Everything you ever wanted to know about

SKF insert bearings and ball bearing units

Contents






Chapter 1

Product range

SKF insert and ball bearing units range overview

Insert bearings typically have a sphered (convex) outside surface and an extended inner ring with different locking devices to enable quick and easy mounting onto the shaft.

SKF also supplies a wide variety of ball bearing units, consisting of:

- an insert bearing (a single row deep groove ball bearing) with a convex sphered outside diameter
- a housing, which has a correspondingly sphered but concave bore.

Ball bearing units can accommodate moderate initial misalignment, but normally do not permit axial displacement. They are ready-to-mount and ready-to-use units.

SKF ball bearing units provide designers with considerable freedom of choice so that compromises can be avoided. Numerous standard series ball bearing units are available (→ tables on pages 17 to 18). The tables list insert bearings and insert bearing housings and their possible combinations to units.

SKF insert bearings and ball bearing units range overview

Common applications

- Agricultural machinery
- Food and beverage processing and packaging
- Conveyor systems
- Material handling
- Textile equipment
- Industrial fans
- Special machinery (e.g. car washing, gym, go-kart)

Product features

- Quick and easy mounting
- Ready-to-use
- Dependable sealing in contaminating environments
- Exceptional lubricant retention
- Ranges include relubrication-required and relubrication-free
- Available in different designs, materials and sizes
- Wide range, including application-specific solutions
- ISO and JIS standard offers

User benefits

- Increased productivity
- Reduced maintenance cost
- Reduced lubricant leakage, less environmental impact
- Maximized bearing life

Wide range of types and materials

Housing types:

- Ball bearing plummer block units
- Flanged ball bearing units
- Ball bearing take-up units

Housing materials:

- Composite material
- Grey cast iron
- Sheet steel
- Stainless steel

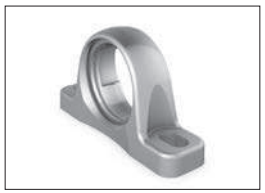
Housing types

Plummer block housings

SY(J): cast iron housings. Plummer block.*

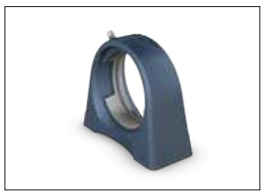
SYK: composite housings. Plummer block.

SYWK: composite housing for SKF Food Line ball bearing units. Plummer block.

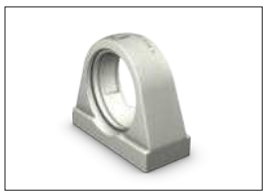


SYWR: stainless steel housing. Plummer block.

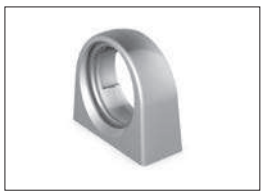
P: pressed steel housing. Plummer block.



SYF: cast iron housings. Plummer block short base.

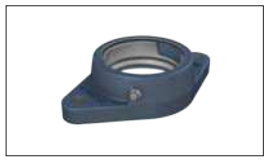


SYFWK: composite housing. SKF Food and Beverage ball bearing units. Plummer block short base.

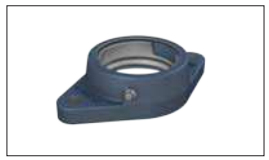


SYFWR: stainless steel housing. Plummer block short base.

Flanged housings



FYTB: cast iron housing. Oval flange.



FYTJ: dimensions according to standard JIS. Oval flange.

FYTBK: composite housing. Oval flange.

FYTWK: composite housing for SKF Food Line ball bearing units. Oval flange.

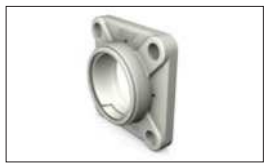
FYTWR: stainless steel housing. Oval flange.

PFT: pressed steel housing. Oval flange.

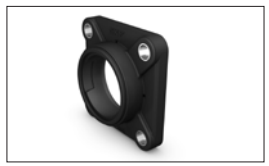
FYC: cast iron housing. dimensions according to standard JIS 1559-1995. Round flange.

PF: pressed steel housing. Round flange.

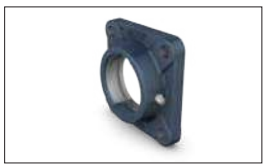
FYAWK: composite housing for SKF Food Line ball bearing units. Three bolt flange



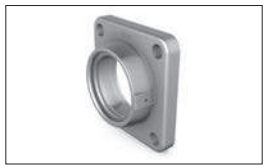
FYWK: composite housing for SKF Food Line ball bearing units. Square flange.



FYK: composite housing. Square flange.



FY(J): cast iron housing. Square flange.*



FYWR: stainless steel housing. Square flange.

PFD: pressed steel housing. Triangular flange.

Take up housings

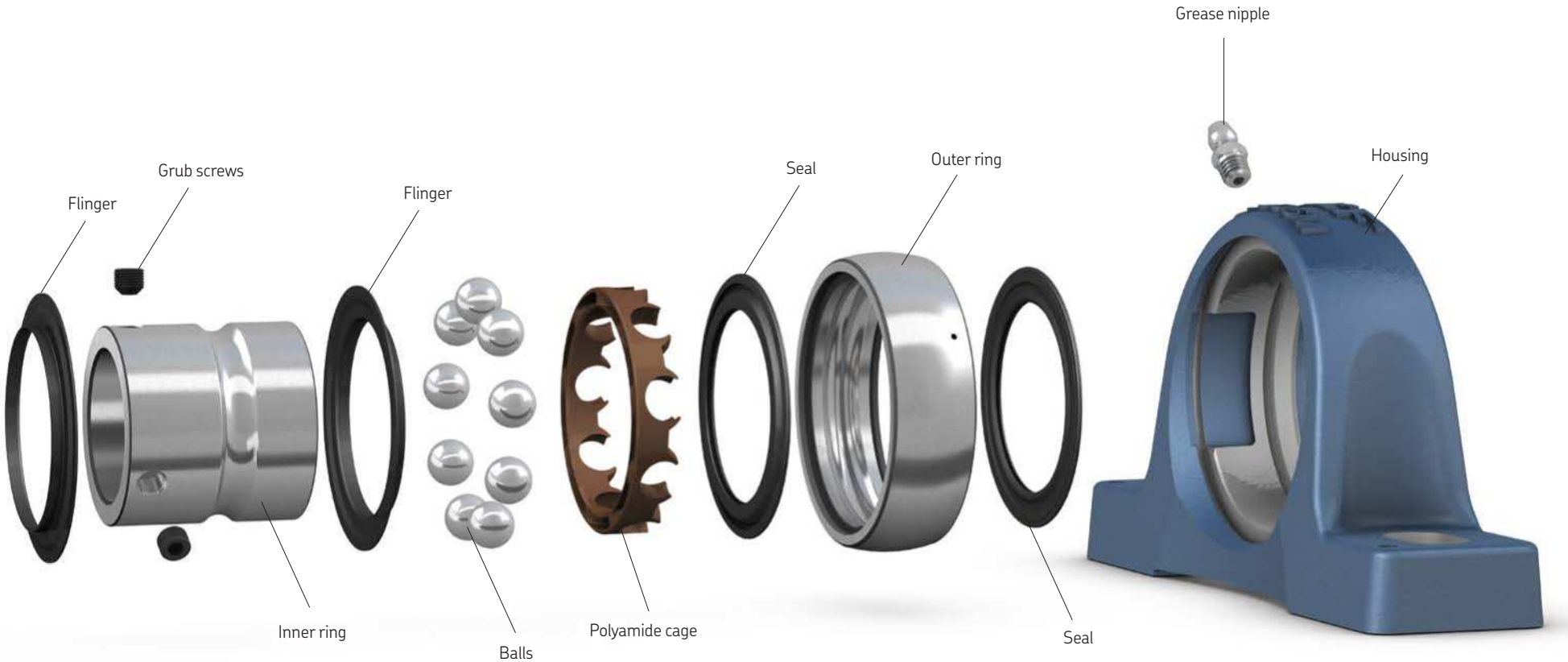
TU(J): cast iron housing.*

TUWK: composite housing for SKF Food Line ball bearing units.

*(J) stands for dimensions in accordance to standard JIS 1559-1995. Where it is not specified, dimensions are according to standard ISO 3228:2013

Ball bearing units components

Example:



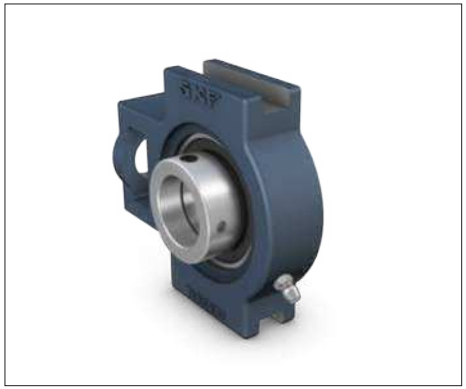
The assortment

Standard range (it also includes ball bearing units with black composite housings for non-food applications)

Insert bearings

Ball bearing plummer block units

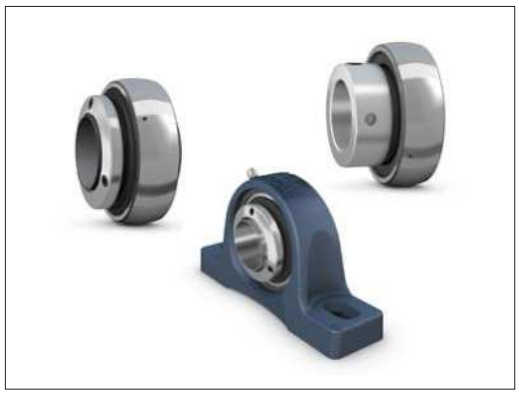
Ball bearing flanged units



Ball bearing take-up units

Application specific range

SKF agricultural insert ball bearing units



Ball bearing units for air handling applications

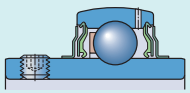
SKF Food Line ball bearing units

Chapter 1.2

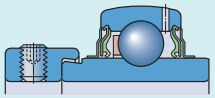
Insert bearings

Locking systems

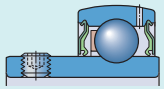
Eccentric locking
After mounting shaft and inner ring bore axis not coaxial



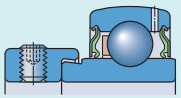
YAR



YEL



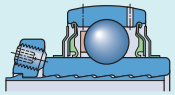
YAT



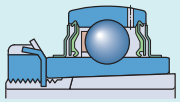
YET

Grub screws	Eccentric locking collar
• YAR, YAT design • Dimension series: 2 • Limiting speed: depending on shaft tolerance • Operating conditions: normal • Direction of rotation: constant or alternating	• YEL, YET design • Dimension series: 2 • Limiting speed: depending on shaft tolerance • Operating conditions: normal • Direction of rotation: constant

Concentric locking
After mounting an interference fit is achieved with bearing inner ring and shaft coaxial



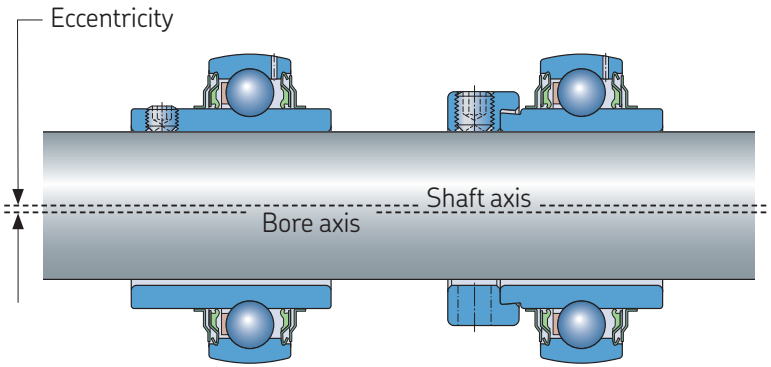
YSP SB

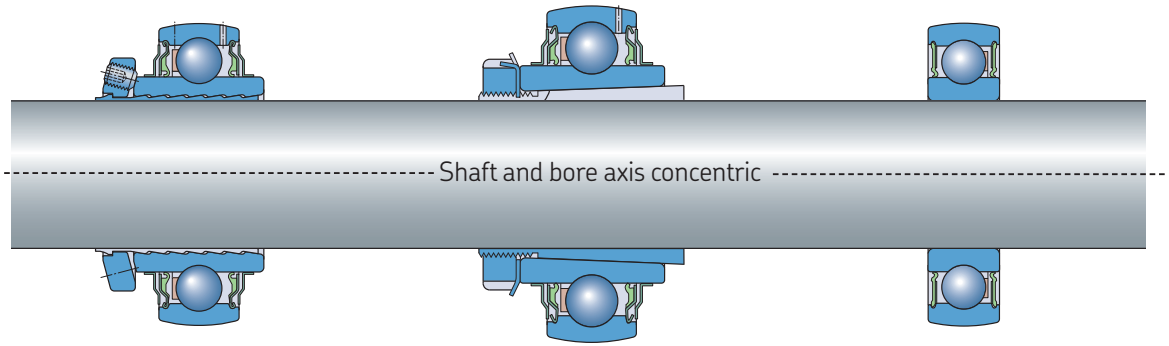


YSA

172

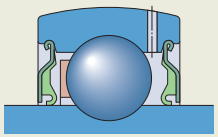
SKF ConCentra locking	Adapter sleeve locking	Interference fit
• YSP design • Dimension series: 2 • Limiting speed: **not** depending on shaft tolerance • Operating conditions: normal to heavy • Direction of rotation: alternating or constant	• YSA design • Dimensional series: X • Limiting speed: **not** depending on shaft tolerance • Operating conditions: normal to heavy • Direction of rotation: alternating or constant	• 172 design • Dimensional series: 2 and 3 • Limiting speed: **not** depending on shaft tolerance • Operating conditions: normal to heavy • Direction of rotation: alternating or constant





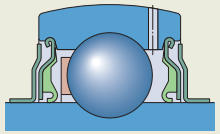
Sealing systems

SKF supplies all insert bearings capped with a seal or shield on both sides. In typical insert bearing applications, no additional external protection is necessary. Therefore, insert bearings are available with several sealing arrangement designs to meet the demands of a wide range of operating conditions.



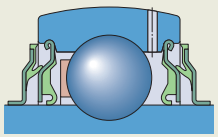
Standard seal

Suitable for medium to high contaminated conditions, the standard integral seal used in SKF ball bearing units provides good protection against moisture and contaminants and also provides reliable retention of the lubricant.



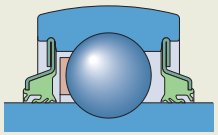
Standard seal + Metallic flinger (-2F designation)

For high contaminated conditions, ball bearing units fitted with plain steel flingers outside the integral seal should be used. The flingers have an interference fit on the inner ring and considerably enchance the sealing effect without increasing friction.



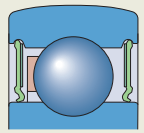
Standard seal + Rubberized flinger (-2RF designation)

Where operating conditions are heavily contaminated and long service life is required, ball bearing units with the highly efficient multiple seal are recommended. Here, the sealing efficiency of the standard integral seal is reinforced by a steel flinger with a vulcanized sealing lip.



Five-lip seal

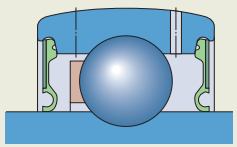
The five-lip seal within SKF agricultural ball bearing units is suitable for extreme contaminated environments and where long service life is required. It consist of a stamped steel insert, with a vulcanized five-lip patented seal made from a low friction compound.



2RS1 seal

The 2RS1 seal is recommended for medium contaminated conditions and allows the highest speed among the seals available for SKF insert bearings for agricultural applications. This contacting seal is integral to insert bearings with a normal inner ring in the 17262(00)-2RS1 and 17263(00)-2RS1 series.

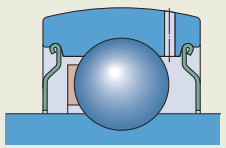
Available on request:



Low friction seal (/LF designation)

The seal is made from acrylonitrile-butadiene rubber and reinforced with a sheet steel insert. The seal lip, which has a thin and flexible design, minimizes the frictional moment, while effectively protecting the bearing from contaminants. The sheet steel insert protects against solid contaminants.

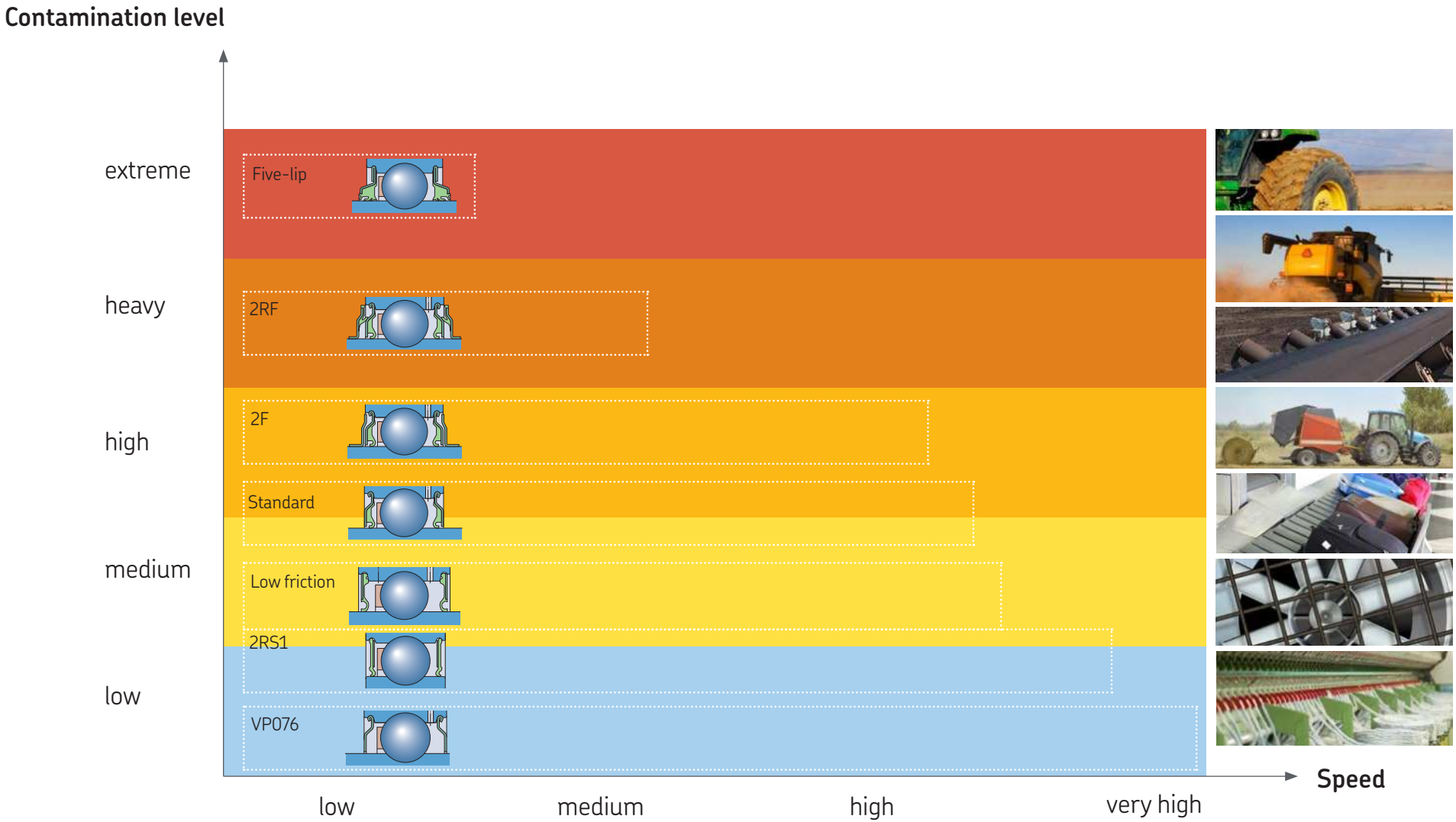
Available on request:



Pressed steel shield (/VP076 designation)

Pressed steel shields are used in temperature or speed sensitive applications where additional friction is not desirable. In applications where shielded bearings are used, contamination should not be severe and water, steam or moisture should not be able to enter the bearing.

Sealing selection chart



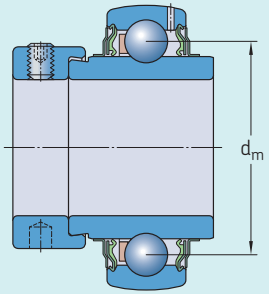
Grease and lubrication

Let's calculate the relubrication interval considering the following example:

Inputs

- Speed: 3 000 rpm
- Brg: YET 206
- T_{op}=65°C*

Bearing mean diameter d_m



Bearing size)	Bearing mean diameter d_m
–	mm
06	46

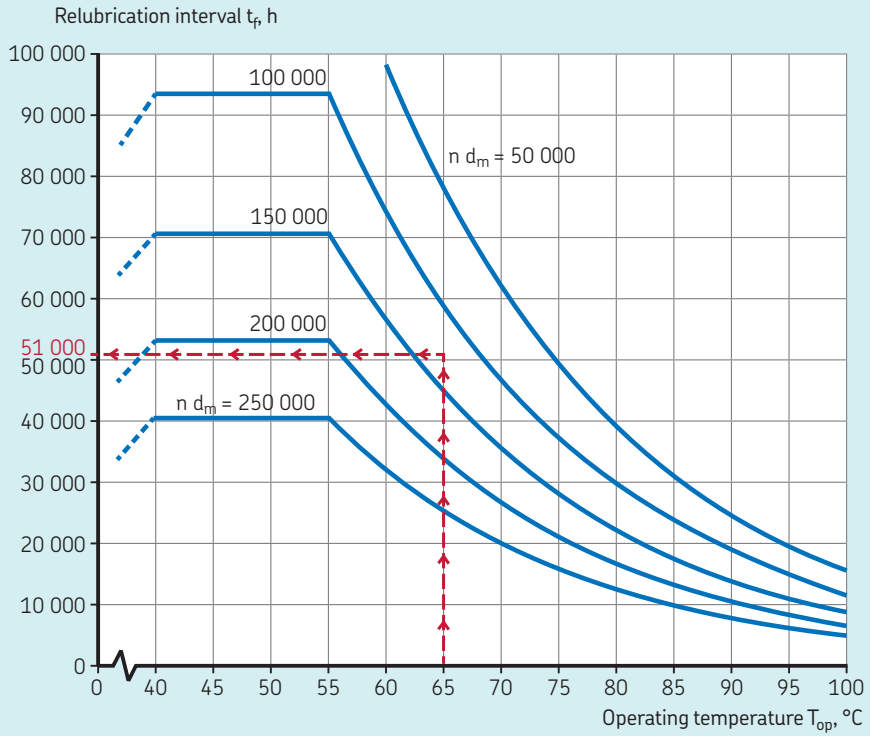
Calculations

d_m = 46 mm

nd_m = 46 × 3 000 = 138 000 mm × r/min

Result: t_f, h = 51 000 hours**

The relubrication interval is 51 000 operating hours.

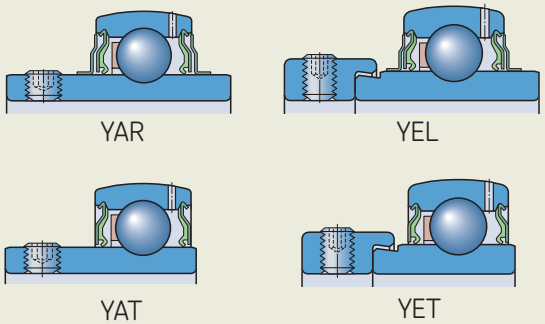


* If T_{op} is not known, an approximated value can be calculated through the empirical formula $T_{op} = T_{env}$+ – 25 °C

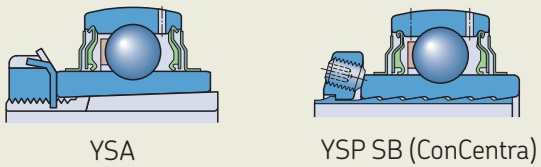
** Calculation is valid under the following conditions:
- horizontal shaft
- stationary machine
- medium contamination level
- equivalent load below 5% of the basic dynamic load rating

Insert bearings radial clearence

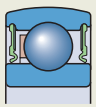
Group N



Group 3



N



Radial internal clearance for insert bearings

Bearing size[1]		Radial internal clearance of insert bearings in the series					
		Group N ISO 9628:2006 YAT 2, YAR 2, YET 2, YEL 2, YHC 2		**Group 3 ISO 9628:2006** YSA 2 K		**Group N ISO 5753-1:2009** 17262 (00) 17263(00)	
from	to.	min	max	min	max	min	max
–	–	µm					
03	03	10	25	–	–	3	18
04	04	12	28	–	–	5	20
05	06	12	28	23	41	5	20
07	08	13	33	28	46	6	20
09	10	14	36	30	51	6	23
11	13	18	43	38	61	8	28
	16	20	51	–	–	–	–
14	16	20	51	–	–	–	–
17	20	24	58	–	–	–	–

[1] For example: bearing size 06 includes all bearings based on a Y 206 bearing, such as YAR 206-101-2F, YAR 206-102-2F, YAR 206-2F, YAR 206-103-2F, YAR 206-104-2F

Insert bearings radial clearance

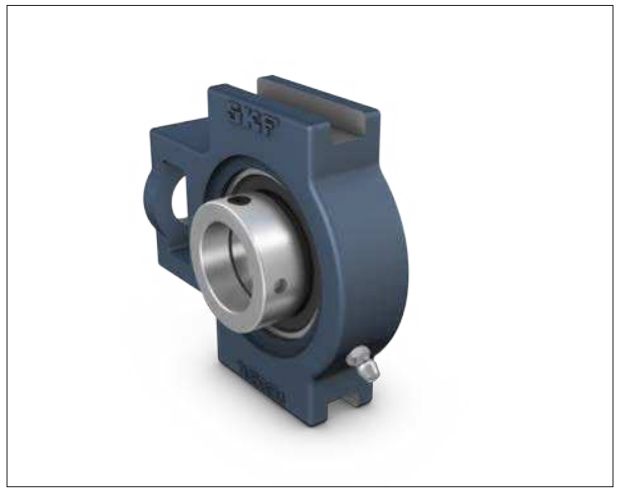
DGBB's radial clearance

Ball bearing units: standard range

Ball bearing plummer block units

Ball bearing flanged units

Ball bearing take-up units



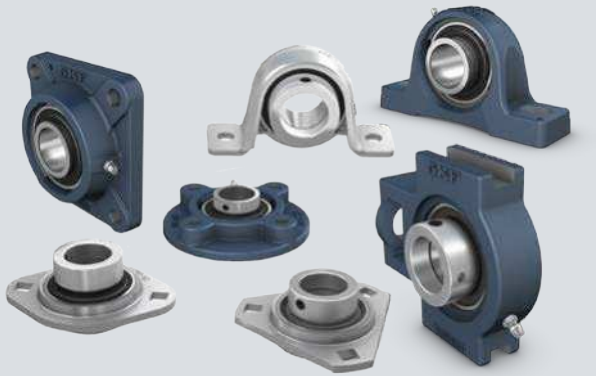
Ball bearing units with grey cast iron or zinc coated pressed steel housings*

- Rings and balls material: standard steel
- Sealing system options:
  - 2RS1 (172 series)
  - Standard seal
  - 2F seal
  - 2RF seal
- Grease: VT307
- Cage material: polyamide
- Housing material:
  - grey cast iron
  - zinc coated pressed steel

Sizes available are in the table on page 17.

To learn more about the standard range

- Ball bearing units catalogue PUB BU 13728 EN
- Why SKF? SKF ball bearing units PUB BU/P9 11638 EN
- skf.com



* for ball bearing units with zinc coated pressed steel housings components have to be ordered separately.

Ball bearing units with composite housings

- Rings and balls material: standard steel
- Locking system: grub screws
- Sealing system options:
  - 2F seal
  - 2RF seal
- Grease: VT307
- Cage material: polyamide
- Housing material: glass fiber reinforced polyamide

Benefits

- Lightweight
- Cost effective
- Relubrication-free

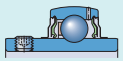
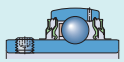
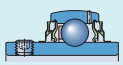
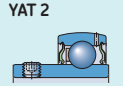
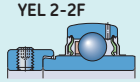
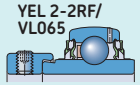
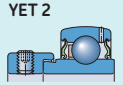
Ball bearing units with composite housings are available as ready-to-mount units in the combinations on the table on page 18. For other combinations, spare parts must be ordered separately.

To learn more about the ball bearing units with composite housings

SKF ball bearing units with composite housings PUB BU/P2 13784/1 EN

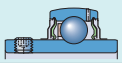
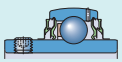
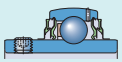
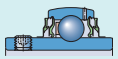
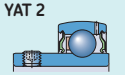
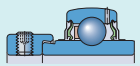
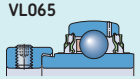
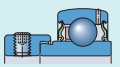
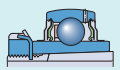
- Customer reference case PUB 46/S6 14057
- skf.com

Standard ball bearing units: tables

	Cast housings										Composite housings		
	 SY (500)	 SYJ 5(00)	 SYF 5(00)	 FY (500)	 FYJ 5(00)	 TU 5(00)	 TUJ 5(00)	 FYTB 5(00)	 FYTJ (500)	 FYC 5(00)	 SYK 5(00)	 FYK 5(00)	 FYTBK 5(00)
YAR 2-2F 	**SY .. TF** 12–65 mm 1/2–2 15/16 in.	**SYJ .. TF** 20–100 mm 3/4–2 1/2 in.	**SYF .. TF** 20–50 mm 3/4–1 3/4 in.[1]	**FY .. TF** 12–65 mm 1/2–2 7/16 in.	**FYJ .. TF** 20–100 mm 3/4–2 1/2 in.[1]	**TU .. TF** 20–55 mm 3/4–2 3/16 in.	**TUJ .. TF** 20–60 mm 3/4–2 in.[1]	**FYTB .. TF** 12–50 mm 3/4–1 3/4 in.	**FYTJ .. TF** 20–50 mm 3/4–1 3/4 in.	**FYC .. TF** 20–65 mm 3/4–2 1/2 in.[1]	**SYK .. TF** 20–40 mm	**FYK .. TF** 20–40 mm 3/4–1 1/2 in.[1]	**FYTBK .. TF** 20–35 mm 3/4–1 1/4 in.[1]
YAR 2-2RF 	**SY .. TR** 20–60 mm 3/4–2 1/2 in.[1]	20–65 mm[1] 3/4–2 1/2 in.[1]	20–50 mm[1] 3/4–1 3/4 in.[1]	**FY .. TR** 20–60 mm 3/4–2 1/2 in.[1]	20–60 mm[1] 3/4–2 1/2 in.[1]	20–55 mm[1] 3/4–2 in.[1]	20–60 mm[1] 3/4–2 in.[1]	**FYTB .. TR** 20–50 mm 3/4–1 3/4 in.[1]	20–50 mm[1] 3/4–1 3/4 in.[1]	20–65 mm[1] 3/4–2 1/2 in.[1]	**SYK .. TR** 20–40 mm	**FYK .. TR** 20–40 mm 3/4–1 1/2 in.[1]	**FYTBK .. TR** 20–35 mm 3/4–1 1/4 in.[1]
YAR 2-2RF/HV 	20–50 mm[1] 3/4–1 15/16 in.	20–50 mm[1] 3/4–1 15/16 in.	20–50 mm[1] 3/4–1 15/16 in.	20–50 mm[1] 3/4–1 15/16 in.	20–50 mm[1] 3/4–1 15/16 in.	20–50 mm[1] 3/4–1 15/16 in.	20–50 mm[1] 3/4–1 15/16 in.	20–50 mm[1] 3/4–1 15/16 in.	20–50 mm[1] 3/4–1 15/16 in.	20–50 mm[1] 3/4–1 15/16 in.	20–40 mm[1] 3/4–1 1/2 in.[1]	20–40 mm[1] 3/4–1 1/2 in.[1]	20–35 mm[1] 3/4–1 7/16 in.[1]
YAR 2-2RF/ VE495 	20–50 mm	20–50 mm	20–50 mm	20–50 mm	20–50 mm	20–50 mm	20–50 mm	20–50 mm	20–50 mm	20–50 mm	20–40 mm[1]	20–40 mm[1]	20–35 mm[1]
YAT 2 	17–50 mm[1]	20–50 mm[1]	20–50 mm[1]	17–50 mm[1]	20–50 mm[1]	20–50 mm[1]	20–50 mm[1]	17–50 mm[1]	20–50 mm[1]	20–50 mm[1]	20–40 mm[1]	20–40 mm[1]	20–35 mm[1]
YEL 2-2F 	**SY .. WF** 20–60 mm 1 7/16–1 15/16 in.	20–60 mm[1]	20–50 mm[1]	**FY .. WF** 20–60 mm 1–2 7/16 in.	20–50 mm[1]	20–55 mm[1]	20–60 mm[1]	**FYTB .. WF** 20–50 mm	20–50 mm[1]	20–60 mm[1]	20–40 mm[1]	20–40 mm[1]	20–35 mm[1]
YEL 2-2RF/ VL065 	20–40 mm[1]	20–40 mm[1]	20–40 mm[1]	20–40 mm[1]	20–40 mm[1]	20–40 mm[1]	20–40 mm[1]	20–40 mm[1]	20–40 mm[1]	20–40 mm[1]	20–40 mm[1]	20–40 mm[1]	20–35 mm[1]
YET 2 	**SY .. FM** 15–60 mm 3/4–1 1/2 in.[1]	20–60 mm[1] 3/4–1 1/2 in.[1]	**SYF .. FM** 20–50 mm 3/4–1 1/2 in.[1]	**FY .. FM** 15–60 mm 3/4–2 3/16 in.[1]	20–60 mm[1] 3/4–1 1/2 in.[1]	**TU .. FM** 20–55 mm 3/4–1 1/2 in.[1]	20–60 mm[1] 3/4–1 1/2 in.[1]	**FYTB .. FM** 15–50 mm 3/4–1 1/2 in.[1]	20–50 mm[1] 3/4–1 1/2 in.[1]	20–40 mm[1] 3/4–1 1/2 in.[1]	20–40 mm[1]	20–40 mm[1] 3/4–1 1/2 in.[1]	20–35 mm[1] 3/4–1 7/16 in.[1]
YSA 2-2FK on adapter sleeve 	20–60 mm[1] 3/4–2 3/8 in.[1]	**SYJ .. KF** 20–60 mm 3/4–2 3/8 in.[1]	20–45 mm[1] 3/4–1 3/4 in.[1]	20–60 mm[1] 3/4–2 3/8 in.[1]	**FYJ .. KF** 20–60 mm 3/4–2 3/8 in.[1]	20–50 mm[1] 3/4–2 in.[1]	20–55 mm[1] 3/4–2 1/8 in.[1]	20–45 mm[1] 3/4–1 3/4 in.[1]	**FYTJ .. KF** 20–45 mm 3/4–1 3/4 in.	20–60 mm[1] 3/4–2 3/8 in.[1]	20–35 mm[1] 3/4–1 1/4 in.[1]	20–35 mm[1] 3/4–1 1/4 in.[1]	20–30 mm[1] 3/4–1 3/16 in.[1]
17262(00) 	17–60 mm[1]	20–60 mm[1]	20–50 mm[1]	17–60 mm[1]	20–60 mm[1]	20–55 mm[1]	20–60 mm[1]	17–50 mm[1]	20–50 mm[1]	20–60 mm[1]	20–40 mm[1]	20–40 mm[1]	20–35 mm[1]

[1] Parts must be ordered separately. For parts written in bold, SKF can provide complete unit (housing mounted with insert bearing)

Standard ball bearing units

	Pressed steel housings			
	 P 40 – P 85	 PF 40 – 90	 PFD 40 – 80	 PFT 40 – 80
YAR 2-2F 	12–45 mm[1)] 1/2–1 3/4 in.[1)]	12–50 mm[1)] 3/4–1 3/4 in.[1)]	12–40 mm[1)] 3/4–1 1/2 in.[1)]	12–40 mm[1)] 3/4–1 1/2 in.[1)]
YAR 2-2RF 	12–45 mm[1)] 3/4–1 3/4 in.[1)]	20–35 mm[1)] 3/4–1 3/4 in.[1)]	20–40 mm[1)] 3/4–1 1/2 in.[1)]	20–40 mm[1)] 3/4–1 1/2 in.[1)]
YAR 2-2RF/HV 	20–40 mm[1)] 3/4–1 1/2 in.[1)]	20–40 mm[1)] 3/4–1 1/2 in.[1)]	20–40 mm[1)] 3/4–1 1/2 in.[1)]	20–40 mm[1)] 3/4–1 1/2 in.[1)]
YAR 2-2RF/ VE495 	20–40 mm[1)]	20–40 mm[1)]	20–40 mm[1)]	20–40 mm[1)]
YAT 2 	17–45 mm[1)] 5/8–1 3/4 in.[1)]	17–50 mm[1)] 5/8–1 15/16 in.[1)]	17–40 mm[1)] 5/8–1 1/2 in.[1)]	17–40 mm[1)] 5/8–1 1/2 in.[1)]
YEL 2-2F 	12–45 mm[1)] 1/2–1 3/4 in.[1)]	20–50 mm[1)] 1/2–1 15/16 in.[1)]	20–40 mm[1)] 1/2–1 1/2 in.[1)]	20–40 mm[1)] 1/2–1 1/2 in.[1)]
YEL 2-2RF/ VL065 	20–40 mm[1)]	20–40 mm[1)]	20–40 mm[1)]	20–40 mm[1)]
YET 2 	15–45 mm[1)] 1/2–1 3/4 in.[1)]	15–50 mm[1)] 3/4–1 3/4 in.[1)]	15–40 mm[1)] 3/4–1 1/2 in.[1)]	15–40 mm[1)] 3/4–1 1/2 in.[1)]
YSA 2-2FK on adapter sleeve 	20–40 mm[1)] 3/4–1 3/4 in.[1)]	20–45 mm[1)] 3/4–1 3/4 in.[1)]	20–35 mm[1)] 3/4–1 1/4 in.[1)]	20–35 mm[1)] 3/4–1 3/4 in.[1)]
17262(00) 	17–45 mm[1)]	17–50 mm[1)]	17–40 mm[1)]	17–40 mm[1)]

[1)] Parts must be ordered separately. For parts written in bold, SKF can provide complete unit (housing mounted with insert bearing)

Notes

Notes

Chapter 2

SKF insert bearings and ball bearing units for agricultural applications

SKF insert bearings and ball bearing units for agricultural applications

Sizes available and designations:

SKF ball bearing units for agricultural applications

				Bearings										
				YEL 2 -2F	YEL 2-2RF/VL065	YELAG 2	YET 2	YAR 2-2F	YAR 2 -2RF	YARAG 2	YSPAG 2	YSP 2 SB -2F	YSA 2-2FK
Housings	Cast iron		SY	**SY.. WF** 20–60 mm 1 7/16–1 15/16 in.		SY.. WDW 20–50 mm 1–1 15/16 in.	**SY.. FM** 15–60 mm	**SY.. TF** 12–65 mm 1/2–2 15/16 in.	**SY.. TR** 20–60 mm	SY.. TDW 20–50 mm 1–1 15/16 in.	SY .. LDW 25–50 mm 1–1 15/16 in.	**SY .. LF** 25–60 mm 1–2 11/16 in.	
			SYJ					**SYJ.. TF** 20–100 mm 3/4–2 1/2 in.					**SYJ.. KF** 20–60 mm
			SYF				**SYF.. FM** 20–50 mm	**SYF.. TF** 20–50 mm					
			FY	**FY.. WF** 20–60 mm 1–2 7/16 in.		FY.. WDW 20–50 mm 1–1 15/16 in.	**FY.. FM** 15–60 mm	**FY.. TF** 12–65 mm 1/2–2 7/16 in.	**FY.. TR** 20–60 mm	FY.. TDW 20–50 mm 1–1 15/16 in.	FY .. LDW 25–50 mm 1–1 15/16 in.	**FY .. LF** 25–60 mm 1–2 11/16 in.	
			FYJ					**FYJ.. TF** 20–100 mm					**FYJ.. KF** 20–60 mm
			FYTB	**FYTB.. WF** 20–50 mm		FYTB.. WDW 20–50 mm 1–1 15/16 in.	**FYTB.. FM** 15–50 mm	**FYTB.. TF** 12–50 mm 3/4–1 3/4 in.	**FYTB.. TR** 20–50 mm	FYTB.. TDW 20–50 mm 1–1 15/16 in.	FYTB .. LDW 25–50 mm 1–1 15/16 in.	**FYTB .. LF** 25–60 mm 1–2 3/16 in.	
			FYTJ					**FYTJ.. TF** 20–50 mm 3/4 – 1 3/4 in.					**FYTJ.. KF** 20–45 mm 3/4–1 3/4 in.
			FYC					**FYC.. TF** 20–65 mm					
			TU				**TU.. FM** 20–55 mm	**TU.. TF** 20–55 mm 3/4–2 3/16 in.					
			TUJ					**TUJ.. TF** 20–60 mm					
	Composite		SYK					**SYK .. TF** 20–40 mm	**SYK .. TR** 20–40 mm				
			FYK		**FYK .. WR/VL065** 20–40 mm			**FYK .. TF** 20–40 mm	**FYK .. TR** 20–40 mm				
			FYTBK					**FYTBK .. TF** 20–35 mm	**FYTBK .. TR** 20–35 mm				

Note:
- pressed steel housings available as spare parts.
- where not indicated separate housings/bearings available on demand.

WF Insert bearing with an eccentric locking collar, YEL 2 series, -2F seals
WR Insert bearing with an eccentric locking collar, YEL 2 series, -2RF seals
WDW Insert bearing with an eccentric locking collar, YELAG 2 series, 5-lip seals
FM Insert bearing with an eccentric locking collar, YET 2 series, standard seals
TF Insert bearing with grub screws, YAR 2 series, -2F seals
TR Insert bearing with grub screws, YAR 2 series, -2RF seals
TDW Insert bearing with grub screws, YARAG 2 series, 5-lip seals
LF Insert bearing with SKF ConCentra locking, YSP 2 SB series, -2F seals
KF Insert bearing with a tapered bore, YSA 2K series, -2F seals
(1) VL065: zinc coated inner bore and side faces

To learn more about SKF agricultural insert bearings

- SKF agricultural insert bearings PUB 46/S7 10249/1 EN
- SKF ball bearings for agricultural applications PUB 46/P211655 EN
- Customer reference case PUB 46/S614057 EN
- Customer reference case PUB 46/P2 12139 EN
- Customer reference case PUB 46/S6 14492 EN
- www.skf.com

SKF insert bearings and ball bearing units for agricultural applications

SKF provides insert bearings with a wide variety of sealing systems: depending on the contamination level (→ table 1) and the rotational speed (→ table 2) it is possible to choose the ideal solution for each agriculture application and machine design.

Table 1

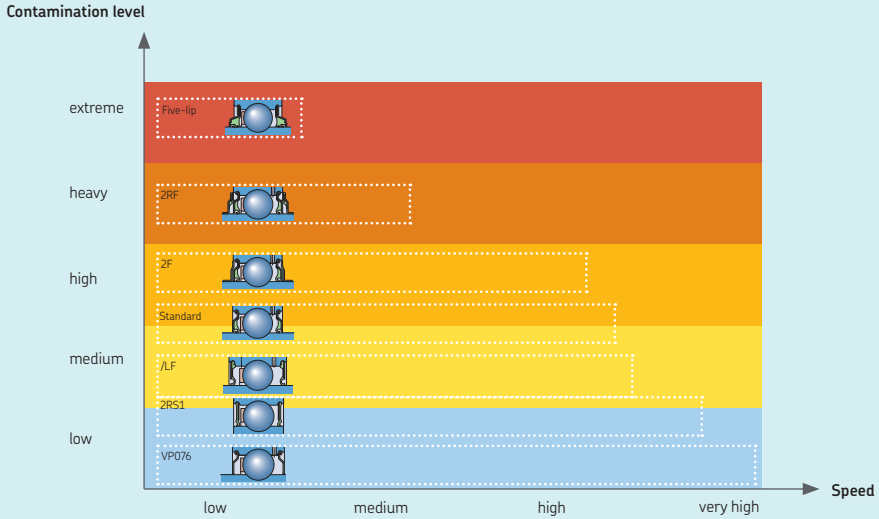
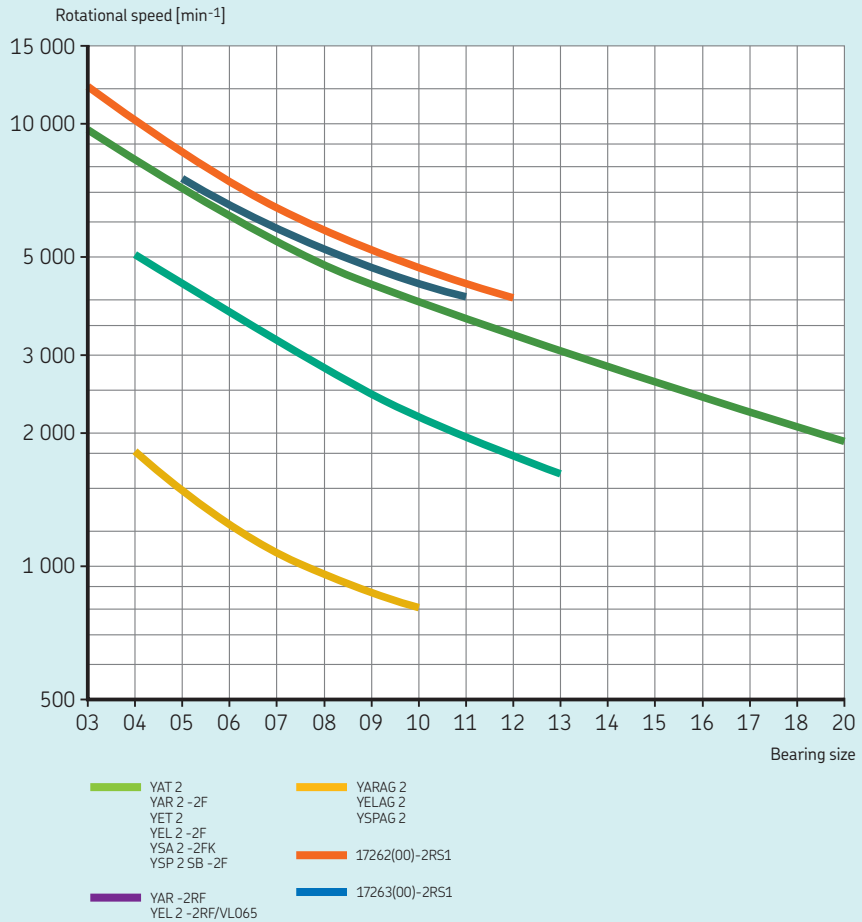
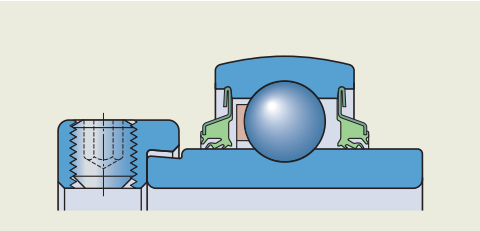


Table 2

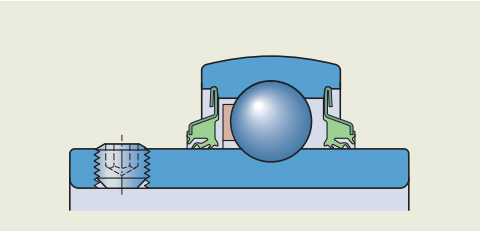


SKF insert bearings with five lip sealing system

Relubrication free insert bearings with high performance 5-lip seal are available in two standard variants:



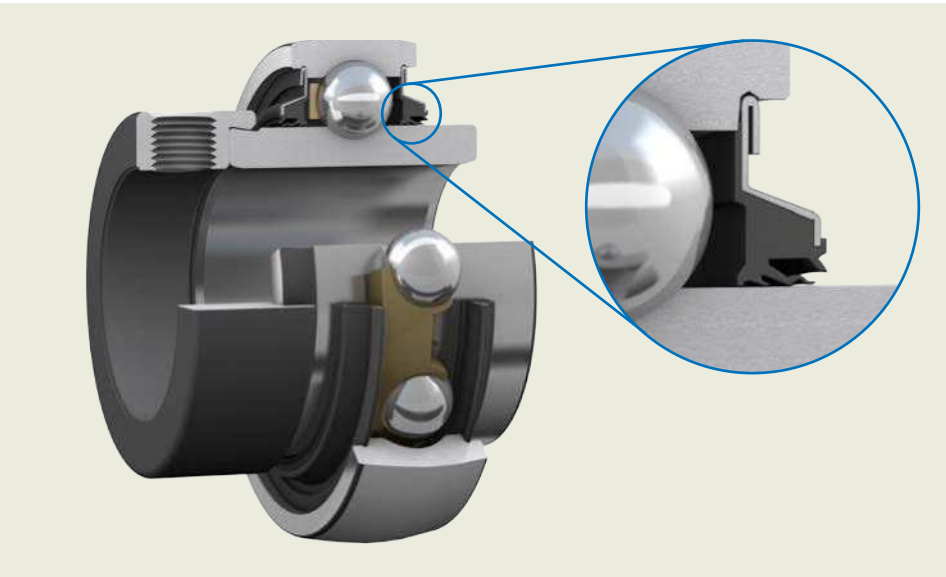
YELAG 2: insert bearings feature an eccentric locking collar and are intended for normal speed and load conditions with constant rotating direction.



YARAG 2: insert bearings feature a grub screw locking system and are intended for normal application conditions with constant and alternating rotation direction.

Sealing system

At the heart of YELAG 2 and YARAG 2 bearing range is a patented seal design that protects the bearing against contaminants in harsh environments while offering a sealed for life lubrication solution that is both cost saving and eco-friendly.



Benefits

OEMs

- Extend service life 30 to 50%*
- Differentiate designs
- Reduce warranty, engineering, testing and assembly costs

End users

- Increase farm productivity
- Reduce maintenance and ownership costs
- Reduce environmental impact

Applications

- Combines and combine headers
- Balers
- Harvesters
- Hay tools/conditioner mowers
- Tillage gang disc/disc harrows
- Rolling cultivators/grain drills

* All figures are rounded off and based on SKF testing against conventional bearings. Savings and results will vary in specific applications.

SKF insert bearings with five lip sealing system

Improve performance and farm productivity

- Dedicated solutions for agricultural applications
- Long and reliable component service life
- High performance sealing solutions – tested and well proven
- Built in reliability helps extend warranty periods
- Enhances your brand image on the market

Reduce management cost

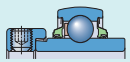
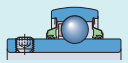
- Reduce warranty cases and associated costs
- Fewer service engineers in the field and call backs to distributors
- Wide, dedicated range reduces engineering and development time and costs
- Fewer suppliers for greater efficiency and cost-effectiveness

Reduce machine ownership cost

- Reduce replacement time and repair costs
- Plug and play unit with fewer components for quick and easy mounting
- Less unplanned downtime
- Increase farm productivity and profitability

Sizes available and designations

Insert bearings with five lip seal are available as spare bearings or as insert bearing units as shown in the table. They can be provided on request assembled with composite housings (designation SYK, FYK, FYTBK).

	Cast housings					
						
Insert bearings	**SY**	**FY**	**FYTB**	**SYK**	**FYK**	**FYTBK**
YELAG 2 	SY .. WDW 20–50 mm 1–1 15/16 in.	FY.. WDW 20–50 mm 1–1 15/16 in.	FYTB .. WDW 20–50 mm 1–1 15/16 in.	SYK.. WD 20–40 mm 1–1 15/16 in	SYK.. WD 20–40 mm 1–1 15/16 in	FYTBK.. WD 20–40 mm 1–1 15/16 in
YARAG 2 	SY.. TDW 20–50 mm 1–1 15/16 in.	FY..TDW 20–50 mm 1–1 15/16 in.	FYTB.. TDW 20–50 mm 1–1 15/16 in	SYK.. TD 20–40 mm 1–1 15/16 in	FYK.. TD 20–40 mm 1–1 15/16 in	FYTBK.. TD 20–40 mm 1–1 15/16 in

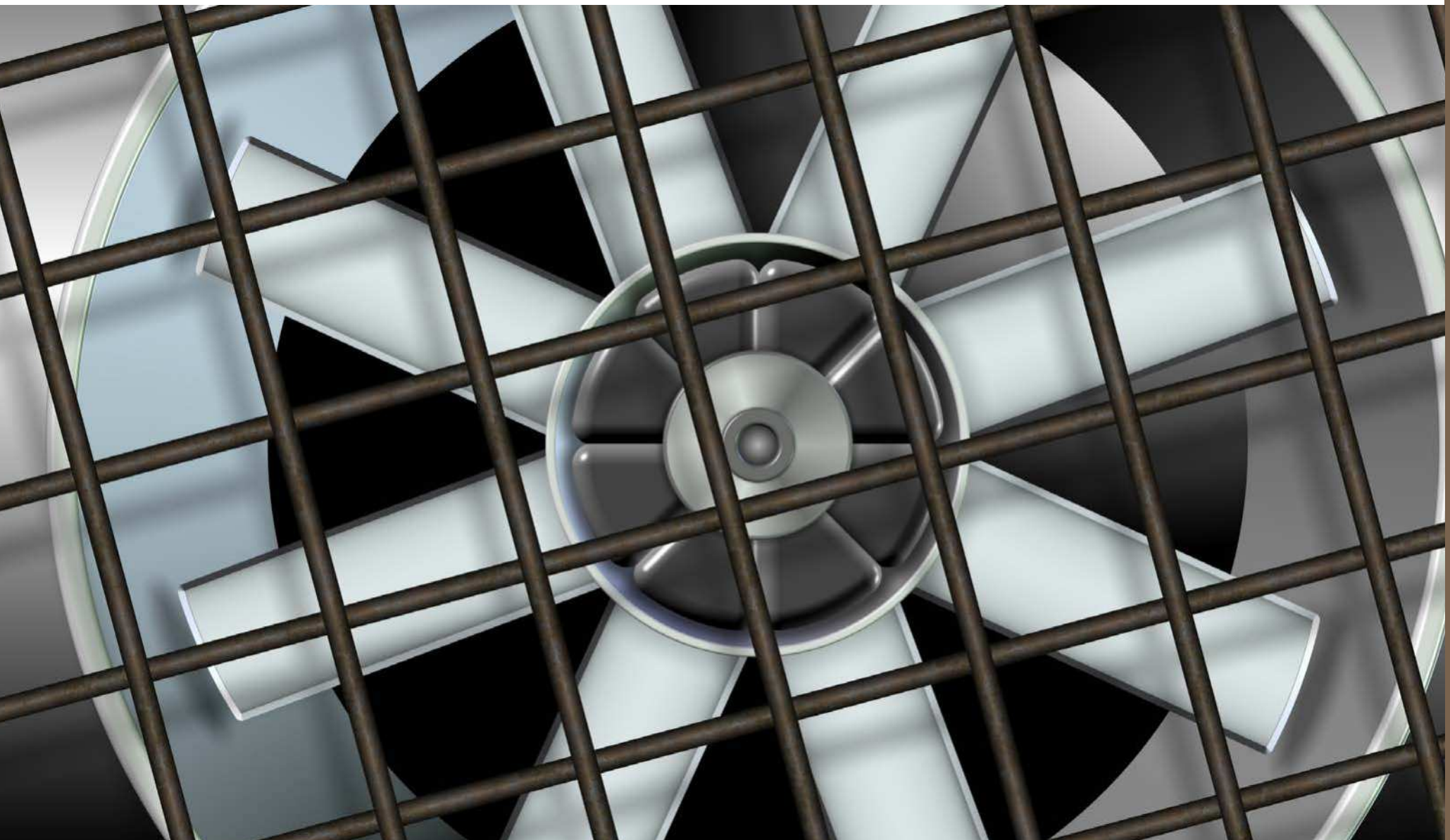
To learn more about the SKF agricultural insert bearings

- SKF agricultural insert bearings PUB 46/S7 10249/1 EN
- SKF ball bearings for agricultural applications PUB 46/P2 11655 EN
- Customer reference case PUB 46/S614057 EN
- Customer reference case PUB 46/P2 12139 EN
- Customer reference case PUB 46/S6 14492 EN
- www.skf.com

Notes

Chapter 3

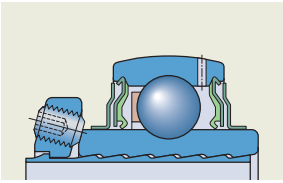
Insert bearings and ball bearing units for air handling applications



SKF ConCentra ball bearing units

Bearings

- Locking system: SKF ConCentra (YSP design)
- Cage material: polyammide
- Rings and balls material: standard steel
- Grease: VT307
- Sealing system: -2F



YSP xxx SB-2F Standard

Benefits

- Fast and easy to mount and dismount
- High speed capability
- Low vibration and noise
- Longer service life

Locking system

The patented SKF ConCentra locking technology is based on the expansion and contraction of two mating surfaces: the bearing bore (→ **Fig. 1**) and the external surface of the stepped sleeve (→ **Fig. 2**). Both surfaces have precision engineered serrations. When the grub screws in the mounting collar are tightened, the inner ring is displaced axially, relative to the stepped sleeve. This forces the bearing inner ring to expand and the stepped sleeve to contract evenly, providing a true concentric fit on the shaft. SKF ConCentra insert bearings provide an easy, quick and reliable way to lock a bearing onto a shaft.

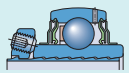
Fig. 1

Fig. 2

Sizes available and designations

SKF ConCentra ball bearing units are available with cast iron plummer (pillow) block or flanged housings in:

- the SY 5(00) M, FY 5(00) M, FYTB 5(00) M series for metric shafts:

	 SY	 FY	 FYTB
YSP xxx SB-2F 	**SY .. LF** 25–60 mm	**FY .. LF** 25–60 mm	**FYTB .. LF** 25–50 mm

For parts written in bold, SKF can provide complete unit (housing mounted with insert bearing)

To learn more about SKF ConCentra ball bearing units

- SKF ConCentra ball bearings and units PUB BU/P2 12227 EN
- www.skf.com

Low friction insert bearing

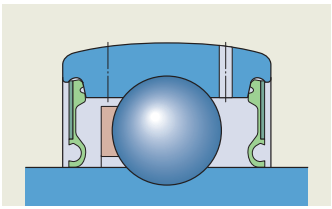
Bearings

- Rings and balls material: standard steel
- Cage material: polyammide
- Sealing system: low friction seal
- Grease: low friction grease SKF GE2
- Designation: suffix “/LF”

Sealing system

The seal is fitted in a recess in the bearing outer ring and seals against the inner ring land. The seal is made from acrylonitrile-butadiene rubber and reinforced with a sheet steel insert.

The seal lip, which has a thin and flexible design, minimizes the frictional moment, while effectively protecting the bearing from contaminants. The sheet steel insert protects against solid contaminants.



Features

- At least 50% lower friction compared with standard insert bearings
- Low-friction seals
- Long life, low-friction grease
- Lightweight, relubrication-free units
- Ready-to-mount units

Benefits

- Reduced energy use
- Reduced grease consumption
- Reduced environmental impact
- Longer service life
- Reduced maintenance
- Easy mounting

Availability

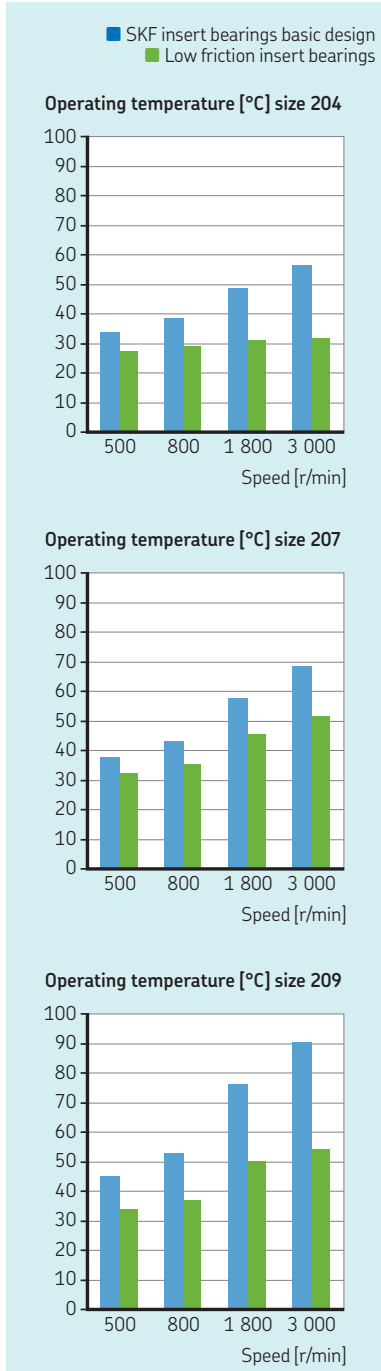
Insert bearings:

YET design: size 204-208

Other designs available on request.

Ball bearing units:

Ball bearing units with composite housings or grey cast iron housings are available on request



Notes

Chapter 4

SKF Food Line ball bearing units

SKF Food Line insert bearings and ball bearing units

SKF Food Line ball bearing unit designs help to eliminate the washdown related problems of corrosion, premature bearing failure and environmental impact.

SKF Food Line insert bearings

- Locking system: grub screws (YAR design)
- Rings and balls material:
  - stainless steel AISI grade 420 **(HV suffix)**
  - zinc coated high grade carbon chromium **(VE495 suffix)**
- Cage material: polyamide
- Grease: GFJ food-grade grease registered by a category H1 (lubricant acceptable with incidental food contact for use in and around food processing areas)
- Sealing system: -2RF seal FDA compliant

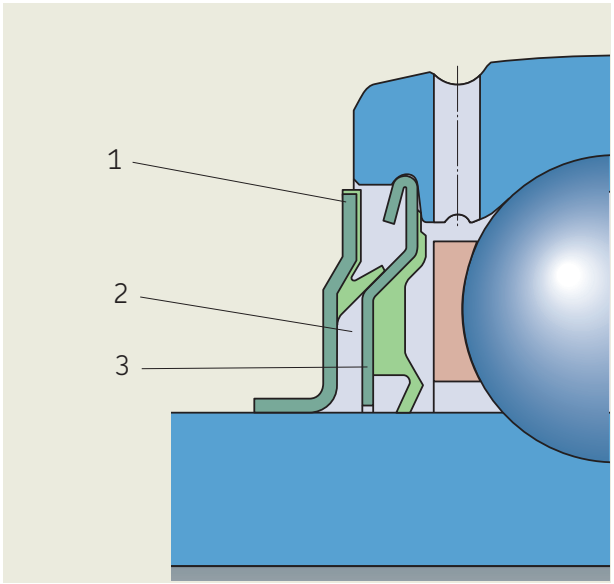
Sealing system

SKF multiple seal consists of a combination of a radial and an axial lip seal each protected by narrow gap seals:

1 A stainless steel flinger adds mechanical and centrifugal protection against solid and liquid contaminants entering the bearing cavity

2 The space between the axial and radial lip seals is filled with SKF GFJ food-grade grease to provide additional protection.

3 Lubricant retention and a further barrier to contamination is provided by the inner radial seal .



SKF Food Line ball bearing units

Food and Beverage insert bearings are available also as ball bearing units assembled with:

- Composite housings (SYWK, SYFWK, FYWK, FYTWK, FYAWK, TUWK)

- Stainless steel housings (SYWR, FYWR, SYFWR, FYTWR)

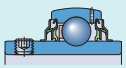
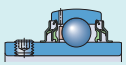
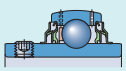
SKF Food Line insert bearings and ball bearing units

Benefits

- Increased productivity by eliminating relubrication downtime
- Improved foreign body prevention – no dripping grease or purge contamination
- Reduced grease use and environmental impact
- Elimination of the risk that a missed relubrication point might cause a subsequent bearing failure
- Corrosion-resistant under virtually all washdown conditions
- Improved bacteria elimination due to solid or filled base design and smooth surface finish
- Wide dimensional range (plus availability in metric and inch sizes)

Sizes available and designations

SKF Food Line ball bearing units are available in the combinations shown in the table below:

	SYWK 	**SYFWK** 	**FYWK** 	**FYTWK** 	**FYAWK** 	**TUWK** 	**SYWR** 	**FYWR** 	**FYTWR** 	**SYFWR** 
YAR-2RF/HV 	**SYWK...YTH** 20–40 mm 3/4–1 1/2 in.*		**FYWK...YTH** 20–40 mm 3/4–1 1/2 in.*	**FYTWK...YTH** 20–35 mm 3/4–1 7/16 in.*						
YAR 2-2RFGR/HV 	**SYWK...LTHR** 50 mm 1 15/16 in.	**SYFWK...LTHR** 20–40, 50 mm 3/4–1 1/2, 1 15/16 in.	**FYWK...LTHR** 50 mm 1 15/16 in.*	**FYTWK...LTHR** 40,50 mm 1 1/2, 1 15/16 in.*	**FYAWK...LTHR** 20-40,50 mm 3/4–1 1/2, 1 15/16 in.	**TUWK...LTHR** 20-40,50 mm 3/4–1 1/2, 1 15/16 in.	**SYWR...YTHR** 20–40 mm 3/4–1 1/2 in.	**FYWR...YTHR** 20–40 mm 3/4–1 1/2 in.	**FYTWR...YTHR** 20–40 mm 3/4–1 1/2 in.	**SYFWR...YTHR** 20–40 mm 3/4–1 1/2 in.
YAR-2RF/VE495 	**SYWK...YTA** 20–40 mm 3/4–1 1/2 in.* **SYWK...LTA** 50 mm 1 15/16 in.	**SYFWK...LTA** 20–40, 50 mm 3/4–1 1/2, 1 15/16 in.	**FYWK...YTA** 20–40 mm 3/4–1 1/2 in **FYWK...LTA** 50 mm 1 15/16 in.	**FYTWK...YTA** 20–35 mm 3/4–1 7/16 in.* **FYTWK...LTA** 40,50 mm 1 1/2, 1 15/16 in.	**FYAWK...LTA** 20-40,50 mm 3/4–1 1/2, 1 15/16 in.	**TUWK...LTA** 20-40,50 mm 3/4–1 1/2, 1 15/16 in.				

**only for size 1.1/4 the suffix A, added to the designation before Y or L, identifies a unit assembled with a bearing and housing 1 size smaller than normal. Examples:*

- *SYWK1.1/4 AYTH*
- *SYFWK 1.1/4 ALTA*

For parts written in bold, SKF can provide complete unit (housing mounted with insert bearing)

To learn more about SKF Food Line ball bearing units

- SKF Food Line ball bearing units catalogue (PUB BU/P1 10844/4 EN)
- www.skf.com

Notes

Chapter 5

SKF product designations

SKF insert bearings designation system overview

YSP

Bearing series:

- **YAR:** inner ring extended on both sides, with grub screws (*)
- **YAT:** inner ring extended on one side, with grub screws
- **YEL:** inner ring extended on both sides, with an eccentric locking collar (*)
- **YET:** inner ring extended on one side, with an eccentric locking collar
- **YSP:** SKF ConCentra ball bearing
- **YSA:** inner ring simmetrically extended on both side with an adapter sleeve
- **(*) AG suffix (YARAG and YELAG):** five lip seal on both sides of the bearing (and black oxide locking collar when present)

2

Dimension series:

- **2:** bearing to ISO 9628:2006
- **17262:** bearing to ISO 15:1998, Dimension series 2, sphered outside diameter
- **17263:** bearing to ISO 15:1998. Dimension series 3, spherred outside diameter

05-100

Bore size:

Bearings for metric shafts

03/12	12 mm bore diameter
03/15	15 mm bore diameter
03	17 mm bore diameter
04	20 mm bore diameter
to	
20	100 mm bore diameter

Bearings for inch shafts

Three-figure combination that follows the designation of the basic metric bearing and is separated from this by a hyphen; the first figure is the number of whole inches and the second and third figures are the number of sixteenths of an inch, e.g. 204-012

- 012 = 3/4 in. = 19.050 mm bore diameter
- 100 = 1 in. = 25.400 mm bore diameter

to

- 208 = 2 1/2 in. = 63.500 mm bore diameter

SB - 2F / HV

Identification of execution:

(valid only for YSP):

SB: SKF ConCentra ball bearing

Seals:

- **No suffix:** contact standard integral seal on both sides of the bearing
- **2F:** Contact standard integral seal with an additional plain flinger on both sides of the bearing
- **2RF**: Contact standard integral seal with an additional rubberized flinger on both sides of the bearing
- **2RS1**: Contact seal of synthetic rubber with sheet steel reinforcement on both sides of the bearing

Other features

- **C:** Cylindrical outside diameter
- **G:** Lubrication groove in the outside diameter, located at the side opposite the locking device
- **GR:** Lubrication groove in the outside diameter, located at the side of the locking device
- **K:** Tapered bore, taper 1:12
- **U:** Bearing without locking system
- **W:** Bearing without lubrication hole(s)

Material:

- **HV:** Bearing components of stainless steel and food-grade grease
- **VE495:** Zinc-coated inner and outer ring, stainless steel sealing system and grub screws, food-grade grease
- **VL065:** Zinc-coated inner ring bore and side rubber faces
- **VL244**: Zinc coated inner ring, outer ring and locking system
- **VP076:** Pressed sheet steel shield on both sides of the bearing

Other features

- **AH:** Anti-rotation PIN
- **VT357:** Bearing filled with a special grease
- **W64:** Solid Oil fill
- **LF:** Bearing with low friction seals and low friction grease

The above designation is an example for training purposes. It is not an actual bearing designation. Examples of existing designations are:

- YAR 206-103 2RF/HV
- YET 204
- YSP 205 SB 2F

SKF ball bearing units designation system overview

FY T W K 30 Y TH

Identification of housing type:

- **FY**(J): Flanged housing
- **SY**(J): Plummer block housing
- **TU**(J): Take-up housing
- **J:** stands for dimensions to standard JIS 1559-1995
- **P:** Plummer block housing, pressed steel
- **PF:** Flanged housing, pressed steel

Identification of unit design:

- **No suffix:** Base version; when flanged: square flange
- **C:** Flanged unit, round flange
- **D:** Flanged unit, triangular flange
- **F:** Plummer block unit, short base
- **TB:** Flanged unit, oval flange

Identification of SKF Food line

- **W:** SKF Food line insert housing and ball bearing units

Identification of housing material:

- **No suffix:** Grey cast iron
- **K:** Composite
- **R:** Stainless steel

Identification of size:

Bearing units for metric shafts: in millimetres uncoded

12: 12 mm bore diameter

to

100: 100 mm bore diameter

Bearing units for inch shafts: in inches uncoded

$^{3}/_{4}$: $^{3}/_{4}$ in. = 19.05 mm bore diameter

to

$2\,^{1}/_{2}$: $2\,^{1}/_{2}$ in. = 63.5 mm bore diameter

Additional housing features (Food Line only):

- **A:** units of the next smaller size than normal
- **L:** Suitable for ECL cover
- **N:** (in combination with suffix VZ1A2 at the end of the designation) SKF food line ball bearing unit with composite housing with relub. feature
- **Y:** suitable for ECW cover
- **Z:** SYF short base units with inch thread (only for ball bearing units with stainless steel housings)

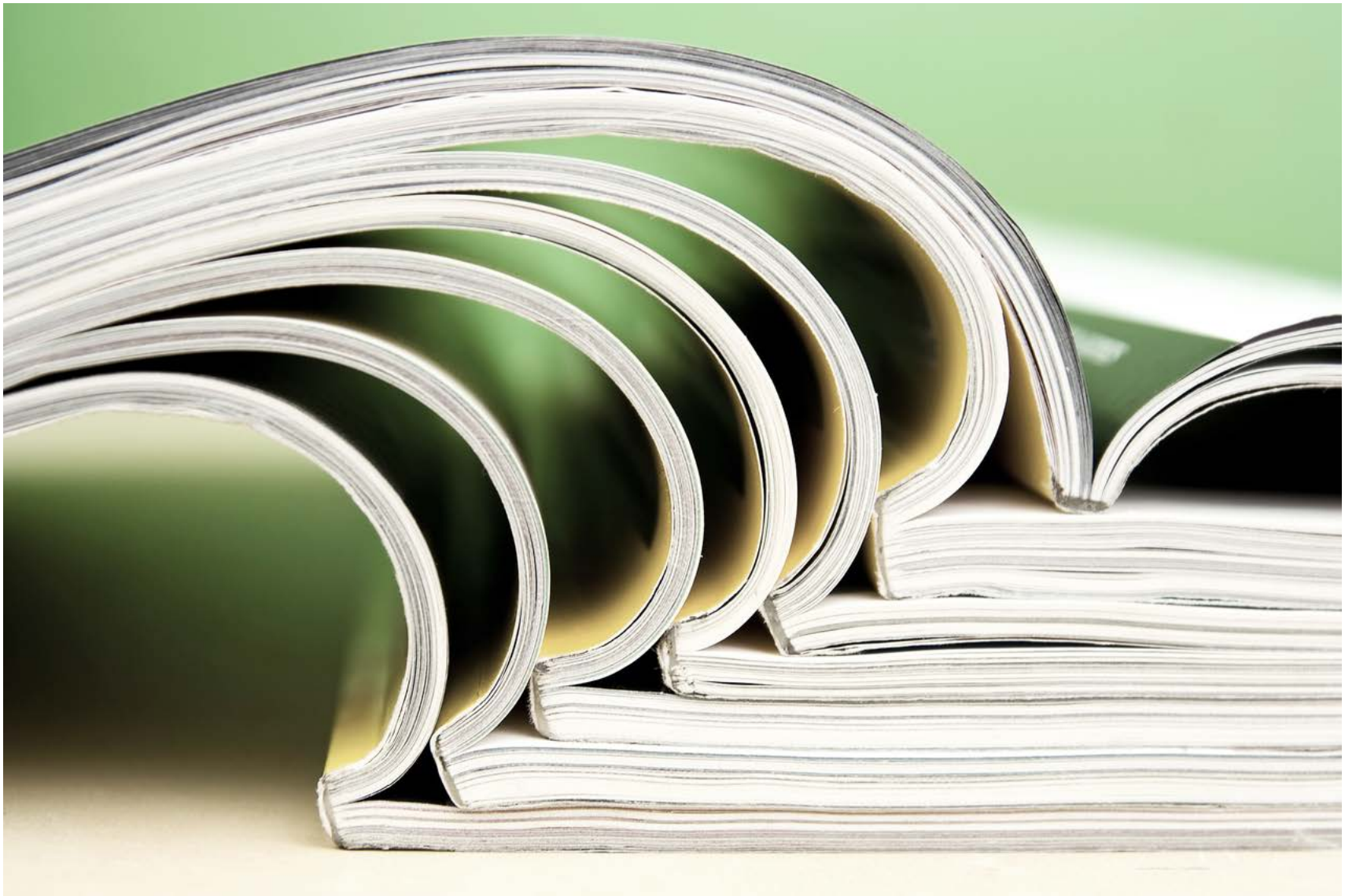
Identification of bearings:

- **FM:** insert bearing with an eccentric locking collar, YET 2 series
- **KF:** insert bearing with a tapered bore, YSA 2-2FK series
- **LF:** insert bearing with SKF ConCentra locking
- **RM:** insert bearing with grub screws, YAT 2 series
- **TF:** insert bearing with grub screws, YAR 2-2F series
- **TR:** insert bearing with grub screws, YAR 2-2RF series
- **WF:** insert bearing with an eccentric locking collar, YEL 2-2F series
- **TA:** SKF Food line insert bearing with grub screws YAR 2-2RF/VE495
- **TAG:** SKF Food line insert bearing with grub screws YAR 2-2RF/VE495, lubrication groove and one hole in the outside diameter of the outer ring, located on the side opposite the locking device.
- **TH:** SKF Food line insert bearing with grub screws YAR 2-2RF/HV, lubrication groove and one hole in the outside diameter of the outer ring, located on the side opposite the locking device
- **THR:** SKF Food line insert bearing with grub screws YAR 2-2RF/HV, lubrication groove and one hole in the outside diameter of the outer ring, located on the same side as the locking device
- **TDW:** insert bearing with grub screws and five-lip seals, YARAG 2 series
- **WDW:** insert bearing with eccentric locking collar and five-lip seals, YELAG 2 series

Notes

Chapter 6

Additional information



Vocabulary

Heat treatment

Gives the steel properties, e.g., hardness and temperature stabilization.

Grinding operation

Accurate machining of hardened rings and rolling elements to required finished dimensions.

Honing

Finishes and polishes the raceway surfaces to required surface roughness.

Assembly process

Assembly of the component parts to make up a finished bearing (matching of rings, rolling elements plus cages, lubricant, seals or shields as required).

Internal clearance

Total distance through which one bearing ring can be moved relative to the other in the radial direction (radial internal clearance) or in the axial direction (axial internal clearance).

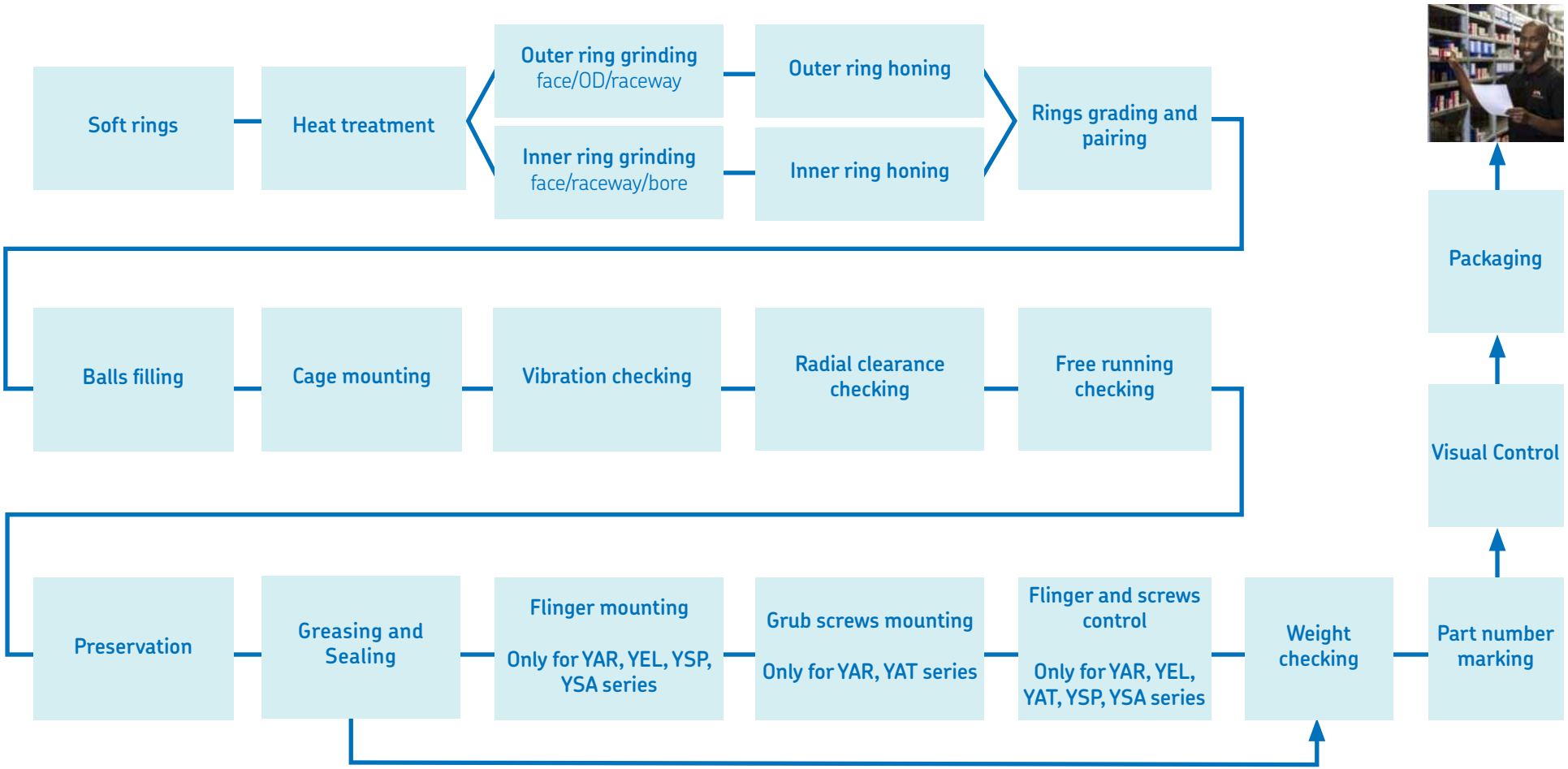
Clearance checking

Internal clearance is measured to confirm that it is within specification.

Vibration checking

Vibration levels are checked to verify the bearing quality and its quiet running.

Insert bearings manufacturing process



Bearing storage

Storage conditions

To maximize the service life of bearings, SKF recommends the following basic housekeeping practices:

- Keep bearings in their original unopened packages until immediately prior to mounting to prevent the ingress of contaminants and corrosion.
- Store bearings in a vibration-free, dry area with a cool, steady temperature.

Inventory control

Inventory control can also play an important role in performance, particularly if seals and lubricants are involved. Therefore, SKF recommends a “first in, first out” inventory policy.

Bearing storage

Shelf life of open bearings

SKF bearings are coated with a rust-inhibiting compound and suitably packaged before distribution. For open bearings, the preservative provides protection against corrosion for approximately five years, provided the storage conditions are appropriate.

Shelf life of capped bearings

The maximum storage interval for capped SKF bearings is dictated by the lubricant inside the bearings. Lubricant deteriorates over time as a result of ageing, condensation, and separation of the oil and thickener. Therefore, capped bearings should not be stored for more than three years.

skf.com

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