Why SKF spherical roller bearings

SKF is the world's leading manufacturer of spherical roller bearings with a market share twice the size of the second largest producer. This has been achieved by purposeful customer-focused development with the commitment of being the leader in bearing development.

SKF invented the spherical roller bearing in 1909 and has been the forerunner in developing new designs ever since.

1999 SKF introduces the Explorer spherical roller bearings.

1989 SKF introduces the E design with hardened steel cages.

1979 SKF introduces the CC – a refinement of the C design.

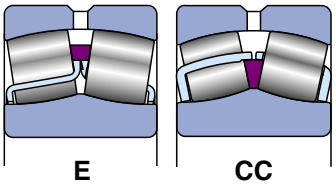
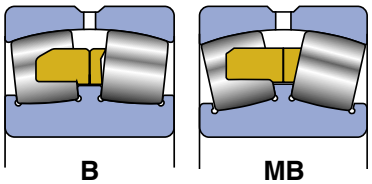
1951 SKF introduces the pioneering C design spherical roller bearing.

1920 SKF is the first in the world to introduce the spherical roller bearing.

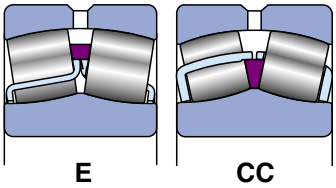
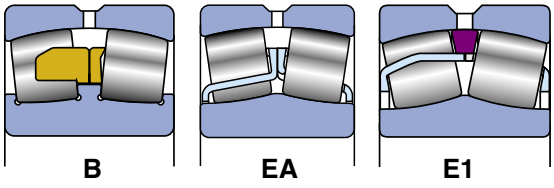
1909 Just two years after the self-aligning ball bearing was introduced came the first attempt to design a spherical roller bearing.

Top performance can only be achieved with a sound basic bearing design

Symmetrical rollers

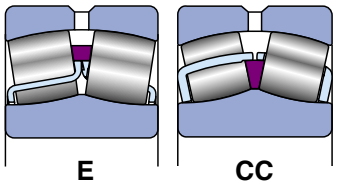
SKF	Competitors	Your SKF advantages
 E CC	 B MB	• **Tolerant design gives maximum service life under all operating conditions.** • **Lower operating temperature giving longer lubricant life.** • **Excellent high speed performance.**
• The patented roller self-guidance – the CC principle – greatly improves roller control and gives lower friction. • The symmetrical rollers in combination with the roller self-guidance is a prerequisite for even load distribution over the rollers under all load and operating conditions.	• Lack of self-guidance gives higher internal friction. • Asymmetrical rollers give unfavourable asymmetrical load distribution along the rollers. This reduces bearing service life. • Asymmetrical rollers cause additional load and friction at the integral central guide flange contact. • An integral central flange makes roller self-guidance impossible – even with symmetrical rollers.	

Floating guide ring

SKF	Competitors	Your SKF advantages
 E CC	 B EA E1	• **Safer bearing function.** • **Lower operating temperature.** • **Excellent high speed performance.**
• The floating guide ring prevents roller edge contact.	• Integral central flange: risk of lubrication break-down and edge stresses under axial load. • No guide ring or cage centring ring: risk of failure due to unguided rollers.	

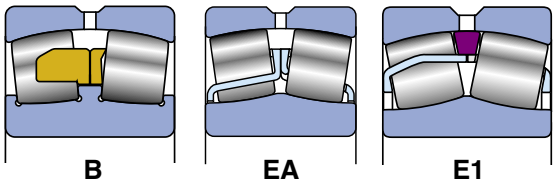
Window-type steel cages

SKF



- Steel has high fatigue strength.
- Closed design (window-type) gives lowest stresses.
- Hardened steel cages is a standard feature of the E design bearings. This gives extra high fatigue strength.

Competitors



B: Pronged brass or steel cages

EA: Pressed, unhardened steel cages and no guide ring (E1 has a cage centring ring)

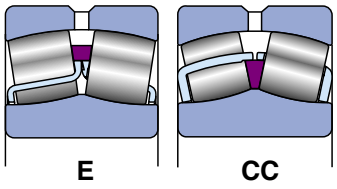
- Pronged cages (open design) are subjected to relatively higher stresses.
- Pronged cages without integral central flange or guide ring to guide the rollers, face even higher stresses.
- Unhardened cages have limited ability to withstand frictional forces due to roller skew.

Your SKF advantages

- **Robust and tolerant bearings. The cages do not limit bearing life and performance.**
- **SKF offers one design per size to fit all types of application.**

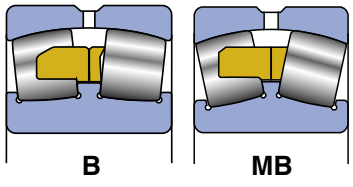
Optimum material and heat treatment

SKF



- Patented XBITE heat treatment for high toughness and excellent surface hardness.
- Dimensionally stable (S1) up to 200 °C as standard.

Competitors



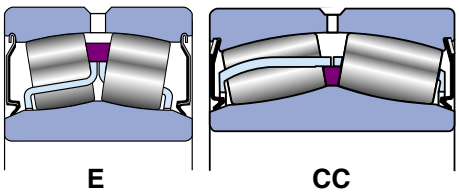
- Martensitic, through hardened material is more crack sensitive at high interference fit.
- Growth of unstabilised rings may lead to destroyed shafts, loss of axial freedom and preloading of bearings.

Your SKF advantages

- **High performance in heavy-duty applications.**
- **High temperature performance.**
- **No damage to surrounding components.**
- **Less need of special bearings.**

SKF standard sealed spherical roller bearings

Your SKF advantages



- The widest standard range on the market.
- Available in E or CC design depending on size and series.
- Cylindrical bore is standard. Several smaller bearings are also available with tapered bore.

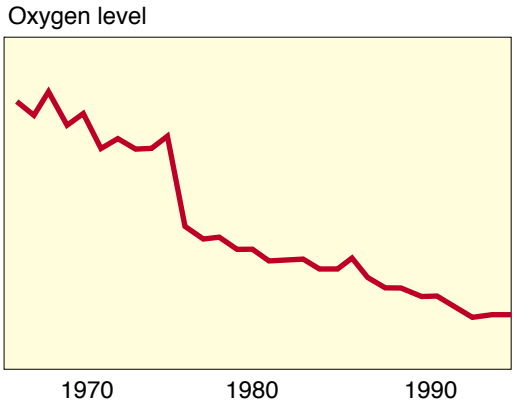
- They are ready-to-mount and lubricated for life units.
- Incorporate all well-proven features of corresponding open E and CC design spherical roller bearings, including the Explorer features.
- Double-lip, sheet steel reinforced seals (nitrile or fluoro rubber).
- Depending on the temperature range, the bearings are delivered with either of two different standard greases.

- **Simplified bearing arrangement/space saving.**
- **Manufacturing cost saving.**
- **Less or no maintenance required.**
- **Reduced operating cost.**
- **Reduced inventory**
- **Longer bearing service life.**
- **Environmentally friendly.**

SKF Explorer

The new performance class for spherical roller bearings

Material quality

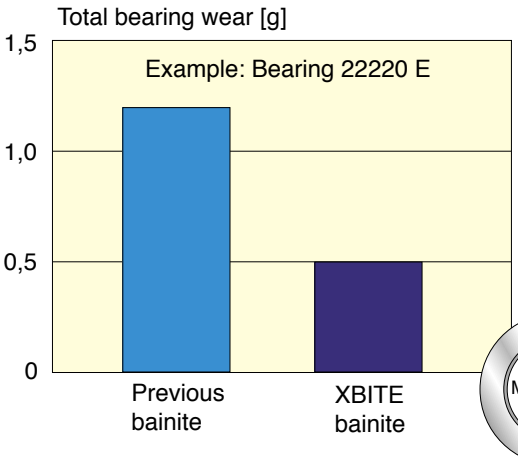


- **Extremely clean and homogenous steel.**
- **Reduced oxygen level.**
- **Improved steel quality.**

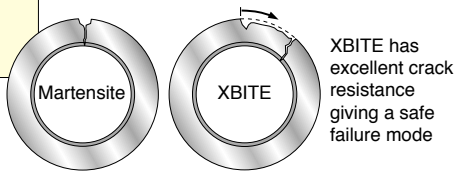
Advantage

- **Increased bearing service life.**

Patented XBITE steel



- **Residual compressive surface stress 50-100 Mpa.**
- **Improved surface hardness.**
- **Improved toughness.**
- **Dimensionally stable at high temperatures (S1).**

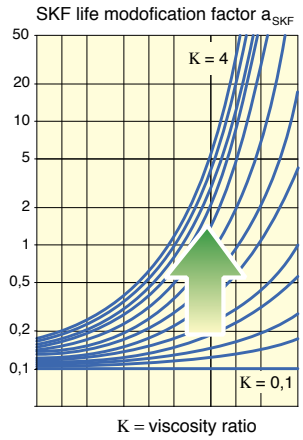


XBITE has excellent crack resistance giving a safe failure mode

Advantage

- **Longer service life.**
- **High load carrying capacity.**
- **Increased wear and crack resistance.**
- **Bearings can be mounted with very tight fit on the shaft.**
- **High temperature performance.**

Raceway quality



- **Improved raceway surfaces.**
- **Improved load carrying lubricant film.**

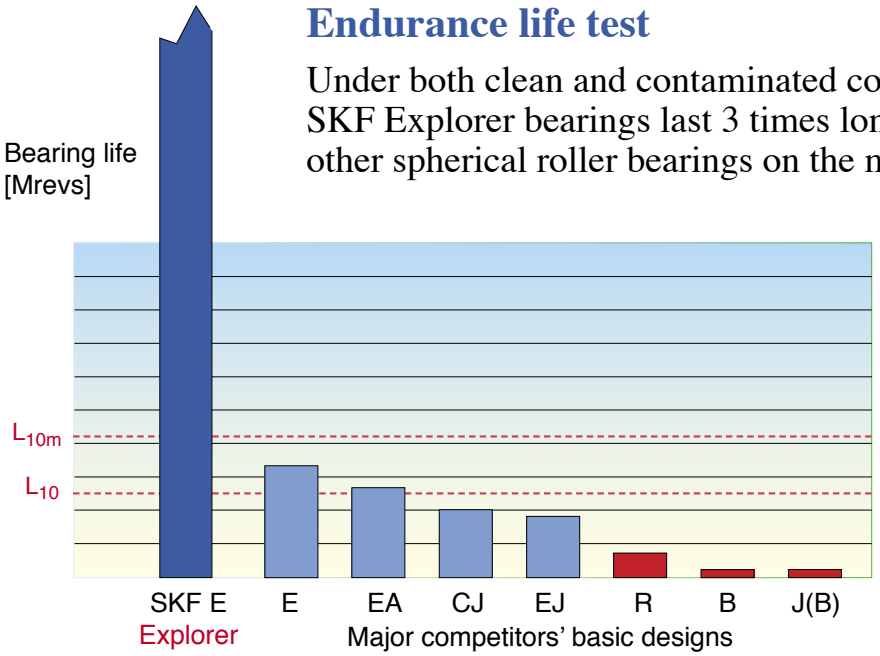
Advantage

- **Lower operating temperature.**
- **Longer lubricant life.**
- **Longer bearing service life.**

SKF Explorer – A quantum leap in bearing performance

Endurance life test

Under both clean and contaminated conditions, SKF Explorer bearings last 3 times longer than other spherical roller bearings on the market.



Test conditions

Bearing: 22220
Sample: 35 pcs per brand
Load: 140 kN
Speed: 1500 r/min
Lubrication: Circulating oil

The power of SKF Explorer

Existing machine

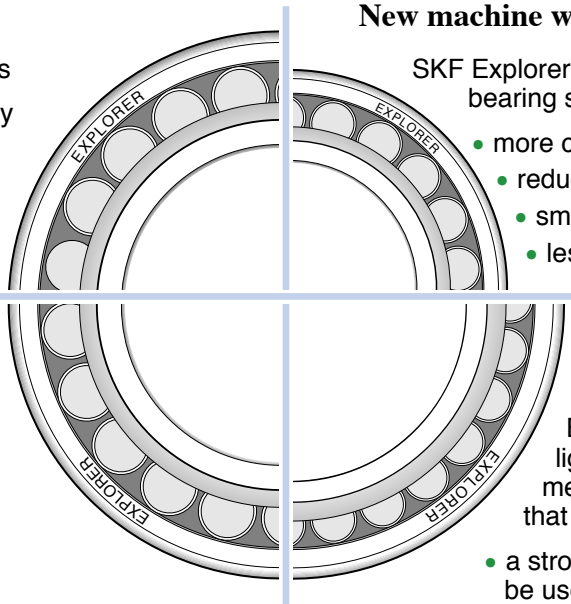
Switching to SKF Explorer bearings gives

- several times the service life previously achieved
- more machine uptime
- higher safety factor
- reduction of machine life cycle cost

New machine with same power

SKF Explorer makes it possible to use a smaller bearing size which allows

- more compact machines
- reduced friction/higher speeds
- smoother and quieter running
- less lubricant usage



Existing machine with increased power

Same size SKF Explorer bearings allow power increases of 15% to 25% with

- same service life
- same machine uptime
- same machine design

New machine with same or increased power

The higher carrying capacity of SKF Explorer bearings allows the use of a lighter series with same outside diameter and increased bore diameter, so that

- a stronger shaft and even hollow shaft can be used
- the total design can be stiffer and also cheaper

SKF spherical roller bearing range

- **SKF has the widest range of standard spherical roller bearings – including the widest range of sealed bearings.**
- **The SKF Explorer bearings are easily identified by the "Explorer" marking on both bearing and box. The designations, however, remain the same as before.**

Publication **5456 E**