NTN

HANDBOOK

Our industrial products
and services at a glance



NTN | SNR | Brands of **NTN corporation**

SNR - Deep groove ball bearings

The simply smart brand

NTN proposes the SNR simply smart range of deep groove ball bearings. It is a compact range that contains the indispensable sizes and offers standard sealing options with premium brand quality.

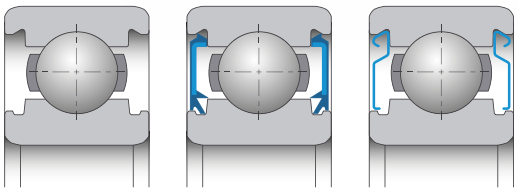


Technical features

- Normal internal clearance and C3
- **SNR** deep groove ball bearings are designed with a steel cage as standard - options on request
- Sealed versions are already greased. The maximum operating temperature is +120°C
- Suitable solutions for almost all applications

Range overview

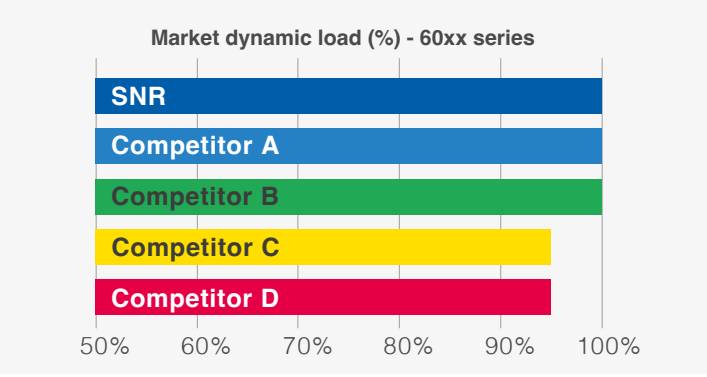
Series	60X	62X	63X	60XX	62XX	63XX
Dim.	607	623	634	6000	6200	6300
	~ 609	~ 629	~ 635	~ 6028	~ 6226	~ 6322
INTERNAL CLEARANCE: normal, C3						
OPEN / SHIELDED –ZZ / SEALED –EE						



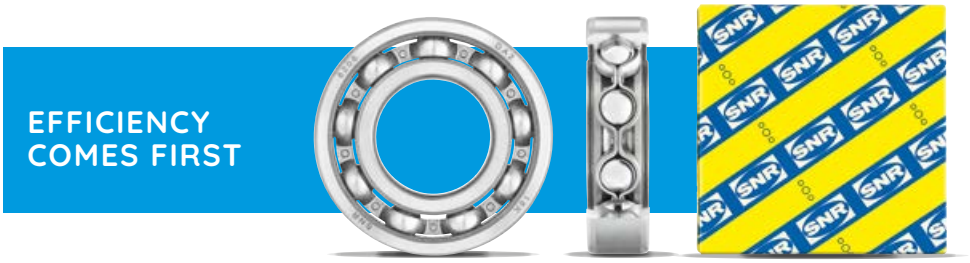
Open | Contact seals („-EE“) | Steel shields („-ZZ“)

More info about prefix, suffix and Interchange table
Check from page 42

A range with continuous technical improvement to meet the needs of your application



Study carried out in 2022, based on the main European market player catalogues



Double-row deep groove ball bearings

Double row deep groove ball bearings are designed to accept higher loads than a single row ball bearing.

They have identical outside diameters and bores but are slightly wider, thus having a much higher load capacity.

Technical features

- Polyamide cage as standard (no suffix)
- Without filling slot (suffix A)
- Normal internal clearance
- Open type

Range overview

	Bore diameter code										
Serie	00	01	02	03	04	05	06	07	08	09	10
42xxA											





Easy to work

Premium quality

Competitiveness booster

EMTR
Focus on our ball bearing range dedicated to electric motors

- Deep groove ball bearings of series 6000, 6200 and 6300
- For applications with specific temperatures or speed requirements

Are you looking for higher reliability and quality, with the lowest noise level, without compromising on price?
The new EMTR bearing range with optimised design for electric motors brings you the solution.



Technical features

- C3 internal clearance
- Special low noise grease
  - Up to 150°C usage: no suffix in the designation
  - High temperature usage (up to 200°C): D189 suffix
- Precision Class P6 (ISO 492) and improved grade for balls (G10) with special vibration check
- Benefit:
  - Raceway roughness: improved by 25%*
  - Raceway roundness: improved by 20%*

  * Compared to **SNR**'s standard tolerance

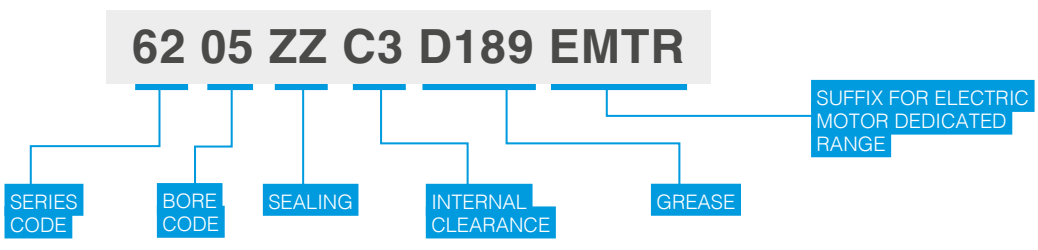
Benefits



Range overview

6201 >> 6206 + 6304

Designations

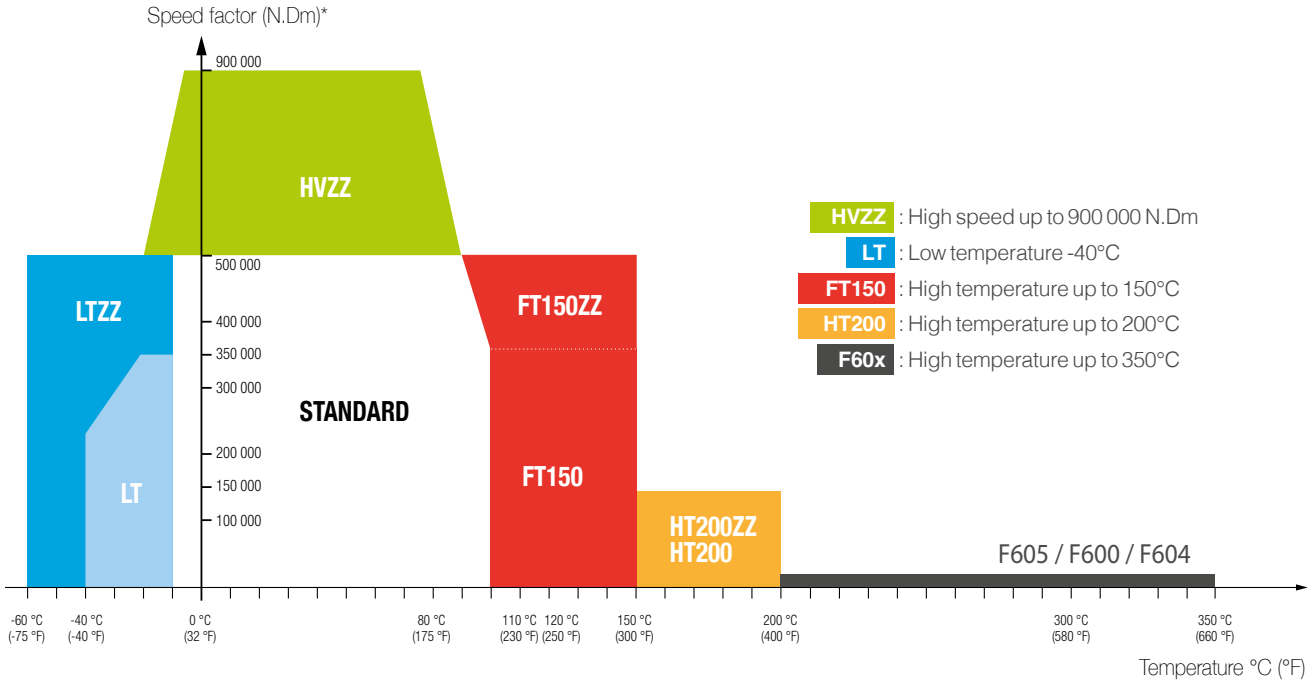


TOPLINE

The unique range of ball bearings dedicated to extreme applications.

Deep groove ball bearings of series 6000, 6200 and 6300.

For applications with specific temperatures or speed requirements.



- High availability to solve problems quickly
- A unique product range from a premium brand
- A ready to use range for specific applications
- Wide selection of bore diameters for the 6000, 6200 and 6300 series
- Technically optimised products: cage, internal clearance, lubricant and seals
- The technical support from our teams

"A bearing for each specific use"



* N.Dm is a speed factor where N is the speed of rotation in rpm and Dm is the average diameter of the bearing (d + D)/2







TOPLINE

The unique range of ball bearings dedicated to extreme applications



Products	Cage	Internal clearance	Grease	Sealing	Other	Temperature range
HVZZ	Glass fibre reinforced polyamide 6.6	C3	Superior quality. Lithium thickener + synthetic base oil	Steel shields	Precision P6, P5. High-precision balls (<= Class 10)	-20°C to +120°C
LT LTZZ	Steel	C3	Suited to low temperatures. Lithium thickener + synthetic base oil	Nitrile rubber seals (NBR) or steel shields	-	LT: -40°C to +100°C LTZZ: -60°C to +120°C
FT150 FT150ZZ	Steel	C3	Adapted to high temperatures. Polyurea thickener + synthetic base oil	Fluoroelastomer seals (FKM) or steel shields	-	-30°C to +150°C
HT200 HT200ZZ	Steel	C4	Adapted to high temperatures. PTFE solid lubricant and PFPE oil	Fluoroelastomer seals (FKM) or steel shields	Specific heat treatment	-40°C to +200°C
F605	Steel	Multiple of C5*	**	-	Brand is stamped	Temperature range between +200°C and +350°C (continuous or cyclic)
F600	Steel	Multiple of C5*		-	Specific surface treatment (phosphatisation + MoS2 deposition)*** Brand is stamped	
F604	Steel	Multiple of C5*	Suitable for very high temperatures. Polyalkylene glycol base oil + solid additive	Steel shields		



* Significantly increased internal clearance to offset the material's expansion effects.

** In case of F600 and F605, if additional lubrication is required, an appropriate amount of grease may be introduced into the bearing. Contact **NTN** for more information.

*** Surface treatment for greater oxidisation resistance and improved lubrication. Caution: F600 and F604 products must be used with care in damp environments, since MoS2 may react with water to produce sulphuric acid.



SNR - High precision bearings

Machline is a complete line of precision bearings. It combines high rotation speed and increased load capacity to meet the ever-increasing requirements of your machines.

The ML and CH ranges have been specially designed to withstand very high rotation speeds.

The sealed MLE range has lifetime lubrication and thus eliminates periodic greasing.

All Machline spindle bearings are produced to the P4S precision specification, which incorporates ISO 4 (ABEC 7) dimensional tolerances and ISO 2 (ABEC 9) dynamic tolerances.

Offer

- Machline high precision: standard
- Machline ML: high Speed
- Machline MLE: sealed
- Machline CH: hybrid (available in all ranges)

All Machline bearings are available in the universal version (U), as a universal bearing set (DU, TU) and a matched bearing set (DB, DF, DT…).



machline

Designations

ML E CH 719 12 C V U J 7 4S *

ML HIGH SPEED BEARING SERIES

E SEALED BEARING

CH HYBRID BEARING

SERIES
719 (ISO 19)
70 (ISO 10)
72 (ISO 02)

BORE

Code	Dimensions
00	10 mm
01	12 mm
02	15 mm
03	17 mm
04 x 5	20 mm
05 x 5	25 mm
… x 5	etc…

CONTACT ANGLE

Code	Stand.	ML
C	15°	17°
H	25°	25°

V HIGH PRECISION BEARING
Series 719-70
Phenolic laminated cage centered on the outer ring

G1 HIGH LOAD CAPACITY BEARING
Serie 72
Phenolic laminated cage centered on the outer ring

Preceding preload and precision suffix

ASSEMBLY CODE
Universal bearings and universal bearing sets
U: Single universal bearing
DU: Duplex universal bearing
TU: Triplex universal bearing
QU: Quadruplex universal bearing
DB: O – Arrangement < >
DF: X – Arrangement > <
DT: Tandem arrangement >>

PRECISION

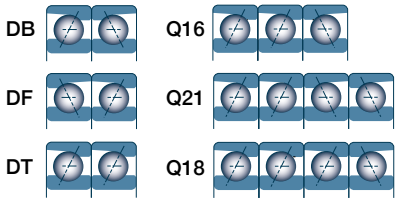
Code	Precision
4	P4S for standard
4S	P4S for ML and MLE
2	ISO 2 (ABEC 9)

PRELOAD

Code	Denomination
7	Light
8	Medium
9	High
X	Special
0	Not defined

SPECIFICITIES
Example
D = greased bearing

Universal bearing sets
Same contact angle



NTN | SNR | Brands of NTN corporation

Interchange table

	TYPE OF BEARING	TECHNICAL SPECIFICATION	NTN	SNR	FAG	SKF	NSK
DEEP GROOVE BALL BEARINGS	600 6700 6800 (61800) 6900 (61900) 6000 / 6200 6300 / 6400 16000 / 16100	1 or 2 pressed steel shields	Z / ZZ	Z / ZZ	Z / 2Z	Z / 2Z	Z / ZZ
		1 or 2 contact seals	LU / LLU	E / EE	HRS / 2HRS	RS1 / 2RS1	DU / DDU
		1 or 2 non contact seals	LB / LLB	-	RSR / 2RSR BRS / 2BRS	RZ / 2RZ	V / VV
		Groove without/with retaining ring	N / NR	N / NR	N / NR	N / NR	N / NR
		Internal clearance (if diff. from normal radial clearance)	C2 / C3 etc.	C2 / C3 etc.	C2 / C3 etc.	C2 / C3 etc.	C2 / C3 etc.
DOUBLE ROW DEEP GROOVE BALL BEARINGS	4200-4300	Polyamide cage	-	No suffix	TVH	TN9	T
		Without filling slot	-	A	-	A	B
		Internal clearance (if diff. from normal radial clearance)	-	-	-	C2 / C3 etc.	C2 / C3 etc.
ANGULAR CONTACT BALL BEARINGS	7000 / 7200/ 7300 / 7400 7800 (71800) 7900 (71900)	Contact angle 30°	No suffix	-	-	A	A
		Contact angle 40°	B	B	B	B	B
		Polyamide cage	T2	A	TVP	P	T85 / TYN
		Pressed steel cage	No suffix	-	-	J	W
		Solid brass cage	L1	M	M	M / MB	No suffix
		Universal design	G	G	UA / UO / UL*	CB / G	G / SU
DOUBLE ROW SELF-ALIGNING BALL BEARINGS	1200 / 1300 2200 / 2300 11200 / 11300	Pressed steel cage	J	No suffix	-	J1	No suffix
		Polyamide cage	T2	G15	TVH	TN9	T
		2 contact seals	-	EE	2RS	2RS1	DDU
		Internal clearance (if diff. from normal radial clearance)	C2 / C3 etc.	C2 / C3 etc.	C2 / C3 etc.	C2 / C3 etc.	C2 / C3 etc.
		Tapered bore 1:12	K	K	K	K	K
DOUBLE ROW ANGULAR CONTACT BALL BEARINGS	3200-3300 5200-5300	Contact angle 32° to 35° with slot	3xxxS	3xxxB	No suffix	No suffix	No suffix
		Contact angle 25° to 30° without slot	5xxxS	3xxxA	B	A	B
		Polyamide cage	T2	G15	TVH / TVP	TN9	T
		Pressed steel cage	No suffix	No suffix	No suffix	No suffix	J
		1 or 2 pressed steel shields	5xxxSCZZ	5xxx ZZ	Z / 2Z	Z / 2Z	Z / ZZ
		1 or 2 contact sealed type	5xxxSCLLD	5xxx EE	HRS / 2HRS	RS1 / 2RS1	RSR / 2RSR
		1 or 2 non contact seals	5xxxSCLLM	-	RSR / 2RSR	-	ZR / 2ZR
		Internal clearance (if diff. from normal radial clearance)	C2 / C3 etc.	C2 / C3 etc.	C2 / C3 etc.	C2 / C3 etc.	C2 / C3 etc.
THRUST BALL BEARINGS	51100-51200 51300-51400	Pressed steel cage	J	No suffix	No suffix	No suffix	No suffix
		Solid brass cage	-	-	M, MP	M	M
		Polyamide cage	T2	-	-	-	-
FOUR-POINT CONTACT BALL BEARINGS	QJ200 - QJ300	Polyamide cage	T2X	-	TVP	-	-
		Solid cage	L1	MA	MPA	MA	No suffix
		Internal clearance (if diff. from normal radial clearance)	C2 / C3 etc.	C2 / C3 etc.	C2 / C3 etc.	C2 / C3 etc.	C2 / C3 etc.

The interchanges are given for information only and you should check that the chosen product corresponds to your requirements. In case of doubt, please do not hesitate to contact us.

*Several specific internal clearances on universal design.

For **NTN** alternative products, please contact us.

Prefixes & suffixes

PREFIXES FOR BALL BEARINGS		
MATERIAL		
Prefix	Brand	Description
F-	**NTN**	Stainless steel ball bearing
S	**SNR**	Stainless steel ball bearing
S-	**NTN**	Material in ceramic
TA- / TAB-	**NTN**	Nitrided steel
TM- / TMB-	**NTN**	Special heat treatment
TS2-	**NTN**	Special heat treatment up to 160 °C
TS3-	**NTN**	Special heat treatment up to 200 °C
TS4-	**NTN**	Special heat treatment up to 250 °C
COMPONENT		
2-	**NTN**	Only applies to inner and outer ring
5-	**NTN**	Concerns balls only
DIMENSION		
W-	**NTN**	Modified width
R-	**NTN**	Inch dimensions
SPECIAL RANGE		
U-RSH	**NTN**	Sensor bearing
7MC3-	**NTN**	Outer ring with ceramic coating
7MP-	**NTN**	Plastic-vulcanised outer ring
AC-	**NTN**	Anti-rotation protection
EC-	**NTN**	Expansion compensation for general purposes
EC1-	**NTN**	Expansion compensation for high temperatures (max. 150 °C)
EC2-	**NTN**	Expansion compensation for particularly high temperatures (max. 180 °C)

SUFFIXES FOR BALL BEARINGS		
COMPONENT		
Prefix	Brand	Description
/2AS	**NTN**	Standard Grease
/5K	**NTN**	Standard Grease
2RS	**SNR**	Contact seal on both sides - Only for stainless steel deep groove ball bearings
A	**NTN**	Polyacryl material for the seal
A1	**NTN**	Fluorine material for the seal
A2	**NTN**	Silicon material for the seal
Dxxx	**SNR**	Grease type if non standard
E	**SNR**	Contact seal on one side
EE	**SNR**	Contact seals on both sides
F1	**NTN**	Machined steel cage
F2	**NTN**	Machined stainless steel cage
FG1	**SNR**	Food grade LUBSOLID™
G14	**SNR**	Polyamide 6.6 cage
G15	**SNR**	Polyamide 6.6 cage with glass fibers
J	**NTN**	Pressed steel cage
JR	**NTN**	Pressed rivet cage
JR2	**NTN**	Cage with reinforced type of pressed steel
L1	**NTN**	Machined brass cage
L1B	**NTN**	Machined brass cage centered on balls
LB, LLB	**NTN**	Nitrile non-friction seal
LH, LLH	**NTN**	Nitrile low torque seal
LP03	**NTN**	Standard solid grease

SUFFIXES FOR BALL BEARINGS		
COMPONENT		
Prefix	Brand	Description
LP09	**NTN**	Food grade solid grease
LU, LLU	**NTN**	Nitrile double lip contact seal
M	**SNR**	Massive brass cage, centered on balls
MA	**SNR**	Massive brass cage, outer ring guided
MB	**SNR**	Massive brass cage, centered on inner ring
QT	**NTN**	More than 50% grease filling rate
T2	**NTN**	Polyamide resin molded cage
T2X	**NTN**	Polyamide 6.6 + glass fiber 25%
U	**NTN**	Open bearing with existing groove to put seal afterwards
Y	**NTN**	Pressed brass cage
Z, ZZ	**NTN/SNR**	Steel shield
Z1, ZZ1	**NTN**	Stainless steel shield
DESIGN		
/GH	**NTN**	Heavy preload
/GL	**NTN**	Light preload
/GM	**NTN**	Medium preload
/GN	**NTN**	Normal preload
A	**SNR**	Double row angular contact ball bearings: PA66 + glass fiber cage; 25° contact angle; no filling slot Double row deep groove ball bearings: PA66 + glass fiber cage; no filling slot
B	**NTN**	Single row angular contact: 40° contact angle
BG	**NTN**	40° contact angle, universal design
C2	**NTN/SNR**	Radial internal clearance, C2 class
C3	**NTN/SNR**	Radial internal clearance, C3 class
C4	**NTN/SNR**	Radial internal clearance, C4 class
C5	**NTN/SNR**	Radial internal clearance, C5 class
CM	**NTN**	Special normal radial internal clearance with tighten tolerances
CSnn-n	**NTN**	Special clearance
K	**NTN/SNR**	Tapered bore, taper 1:12
N	**NTN/SNR**	Groove for snap ring on outer ring
N2	**SNR**	Anti-rotation slots on outer ring
NR	**NTN/SNR**	Groove and snap ring on outer ring
P2	**NTN/SNR**	Tolerance class 2
P4	**NTN/SNR**	Tolerance class 4
P5	**NTN/SNR**	Tolerance class 5
P6	**NTN/SNR**	Tolerance class 6
P63E	**NTN**	P6 precision class + C3 internal clearance; electric motor quality
S	**SNR**	Spherical outer diameter
W, W-1	**NTN**	Slot or knock out hole on ring
X1, X2, Xn…	**NTN**	Chamfer modification
SPECIAL RANGES		
EMTR	**SNR**	Electric motor product range
F6xx	**SNR**	TOPLINE range for very high temperature - Maximum 350°C
FT150, FT150ZZ	**SNR**	TOPLINE range for high temperature - Maximum 150°C
HT200, HT200ZZ	**SNR**	TOPLINE range for high temperature - Maximum 200°C
HVZZ	**SNR**	TOPLINE range- High speed bearings with shields on both sides
LT, LTZZ	**SNR**	TOPLINE range for low temperature



NTN and SNR - Tapered roller bearings



The tapered roller bearing consists of 2 loose elements: the inner ring (cone) with tapered rolling elements + the cage (we could also say "the mounted cone") and the outer ring (cup).

This is the best bearing solution for supporting combined axial & radial heavy loads.

The single row type is usually used by pair, the operating clearance or preload is adjusted during the mounting of the bearings.

A set of preloaded tapered roller bearings offers, in addition to a high load capacity, the necessary high rigidity required inside the gearboxes or transmission.

Benefits

A complete range of tapered roller bearings from the world's second largest manufacturer (approx. 100 million units/year), with ISO metric and ABMA inch series.

- Under **NTN** brand, **complete ranges of metric and inch series**, with high technology products
  - A metric range that covers all the market needs
  - A numerous inch range (>270 series), that is the best alternative to the market leader
  - High quality steels, with case hardened steel and through hardened steel
  - The larger sizes under the label ULTAGE™, with the highest performance on the market
  - 2 and 4 rows for specific applications
- Under **SNR** brand, **a compact range of metric series** that covers the **essential needs** with all the **benefits of a premium brand** without any technical compromise
  - An "Easy to Work" range, with only 1 bearing part number per dimension
  - New opportunities of competitivity in the European market
  - High quality products, a range approved by many major European OE customers

NTN and **SNR** ranges represent approximately 1900 part numbers in the European gross price list, to meet the market needs with the adequate tapered roller bearing.

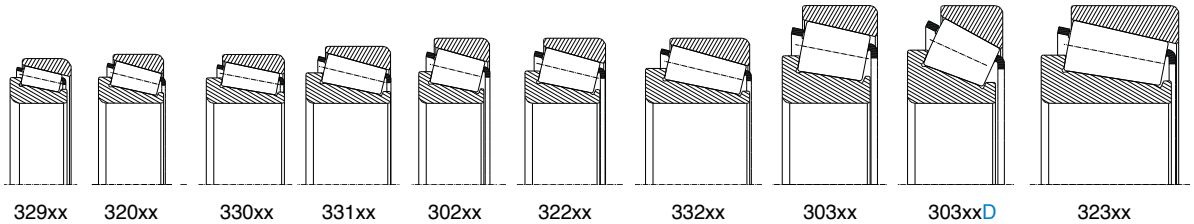




Metric series range overview

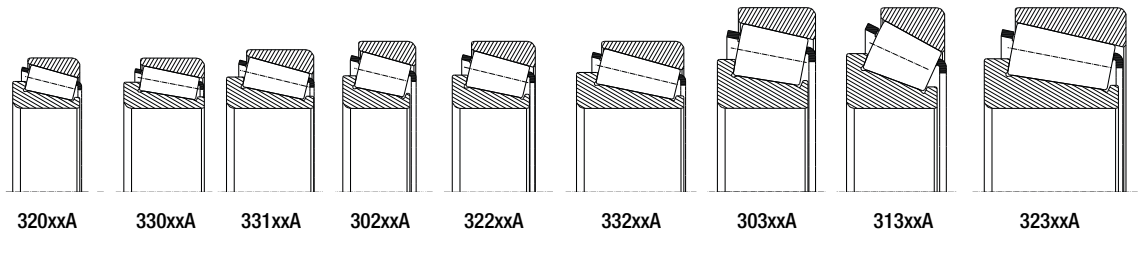
NTN metric tapered roller bearings, the complete range

- 10 standard metric series, including 1 steeper angle series with suffix D (= 313xx in Europe)
- 3 additional steeper angle series 322xxC, 323xxC (suffix C **NTN** = suffix B in Europe) and T7FCxxx
- Bore diameter from 15 mm to 850 mm (440 mm in catalog)
- Case hardened steel (prefix “4T-“) or through hardened steel (suffix “U”), interchangeability for both
- Pressed steel cage
- Tolerance: ISO492 normal class
- Designation:
  - For case hardened steel: **4T-32006X**
  - For through hardened steel: **32018XU**



SNR metric tapered roller bearings, the simply smart range

- 9 most popular metric series, including 1 steeper angle series 313xxA
- Outer diameter < 200 mm
- High grade through hardened steel
- Pressed steel cage
- Tolerance: ISO492 normal class
- Easy to work range: designation with only 1 suffix A ➔ **32014A**



Inch series range overview

NTN inch series tapered roller bearings, the best alternative to the market leader

- >270 series defined according to ABMA standard
- Bore diameter from 12.7 mm to 1270 mm
- 100% case hardened steel, with the prefix “4T-“
- Pressed steel cage
- Tolerance: ANSI/ABMA std 19 class 4 or ANSI/ABMA std 19.1 class K or N for metric J series
- Designation:

	Mounted cone					Outer ring (cup)			
ABMA inch series	4T-		HH	228340	*Suffix*	/	HH	228310	V3
	4T-			25577	*Suffix*	/		25520	*Suffix*
ABMA “J“ metric series	4T-	J	LM	102949	*Suffix*	/	J	LM	102910	*Suffix*

Duty class prefix	
EH	Extra Heavy series
EL	Extra Light series
H	Heavy series
HH	Heavier than Heavy series
HM	Heavy-Medium series
L	Light series
LL	Lighter than Light series
LM	Lighter-Medium series
M	Medium series

Code	Included cup angle
1	0 to 23°59'59.99''
2	24° to 25°29'59.99''
3	25°30' to 26°29'59.99''
4	27° to 28°29'59.99''
5	28°30' to 30°29'59.99''
6	30°30' to 32°29'59.99''
7	32°30' to 35°59'59.99''
8	36° to 44°59'59.99''
9	45° and over, excluding thrust

Series number
0-9
00-99
000-999

Component number
Cone -> **30** to **49** (and **20** to **29**)
Cup -> **10** to **19** (and **20** to **29**)

- Cone and cup can be managed separately, each cone of the same series could be associated with one cup of the series
- Interchangeability is guaranteed. It is recommended to not mix cones and cups from different origins, for optimal performance after assembly
- A reduced stock allows to generate many bearing combinations:

Example: **25500 series**

4T-	25572		4T-	25519	=	4T-	25572	/	25520
4T-	25577		4T-	25520		4T-	25577	/	25520
4T-	25578		4T-	25522		4T-	25578	/	25520
4T-	25580		4T-	25526		4T-	25580	/	25520
4T-	25582					4T-	25582	/	25520
4T-	25584					4T-	25584	/	25520
4T-	25590					4T-	…	/	…
4T-	25592					…			
8 cones		**X**	**4 cups**		=	**32 possible bearings**			

High performance steel

2 technologies of steel, used as standard

Carburised (case hardened) steel

Carburising hardens the steel from the surface to the proper depth, leaving a relatively soft core. This provides hardness and toughness, making the material suitable for impact loads.
Case hardened steel is applied to rollers and both rings and could be identified by the prefix "4T-". It is the standard material for all inch series.

Through hardened steel is obtained from high grade carbon chromium bearing steel. It is applied to larger **NTN** bearings from metric series and to all **SNR** range.

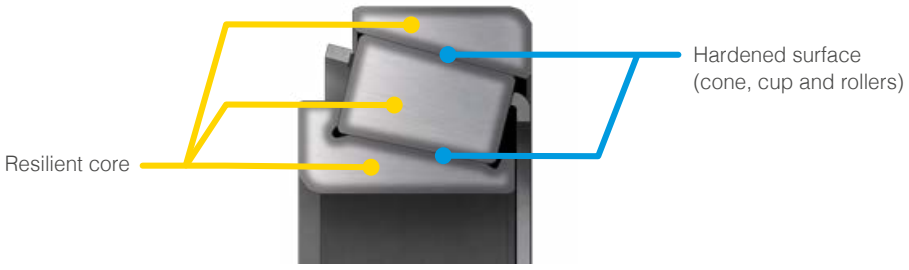
NTN	BEARING SIZE		
	Small	Medium	Large
Inch			
Metric			

Case hardened steel 4T- Through hardened steel U

2 technologies of **NTN** steel offer the same basic rating life

Case hardened steel offers additional benefits such as:

- **Better resistance to cracks**, especially in case of high tight fit condition
- **Better resistance to shocks loads,** thanks to its resilient core



Cross-section of a bearing made of case hardened steel



GOOD TO KNOW!

Inch and metric tolerance systems are not defined in the same way for diameters: in the inch tolerance system, diameters are defined to positive whereas in the metric tolerance system, they are defined to negative (versus nominal diameter).

A special attention has to be put on the shaft diameter definition!!!

Example: Inch bore diam. (in mm) ▶ **Ø 111.125** $^{+0,025}_{0}$

Metric bore diam. (in mm) ▶ **Ø 105** $^{0}_{-0,020}$

ULTAGE™ large size metric series

ULTAGE™ large size metric series (OD ≥ Ø270mm) deliver longer life, higher load ratings, and higher speed capabilities.

Developed as the new standard of **NTN** bearings, the **ULTAGE™** series will contribute to improvements in industrial machinery today and into the future.

Technical features

ULTAGE™ offers the **highest level of reliability**, thanks to:

Optimised crowning on rollers, for a better load distribution on raceways.

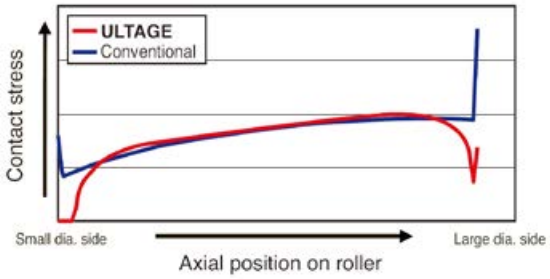
- Basic load rating **Cr: +16%** larger than conventional bearings
- Service life: **60% longer** than conventional bearings
- **Higher allowable misalignment:** 0.0017 rad (6') is achievable for 0.27Cr, with a minimum required load 0.04Cor.

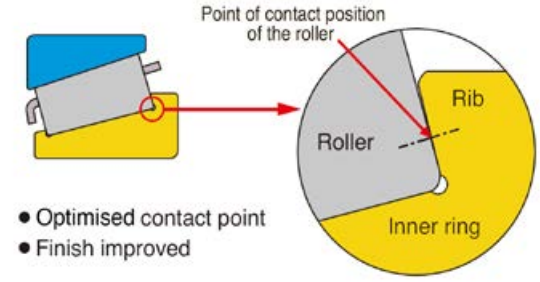
Improved allowable rotation speed, resulting from an optimized design between the roller large face and the cone large rib.

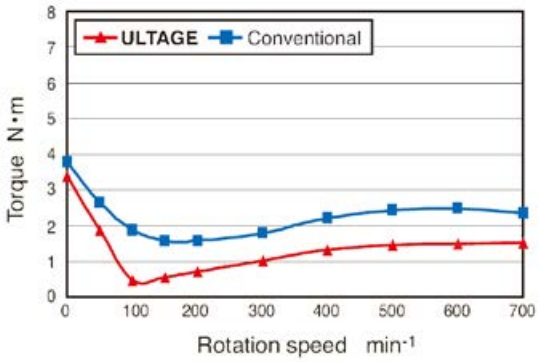
- Lower torque and lower temperature rise.
- Higher rotation speed, **up to +10%**

Improved dimensional stability over time, with a special heat-treatment to the bearing steel, for a better dimensional stability over time and less dimensional changes during operation:

- 1/10 compared with standard through hardened steel
- 1/4 compared with case hardened steel







Benefits

Cr			DIMENSION CHANGE
+16%	+ 60%	+10%	1/10

Designation of ULTAGE™ TRB:

Additional suffix "UTG" → **30328 U UTG**

Interchange tables, prefixes & suffixes

PREFIXES	NTN	SNR	TIMKEN	FAG	SKF	KOYO JTEKT
MATERIAL						
Case-hardened steel (inner ring, outer ring and rolling elements)	E-	-			Suffix "/ HA4"	
Case-hardened steel (inner and outer rings)	2E-	-			Suffix "/ HA1"	
Case-hardened steel (inner ring and rollers)	3E-	-			-	
Case-hardened steel (rollers only)	5E-	-			Suffix "/ HA5"	
Case-hardened steel (inner ring only)	6E-	-		W209B	Suffix "/ HA3"	
Case-hardened steel + carbonitriding (inner and outer rings, rollers)	EA-	-				KE
Through-hardening steel + interchangeability	T-	-	-	-	-	-
Case-hardened steel 4T- + interchangeability	4T-	-				
High quality grade case-hardened steel + interchangeability	ET-	-				
High quality grade case hardened steel + carbonitriding + interchangeability	ETA-	-				KE
ECO Top series (ETA steel + Optimised inner geometry) + interchangeability	ECO-	-				KE
NTN Fine Austenite Strengthening Treatment	FA-	-	-	-	-	-
EXECUTION						
Flanged outer ring (metric series)	FL	-			Suffix "R"	
HL- treatment for rollers, for improved lubrication	HL-	-	-	-	-	-
HEAT STABILISATION						
Heat stabilisation up to 160 °C for rings and rollers	TS2-	-	-	-	-	-
Heat stabilisation up to 160 °C for inner and outer ring	2TS2-	-	-	-	-	-
Heat stabilisation up to 200 °C for rings and rollers	TS3-	-		S1	S1	S1
Heat stabilisation up to 200 °C for inner and outer ring	2TS3-	-		-	-	-
Heat stabilisation up to 250 °C for rings and rollers	TS4-	-		S2	S2	S2
DESIGNATION	**NTN**		**TIMKEN**	**FAG**	**SKF**	**KOYO**
Single row tapered roller bearing with special dimensions	CR	-	-	-	-	-
Double row tapered roller bearing with special dimensions, back-to-back arrangement	CRI	-				
Four row tapered roller bearing	CRO	-				
Sealed four-row tapered roller bearing for roll-necks rolling mill, ULTAGE™ range	CROU… LL	-				
Thrust tapered roller bearing	CRT	-	T, TT			
"J-Line metric series, according to ABMA standard. Can be used with all others ABMA prefixes (EL, EH, H, HH, HM, M, LM, L, LL)."	J	J	J	KJ	J	J
Extra Light series (according to ABMA)	EL	EL	EL	KEL	EL	EL
Lighter than Light series (according to ABMA)	LL	LL	LL	KLL	LL	LL
Light series (according to ABMA)	L	L	L	KL	L	L
Light Medium series (according to ABMA)	LM	LM	LM	KLM	LM	LM
Medium series (according to ABMA)	M	M	M	KM	M	M
Heavy series (according to ABMA)	H	H	H	KH	H	H
Heavy Medium series (according to ABMA)	HM	HM	HM	KHM	HM	HM
Heavier than Heavy series (according to ABMA)	HH	HH	HH	KHH	HH	HH
Extra Heavy series (according to ABMA)	EH	EH	EH	KEH	EH	EH
T7FC metric series (according to ISO355)	T7FC…	-	JW...49/ JW...10	T7FC…	T7FC…	T7FC…
T4CB metric series (according to ISO355)	T4CB…	-	JP…49/ JP…10	T4CB…	T4CB…	T4CB…
T2EE metric series (according to ISO355)	T2EE..	-	JF…49/ JF…10	T2EE..	T2EE..	T2EE..

The interchanges are given for information only and you should check that the chosen product corresponds to your requirements. In case of doubt, please do not hesitate to contact us.

SUFFIXES	NTN	SNR	TIMKEN	FAG	SKF	KOYO JTEKT
MATERIAL						
Bore diameter deviation from standard type (inch)	A	A	A			A
Deviating dimensions, for width or radius versus standard type (inch)	AS	AS	AS			
Flanged outer ring (inch series)	B	-	B			B
Change of internal construction	CA	-	CA			
Steeper contact angle for 323xx series (only for metric dimensions)	C	-	B	B	B	C
Average axial clearance of xxx µm (for double row tapered roller bearings)	CSxxx	-		Axxx-xxx	Cxxx	CSxxx
Double outer ring (cup) with groove & oil holes. One hole countered-bored for locking pin	CD	-	CD			
Steeper contact angle (European series 313xx = Japanese series 303xxD)	D	-	313xx	313xx	313xx	D
Double inner ring (cone) or double outer ring (cup)	D	-	D	D	D	D
Lubricating holes on spacer	D1	-				
Raceways with optimised profile for heavy loads	EW	-	-	-	-	-
Matched bearings in “O” arrangement (back to back)	DB	DB	DB	DB	/DB	
Matched bearings in "X" arrangement (face to face)	DF	DF	DF	DF	/DF	
Tandem arrangement	DT	DT		DT	/DT	
Double cup with centering hole, without lubrication groove	DC	-	DC		DC	
Double inner ring (cone) or double outer ring (cup) with lubrication groove and keyway or slot	DW	-	DW			
Only inner ring (cone), for metric	-G	-	Prefix "X"			
Only outer ring (cup), for metric	#G	-	Prefix "Y"			
Seal on inner ring (cone)	L	-	LA, LB		Desig-nation "JK0S"	
Tolerance class 6X	P6X	P6X	6X	P6X	CLN	6X
Tolerance class K (ABMA, J inch series, inch series)	PK	-		Prefix K		PK
Special tolerance	PX1, PX2,..	-	-	-	-	-
Non-interchangeable with bearings of the same basic p/n, for metric series	R	-	R			
Non-interchangeable with bearings of the same basic p/n, for inch series	S	-	S			S
Specification for quick adjustment of the preload	SA	-	-	-	-	-
Low torque specification	ST	-		QCL7C		LFT
Double inner ring (double cone) with tapered bore	TD	-	TD			
Double outer ring (double cup) with tapered outer diameter	TD	-	DT			
Polyamide cage	T2	-	F	TVP / TVH	TN9	
Through-hardened steel SUJ2/100Cr6 + interchangeability (according to ISO355)	U	A	M			J, JR
ULTAGE™ execution	UTG	-	-	Explorer	XL (X-Life)	-
Special chamfer (n = serial number)	X1, X2, Xn…	-	-	-	-	YA1, YA2, YAn …
Special specification	V1, V2, Vn	-	-	-	-	-
Special groove in the inner ring (for double row tapered roller bearings)	W6	-	DGW		G	SG
Bearing dimensions according to ISO	X	-	X	X	X	J, JR

The interchanges are given for information only and you should check that the chosen product corresponds to your requirements. In case of doubt, please do not hesitate to contact us.



NTN and SNR - Spherical roller bearings

Spherical roller bearings are engineered to offer excellent resistance to high temperatures and loads, meaning that they are capable of withstanding the harshest applications:

- Misalignment
- Shock & vibration
- Pollution
- Performance and wear resistance

A wide range of spherical roller bearings is available, offering the best performances on the market.



Less downtime, more profit!

Benefits*

+24%	x2	+20%
LOAD CAPACITY	SERVICE LIFE	SPEED LIMITS

High quality material

- High quality grade steel – excellent inclusion property

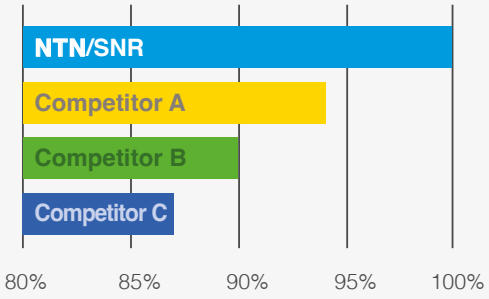
Mastery of heat treatment

- Better wear resistance
- Dimensional stability up to 200°C

Internal design

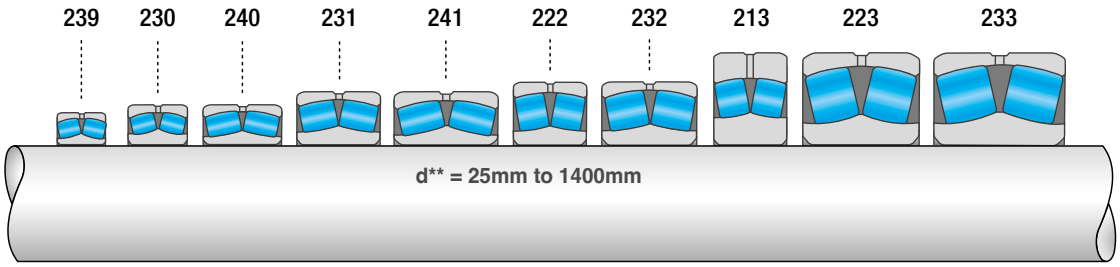
- Optimised number and geometry of rollers
- Improved surface roughness
- Surface treated cages

Market dynamic load (%)



Study carried out in 2021, based on the 3 main European market player catalogues

Range overview



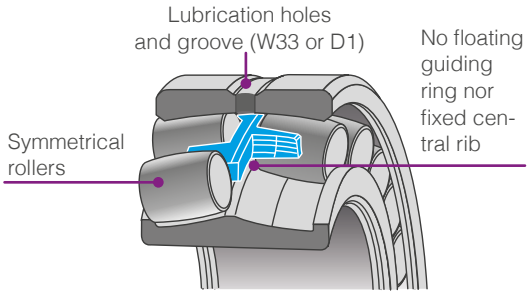
* **NTN** W33 design and **SNR** design vs conventional design

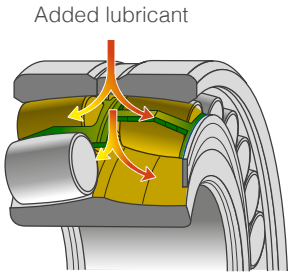
** d = bore diameter

Technical features

55% of bearing failures are due to lubrication defects, meaning that lubrication plays a major role in ensuring peak performance.

E DESIGN TYPE





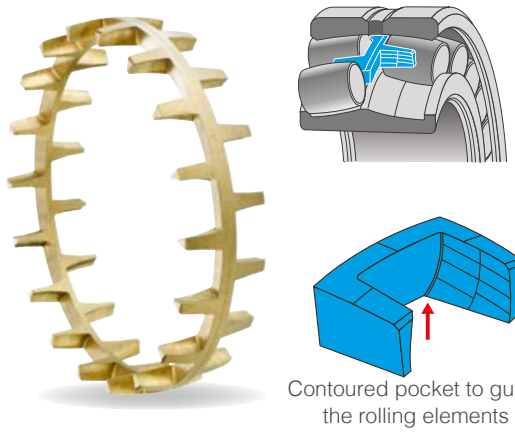
The lubricant flows more freely inside the bearing

An improved design for better lubrication

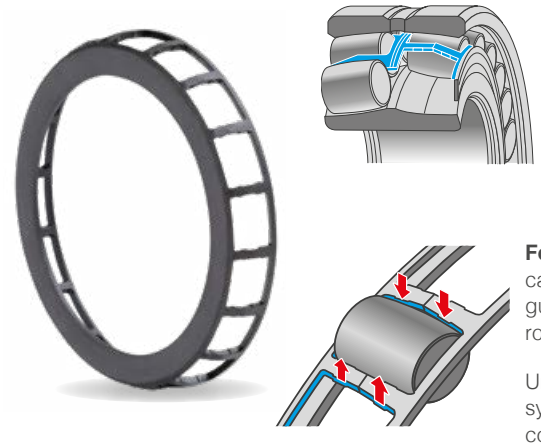
- **No central shoulder section:** higher volume available and lubricant can flow more freely, meaning all parts are constantly lubricated
- **Wider lubrication holes and grooves:** design feature simplifies maintenance and relubrication
- **Improved cage materials and design**

E CAGE DESIGNS

Optimised guidance precision for kinematic property maximisation



EM – Machined solid brass cage



EA – Drawn steel cage

This successful design eliminates the need for a central guide ring, offering you many advantages:

- Less friction and heating in service
- Increased rigidity and stability of the assembly
- Longer life

SNR - EF800 series for high-vibration applications

The EF800 series is equipped with a solid brass cage and is particularly recommended for use in heavy-duty applications and vibration systems.



Enhanced efficiency of your screeners!

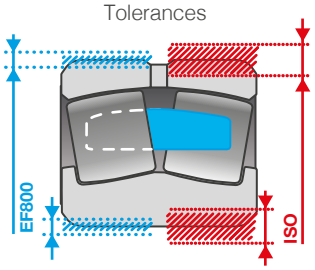
Benefits

- Increased service life
- Wider maintenance intervals
- Greater operational profitability

Technical features

- Bearing with symmetrical rollers and machined brass one-piece cage centred on the rolling elements
- No floating guide ring or fixed central shoulder section to avoid any risk of a cage/ring seizure in the event of thermal expansion
- Special tolerances for the outer diameter and bore
- Reduced internal radial clearance:The C4 internal clearance of the EF800 series is reduced to 2/3 of the standard C4 internal clearance in order to obtain improved running properties during operation.

Tolerances



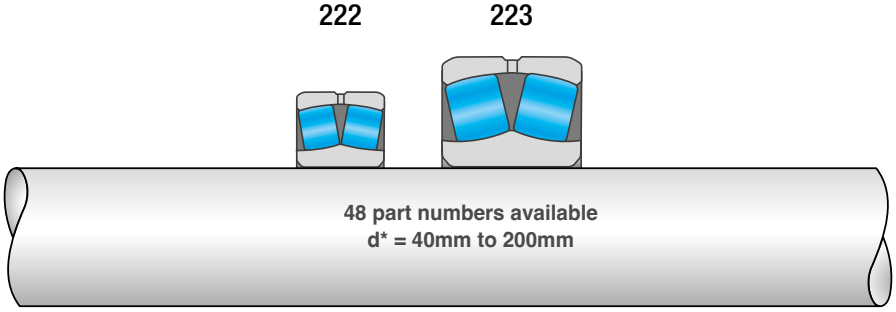
Reduced bore tolerances for cylindrical, tapered and for the outer diameters compared with tolerance ranges of standard series, guaranteeing perfect ring adjustment.

	22320		Clearance in microns											
Clearance	Minimum	Maximum	130	135	140	145	150	155	160	165	170	175	180	185
C4	135	180												
Clearance EF800	150	180												

EF800 series = C4 with reduced tolerance
E.g. EF800 clearance value compared to the clearance value of group C4

Range overview

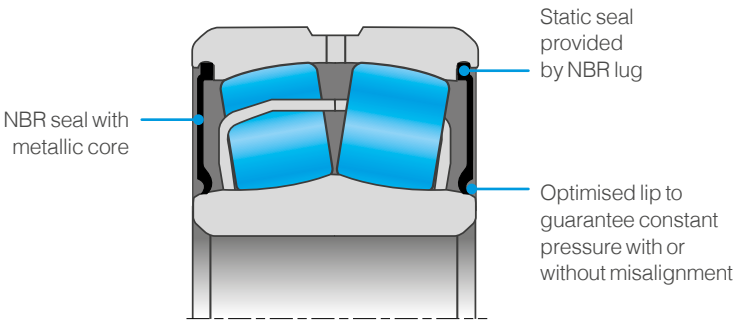
Further dimensions are possible upon request.

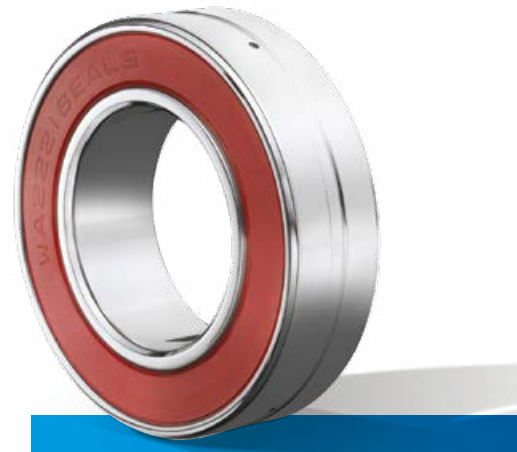


*d = bore diameter

SNR - Sealed spherical roller bearings

To prevent contamination if bearings are used in hostile environments, such as outdoors or in dusty conditions, you are advised to use sealed bearings.



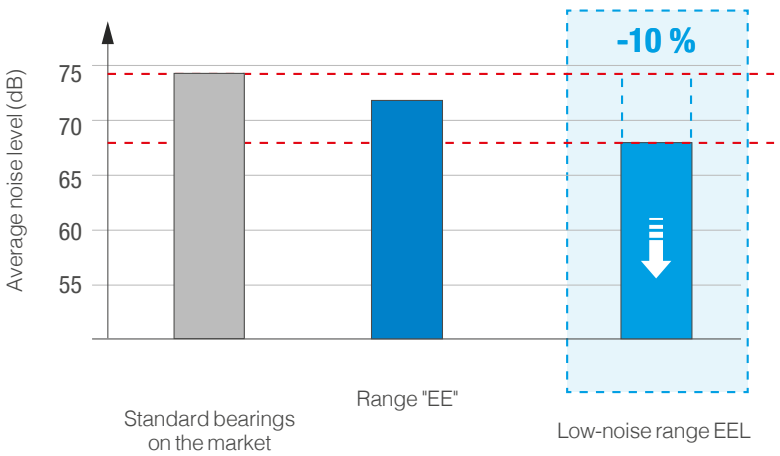


Seals have been tested under the most extreme conditions to guarantee their reliability and performance for your applications

Benefits

- Increased service life
- Wider maintenance intervals
- Greater operational profitability
- Environment protection
- Same load ratings as open spherical roller bearings
- Identical internal design to the open bearings with the EA design
- Non-ISO width with a minimal increase in order to integrate seals, “10X” prefix and the suffix “EE”
- Specially designed NBR seal to guarantee impermeability by means of constant contact pressure of the lip, even in the event of misalignment
- Pre-filled bearing with a quantity and quality of lubricant suited to high loads; no relubrication is required for applications below 70°C

Optionally also available in the low-noise version ("-EEL")

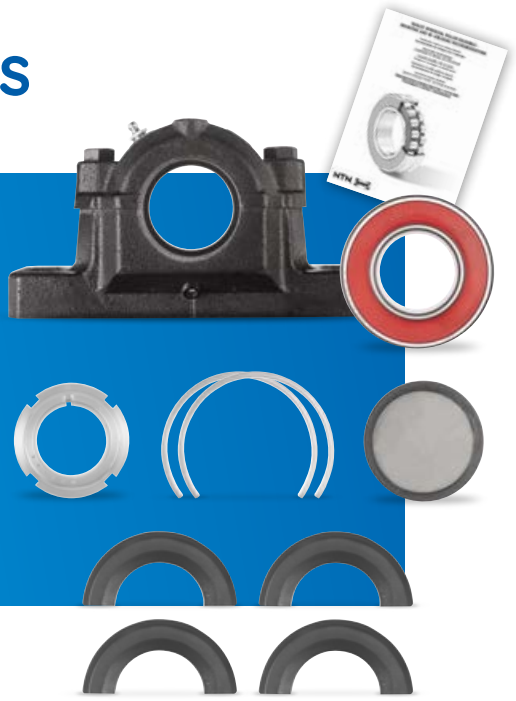




The Low Noise grade significantly reduces the bearing's acoustic impact

NTN | SNR | Brands of NTN corporation

SNR - Multi-market kits



ALL-IN-ONE,
make your life easier!

Choose the Spherical Roller Bearing KITs

Peace of mind

Offering you an optimal level of service

- **Only one** reference to order (to manage) instead of several
- Kits are composed of specific components to avoid the risk of errors and omissions
- **Fixed or floating** mounting are possible with 1 KIT reference
- Maintenance people **save time** looking for required components. One storage place in the warehouse

Productivity

Improve the performance of your activity

- Economic gain: KIT **cheaper** than retail components
- Sealed spherical bearing KITs: **ECO Friendly!** (vs a standard open bearing)
  - Reduced grease consumption
  - Maintenance interval increased by 3
  - Service life extended by 3

Have a look at our KIT brochure

- Find all range references and component detail
- Multi-market application examples which benefit from kits




[KIZEI]®
ISO SPHERICAL ROLLER BEARING WITH SHIELDS
NTN is launching an unprecedented solution to extend your bearing service life time! A bearing protected by steel shields on both sides, KIZEI® is 100% interchangeable with standard open spherical roller bearings thanks to ISO dimensions. Mounting elements and procedures are identical to that of a standard bearing. This exclusive **SNR** product will dramatically reduce your maintenance costs and improve your equipment reliability!
Armoured to face the dirt!
SNR®
Brand of **NTN corporation**
NTN | SNR | Brands of NTN corporation
DOC_1_SRBZZ_AP2_GBa - NTN-SNR © 09/2022 - Photos: NTN-SNR / PEDRO STUDIO PHOTO / SHUTTERSTOCK

SNR - KIZEI® Spherical roller bearings



THE FIRST SPHERICAL ROLLER BEARING WITH METALLIC SHIELDS

NTN Europe's R&D department has pioneered an unprecedented solution to increase the service life of your spherical roller bearings.

Benefits

Improved production performance with longer service life

INITIAL BEARING	**[KIZEI]®**
1,100 hours in service	**2,200 hours in service**
 Outer ring	 Outer ring

Less deterioration to the bearing after a service life lasting **twice as long**

- **Reduced maintenance costs**

	Open spherical roller bearing	[KIZEI]
Life duration	1 month	**3 months**
Production downtime	12 times/year	**4 times/year**
Maintenance costs	100	**30**

Maintenance costs can be reduced by a factor of 3

- **Easy to use**

ISO dimensions



- Same dimensions as an open spherical roller bearing

Easy mounting process



- Standard accessories
- Possible clearance measurement of K bores

Regreasing frequency divided by 3



- Compared to an open spherical bearing

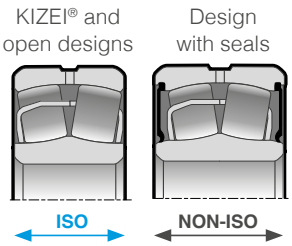
Range overview and designations

- 60 part numbers available
- d = 40mm to 140mm
- From 22208 to 22228
- Tapered "K" or cylindrical bores
- Internal radial clearance CN or C3

Further dimensions and clearances are possible upon request

DESIGNATION **22208EAKW33ZZ**

Technical features



- **Same load ratings and speed limits** as open spherical roller bearings
- **ISO dimensions:** 100% interchangeable with an open spherical roller bearing
- **Premium quality nitrided steel plate cage and shields**
  Maximised shock and optimised corrosion resistance
- **Extensive range of operating temperatures** from -40°C to +200°C
  Dimensional stability up to +200°C
- **KIZEI® is supplied ungreased:** the initial lubrication process is similar to an open spherical roller bearing; 30% of the free volume must be filled with the appropriate grease. The bearing can be lubricated while in service via the dedicated holes and grooves on the outer ring
- **Optimal misalignement**
- **Internal inspection possible** for easier maintenance
- **Easy mounting process:** no special tools are required and the clearance can be checked after mounting

The widest range on the market

	OPEN	[KIZEI]	SEALED
Dimensions	ISO	ISO	Special
Protection	0	+*	++
Grease retention	0	+	++
Temperature range	-40°C to +200°C	-40°C to +200°C	-10°C to +110°C
Limiting speed	++	++	+
Load capacity	+++	+++	+++
Clearance inspection	Yes	Yes	No
Internal control	Yes	Yes	No
Sleeve and nut	Standard	Standard	Special
Supplied already greased	No	No	Yes

*Valid against solid contamination - Not suitable for liquids



NTN and SNR - Thrust spherical roller bearings

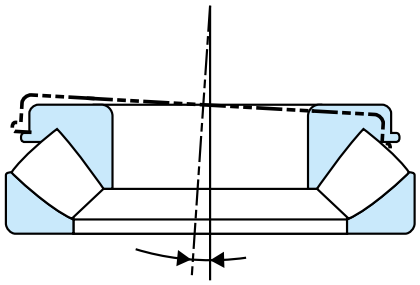
Thrust spherical roller bearings are intended for heavy applications, generating large axial loads: injection presses, cranes, pumps, mines, quarries, turbines and equipment for energy.



Technical features

- ISO dimensions: 100% interchangeable
- Drawn steel cage
- Optimised number and geometry of rollers
- Accept radial load up to 50% of axial load
- Maximum misalignment up to 2%

Allowable misalignments

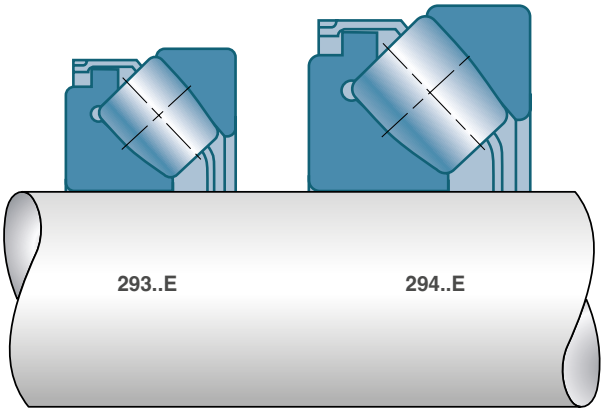


Orientation angle

Lubrication: thrust spherical roller bearings are usually heavily loaded and must be lubricated with oil. Due to the internal construction of these bearings, grease lubrication is only possible at low speeds and with limited loads.

Range overview

Thrust spherical roller bearings with drawn steel cage.



Interchange table, prefixes & suffixes

PREFIXES	NTN/SNR	SKF	FAG	TIMKEN
Non-ISO ring width for LL sealed version (**NTN**)	WA	BS2	WS2	
Non-ISO ring width for EE sealed version (**SNR/NTN** W33)	10X	BS2	WS2	

SUFFIXES INTERNAL CONSTRUCTION / CAGE DESIGN	NTN/SNR	SKF	FAG	TIMKEN
DESIGN				
Increased capacity design, symmetrical rollers	E DESIGN	E "EXPLORER"	E1 "X-LIFE"	E
Standard internal design, symmetrical rollers	V			C, VSC, Y
Optimised internal design, asymmetrical rollers	B			
CAGE				
Drawn steel cage, inner ring guided	A	No suffix, C, CC	No suffix, BE	EJ
KIZEI® range: Nitrided metal shields on both sides of the bearing	ZZ			
One-piece machined brass cage centered on rollers	M	CA, CAC	E1A, BEA, B-MB, M, MA, MB	EM
One-piece machined brass cage centered on rollers, for high vibration applications, special C4 / C3 internal clearance	F800 / F801	VA405	T41A, T41D	W800
Two glass fibre-reinforced polyamide cages	G15		TVPB (BI)	
Asymmetrical rollers, two solid machined brass cages centered on inner ring	L1	CA, CAC	E1A, BEA, B-MB, M, MA, MB	EM
Solid steel cage. Inner ring guided	F1			
SEALING				
Reinforced seal properties (NBR) on both sides of the bearing. 30% grease-filled (**SNR/NTN** W33)	EE	2CS, 2RS	2RSR	
Low-noise version (EE sealed parts only)	L			
Reinforced seal properties (NBR) on both sides of the bearing (**NTN**)	LLS	2CS, 2RS	2RSR	
GROOVE AND HOLES				
Lubrication groove and holes on the outer ring	D1 / W33	No suffix, W33	No suffix, S	W33
Lubrication holes on inner ring (no re-greasing groove)	W34	W26	HA40AB	W94
Groove for stop segment on outer ring	N			

SUFFIXES BORE TYPE	NTN/SNR	SKF	FAG	TIMKEN
Cylindrical bore (No suffix)	-	-	-	-
Tapered bore / taper 1:12	K	K	K	K
Tapered bore / taper 1:30	K30	K30	K30	K30

SUFFIXES BEARING CLEARANCE / TOLERANCES	NTN/SNR	SKF	FAG	TIMKEN
Clearance < C2	C1			
Clearance < standard	C2	C2	C2	C2
Standard clearance (No suffix)	CN	CN	CN	CN
Clearance > standard	C3	C3	C3	C3
Clearance > C3	C4	C4	C4	C4
Clearance > C4	C5	C5	C5	C5
Special clearance	CSxx			
P5 rotation precision	P5	P5	P5	P5
P6 rotation precision	P6	P6	P6	P6
P5 rotation precision between IR / OR	PX50	C08	T52BW	C08

Conversion table – Thrust Spherical Roller Bearings

TYPE OF BEARING	Technical Specification	NTN/SNR	FAG	SKF	NSK
Thrust spherical roller bearings Series 29300-29400	Drawn steel cage	No suffix	No suffix	E, EF	No suffix
	Massive brass cage	-	MB	No suffix, EM	M
	Increased capacity design	E	E1	E	E

The interchanges are given for information only and you should check that the chosen product corresponds to your requirements. In case of doubt, please do not hesitate to contact us.

SKF "Explorer", FAG "X-life" and NSK "HPS" bearings are trademarks registered by their respective companies

SNR - Bearing units with cast iron housings

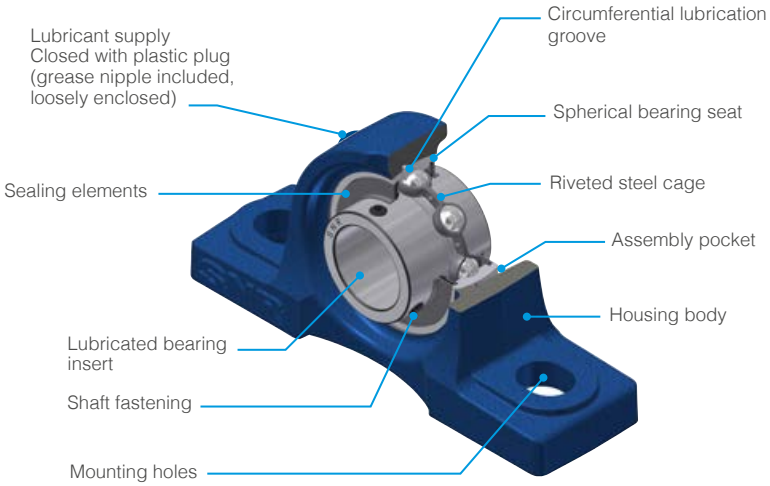
Sealed deep grooved ball bearing, which can be mounted to a housing by means of its spherical outer ring.

BEARING INSERT
+
SEAL
+
HOUSING
=
BEARING UNIT



Technical features

- Easy assembly / disassembly
- Robust design
- Universally applicable
- Lubricated and sealed for life
- Quickly ready for operation
- Cost effective
- Compensation of shaft misalignments
- Powder-coated cast iron housings



Benefits

One stop shop for all your bearing unit needs

- Save time and money
- Find everything that you need in our comprehensive range of quality products from JIS- and ISO- standards

Improve your reactivity thanks to short lead times

- Control emergency situations
- A high level of product availability in our European Distribution Centre allows you to manage all situations

Optimise the output of your machines with our complete product expertise

- Define the best suitable bearing unit combinations
- Benefit from the advice of our highly skilled engineering team for your specific applications

Designations

EX FL 213 CCE

BEARING INSERT

UC..G2: Chrome steel bearing insert with shaft fastening with socket set screws, wide design

US..G2: Chrome steel bearing insert with shaft fastening with socket set screws, narrow design

EX..G2: Chrome steel bearing insert with shaft fastening with eccentric locking collar, wide design

ES..G2: Chrome steel bearing insert with shaft fastening with eccentric locking collar, narrow design

UK..G2H: Chrome steel bearing insert with shaft fastening with adapter sleeve, wide design

LK..G2H: Chrome steel bearing insert with shaft fastening with adapter sleeve, narrow design

CS: Chrome steel bearing insert with shaft fastening with interference fit

For customised solutions, combine the cast housings with suitable bearing inserts series:

T20, T04, L3, L4, AGR

HOUSING

PE PLE P	Pillow block regular design
PH:	Pillow block high design
PAE PG PA	Tap base pillow block
FE F	Four-bolt flange, square design
FCE FC FEE	Four-bolt flange with centering rim, round design
FTE:	Three-bolt flange, triangular design
FLE FL	Two-bolt flange, oval design
FLZ:	Two-bolt flange with centering rim, oval design
FD:	Two-bolt flange, oval narrow design
FAE FA	Two-bolt flange with long hole for shaft adjustment, oval design
FS:	Four-bolt flange with centering rim, square design
T:	Take-up unit
T+WB:	Take-up unit with frame
SP:	Tensioner unit
C:	Cartridge unit
EHE:	Hanger unit

BORE CODE

Series 200
201 to 218
(bore- Ø 12 – 90 mm)

Series 300
305 to 328
(bore- Ø 20 – 140 mm)

PROTECTIVE COVER

For use with UC, US, UK, LK, CS

SCO: Open cover

SCC: Closed cover

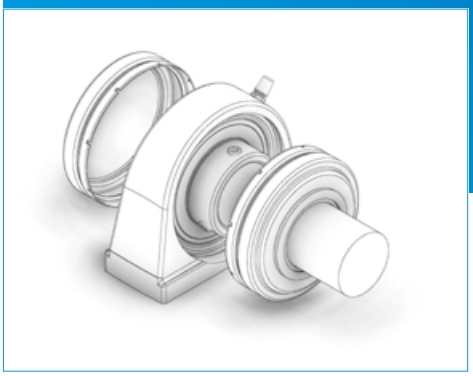
For use with EX, ES

SCOE: Open cover

SCCE: Closed cover

Housing prepared for cover installation: **N**

⚠ The **protective covers** are fixed in housing grooves. For units that are to be fitted with protective covers, housings with suffix **N** must be ordered. Units already ordered with cover(s) are automatically delivered with grooved housings.



SNR - Bearing units with pressed steel housings



Best economical solution for lightweight constructions

Benefits

- Particularly used in applications where weight is a major constraint

Technical features

- Two-piece housing made from zinc coated sheet steel
- Available as pillow block, flanged or take-up unit
- Suitable for narrow ball bearing inserts set screw type US..G2, eccentric locking collar type ES..G2 and type CS with interference fit
- Made for low to moderate loads & speeds

Designations

US PFL 207

BEARING INSERT

US..G2: Chrome steel bearing insert with shaft fastening with socket set screws, narrow design

ES..G2: Chrome steel bearing insert with shaft fastening with eccentric locking collar, narrow design

HOUSING

PP: Pillow block

PF: Three or four-bolt flange, round design

PFL: Two-bolt flange, oval design

PFT: Three-bolt flange, triangular design

PFE: Take-up unit for shaft adjustment, rectangular design

BORE CODE

201 to 212
(bore- Ø 12 – 60 mm)

SNR - Bearing units with stainless steel housings



Benefits

Premium line

- Optimum performance with a strong focus on protection from oxidation, mould, bacteria and chemical cleaning agents
- High performance lubricant
- High-quality stainless steel
- Relubrication facility on all housings

Resilient

- Excellent mount stability and impact resistance
- Recess-free housing contact surface to prevent deposits of the process material
- Designed to withstand aggressive cleaning and corrosive environments
- Open or closed protective covers from stainless steel available for all housings

Less downtime, more profitability

- Protective covers for units provide additional protection during high pressure washdown

Technical features

- 100% stainless steel resistant to corrosion: will never chip and contaminate the end product
- Food-grade seal with additional slinger (SUC)
- USDA H1 grease fully compliant with FDA regulations
- Shaft fastening by set screw or eccentric locking collar
- Metal cage
- The protective covers are fixed in housing grooves



SUITABLE FOR THE USE OF LUBSOLID™ BEARING INSERTS

Designations

SUC F 206 FG1 CO

BEARING INSERT

SUC: Stainless steel bearing insert with shaft fastening by socket set screw

SES: Stainless steel bearing insert with shaft fastening by eccentric locking collar

SUC: FG1: Stainless steel bearing insert with shaft fastening by socket set screw, LUBSOLID™ filling

HOUSING

SP: Pillow block
SPA: Tap base pillow block
SF: Four-bolt flange
SFL: Two-bolt flange
SFB: Three-bolt flange
ST: Take-up

BORE CODE

201 to 212
(bore- Ø 12 – 60 mm)

LUBSOLID™

Only when the unit is equipped with **LUBSOLID™ bearing insert**

PROTECTIVE COVER

For use with SUC
SCO: Open covers
SCC: Closed covers

For use with SES
SCOE: Open covers
SCCE: Closed covers

Housing prepared for covers installation: **N**

⚠ For units that are to be fitted with protective covers, housings with suffix **N** must be ordered. Units already ordered with cover(s) are automatically delivered with grooved housings.

SNR - Bearing units with thermoplastic housings



Benefits

Easy to clean

- Resistant to numerous chlorine-containing and corrosive cleaning solutions
- Insensitive to bacteria formation
- Recess-free housing contact surface to prevent deposits of the process material
- Protective caps for units to provide additional protection against regular wash downs
- Smooth surfaces

Resilient

- Good friction and wear properties
- Mounting holes reinforced with metal bushings
- Equipped with bearing inserts from stainless steel

Technical features

- 100% stainless steel bearing inserts resistant to corrosion: will never chip and contaminate the end product
- All metallic components made of high-quality stainless steel
- Food-grade seal with additional slinger
- High performance lubricant according to NSF H1
- Metal cage

Specific features

- Relubrication facility on all housings
- Additional protection through open or closed end covers (tool-free installation)
- Can optionally be combined with food-grade solid grease bearing insert

SUITABLE FOR THE USE OF LUBSOLID™ BEARING INSERTS



Designations

MUC PPL 206

BEARING INSERT

MUC..FD: Stainless steel bearing insert with shaft fastening by socket set screw

SUC..FG1: Stainless steel bearing insert with shaft fastening by socket set screw, LUBSOLID™ filling

HOUSING

PPL: Pillow block

TBL: Tap base pillow block

FPL: Four-bolt flange

NFL: Two-bolt flange

FBL: Three-bolt flange

BORE CODE

204 to 208

(bore- Ø 20 – 40 mm)

PROTECTIVE CAP

All housings are equipped with appropriate grooves where caps can snap into place

CV: Open cap

CF: Closed cap

⚠ Protective caps must be ordered separately.

SNR - SENTINEL™ series

SNR stainless steel insert with full-pack LUBSOLID™ (FG1) as lubricant for bearing unit application (thermoplastic or stainless steel housings) is the best opportunity to mix security for food/beverage industries and sustainability for the production equipment.

SENTINEL SERIES

Technical features

- 440C stainless steel bearing, 302 stainless steel cage and slingers
- Specific silicone seals with 302 stainless steel reinforced
- Anti-rotation pin on outer diameter
- **SNR** full-pack LUBSOLID™ (FG1), NSF approval / H1 category code
- Operating temperature: from -10°C to +80°C (100°C peak)

Benefits

- 440C material is the best compromise between load rating capacity and corrosion resistance
- LUBSOLID™ avoid leakage even when bearings are subjected to high vibration and centrifugal force
- Compare with general-purpose food grease lubricant, solid grease is less prone to emulsification and leakage due to water penetration
- LUBSOLID™ with full-pack application confer an additional barrier against pollution



Range overview

- Code bore P/N inserts from 204 to 210 (Shaft diameter 20 to 50 mm)
- Thermoplastic housings: 5 designs
- Stainless steel housings: 6 designs
  For housing information, see previous pages about stainless steel and thermoplastic bearing unit

Designations

SUC 204 FG1

INSERT
SUC: Stainless steel insert bearing, fitting on shaft with 2 screws

DIMENSIONAL
From 204 to 210

LUBRICANT
FG1: LUBSOLID™: solid lubricant NSF approval, category H1



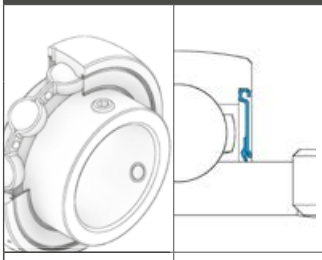
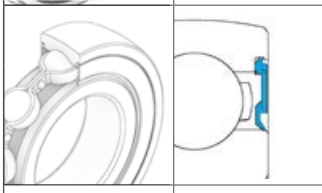
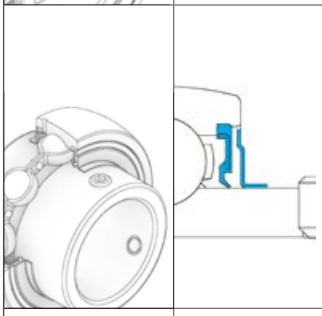
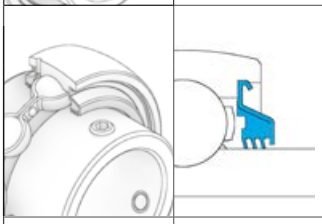
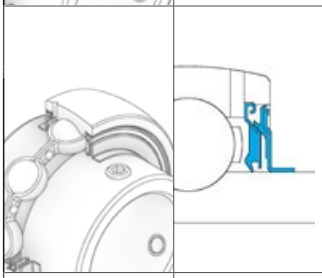
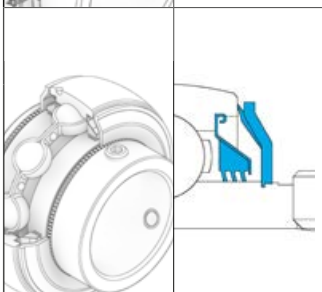
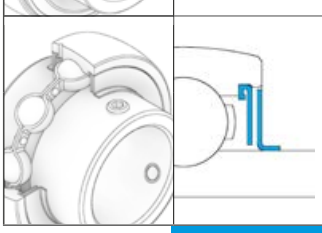
THE ULTIMATE SHIELD AGAINST CONTAMINATION

A commercial success for the past 5 years in America, the SENTINEL™ range is finally coming to Europe! A real revolution in the food-processing market, all bearing units and ball bearings in this series are sealed and equipped with solid lubrication. Resistance to water infiltration and various contaminants, elimination of grease leaks and reduced maintenance interventions make this range the perfect recipe for meeting your environmental, safety and productivity requirements.

SENTINEL™ SERIES, the ultimate shield against contamination.

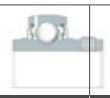
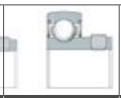


Sealing solutions

Seals for insert bearings	References	Technical characteristics	Benefits
	**One-lip seal with protective edge** US..G2, US..G1N, US..G2T04, US..G2T20, CUS, ES..G2, ES..G1N, ES..G2T04, ES..G2T20, SES, CES, LK..G2H	Zinc-coated sheet steel retainer* with vulcanised seal. The axially preloaded seal lip from NBR** is located behind a protective edge. * Stainless steel for SES Black-oxide-coated for T20 ** Silicon for SES and design T20	• Normal environmental conditions • Medium to high rotation speeds
	**One-lip seal** CS	Sheet steel retainer over-moulded with NBR material. Axially preloaded seal lip.	• Normal environmental conditions • Medium to high rotation speeds
	**One-lip seal with slinger** UC..G2, UC..G2T04, SUC, MUC..FD, EX..G2, EX..G2T04, CEX, UK..G2H	Zinc-coated sheet steel retainer* over-moulded with NBR and axially preloaded seal lip** + preconnected, zinc-coated sheet steel slinger* for improved protection against mechanical impacts. * Stainless steel for SUC ** Silicon for SUC / Food grade NBR for MUC..FD	• Additional protection against particles • Medium to high rotation speeds
	**Triple lip seal** UC..G2L3, EX..G2L3	Zinc-coated sheet steel retainer with vulcanised triple lip seal. The lips from NBR are axially preloaded and angled outwards. The protective edge of the retainer serves as a safeguard against mechanical impacts.	• For medium to heavily polluted environments • Lower rotation speed • Higher friction
	**Multiple seal system** UC..G2L4, EX..G2L4	Two zinc-coated steel sheet elements with vulcanised seal lips from NBR. The internal retainer is equipped with a radial seal to the inner ring, while the external slinger has a radial seal to the outer ring. A third seal lip is intermediate and acts axially.	• For medium to heavily polluted environments • Medium rotation speeds • Lower friction • Suitable for pressure washing
	**High-performance seal system** UC..AGR, EX..AGR	Zinc-coated steel sheet retainer with vulcanised triple lip seal. The lips from NBR are axially preloaded and angled outwards. The triple lip seal is completely covered by a massive steel protector. The zinc-coated impact shield is additionally equipped with a lip seal and strongly secured on a knurled seat.	• For extremely polluted environments • Shock resistant • Low rotation speeds • Suitable for high-pressure washing • Higher friction
	**High temperature non-contact seal** UC..T20, EX.. T20	Labyrinth seal from two black-oxide-coated steel sheet slinger in parallel arrangement.	• For high temperature use • Very low friction

Combination overview

Cast iron housings with chrome steel bearing inserts

	HOUSINGS \ BEARING INSERTS		 UC2..G2 / UC3..G2	 US2..G2	 EX2..G2 / EX3..G2	 ES2..G2	 LK2..G2H	 UK2..G2H/ UK3..G2H	Suitable protective covers for combination with (available for shaft-Ø 12-65mm)* UC2..G2 / US2.. G2 / LK2..G2H / UK2.. G2H	EX2..G2 / ES2..G2
Pillow blocks		PE2	UCPE2	USPE2	EXPE2	ESPE2	LKPE2+H	UKPE2+H	SCC2 / SCO2	SCCE2 / SCOE2
		PLE2	UCPLE2	USPLE2	EXPLE2	ESPLE2	LKPLE2+H	UKPLE2+H	SCC2 / SCO2	SCCE2 / SCOE2
		P2 / P3	UCP2 / UCP3	USP2	EXP2 / EXP3	ESP2	LKP2+H	UKP2+H / UKP3+H	SCC2 / SCO2	SCCE2 / SCOE2
		PH2	UCPH2	USPH2	EXPH2	ESPH2	LKPH2+H	UKPH2+H	SCC2 / SCO2	SCCE2 / SCOE2
		PAE2	UCPAE2	USPAE2	EXPAE2	ESPAE2	LKPAE2+H	UKPAE2+H	SCC2 / SCO2	SCCE2 / SCOE2
		PG2	UCPG2	USPG2	EXPG2	ESPG2	LKPG2+H	UKPG2+H	SCC2 / SCO2	SCCE2 / SCOE2
		PA2	UCPA2	USPA2	EXPA2	ESPA2	LKPA2+H	UKPA2+H	SCC2 / SCO2	SCCE2 / SCOE2
Flanged units		FE2	UCFE2	USFE2	EXFE2	ESFE2	LKFE2+H	UKFE2+H	SCC2 / SCO2	SCCE2 / SCOE2
		F2 / F3	UCF2 / UCF3	USF2	EXF2 / EXF3	ESF2	LKF2+H	UKF2+H / UKF3+H	SCC2 / SCO2	SCCE2 / SCOE2
		FCE2	UCFCE2	USFCE2	EXFCE2	ESFCE2	LKFCE2+H	UKFCE2+H	-	-
		FC2	UCFC2	USFC2	EXFC2	ESFC2	LKFC2+H	UKFC2+H	SCC2 / SCO2	SCCE2 / SCOE2
		FEE2	-	USFEE2	-	ESFEE2	-	-	-	-
		FTE2	-	USFTE2	-	ESFTE2	-	-	-	-
		FLE2	UCFLE2	USFLE2	EXFLE2	ESFLE2	LKFLE2+H	UKFLE2+H	SCC2 / SCO2	SCCE2 / SCOE2
		FL2 / FL3	UCFL2 / UCFL3	USFL2	EXFL2 / EXFL3	ESFL2	LKFL2+H	UKFL2+H / UKFL3+H	SCC2 / SCO2	SCCE2 / SCOE2
		FLZ2	UCFLZ2	USFLZ2	EXFLZ2	ESFLZ2	LKFLZ2+H	UKFLZ2+H	-	-
		FD2	-	USFD2	-	ESFD2	-	-	-	-
		FAE2	-	USFAE2	-	ESFAE2	-	-	-	-
		FA2	UCFA2	USFA2	EXFA2	ESFA2	LKFA2+H	UKFA2+H	SCC2 / SCO2	SCCE2 / SCOE2
		FS3	UCFS3	-	EXFS3	-	-	UKFS3+H	-	-
Tensioner- / Hang up- / Cartridge Units		T2 / T3	UCT2 / UCT3	UST2	EXT2 / EXT3	EST2	LKT2+H	UKT2+H / UKT3+H	SCC2 / SCO2	SCCE2 / SCOE2
		T2+WB	UCT2+WB	UST2+WB	EXT2+WB	EST2+WB	LKT2+H+WB	UKT2+H+WB	SCC2 / SCO2	SCCE2 / SCOE2
		SP2	UCSP2	USSP2	EXSP2	ESSP2	LKSP2+H	UKSP2+H	SCC2 / SCO2	SCCE2 / SCOE2
		C2 / C3	UCC2 / UCC3	USC2	EXC2 / EXC3	ESC2	LKC2+H	UKC2+H / UKC3+H	-	-
		EHE2	UCEHE2	USEHE2	EXEHE2	ESEHE2	LKEHE2+H	UKEHE2+H	-	-

* The protective covers are fixed in housing grooves. For units that are to be fitted with protective covers, housings with suffix N must be ordered. Units already ordered with cover(s) are automatically delivered with grooved housings.

Pressed steel housings with chrome steel bearing inserts

HOUSINGS \ BEARING INSERTS		 US2..G2	 ES2..G2
	PP2	USPP2	ESPP2
	PF2	USPF2	ESPF2
	PFL2	USPFL2	ESPFL2
	PFT2	USPFT2	ESPFT2
	PFE2	USPFE2	ESPFE2

Stainless steel housings with stainless steel bearing inserts

HOUSINGS \ BEARING INSERTS		 SUC2	SUC2..FG1**	 SES2	Suitable protective covers for combination with (available for shaft-Ø 12-60mm)* SUC2 / SUC2.. FG1**	SES2
	SP2	SUCP2	SUCP2..FG1	SESP2	SCC2 / SCO2	SCCE2 / SCOE2
	SPA2	SUCPA2	SUCPA2.. FG1	SESPA2	SCC2 / SCO2	SCCE2 / SCOE2
	SF2	SUCF2	SUCF2..FG1	SESF2	SCC2 / SCO2	SCCE2 / SCOE2
	SFL2	SUCFL2	SUCFL2..FG1	SESFL2	SCC2 / SCO2	SCCE2 / SCOE2
	SFB2	SUCFB2	SUCFB2.. FG1	SESFB2	SCC2 / SCO2	SCCE2 / SCOE2
	ST2	SUCT2	SUCT2..FG1	SEST2	SCC2 / SCO2	SCCE2 / SCOE2

Thermoplastic housings with stainless steel bearing inserts

HOUSINGS \ BEARING INSERTS		 MUC2..FD	SUC2..FG1**	Suitable protective caps (available for shaft-Ø 15-40 mm)
	PPL2	MUCPPL2	SUCPPL2..FG1	CV2 / CF2
	TBL2	MUCTBL2	SUCTBL2..FG1	CV2 / CF2
	FPL2	MUCFPL2	SUCFPL2..FG1	CV2 / CF2
	NFL2	MUCNFL2	SUCNFL2..FG1	CV2 / CF2
	FBL2	MUCFBL2	SUCFBL2..FG1	CV2 / CF2

* The protective covers are fixed in housing grooves. For units that are to be fitted with protective covers, housings with suffix N must be ordered. Units already ordered with cover(s) are automatically delivered with grooved housings.

** LUBSOLID™ filling.

Protective caps & covers

Benefits

- Improvement of safety characteristics (safety at work)
- Protection of the bearing from external influences such as impact loads, dust, dirt or moisture ingress
- Protection against lubricant leakage (especially for covers)
- Can be used for shaft-end or through-shafts

Stainless steel covers for bearing units series

SUFFIX	Description	Cover type	Suitable in combination with bearing insert type:	Design
CC	Bearing unit with narrow cover (closed version)	SCC	Set screw, adapter sleeve, Fit	
CO	Bearing unit with narrow cover for metric shaft (open version)	SCO		
COU	Bearing unit with narrow cover for imperial shaft (open version)	SCOU		
CCE	Bearing unit with wide cover (closed version)	SCCE	Eccentric locking collar	
COE	Bearing unit with wide cover for metric shaft (open version)	SCOE		
COEU	Bearing unit with wide cover for imperial shaft (open version)	SCOEU		
N	Unit / Housing prepared for cover(s) installation	-	/	

Bearing units that are ordered with cover(s) include the housings with grooves. If you want to install the protective covers later, housings with suffix N must be ordered (for example: P210N).

Protective caps for bearing units series

CAP TYPE / SUFFIX	Description	Suitable in combination with bearing insert type:	Design Open / Closed	Notice
PCO	Protective cap for bearing inserts type G1N (open version)	US..G1N / ES..G1N		Protective caps have to be ordered separately from the bearing units.
PCC	Protective cap for bearing inserts type G1N (closed version)			
CV	Protective cap for thermoplastic series (open version)	MUC..FD		
CF	Protective cap for thermoplastic series (closed version)			
-G1N	Bearing insert with groove in the outer ring			

- The installation of protective caps can be done tool free. For mounting the yellow pressed steel caps bearing insert series G1N must be installed to the bearing unit. These bearings have a special groove machined in their outer rings in which the protector can snap into place (for example: US206G1N).
- All thermoplastic housings are equipped with appropriate grooves where caps can snap into place.

SNR - SNCD housings

SNCD housings are made for support spherical roller bearings with tapered or cylindrical bore. The split housings are available for fixed or floating bearing arrangement and can support bearings with shaft diameters from 115 to 500 mm.



Benefits

Interchangeable

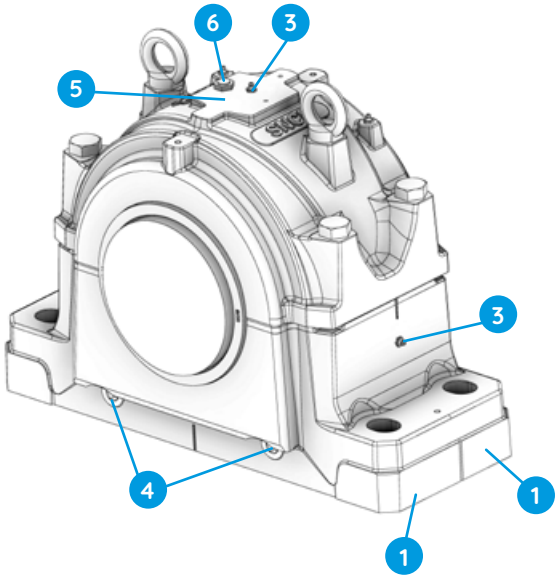
- Full interchangeable with grey cast
- Compatible with market standards

More than 400 arrangements possible

- Suitable for 222, 223, 230 and 231 SRB series
- Cylindrical bores or adapter sleeves solutions
- Metric and imperial dimensions

One global supplier

- Housings, bearings and accessories
- Technical assistance (study and recommendations)
- Service engineering



Technical features

All inclusive

1 Machined stop edges

2 Housing positioning mounting bores

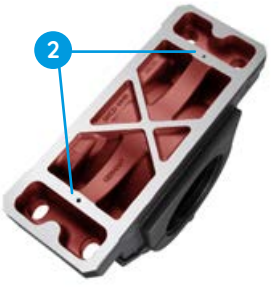
3 Grease nipple connections (grease nipple attached)

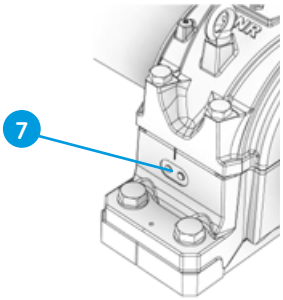
4 Grease drain holes

5 Machined surface for condition monitoring systems

6 Ready to use connection for temperature sensor

7 Ready to use connection for vibration sensor





SNR - SNC / SNCD500

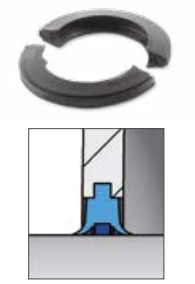


- SN housing according to ISO113-2010 for bearings with a cylindrical or tapered bore
- High stiffness and stability due to special design elements
- Reduced stress in the bearing
- Extended service life and prolonged service intervals
- For shaft diameters from 20 mm to 140 mm
- Housing material: cast iron with flake graphite and/or spheroidal graphite (SNCD500)
- 5 different seal arrangements for a wide range of applications
- User-friendly design features for ease of service and rapid installation

Also available as heavy duty version from spheroidal graphite cast iron and with different mounting bore pattern

Sealing

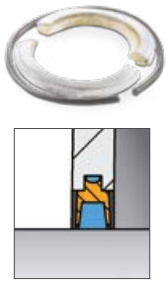
SC...DS



Double lip seal

Multipurpose seal

SC...FS / SC...FSS*

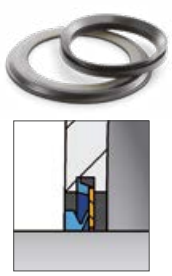


Felt strip seal

Well suited for higher rotational shaft speed

*With steel retainer

SC...SV



V-Ring seal

Reduced friction

Optional V-ring for better sealing effect in downtimes



SC...LA



Labyrinth seal

Well suited for high temperature applications

SC...TA



Taconite seal

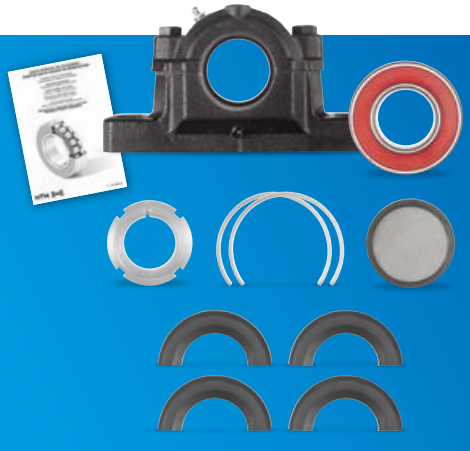
Multiple seal for harsh environments

Multi-market kits

66 kits available in “normal clearance” or “C3 internal clearance” for shaft diameters from 35 mm to 90 mm.

ALL IN 1

ALL-IN-ONE, MAKE YOUR LIFE EASIER



SNC HOUSING SEALED KIT
including a sealed spherical roller bearing and specific accessories



SNC HOUSING STANDARD KIT
including an open spherical roller bearing with specific accessories and a monopoint greaser

For more information, have a look at page 68!

SNR - Linear guides

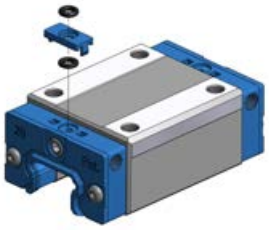
Two technologies - one geometry - one rail per size (modular system).
According to DIN ISO 12090.

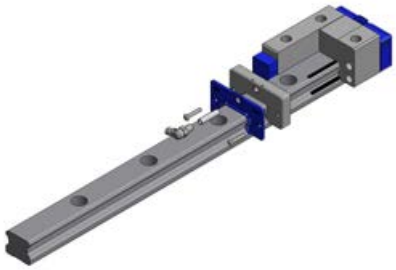
LGBC... (BALL CHAIN TYPE)	DF CONFIGURATION	LGBX... (CONVENTIONAL TYPE)

Lubrication options

- Lateral lubrication channels closed with set screws = simply switch between the lubrication points
- Lubrication option from above as standard
- Fixable adapters for high carriage types

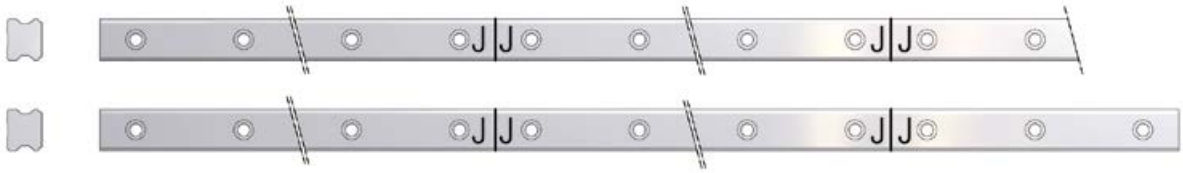






Jointed rail

The rail joint is always marked with a "J" (J = Jointed Rail!)



- No assembly sequence - error prevention!
- Simply replace in case of damage - measure the length, done!
- Easy to extend

Extension of interchangeability

Separate delivery of carriage and rail up to precision class "P" possible!

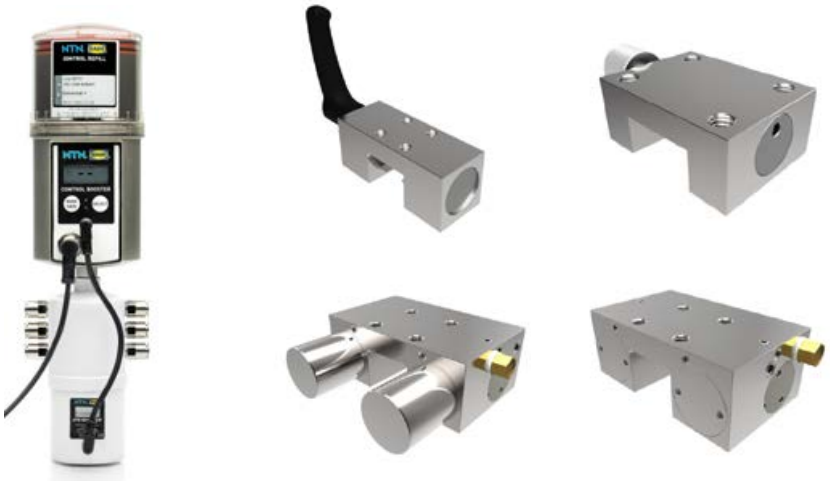
One step ahead with quality for over 30 years

Maximum lengths

• Standard rails LGBR 15…55	~ 4.000 mm
• Miniature rails	
- LGMR, narrow 09…15	~ 2.000 mm
- LGMW, wide 09…15	~ 2.000 mm
• Miniature rails LGMR 07	~ 450 mm

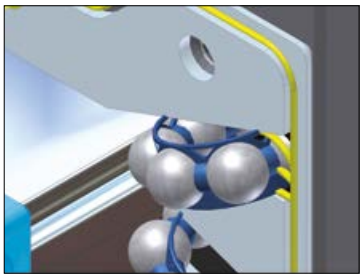
Accessories

- Clamping elements
- Central lubrication
- Brass caps
- Cover strip
- etc.

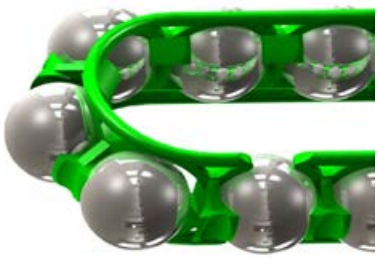


* available only in certain territories

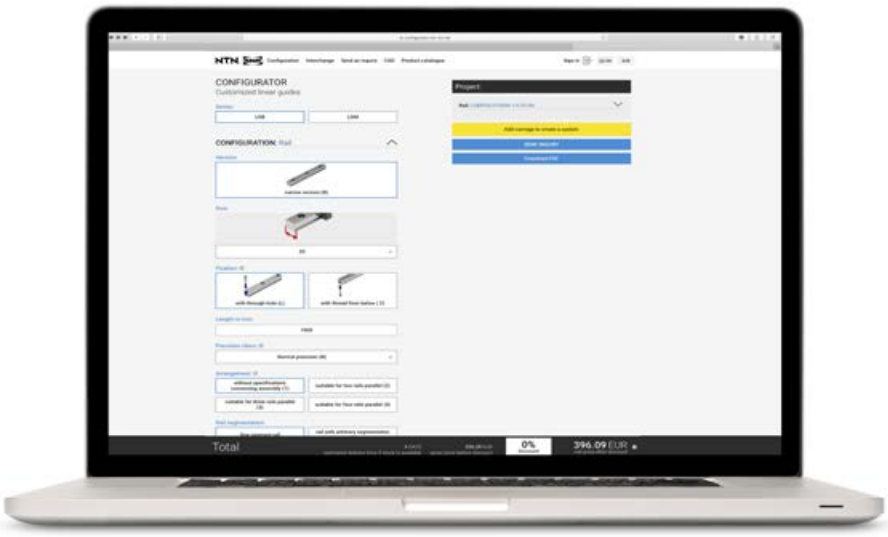
Extremely powerful ball chain



Spacer ball for
smooth ball circulation



Online configuration



SNR - Ball screws

We offer all manufacturing technologies:

Rolling, whirling, grinding



Tolerance classes

- Transport Ball Screws (T10, **T7**, **T5**, T3)
- Positioning Ball Screws (**P5**, P3)
  Blue marking is our standard

Preload

To increase the rigidity:

Z0 = axial clearance

Z1 = without axial clearance, without preload

Z2 = light preload (~ 3% Ca)

Z3 = medium preload (~ 5% Ca)

Z4 = high preload (~7% Ca)

Higher preload normally with double nuts!

SNR Ball Screws: Easy to work with!

Fixed and floating bearing units

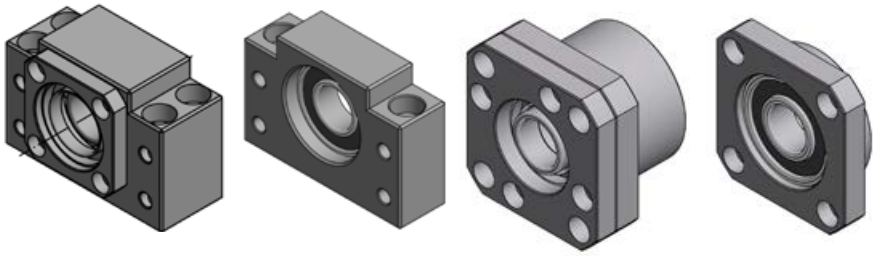
European range:

Type BSTK / BSTL



Asian range:

Type BK / EK / FK / BF / EF / FF



Lubrication

There is no lifetime lubrication for ball screws!

In general, the same greases should be used as for Linear Guides + Bearings.

Standard & special solutions for mechanical engineering

SNR - Ball bushings

Extensive support from NTN.
ISO standard & JIS standard.
One of the widest product ranges on the market.

Application

- General engineering
- Wood working industry
- Fitness equipment
- Packaging machines
- Medical equipment



Why ball bushings?

- Cost-effective implementation of linear movements
- Self-supporting guide, which is clamped at the ends
- Minimised maintenance effort due to low lubricant consumption
- Low friction
- Interchangeable: diameter, length and grooves are standard

Which ball bushings?

STANDARD BALL BUSHINGS

- Same dimensions and tolerances as super ball bushings
- $v_{max.}$ = 1,5m/s
- Damp or wet environment
- Suitable for vacuum applications
- High temperature versions

SUPER BALL BUSHINGS

- Same dimensions and tolerances as standard ball bushings
- $v_{max.}$ = 3m/s
- Misalignment compensation up to ±0,5°
- Higher load ratings
- Smooth running performance
- Same loads ▶ smaller size
- Reduced system costs!

Ball bushings for simple and inexpensive implementation of linear movements.

Widest product ranges

One of the widest product ranges on the market!

ISO BALL BUSHINGS

Closed



Open



Adjustable



With flange



Tandem



Tandem with flange



Tandem with middle flange



BALL SLEEVES

Closed



Open



JIS BALL BUSHINGS

Closed



In addition:
Support rails, shaft supports,
clamping elements etc.

Stainless versions for high temperatures

Linear units

SINGLE

Closed



Open



Open adjustable



TANDEM

Closed



Open



Open adjustable



QUATTRO

Closed



Open



With standard ball bushings and super ball bushings available.

Trust & support for common success!