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

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ROD ENDS

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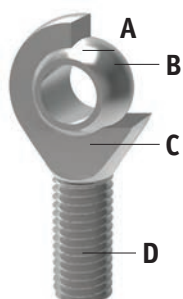
A Made from Polyamid-PTFE-fibreglass-compound, maintenance free, absorbs any foreign particles

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
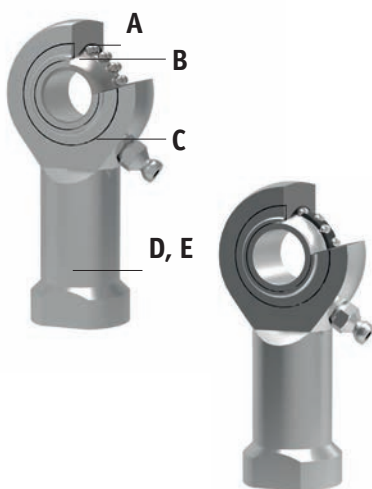
A Radial clearance: 10-30µm, low friction

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

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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.

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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

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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):

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

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

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

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

female threaded rod end:

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

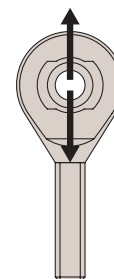Where: E = Ball diameter

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.
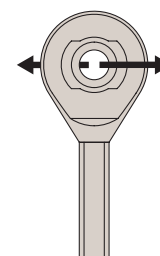
Axial strength (A Value):

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

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

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