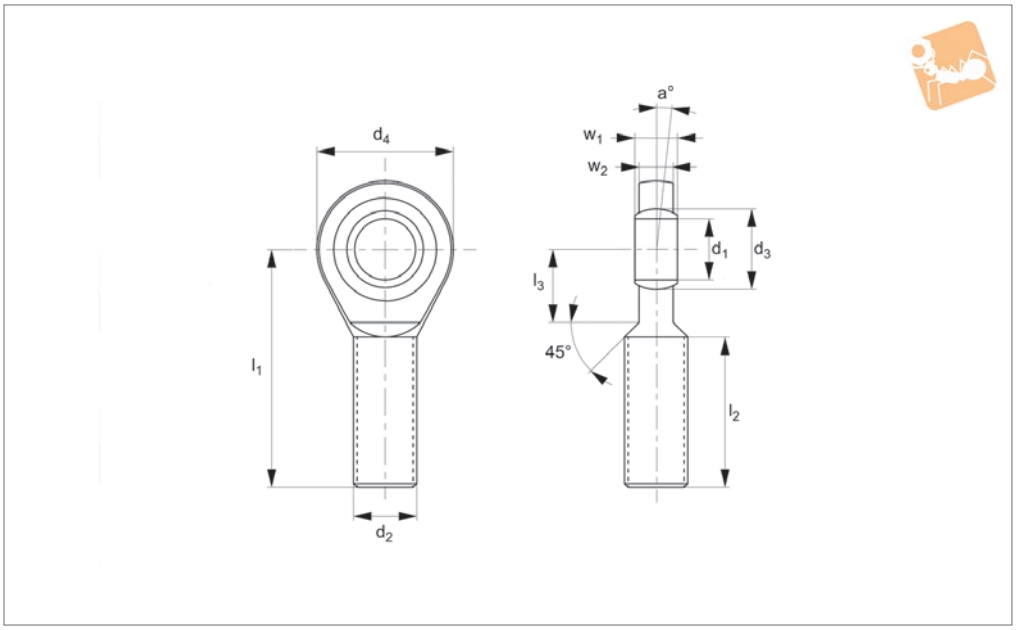
Ball: low carbon steel, surface hardened.
Silver zinc plated.
Housing: low carbon steel, zinc plated for corrosion resistance.

Technical Notes

Standard thread is right hand thread.

Order No.	Thread hand	d_1 tol. H7	l_1	d_2	d_3	l_2	a °	l_3	w_1	w_2	Static load C_0 kN max.
R3572.MR005	Right	5	33	M 5	16	20	13	41	8	6.0	4.6
R3572.MR006	Right	6	36	M 6	18	22	13	45	9	6.75	5.8
R3572.MR008	Right	8	42	M 8	22	25	14	53	12	9.0	9.3
R3572.MR010	Right	10	48	M10	26	29	13	61	14	10.5	11.6
R3572.MR012	Right	12	54	M12	30	33	13	69	16	12.0	13.6
R3572.MR013	Right	12	54	M12x1,25	30	33	13	69	16	12.0	13.6
R3572.MR014	Right	14	60	M14	34	36	16	77	19	13.5	19.2
R3572.MR016	Right	16	66	M16	40	40	15	86	21	15.0	22.8
R3572.MR017	Right	16	66	M16x1,5	40	40	15	86	21	15.0	22.8
R3572.MR018	Right	18	72	M18x1,5	44	44	15	94	23	16.5	34.0
R3572.MR020	Right	20	78	M20x1,5	50	47	14	103	25	18.0	42.0
R3572.MR022	Right	22	84	M22x1,5	54	51	15	111	28	20.0	45.6
R3572.MR025	Right	25	94	M25x2	60	57	15	124	31	22.0	54.4
R3572.MR030	Right	30	110	M30x2	70	66	17	145	37	25.0	70.4

Low Cost Rod End - Male
with integral spherical plain bearing



R3573

Material
Housing: Heat treated steel, surface galvanized, free of Cr VI. Outer ring: heat treated steel, hardened, single split, bonded with PTFE fabric. Joint Ball: Ball bearing steel, hardened, ground, polished up to size 12, hard chromium plated.

Technical Notes
For tolerances see technical pages.
Standard thread is right hand thread.

Series E,
Maintenance free

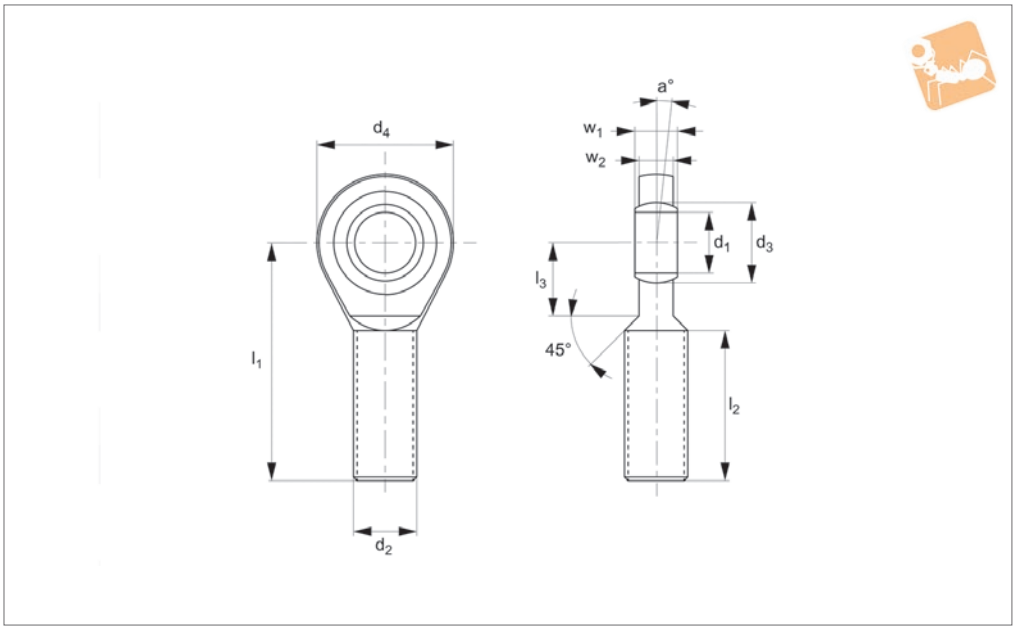
Important Notes
*Denotes fine pitch thread.

Order No.	Thread hand	d_1	l_1	d_2	d_3	l_2	d_4	a °	l_3	w_1	w_2	Static load C_0 kN max.	Weight g
R3573.R006	Right	6	36	M6	10	18	21	13	12	6	4.4	6.6	17
R3573.R008	Right	8	42	M8	13	22	24	15	14	8	6	10.3	29
R3573.R010	Right	10	48	M10	16	26	29	12	15	9	7	14.1	51
R3573.R012	Right	12	54	M12	18	28	34	11	18	10	8	19.6	86
R3573.R015	Right	15	63	M14	22	34	40	8	20	12	10	28.8	140
R3573.R017	Right	17	69	M16	25	36	46	10	23	14	11	36.0	190
R3573.R020	Right	20	78	M20x1,5*	29	43	53	9	27	16	13	48.0	310
R3573.R025	Right	25	94	M24x2*	35.5	53	64	7	32	20	17	66.4	560
R3573.R030	Right	30	110	M30x2*	40.7	65	73	6	37	22	19	88	890
R3573.R035	Right	35	140	M36x3*	47	82	82	6	42	25	21	116.8	1400
R3573.R040	Right	40	150	M39x3*	53	86	92	7	48	28	23	144	1800
R3573.R041	Right	40	150	M42x3*	53	86	92	7	48	28	23	144	1850
R3573.R045	Right	45	163	M42x3*	60	94	102	7	52	32	94	192	2600
R3573.R046	Right	45	163	M45x3*	60	94	102	7	52	32	27	192	2660
R3573.R050	Right	50	185	M45x3*	66	107	112	6	60	35	30	232	3400
R3573.R051	Right	50	185	M52x3*	66	107	112	6	60	35	30	232	3500
R3573.R060	Right	60	210	M52x3*	80	115	135	6	75	44	38	360	5900
R3573.R061	Right	60	210	M60x4*	80	115	135	6	75	44	38	360	6020
R3573.R070	Right	70	235	M56x4*	92	125	160	6	87	49	42	488	8200
R3573.R071	Right	70	235	M72x4*	92	125	160	6	87	49	42	488	8380
R3573.R080	Right	80	270	M64x4*	105	140	180	6	100	55	47	600	12000
R3573.R081	Right	80	270	M80x4*	105	140	180	6	100	55	47	600	12200
R3573.L006	Left	6	36	M6	10	18	21	13	12	6	4.4	6.6	17
R3573.L008	Left	8	42	M8	13	22	24	15	14	8	6	10.3	29
R3573.L010	Left	10	48	M10	16	26	29	12	15	9	7	14.1	51
R3573.L012	Left	12	54	M12	18	28	34	11	18	10	8	19.6	86
R3573.L015	Left	15	63	M14	22	34	40	8	20	12	10	28.8	140
R3573.L017	Left	17	69	M16	25	36	46	10	23	14	11	36.0	190
R3573.L020	Left	20	78	M20x1,5*	29	43	53	9	27	16	13	48.0	310
R3573.L025	Left	25	94	M24x2*	35.5	53	64	7	32	20	17	66.4	560
R3573.L030	Left	30	110	M30x2*	40.7	65	73	6	37	22	19	88	890

Low Cost Rod End - Male

with integral spherical plain bearing

Order No.	Thread hand	d_1	l_1	d_2	d_3	l_2	d_4	a °	l_3	w_1	w_2	Static load C_0 kN max.	Weight g
R3573.L035	Left	35	140	M36x3*	47	82	82	6	42	25	21	116.8	1400
R3573.L040	Left	40	150	M39x3*	53	86	92	7	48	28	23	144	1800
R3573.L041	Left	40	150	M42x3*	53	86	92	7	48	28	23	144	1850
R3573.L045	Left	45	163	M42x3*	60	94	102	7	52	32	94	192	2600
R3573.L046	Left	45	163	M45x3*	60	94	102	7	52	32	27	192	2660
R3573.L050	Left	50	185	M45x3*	66	107	112	6	60	35	30	232	3400
R3573.L051	Left	50	185	M52x3*	66	107	112	6	60	35	30	232	3500
R3573.L060	Left	60	210	M52x3*	80	115	135	6	75	44	38	360	5900
R3573.L061	Left	60	210	M60x4*	80	115	135	6	75	44	38	360	6020
R3573.L070	Left	70	235	M56x4*	92	125	160	6	87	49	42	488	8200
R3573.L071	Left	70	235	M72x4*	92	125	160	6	87	49	42	488	8380
R3573.L080	Left	80	270	M64x4*	105	140	180	6	100	55	47	600	12000
R3573.L081	Left	80	270	M80x4*	105	140	180	6	100	55	47	600	12200



R3575.M

Material
Housing: Heat treated steel, surface galvanized, free of Cr VI. Outer ring: heat treated steel,
hardened, single split, bonded with PTFE fabric.

Joint Ball: Ball bearing steel, hardened, ground, polished up to size 12, hard chromium plated.

Technical Notes
For tolerances see technical pages, maintenance required.

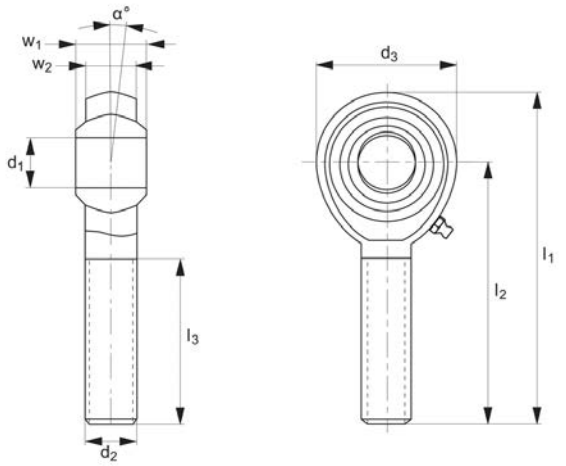
Tips
Standard thread is right hand thread.

Important Notes
*Denotes fine pitch thread.

Order No.	Thread hand	Type	d_1 tol. H7	l_1	d_2	d_3	l_2	d_4	a °	l_3	w_1	w_2	Static load C_0 kN max.	Weight g
R3575.MR006	Right	Male	6	36	M 6	10	18	21	13	12	6	4.4	6.6	17
R3575.MR008	Right	Male	8	42	M 8	13	22	24	15	14	8	6	10.3	29
R3575.MR010	Right	Male	10	48	M10	16	26	29	12	15	9	7	14.1	51
R3575.MR012	Right	Male	12	54	M12	18	28	34	11	18	10	8	19.6	86
R3575.MR015	Right	Male	15	63	M14	22	34	40	8	20	12	10	28.8	140
R3575.MR017	Right	Male	17	69	M16	25	36	46	10	23	14	11	36.0	190
R3575.MR020	Right	Male	20	78	M20x1,5*	29	43	53	9	27	16	13	48.0	310
R3575.MR025	Right	Male	25	94	M24x2*	35.5	53	64	7	32	20	17	66.4	560
R3575.MR030	Right	Male	30	110	M30x2*	40.7	65	73	6	37	22	19	88	890
R3575.MR035	Right	Male	35	140	M36x3*	47	82	82	6	42	25	21	116.8	1400
R3575.MR040	Right	Male	40	150	M39x3*	53	86	92	7	48	28	23	144	1800
R3575.MR041	Right	Male	40	150	M42x3*	53	86	92	7	48	28	23	144	1850
R3575.MR045	Right	Male	45	163	M42x3*	60	94	102	7	52	32	27	192	2600
R3575.MR046	Right	Male	45	163	M45x3*	60	94	102	7	52	32	27	192	2660
R3575M.R050	Right	Male	50	185	M45x3*	66	107	112	6	60	35	30	232	3400
R3575.MR051	Right	Male	50	185	M52x3*	66	107	112	6	60	35	30	232	3500
R3575.MR060	Right	Male	60	210	M52x3*	80	115	135	6	75	44	38	360	5900
R3575.MR061	Right	Male	60	210	M60x4*	80	115	135	6	75	44	38	360	6020
R3575.MR070	Right	Male	70	235	M56x4*	92	125	160	6	87	49	42	488	8200
R3575.MR071	Right	Male	70	235	M72x4*	92	125	160	6	87	49	42	488	8380
R3575.MR080	Right	Male	80	270	M64x4*	105	140	180	6	100	55	47	600	12000
R3575.MR081	Right	Male	80	270	M80x4*	105	140	180	6	100	55	47	600	12200

Stainless Low Cost Rod Ends
Male

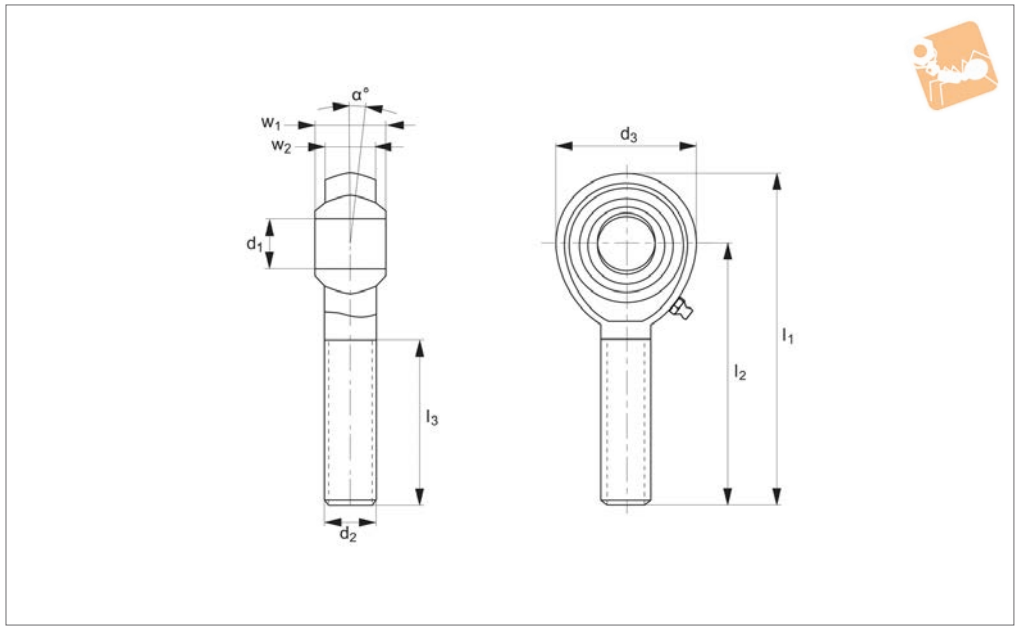
R3577.A2



Material
Housing: stainless steel (AISI 303)
Ball: stainless steel, hardened, ground and polished.
Race: teflon or PTFE liner.
Stainless steel bearing ring lined with bronze and PTFE Composite

Technical Notes
Standard thread is right hand thread.

Order No.	Thread hand	d_1 tol. H7	l_1	d_2	d_3	l_2	a °	l_3	w_1	w_2	Static load kN max.	Weight g
R3577.R005-A2	Right	5	42	M5	18	33	13	19	8	6	4.8	13
R3577.R006-A2	Right	6	46	M6	20	36	13	21	9	6.75	6.2	20
R3577.R008-A2	Right	8	54	M8	24	42	14	25	12	9	10.3	38
R3577.R010-A2	Right	10	62	M10	28	48	13	28	14	10.50	14.4	55
R3577.R012-A2	Right	12	70	M12	32	54	13	32	16	12	19.2	85
R3577.R016-A2	Right	16	87	M16	42	66	15	37	21	15	31.2	210
R3577.L005-A2	Left	5	42	M5	18	33	13	19	8	6	4.8	13
R3577.L006-A2	Left	6	46	M6	20	36	13	21	9	6.75	5.2	20
R3577.L008-A2	Left	8	54	M8	24	42	14	25	12	9	7.0	38
R3577.L010-A2	Left	10	62	M10	28	48	13	28	14	10.50	10.4	55
R3577.L012-A2	Left	12	70	M12	32	54	13	32	16	12	13.0	85
R3577.L016-A2	Left	16	87	M16	42	66	15	37	21	15	31.2	210



R3577.A4

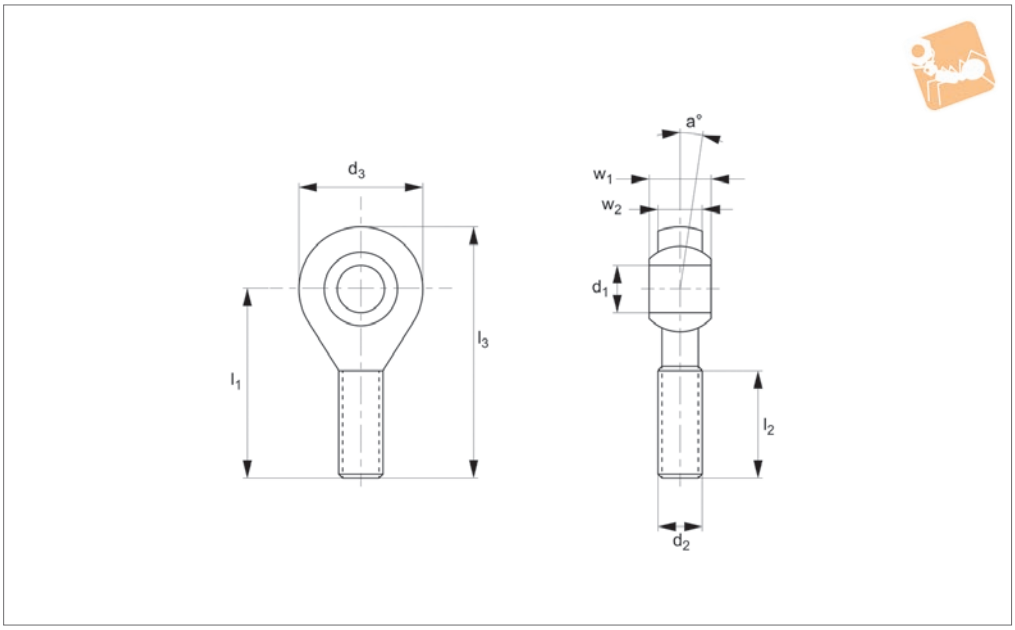
Material
Housing: stainless steel (AISI 316)
Ball: stainless steel, 1,4571
Race: PTFE liner.

Technical Notes
Standard thread is right hand thread.

Order No.	Thread hand	d_1 tol. H7	l_1	d_2	d_3	l_2	l_3	w_1	w_2	α	Static load kN max.
R3577.R005-A4	Right	5	42	M 5	18	33	19	8	6.00	13	4.8
R3577.R006-A4	Right	6	46	M 6	20	36	21	9	6.75	13	6.2
R3577.R008-A4	Right	8	54	M 8	24	42	25	12	9.00	14	10.3
R3577.R010-A4	Right	10	62	M10	28	48	28	14	10.50	13	14.4
R3577.R012-A4	Right	12	70	M12	32	54	32	16	12.00	13	19.2
R3577.R016-A4	Right	16	87	M16	42	66	37	21	15.00	15	31.2
R3577.L005-A4	Left	5	42	M 5	18	33	19	8	6.00	13	4.8
R3577.L006-A4	Left	6	46	M 6	20	36	21	9	6.75	13	5.2
R3577.L008-A4	Left	8	54	M 8	24	42	25	12	9.00	14	7.0
R3577.L010-A4	Left	10	62	M10	28	48	28	14	10.50	13	10.4
R3577.L012-A4	Left	12	70	M12	32	54	32	16	12.00	13	13.0
R3577.L016-A4	Left	16	87	M16	42	66	37	21	15.00	15	31.2

Plastic Rod End Male

R3580



Material
Housing: Black plastic (Igumid G)
Spherical bearing: Iglidur W300.

Technical Notes
Resistant to dirt and dust, resistant to corrosion and chemicals.

High vibration dampening capacity suitable for rotating, oscillating and linear movements.
Available with a metal sleeve to take a higher torque (Add -MS to part No.)
Standard thread is right hand thread.

Important Notes
Dimensional series K according to standard DIN ISO 12240. *Denotes fine pitch thread.
Short term max axial strength is up to 20 minutes. Any length of time greater than this is considered long term.

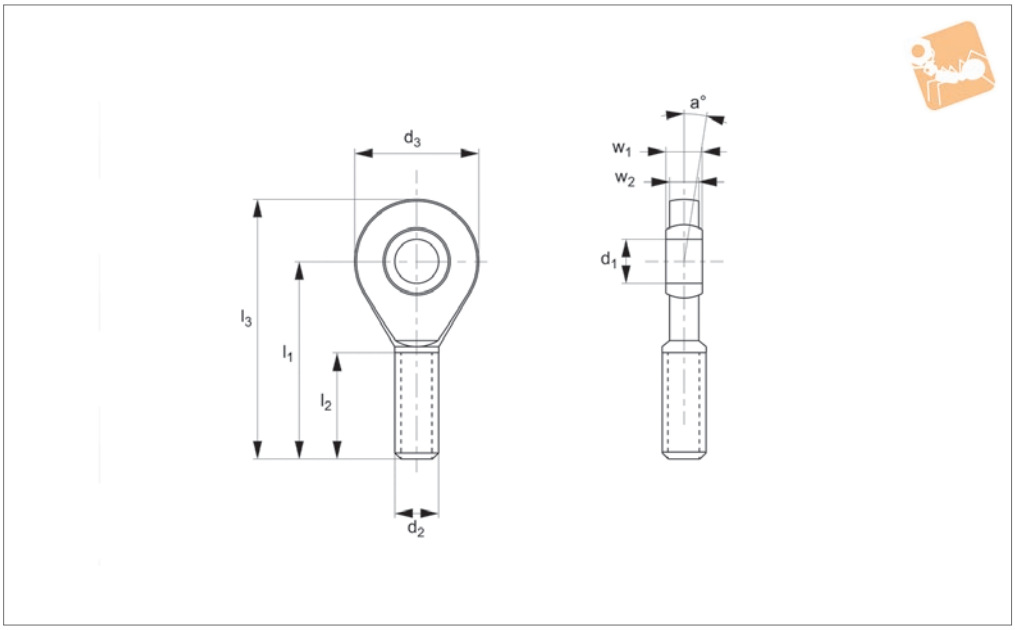
Order No.	Thread hand	d_1 tol. E10	l_1	d_2	d_3	l_2	a °	l_3	w_1	w_2	Radial load (long term) N max.
R3580.R005	Right	5	33	M5	18	19	15	42	8.0	6.0	40
R3580.R006	Right	6	36	M6	20	21	14.5	46	9.0	7.0	50
R3580.R008	Right	8	42	M8	24	25	12.5	55	12.0	9.0	100
R3580.R010	Right	10	48	M10	30	28	12.5	63	14.0	10.5	150
R3580.R011	Right	10	48	M10 x 1,25*	30	28	12.5	63	14.0	10.5	150
R3580.R012	Right	12	54	M12	34	32	12.5	71	16.0	12.0	200
R3580.R013	Right	12	54	M12 x 1,25*	34	32	12.5	71	16.0	12.0	200
R3580.R014	Right	14	61	M14	38	36	12.5	79	19.0	13.5	350
R3580.R016	Right	16	66	M16	42	37	11.5	88	21.0	15.0	400
R3580.R017	Right	16	66	M16 x 1,5*	42	37	11.5	88	21.0	15.0	400
R3580.R018	Right	18	72	M18 x 1,5*	46	41	11.5	96	23.0	16.5	500
R3580.R020	Right	20	78	M20 x 1,5*	50	45	11.5	104	25.0	18.0	650
R3580.R021	Right	20	78	M20 x 2,5	50	45	11.5	104	25.0	18.0	650
R3580.R022	Right	22	84	M22 x 1,5*	56	48	11	112	28.0	20.0	750
R3580.R025	Right	25	95	M24 x 2*	61	55	11	126	31.0	22.0	950
R3580.R030	Right	30	112	M30 x 2*	71	66	11	147	37.0	25.0	1150
R3580.L005	Left	5	33	M5	18	19	15	42	8.0	6.0	40
R3580.L006	Left	6	36	M6	20	21	14.5	46	9.0	7.0	50
R3580.L008	Left	8	42	M8	24	25	12.5	55	12.0	9.0	100
R3580.L010	Left	10	48	M10	30	28	12.5	63	14.0	10.5	150
R3580.L011	Left	10	48	M10 x 1,25*	30	28	12.5	63	14.0	10.5	150
R3580.L012	Left	12	54	M12	34	32	12.5	71	16.0	12.0	200
R3580.L013	Left	12	54	M12 x 1,25*	34	32	12.5	71	16.0	12.0	200
R3580.L014	Left	14	61	M14	38	36	12.5	79	19.0	13.5	350
R3580.L016	Left	16	66	M16	42	37	11.5	88	21.0	15.0	400
R3580.L017	Left	16	66	M16 x 1,5*	42	37	11.5	88	21.0	15.0	400
R3580.L018	Left	18	72	M18 x 1,5*	46	41	11.5	96	23.0	16.5	500
R3580.L020	Left	20	78	M20 x 1,5*	50	45	11.5	104	25.0	18.0	650
R3580.L021	Left	20	78	M20 x 2,5	50	45	11.5	104	25.0	18.0	650
R3580.L022	Left	22	84	M22 x 1,5*	56	48	11	112	28.0	20.0	750

Order No.	Thread hand	d_1 tol. E10	l_1	d_2	d_3	l_2	a °	l_3	w_1	w_2	Radial load (long term) N max.
R3580.L025	Left	25	95	M24 x 2*	61	55	11	126	31.0	22.0	950
R3580.L030	Left	30	112	M30 x 2*	71	66	11	147	37.0	25.0	1150

Order No.	Radial load (short term) N max.	Static strength (long term) N max.	Static strength (short term) N max.	Thread depth min.	Torque thread strength Nm max.	Torque through ball MS Nm max.	Torque through ball standard Nm max.
R3580.R005	80	400	800	13	0.4	12	5
R3580.R006	100	500	1000	15	0.5	15	10
R3580.R008	200	850	1700	18	2.0	40	12
R3580.R010	300	1250	2500	20	5.0	50	20
R3580.R011	300	1250	2500	20	3.0	50	20
R3580.R012	400	1350	2700	22	6.0	70	30
R3580.R013	400	1350	2700	22	6.0	70	30
R3580.R014	700	1700	3400	25	12.0	75	35
R3580.R016	800	1950	3900	26	17.0	110	40
R3580.R017	800	1950	3900	26	17.0	110	40
R3580.R018	1000	2100	4200	29	20.0	150	45
R3580.R020	1300	3000	6000	32	25.0	200	55
R3580.R021	1300	3000	6000	32	25.0	200	55
R3580.R022	1500	3600	7200	34	25.0	225	60
R3580.R025	1900	3750	7500	39	45.0	260	65
R3580.R030	2300	4400	8800	46	85.0	300	70
R3580.L005	80	400	800	13	0.4	12	5
R3580.L006	100	500	1000	15	0.5	15	10
R3580.L008	200	850	1700	18	2.0	40	12
R3580.L010	300	1250	2500	20	5.0	50	20
R3580.L011	300	1250	2500	20	3.0	50	20
R3580.L012	400	1350	2700	22	6.0	70	30
R3580.L013	400	1350	2700	22	6.0	70	30
R3580.L014	700	1700	3400	25	12.0	75	35
R3580.L016	800	1950	3900	26	17.0	110	40
R3580.L017	800	1950	3900	26	17.0	110	40
R3580.L018	1000	2100	4200	29	20.0	150	45
R3580.L020	1300	3000	6000	32	25.0	200	55
R3580.L021	1300	3000	6000	32	25.0	200	55
R3580.L022	1500	3600	7200	34	25.0	225	60
R3580.L025	1900	3750	7500	39	45.0	260	65
R3580.L030	2300	4400	8800	46	85.0	300	70

Plastic Rod End Male

R3583



Material
Housing: Black plastic (Igumid G).
Spherical Bearing: Iglidur w300.

Technical Notes
Maintenance free, self lubricating. High strength under impact loads. Very high tensile strength for varying loads. Resistant to dirt and dust, resistant to corrosion and chemicals, standard thread is right hand thread.
High vibration dampening capacity, suitable for rotating, oscillating and linear movements.
Available with a metal sleeve to take a higher torque, (add -MS to part No.)
Suitable for use with R3409 clevis joints.

Important Notes
Dimensional series E.*Denotes fine pitch thread.
Short term max axial strength is up to 20 minutes. Any length of time greater than this is considered long term.

Order No.	Thread hand	d_1 tol. E10	l_1	d_2	d_3	l_2	a °	l_3	w_1
R3583.R005	Right	5	36	M5	19	20	16.5	45.5	6
R3583.R006	Right	6	36	M6	21	20	13.5	46.5	6
R3583.R008	Right	8	41	M8	24	24	12	53.0	8
R3583.R010	Right	10	47.5	M10	29	27	12	62.0	9
R3583.R011	Right	10	47.5	M10 x 1,25*	9	27	12	62.0	9
R3583.R012	Right	12	54	M12	34	29	10.5	71.0	10
R3583.R013	Right	12	54	M12 x 1,25*	34	29	10.5	71.0	10
R3583.R015	Right	15	63	M14	40	34	10.5	83.0	12
R3583.R017	Right	17	69	M16	46	37	9	92.0	14
R3583.R018	Right	17	69	M16 x 1,5*	46	37	9	92.0	14
R3583.R020	Right	20	80	M20 x 1,5*	53	43	8	106.5	16
R3583.R021	Right	20	80	M20 x 2,5	53	53	8	106.5	16
R3583.R025	Right	25	97	M24 x 2*	64	53	8	129.0	20
R3583.R030	Right	30	113	M30 x 2*	73	65	12.5	149.5	22
R3583.L005	Left	5	36	M5	19	20	16.5	45.5	6
R3583.L006	Left	6	36	M6	21	20	13.5	46.5	6
R3583.L008	Left	8	41	M8	24	24	12	53.0	8
R3583.L010	Left	10	47.5	M10	29	27	12	62.0	9
R3583.L011	Left	10	47.5	M10 x 1,25*	9	27	12	62.0	9
R3583.L012	Left	12	54	M12	34	29	10.5	71.0	10
R3583.L013	Left	12	54	M12 x 1,25*	34	29	10.5	71.0	10
R3583.L015	Left	15	63	M14	40	34	10.5	83.0	12
R3583.L017	Left	17	69	M16	46	37	9	92.0	14
R3583.L018	Left	17	69	M16 x 1,5*	46	37	9	92.0	14
R3583.L020	Left	20	80	M20 x 1,5*	53	43	8	106.5	16
R3583.L021	Left	20	80	M20 x 2,5	53	53	8	106.5	16
R3583.L025	Left	25	97	M24 x 2*	64	53	8	129.0	20
R3583.L030	Left	30	113	M30 x 2*	73	65	6.5	149.5	22

Order No.	w_2	Radial load (long term) N max.	Radial load (short term) N max.	Static strength (long term) N max.	Static strength (short term) N max.	Thread depth min.	Torque strength outside thread Nm max.	Torque through ball Nm max.
R3583.R005	4.4	25	50	275	550	14	0.4	2.0
R3583.R006	4.4	40	80	425	850	14	0.5	2.5
R3583.R008	6.0	80	160	800	1600	17	2.0	7.0
R3583.R010	7.0	125	250	1300	2600	19	5.0	14.0
R3583.R011	7.0	125	250	1300	2600	19	3.0	14.0
R3583.R012	8.0	150	300	1550	3100	20	6.0	25.0
R3583.R013	8.0	150	300	1550	3100	20	6.0	25.0
R3583.R015	10.0	300	600	1700	3400	24	12.5	30.0
R3583.R017	11.0	450	900	1800	3600	26	17.5	35.0
R3583.R018	11.0	450	900	1800	3600	26	21.0	35.0
R3583.R020	13.0	850	1700	3400	6800	30	25.0	40.0
R3583.R021	13.0	850	1700	3400	6800	30	25.0	40.0
R3583.R025	17.0	500	1000	3500	7000	37	45.0	55.0
R3583.R030	19.0	1000	2000	3500	7000	46	85.0	70.0
R3583.L005	4.4	25	50	275	550	14	0.4	2.0
R3583.L006	4.4	40	80	425	850	14	0.5	2.5
R3583.L008	6.0	80	160	800	1600	17	2.0	7.0
R3583.L010	7.0	125	250	1300	2600	19	5.0	14.0
R3583.L011	7.0	125	250	1300	2600	19	3.0	14.0
R3583.L012	8.0	150	300	1550	3100	20	6.0	25.0
R3583.L013	8.0	150	300	1550	3100	20	6.0	25.0
R3583.L015	10.0	300	600	1700	3400	24	12.5	30.0
R3583.L017	11.0	450	900	1800	3600	26	17.5	35.0
R3583.L018	11.0	450	900	1800	3600	26	21.0	35.0
R3583.L020	13.0	850	1700	3400	6800	30	25.0	40.0
R3583.L021	13.0	850	1700	3400	6800	30	25.0	40.0
R3583.L025	17.0	500	1000	3500	7000	37	45.0	55.0
R3583.L030	19.0	1000	2000	3500	7000	46	85.0	70.0

Pages 106 - 109

Heavy Duty Rod Ends - integral spherical plain bearing

Male and female series K rod ends, maintenance free. These are our most popular range of heavy duty rod ends.

Sizes Bore diameters 5mm up to 30mm.

Pages 110 - 113

Heavy Duty Rod Ends - integral spherical plain bearing

Male and female series E rod ends, maintenance free.

Sizes Bore diameters 6mm up to 60mm.

Pages 114 - 1120

Heavy Duty Rod Ends - integral ball bearing

Male and female series K rod ends. R3559 and R3560 have different bore sizes in relation to the thread size. All require maintenance.

Sizes Bore diameters 6mm up to 30mm.

Pages 121- 123

Heavy Duty Rod Ends - integral roller bearings

Male and female series E rod ends, require maintenance.

Sizes Bore diameters 12mm up to 30mm.

Pages 129 - 135

Stainless Steel Heavy Duty Rod Ends - integral spherical plain bearing

Male and female rod ends maintenance free. R3565 and R3566 K series rod ends, R3567 and R3568 E series rod ends.

Sizes R3565 and R3566 bore diameters 5mm up to 30mm. R3567 and R3568 bore diameters 6mm up to 60mm.

Pages 136 - 138

Low Cost Rod Ends - with spherical plain bearing

These are our most popular male and female rod ends. Maintenance free.

Sizes Female-bore diameters 5mm up to 12mm; Male-bore diameters 5mm up to 16mm.

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Low Cost Rod Ends - spherical plain bearing

Male and female series E rod ends, maintenance free.

Sizes Bore diameters 6mm up to 80mm.

Pages 139 - 145

Stainless Steel Low Cost Rod Ends - spherical plain bearing

Male and Female Series K rod ends, maintenance free.

Sizes Bore diameters 5mm up to 20mm.

Pages 146 - 147

Plastic Rod Ends

Male and female rod ends, Series K and Series E rod ends.

Sizes Bore diameters 2mm up to 30mm.

Pages 150 - 157

Rod Ends with Studs

Steel and Stainless steel, male and female maintenance free.

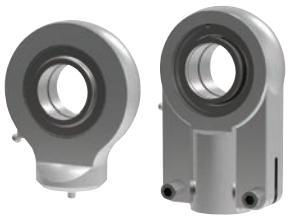
Sizes M6 up to M16.

Pages 158 - 165

Hydraulic Rod Ends - spherical plain bearings

Various options from Weld on base through to female thread, require maintenance.

Sizes Bore diameters up to 160mm.

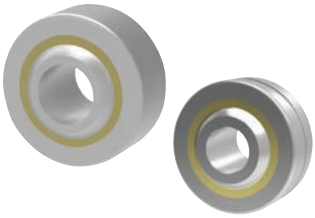


Pages 166 - 179

Spherical Plain Bearings - steel and stainless steel

Series K and series E spherical bearings. R3640 are our lowest cost, most popular option. R3641 and stainless steel R3642 require maintenance. R3640, R3644, and stainless steel R3645 are maintenance free.

Sizes Bore diameters 5mm up to 30mm.



Pages 182 - 186

Technical Information

Rod End Bearings

Rod ends with integral maintenance-free spherical plain bearings

In many cases heavy-duty rod ends with integral spherical plain bearings are most often used. They are above all used for small swivelling or tilting movements at low speeds. They stand out for their high load capacity and can also be used for shock-like loads. The rod end ball slides on a plastic bearing shell consisting of a glass fibre-filled nylon/teflon compound. This design assures a maintenance-free rod end. Heavy-duty plain bearing rod ends have slight initial movement friction and virtually no clearance. The plastic material used has another advantage in that it can absorb many foreign particles so that no damage can occur. The balls of heavy-duty rod ends with integral spherical plain bearings are hard chrome plated. This reliable corrosion protection ensures that the function of the rod end will not be affected by a corroded ball surface under humid operating conditions.

Rod ends with integral ball bearings

This design is especially suitable for high speeds, large swivelling angles or rotating movements with relatively low or medium loads. Prominent technical features are the low bearing friction, long-time greasing as well as the sealing against some dirt penetration (by means of shields on both sides). Under normal operating conditions the rod ends are maintenance-free.

Greasing nipples are provided for lubrication in case of rough operations and maximum loads. To avoid incompatibility with the production lubrication, we recommend lubrication with a calcium-complex-soap-grease. A special heat treatment procedure gives the rod end housing a raceway hardness adapted to the antifriction bearing, ensuring at the same time high stability with changing loads.

Rod ends with integral roller bearings

This design based on the structure of a self-aligning roller bearing is preferably used for high speed, large tilting angles or rotating movements under high loads. Compared to rod ends with ball bearings, rod ends with self-aligning roller bearings have essentially higher basic load ratings. This design is equipped with a cage to minimise the rolling friction and heat build-up. These rod ends, with long-time lubrication are under normal operating conditions maintenance-free.

Greasing nipples are provided for lubrication in case of rough operations and maximum loads. To avoid incompatibility with the production lubrication, we recommend lubricating with a calcium-complex-soap-grease.

Shields on both sides limit dirt particles from penetrating into the bearing. The rod ends with roller bearings are, subjected to a special heat treatment to obtain a raceway hardness adapted to the antifriction bearings, ensuring at the same time a high stability with changing loads.

Static load capacity C_0 (plain bearings)

The static load capacity C_0 is the radially acting static load which does not cause any permanent deformation of the components when the spherical bearing or rod end is stationary, (i.e. the load condition without pivoting, swivelling or tilting movements).
It is also a precondition here that the operating temperature must be at normal room temperature and the surrounding components must possess sufficient stability.

The values specified in the tables are determined by static tension tests on a representative number of series components at 20°C normal room temperature. The static load capacity may vary with lower or higher temperature depending on the material.

In the case of all rod ends with plain bearings, the static load rating refers to the maximum permissible static load of the rod end housing in a tensile direction up to which no permanent deformation occurs at the weakest housing cross-section. The value in the product tables has a safety factor of 1.2 times the tensile strength of the rod ends housing material.

Static load capacity C_0 (roller and ball bearings)

For our rod ends with roller and ball bearings, the static load rating is the load at which the bearing can operate at room temperature without its performance being impaired as a result of deformations, fracture, or damage to the sliding contact surfaces (max 1/10,000th of the ball diameter).

Dynamic load capacity C (plain bearings)

Dynamic load ratings serve as values for calculation of the service life of dynamically-loaded spherical bearings and rod ends. The values themselves do not provide any information about the effective dynamic load capacity of the spherical bearing or rod end. To obtain this information, it is necessary to take into account the additional influencing factors such as load type, swivel or tilt angle, speed characteristic, max. permitted bearing clearance, max. permitted bearing friction, lubrication conditions and temperature, etc.

Dynamic load capacities depend on the definition used to calculate them. Comparison of values is not always possible owing to the different definitions used by various manufacturers, and because the load capacities are often determined under completely different test conditions.

Dynamic load capacity C (roller and ball bearings)

For our rod ends with roller and ball bearings, the dynamic load capacity is the load at which 90% of a large quantity of identical rod ends reach 1 million revolutions before they fail (due to fatigue of the rolling surfaces).

Rod Ends from Automotion Components

Permissible load

The maximum load is defined by the static basic load rating C_0. If static loads are a combination of radial and axial loads, the equivalent static load will have to be calculated.

Permissible load:

$$P_0 \leq C_0 \text{ (N)}$$

Where: P_0 = Static equivalent load (kN)

Self-aligning ball bearing = $P_0 = F_r + Y_0 \cdot F_a$

Self-aligning roller bearing = $P_0 = F_r + 5 \cdot F_a$

F_a = Axial load

F_r = Radial load

Y_0 = Axial factor, static, see individual product pages

C_0 = Basic static load rating (kN), see individual product pages

Nominal service life

Rod Ends with integral self-aligning ball bearing R3556, R3557, R3559, R3560, R3563, R3564.

Rotating:

$$G_{h_{rot.}} = 10^6 \frac{\left(\frac{C}{P}\right)^3}{60 \cdot n} \text{ (h)}$$

Oscillating:

$$G_{h_{osc.}} = 10^6 \frac{\left(\frac{C}{P \sqrt[3]{\frac{ß}{90}}}\right)^3}{60 \cdot f} \text{ (h)}$$

Where: P = Dynamic equivalent load (kN)

Self-aligning ball bearing = $P = F_r + Y \cdot F_a$

Self-aligning roller bearing = $P = F_r + 9.5 \cdot F_a$

C = Basic dynamic load (kN), see individual product pages

Y = axial factor, dynamic, see individual product pages

$Gh_{rot.}$ = nominal service life for rotation (hours of operation)

$Gh_{osc.}$ = nominal service life for rotation (hours of operation)

ß = half of swivelling angle (degree), ß = 90 should be used for rotation. **Condition:** Swivelling angle ß ≦ 3°. For swivelling angles ß<3° we recommend the use of heavy-duty spherical plain bearing rod ends

n = rotation speed (rpm)

f = frequency of oscillation (rpm)

h = hours

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Nominal service life
Rod ends with integral self-aligning roller bearing R3561, R3562.

Rotating:

$$G_{h\,rot.} = 10^6 \frac{\left(\frac{C}{P}\right)^{3{,}333}}{60 \cdot n}\ (h)$$

Oscillating:

$$G_{h\,osc.} = 10^6 \frac{\left(\frac{C}{P \sqrt[3]{\frac{ß}{90}}}\right)^{3{,}333}}{60 \cdot f}\ (h)$$

See table on page 114 for key to symbols

Calculation example
At the rotating side of a crank mechanism a ball or roller bearing rod end should be installed. The expected service life amounts to at least 5000 hours.

Known: rotation speed n = 300 rpm, radial load F_r = 0,75 kN
Selected: R3557.R008 = 4,0 kN

$$G_{h\,rot.} = 10^6 \frac{\left(\frac{C}{P}\right)^3}{60 \cdot n}$$

$$= 10^6 \frac{\left(\frac{4{,}0}{0{,}75}\right)^3}{60 \cdot 300} = \underline{\underline{8428\ h > 5000\ h}}\ \boxtimes$$

Technical Information

Selection/Calculation Spherical-plain Bearing

Permissible load

The maximum permissible load is calculated by using equation **1**. If static loads are a combination of radial and axial loads, the equivalent static load will have to be calculated using equation **2**.

Permissible load:

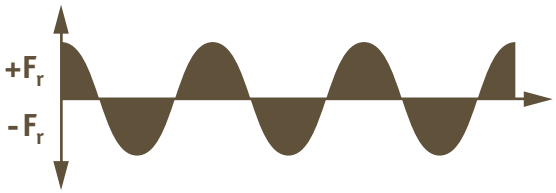
Equation **1** $P_{max.} = C_0 \cdot C_2 \cdot C_4$

Equation **2** $P = F_r + F_a \leqq P_{max.}$

Where:

P_{max}	=	Maximum permissable load (kN)
C_0	=	static basic load (kN), see individual product pages
C_2	=	Temperature factor, see below
C_4	=	Factor for type of load, see below
P	=	Equivalent dynamic load (kN)
F_r	=	Radial load
F_a	=	Axial load (kN), **condition:** $F_a \leqq 0.2 \cdot F_r$

Load factor C_4 :

		C_4 :
Constant:		1,0
Pulsating:		0,3
Alternating:		0,2

Temperature factor C_2:

Up to 60°C	1,0
60°C to 80°C	0,8
80°C to 100°C	0,7
100°C to 120°C	0,8

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Permissible sliding velocity
The permissible sliding velocity of heavy-duty rod ends mainly depends on the load and temperature conditions. Heat generated by friction in the rod end housing is the main limitation on sliding velocity. When selecting the rod end size, it is necessary to determine the sliding velocity and the pv-value, which is a product of the specific bearing load p (N/mm²) and the sliding velocity v (m/s).

Specific bearing load:

$$p = k \cdot \frac{P}{C}$$

Permissible pv-value = 0,5 N/mm² · m/s

Where: P = Specific bearing load (N/mm²)
C = Basic dynamic load rating (N), see individual product pages
k = Specific load factor (N/mm²) for tribological pairing
k = 50 N/mm²

Mean sliding velocity:

$$V_m = 5{,}82 \cdot 10^{-7} \cdot d_3 \cdot ß \cdot f$$

Permissible sliding velocity $v_{max.}$ = 0,15 m/s

Where: V_m = Mean sliding velocity (m/s)
d_3 = Pivot ball diameter (mm), see individual product pages
ß = Half swivelling angle (degree), for swivelling angle > 180° ß = 90° to be used
f = Frequency of oscillation (rpm)

Nominal service life:

$$G = C_1 \cdot C_2 \cdot C_3 \cdot \frac{3}{d_3 \cdot ß} \cdot \frac{C}{P} \cdot 10^8$$

$$G_h = C_1 \cdot C_2 \cdot C_3 \cdot \frac{5}{d_3 \cdot ß \cdot f} \cdot \frac{C}{P} \cdot 10^6$$

Where: G = Nominal service life (number of oscillations or revolutions)
G_h = Nominal service life (hours)
C_1 = Load direction factor, see table on next page
C_2 = Temperature factor, see previous page
C_3 = Material factor, see alignment chart on next page

Where: C_1 = Load direction factor

$C_1 = 1,0$ = Single load direction

Alternating load direction at f < 30 rpm: $C_1 = 0,250$

Alternating load direction at f > 30 rpm: $C_1 = 0,125$

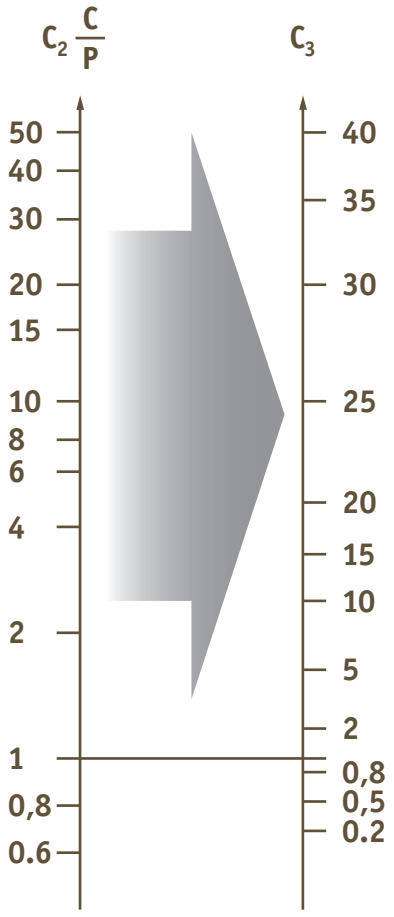
Alignment:

To find C_3 calculate $C_2 \cdot \frac{C}{P}$ then using this value on the chart below, read across to C_3

Where: C_2 = Temperature factor

C = basic dynamic load rating (N) see individual product pages

P = Specific bearing load (N/mm²)



Rod Ends from Automotion Components

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Calculation example

The rod end assembly of conveyor equipment calls for heavy-duty rod end with a service life of 7000 hours in conjunction with an alternating acting load of 5 kN. 25 swivelling moments with a swivelling angle of 20° take place per minute. The operating temperature amounts to approx. 60° C. The choice is a heavy-duty rod end R3554.R015 with: C = 13,4 kN, d_3 = 22mm.

Checking the permissible load of the rod end:

$$P_{max.} = C_0 \cdot C_2 \cdot C_4$$

$$P_{max.} = 41 \cdot 0{,}2 \cdot 1{,}0 = 8{,}2 \text{ kN} > 5{,}0 \text{ kN}$$

Where: C_0 = 41 kN
C_2 = 1,0 (temperature 60° C)
C_4 = 0,2 (alternating load)

Checking the permissible sliding velocity:

$$V_m = 5{,}82 \cdot 10^{-7} \cdot d_3 \cdot ß \cdot f = 5{,}82 \cdot 10^{-7} \cdot 22 \cdot 10 \cdot 25$$

$$= \underline{0{,}0032 \text{ m/s} < 0{,}15 \text{ m/s}} \ \boxtimes$$

Checking the p · V -value:

$$pV = p \cdot V_m$$

$$pV = 18{,}66 \cdot 0{,}0032$$

$$= 0{,}06 \text{ N/mm}^2 \cdot \text{m/s} < 0{,}5 \text{ N/mm}^2 \cdot \text{m/s} \ \boxtimes$$

$$p = k \cdot \frac{P}{C} = 50 \cdot \frac{5000}{13400} \ 18{,}66 \text{ N/mm}^2$$

Nominal service life:

$$G_h = C_1 \cdot C_2 \cdot C_3 \cdot \frac{5}{d_3 \cdot ß \cdot f} \cdot \frac{C}{P} \cdot 10^6$$

$$G_h = 0{,}25 \cdot 1.0 \cdot 12 \cdot \frac{5}{22 \cdot 10 \cdot 25} \cdot \frac{13{,}4}{5{,}0} \cdot 10^6$$

$$= \underline{7308 \text{ h} > 7000 \text{ h}} \ \boxtimes$$

Where: C_1 = 0,25 (alternating load direction, f = 25 rpm < 30 rpm)

$$C_3 = C_2 \cdot \frac{C}{P} = 1{,}0 \cdot \frac{13{,}4}{5{,}0} = 2{,}68$$

See alignment chart (on page 118) C_3 = 12

Where: d_3 = 22
f = 25 rpm
ß = 10° (half the swivelling angle 20° = 10°)
C = 13,4 kN
P = 5,0 kN

Rod Ends from Automotion Components

Rod Ends from Automotion Components

Low cost rod ends load ratings
The ultimate radial static load rating is measured as the failure point when a load is increasingly applied to a pin through the rod end's bore and pulled straight up while the rod end is held in place. Note that the actual rating is determined by calculating the lowest of the following three values:

1: Raceway material comprehensive strength (R value):

$$R = E \times T \times X$$

2: Rod end head strength (H value, cartridge type construction):

$$H = \left[\left(\frac{T}{2}\sqrt{D^2 - T^2}\right) + \left(\frac{D^2}{2} \times \text{SIN}^{-1}\frac{T}{2}\right) - \left(\text{O.D. of Bearing} \times T\right)\right] \times X$$

Angle of $\frac{T}{2}$ expressed in radians

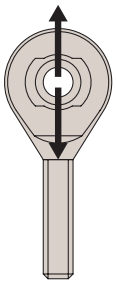
3: Shank strength (S Value) male threaded rod end:

$$S = [(\text{root diameter of thread}^2 \times .78) - (N^2 \times .78)] \times X$$

female threaded rod end:

$$S_2 = [(J^2 \times .78) + (\text{major diameter of thread} \times .78)] \times X$$

Where:
- E = Ball diameter
- T = Housing width
- X = Allowable stress
- D = Head diameter
- N = Diameter of drilled hole in shank of male rod end
- J = Shank diameter of female rod end

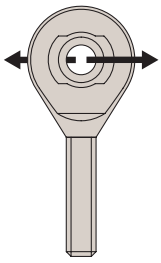


The axial static load capacity is measured as the force required to cause failure via a load parallel to the axis of the bore. Depending on the material types and construction methods, the ultimate axial load is generally 10-20% of the ultimate radial static load. The formula does not account for the bending of the shank due to a moment of force, nor the strength of the stake in cartridge-type construction.

Axial strength (A Value):

$$A = .78\ [\ (E + .176T)^2 - E2\ ] \times X$$

Where:
- X = Allowable stress (see table below)
- E = Ball diameter
- T = Housing width



Material	Allowable stress (PSI)
300 Series Stainless Steel	35,000
Low Carbon Steel	52,000

ov-rod-ends-spherical-plain-bearings-lnh- Updated - 29-03-2023

Operating temperatures

Heavy-duty ball and roller bearing rod ends can be used for operating temperatures between -20°C and +120°C. The temperature range of heavy-duty rod ends with integral spherical plain bearing is between -30°C and +60°C, without affecting the load capacity. Higher temperatures will reduce the load capacity taken into account for the calculation of the 'working life' under the temperature factor C_2 on page 116.

Loads

The decisive parameters for the selection and calculation of heavy-duty rod ends are size, direction and type of load.

Radial or combined loads

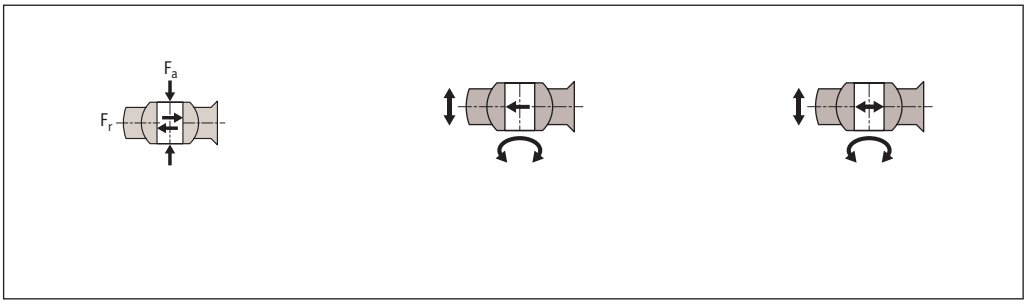
The heavy-duty rod ends have been especially designed to cope with high radial loads. They can be used for combined loads, the axial load share of which does not exceed 20% of the corresponding radial load.

Unilaterally acting load

In this case the load acts only in the same direction, which means that the load area is always in the same bearing section.

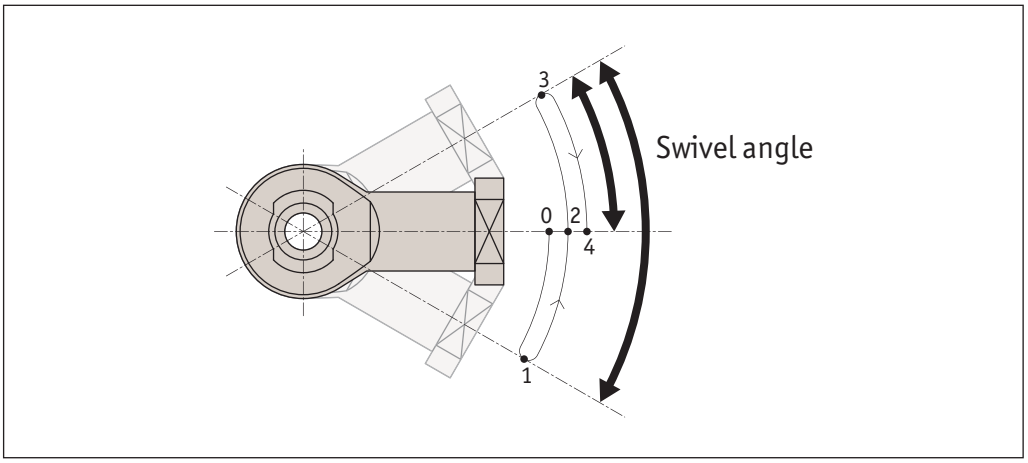
Alternately acting load

In case of alternating loads, the load areas facing each other are alternately loaded and/or relieved, which means that the load changes its direction constantly by approximately 180°.



Swivelling angle

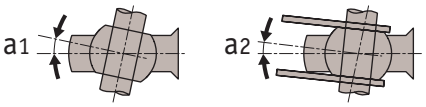
The swivelling angle is the movement of the rod end from one final position to the other. Half the swivelling angle a° is used to calculate the service or 'working life'.



Angle of tilt

The angle of tilt, also called setting angle, refers to the movement of the joint ball and/or the inner ring to the rod end axis (in degrees). The tilting angle (a) indicated in the table for the heavy-duty ball and roller bearing rod ends corresponds to the maximum possible movement being limited by the shields on both sides. It is important that this tilting angle is not exceeded either during installation or operation, as otherwise the shields may be damaged. For heavy-duty plain bearing rod ends a distinction is made between the tilting angles (a1 and a2).

If the movement is not limited by adjacent components, then angle a1 can fully be used without affecting the rod end capacity. Tilting angle a2 is the movement limit when connecting a forked component.



Nominal service life

The term 'nominal service life' is used for heavy-duty ball and roller bearing rod ends and represents the number of swivelling motions or rotations and/or the number of service hours the rod end performs before showing the first signs of material fatigue on the raceway or roller bodies. In view of many factors that are difficult or impossible to assess, the service life of several apparently identical bearings differ under the same operating conditions.

For this reason, the following method for the service life determination of heavy-duty ball and roller rod ends results in a nominal service life being achieved or exceeded by at least 90% of a large quantity of identical rod ends.

Working life

The term 'working life' is used with heavy-duty plain bearing rod ends. It represents the number of swivelling motions or rotations and/ or the number of service hours the heavy duty plain bearing rod end performs before becoming unserviceable due to material fatigue, wear, increased bearing clearance or increase of the bearing friction moment.

The 'working life' is not only influenced by the size and the type of load, it is also affected by a number of factors, which are difficult to assess. A calculation of the exact service life is therefore impossible. Field-experienced standard values for the approximate 'working life' can nevertheless be determined by using the following calculation procedure which is based on numerous results from endurance test runs and values from decades of experience. The values determined by this formula are achieved, if not exceeded, by the majority of the heavy-duty rod ends.

Heavy-duty rod ends (R3550, R3551, R3556, R3557, R3561, R3562, R3563, R3564, R3565, R3566, R3610, R3611, R3613, R3614)

d1		d1mp Tolerance Limit		V_{d1p}	V_{d1mp}	b1s Tolerance Limit		hs, h1s, h2s Tolerance Limit	
over	icl.	upper	lower	max.	max.	upper	lower	upper	lower
	6	+0,012	0	0,012	0,009	0	-0,12	+0,8	-1,2
6	10	+0,015	0	0,015	0,011	0	-0,12	+0,8	-1,2
10	18	+0,018	0	0,018	0,014	0	-0,12	+1,0	-1,7
18	30	+0,021	0	0,021	0,016	0	-0,12	+1,4	-2,1
30	50	+0,025	0	0,025	0,019	0	-0,12	+1,8	-2,7

Heavy-duty rod ends (R3553, R3554, R3559, R3560, R3567, R3568)

d1		d1mp Tolerance Limit		V_{d1p}	V_{d1mp}	b1s Tolerance Limit		hs, h1s, h2s Tolerance Limit	
over	icl.	upper	lower	max.	max.	upper	lower	upper	lower
	10	0	-0,008	0,008	0,006	0	-0,12	+0,8	-1,2
10	18	0	-0,008	0,008	0,006	0	-0,12	+0,8	-1,2
18	30	0	-0,010	0,010	0,008	0	-0,12	+1,0	-1,7
30	50	0	-0,012	0,012	0,009	0	-0,12	+1,4	-2,1
50	80	0	-0,015	0,015	0,011	0	-0,15	+1,8	-2,7

Dimensions and tolerance symbols

d_1 = nominal bore diameter of the inner ring or joint ball.

d_{1mp} = mean bore diameter deviation in one plane, arithmetical mean of the largest and smallest bore diameter.

V_{d1p} = bore diameter variation in one plane, difference between the largest and smallest bore diameter.

V_{d1mp} = mean bore diameter variation, difference between the largest and smallest bore diameter of one inner ring or joint ball.

b_{1s} = single inner ring or joint ball width deviation.

h, h_1, h_2 = single length from inner ring or ball bore centre to shank end.

h_s, h_{1s}, h_{s2} = single length variation of a single rod end.

Rod Ends from Automotion Components

Technical Information

Plastic Rod Ends

Load

The load capacity of the maintenance free bearing element parts is very high at normal ambient temperatures. These bearings absorb high forces and weigh only one fifth of traditional, metal bearing housings. The excellent dampening properties are based on the fact that the polymer material of the two part bearing can absorb vibrations differently than steel.

However, plastic specific properties, such as dependence on temperature and behaviour under long term stress must be taken into consideration when using these bearings.
The load capacity of the rod end bearing should therefore be checked in a practical test, particularly if it will be used under continuous high loads and at elevated temperatures.

Chemical resistance

The moisture absorption is approximately 1.3% of weight in standard atmosphere.
The saturation limit in water is 6.5%. This must be taken into account for these types of applications.
The housing made of igumid G is resistant to weak alkalines, acids and fuels, as well as all types of lubricants.

Medium	Resistance
Alcohol	+ to 0
Hydrocarbons	+
Greases, oils without additives	+
Fuels	+
Diluted acids	0 to -
Strong acids	-
Diluted alkalines	+
Strong alkalines	0

Chemical resistance of plain bearings.

+ resistant
0 conditionally resistant
- not resistant.

All data given at room temperature (20°C).

Radiation resistance

Self aligning plain bearings are resistant to radiation up to an intensity of 3 x 102 Gy.

Application temperatures

These bearings can be used in temperatures from -30°C to + 80°C. The table below shows the effect of temperature on the load capacity of the bearings.

Minimum	-30°C
Maximum, long term	-80°C
Maximum, short term	+120°C

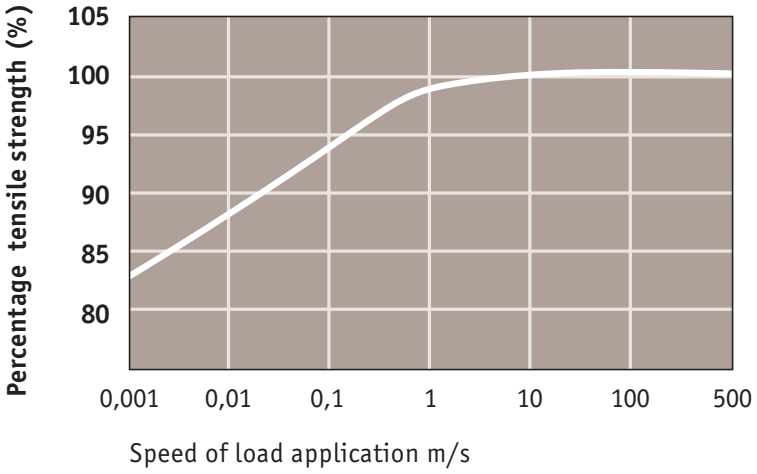
Coefficients of sliding friction and speed

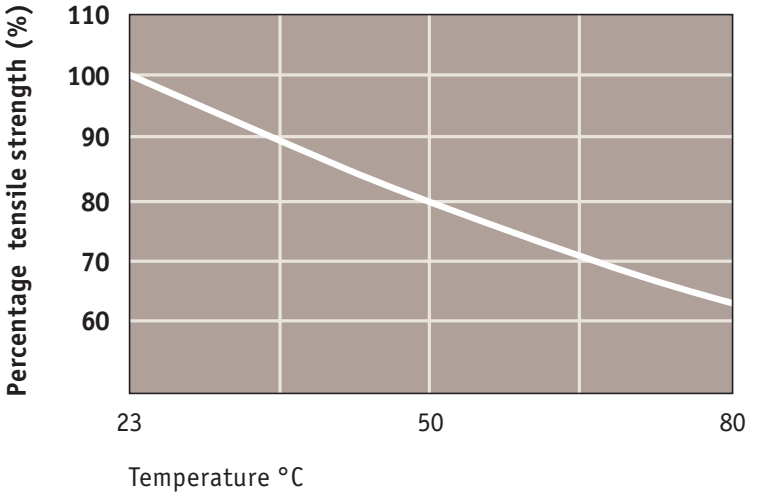
One important advantage of plastic spherical bearings is that rapid, rotary movements of a mounted shaft take place directly in the spherical portion. In metallic rod ends, rotary motion takes place between the race and the spherical bearing. High speeds can be achieved with plastic bearings.

These bearings are used in such a way that the angular movements of the spherical bearings take place at the outer diameter. By contrast, rotations of the shaft are supported directly in the I.D. of the spherical portion. The advantage therefore lies in the polymer vs. steel relationship. Polymer produces lower friction and permits high speeds, even when running dry.

UV resistance

The corrosion resistance of these bearings makes them very useful for outside applications. They are permanently resistant to UV radiation. A small change in colour (dark colouration) of the spherical ball due to UV radiation does not affect the mechanical electrical or thermal properties.





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