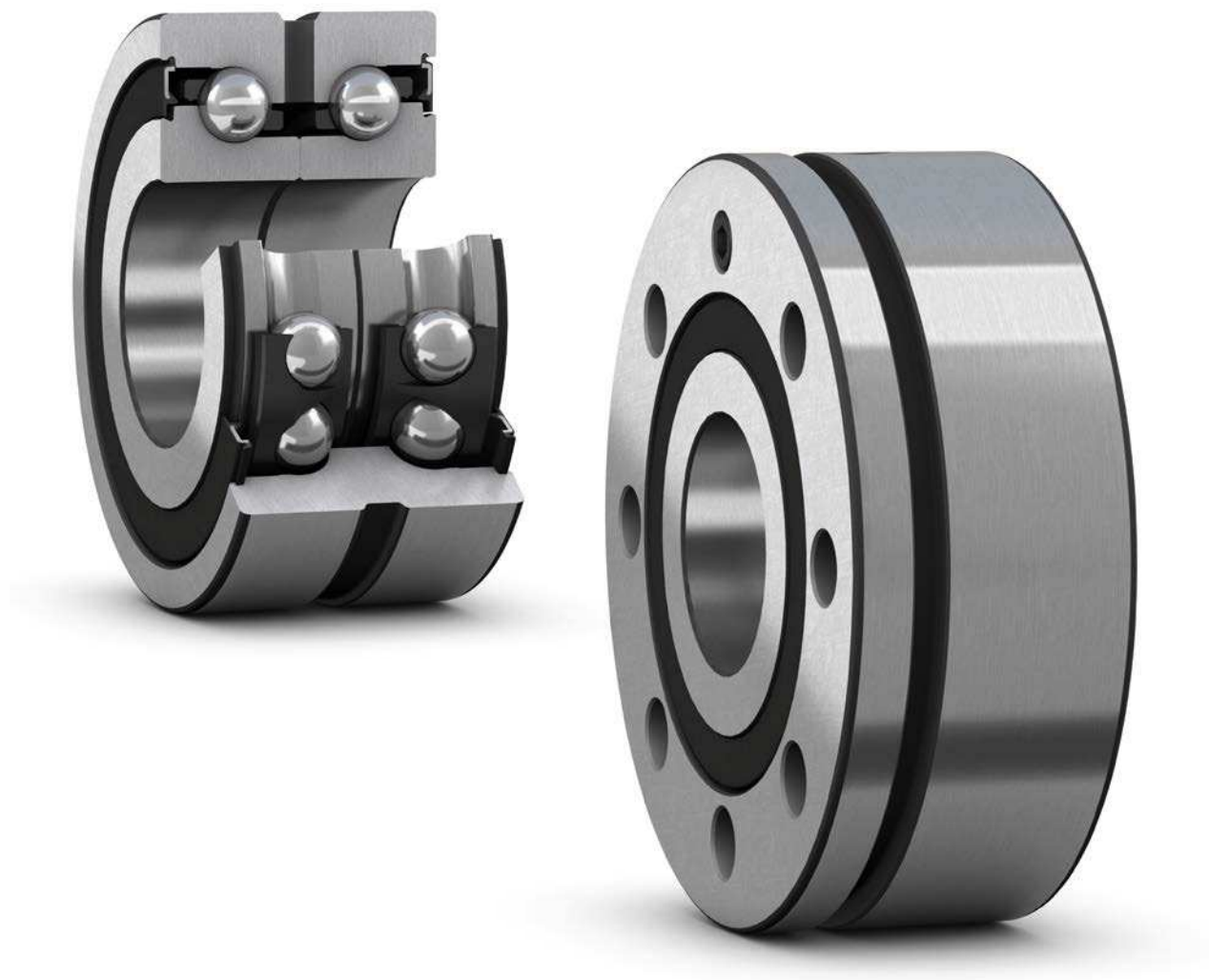
# SKF double direction angular contact thrust ball bearings for screw drives

– SKF BEAM / BEAS series



# Higher speed and dynamic load. Lower vibration and friction.

The double direction angular contact thrust ball bearings from SKF have been developed for machine tool applications where space is tight and easy mounting is required. Optimized for increased load capacity and speed, these ready-to-mount bearings are available in two series:

– Double direction bearings in the BEAS series, for shaft diameters from 8 to 30 mm
– Double direction bearings for bolt mounting in the BEAM series, for shaft diameters from 12 to 60 mm

## New generation of SKF BEAM/BEAS:

- Optimized design of the internal geometry
- New ball-centered cage made of glass-fibre reinforced polyamide
- New RSH seal with optimized axial contact
- Increased number of holes for easier mounting

Ball screws are high-accuracy and high-efficiency mechanical devices widely used to drive the axis of a machine tool. They are, in most cases, supported at both ends by ball screw support bearings specially designed for the specific requirements of this application. SKF BEAM/BEAS bearings thus provide the appropriate level of axial stiffness and load carrying capacity, while also accommodating high accelerations. SKF double direction angular contact thrust ball bearings are beneficial in all applications where secure radial and axial support is required.

Double direction angular contact thrust ball bearings, BEAM series

Double direction angular contact thrust ball bearings, BEAS series

# Added value for customers

UP TO 20% DYNAMIC LOAD RATING INCREASE

UP TO 35% SPEED INCREASE

With SKF BEAM/BEAS work can be completed faster – by virtue of higher speed limit and load rating. Maintenance intervals may also be extended due to improved sealing and lower friction design.

## Improved technical bearing values

There is significant improvement in the dynamic and static load ratings of the SKF new generation BEAM/BEAS compared to the previous generation. Thanks to the optimized internal geometry of the bearing, the dynamic load capacity has been increased by up to 20% for the BEAM range, and up to 17% for the BEAS range. The new design also allows for an increase of the speed limit by up to 15% for BEAM and up to 35% for BEAS – depending on the bearing size – compared to previous generation values. The "closed" design of the cage is more suitable for high speed.

## New low contact seals and cages

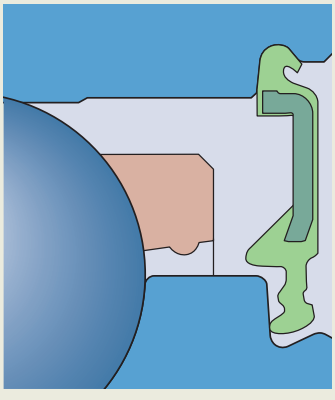
SKF new generation BEAM and BEAS are sealed and greased as standard. Lower bearing friction means not only lower energy consumption and longer grease/bearing life but also lower temperature increase. This reduces thermal deformation of the customer's machine structure – resulting in better machining precision. What's more, the new glass-fibre reinforced polyamide cage is centered on the balls to considerably reduce the risk of vibration.

The new low contact seal design minimizes friction while improving the sealing performance – contributing to longer bearing life. Comparative tests with products on the market have shown that the new seal design can be up to 7% more effective against dust contamination.

## Reducing cost of ownership

The new generation of SKF BEAM/BEAS helps to reduce your total cost of ownership through:

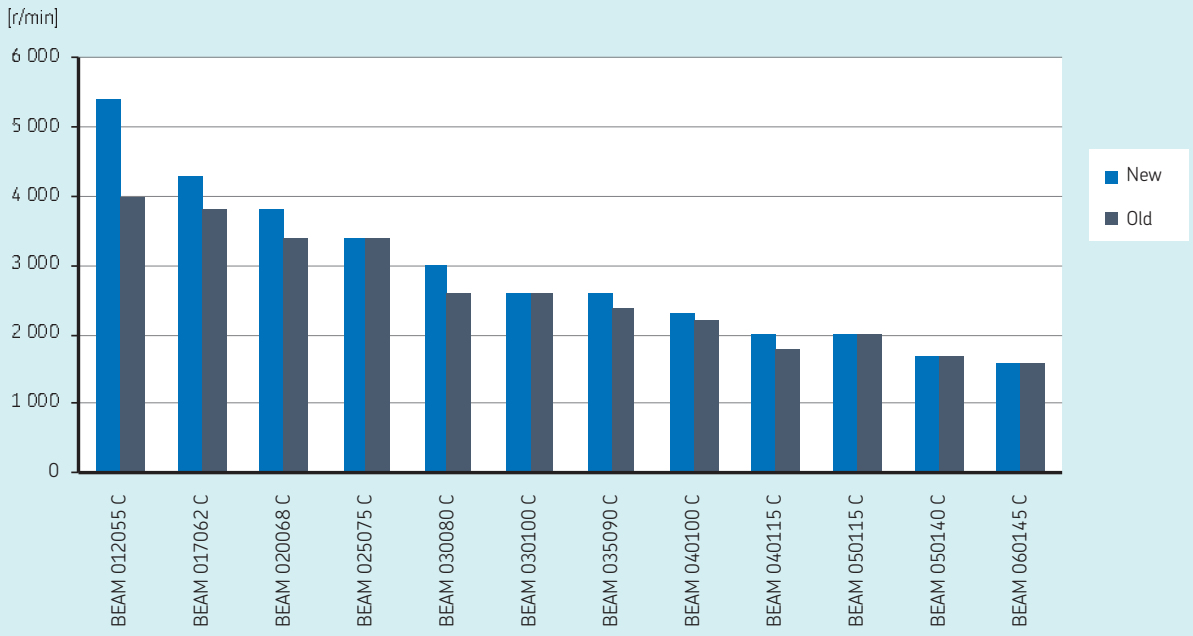
- **improved efficiency**: increased loading capacity and speed limit help to reduce machining operation time
- **energy savings**: lower friction contributes to reduce energy consumption
- **increased uptime**: lower friction and improved sealing capacity also lead to longer bearing life – which in turn contributes to longer maintenance time intervals
- **reduced downtime**: faster assembly and replacement help to reduce machine downtime
- **interchangeable design:** the new features do not affect interchangeability



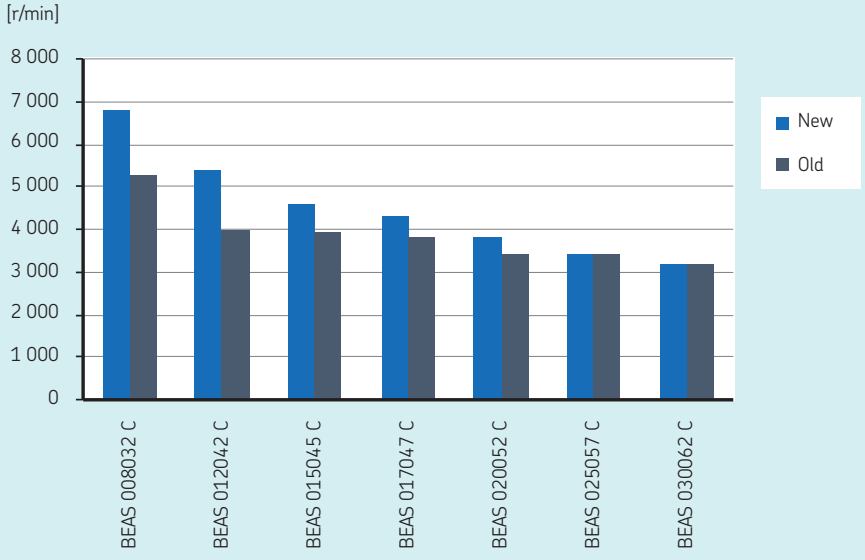
New low contact seals design

New cage design

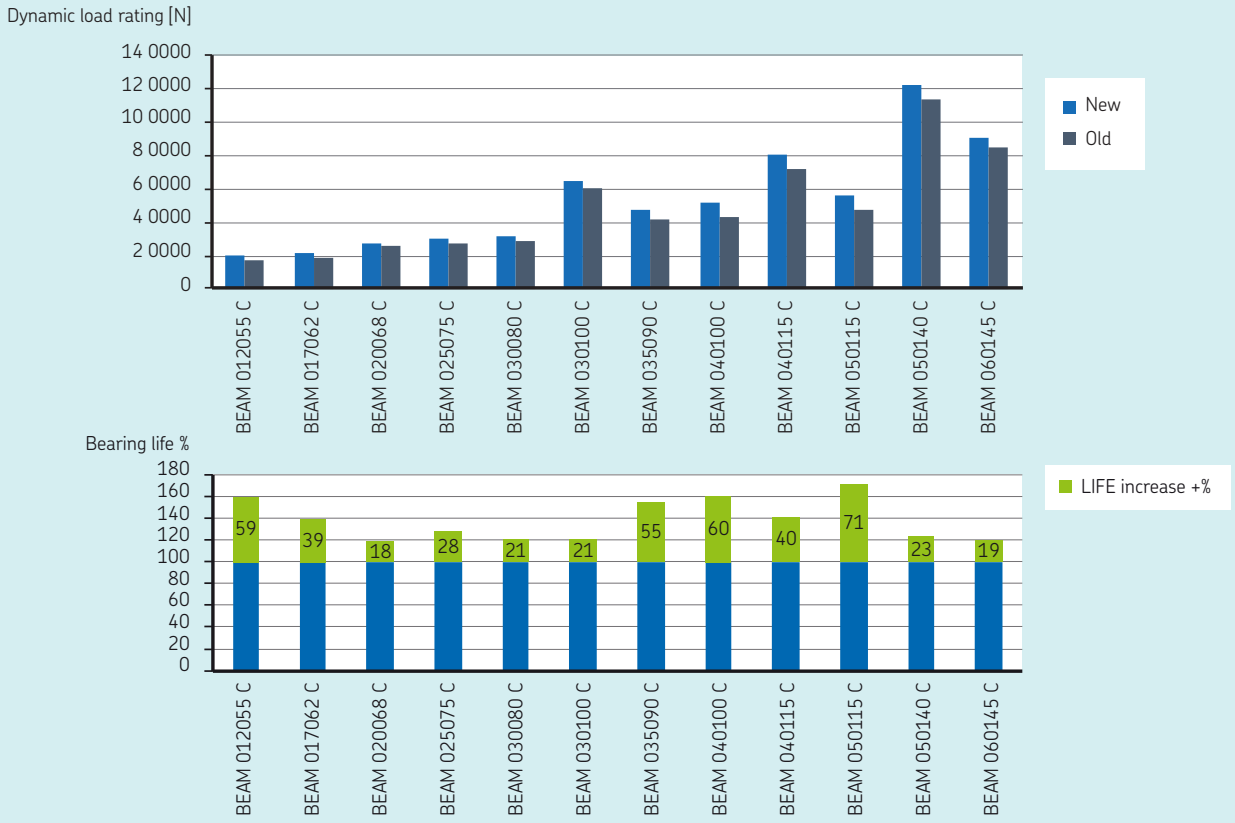
## Increase of speed limit SKF BEAM series



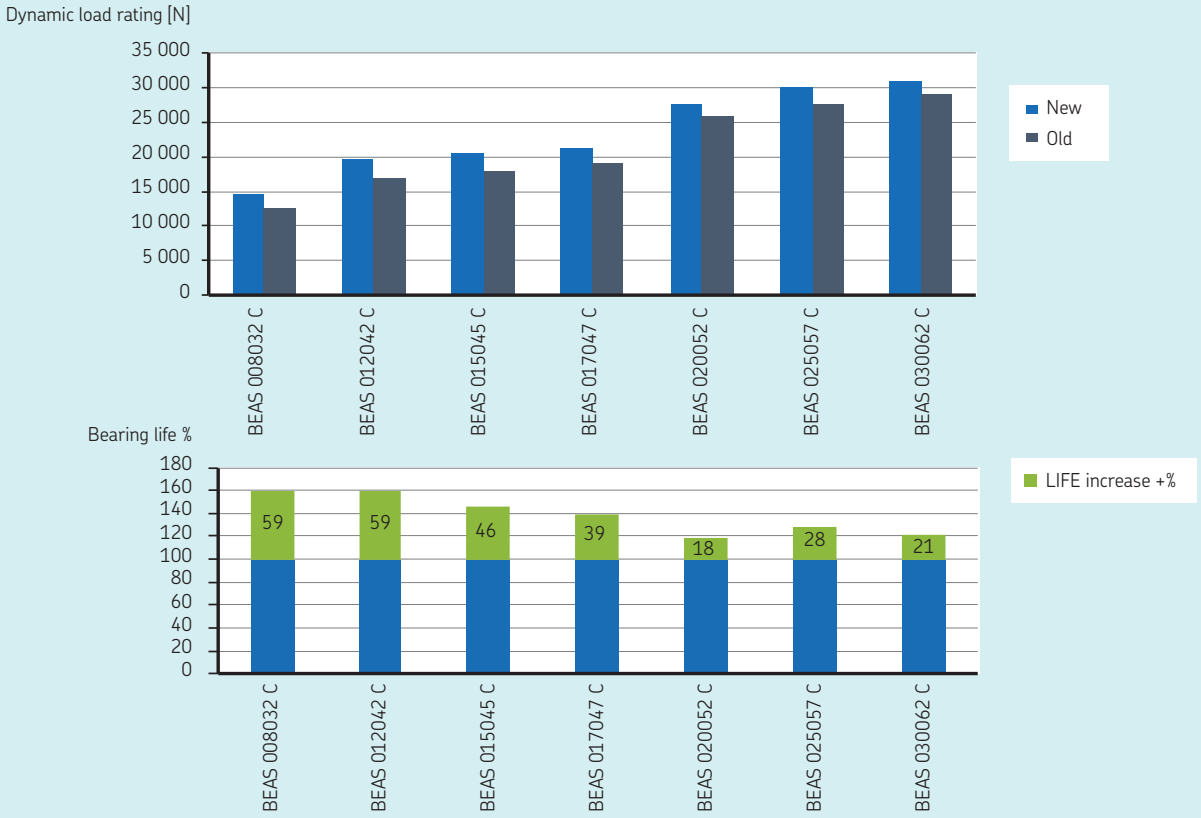

## Increase of speed limit SKF BEAS series



## Increase of load rating and life SKF BEAM series




## Increase of load rating and life SKF BEAS series



## Standard execution

**Tolerance of angular contact thrust ball bearings for screw drives**

| Inner ring and bearing height | | Double direction bearings | | | | |
|---|---|---|---|---|---|---|
| d | | $\Delta_{ds}$, $\Delta_{dmp}$ | | $\Delta_{Bs}$ | | $S_{ia}$ |
| over | incl. | high | low | high | low | max |
| mm | | µm | | µm | | µm |
| 8 | 10 | 0 | -5 | 0 | -250 | 2 |
| 10 | 18 | 0 | -5 | 0 | -250 | 2 |
| 18 | 25 | 0 | -5 | 0 | -250 | 2 |
| 25 | 30 | 0 | -5 | 0 | -250 | 2,5 |
| 30 | 50 | 0 | -5 | 0 | -250 | 2,5 |
| 50 | 80 | 0 | -8 | 0 | -250 | 3 |

| Outer ring | | Double direction bearings | | | |
|---|---|---|---|---|---|
| D | | $\Delta_{Ds}$, $\Delta_{Dmp}$ | | $\Delta_{Cs}$ | |
| over | incl. | high | low | high | low |
| mm | | µm | | µm | |
| 30 | 50 | 0 | -10 | 0 | -250 |
| 50 | 80 | 0 | -10 | 0 | -250 |
| 80 | 110 | 0 | -10 | 0 | -250 |
| 110 | 140 | 0 | -10 | 0 | -250 |
| 140 | 150 | 0 | -15 | 0 | -250 |

## PE execution

**Tolerance of angular contact thrust ball bearings for screw drives**

| Inner ring and bearing height | | Double direction bearings | | | | |
|---|---|---|---|---|---|---|
| d | | $\Delta_{ds}$, $\Delta_{dmp}$ | | $\Delta_{Bs}$ | | $S_{ia}$ |
| over | incl. | high | low | high | low | max |
| mm | | µm | | µm | | µm |
| 8 | 10 | 0 | -8 | 0 | -250 | 5 |
| 10 | 18 | 0 | -10 | 0 | -250 | 5 |
| 18 | 25 | 0 | -10 | 0 | -250 | 5 |
| 25 | 30 | 0 | -10 | 0 | -250 | 5 |
| 30 | 60 | 0 | -10 | 0 | -250 | 5 |

| Outer ring | | Double direction bearings | | | |
|---|---|---|---|---|---|
| D | | $\Delta_{Ds}$, $\Delta_{Dmp}$ | | $\Delta_{Cs}$ | |
| over | incl. | high | low | high | low |
| mm | | µm | | µm | |
| 30 | 50 | 0 | -11 | 0 | -250 |
| 50 | 80 | 0 | -13 | 0 | -250 |
| 80 | 120 | 0 | -15 | 0 | -250 |

## Axial preload

**Axial preload, frictional moment**

| Designation | Axial preload | Frictional moment[1)] |
|---|---|---|
| – | N | Nm |
| **BEAS 008032 C** | 300 | 0,08 |
| **BEAS 010034 C** | 410 | 0,12 |
| **BEAS 012042 C** | 650 | 0,16 |
| **BEAS 015045 C** | 650 | 0,2 |
| **BEAS 017047 C** | 720 | 0,24 |
| **BEAS 020052 C** | 1 650 | 0,3 |
| **BEAS 025057 C** | 1 920 | 0,4 |
| **BEAS 030062 C** | 2 250 | 0,5 |
| **BEAM 012055 C** | 650 | 0,16 |
| **BEAM 015060 C** | 650 | 0,2 |
| **BEAM 017062 C** | 720 | 0,24 |
| **BEAM 020068 C** | 1 650 | 0,3 |
| **BEAM 025075 C** | 1 920 | 0,4 |
| **BEAM 030080 C** | 2 250 | 0,5 |
| **BEAM 030100 C** | 3 710 | 0,8 |
| **BEAM 035090 C** | 2 750 | 0,6 |
| **BEAM 040100 C** | 3 460 | 0,7 |
| **BEAM 040115 C** | 4 890 | 1,3 |
| **BEAM 050115 C** | 3 930 | 0,9 |
| **BEAM 050140 C** | 6 750 | 2,6 |
| **BEAM 060145 C** | 4 100 | 2 |

[1)] The guideline values for the frictional moment apply to bearings with contact seals (designation suffix 2RSH). For bearings with non-contact seals (designation suffix 2RSL), the frictional moment is only half.

## Axial and tilting stiffness

**Axial and tilting stiffness**

| Designation | Axial stiffness[2)] | Tilting stiffness[2)] |
|---|---|---|
| – | N/µm | Nm/mrad |
| **BEAS 008032 C** | 270 | 20 |
| **BEAS 010034 C** | 330 | 25 |
| **BEAS 012042 C** | 400 | 50 |
| **BEAS 015045 C** | 430 | 65 |
| **BEAS 017047 C** | 470 | 80 |
| **BEAS 020052 C** | 680 | 140 |
| **BEAS 025057 C** | 790 | 200 |
| **BEAS 030062 C** | 900 | 290 |
| **BEAM 012055 C** | 400 | 50 |
| **BEAM 015060 C** | 430 | 65 |
| **BEAM 017062 C** | 470 | 80 |
| **BEAM 020068 C** | 680 | 140 |
| **BEAM 025075 C** | 790 | 200 |
| **BEAM 030080 C** | 900 | 290 |
| **BEAM 030100 C** | 940 | 400 |
| **BEAM 035090 C** | 930 | 400 |
| **BEAM 040100 C** | 1 100 | 550 |
| **BEAM 040115 C** | 1 240 | 880 |
| **BEAM 050115 C** | 1 340 | 970 |
| **BEAM 050140 C** | 1 480 | 1 530 |
| **BEAM 060145 C** | 1 380 | 1 520 |

[2)] The values are valid for unmounted bearings.

## Designation system

**Examples:** BEAM 030080 C -2RSH / PE

BEAM 030080 C -2RSH / PE

**Bearing series**

**BEAM** Double direction bearing for bolt mounting
**BEAS** Double direction bearing

**Bearing size**

**008032** 8 mm bore diameter and 32 outside diameter
to
**060145** 60 mm bore diameter and 145 outside diameter

**Design features**

**C** Improved internal design

**Sealing solutions**

**-2RSH** Contact seal on both sides, NBR
**-2RSL** Non-contact seal on both sides, NBR

**Tolerance class**

**-** Super precision tolerance class

**/ PE** Less stringent tolerance class

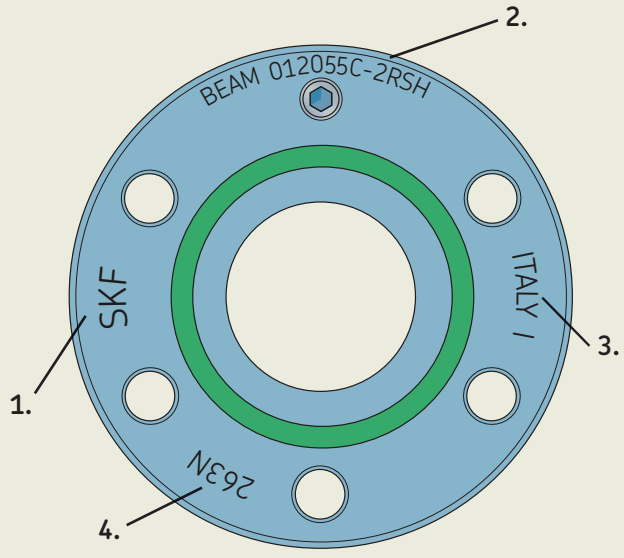
## Markings on bearings

The BEAM and BEAS bearings have various markings on the side faces of the rings **(→ fig. 1).**

1. SKF trademark
2. Complete designation of the bearing/unit
3. Country of manufacture
4. Date of manufacture, coded

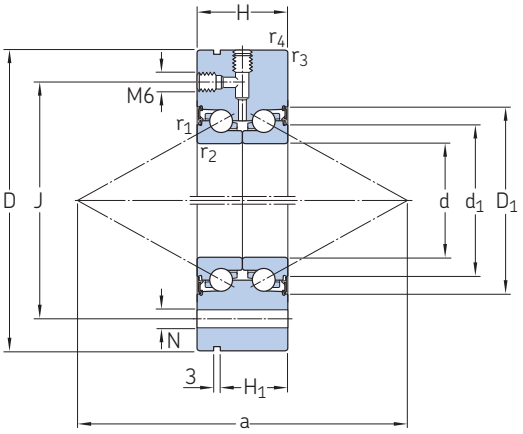
Previously, the marking was on the outer ring outside surface. Now, the laser marking is placed on the side face of the outer ring. This is the bearing side usually visible on the machine tool, which means that the bearing designation is easily read without dismounting it.

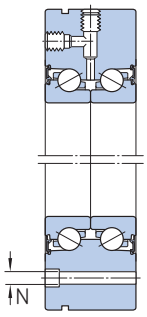
**Fig. 1**



## Double direction angular contact thrust ball bearings for screw drives, BEAM series

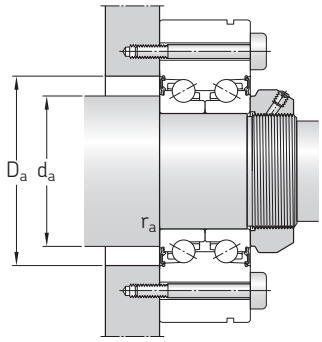
d **12-60** mm

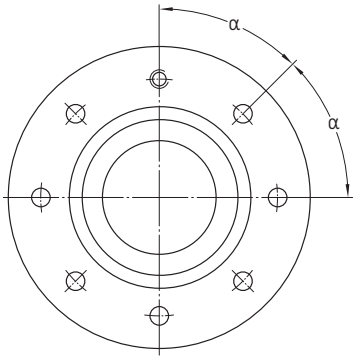


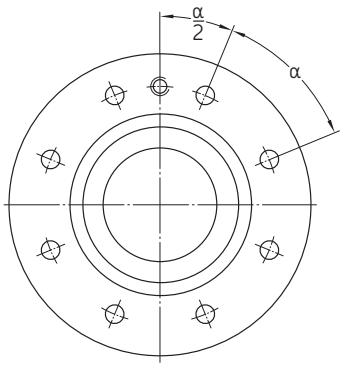




BEAM 060145 C

| Principal dimensions | | | Basic load rating | | Fatigue load limit | Attainable speed | Mass | Designation |
|---|---|---|---|---|---|---|---|---|
| | | | dynamic | static | | | | |
| d | D | H | C | $C_0$ | $P_u$ | | | |
| mm | | | kN | | kN | r/min | kg | – |
| **12** | 55 | 25 | 19,6 | 30 | 1,1 | 5 400 | 0,35 | **BEAM 012055 C-2RSH** |
| | 55 | 25 | 19,6 | 30 | 1,1 | 9 000 | 0,35 | **BEAM 012055 C-2RSL** |
| **15** | 60 | 25 | 20,4 | 33,5 | 1,3 | 4 600 | 0,42 | **BEAM 015060 C-2RSH** |
| | 60 | 25 | 20,4 | 33,5 | 1,3 | 7 700 | 0,42 | **BEAM 015060 C-2RSL** |
| **17** | 62 | 25 | 21,2 | 37,5 | 1,4 | 4 300 | 0,45 | **BEAM 017062 C-2RSH** |
| | 62 | 25 | 21,2 | 37,5 | 1,4 | 7 200 | 0,45 | **BEAM 017062 C-2RSL** |
| **20** | 68 | 28 | 27,5 | 51 | 1,9 | 3 800 | 0,58 | **BEAM 020068 C-2RSH** |
| | 68 | 28 | 27,5 | 51 | 1,9 | 6 400 | 0,58 | **BEAM 020068 C-2RSL** |
| **25** | 75 | 28 | 30 | 60 | 2,2 | 3 400 | 0,7 | **BEAM 025075 C-2RSH** |
| | 75 | 28 | 30 | 60 | 2,2 | 5 600 | 0,7 | **BEAM 025075 C-2RSL** |
| **30** | 80 | 28 | 31 | 69,5 | 2,6 | 3 000 | 0,75 | **BEAM 030080 C-2RSH** |
| | 80 | 28 | 31 | 69,5 | 2,6 | 4 900 | 0,75 | **BEAM 030080 C-2RSL** |
| | 100 | 38 | 64 | 118 | 4,3 | 2 600 | 1,72 | **BEAM 030100 C-2RSH** |
| | 100 | 38 | 64 | 118 | 4,3 | 4 300 | 1,72 | **BEAM 030100 C-2RSL** |
| **35** | 90 | 34 | 47,5 | 98 | 3,7 | 2 600 | 1,13 | **BEAM 035090 C-2RSH** |
| | 90 | 34 | 47,5 | 98 | 3,7 | 4 300 | 1,13 | **BEAM 035090 C-2RSL** |
| **40** | 100 | 34 | 51 | 114 | 4,3 | 2 300 | 1,43 | **BEAM 040100 C-2RSH** |
| | 100 | 34 | 51 | 114 | 4,3 | 3 900 | 1,43 | **BEAM 040100 C-2RSL** |
| | 115 | 46 | 80 | 176 | 6,4 | 2 000 | 2,6 | **BEAM 040115 C-2RSH** |
| | 115 | 46 | 80 | 176 | 6,4 | 3 400 | 2,6 | **BEAM 040115 C-2RSL** |
| **50** | 115 | 34 | 56 | 146 | 5,4 | 2 000 | 1,8 | **BEAM 050115 C-2RSH** |
| | 115 | 34 | 56 | 146 | 5,4 | 3 600 | 1,8 | **BEAM 050115 C-2RSL** |
| | 140 | 54 | 122 | 270 | 10 | 1 700 | 4,5 | **BEAM 050140 C-2RSH** |
| | 140 | 54 | 122 | 270 | 10 | 2 800 | 4,5 | **BEAM 050140 C-2RSL** |
| **60** | 145 | 45 | 90 | 232 | 8,7 | 1 600 | 4,1 | **BEAM 060145 C-2RSH** |
| | 145 | 45 | 90 | 232 | 8,7 | 3 000 | 4,1 | **BEAM 060145 C-2RSL** |



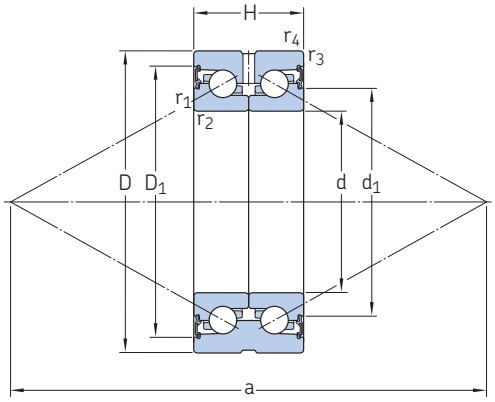




BEAM 030100 C
BEAM 040115 C
BEAM 050140 C
BEAM 060145 C

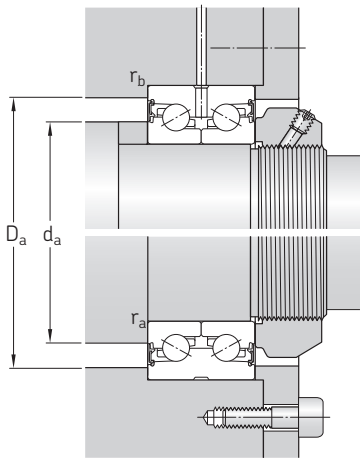
| **Dimensions** | | | | | | | **Abutment and fillet dimensions** | | | **Holes for attachment bolts in accordance with DIN 912** | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | Size | Dimensions | | |
| d | $d_1$ ~ | $D_1$ ~ | $H_1$ ~ | $r_{1,2}$ min. | $r_{3,4}$ min. | a | $d_a$ min. | $D_a$ max. | $r_a$ max. | | J | N | Pitch nr. × α [°] |
| mm | | | | | | | mm | | | – | mm | | – |
| **12** | 22,7 | 32,1 | 17 | 0,3 | 0,6 | 55 | 16 | 33 | 0,3 | M6 | 42 | 6,8 | 5×60° |
| | 22,7 | 32,1 | 17 | 0,3 | 0,6 | 55 | 16 | 33 | 0,3 | M6 | 42 | 6,8 | 5×60° |
| **15** | 26,7 | 36,1 | 17 | 0,3 | 0,6 | 62 | 20 | 35 | 0,3 | M6 | 46 | 6,8 | 5×60° |
| | 26,7 | 36,1 | 17 | 0,3 | 0,6 | 62 | 20 | 35 | 0,3 | M6 | 46 | 6,8 | 5×60° |
| **17** | 28,7 | 38,1 | 17 | 0,3 | 0,6 | 65 | 23 | 37 | 0,3 | M6 | 48 | 6,8 | 5×60° |
| | 28,7 | 38,1 | 17 | 0,3 | 0,6 | 65 | 23 | 37 | 0,3 | M6 | 48 | 6,8 | 5×60° |
| **20** | 32,2 | 43,2 | 19 | 0,3 | 0,6 | 73 | 25 | 43 | 0,3 | M6 | 53 | 6,8 | 7×45° |
| | 32,2 | 43,2 | 19 | 0,3 | 0,6 | 73 | 25 | 43 | 0,3 | M6 | 53 | 6,8 | 7×45° |
| **25** | 37,2 | 48,2 | 19 | 0,3 | 0,6 | 82 | 32 | 48 | 0,3 | M6 | 58 | 6,8 | 7×45° |
| | 37,2 | 48,2 | 19 | 0,3 | 0,6 | 82 | 32 | 48 | 0,3 | M6 | 58 | 6,8 | 7×45° |
| **30** | 42,3 | 53,2 | 19 | 0,3 | 0,6 | 90 | 40 | 53 | 0,3 | M6 | 63 | 6,8 | 11×30° |
| | 42,3 | 53,2 | 19 | 0,3 | 0,6 | 90 | 40 | 53 | 0,3 | M6 | 63 | 6,8 | 11×30° |
| | 48,7 | 64,7 | 30 | 0,3 | 0,6 | 105 | 47 | 64 | 0,3 | M8 | 80 | 8,8 | 8×45° |
| | 48,7 | 64,7 | 30 | 0,3 | 0,6 | 105 | 47 | 64 | 0,3 | M8 | 80 | 8,8 | 8×45° |
| **35** | 49,2 | 62,7 | 25 | 0,3 | 0,6 | 105 | 45 | 62 | 0,3 | M8 | 75 | 8,8 | 7×45° |
| | 49,2 | 62,7 | 25 | 0,3 | 0,6 | 105 | 45 | 62 | 0,3 | M8 | 75 | 8,8 | 7×45° |
| **40** | 54,2 | 67,8 | 25 | 0,3 | 0,6 | 114 | 50 | 67 | 0,3 | M8 | 80 | 8,8 | 7×45° |
| | 54,2 | 67,8 | 25 | 0,3 | 0,6 | 114 | 50 | 67 | 0,3 | M8 | 80 | 8,8 | 7×45° |
| | 62,1 | 80 | 36 | 0,6 | 0,6 | 135 | 56 | 80 | 0,6 | M8 | 94 | 8,8 | 12×30° |
| | 62,1 | 80 | 36 | 0,6 | 0,6 | 135 | 56 | 80 | 0,6 | M8 | 94 | 8,8 | 12×30° |
| **50** | 67,7 | 81,3 | 25 | 0,3 | 0,6 | 137 | 63 | 82 | 0,3 | M8 | 94 | 8,8 | 11×30° |
| | 67,7 | 81,3 | 25 | 0,3 | 0,6 | 137 | 63 | 82 | 0,3 | M8 | 94 | 8,8 | 11×30° |
| | 76,1 | 97,1 | 45 | 0,6 | 0,6 | 163 | 63 | 98 | 0,6 | M10 | 113 | 11 | 12×30° |
| | 76,1 | 97,1 | 45 | 0,6 | 0,6 | 163 | 63 | 98 | 0,6 | M10 | 113 | 11 | 12×30° |
| **60** | 82,1 | 100 | 35 | 0,6 | 0,6 | 169 | 82 | 100 | 0,6 | M8 | 120 | 8,8 | 8×45° |
| | 82,1 | 100 | 35 | 0,6 | 0,6 | 169 | 82 | 100 | 0,6 | M8 | 120 | 8,8 | 8×45° |

## Double direction angular contact thrust ball bearings for screw drives, BEAS series

d **8-30** mm




| Principal dimensions | | | Basic load rating | | Fatigue load limit | Attainable speed | Mass | Designation |
|---|---|---|---|---|---|---|---|---|
| | | | dynamic | static | | | | |
| d | D | H | C | $C_0$ | $P_u$ | | | |
| mm | | | kN | | kN | r/min | kg | – |
| **8** | 32 | 20 | 14,6 | 20 | 0,8 | 6 800 | 0,09 | **BEAS 008032 C-2RSH** |
| | 32 | 20 | 14,6 | 20 | 0,8 | 11 300 | 0,09 | **BEAS 008032 C-2RSL** |
| **10** | 34 | 20 | 15,3 | 22,8 | 0,9 | 6 000 | 0,1 | **BEAS 010034 C-2RSH** |
| | 34 | 20 | 15,3 | 22,8 | 0,9 | 10 000 | 0,1 | **BEAS 010034 C-2RSL** |
| **12** | 42 | 25 | 19,6 | 30 | 1,1 | 5 400 | 0,2 | **BEAS 012042 C-2RSH** |
| | 42 | 25 | 19,6 | 30 | 1,1 | 9 000 | 0,2 | **BEAS 012042 C-2RSL** |
| **15** | 45 | 25 | 20,4 | 33,5 | 1,3 | 4 600 | 0,22 | **BEAS 015045 C-2RSH** |
| | 45 | 25 | 20,4 | 33,5 | 1,3 | 7 700 | 0,22 | **BEAS 015045 C-2RSL** |
| **17** | 47 | 25 | 21,2 | 37,5 | 1,4 | 4 300 | 0,24 | **BEAS 017047 C-2RSH** |
| | 47 | 25 | 21,2 | 37,5 | 1,4 | 7 200 | 0,24 | **BEAS 017047 C-2RSL** |
| **20** | 52 | 28 | 27,5 | 51 | 1,9 | 3 800 | 0,32 | **BEAS 020052 C-2RSH** |
| | 52 | 28 | 27,5 | 51 | 1,9 | 6 400 | 0,32 | **BEAS 020052 C-2RSL** |
| **25** | 57 | 28 | 30 | 60 | 2,2 | 3 400 | 0,36 | **BEAS 025057 C-2RSH** |
| | 57 | 28 | 30 | 60 | 2,2 | 5 600 | 0,36 | **BEAS 025057 C-2RSL** |
| **30** | 62 | 28 | 31 | 69,5 | 2,6 | 3 200 | 0,41 | **BEAS 030062 C-2RSH** |
| | 62 | 28 | 31 | 69,5 | 2,6 | 5 300 | 0,41 | **BEAS 030062 C-2RSL** |




| Dimensions | | | | | | Abutment and fillet dimensions | | | |
|---|---|---|---|---|---|---|---|---|---|
| d | $d_1$ ~ | $D_1$ ~ | $r_{1,2}$ min. | $r_{3,4}$ min. | a | $d_a$ min. | $D_a$ max. | $r_a$ max. | $r_b$ max. |
| mm | | | | | | mm | | | |
| **8** | 17,7 | 26,3 | 0,3 | 0,6 | 43 | 11 | 26 | 0,3 | 0,6 |
| | 17,7 | 26,3 | 0,3 | 0,6 | 43 | 11 | 26 | 0,3 | 0,6 |
| **10** | 19,7 | 28,3 | 0,3 | 0,6 | 46 | 14 | 28 | 0,3 | 0,6 |
| | 19,7 | 28,3 | 0,3 | 0,6 | 46 | 14 | 28 | 0,3 | 0,6 |
| **12** | 22,7 | 32,1 | 0,3 | 0,6 | 55 | 16 | 33 | 0,3 | 0,6 |
| | 22,7 | 32,1 | 0,3 | 0,6 | 55 | 16 | 33 | 0,3 | 0,6 |
| **15** | 26,7 | 36,1 | 0,3 | 0,6 | 62 | 20 | 35 | 0,3 | 0,6 |
| | 26,7 | 36,1 | 0,3 | 0,6 | 62 | 20 | 35 | 0,3 | 0,6 |
| **17** | 28,7 | 38,1 | 0,3 | 0,6 | 65 | 23 | 37 | 0,3 | 0,6 |
| | 28,7 | 38,1 | 0,3 | 0,6 | 65 | 23 | 37 | 0,3 | 0,6 |
| **20** | 32,2 | 43,2 | 0,3 | 0,6 | 73 | 25 | 43 | 0,3 | 0,6 |
| | 32,2 | 43,2 | 0,3 | 0,6 | 73 | 25 | 43 | 0,3 | 0,6 |
| **25** | 37,2 | 48,2 | 0,3 | 0,6 | 82 | 32 | 48 | 0,3 | 0,6 |
| | 37,2 | 48,2 | 0,3 | 0,6 | 82 | 32 | 48 | 0,3 | 0,6 |
| **30** | 42,3 | 53,2 | 0,3 | 0,6 | 90 | 40 | 53 | 0,3 | 0,6 |
| | 42,3 | 53,2 | 0,3 | 0,6 | 90 | 40 | 53 | 0,3 | 0,6 |

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