

R4200 Slim Bearings

Overview



Description

The slim bearing consists of two rings, with four-point ball bearing contact, in a C-cross section size of only 9,525 x 9,525mm (3/8" x 3/8").

Due to the split bearing rings, a plastic cage strip with both guided and retained balls, of larger than normal size can be integrated. The 90° pressure angle of the bearing makes it possible to take up radial and axial forces, as well as torques, from any direction.

The temperature limits of the standard bearing in continuous operation are -40°C to +100°C, and for short periods up to 120°C. A compatible ball cage made of PTFE is available for higher working temperatures.

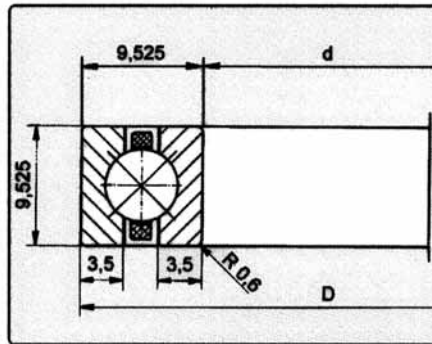
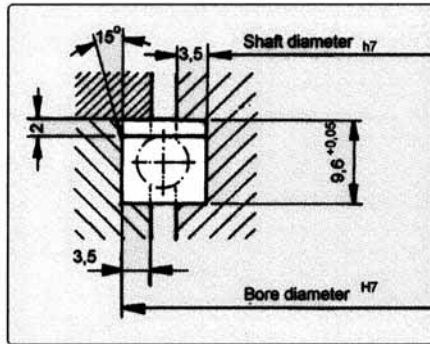
Features

- ⊙ Free choice of material for adjoining structure, e.g: aluminium. Due to the splitted bearing rings, there is no difficulty from differential expansion.
- ⊙ Corrosion resistant, (due to choice of material of the bearing rings).
- ⊙ Low maintenance.
- ⊙ High static and dynamic strength.
- ⊙ Long service life.
- ⊙ Great stiffness, (due higher quantity of larger balls).
- ⊙ Low bearing weight.
- ⊙ Easy to fit.
- ⊙ Economic installation, no special tools required.
- ⊙ Optimum price/ performance ratio.

With our split ring design we can use bigger balls in the same cross section, drastically increasing load capacities. We can also manufacture bearings from stainless steel X46EM13.

Split Bearing - Slim

slim bearing type



Fitted dimensions

Order No.	d mm	d inch	D	Max. dyn. load C _a kN	Max. dyn. load C _{oa} kN	Kg
PBXC 040	101,60	4	120,65	13,6	42,2	0,18
PBXC 042	107,95	4¼	127,00	14,0	44,7	0,19
PBXC 045	114,30	4½	133,35	14,3	47,0	0,20
PBXC 047	120,65	4¾	139,70	14,6	49,5	0,21
PBXC 050	127,00	5	146,05	15,0	51,9	0,22
PBXC 055	139,70	5½	158,75	15,4	56,7	0,24
PBXC 060	152,40	6	171,45	15,9	61,6	0,26
PBXC 065	165,10	6½	184,15	16,3	66,3	0,28
PBXC 070	177,80	7	196,85	16,8	71,2	0,30
PBXC 075	190,50	7½	209,55	17,2	76,0	0,32
PBXC 080	203,20	8	222,25	17,5	81,2	0,34
PBXC 085	215,90	8½	234,95	17,9	85,7	0,36
PBXC 090	228,60	9	247,65	18,2	90,5	0,38
PBXC 095	241,30	9½	260,35	18,6	95,3	0,39
PBXC 100	254,00	10	273,05	19,0	100,1	0,41
PBXC 105	266,70	10½	285,75	19,4	105,0	0,43
PBXC 110	279,40	11	298,45	19,7	109,8	0,45
PBXC 115	292,10	11½	311,15	20,0	114,6	0,47
PBXC 120	304,80	12	323,85	20,3	119,4	0,49
PBXC 130	330,20	13	349,25	20,9	129,1	0,53
PBXC 140	355,60	14	374,65	21,5	138,7	0,56
PBXC 150	381,00	15	400,05	22,0	148,4	0,60
PBXC 160	406,40	16	425,45	22,5	158,0	0,64
PBXC 170	431,80	17	450,85	23,0	167,7	0,68
PBXC 180	457,20	18	476,25	23,6	177,3	0,72
PBXC 190	482,60	19	501,65	24,0	187,0	0,76
PBXC 200	508,00	20	527,05	24,4	196,7	0,79
PBXC 210	533,40	21	552,45	24,8	206,3	0,83
PBXC 220	558,80	22	577,85	25,2	216,0	0,87
PBXC 230	584,20	23	603,25	25,6	225,6	0,91
PBXC 240	609,60	24	628,65	26,0	235,3	0,95
PBXC 250	635,00	25	654,05	26,5	244,9	0,98
PBXC 260	660,40	26	679,45	27,1	254,6	1,02
PBXC 270	685,80	27	704,85	27,6	264,4	1,06
PBXC 280	711,20	28	730,25	28,1	274,2	1,10
PBXC 290	736,60	29	755,65	28,6	284,0	1,14
PBXC 300	762,00	30	781,05	29,1	293,8	1,18
PBXC 310	787,40	31	806,45	29,6	303,6	1,22
PBXC 320	812,80	32	831,85	30,1	313,3	1,26
PBXC 330	838,20	33	857,25	30,5	323,1	1,30
PBXC 340	863,60	34	882,65	31,0	332,9	1,34



R4200



Material
Corrosion resistant split bearing rings.
Ball bearings retained in plastic cage.



ROTARY OTHER



R4200

Static Strength

Given

PBXC 115

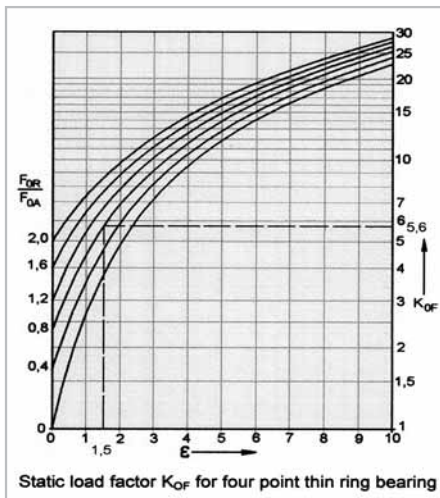
Static Strength $C_{0a} = 114,6 \text{ kN}$

Bearing Loads

Axial Load $F_{0A} = 7,5 \text{ kN}$

Radial Load $F_{0R} = 6,0 \text{ kN}$

Tilting Torque $M_{0K} = 1,7 \text{ kNm}$



Desired

Static safety factor

$$E = \frac{2 \times M_{0K} \times 10^3}{F_{0A} \times D_L}$$

E = Load eccentricity value.

D_L = Running circle diameter in mm = $\frac{d+D}{2}$

$$E = \frac{2 \times 1,7}{7,5 \times 301,6} \times 10^3 = 1,5$$

$$\frac{F_{0R}}{F_{0A}} = \frac{6}{7,5} = 0,8 \quad K_{OF} = 5,6$$

$$P_0 = F_{0A} \times K_{OF} = 7,5 \times 5,6 = 42 \text{ kN}$$

$$\text{Static safety factor } S_0 = \frac{C_{0a}}{P_0}$$

$$S_0 = \frac{114,6}{42} = 2,73 \text{ times.}$$

Calculation of Service Life

Given

PBXC 115

Dynamic strength figure $C_a = 20 \text{ kN}$

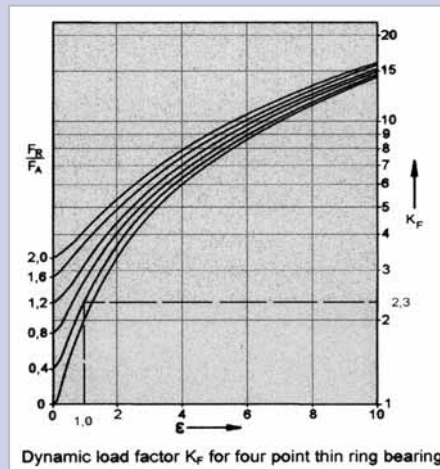
Bearing Loads

Axial Load $F_A = 2,50 \text{ kN}$

Radial Load $F_R = 1,00 \text{ kN}$

Tilting Torque $M_k = 0,38 \text{ kNm}$

Speed $n = 20 \text{ min}^{-1}$



Desired

Nominal service life

$$E = \frac{2 \times M_k \times 10^3}{F_A \times D_L}$$

E = Load eccentricity value

D_L = Running circle diameter in mm = $\frac{d+D}{2}$

$$E = \frac{2 \times 0,38}{2,5 \times 301,6} \times 10^3 = 1,0$$

$$\frac{F_R}{F_A} = \frac{1,0}{2,5} = 0,4 \quad K_F = 2,3$$

$$P = F_A \times K_F = 2,5 \times 2,3 = 5,75 \text{ kN}$$

$$\text{Service life } L_h = 16,666 \times \left(\frac{C_a}{P} \right)^3$$

$$L_h = \frac{16,666}{20} \times \left(\frac{20}{5,75} \right)^3 = 35,000 \text{ hours.}$$