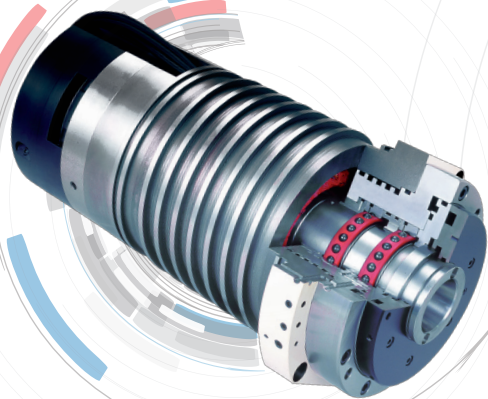


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Products for Machine Tools



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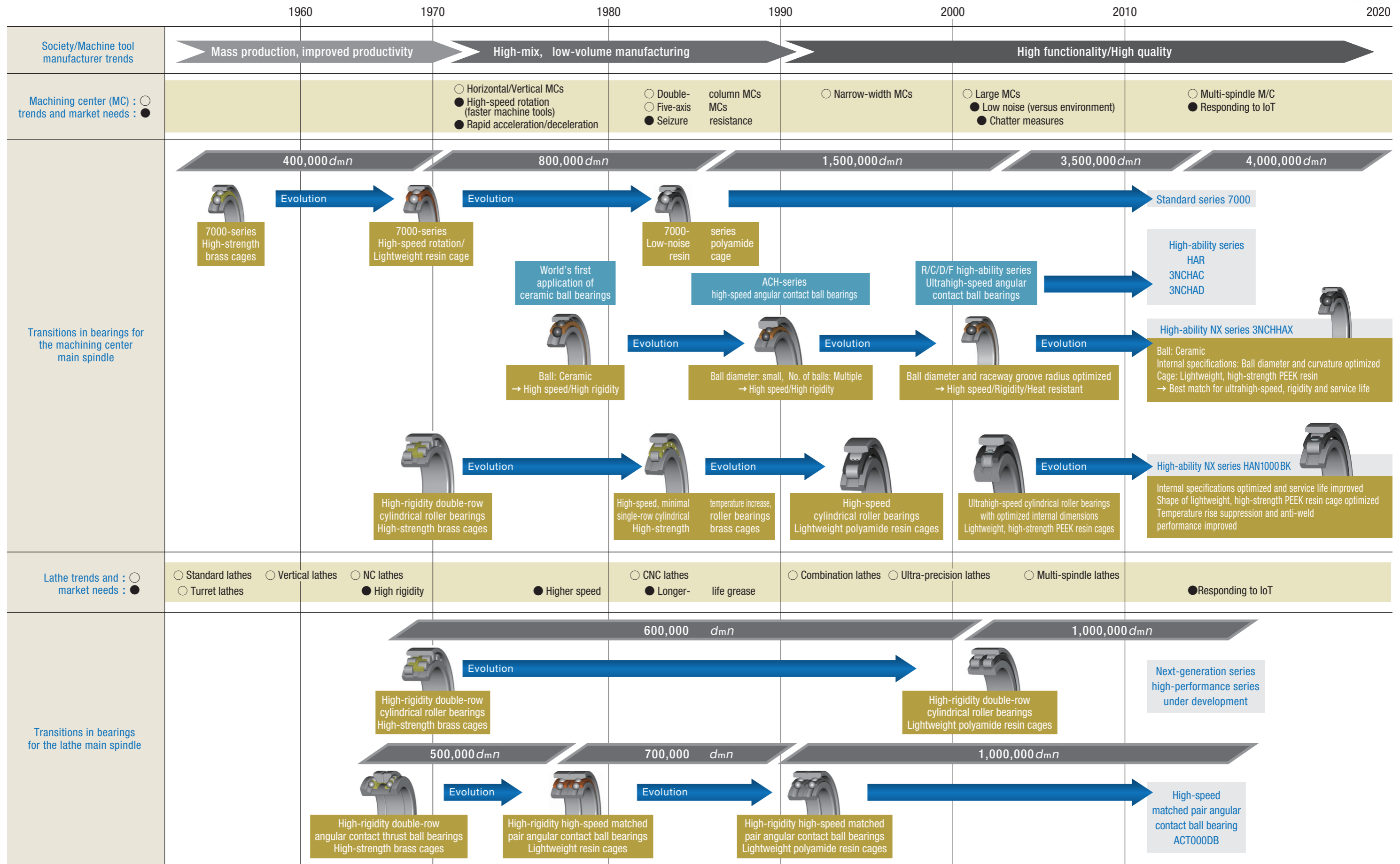
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Koyo **TOYODA**

CAT.NO.B1016E

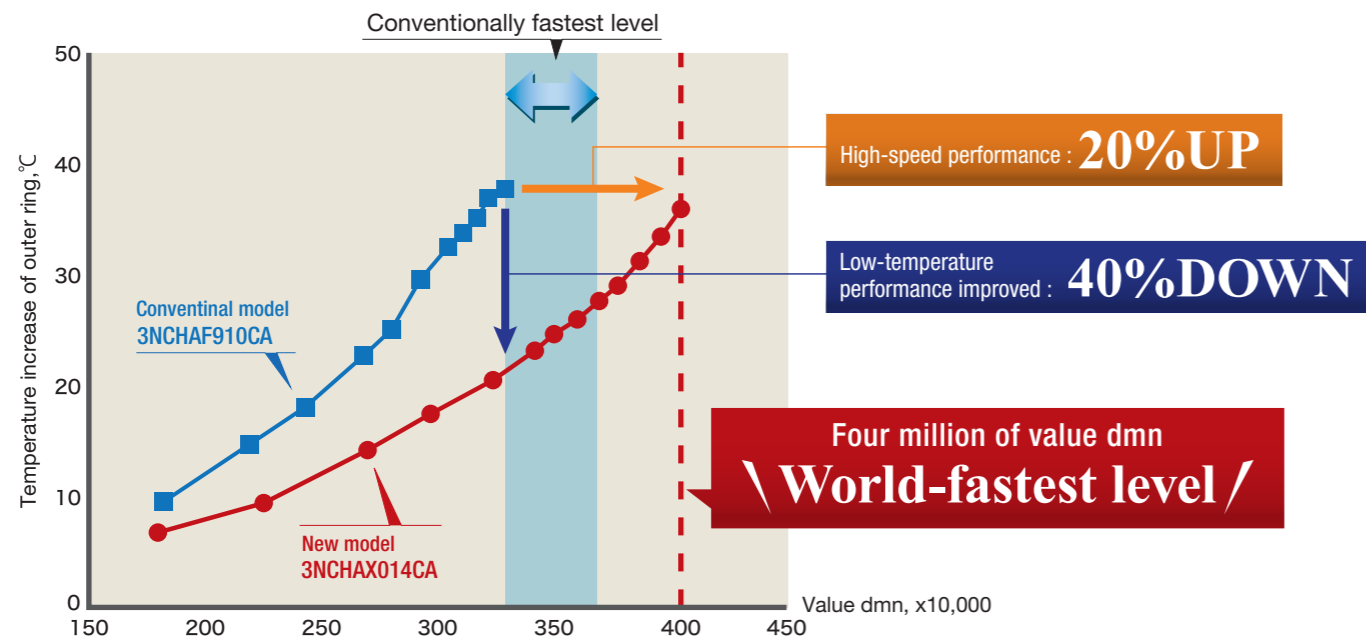
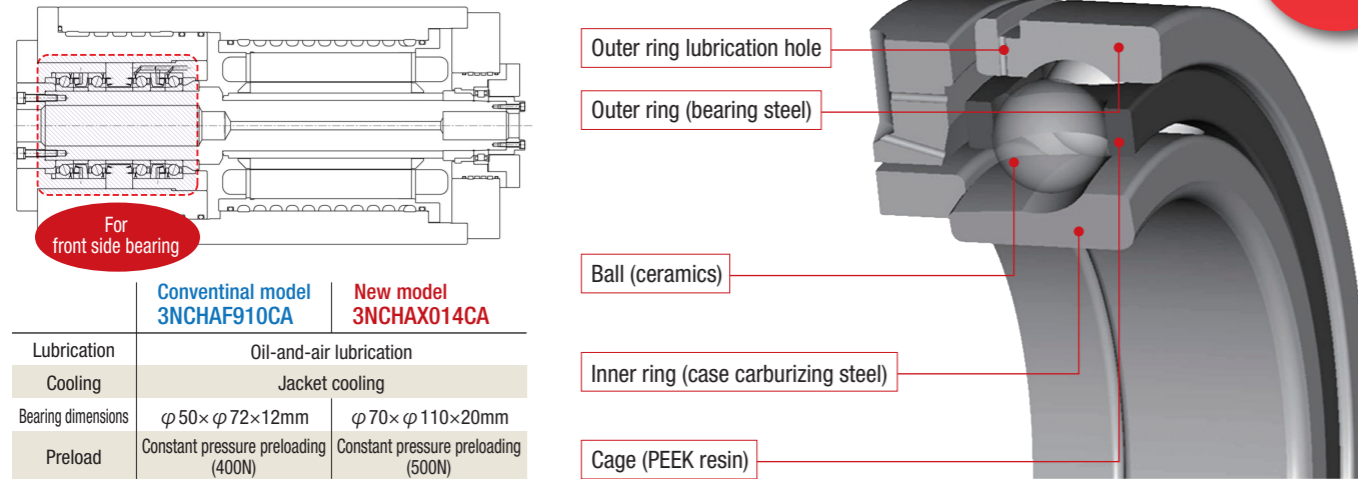
Changes in Spindle Technologies in Response to Market Needs



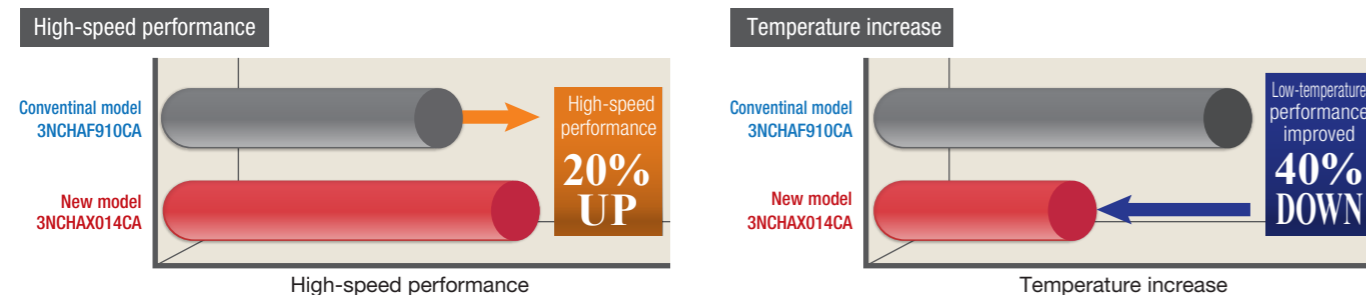
High-ability **NX Series** Extremely Ultrahigh-speed Angular Contact Ball Bearings

Four million of value $d_m n$ is realized by oil-and-air lubrication

New Series



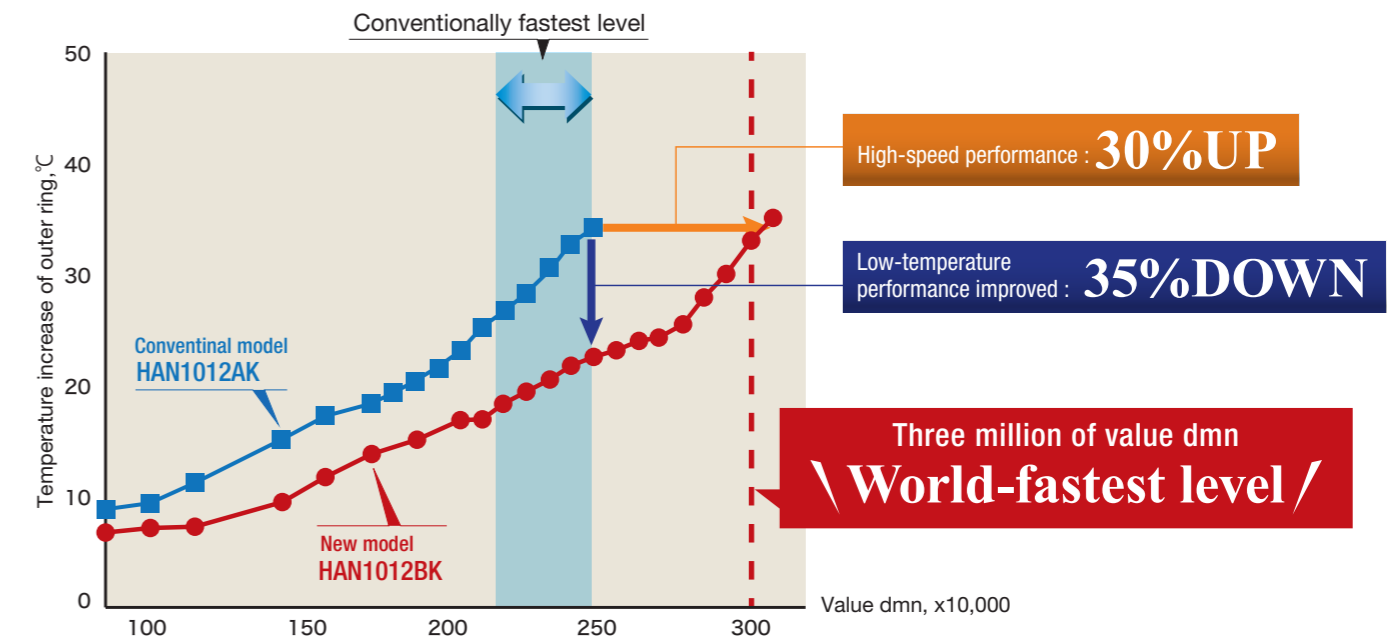
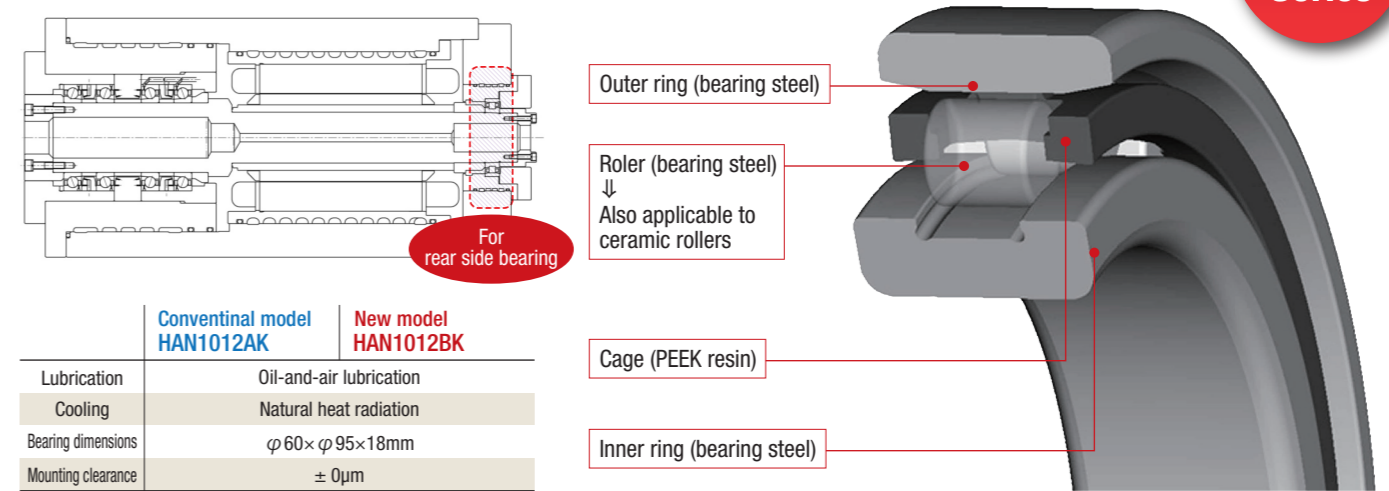
Enhanced performance by optimized designs of cage and bearing rings



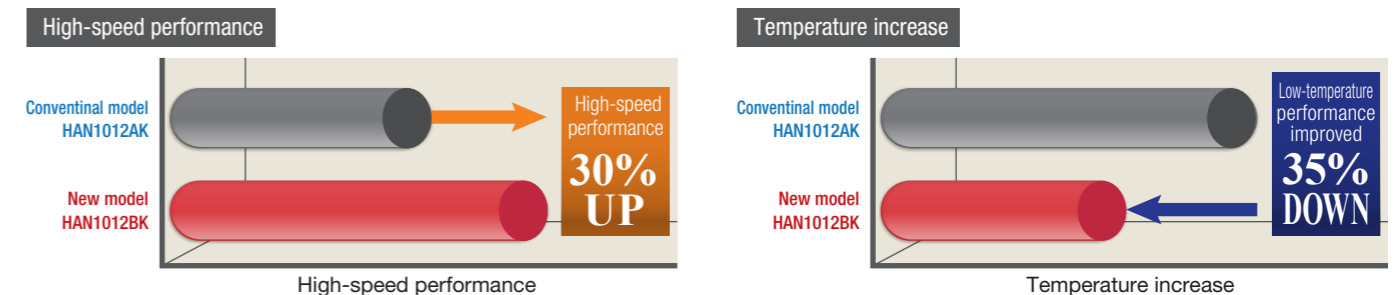
High-ability **NX Series** Ultrahigh-speed Cylindrical Roller Bearings

Three million of value $d_m n$ is realized by steel rollers and oil-and-air lubrication

New Series

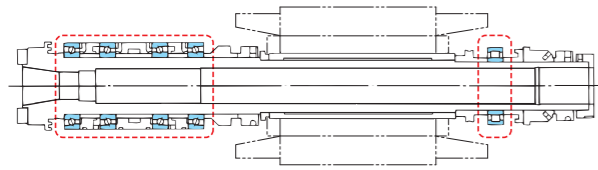


Enhanced performance by optimized cage design



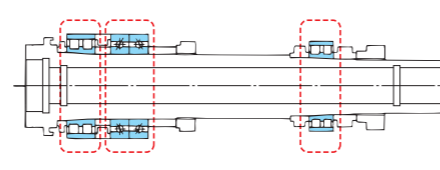
Bearings for spindle

Bearings for machining center spindle



Bearing type	Cross-section	Bearing series	Contact angle
Angular contact ball bearings	Standard type	79C 70C 72C	15°
		70 72	30°
	High-speed type	HAR9C HAROC	15°
		HAR9CA HAROCA	20°
		HAR9 HARO	30°
		3NCHAC9C 3NCHAC0C	15°
	Ultrain-high-speed type	3NCHAC9CA 3NCHAC0CA	20°
		3NCHAD0CA	20°
	Extremely ultrahigh-speed type	3NCHAX9CA	20°
		3NCHAX0CA	20°
N-series single-row cylindrical roller bearings	Standard type	N10 (K)	—
	Ultrain-high-speed type	HAN10B (K)	—

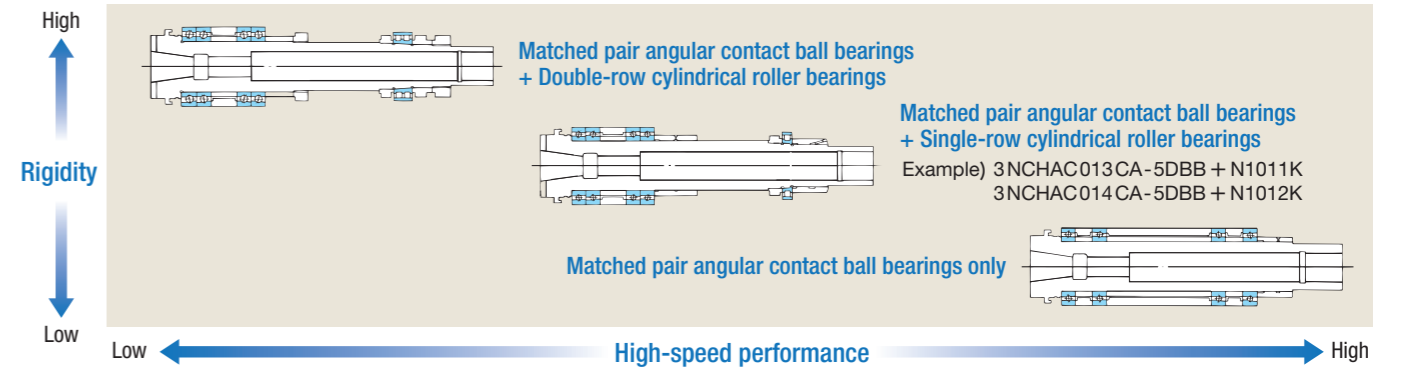
Bearings for lathe spindle



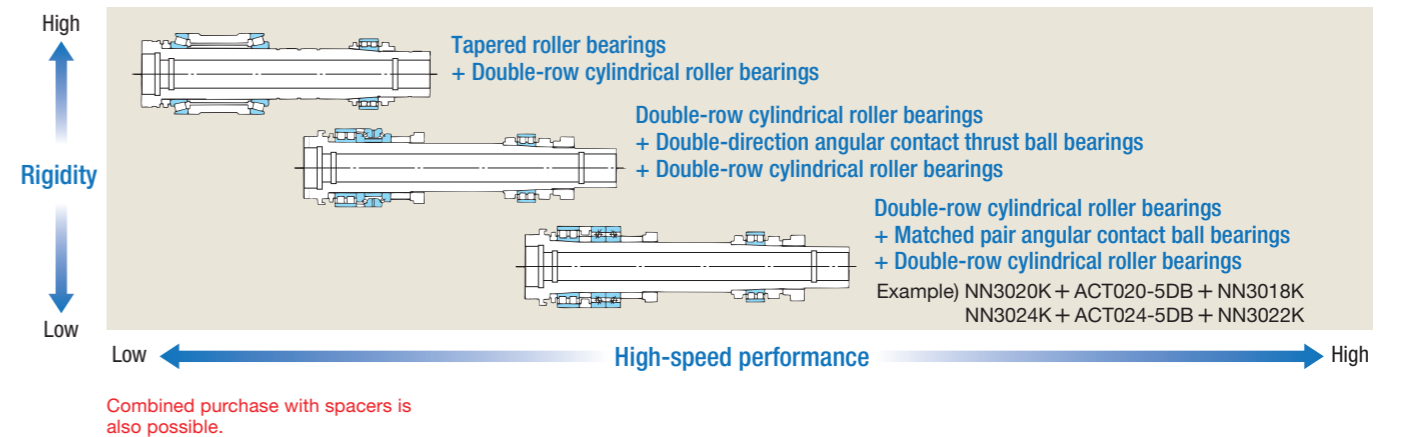
Bearing type	Cross-section	Bearing series	Contact angle
NN-series double-row cylindrical roller bearings		NN30 (K)	—
NNU-series double-row cylindrical roller bearings		NNU49 (K)	—
Double-direction angular contact thrust ball bearings		2344B 2347B 2394B 2397B	60°
High-speed matched pair angular contact bearings		ACT0DB ACT0BDB	30° 40°
Tapered roller bearings		329JR 320JR 302JR 322JR	Nominal contact angle Over 10° Under 17°

Examples of bearing arrangements

For machining centers

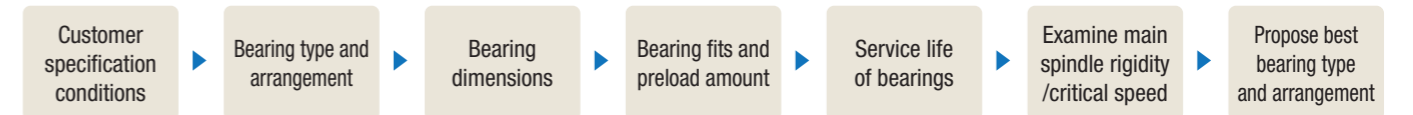


For lathes

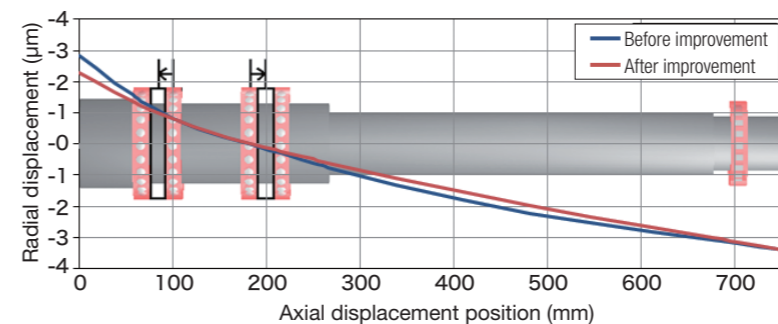


Example of technology examination

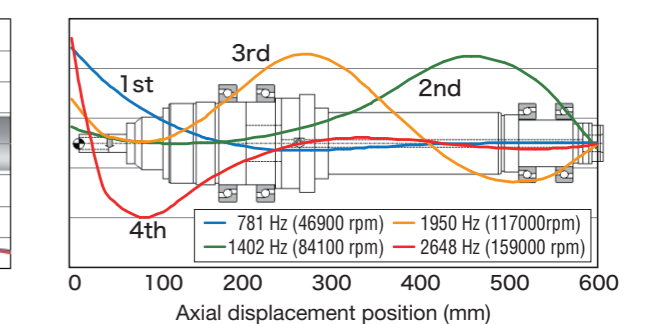
Examination flow



Calculation of entire spindle deformation



Spindle critical speed



Ball screw related products

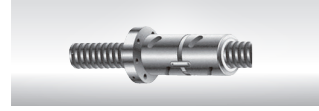
Ball screw

The following chart lists ball screws for support bearings.

● External ball circulation (standard)



○ Internal ball circulation (compact)



▲ Return-block type (compact/high load/high lead)



SAC2562B For $\phi 25$ shaft diameter

Ball screw shaft dia.	Lead						
	5	6	8	10	12	16	20
28	●○	●○	●○	●	●	●	
32	●○	●○	●○	●○	●	●	●
36	●○	●○	●○▲	●○▲	●▲	●	

SAC3062B For $\phi 30$ shaft diameter

Ball screw shaft dia.	Lead							
	5	6	8	10	12	16	20	25
32	●○	●○	●○	●○	●	●	●	
36	●○	●○	●○▲	●○▲	●▲	●		
40	●○	●○	●○	●○▲	●	●	●▲	●

SAC3572B For $\phi 35$ shaft diameter

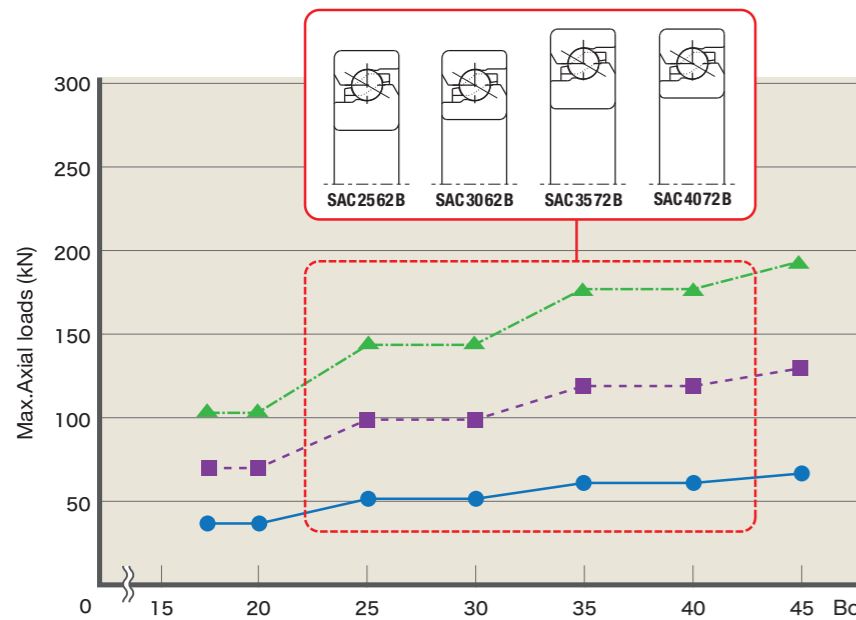
Ball screw shaft dia.	Lead							
	5	6	8	10	12	16	20	25
40	●○	●○	●○	●○▲	●	●	●▲	●
45	●○	●○	●○	●○	●	●	●▲	
50	●○	●○	●○	●○▲	●○	●○▲	●▲	●

SAC4072B For $\phi 40$ shaft diameter

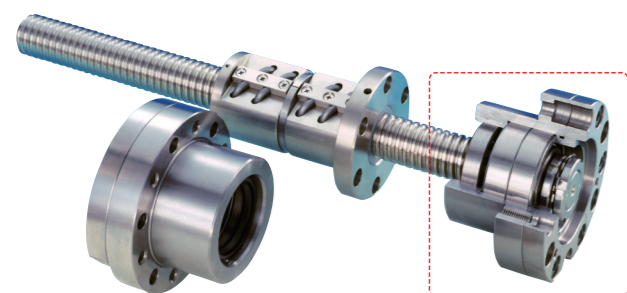
Ball screw shaft dia.	Lead							
	5	6	8	10	12	16	20	25
45	●○	●○	●○	●○	●	●	●▲	
50	●○	●○	●○	●○▲	●○	●○▲	●▲	●

Ball screw support bearings (SAC series) / Ball screw support unit (BSU series)

Ball screw support bearing selection chart



Number of rows to receive axial load	Sample combination (arrow indicates direction of load.)
Triple row	
Double row	
Single row	



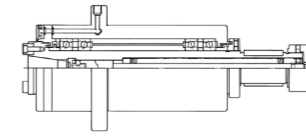
Bearing type	Cross-section	Bearing series	Contact angle
Precision ball screw support bearings	Double-seal type Single-seal type	SAC	60°
Precision ball screw support bearing unit		BSU	(60°)

Spindle unit products

For machining centers

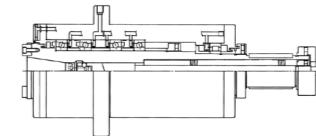


NT30
standard/high-speed type



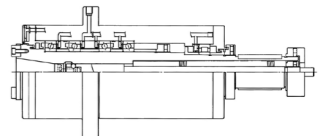
Limiting speed : 16,000 min⁻¹
Lubrication method : Grease
Drive method : Belt

NT40
standard/high-speed type



Limiting speed : 10,000~16,000 min⁻¹
Lubrication method : Grease or oil-air
Drive method : Belt or built-in

NT50
standard/high-speed type



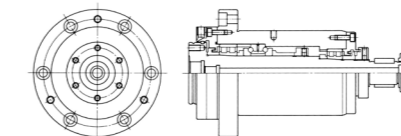
Limiting speed : 6,000~11,000 min⁻¹
Lubrication method : Grease or oil-air
Drive method : Belt or built-in

Please contact JTEKT for details regarding the machining center spindle unit.

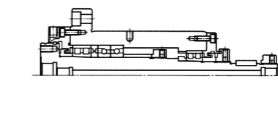
For lathes



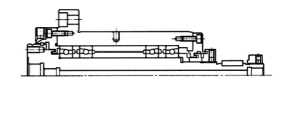
SPM 100CA



SPM 100CB

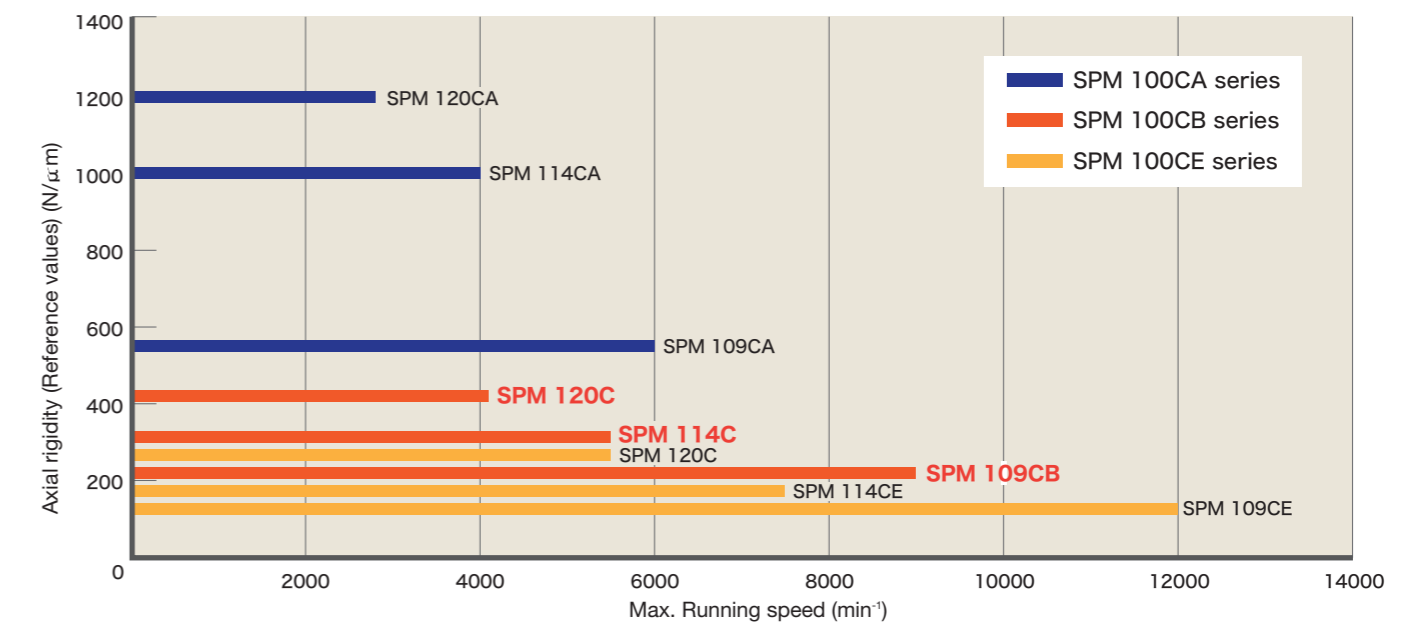


SPM 100CE

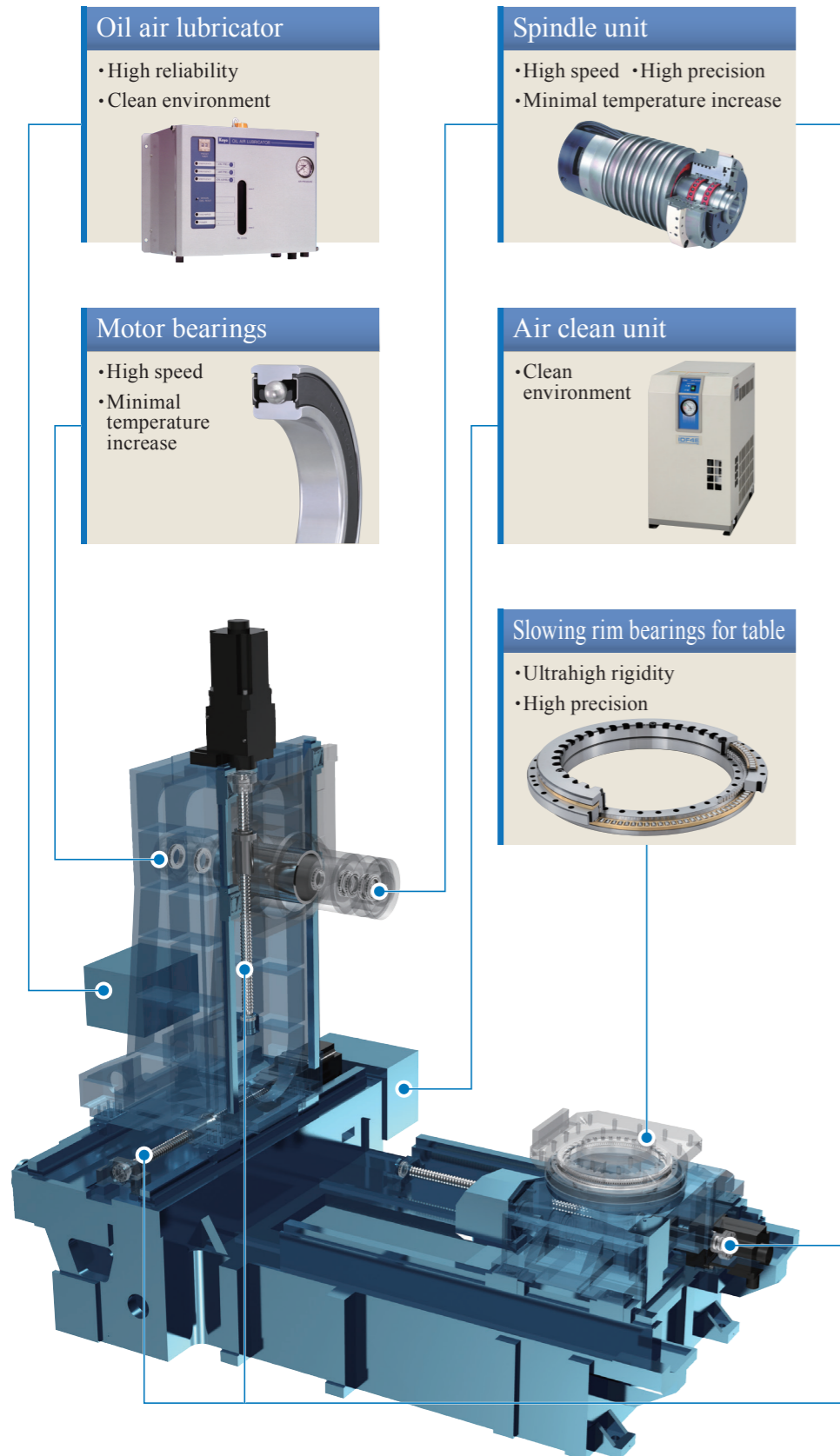


	SPM 100CA			SPM 100CB			SPM 100CE		
Shaft diameter: mm	45	70	100	45	70	100	45	70	100
Limiting speed: min ⁻¹	6000	4000	2800	9000	5500	4100	12000	7500	5500
Lubrication method	Grease								
Drive method	Belt								

Example of rotational speed/rigidity range and spindle unit selection




Product line-up for machining centers



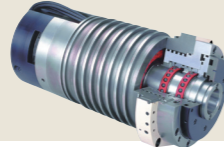
Oil air lubricator

- High reliability
- Clean environment




Spindle unit

- High speed • High precision
- Minimal temperature increase




Spindle bearings

- High speed • High precision
- Minimal temperature increase




Motor bearings

- High speed
- Minimal temperature increase



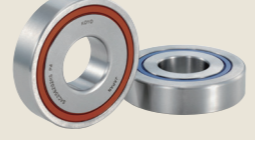
Air clean unit

- Clean environment



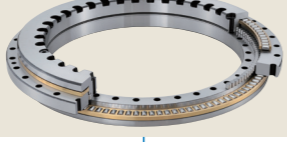
Ball screw support bearings

- High rigidity • High precision
- Long Life



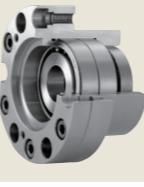
Slowing rim bearings for table

- Ultrahigh rigidity
- High precision



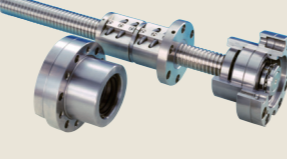
Ball screw support bearing unit

- Easy installation
- High rigidity
- High precision

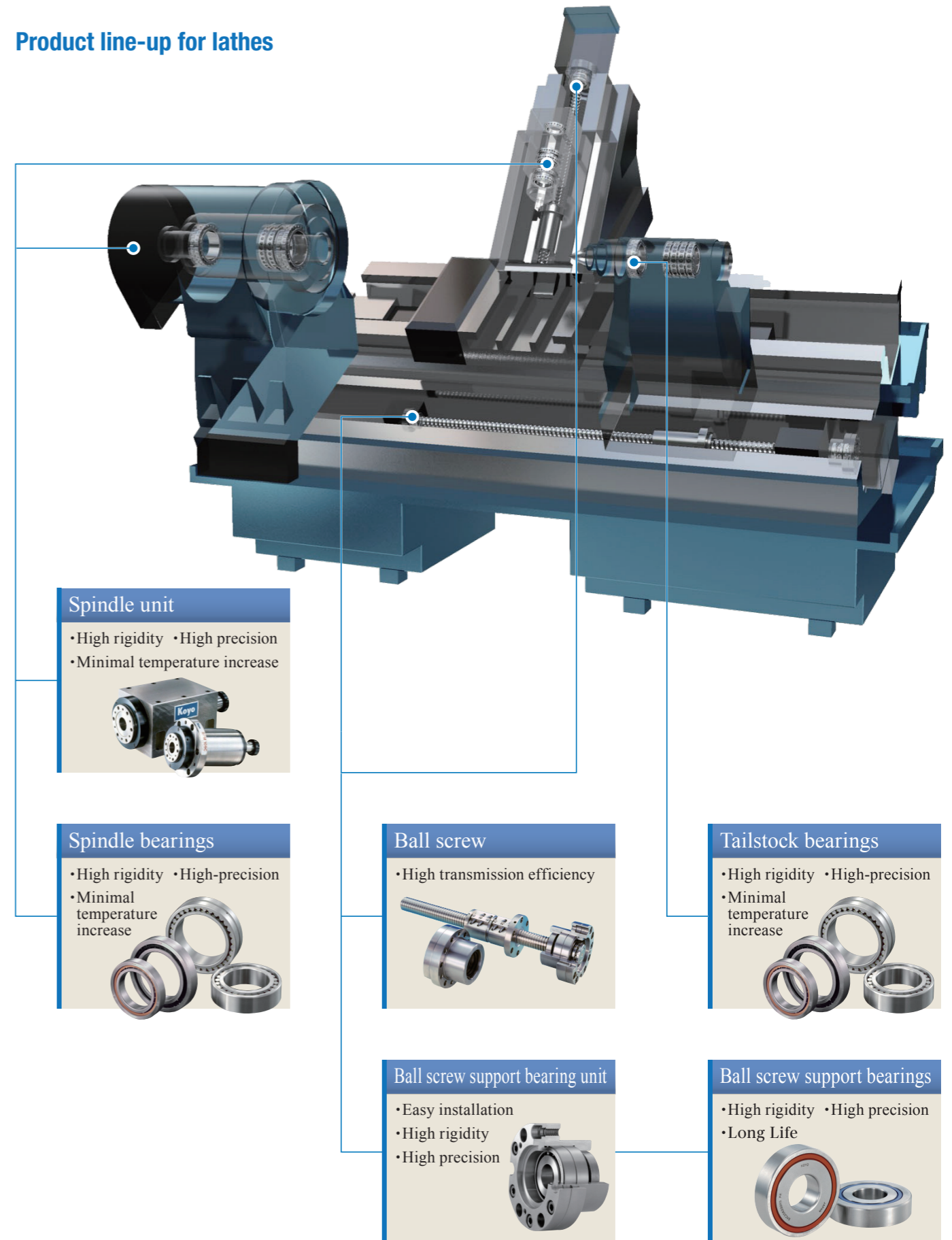


Ball screw

- High transmission efficiency




Product line-up for lathes




Spindle unit

- High rigidity • High precision
- Minimal temperature increase



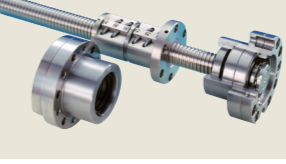
Spindle bearings

- High rigidity • High-precision
- Minimal temperature increase




Ball screw

- High transmission efficiency



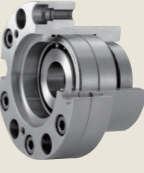
Tailstock bearings

- High rigidity • High-precision
- Minimal temperature increase



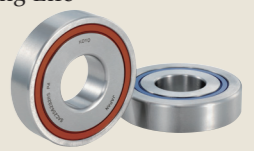
Ball screw support bearing unit

- Easy installation
- High rigidity
- High precision



Ball screw support bearings

- High rigidity • High precision
- Long Life



Please consult JTEKT for detailed information on products other than the main spindle bearings.

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