



**SKF**



# Re-lubrication free fans for Air Handling Units (AHU's)

SKF Fluid Segment

**SKF**<sup>®</sup>

# Industry and application

## Air handling units (HVAC)

- Schools
- Airports
- Office blocks
- Hospitals
- Stadiums / arena's
- Other facilities
  
- Solution developed to fit the specific requirements of air handling units – controlled environmental conditions



# Customer needs and market trends

## Commercial

- Less maintenance
- Re-lubrication free air handling units

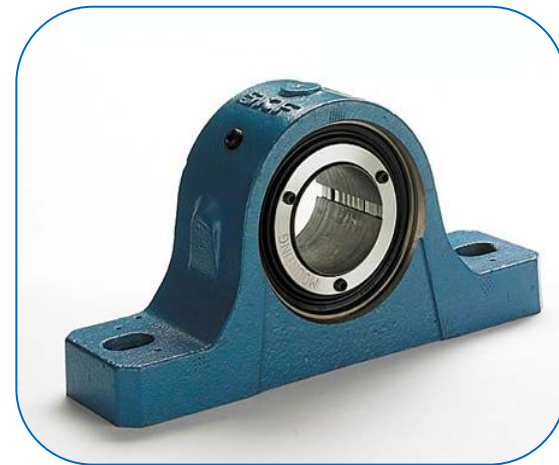
## Technical

- Increased unit life (bearing, seal and grease)
- Improved fan efficiency and flow
- Reliability in operation
- Lower energy consumption
- Low vibrations and noise
- Easy assembly and mounting
- Concentric locking

# The new solution

## SKF re-lubrication free ConCentra roller units

- Complete SKF re-lubrication free fan shaft solution
  - Re-lubrication free roller units combined with re-lubrication free ball units
- Unique market offer
- Re-lubrication free sealed unit
- Superior unit service life
- Concentric locking
- SKF Explorer roller bearing performance



# SKF ConCenta re-lubrication free roller units

- Lubricated for life, sealed unit with concentric locking, meeting the required maintenance and service life needs.
- New standard variant designation
- Supplied without the grease nipple for re-greasing.
- Fully interchangeable, dimension wise, with the main market standards and we have complete offers for US, EU and Asia
- A new grease has been tested at SKF Business Technology Park and at Development Centre in Sweden.

# Customer benefits

## Re-lubrication free:

- No grease lines / grease disposal
- Reduced maintenance costs for users
- Increased fan reliability, as users frequently neglect to grease
- No risk for over greasing or use of wrong grease
- No risk for introducing contaminants
- Increased service life

## Concentric locking:

- Lower vibration, lower noise
- Higher holding power
- No shaft damages
- Commercial shafting possible
- Easier balancing in manufacturing
- Higher speed and lower load capabilities than sleeve mounting
- Easy mounting and dismounting

# OEM issues

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- Warranty claims due to bearing failures
- Bad reputation in the industry / market place
- High maintenance costs
- Longer time to market, due to the assembly procedure



# OEM benefits

- Quicker & easy mounting / factory assembly
  - Typically 20 - 30 minute saving per unit, so quicker time to market
  - No subjectivity as with feeler gauge on SNL
- No grease lines, lower cost and time saving
- Decrease fan warranty claims:
  - Users frequently neglect to grease, over / under grease, wrong grease...
  - Less opportunity with improper installation as with SNL
- Have a **unique offer** in the HVAC market
  - Position as a leader / innovator in the fan industry
- Provide a longer service life to the user (no loosening of set screws)
- Reduced need for balancing when the brg's require changing
- ConCentric locking
  - Load ratings improved, lower eccentricity, higher speed
  - Fewer components

# End user issues and benefits

## Issues

- End users can often neglect to follow the re-lubrication recommendations.
  - This results in early bearing failures, customer disappointment and complaints to the producer and the risk of a bad reputation (warranty claims at the OEM etc...)

## Benefits with the re-lubrication free and concentric locking bearing units:

- Lower vibrations and noise
- Superior increases in service life (longer re-lubrication interval)
  - No contamination / dirt in the housing ensures a cleaner and optimised process, reducing the risk of overheating (premature failure) and increasing user reliability
- Lower lifetime costs
- Maintenance cost savings (fewer calls & 20-30min time saving per replacement)
- Lower power consumption
- Dimensions meeting ISO standards

# Sustainability

- Air handling unit field test - SKF Katrineholm, Sweden
- Moving from the SNL solution with G seals to the Relubrication free solution.



- Factors – using input from key customers and SKF laboratory testing:
  - Load, speed and shaft size
  - Friction / torque and power consumption (brg + grease)
- Assuming the Fan has two bearings and is running 24/7:  
**Power saving** per fan **2000kWh per year** x 000's of fans in the field...
- Kg's of **grease saved** during the lifetime of the fan:  
Unit size 1 7/16 – 100 fans would save 24kg of grease per year

# Re-lubrication free ConCentra unit range

## ConCentra ball unit range:

25 – 60mm shaft size (metric)

## ConCentra roller unit range:

35 – 75mm shaft size

- Smaller HVAC units:  
Two Concentra ball bearing units
- Medium HVAC units:  
One Concentra ball and one Concentra roller unit
- Larger HVAC units:  
Two Concentra roller units

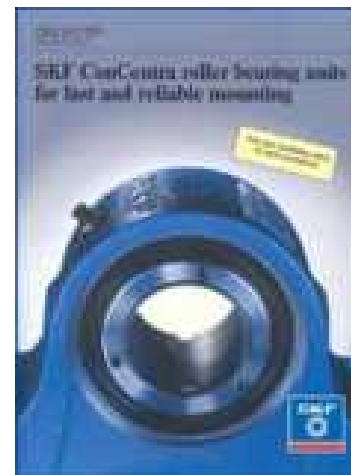
# Communication brochures & ConCentra Technology

- Please refer to the brochure “Re-lubrication free fan solutions” for more information on the SKF offer – publ 6578.

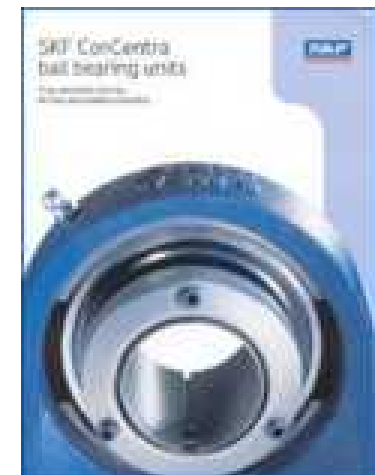


”Re-lubrication free fan solutions” Publ. 6578

Please refer to the ConCentra ball and roller brochures for more technical details regarding the ConCentra technology.



Publication 5103



Publication 6107

# Additional Facility Management reference cases.

## Publ. 6159

Customer reference case  
Pulp and paper industry  
Carton-board manufacturer  
Hot gas fans  
INSOCOAT bearings



Aerial view of AssiDomän Cartonboard AB in Frövå, Sweden

### INSOCOAT® bearings increase service life in a hot gas fan

#### The challenge

AssiDomän Cartonboard AB, a major international producer of heavy duty carton-board was experiencing high maintenance and repair costs related to their large flue gas recirculation fan. These costs were the result of premature bearing failures caused by stray electric currents introduced into the bearings by the variable frequency converter. The bearings in the hot gas fan motor in the boiler lasted only six months on an average. A solution was needed to eliminate the damaging electric currents, improve reliability and reduce maintenance and repair costs. The maintenance department decided to install INSOCOAT® bearings, available only from SKF® in the fan motor.

**Savings and value**  
Since changing to INSOCOAT bearings five years ago, this producer has had no bearing failures in the hot gas fan. In addition, the frequency drive can be used to its full capacity. The plant's savings in maintenance and repair costs using INSOCOAT bearings are dramatic. In addition, reduced downtime and increased productivity have had a significant impact on the bottom line.

Operating data	
Bearings:	6322 M/C3/L0241
Speed:	950 r/min
Power:	400 kW
Operating temperature:	> 100 °C
<b>Value added</b>	
✓ Increased mean time between failures	
✓ Improved reliability	
✓ Reduced maintenance costs	

**Financial outcome over 5 years**  
✓ Initial investment (bearings) 5 000 €  
✓ Total savings 250 000 €

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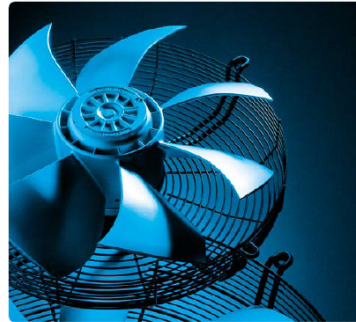
Publication 6159 EN  
Printed in Sweden.

skf.com



## Publ. 6157

Customer reference case  
Industrial electric motors  
HVAC manufacturer  
Variable speed drives  
Hybrid bearings



Ziehl-Abegg fan

### Hybrid bearings provide longer service life for fans with variable frequency drives

**The challenge**  
Ziehl-Abegg AG is a manufacturer of high quality fans, motors and control systems. Their objective: increase the service life of their motors with variable frequency drives to provide additional customer value. To meet this objective, the company replaced the all-steel bearings in their fan motors with SKF® hybrid bearings. The result was better than expected and they were able to double and in some cases, triple the service life of their motors.

In addition to increased bearing service life, hybrid bearings were also able to reduce the noise level of the motors. Fans and their drive units are used in a variety of applications like mobile and stationary refrigeration systems, and air handling/air conditioning systems. For these applications, there is a trend toward integrated motor drive units,

as they provide customer benefits in terms of high power output and reduced energy consumption. These units also enable more compact designs, reduced noise level and possibilities for multiple use. For this trend to be successful, however, the fan and the drive unit must have a high degree of reliability and require virtually no maintenance under a variety of operating conditions.

**Solution and value**  
As fan manufacturers like Ziehl-Abegg AG frequently have no control over the operating



## Publ. 6158

Customer reference case  
Hospital/buildings  
HVAC end-user  
Direct driven fans  
Hybrid bearings



Fan installation at Sunderby Hospital

### Daytime service at Sunderby hospital

**The challenge**  
Sunderby hospital in northern Sweden is a modern building with around 150 fan installations. As in other modern buildings, the fans, which are equipped with variable frequency converters, are operated at maximum capacity. The variable frequency converters are used to control airflow in order to reduce energy consumption and operating costs.

The motors in these direct drive fans were failing prematurely and had a mean time between failure (MTBF) of 3 - 4 years. To add to the replacement costs, hospital regulations prohibited maintenance during the day, requiring more expensive labour costs at night. It was estimated that each motor replacement was costing upwards of 440 €.

**Solution and savings**  
Working with the service consultant for the hospital, SKF service engineers were able to determine that stray electric currents from the variable frequency converters were damaging the bearings, causing them to fail prematurely. To solve the problem, SKF® hybrid bearings were recommended by the service engineers. Their recommendation to use SKF hybrid bearings and not INSOCOAT® bearings, which can also provide protection against stray electric currents, was based on the size of the motor.



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# SKF ConCentra Technology

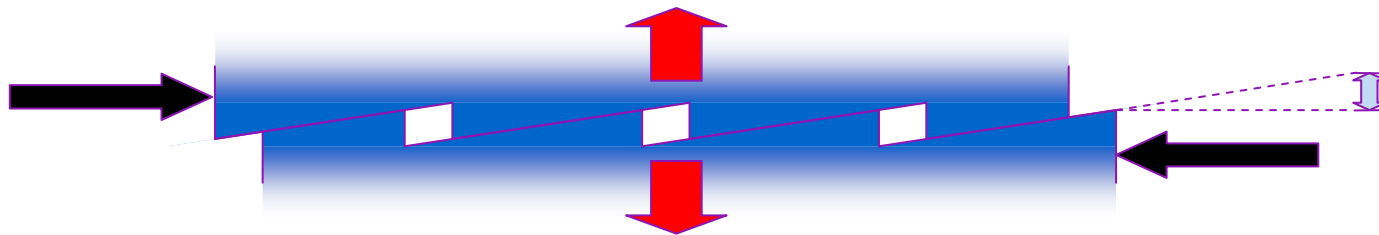
# Fast and reliable way to replace bearings

## SKF solutions mean lower maintenance costs

- Problem:**
- Maintenance costs increase, frequent replacement of bearings has led to worn shafts
  - Recurring problem with vibration in fans at high speeds

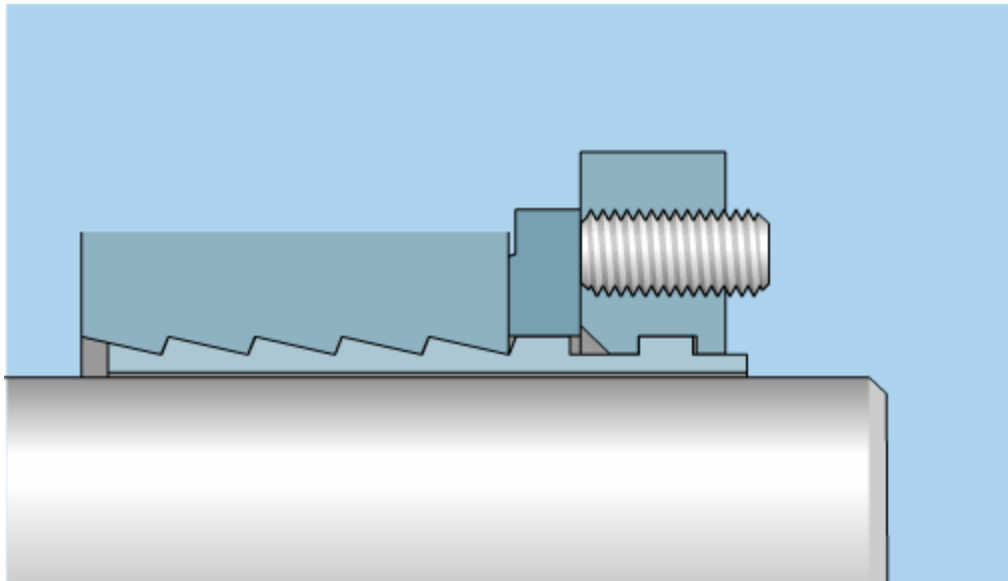
- Solution:**
- SKF ConCentra enables fast and reliable mounting
  - Greater reliability during operation
  - Lower maintenance costs

- Value:**
- Increased service interval, shorter periods of service downtime, reduced noise



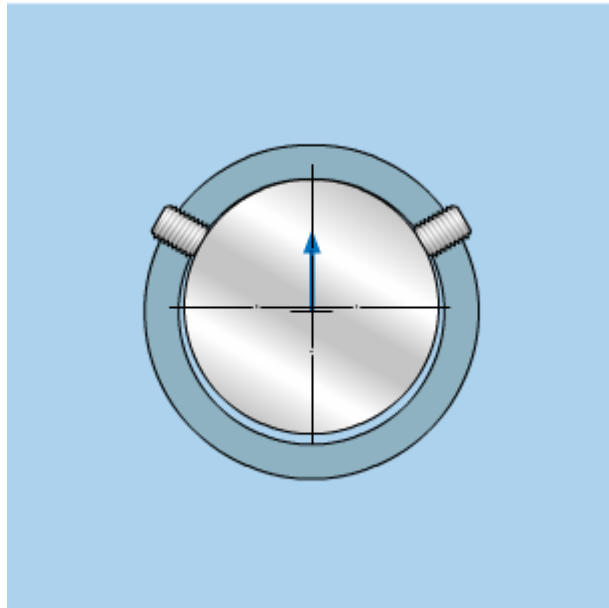


# SKF ConCentra Technology



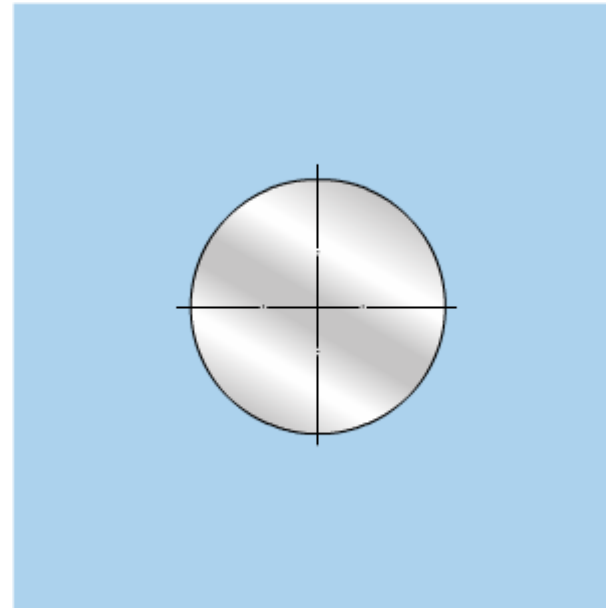
- Easy mounting
- Easy dismounting
- True concentric locking
- Low vibrations / noise
- Increased bearing life
- Easier balancing
- Higher speed capabilities
- No shaft damages
- Low load capabilities

# SKF ConCentra Ball Bearing Unit



## Eccentric locking

- Set screw locking
- Eccentric locking collar



## True concentric locking

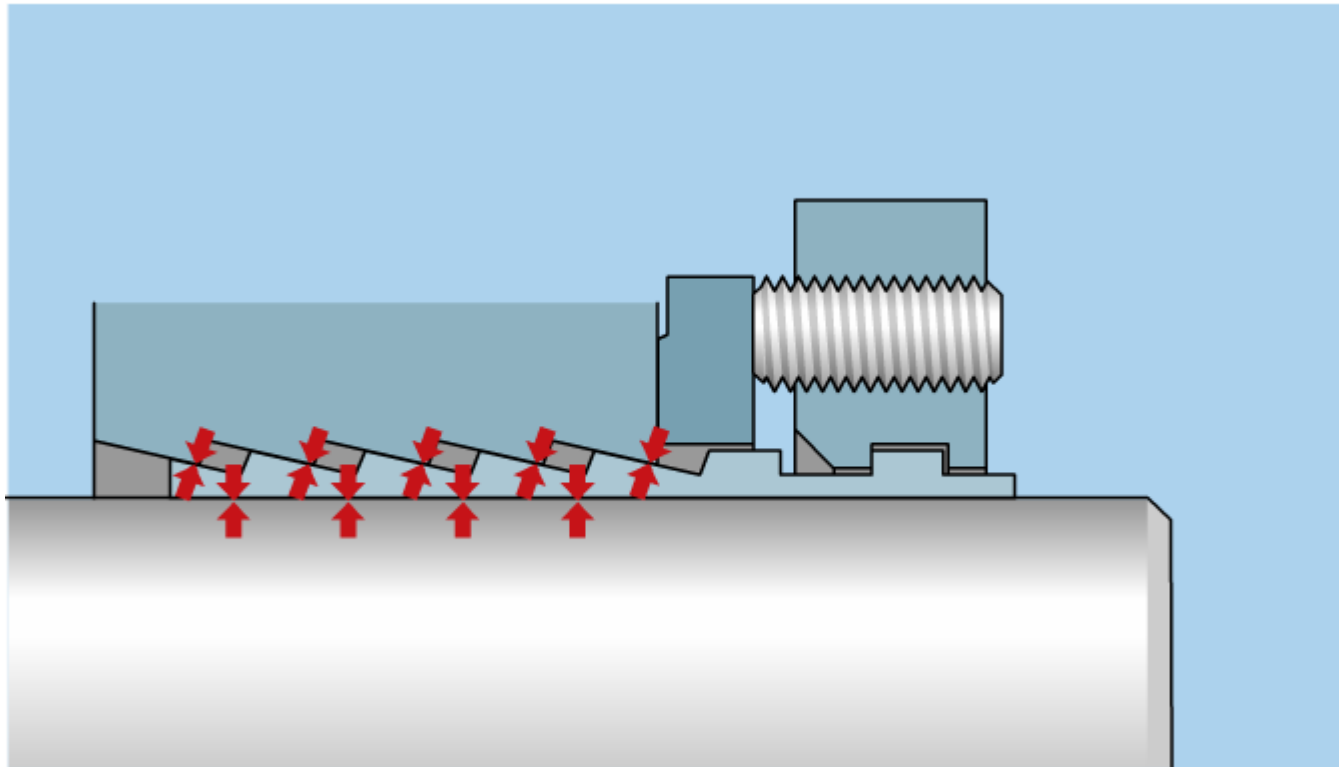
ConCentra locking

### Benefits:

Low vibration levels

Longer bearing life

# ConCentra Technology



Easy dismounting

# Easy and reliable mounting and dismounting

- Supplied ready to fit as unit assembly
- Hexagonal key with a torque indicator to achieve the right tightening
- Fast reliable mounting and dismounting



# ConCentra Bearing Units: Technical features

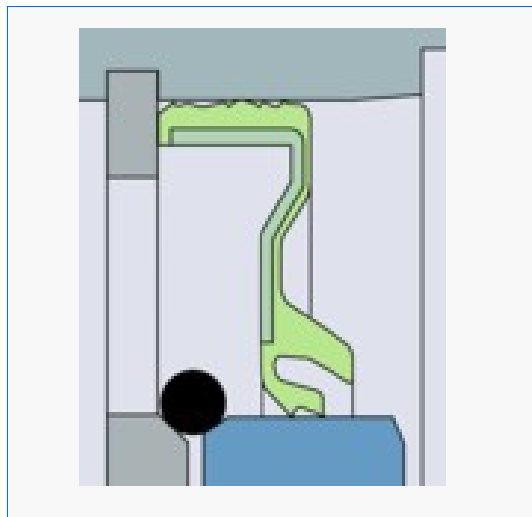
- The shafts size is set by the fan design. The load, speed and temperature determine if there should be a roller bearing or a ball bearing.
- The load should not exceed  $c/p \geq 15$  for ball or roller bearing units.
- Re-lubrication free ConCentra Roller Bearing units are available for metric shafts 35-75 mm. The main dimension of the SYT housings follow the ISO 113-2:1999 standard for split housings with adapter sleeve mounted bearings in this range.
- For inch sized shafts the range cover 1.7/16" to 4" shafts. There are 2 housing styles SYR and SYE following the 2 main standards of roller bearing units in the North American market.
- Two roller bearing units on a shaft require one locating unit and one non-locating unit. The locating unit should, if possible, be placed where the radial load is highest.

# ConCentra Bearing Units: Technical features

- They are separated from each other by different suffixes - Metric suffixes are:
  - FW for locating unit
  - LW for non locating unit
  - The inch suffixes are
  - NHW for locating unit
  - NW for non locating unit.
- ConCentra ball bearings are available for metric shafts 25-60 mm and inch shafts 1" to 2 15/16". The SY housings conform to the ISO:3228:1993 standard.
- ConCentra ball bearings have no fixed and float unit but can accommodate some initial misalignment of the shaft approx +/- 2 degrees.
- The mounting principle is the same for all ConCentra units. The set screws should be tightened following the tightening pattern that is in the mounting instruction. When the correct torque is achieved the bearing sits firmly on the shaft with correct internal clearance.

# ConCentra Roller Bearing Unit

- Explorer class bearing, SRB series 222
- Easy mounting compared to split housings
- Ready to fit unit - prefilled with grease and relubrication free
- Only one part number for complete bearing arrangement.
- Two sealing option - Nitrile rubber double-lip seal (see below)
- Cast iron housings as standard



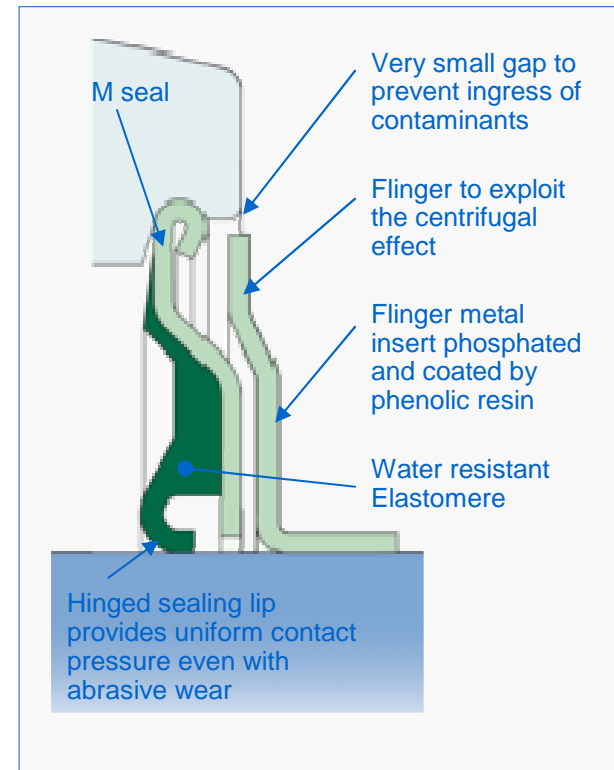
## Double-lip seal

Type of seal:	nitrile rubber double-lip seal
Lubrication:	grease
Temperature range:	-40 to +100 °C
Max misalignment:	1,5°
Material:	nitrile rubber

# ConCentra Ball Bearing Unit

## Seal Arrangement

- The bearing is provided with additional pressed steel flingers located outboards the M seal
- The flingers are pressed onto the inner ring providing better sealing without increasing the friction
- Excellent additional protection for tougher conditions





# How to order

Prefix

Size

Suffix

Housing series:

Shaft size:

**Ball Bearings:**  
PF metric units suffix  
PF/AH inch unit suffix (AH air handling is common to use in N.A)

**Roller Bearings:**  
Locating or Non-locating and relub free

F locating metric unit  
NH locating inch unit

L non-locating metric unit  
N non-locating inch unit  
W re-lubrication free

## ConCentra Ball bearing unit

SY 25 PF

SY 1. PF/AH

## ConCentra Roller bearing unit

SYT 40 FW

SYR 2.7/16 NHW



# Where to find more information

## **SKF Distributor College:**

([SKF.com/Services/SKF Distributor Network/SKF Authorized Distributor](http://SKF.com/Services/SKF%20Distributor%20Network/SKF%20Authorized%20Distributor))

1. ConCentra products
2. Split housings(SNL, SONL) and accessories
3. Lock nuts
4. Split flanged housings (FNL)



**SKF**

