# TOLERANCES

## ▪ Rod ends

| Descriptions | |
|---|---|
| d | nominal bore diameter of the bearing |
| Δdmp | mean bore diameter deviation of the bearing from nominal dimension |
| Vdp | bore diameter variation in one plane (roundness) |
| Vdmp | mean bore diameter variation (cylindricity) |
| ΔBs | single inner ring width deviation |

**Tab.1**

### Rod ends (K serie, ISO 12240-4)

Types: BRM_,BRF_, BRTM_,BRTF_, BEM_, BEF_, BEMN_, BEFN_, BEMA_, BEFA_, DSA_T/K, DSI_T/K, DPOS_, DPHS_, DGF_LO, DGIHN-K_LO, all Tescubal and Tesno lines.

| d [mm] | over incl. | - 6 | 6 10 | 10 18 | 18 30 | 30 50 | 50 80 | 80 120 | 120 180 |
|---|---|---|---|---|---|---|---|---|---|
| Δdmp | µm | +12 0 | +15 0 | +18 0 | +21 0 | +25 0 | +30 0 | +35 0 | +40 0 |
| Vdp | µm | 12 | 15 | 18 | 21 | 25 | 30 | 35 | 40 |
| Vdmp | µm | 9 | 11 | 14 | 16 | 19 | 22 | 26 | 30 |
| ΔBs | µm | 0 -120 | 0 -120 | 0 -120 | 0 -120 | 0 -120 | 0 -300 | 0 -350 | 0 -400 |

**Tab.2**

### Rod ends (E /EH serie, ISO 12240-4)

Types: PM_, PF_, EM_, EF_, EMA_, EFA_, EMN_, EFN_, DGAR_UK (-2RS), DGIR_UK (-2RS), DSA_ES (-2RS), DSI_ES (-2RS), DGK_DO, DGF_DO, DGIHR_DO, DGIHR-K_DO, DGIHO-K_DO, DGK_SK.

| d [mm] | over incl. | - 10 | 10 18 | 18 30 | 30 50 | 50 80 | 80 120 | 120 180 |
|---|---|---|---|---|---|---|---|---|
| Δdmp | µm | 0 -8 | +15 0 | +21 0 | +25 0 | +30 0 | +35 0 | +40 0 |
| Vdp | µm | 8 | 8 | 10 | 12 | 15 | 20 | 25 |
| Vdmp | µm | 6 | 6 | 8 | 9 | 11 | 15 | 19 |
| ΔBs | µm | 0 -120 | 0 -120 | 0 -120 | 0 -120 | 0 -150 | 0 -200 | 0 -250 |

**Tab.3**

## ▪ Spherical-plain bearings

| Descriptions | |
|---|---|
| d | nominal bore diameter of the bearing |
| Δdmp | mean bore diameter deviation of the bearing from nominal dimension |
| Vdp | bore diameter variation in one plane (roundness) |
| Vdmp | mean bore diameter variation (cylindricity) |
| ΔBs | single inner ring width deviation |
| D | nominal outside diameter of the bearing |
| ΔDmp | mean outside diameter deviation of the bearing from nominal dimension |
| VDp | outside diameter variation in one plane (roundness) |
| VDmp | mean outside diameter variation (cylindricity) |
| ΔCs | single outer ring width deviation |

**Tab.4**

### Spherical-plain bearings (K serie, ISO 12240-1)

Types: WLT_, WLK_, GLK_, GLKS_, DG_PW, DG_PB, DSG_PB, DS_PB, all Tescubal and Tesno lines.

| | Inner ring d [mm] | | | | | |
|---|---|---|---|---|---|---|
| | over incl. | - 6 | 6 10 | 10 18 | 18 30 | 30 50 |
| Δdmp | µm | +12 0 | +15 0 | +18 0 | +21 0 | +25 0 |
| Vdp | µm | 12 | 15 | 18 | 21 | 25 |
| Vdmp | µm | 9 | 11 | 14 | 16 | 19 |
| ΔBs | µm | 0 -120 | 0 -120 | 0 -120 | 0 -120 | 0 -120 |

**Tab.5**

| | Outer ring D [mm] | | | | | |
|---|---|---|---|---|---|---|
| | over incl. | - 18 | 18 30 | 30 50 | 50 80 | 80 120 |
| ΔDmp | µm | 0 -11 | 0 -13 | 0 -16 | 0 -19 | 0 -22 |
| VDp | µm | 18 | 21 | 25 | 30 | 35 |
| VDmp | µm | 18 | 21 | 25 | 30 | 35 |
| ΔCs | µm | 0 -240 | 0 -240 | 0 -240 | 0 -300 | 0 -400 |

**Tab.6**

**Spherical-plain bearings (E,G serie, ISO 12240-1)**

Types: GLE_, GLG_, DGE_UK(-2RS), DGE_FW(-2RS), DGE_ES(-2RS), DGEG_ES(-2RS), DGEZ_ES(-2RS).

| | | Inner ring d [mm] | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | over incl. | - 10 | 10 18 | 18 30 | 30 50 | 50 80 | 80 120 | 120 180 | 180 250 | 250 315 |
| Δdmp | µm | 0 -8 | 0 -8 | 0 -10 | 0 -12 | 0 -15 | 0 -20 | 0 -25 | 0 -30 | 0 -35 |
| Vdp | µm | 8 | 8 | 10 | 12 | 15 | 20 | 25 | 30 | 35 |
| Vdmp | µm | 6 | 6 | 8 | 9 | 11 | 15 | 19 | 23 | 26 |
| ΔBs | µm | 0 -120 | 0 -120 | 0 -120 | 0 -120 | 0 -150 | 0 -200 | 0 -250 | 0 -300 | 0 -350 |

**Tab.7**

| D | | Outer ring D [mm] | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | over incl. | - 18 | 18 30 | 30 50 | 50 80 | 80 120 | 120 150 | 150 180 | 180 250 | 250 315 | 315 400 | 400 500 |
| ΔDmp | µm | 0 -8 | 0 -9 | 0 -11 | 0 -13 | 0 -15 | 0 -18 | 0 -25 | 0 -30 | 0 -35 | 0 -40 | 0 -45 |
| VDp | µm | 10 | 12 | 15 | 17 | 20 | 24 | 33 | 40 | 47 | 53 | 60 |
| VDmp | µm | 6 | 7 | 8 | 10 | 11 | 14 | 19 | 23 | 26 | 30 | 34 |
| ΔCs | µm | 0 -240 | 0 -240 | 0 -240 | 0 -300 | 0 -400 | 0 -500 | 0 -500 | 0 -600 | 0 -700 | 0 -800 | 0 -900 |

**Tab.8**

**Spherical-plain bearings (E,G serie, ISO 12240-1)**

Types: DGE_LO, DGE_HO-2RS.

| | | Inner ring d [mm] | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | over incl. | 10 18 | 18 30 | 30 50 | 50 80 | 80 120 | 120 180 | 180 250 | 250 315 | 315 400 |
| Δdmp | µm | +18 0 | +21 0 | +25 0 | +30 0 | +35 0 | +40 0 | +45 0 | +52 0 | +57 0 |
| Vdp | µm | 18 | 21 | 25 | 30 | 35 | 40 | 46 | 52 | 0 57 |
| Vdmp | µm | 14 | 16 | 19 | 22 | 26 | 30 | 35 | 39 | 0 43 |
| ΔBs | µm | 0 -180 | 0 -210 | 0 -250 | 0 -300 | 0 -350 | 0 -400 | 0 -450 | 0 -520 | 0 -570 |

**Tab.9**

| | | Outer ring D [mm] | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | over incl. | 18 30 | 30 50 | 50 80 | 80 120 | 120 150 | 150 180 | 180 250 | 250 315 | 315 400 | 400 500 | 500 600 |
| ΔDmp | µm | 0 -9 | 0 -11 | 0 -13 | 0 -15 | 0 -18 | 0 -25 | 0 -30 | 0 -35 | 0 -40 | 0 -45 | 0 -50 |
| VDp | µm | 12 | 15 | 17 | 20 | 24 | 33 | 40 | 47 | 53 | 60 | 67 |
| VDmp | µm | 7 | 8 | 10 | 11 | 14 | 19 | 23 | 26 | 30 | 34 | 38 |
| ΔCs | µm | 0 -240 | 0 -240 | 0 -300 | 0 -400 | 0 -500 | 0 -500 | 0 -600 | 0 -700 | 0 -800 | 0 -900 | 0 -1000 |

**Tab.10**

## ▪ Angular contact spherical-plain bearings (ISO 12240-2)

| Descriptions | |
|---|---|
| d | nominal bore diameter of the bearing |
| Δdmp | mean bore diameter deviation of the bearing from nominal dimension |
| Vdp | bore diameter variation in one plane (roundness) |
| Vdmp | mean bore diameter variation (cylindricity) |
| ΔBs | single inner ring width deviation |
| D | nominal outside diameter of the bearing |
| ΔDmp | mean outside diameter deviation of the bearing from nominal dimension |
| VDp | outside diameter variation in one plane (roundness) |
| VDmp | mean outside diameter variation (cylindricity) |
| ΔCs | single outer ring width deviation |
| T | nominal width of the bearing |
| ΔTs | mean width deviation of the bearing |

**Tab.11**

**Angular contact spherical-plain bearings**

Types: DGE_SX, DGE_SW.

| | Inner ring d [mm] | | | | | |
|---|---|---|---|---|---|---|
| | over incl. | - 50 | 50 80 | 80 120 | 120 180 | 180 200 |
| Δdmp | µm | 0 -12 | 0 -15 | 0 -20 | 0 -25 | 0 -30 |
| Vdp | µm | 12 | 15 | 20 | 25 | 30 |
| Vdmp | µm | 9 | 11 | 15 | 19 | 23 |
| ΔBs | µm | 0 -240 | 0 -300 | 0 -400 | 0 -500 | 0 -600 |
| ΔTs | µm | +250 -400 | +250 -500 | +250 -600 | +350 -700 | +350 -800 |

**Tab.12**

| | Outer ring D [mm] | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | over incl. | - 50 | 50 80 | 80 120 | 120 150 | 150 180 | 180 250 | 250 315 |
| ΔDmp | µm | 0 -14 | 0 -16 | 0 -18 | 0 -20 | 0 -25 | 0 -30 | 0 -35 |
| VDp | µm | 14 | 16 | 18 | 20 | 25 | 30 | 35 |
| VDmp | µm | 11 | 12 | 14 | 15 | 19 | 23 | 26 |
| ΔCs | µm | 0 -240 | 0 -300 | 0 -400 | 0 -500 | 0 -500 | 0 -600 | 0 -700 |

**Tab.13**

## ▪ Axial spherical-plain bearings (ISO 12240-3)

| Descriptions | |
|---|---|
| d | nominal bore diameter of the bearing |
| Δdmp | mean bore diameter deviation of the bearing from nominal dimension |
| Vdp | bore diameter variation in one plane (roundness) |
| Vdmp | mean bore diameter variation (cylindricity) |
| ΔBs | single inner ring width deviation |
| D | nominal outside diameter of the bearing |
| ΔDmp | mean outside diameter deviation of the bearing from nominal dimension |
| VDp | outside diameter variation in one plane (roundness) |
| VDmp | mean outside diameter variation (cylindricity) |
| ΔCs | single outer ring width deviation |
| T | nominal width of the bearing |
| ΔTs | mean width deviation of the bearing |

**Tab.14**

### Axial spherical-plain bearings

Types: DGE_AX, DGE_AW.

| | | Inner ring d [mm] | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | over<br>incl. | -<br>18 | 18<br>30 | 30<br>50 | 50<br>80 | 80<br>120 | 120<br>180 | 180<br>200 |
| Δdmp | µm | 0<br>-8 | 0<br>-10 | 0<br>-12 | 0<br>-15 | 0<br>-20 | 0<br>-25 | 0<br>-30 |
| Vdp | µm | 8 | 10 | 12 | 15 | 20 | 25 | 30 |
| Vdmp | µm | 6 | 8 | 9 | 11 | 15 | 19 | 23 |
| ΔBs | µm | 0<br>-240 | 0<br>-240 | 0<br>-240 | 0<br>-300 | 0<br>-400 | 0<br>-500 | 0<br>-600 |
| ΔTs | µm | +250<br>-400 | +250<br>-400 | +250<br>-400 | +250<br>-500 | +250<br>-600 | +350<br>-700 | +350<br>-800 |

**Tab.15**

| | | Outer ring D [mm] | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | over<br>incl. | 18<br>30 | 30<br>50 | 50<br>80 | 80<br>120 | 120<br>150 | 150<br>180 | 180<br>250 | 250<br>315 | 315<br>400 |
| ΔDmp | µm | 0<br>-9 | 0<br>-11 | 0<br>-13 | 0<br>-15 | 0<br>-18 | 0<br>-25 | 0<br>-30 | 0<br>-35 | 0<br>-40 |
| VDp | µm | 12 | 15 | 17 | 20 | 24 | 33 | 40 | 47 | 53 |
| VDmp | µm | 7 | 8 | 10 | 11 | 14 | 19 | 23 | 26 | 30 |
| ΔCs | µm | 0<br>-240 | 0<br>-240 | 0<br>-300 | 0<br>-400 | 0<br>-500 | 0<br>-500 | 0<br>-600 | 0<br>-700 | 0<br>-800 |

**Tab.16**

### ▪ Recommended fit and tolerance for spherical-plain bearings

Choosing the fit, it has to be cared for no movement between inner ring bore and shaft or between outer ring and housing. Extremly tight fit might affect the radial clearance in a negative way.

| Housing fit for spherical-plain bearings | |
|---|---|
| Series K (normal, strong load type) | Series E, G, W |
| M7 / N7 | M6 / J6 |

**Tab.17**

| Shaft fit for spherical-plain bearings and rod ends | |
|---|---|
| Series K, W | Series E, G |
| k6 / m6 | j6 / h6 |

**Tab.17**