Loads

Minimum load For additional information → page 106	$F_{am} = 0{,}0005\ C_0 + A\left(\frac{n}{1\,000}\right)^2$	**Symbols** A minimum load factor (page 888) C_0 basic static load rating [kN] (page 888) F_a axial load [kN] F_{am} minimum axial load [kN] n rotational speed [r/min] P equivalent dynamic bearing load [kN] P_0 equivalent static bearing load [kN]
Equivalent dynamic bearing load For additional information → page 91	$P = F_a$	
Equivalent static bearing load For additional information → page 105	$P_0 = F_a$	

Temperature limits

The permissible operating temperature for cylindrical roller thrust bearings can be limited by:

- the dimensional stability of the bearing washers and rollers
- the cage
- the lubricant

Where temperatures outside the permissible range are expected, contact SKF.

Bearing washers and rollers

The bearings are heat stabilized up to at least 120 °C (*250 °F*).

Cages

Brass cages can be used at the same operating temperatures as the bearing washers and rollers. For temperature limits of polymer cages, refer to *Polymer cages*, page 188.

Lubricants

For temperature limits of SKF greases, refer to *Selecting a suitable SKF grease*, page 116.

When using lubricants not supplied by SKF, temperature limits should be evaluated according to the SKF traffic light concept, page 117.

Permissible speed

The speed ratings in the product table, page 888 indicate:

- the **reference speed**, which enables a quick assessment of the speed capabilities from a thermal frame of reference
- the **limiting speed**, which is a mechanical limit that should not be exceeded unless the bearing design and the application are adapted for higher speeds

For additional information, refer to *Operating temperature and speed*, page 130.

Design considerations

Abutment dimensions

Abutment dimensions should fulfil the following:

- Support surfaces in housings and on shafts should be at right angles to the shaft axis and provide uninterrupted support over the entire washer face.
- The abutment diameter on the shaft should be ≥ $d_{a\ min}$ and in the housing ≤ $D_{a\ max}$ (**fig. 6**). Values for $d_{a\ min}$ and $D_{a\ max}$ are listed in the **product table**, **page 888**
- Shafts and housings should be manufactured to suitable tolerance classes (**table 4**) to provide satisfactory radial guidance for the individual thrust bearing components.
  - Housing centred washers require a radial gap between the shaft and washer bore.
  - Shaft centred washers require a radial gap between the washer and the housing bore.

Cylindrical roller and cage thrust assemblies are generally centred radially by the shaft to reduce the circumferential speed at which the cage slides against the guiding surface. This is particularly important for higher-speed applications. The guiding surface should be ground.

Raceways on shafts and in housings

- should have the same hardness, surface finish and axial run-out as a bearing washer, if the load carrying capacity of a cylindrical roller and cage thrust assembly is to be fully exploited
- should be designed using the dimensions E_a and E_b (**product table**, **page 888**), which take radial displacement of the roller set into consideration

For additional information, refer to *Raceways on shafts and in housings*, **page 179**.

Fig. 6

Abutment diameters

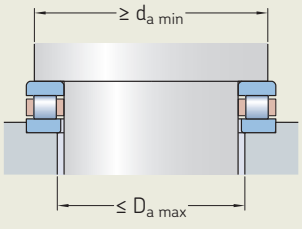


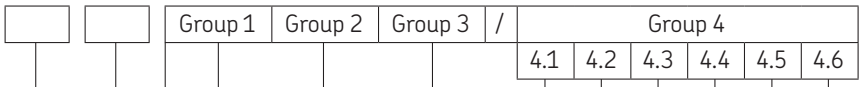
Table 4

Shaft and housing tolerance classes

Bearing component	Prefix	Tolerance class[1] Shaft centred	Housing centred
Cylindrical roller and cage thrust assemblies	K	h8	–
Shaft washers	WS	h8	–
Housing washers	GS	–	H9

[1] The envelope requirement (symbol Ⓔ from ISO 14405-1) is not shown but applies to all tolerance classes.

Designation system



Prefixes

GS Housing washer
K Cylindrical roller and cage thrust assembly
WS Shaft washer

Basic designation

Listed in table 4, page 30

LS.. Universal washer, the number following identifies the bore and outside diameter

Suffixes

Group 1: Internal design

Group 2: External design (seals, snap ring groove, etc.)

Group 3: Cage design

M Machined brass cage
TN Glass fibre reinforced PA66 cage

Group 4.1: Materials, heat treatment

HA1 Case-hardened shaft and housing washers
HB1 Bainite-hardened shaft and housing washers

Group 4.2: Accuracy, clearance, preload, quiet running

P5 Dimensional and geometrical tolerances to class P5

Group 4.3: Bearing sets, matched bearings

Group 4.4: Stabilization

Group 4.5: Lubrication

Group 4.6: Other variants