

Improved design for high-speed applications

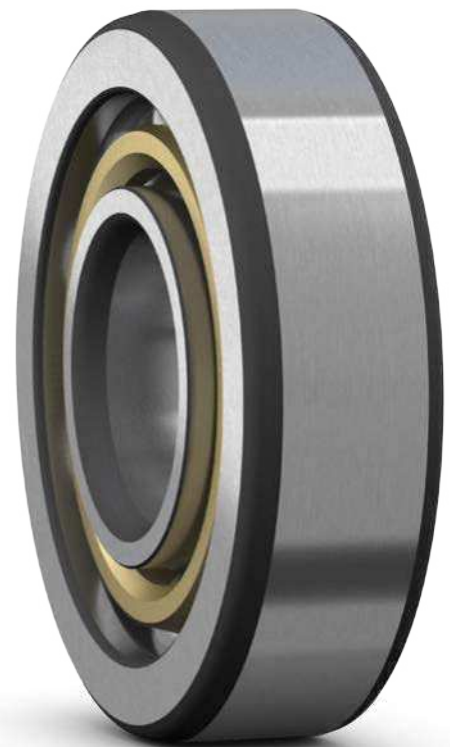
SKF Explorer single row angular contact ball bearings

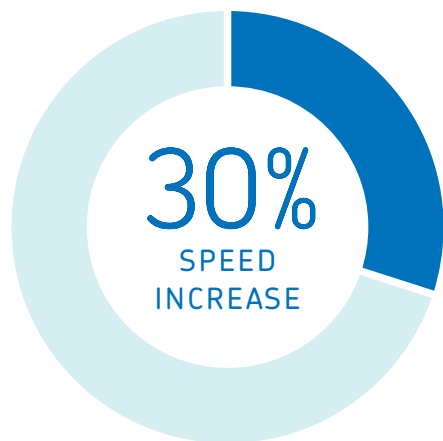
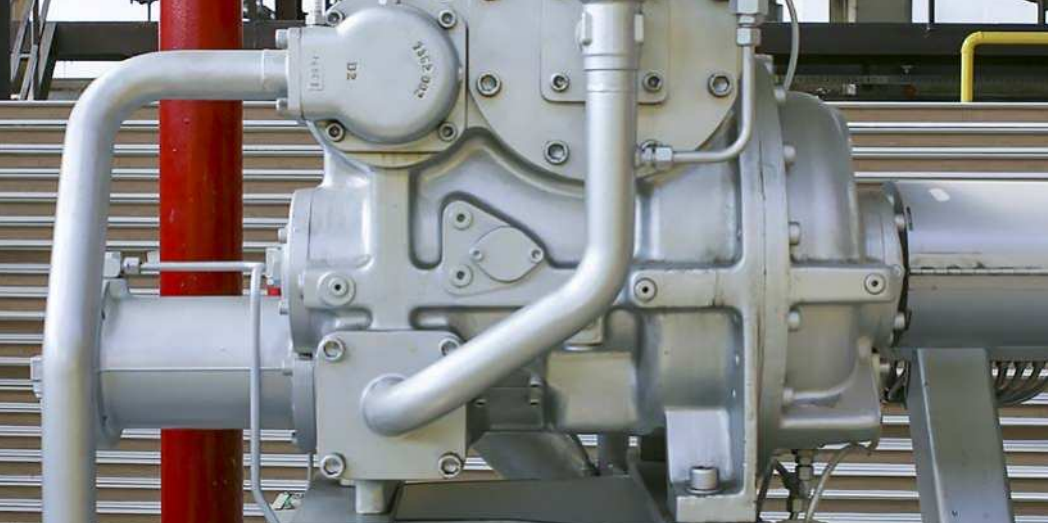


Optimized for reliability and energy efficiency

To reduce total cost of ownership (TCO), operators of screw compressors, pumps and gearboxes are constantly looking for better reliability and energy efficiency. Manufacturers are responding with equipment that can run faster and take advantage of variable speed drives and variable frequency drives (VSDs and VFDs).

SKF has a long and proven track record of supporting this industry with bearings that have shown outstanding field performance in demanding operating conditions. With the new design features in its SKF Explorer single row angular contact ball bearings, SKF is helping manufacturers to meet customer demands for ever higher levels of energy efficiency and reliability.





Benefits

- The redesigned 40° contact angle assortment significantly increases the limiting speed up to 30%
- Reduced noise and vibration levels by 15%

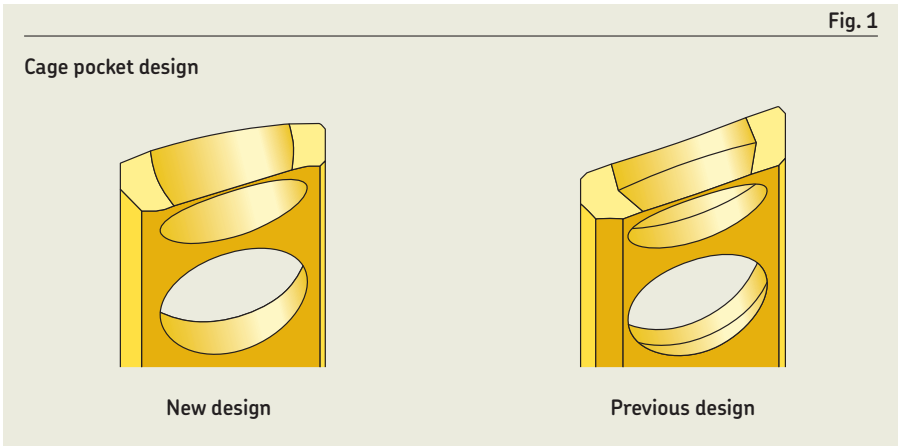


Designed for increased speed and improved robustness

Several improvements have been made to ensure SKF Explorer single row angular contact ball bearings meet today's rigorous performance demands.

Optimized brass cage design

Enhanced cage geometry and stronger brass material reduce cage contact forces and increase cage strength, allowing it to accommodate vibrations, shock loads and higher speeds under severe operating conditions.



Features	Benefits
- Optimized cage pocket geometry (fig. 1) - Smaller cross section and reduced mass - Stronger brass cage material with increased material strength and reduced lead content	- For 40° contact angle assortment, limiting speed increased by up to 30% (diagram 1) - More stable temperature due to the optimized ball-to-cage contact (diagram 2) - Reduced noise and vibration levels by 15% - Acceleration in speeding up due to reduced mass - Better lubricant film formation and more space for grease - Improved robustness (diagram 3, page 5) - Extended bearing service life - Environmental care due to the reduced lead content

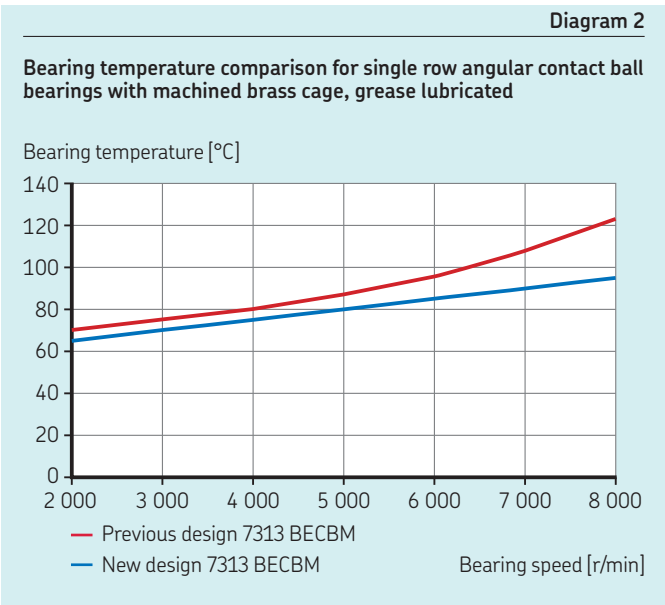
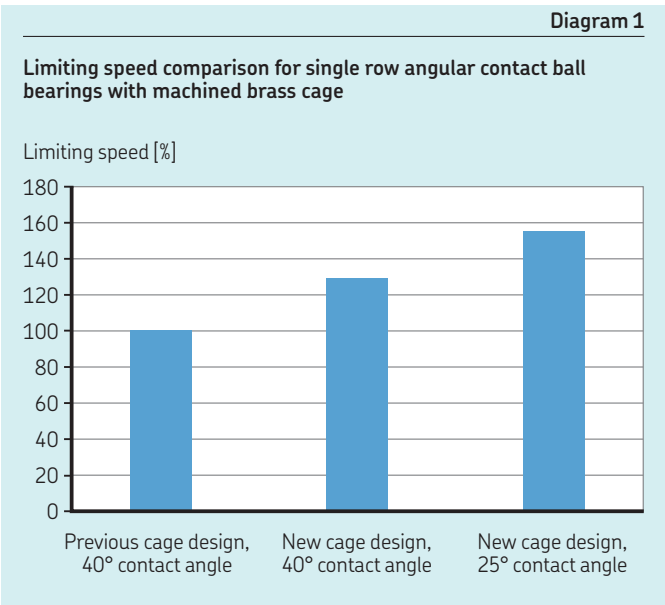
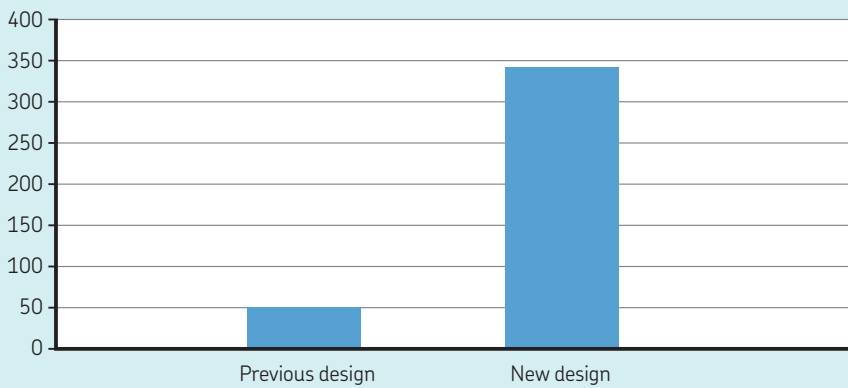


Diagram 3

Dynamic cage robustness test with brass cages

Bearing runtime before failure [h]



Test condition by applying extreme clearance values. At this test, the new brass cage design ran more than 6 times longer than the former design.

Features	Benefits
Optimized machined brass cage	Limiting speed increased by up to 20% compared with 40° contact angle design (diagram 1, page 4)
25° contact angle	Less sensitive to axial overloading and misalignment. The optimized raceway geometry in the area of the shoulder transition accommodates two times higher axial (shock) loads before edge stresses can occur
Universally matchable design	To limit the risk of unloading the backup bearing in sets which are predominantly loaded in one direction, a more robust solution is obtained by combining 40° and 25° contact angle

25° contact angle bearing assortment

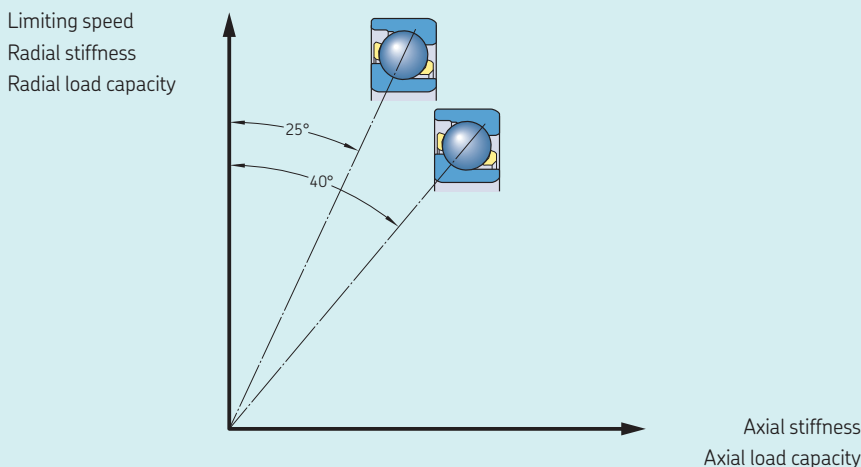
The combination of design features such as redesigned brass cage and new raceway geometry enables new solutions for many demanding applications.

Compared to 40° standard contact angle, the design allows the bearing to run at higher speeds (**diagram 4**) and accommodate higher radial loads by trading off lower axial load carrying capacity.

This makes it possible to react to short-term service demands and upgrade from open to sealed execution where required.

Diagram 4

Comparison of single row angular contact ball bearings with different contact angles



Improved availability of sealed single row angular contact ball bearings

This makes it possible to react to short-term service demands and upgrade from open to sealed execution where required.

Benefits

- Reduced need for maintenance
- Increased service life in contaminated environments compared to open bearings
- Non-contact seal lip design enables high-speed performance

Applications for SKF Explorer single row angular contact ball bearings

For both designers and operators, SKF Explorer single row angular contact ball bearings offer important advantages.

Compressors

For high-speed chillers with one or two-stage air-conditioning compressors, SKF 25° contact angle bearings with new brass cage design improve total cost of ownership (TCO) where common precision or hydrodynamic/floating bearings are applied.

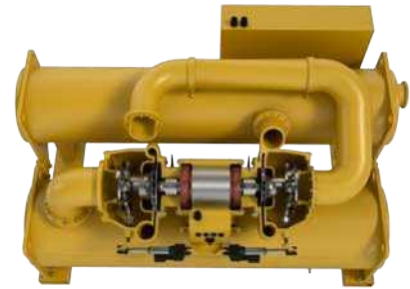
Screw Compressors

- Speed: up to $n_{dm} = 750\,000$ mm/min
- Temperature: up to 150 °C
- Axial load: acts predominantly in one direction
- Life: approximately 50 000 hours



Centrifugal compressors

- Speed: up to $n_{dm} = 750\,000$ mm/min
- Temperature: up to 150 °C
- Axial load: constant load direction, low loads
- Life: 50 000 hours



Pumps

In centrifugal pumps with multistage design, the new 25° contact angle standard offers an upgrade to the hydrodynamic/floating radial bearings that typically support the predominantly radial loads in these units. For double-suction impellers or closed impeller pumps, the 25° standard provides cooler running, substantially reduced vibration levels and extended service life in applications with high radial loads.

And for fluid industry applications or electric motors with vertical shafts, combining the two bearing angles increases robustness: the 40° bearing can handle higher thrust loads without unloading the opposed 25° bearing.

Process pumps

- Speed: up to $n_{dm} = 400\,000$ mm/min
- Temperature: up to 150 °C
- Axial load: constant load direction, medium to high loads. This could cause axial offloading of one bearing, resulting in undefined ball movements and higher cage forces
- Life: 50 000 hours
- Issue: axial load dominant in one direction



Broad coverage for SKF Explorer single row angular contact ball bearings

New machined brass cage for 40° contact angle 72 B(E) and 73 B(E) series

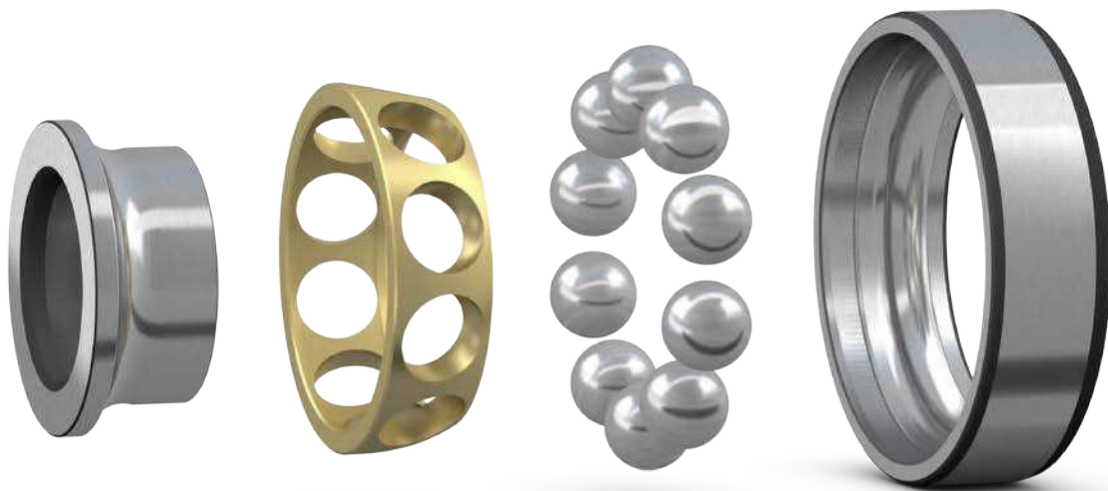
The suffix B(E) placed directly after the bore diameter defines the 40° contact angle bearing design. The machined brass cage is identified by M in the suffix. As the optimized brass cage design will replace the existing cage design in the 72 B(E) and 73 B(E) series, the bearing designation will remain unchanged.

25° contact angle 72 AC and 73 AC series

The 25° contact angle design can be distinguished from the existing 40° contact angle design by the suffix AC, placed directly after the bore diameter in the bearing designation. The AC design is available from bore diameter 15 mm up to 70 mm in 72 AC series and from bore diameter 17 mm up to 70 mm in the 73 AC series. The optimized brass cage design will be the standard for both of these series.

Sealed SKF single row angular contact ball bearings

Sealed SKF single row angular contact ball bearings with a non-contact seal on both sides are identified by the designation suffix 2RZ. Sealed bearings are available with bore diameters ranging from 15 to 55 mm in the 72 B(E) series and from 12 to 50 mm in the 73 B(E) series. For additional information about the assortment, refer to **table 1 (page 8)**.



Features	Benefits
Optimized brass cage for 40° contact angle assortment	Up to 30% higher limiting speed and reduced noise compared to previous design
New 25° contact angle assortment designed with brass cage	Increased speed capabilities
New raceway geometry for 25° contact angle assortment	Improved robustness at high axial loads and misalignment
Bearing arrangement with 40° contact angle to take the main axial load and 25° contact angle as backup bearing	Improved robustness for applications where axial load is predominantly acting in one direction, resulting in longer service life
Sealed single row angular contact bearing assortment	Reduced need for maintenance
SKF Explorer performance class	Best in class performance

Table 1

SKF single row angular contact ball bearings assortment

Bore diameter [mm]	10	12	15	17	20	25	30	35	40	45	50	55	60	65	70	75	80
Bearing size	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16

72.. ACCBM

73.. ACCBM

72.. BE-2RZP

73.. BE-2RZP

■ SKF Explorer bearings

■ SKF standard bearings