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ROD ENDS WITH INTEGRAL SELF-ALIGNING BALL BEARINGS

6574, 6576, 6582, 6584.

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 rough 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 incompatability 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 SELF-ALIGNING ROLLER BEARINGS

6578 and 6580.

The 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 self-aligning 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 incompatability with the production lubrication, we recommend lubricating with a calcium-complex-soap-grease.
Shields on both sides prevent dirt particles from penetrating into the bearing. The rod ends with self-aligning roller bearings are, just as the design with the self-aligning ball bearings, 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.

ROD ENDS WITH INTEGRAL MAINTENANCE- FREE SPHERICAL PLAIN BEARINGS

6570, 6572, 6586, 6588, 6596 and 6598.

In many cases heavy-duty rod ends with integrated spherical plain bearings serve their purpose. They are above all used for small swivelling or tilting movements at low speeds. They stand out for their high loadability and can also be used for shocklike loads. The rod end ball slides on a plastic bearing shell consisting of a glass fibre-filled nylon/ teflon compount. This design ansures an absolutely maintenance-free rod end. Heavy-duty plain bearing rod ends have a slight initial stress and virtually no clearance. The plastic material used has a favourable secondary advantage in that it absorbs any foreign particles and encloses them so that no damage can occur. The joint balls of heavy-duty rod ends with integrated spherical plain bearings are standardly fitted with hard chrome plating. 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.

BASIC LOAD RATINGS

Static basic load rating of anti-friction bearing rod ends:

The static basic load rating C0 of an antifriction bearing rod end corresponds to that of a static radial load causing a lasting overall deformation of 1/10,000 of the roller body diameter at the contact point most highly stressed between roller body and raceway.

Static basic load ratings of plain bearing rod ends:

The static basic load rating C0 of a plain bearing rod end corresponds to that of static radial load that does not yet cause a lasting deformation at the weakest housing section. It contains at least a 1,2 fold security compared to the yield stress of the material used for the rod end housing.

Dynamic basic load rating of antifriction bearing rod ends:

The dynamic basic load rating C of an antifriction bearing rod end is the external radial load, unchangeable in size and direction, at which 90% of a large quantity of obviously identical rod ends will reach or exceed 1 million of rotations or swivelling movements.

Dynamic basic load ratings of plain bearing rod ends:

The dynamic basic load rating C is the parameter for the calculation of dynamically loaded maintenance-free heavy-duty rod ends with integrated spherical plain bearing, in other words, making tilting, swivelling or rotating movements under load.
Basic load ratings always depend on the definitions they are based on. For this reason it is not always possible to compare basic load rating data supplied by different manufacturers.

OPERATING TEMPERATURES

Heavy-duty antifriction 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 loadability. Higher temperatures will reduce the loadability taken into account for the calculation of the working life under the temperature factor C2.

LOADS

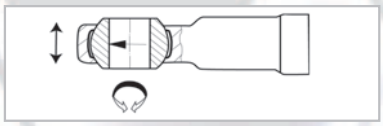
The decisive parameters for the selection and calculation of heavy-duty rod ends are size, direction and type of load.

Radial or combinated loads -

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

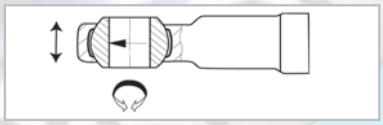
Unilaterally acting load -

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



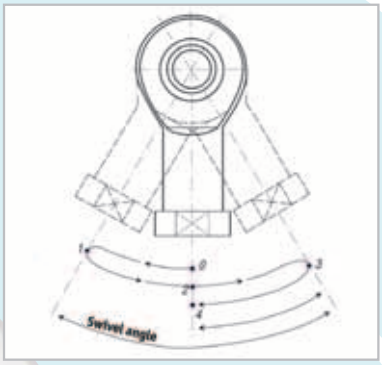
Alternately acting load -

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°.



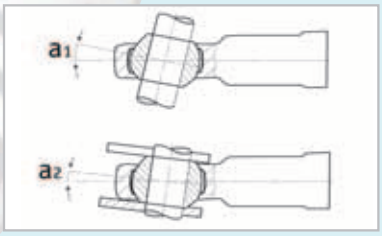
SWIVELLING ANGLE

The swivelling angle is the excursion of the rod end from one final position to the other. Half the swivelling angle ß is used to calculate the service or working life.



ANGLE OF TILT

The angle of tilt, also called setting angle, refers to the possible excursion 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 antifriction bearing rod ends corresponds to the maximum possible excursion beaing 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.
As far as heavy-duty plain bearing rod ends are concerned, distinction is made between the tilting angles a1 and a2.
If the excursion is not limited by adjacent components, excursion angle a1 can fully be used without affecting the rod end capacity. Tilting angle a2 is the excursion limit when connecting a forked component.



NOMINAL SERVICE LIFE

The term 'nominal sevice life' is used for heavy-duty antifriction 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 at the raceway or roller bodies.
In view of many influence factors that are difficult or impssible to assess, the service life of several obviously identical bearings differ under the same operating conditions. For this reason, the following method for the service life determination of heavy-duty antifriction rod ends results in a nominal service life being achieved or exceeded by at least 90% of a larger 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 because of 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 partially difficult to assess. A calculation of the exact service life is therfore 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.

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TOLERANCES

For rod ends: 6570, 6572, 6574, 6576, 6578, 6580, 6596, 6598.

d1		△d1mp tolerance limit		Vd1p	Vd1mp	△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

For rod ends: 6582, 6584, 6586, 6588.

d1		△d1mp tolerance limit		Vd1p	Vd1mp	△b1s tolerance limit		△hs, h1s, h2s tolerance limit	
over	icl.	upper	lower	max.	max.	upper	lower	upper	lower
	10	+0,002	-0,010	0,008	0,006	0	-0,12	+0,8	-1,2
10	18	+0,003	-0,011	0,008	0,006	0	-0,12	+0,8	-1,2
18	30	+0,003	-0,013	0,010	0,008	0	-0,12	+1,0	-1,7
30	50	+0,003	-0,015	0,012	0,009	0	-0,12	+1,4	-2,1
50	80	+0,004	-0,019	0,015	0,011	0	-0,15	+1,8	-2,7

DIMENSION AND TOLERNACE SYMBOLS

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

$\triangle d_{1mp}$ = 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_1 = inner ring or joint ball width.

$\triangle b_{1s}$ = 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.

$\triangle h_s, \triangle h_{1s}, \triangle h_{2s}$ = single length variation of a single rod end.

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