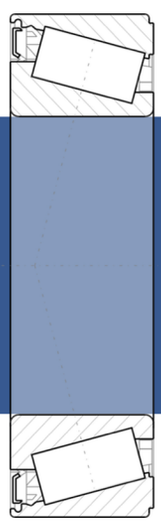
Integral Tapered Roller Bearings (JKOS)

Technical details



Version: 6/2021

GSWC Integral Tapered Roller Bearings (JKOS)

GSWC Integral Tapered Roller Bearings are sealed at one side, self-retaining and lubricated for life. They are mounted in pairs in order to obtain a bearing unit sealed at both sides. Due to the large spread, the bearing unit accommodates all load combinations from radial loads, axial loads and tilting moments.
Particularly economical solutions can be realized with Integral Tapered Roller Bearings for constructions exposed to very high loading and moderate speeds such as idlers, crane run wheels and sheaves.
The maximum operating temperature is 120°C.

Advantages:

- *Easy mounting:*
  Units consisting of cone, cup, roller set and seal are ready-to-mount (self-retaining).

- *No Adjustment necessary:*
  The correct radial clearance is automatically obtained by assembling the bearings in
  O-arranged pairs.

- *Maintenance-free:*
  Lubrication for life and a double-lip, low friction seal at both sides of the bearing pair.

Mounting:

Because the axial clearance is automatically obtained, the observance of the following tolerances is sufficient:

- Point load on outer ring / Turning inner ring:
  Shaft tolerance m6; Housing tolerance H7.

- Circumferential load on outer ring / Turning outer ring:
  Shaft tolerance g6; Housing tolerance M7.

The cones are axially clamped, for instance by a shaft nut or a shaft end cap. The maximum clamping force for the bearing pair is indicated in the dimensional table.

The cups are axially placed in the housing bore by a snap ring. The load capacity of the snap ring connection can also be found in the dimensional table.

If more than one pair of integral tapered roller bearings is mounted on a single shaft, cups can rotate at different speeds due to the variant diameters of cone and cup.

Dimensioning:

Even if integral tapered roller bearings are mounted in pairs, the calculation is based on the individual observation of both bearings.
Accordingly, the dimensional table indicates load ratings (C, C_0), e-value, and thrust factors (Y, Y_0) for single bearings.

Calculations:

Equivalent dynamic load of the single tapered roller bearing:

$P = F_r$	[kN] für / for	$\frac{F_a}{F_r} \leq e$
$P = 0{,}4 \cdot F_r + Y \cdot F_a$	[kN] für / for	$\frac{F_a}{F_r} > e$

P = Gesamtbelastung / Overall load
F_r = Radialbelastung / Radial load
F_a = Axialbelastung / Axial load

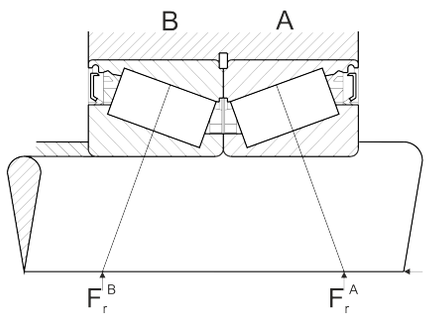
Equivalent static load of the single tapered roller bearing:

$P_0 = F_r$	[kN] für / for	$\frac{F_a}{F_r} \leq \frac{1}{2 \cdot Y_0}$
$P_0 = 0{,}5 \cdot F_r + Y_0 \cdot F_a$	[kN] für / for	$\frac{F_a}{F_r} > \frac{1}{2 \cdot Y_0}$

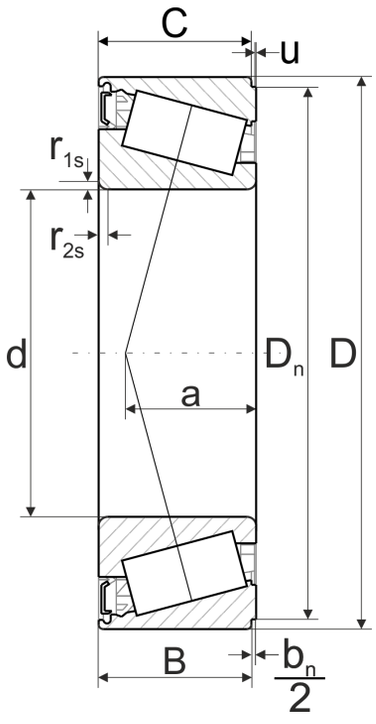
Axial load

Due to the inclination of the raceways of tapered roller bearings, a radial load generates axial reaction forces, which must be taken into account for the determination of the equivalent load.
The bearing accommodating the external axial load “K” is labeled as “A”, the other bearing as “B”. In case no equation is given, the axial load “F” is not considered.
The axial load is calculated as follows:

$Y = Y_A = Y_B$	Lager / Bearing „A“	Lager / Bearing „B“
$F_r^A \leq F_r^B$	$F_a = K_a + 0{,}5 \cdot \frac{F_r^B}{Y}$	——
$F_r^A > F_r^B$ $K_a > 0{,}5 \cdot \left(\frac{F_r^A - F_r^B}{Y}\right)$	$F_a = K_a + 0{,}5 \cdot \frac{F_r^B}{Y}$	——
$F_r^A > F_r^B$ $K_a \leq 0{,}5 \cdot \left(\frac{F_r^A - F_r^B}{Y}\right)$	——	$F_a = 0{,}5 \cdot \frac{F_r^A}{Y} - K_a$



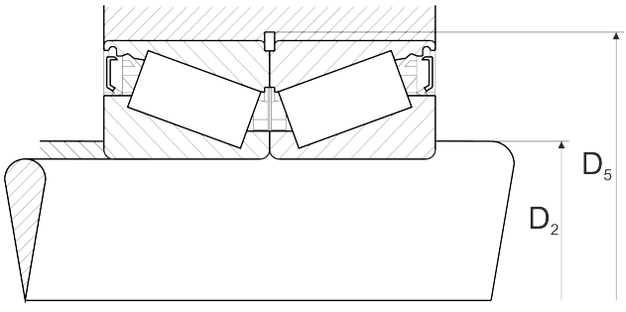
JKOS xxx



Code	Dimensions									Load rating · Factor				
GSWC	d	D	B	C	D_n	$\frac{b_n}{2}$	a	u	r_{1s}, r_{2s}	C_{dyn}	e	Y	C_0	Y_0
							≈	+0,05	min.					
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[kN]			[kN]	
JK0S 020	20	42	17	16,5	38,1	0,75	11,1	0,025	0,6	22,8	0,37	1,6	29	0,9
JK0S 025	25	47	17	16,5	43,1	0,75	12,4	0,015	0,6	25	0,42	1,4	34	0,8
JK0S 030	30	55	19	18,5	51,4	0,75	14,8	0,020	1,0	36	0,43	1,4	46,5	0,8
JK0S 035	35	62	20	19,5	58,4	0,75	16,2	0,020	1,0	36	0,44	1,4	50	0,7
JK0S 040	40	68	21	20,5	64,4	0,75	15,8	0,030	1,0	50	0,37	1,6	69,5	0,9
JK0S 045	45	75	22	21,5	70,7	1,00	17,2	0,020	1,0	55	0,38	1,6	81,5	0,9
JK0S 050	50	80	22	21,5	75,7	1,00	18,7	0,020	1,0	60	0,42	1,4	93	0,8
JK0S 060	60	95	26	25,0	89,8	1,25	23,1	0,030	1,5	76,5	0,43	1,4	122	0,8
JK0S 070	70	110	27	26,5	104,8	1,25	25,0	0,030	1,5	98	0,43	1,4	160	0,8
JK0S 080	80	125	30	29,5	119,8	1,25	28,0	0,030	1,5	129	0,42	1,4	212	0,8
JK0S 090	90	140	33,5	33,0	133,7	1,25	31,6	0,030	2,0	156	0,42	1,4	260	0,8
JK0S 100	100	150	33,5	33,0	143,6	1,25	34,4	0,030	2,0	166	0,46	1,3	290	0,7

Formulation of order:

Orders of DURABO integral tapered roller bearings should state the amount of single bearings required and not the number of pairs. Snap rings must be requested separately.



Code	Additional information			Abutments				Weight
				Snap ring	Shaft	Nut	Tolerance	
GSWC	Z_{MAX} [kN]	F_{BR} [kN]	S_L [min^{-1}]		D_2 (min) [mm]	D_5 [mm]	[mm]	≈ [kg]
JK0S 020	4,5	13,3	4800	BR42	25	43,2	+0,16	0,100
JK0S 025	5,0	14,9	4000	BR47	30	48,2	+0,16	0,128
JK0S 030	7,2	15,7	3400	BR55	36	56,5	+0,19	0,180
JK0S 035	7,2	14,2	3000	BR62	41	63,5	+0,19	0,240
JK0S 040	10,0	12,9	2700	BR68	46	69,5	+0,19	0,290
JK0S 045	11,0	33,8	2400	BR75	51	76,8	+0,19	0,363
JK0S 050	12,0	31,4	2200	BR80	56	81,8	+0,22	0,403
JK0S 060	15,3	50,2	1800	BR95	67	97,0	+0,22	0,620
JK0S 070	19,6	49,0	1500	BR110	77	112,3	+0,22	0,900
JK0S 080	25,8	40,2	1300	BR125	87	127,3	+0,25	1,330
JK0S 090	31,2	40,2	1200	BR140	99	142,6	+0,25	1,900
JK0S 100	33,2	36,2	1100	BR150	109	152,6	+0,25	2,000

Z_{MAX} Maximum axial clamping force of bearing pair

F_{BR} Load carrying capacity of the snap ring connection

S_L Limiting speed (bearing pair, grease)