

Industrial Fans: SKF Capability Presentation

SKF Industrial Market

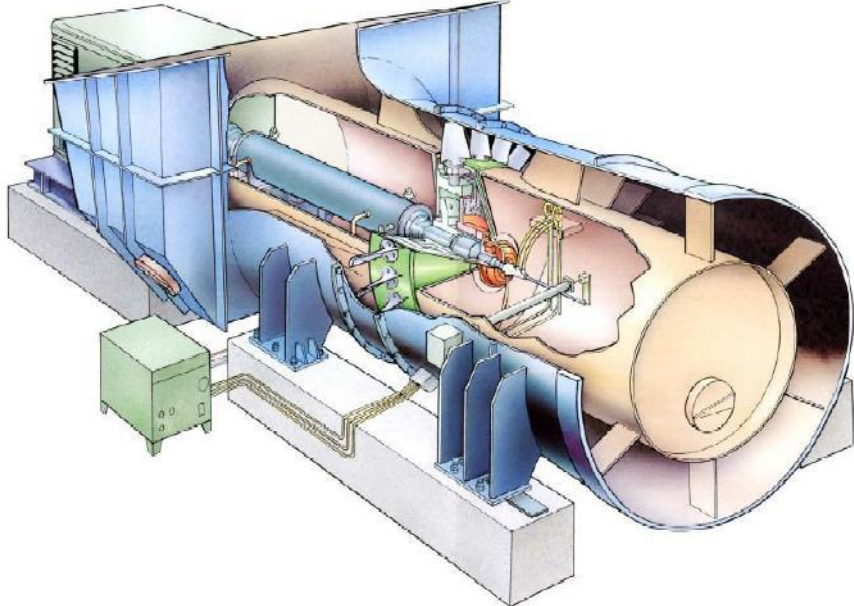
Business Segments & Strategic Accounts

Drives – Fluid Power Segment

1

Introduction & Fan Types

Axial fans (belt & direct drive)



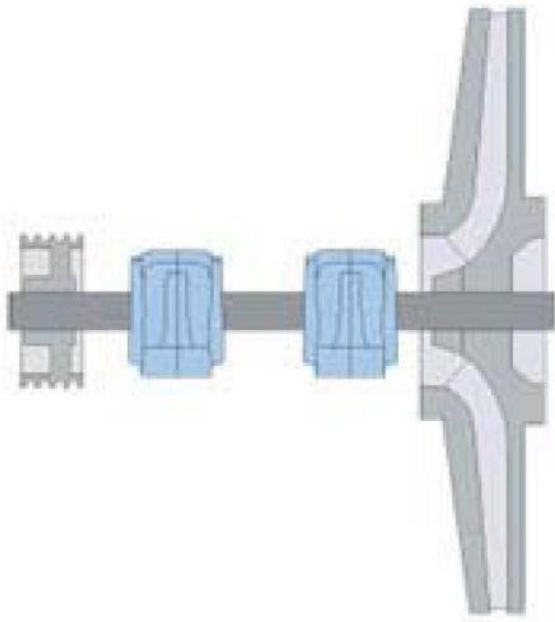
Centrifugal fans (belt and direct drive)



Overhung vs. Straddle Mount

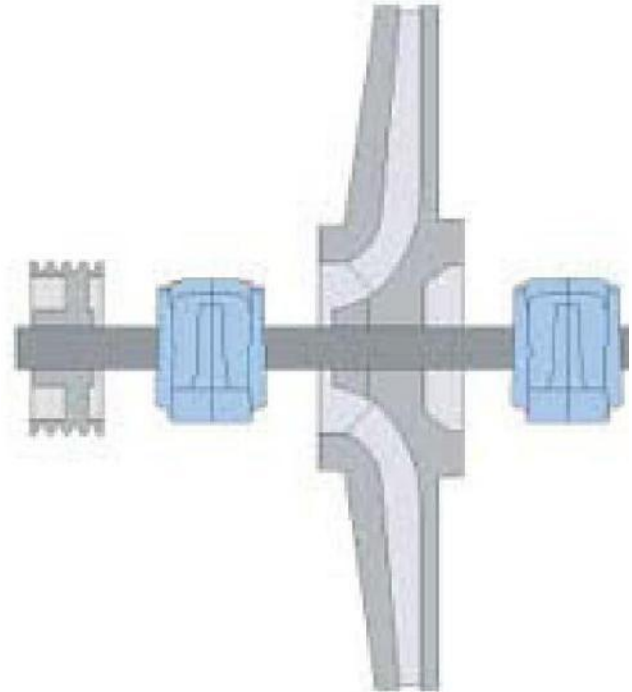
OVERHUNG

- Impeller beyond both bearings on the shaft
- Can have very lightly loaded bearings
- Sensitive to unbalance, fretting, minimum load



STRADDLE

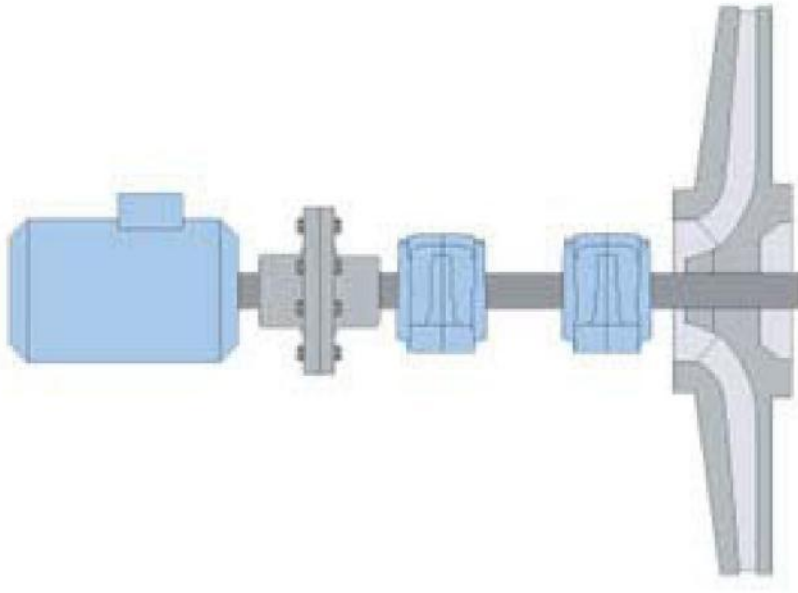
- Impeller between the bearings
- Typically have large thermal expansion of the shaft (hot air/gas)



Direct vs. Belt Drive

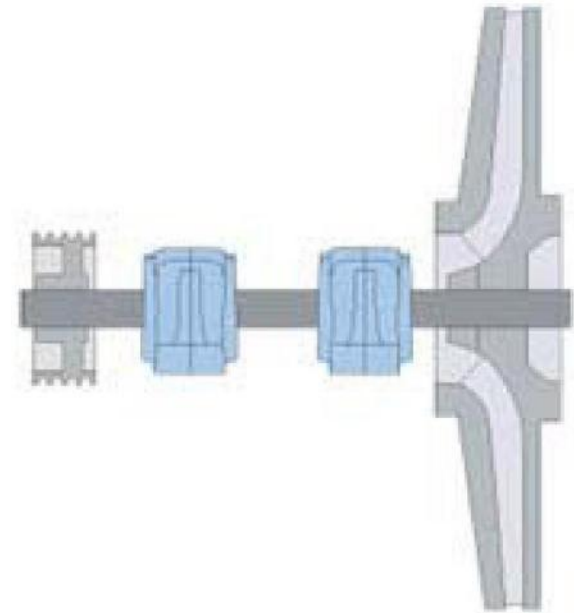
DIRECT

- Couplings can apply load in any direction depending on alignment.
- Coupling can add unbalance.
- Coupling can apply a thrust load.

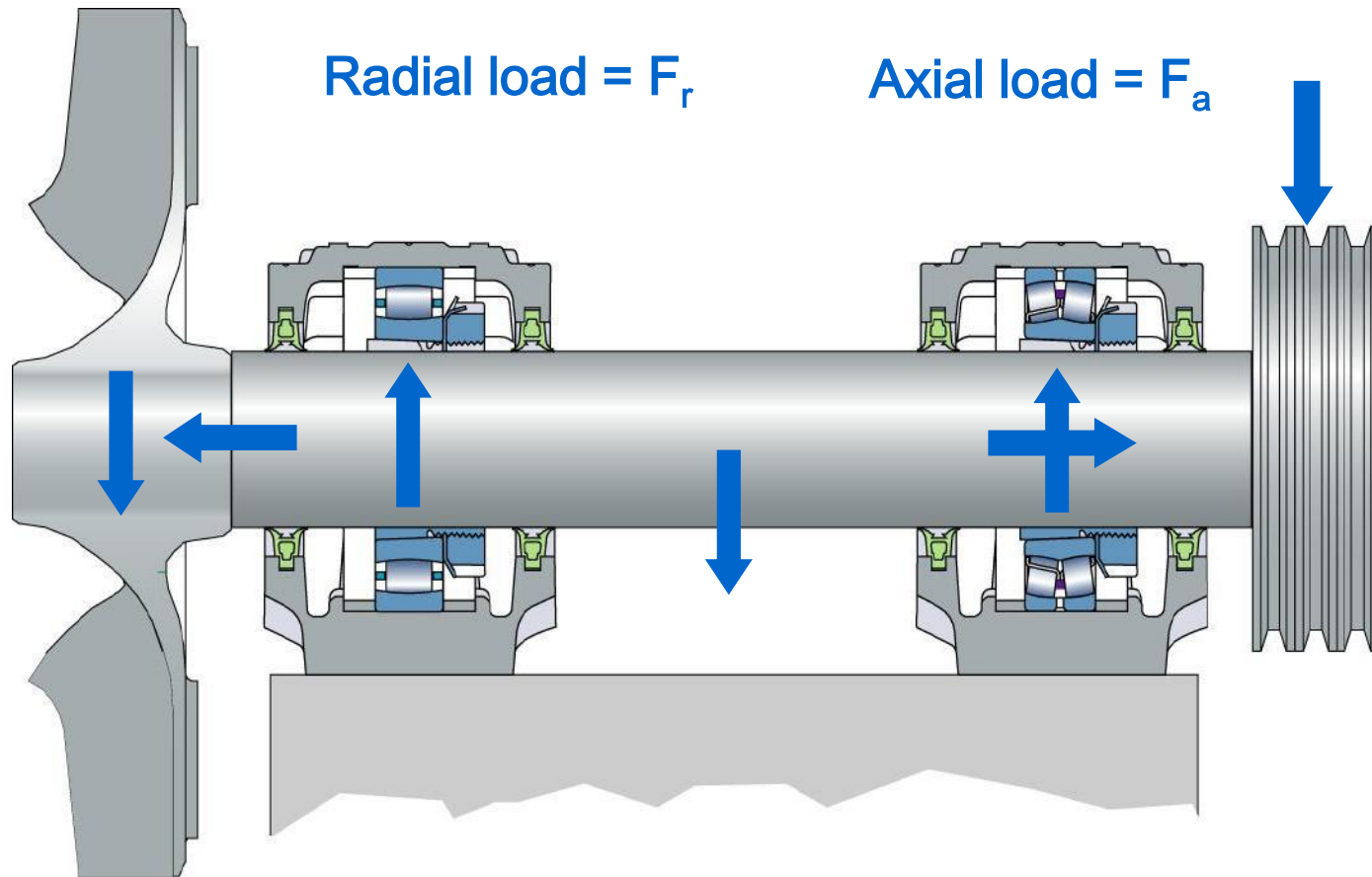


BELT

- Adds a highly variable radial load that can often yield a lightly loaded bearing opposite the belt side.
- Belts and their pulleys can also be out-of-balance.



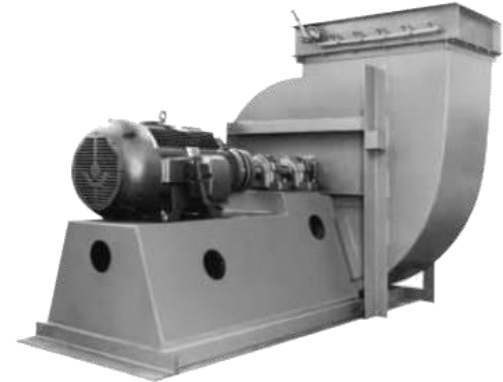
Loads in Fan bearing arrangements



The air flow create an reaction force in counter direction

Most common fan bearings conditions

1. High speed, at least 75% of the speed limit.
2. Low radial load.
3. Possible high thrust load.
4. Rotating inner ring and shaft.
5. Unbalance conditions, increasing over time.
6. Misalignment.
7. Hot locations.
8. Contamination.
9. Large shaft diameter relative to applied load



Typical Problems in Fans

| Problem | Implications |
|--|---|
| High bearing temperature | <ul style="list-style-type: none">• Unplanned fan shutdown• Production decrease• High maintenance cost |
| Excessive vibrations (due to unbalance & misalignment) | <ul style="list-style-type: none">• Unplanned fan shutdown• Production decrease• High maintenance cost |
| Wearing of housing bore (due to unbalance cause slipping of bearing outer ring in housing) | <ul style="list-style-type: none">• Excessive vibrations• Unplanned fan shutdown• Production decrease• High maintenance cost |
| Short bearing life | <ul style="list-style-type: none">• High maintenance cost |

Chain effect problem

Dirt coming from the process

Imbalance of the fan wheel

Outer ring rotating in housing seating

Bearing and or fan failure



Signs of bearing failure

**Axial preloaded
spherical roller bearing**



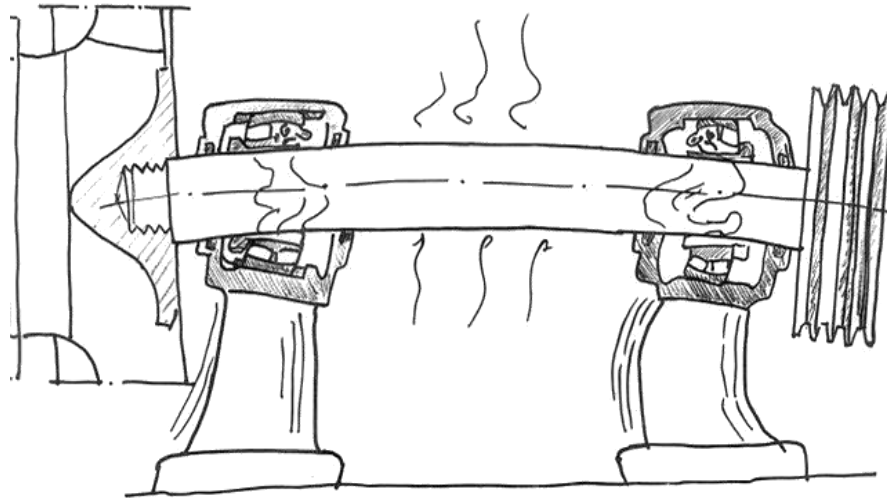
Spalling in the outer ring raceway

**Spherical roller bearing
outer ring creeping
(due to unbalance)**



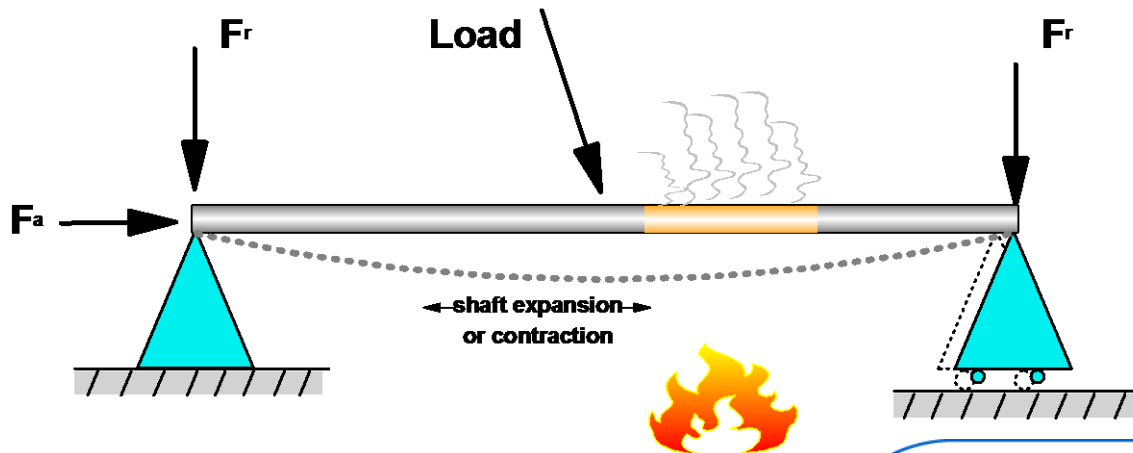
Damage to the outer diameter surface

Shaft expansion



Locating

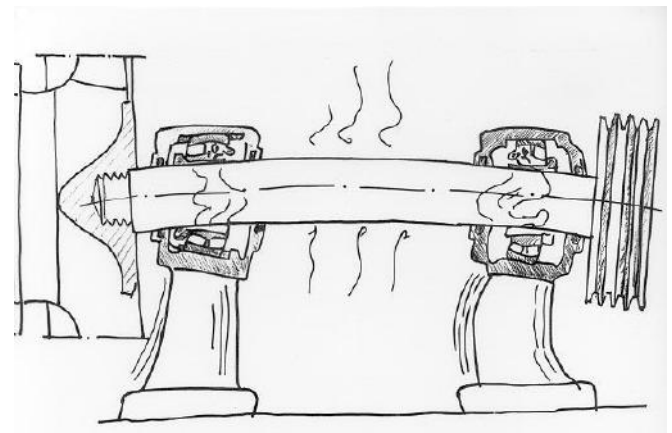
Non-locating



Factors from shaft expansion & fan unbalance

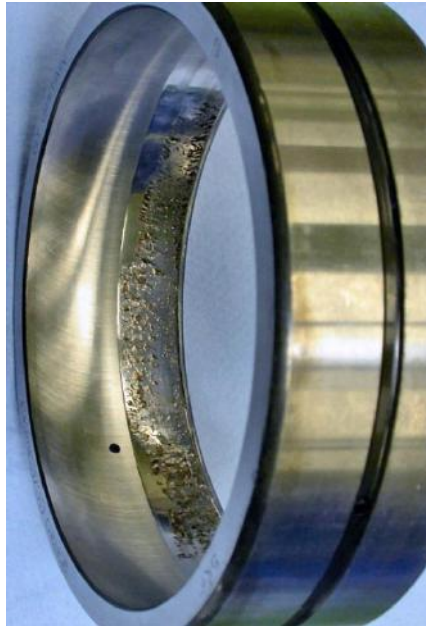
Fretting corrosion

- Fretting corrosion between bearing outer ring and housing.
- This is a common problem since fretting corrosion often will be formed after some time in service

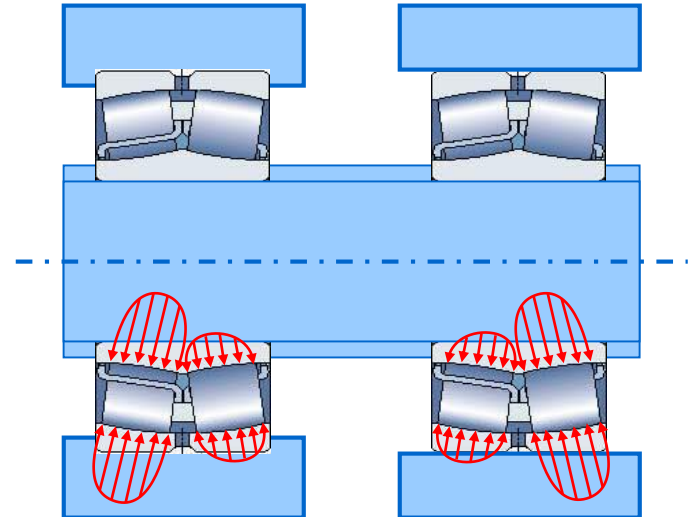
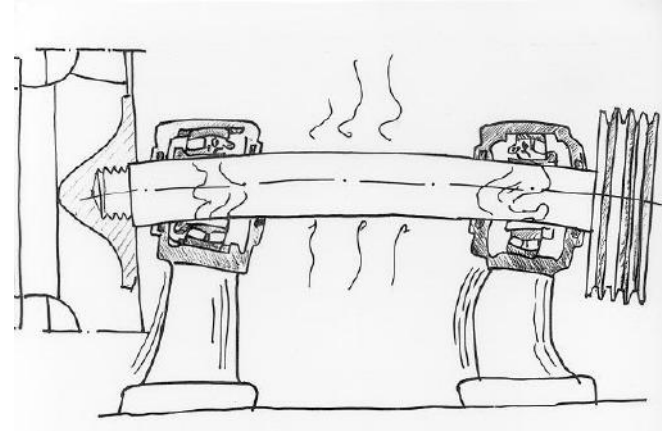


Factors from shaft expansion

Excessive axial loading

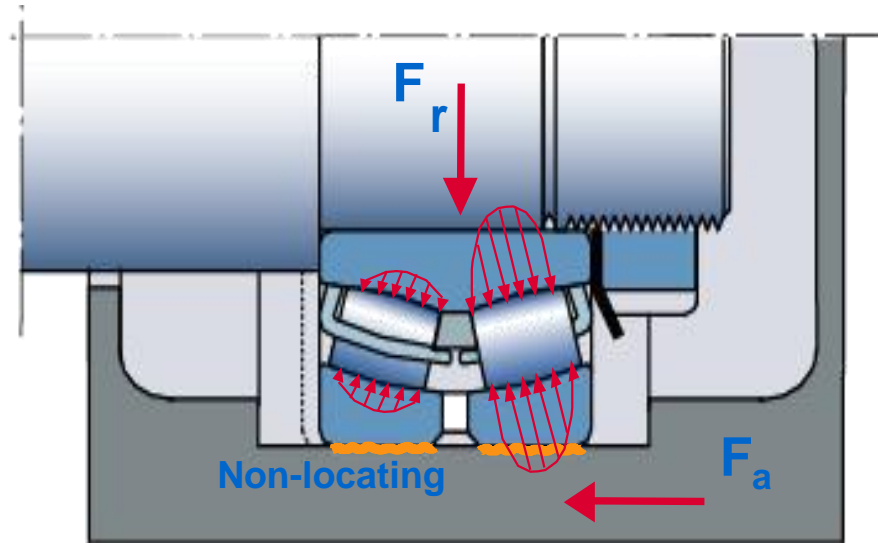


- Poor load distribution affects bearing performance – ie. cross – location



Friction always exist in the traditional system

Friction will increase after some years in service



$$F_a = F_r \times \mu$$

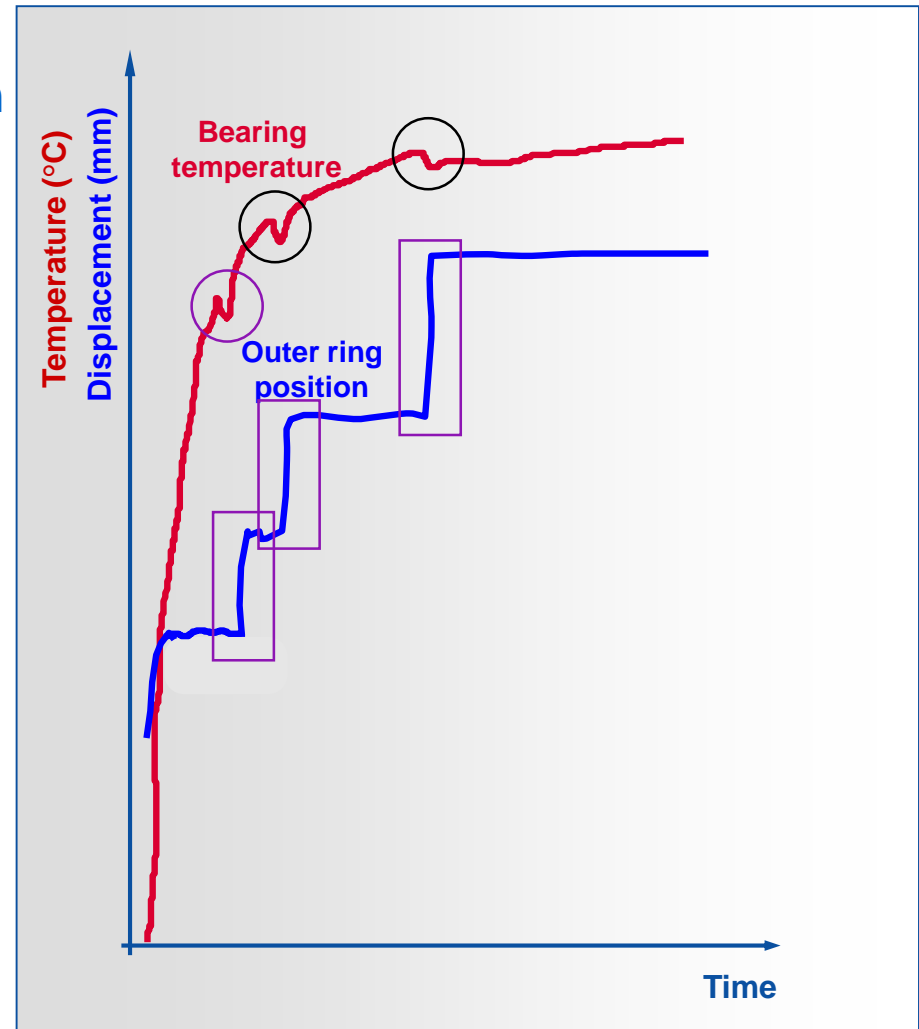
- Friction creates internal axial forces

For steel outer ring and housing or bearing seating of steel or cast iron; $\mu = 0,12-0,16$

Friction always exist in the traditional system

Influence of friction at machine start up with the traditional system

- Floating bearing moves when temperature or axial load increases
- Floating bearing only moves when friction force is overcome "Stick-slip".
- Bearing temperature reduces with each movement (release of internal axial load)
- Temperature reduction in this magnitude means large reduction of axial load.



Factors that increase the operating temperature

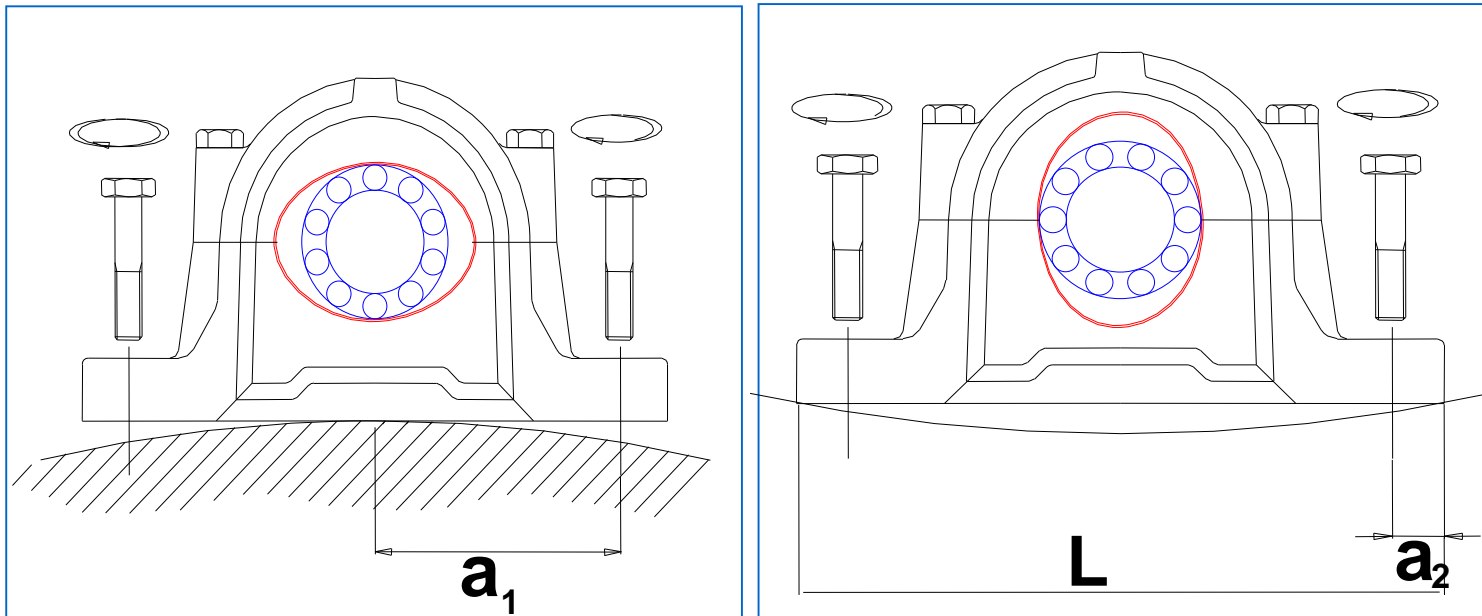
Excessive cooling of housing leading to shrinkage.

All external cooling of the bearing housing is risky and may lead to shrinkage of the outer ring - resulting in loss of internal clearance and unwanted preload



Factors that increase the operating temperature

Frame straightness



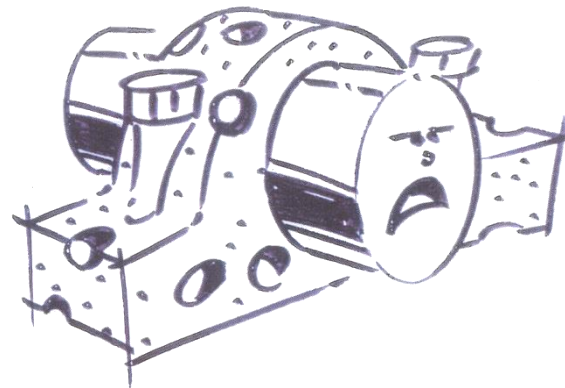
Frame straightness: IT 7, for reference length L
Surface roughness: Ra 12.5

Poor plumber block housing design and quality

Low cap bolt quality will reduce the strength of the bolts which is a serious safety risk



Low material grade will reduce the strength and limit the load capacity



2

Fan sub-segments

2.1 Description of application

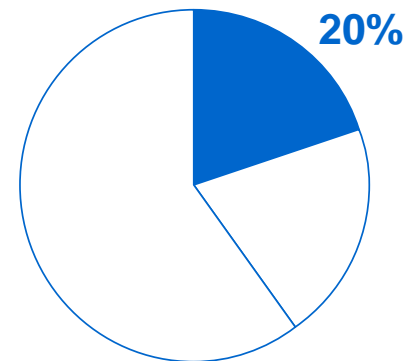
- Heavy duty industry applications

Fan applications in the heavy duty processing industry

- Fans in cement, steel, glass, paper, and power plants (but also in food and HPI)
- Handle hot exhaust gases from above processes, these fans are critical for the process
- Environmental legislation and industry standards influence fan system and components performance
- Increased reliability, lower maintenance cost, safety and reduced emissions are common drivers for investments.



20% of all fans sales value globally in one year are within the heavy duty sub-segment



2.1 Description of application

- Heavy duty industry applications

Customer challenges and needs

- Highest priority on reliability in operation
- Reduce maintenance costs
 - Cost control, since it is central to profitability
- Health, safety and environment
 - Protecting the environment and increasing workers' safety
 - Meeting the environmental challenge



Commercial needs:

- Reduce TCO – Total Cost of Ownership (EU)
- High focus on fan performance-efficiency
- Application support is important
- Environmental legislations and restrictions
- Variable pitch part is growing within axial blower fan design

Technical needs:

- Engineered and customised systems, performance driven.
- Critical factor for reliability is bearing lubrication solutions, oil bath/ oil circulation lubrication demand is increasing
- Improve reliability, performance and efficiency in infrastructure fans
- Predictable maintenance intervals

Reference case

- Fan upgrade service of hot gas fan in power plant



Power plant saves 125000 Sek per year in reduced maintenance cost. Stand still costs not included.

Customer challenge

- One hot gas fan had 1 -2 unplanned stops per year
- Bearing operating temperature was 90 -100 C.
- Used lubrication was oil drop lubrication

SKF solution

- SKF introduced condition monitoring and found shaft misalignment.
- Circulating oil lubrication with SNL housings and oil seal was introduced.
- With circulating oil lubrication the oil is filtered, de-aired and cooled.
- The bearing operating temperature was lowered to 65 C, resulting in longer lubricant life as well as increased bearing service life
- No unplanned stops after 3 years and high temperature alarms has been reduced to zero.
- Savings in maintenance cost is 125000 Sek per year not including standstill costs for the boiler during repair.

Customer value

Reference case

- Fan upgrade service of process fan in power plant



Power plant reduced vibrations and lowered bearing temperature in process fan for induced air.

Customer challenge

- One process fan had frequent stops because of high vibrations as well as high bearing operating temperatures
- Used bearing solution was the traditional one with two spherical roller bearings and grease lubrication

SKF solution

- SKF introduced condition monitoring and found shaft misalignment.
- SKF self-aligning bearing solution with one Spherical roller bearing and one CARB bearing was introduced in SONL housings. Lubrication method selected was oil bath lubrication.

Customer value

- The bearing operating temperature was lowered with 20 C, resulting in longer lubricant life as well as increased bearing service life
- Vibration levels was reduced from 12,5 to 2 mm/s with reduced noise levels.

Reference case (1/3)

- Pulley alignment of fans



Shopping centre saves 41 000 Euro in 30 months

+ short introduction/story

Customer challenge

- One important measure for customer satisfaction is driven by temp and ventilation control and quality
- High focus on energy efficiency and waste management.

SKF solution

- SKF belts and pulley alignment

Customer value

- For the 45 fans in the shopping centre the number of failures saved was 68 over a time period of 30 month.
- Investment in SKF solution was 10 000 Euro
- Net saving in increased service life was 41 000 Euro
- ROI over 30 months 405%

Reference case (2/3)

- Hybrid bearing enables capacity adjustments



Hospital saves on energy and maintenance costs

+ short introduction/story

Customer challenge

- The hospital invested in variable speed drives in order to allow for variable control of fans.
- The bearings in the motors were not changed in any way – standard bearings and variable speed drivers caused electrical current damage to 150 fans.

SKF solution

- SKF Hybrid bearings allow variable speed control to be used, resulting in energy savings of 30-50% of the fan.
- SKF Hybrid bearings have a longer service and lubricant life compared to standard bearings which enables further maintenance savings.

Customer value

- Longer bearing service life resulted in maintenance savings of € 98 000, in 8 years.

Reference case (3/3)

- Lubrication systems



Automatic lubricator reduce maintenance cost in Hospital

At a hospital in Vienna, one of the largest general hospitals in Europe with 2000 beds, SKF provided a lubrication solution in order to lowering maintenance costs

Customer challenge

- Manual re-lubrication on over 200 fans was a very time consuming and costly process
- Regular bearing failures was experienced due to under greasing

SKF solution

- SKF Multipoint lubricator LAGD 400

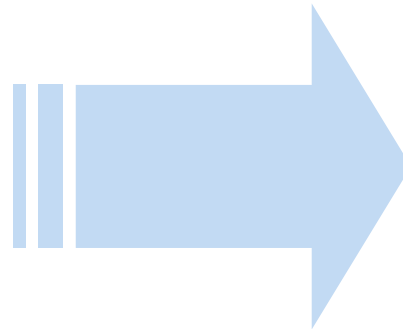
Customer value

- Increased service life of fan bearings
- Lowered grease consumption
- Reduced maintenance costs as less manpower is needed

SKF offers facility sub-segment

Main customer issues:

- Energy efficiency
- Reliability
- Long service life
- Low maintenance costs
- Long re-greasing intervalls
- Low noise
- Variable speed increasing
- Direct drive increasing



Main SKF solutions:

Self aligning solution

Housings & Acc.

E2 solutions for fans

Concentra

Hybrid bearings

Deep groove ball bearings

Condition monitoring

Transmission products

3

SKF capabilities

3.1

Explorer bearings

Offer overview

- SKF Explorer

Offer overview

- SKF's Explorer range for industrial fans consists of **SRB, CARB, CRB, ACBB** and **DGBB with seals**
- SKF Explorer **key characteristics**:
 - **Increased service life**
 - **Increased up-time**
 - **Higher power output**
- *SKF Explorer is essentially a set of product improvements bundled together which focus on **heavy load capacity***
- SKF Explorer bearings are used in a wide range of fan applications



Features

- SKF Explorer

Features

DGGB with seals

- Available in many executions and sizes
- Improved precision and silent running
- Enhanced sealing properties
- Low friction



CRB

- Available in many designs and dimensions
- Ultra clean steel
- Logarithmic roller profile
- Improved surface topography
- Rollers guided by flange
- Separable ring design for easier assembly
- Several cage designs available



ACBB

- 40° contact angle
- Flushing ringside faces
- Matched sets with other bearings
- High stiffness
- High speed capability
- Reduced runout
- Improved running accuracy
- Ultra clean steel



SRB

- Factory greased with an optimum lubricant
- Minimum grease usage
- Factory mounted seals under cleanest possible conditions.
- Integral seals. No dirt can enter the bearing during handling, mounting/dismounting



Benefits

- *SKF Explorer*

Benefits

DGBB with seals

- Greased for life and virtually maintenance free (when sealed on both sides)
- Extended bearing service life
- High speed ability



CRB

- High speed – low noise
- Reduced lubricant consumption
- Robustness against vibrations, cracks, early failures
- Corrosion resistance
- High radial load carrying capacity
- Compact design



ACBB

- Reduced friction, noise and vibration levels
- Reduced lubricant consumption
- Improved wear resistance
- Less sensitive to axial overloading
- Reduced heat generation
- Up to three times longer service life



SRB

- Lower noise and vibrations
- Controlled contamination
- Longer service life
- Less maintenance needed
- Ready-to-mount units
- Safe handling
- Environmentally friendly



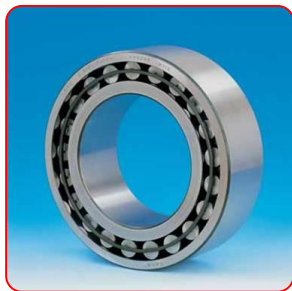
Features & Benefits

- SKF CARB Explorer

Features & Benefits

CARB

- **Single row roller bearing**
 - Relatively long, slightly crowned rollers
 - Inner and outer ring raceways concave and symmetrical
 - Misalignment up to 0,5°
 - frictionless axial displacement up to 10% of the bearing width
- **All CARB bearings are manufactured to the SKF Explorer performance class**
- **Range and variants**
 - Standard range - 13 ISO dimension series with bore diameter of 25-1 250 mm
 - With or without cylindrical or tapered bore
 - Customized to suit particular applications (sealed bearings etc.)



CARB

- **“Three bearings in one”:**
 - Accommodates angular misalignment like the Spherical roller bearing
 - Accommodates axial misalignment like the Cylindrical roller bearing
 - Allows compact designs like the Needle roller bearing
- **Improved reliability**
- **Predicted service life**
- **Longer lubricant life**
- **Down sizing possibilities**



- SNL or SONL with K7 housing fit available for CARB and locating bearing SRB

Benefits, Alternative to previous slide

- SKF Explorer

Increased service life

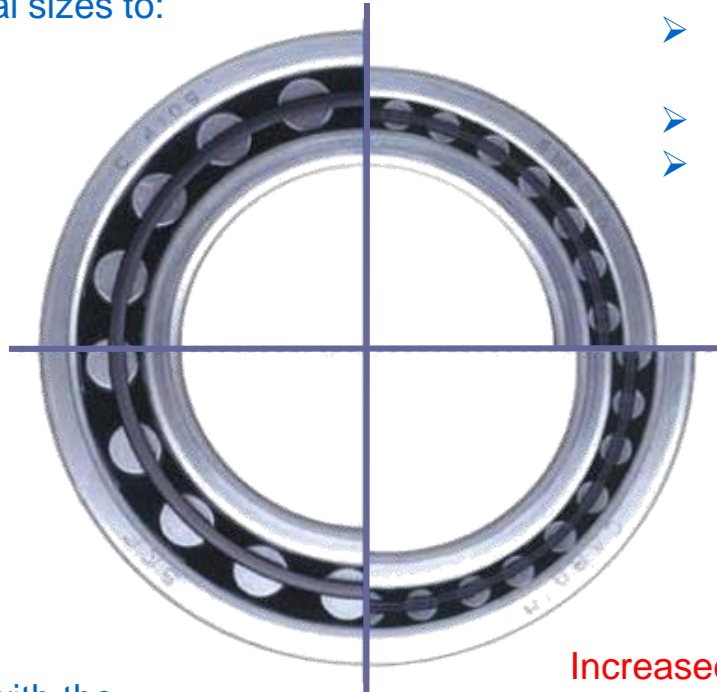
Use the new system with equal sizes to:

- Increase life
- Increased service intervals
- Increase machine uptime

Down sizing

Use a smaller set of bearings to;

- Reduced overall dimensions to save on material cost and weight
- Increased Speed
- Reduced lubricant usage



Increased power output

Replace the existing bearings with the system of equal size maintaining the same service life and machine uptime to;

- Increase power density (output)
- Avoid costly redesign

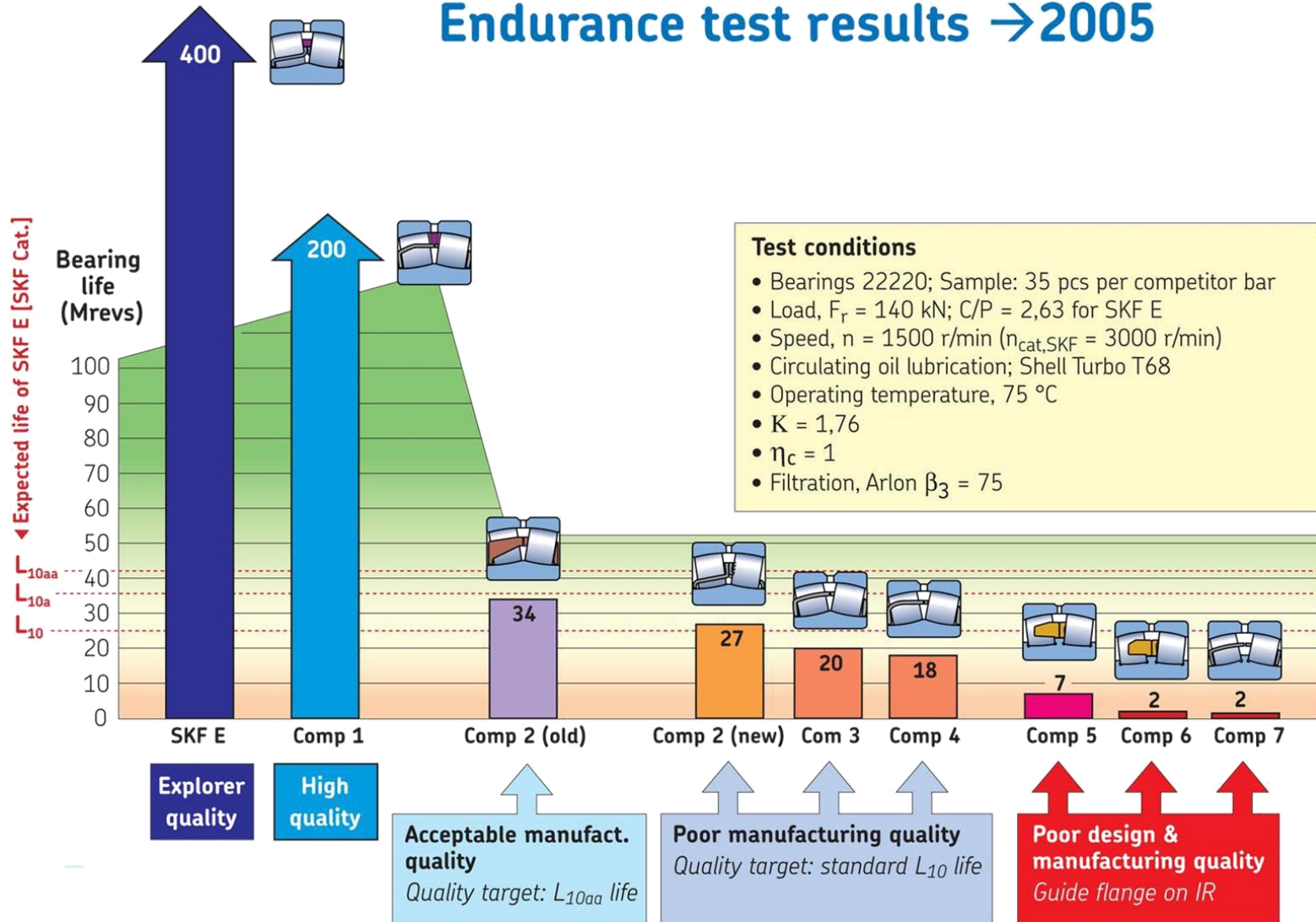
Increased power density

Use a lower profile set of bearings with the same outer diameter to;

- Increased shaft diameter for higher torque
- Achieve a stiffer design

Endurance testing

Endurance test results → 2005



3.2

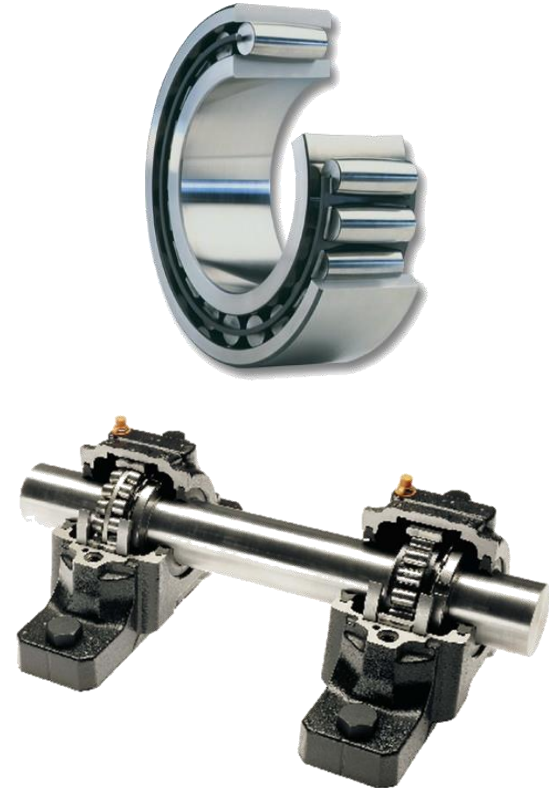
Self-aligning system

Offer overview

- SKF Self aligning system

Offer overview

- SKF's self aligning system for fan applications constitute a combination of CARB toroidal roller bearings and SRBs
- Traditional bearing systems
 - Free bearing moving in the bearing housing creates axial loads in the system
 - Load is higher on one side of the bearing
- SKF self-aligning systems CARB & SRB
 - Secured frictionless axial expansion at non-locating bearing
 - Extended service life for the complete bearing arrangement due to reduction of
 - Friction
 - Vibrations
 - Heat
- SNL or SONL with K7 housing fit available for CARB and locating bearing SRB



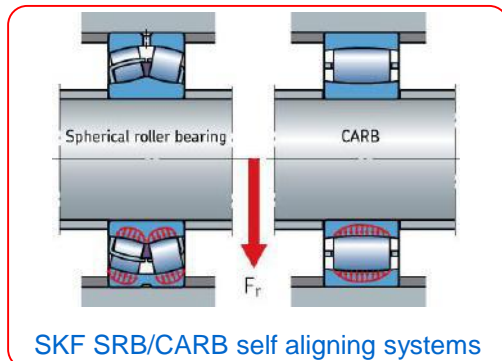
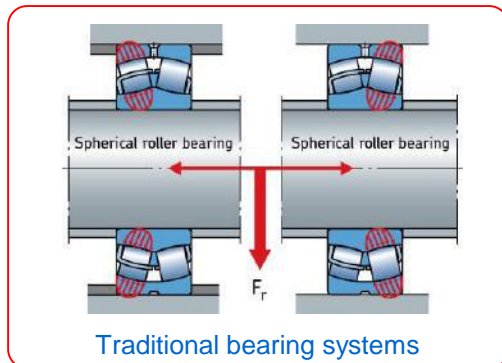
Features & Benefits

- SKF Self aligning system

Features & Benefits

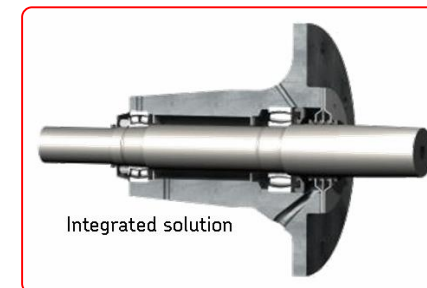
SRB & CARB combination

- Self-aligning solution, using Carb as a non-locating bearing



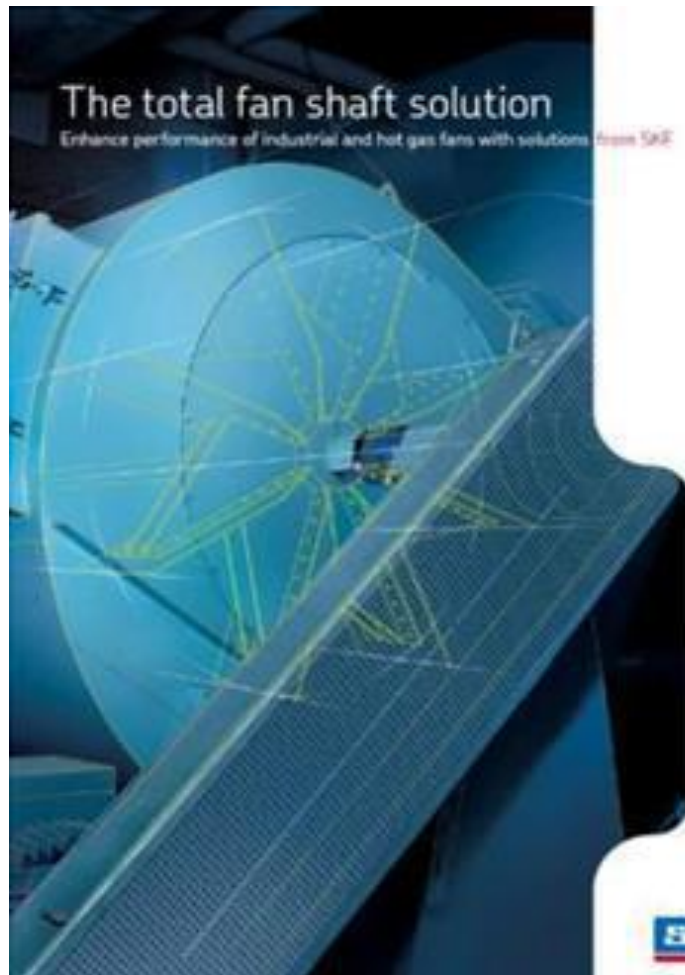
SRB & CARB combination

- Secured frictionless axial expansion at non-locating bearing
 - Lower internal axial load on both bearings
 - Lower bearing operating temperatures
 - Perfect load distribution over three roller rows
- Extended service life for the complete bearing arrangement due to reduction of
 - Friction
 - Vibrations
 - Heat



- SNL or SONL with K7 housing fit for CARB and locating bearing SRB

Total Fan Shaft Solution



“Increase uptime and fan performance without changing the lubrication system”

Includes:

- Housings
- Self aligning solutions
- Mounting sleeves
- Oil and Grease Seals
- Lubrication accessories

3.3

Bearing housings and acc.

Offer overview

- Housing and accessories

Offer overview

- SKF's Housing and Accessories range for industrial fans is constituted by **SNL** and **SONL** housings
- SKF housing **key characteristics**:
 - **Precision-engineered** to meet exact bearing specs
 - Withstand deformation from **heavy loads** and **shock loads**
 - Help **improve bearing performance**
 - **Reduce bearing operating temperatures**
 - **Extend re-lubrication intervals**
 - **Lower maintenance costs**
- SKF housings are frequently used in facility management applications such as fans, conveyors and emergency power installations (SONL).



Features

- Housing and accessories

Features

SNL

- **Universal variant for relubrication:**
 - Drilled and tapped hole with nipple as standard
 - Indications for holes for other relubrication options
 - Variant for oil lubrication
- **Prepared for condition monitoring**
- **Stiff design:**
 - Housing base is reinforced with ribs and extra material surrounding the holes for the attachment bolts
- **Water based painting system**
- **Sealing arrangements available for all conditions**
- **K7 housing fit available**
for CARB and locating bearing SRB



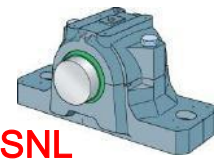
SONL

*Designed specifically for oil lubrication and today's demand for simplicity, function and economy.
(upgrade of the SOFN housings).*

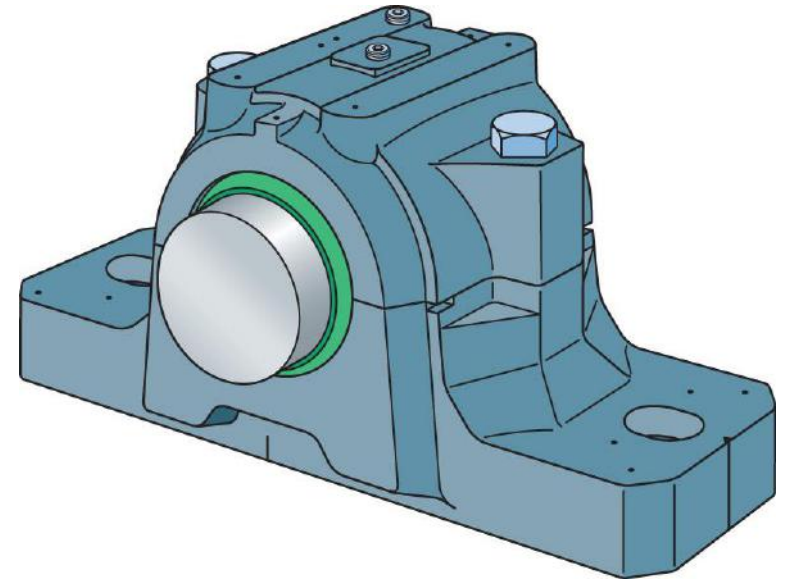
- **Deep and cool**
 - Deep reservoir that holds a large volume of oil which means cooler oil. Oil level is below the bearing rollers and they have no contact with the oil reservoir.
- **Active flow**
 - Oil pick up ring or circulating oil system.
- **Effectively sealed**
 - The oil stays in and the dirt is kept out
- **Magnetic plug to collect metallic parts from wear**
- **K7 housing fit available**
for CARB and locating bearing SRB



SNL series plummer block housings

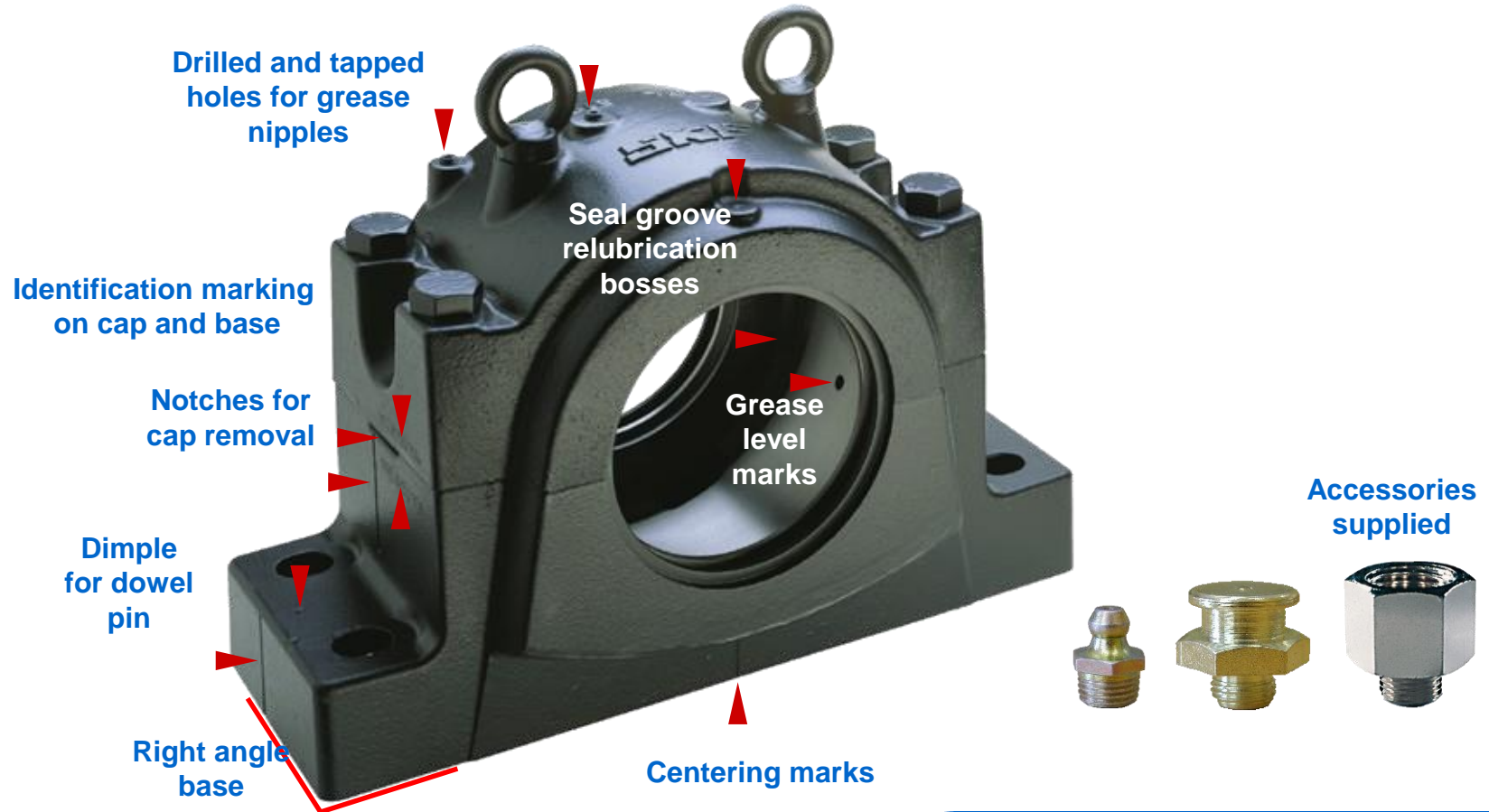


- Accommodates the following bearing types in dimension series 02, 03, 22, 23 and 32
 - Self-aligning ball bearings
 - Spherical roller bearings
 - CARB toroidal roller bearings
- Grease lubrication as standard, option for oil lubrication
- For metric shaft diameters from 20 to 25 mm and 70 to 160 mm
- For inch shaft diameters from $\frac{3}{4}$ to 1 inch and from 2.11/16 to 5.1/2 inches
- Can directly replace old SN, SNA and SNH series housings



SNL housings for Fan & Blowers

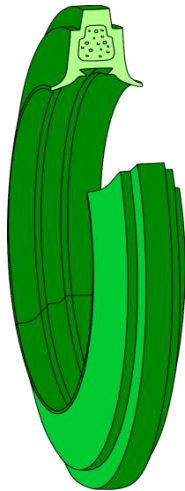
Simple mounting and dismounting



SNL housing seals for Fan & Blowers

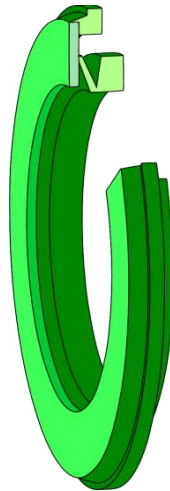
Standard seals for grease lubrication

- For metric and inch shafts
- Supplied with mounting instruction



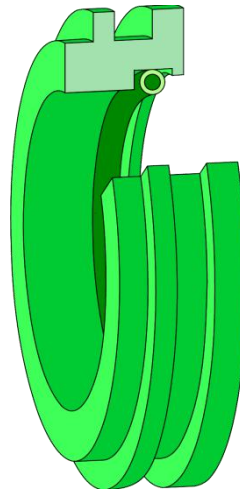
Double-lip

G



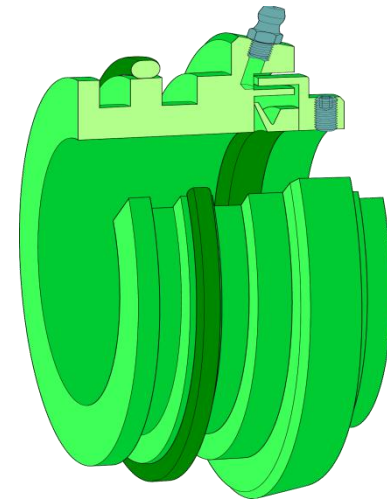
V-ring

A



Labyrinth

S



Taconite

ND

SONL housings for oil bath lubrication

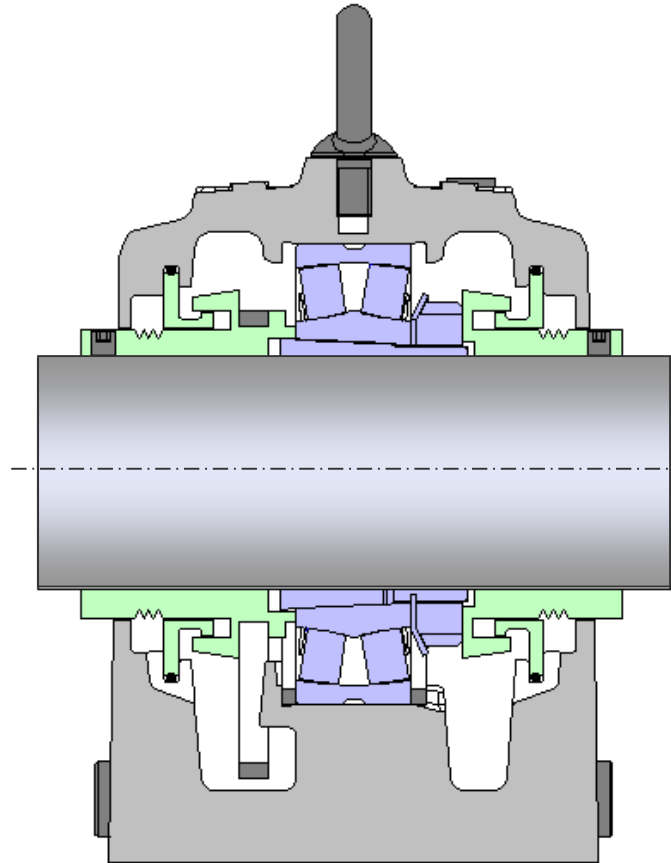
SONL, oil bath lubrication

- Proven oil pick up ring
- Prepared for oil lubrication
- Full range SONL 217-517 to 232-532
 - Additional size is 540
 - Replaces old SOFN



SONL housings for Fan & Blowers

Effectively sealed



Oil level gauge



Magnetic plug



3.4

Lubrication accessories

Description of offer

- Lubrication accessories

SKF bearing greases and other lubrication accessories

- SKF offers a wide range of greases to meet specific application needs from vertical shaft arrangements and horizontal shaft arrangements

- SKF offers grease guns and pumps and automatic lubricators such as SKF SYSTEM 24

SKF bearing grease selection chart

| Bearing working conditions | Temp | Speed | Load | Vertical shaft | Fast outer ring rotation | Oscillating movements | Severe vibrations | Shock load or frequent start-up | Low noise | Low friction | Rust inhibiting properties |
|----------------------------|--------|---------|---------|----------------|--------------------------|-----------------------|-------------------|---------------------------------|-----------|--------------|----------------------------|
| LGMT 2 | M | M | L to M | ○ | — | — | + | — | — | ○ | + |
| LGMT 3 | M | M | L to M | + | ○ | — | + | — | — | ○ | ○ |
| LGEP 2 | M | L to M | H | ○ | — | ○ | + | + | — | — | + |
| LGFP 2 | M | M | L to M | ○ | — | — | — | — | — | ○ | + |
| LGFB 2 | M | M | M to H | ○ | — | ○ | + | + | — | — | + |
| LGEM 2 | M | VL | H to VH | ○ | — | + | + | + | — | — | + |
| LGEV 2 | M | VL | H to VH | ○ | — | + | + | + | — | — | + |
| LGLT 2 | L to M | M to EH | L | ○ | — | — | — | ○ | + | + | ○ |
| LGFL 1 | L to M | M to EH | L | — | — | — | ○ | — | + | + | + |
| LGGB 2 | L to M | L to M | M to H | ○ | — | + | + | + | — | ○ | ○ |
| LGWM 1 | L to M | L to M | H | — | — | + | — | + | — | — | + |
| LGWA 2 | M to H | L to M | H | ○ | ○ | ○ | ○ | + | — | ○ | + |
| LGHB 2 | M to H | VL to M | H to VH | ○ | + | + | + | + | — | — | + |
| LGHP 2 | M to H | M to H | L to M | ○ | — | — | + | ○ | + | ○ | + |
| LGET 2 | VH | L to M | H to VH | ○ | + | + | ○ | ○ | — | — | ○ |



Fan and blower solutions



SKF automatic lubrication systems and greases

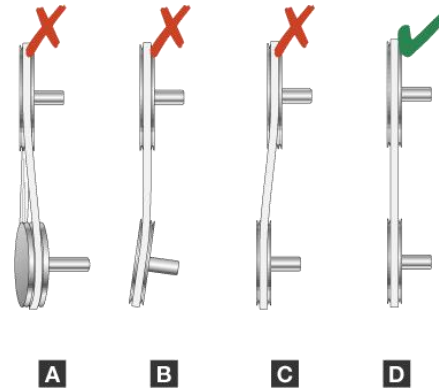
- Specially formulated to enable precise, 24/7 lubrication to reduce:
 - Machinery failures
 - Safety and environmental risks
 - Maintenance manpower demands



Belt & Shaft alignment

Belt misalignment

- A. Vertical angle misalignment
- B. Horizontal angle misalignment
- C. Parallel misalignment
- D. Correct alignment



Misalignment causes

- Increased wear on pulleys and belts
- Increased friction
- Increased noise
- Increased bearing life
- Decreased bearing life
- Increased energy consumption
- Increased vibrations
- Belt failures



PRODUCT VALUE SHEET


Belt-driven machinery downtime can be a thing of the past ...

Benefits

- Helps reduce friction and thereby energy consumption
- Helps reduce wear on pulleys and belts
- Helps reduce vibration and noise
- Helps extend bearing and shaft service life to provide greater return on your investment in equipment
- Enhances the efficiency of your maintenance personnel
- Improves the results of avoiding unplanned downtime
- Versatile tools for widespread use throughout your facility

Typical applications

- V-belt drives
- Flatbed belt drives, timing belts, HTD belts, GT belts
- Rubber choker drives



For more information on SKF maintenance products, or other SKF products or solutions, please contact your local SKF representative. Visit us on the web at www.skf.com

SKF Belt Alignment Tool increases productivity and avoids unplanned downtime

As much as 74% of general bearing failures and associated downtime are the result of misalignment. The SKF Belt Alignment Tool accurately and efficiently helps users to find, correct and prevent belt misalignment, using a simple three-step process, for example in the following applications:

Simple to attach
Components of tool have components a user can attach and remove.

Accurate
Users can adjust and precisely measure to align the pulley, allowing adjustment of pulley or shaft with precision tool.

Easy detection
3-D target area on receiver identifies the nature of misalignment—horizontal, vertical, parallel or a combination.

Operator-friendly
Facilitates simultaneous adjustment of pulley and alignment. Allows for quick visual identification of misalignment and direction.

Versatile
Special size adapter allowing alignment of most related industrial belt designs. In use on most systems, is available as an accessory.



Return on Investment (ROI) summary* over a 2-year period.

| | |
|---|--------------------|
| Annual savings in belt purchases | € 1 900 |
| Annual savings in energy consumption | € 2 070 |
| Value of lower product failure | € 3 370 |
| Total benefits | € 7 340 |
| Investment in the SKF Belt Alignment Tool | € 5 000 |
| Net benefits | € 2 340 |
| Return on investment | over 2400 h |

*Based on a typical application scenario. The SKF Belt Alignment Tool is a maintenance investment. The return on investment (ROI) is calculated based on the savings in belt purchases, energy consumption and product failure. The ROI is calculated based on the savings in belt purchases, energy consumption and product failure. The ROI is calculated based on the savings in belt purchases, energy consumption and product failure.

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Belt drive offering

Noise and vibrations:

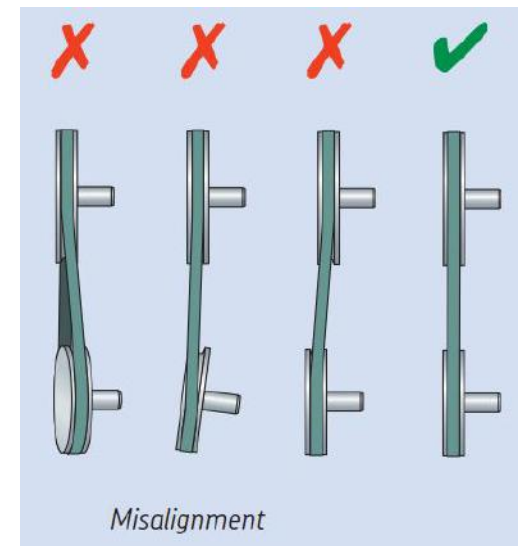
- Incorrect alignment of the belt pulley can increase wear on the pulley and the belt, which creates vibrations
- Customer attempts to realign often fail, because their methods are not sufficiently precise and also time-consuming

Precision alignment with laser, TMEB 2:

- Easy and accurate
- Magnets for quick and easy mounting
- Maximum working distance is 6 m
- Supplied in a portable lightweight case

High quality belts:

- Longer service life
- Energy-saving
- Reduced maintenance



In line with SKF – Saving energy Shopping mall using belt-driven fans

SKF solutions saves more than 41 000 € in 30 months

Problem:

- Misaligned belts and inferior belt quality increased energy costs
- Frequent servicing of the system is essential and costly

Solution:

- SKF alignment tool enables quick and correct alignment
- New high quality belts further reduce energy consumption and provide longer service life

Value:

- Longer belt service life, reduced maintenance belts, total approx. 20% energy saving
- Cuts maintenance costs

SKF alignment solutions save money, cut downtime

SKF shaft and belt alignment tools increase productivity and avoid premature machine failure.

By reducing 30% of premature bearing failure and increasing bearing life by 40% through SKF shaft alignment, SKF can reduce total operating and off-line expenses and reduce prevent maintenance.

SKF Shaft Alignment Tool: THER 2
This alignment tool can adjust bearings in operation. It can measure misalignment and correct it. This tool makes bearing work and adjust it to the shaft using magnetic balls.

SKF belt alignment tool: THER 2
SKF belt alignment tool (THER 2) is a belt alignment tool that can be used to align belts during the alignment process.

SKF bearings have a proven record of reliability and long service life. They are available in a wide range of sizes and configurations. SKF bearings are available in a wide range of sizes and configurations.

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SKF

360
Increase the return on your maintenance investment with SKF
The SKF 360° Solution programme embodies our goal to help you get more out of your plant machinery and equipment investment. This means lowering your maintenance costs, or raising your productivity, or both. Here's an example of the SKF 360° Solution programme at work in a busy retail handling system.

Shopping centre retail 40 x 25m
By installing SKF shaft alignment tools, the centre's energy consumption is reduced to 10% of the original. This means that per year, the centre saves 41 000 € in energy costs. This is a significant saving, especially in a retail environment where energy costs are high.

SKF bearings have a proven record of reliability and long service life. They are available in a wide range of sizes and configurations. SKF bearings are available in a wide range of sizes and configurations.

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SKF

| | |
|---|----------|
| SKF 360° Solution programme (SKF Shaft Alignment, SKF Belt Alignment) | 41 000 € |
| SKF bearings (SKF bearings, SKF shaft alignment) | 10 000 € |
| SKF solution ROI over 30 months | 51 000 € |



SKF Shaft Alignment Tools – the new range

- Confidence in performing correct shaft alignment
- Easy to operate and intuitive to use
- Attractive and innovative design
- Competitive features and functions
- Truly affordable prices



- Complete new range of SKF Shaft Alignment Tools is launched.
 - New: Android app for TKSA 11
 - New: Shaft Alignment Tool TKSA 51
- Competitive & best product range for shaft alignment instruments.
- Comprehensive offer from entry-level to expert users.
- Focus on intuitiveness and usability.
- Versatile features and functions for almost all applications.
- Promotion offers and demo unit discounts.
- Great business opportunity to win new customers & grow the business.