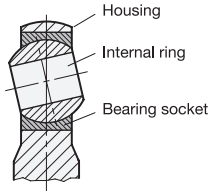



**Steel version**

Type **N**
Steel housing, zinc plated
Pairings:
Steel internal ring, hardened
Brass bearing socket
**Lubrication possible**

**Features of general use:**

For universal application conditions,
especially with high alternating and shock loads in radial and in particular in axial direction.

Type **W**
Steel housing, zinc plated
Pairings:
Steel internal ring, hardened
Steel bearing socket, zinc plated, with PTFE insert
**Self-lubricating**

For universal application conditions,
especially with dynamic load; axial load capacity lower than for type **N**.

**Stainless steel version**

Type **NH**
Stainless steel housing
Pairings:
Steel internal ring, hardened, hard chrome plated
Bronze bearing socket
**Lubrication possible**

As Type **N**
in areas exposed to corrosion.

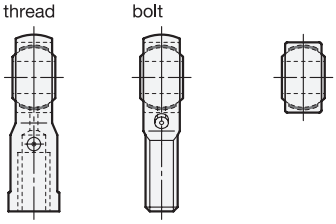
Ball joint heads

with internal thread

with threaded bolt

Ball joints

without housing



Type **WH**
Stainless steel housing
Pairings:
Steel internal ring, hardened
Bronze bearing socket, with PTFE insert
**Self-lubricating**

As Type **W**
in areas exposed to corrosion.

Type **WK**
Stainless steel housing
Pairings:
Stainless steel internal ring, hardened
Stainless steel bearing socket, with PTFE insert
**Self-lubricating**

As Type **W**
in areas exposed to corrosion with high requirements on corrosion resistance,
e.g. in the food industry.

## Bearing play

Bearing play refers to the dimension by which the internal ring inside the bearing socket can be moved in a radial or an axial direction without lubrication.

| Types **N**, **NH** Lubrication possible | | Types **W**, **WH**, **WK** Self-lubricating | | |
|---|---|---|---|---|
| $d_1$ Bore internal ring | Radial bearing play | $d_1$ Bore internal ring | Radial bearing play | Axial bearing play |
| 5 ... 10 | 0,005 ... 0,035 | 5 ... 10 | 0,005 ... 0,030 | 2 to 3 times radial play |
| 12 ... 20 | 0,010 ... 0,040 | 12 ... 18 | 0,005 ... 0,035 | |
| 22 ... 30 | 0,010 ... 0,050 | 20 ... 30 | 0,005 ... 0,055 | |

Load applied to obtain the measured results: 100 N at room temperature.

## Lubrication

Rod end bearings of type **N** (lubrication possible) require regular lubrication. When delivered, the rod end bearings are not lubricated. The initial lubrication takes place when installed. Within the temperature range of -20 °C to +125 °C, a multipurpose grease has proven to be adequate. Under extreme conditions, a high quality grease such as Gleitmo 805 K should be used. Rod end bearings of type **W** (self-lubricating) **must not be lubricated**. The internal ring moves on a PTFE insert in the bearing socket.

## Operating temperature

Rod end bearings of type **N** (lubrication possible) can be used within a temperature range of -50 °C to +200 °C and if used with a high temperature grease, even higher. Rod end bearings of type **W** (self-lubricating) can be used from -50 °C to +200 °C. In general, use at higher temperatures is possible, but this reduces the service life.

## Load values

Load values are bearing related values, derived from the material data of the material used. They are used to select a rod end bearing for a given load, but may have to be reduced in case of special operating conditions.

## Static load values Co in kN

Co indicates the permitted radial load at standstill which a rod end bearing at its weakest cross section can withstand without causing permanent deformation when the load is at rest. The Co values listed in the catalog tables have been calculated based on the respective material characteristics and were verified on a representative number of rod end bearings in a tensile test at room temperature. An 80% utilisation of the yield strength was applied in each case, so that a safety factor of 1,25 is included. The static load value Co is also used to determine the permissible **axial load**, which is primarily limited by the axial fixing of the internal ring. Tests were carried out to determine the permissible axial load Fa at the largest tilting angle:
Fa = 0,4 Co for type N
Fa = 0,2 Co for types NH, W, WH, WK

| $d_1$ | GN 648.1 | | GN 648.2 | | GN 648.5 | GN 648.6 | GN 648.8 | | GN 648.9 |
|---|---|---|---|---|---|---|---|---|---|
| Size | Type N | Type W | Type N | Type W | Type NH/WH/WK | Type NH/WH/WK | Type N | Type W | Type WK |
| 5 | 9,9 | 8 | 4,3 | 4,3 | 11,8 | 6,2 | 19,8 | 12,5 | 12,5 |
| 6 | 11,9 | 8,9 | 6 | 6 | 13,1 | 8,8 | 25,8 | 15,5 | 15,5 |
| 8 | 17,1 | 14,1 | 11 | 11 | 20,7 | 16,1 | 42,6 | 27,8 | 27,8 |
| 10 | 21,4 | 19,3 | 17,4 | 17,4 | 28,3 | 25,5 | 60 | 39,0 | 39,0 |
| 12 | 27 | 23,5 | 25,5 | 23,5 | 34,5 | 34,5 | 80 | 53,5 | 53,5 |
| 14 | 24,5 | 21 | 24,5 | 21 | 39,5 | 39,5 | 102,5 | 70 | 70 |
| 16 | 37 | 32 | 36,5 | 32 | 60,5 | 60,5 | 128,5 | 88 | 88 |
| 18 | 43 | 38,5 | 43 | 38,5 | 73 | 73 | 157 | 106,5 | 106,5 |
| 20 | 49,5 | 44 | 49,5 | 44 | 83 | 83 | 188,5 | 130 | 130 |
| 22 | 57 | 53 | 57 | 53 | 100 | 100 | 229 | 162 | 162 |
| 25 | 68 | 62 | 68 | 61 | 118 | 118 | 293 | 204 | 204 |
| 30 | 82 | 82 | 82 | 82 | 155 | 155 | 381 | 281 | 281 |

## Dynamic load value C in kN

They help to determine the service life of dynamically stressed rod end bearings.

| $d_1$ | GN 648.1 / GN 648.2 | | GN 648.5/.6 | | GN 648.8 | | GN 648.9 |
|---|---|---|---|---|---|---|---|
| Size | Type N | Type W | Type NH | Type WH/WK | Type N | Type W | Type WK |
| 5 | 2,5 | 7,5 | 3,3 | 7,5 | 3,3 | 7,5 | 7,5 |
| 6 | 3,2 | 9,3 | 4,3 | 9,3 | 4,3 | 9,3 | 9,3 |
| 8 | 5,4 | 16,7 | 7,1 | 16,7 | 7,1 | 16,7 | 16,7 |
| 10 | 7,5 | 23,4 | 10 | 23,4 | 10 | 23,4 | 23,4 |
| 12 | 10 | 32 | 13,5 | 32 | 13,5 | 32,0 | 32,0 |
| 14 | 13 | 42 | 17 | 42 | 17 | 42,0 | 42,0 |
| 16 | 16 | 52,5 | 21,5 | 52,5 | 21,5 | 52,5 | 52,5 |
| 18 | 19,5 | 64 | 26 | 64 | 26 | 64,0 | 64,0 |
| 20 | 23,5 | 78 | 31,5 | 78 | 31,5 | 78,0 | 78,0 |
| 22 | 29 | 97 | 38 | 97 | 38 | 97,0 | 97,0 |
| 25 | 35 | 122 | 47 | 122 | 47 | 122 | 122 |
| 30 | 64 | 168 | 64 | 168 | 64 | 168 | 168 |