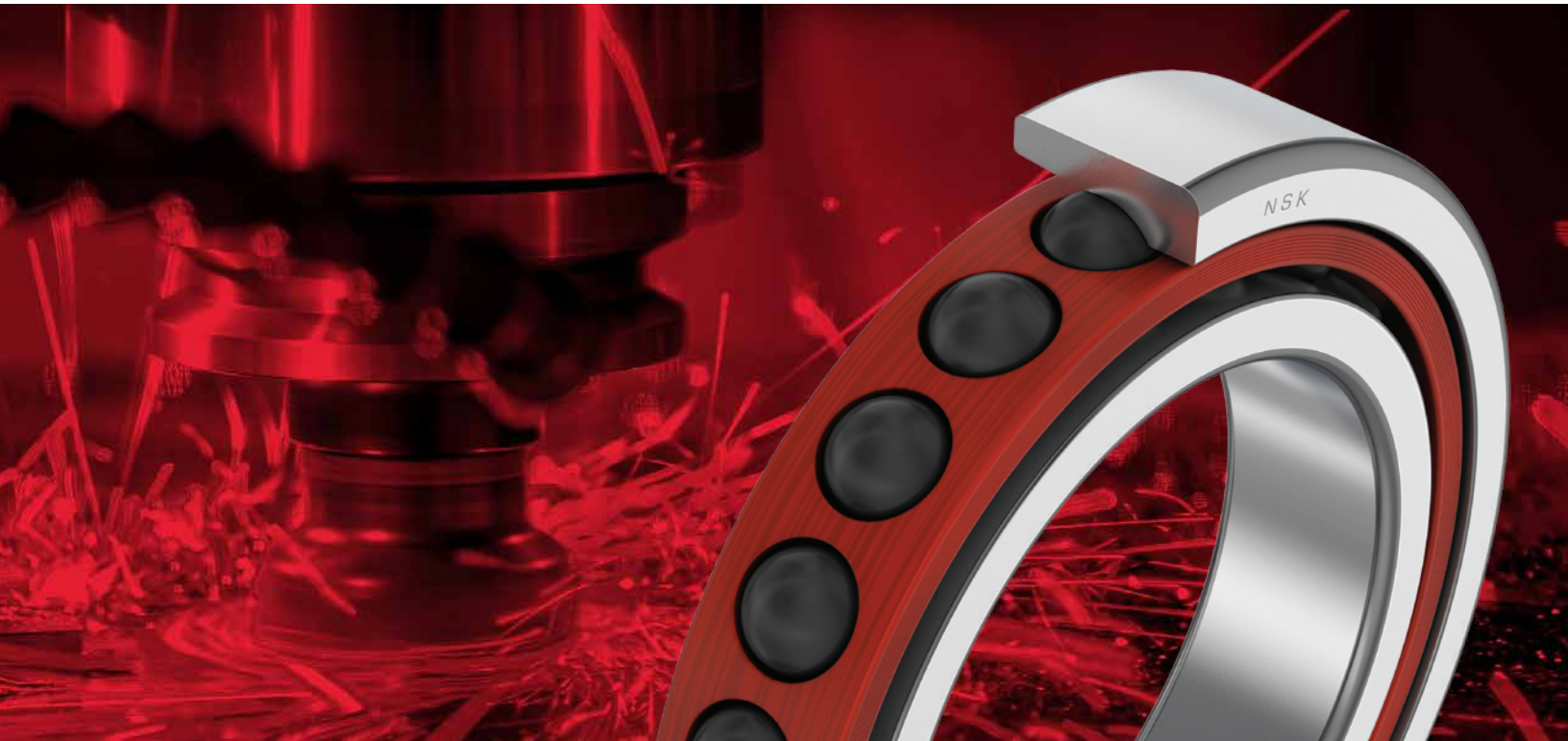


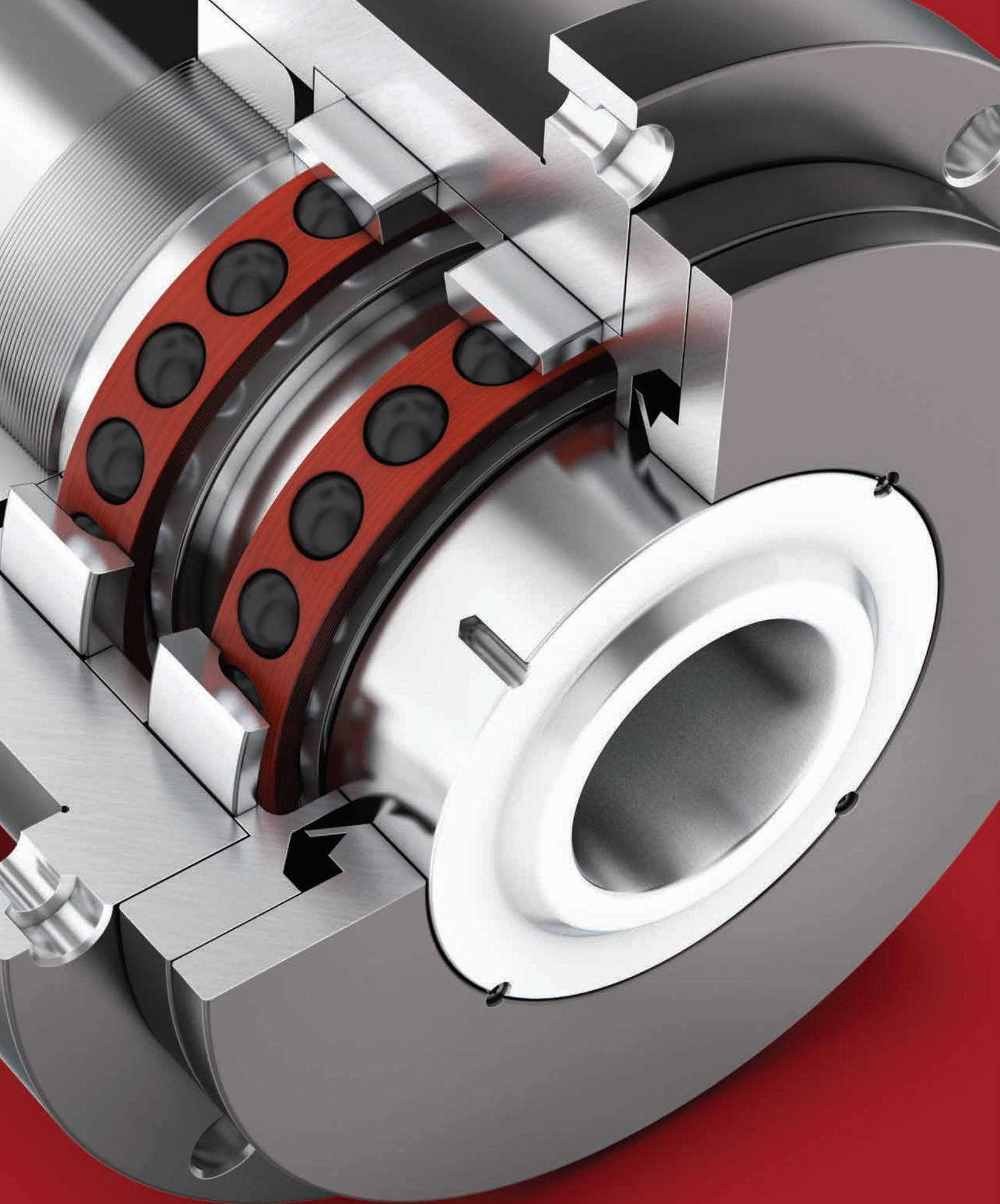
NSK

ROBUSTDYNA™ ANGULAR CONTACT BALL BEARINGS

HIGH LOAD CAPACITY AND ULTRA-HIGH SPEED FOR MACHINE TOOL SPINDLES



STAY IN MOTION. STAY IN CONTROL.



ENABLING HIGHLY VERSATILE, ULTRA-HIGH SPEED MACHINING

ROBUSTDYNA™ angular contact ball bearings are a crystallization of NSK prowess with material engineering and design optimization for machine tool bearings, excelling at both heavy cutting and ultra-high speed finishing.

With an optimized internal design that considerably expands their performance envelope, ROBUSTDYNA bearings support reduced machining time and stable operation over a longer operating life with:

- ➔ **Higher machining capacity** with maximum load capacity increased by 15% compared to NSKROBUST™ equivalents
- ➔ **Longer spindle life** with a 40% increase in dynamic load rating that extends bearing fatigue life as much as 3 times
- ➔ **Higher impact resistance** with higher static load ratings that reduce the risk of bearing damage
- ➔ **Ultra-high speed performance** with NSK's proprietary heat- and seizure-resistant SHX steel achieving limiting speeds as great as 3 million d_mN



HIGHER CAPACITY. HIGHER SPEED. LONGER OPERATING LIFE.

Built on the foundation of advanced material and analysis technologies behind NSK's proven ultra-high speed NSKROBUST lineup, ROBUSTDYNA angular contact ball bearings boast an optimized internal design to support heavy cutting of materials such as titanium alloys and ceramics with stability and durability. Without sacrifice to high-speed finishing capabilities.

For stable operation over a long operating life, ROBUSTDYNA bearings are available with long-life SHJ steel inner and outer rings. For superior heat resistance and utmost limiting speeds, SHX steel is available.



X-type
with heat-resistant
SHX steel



J-type
with long-life
SHJ steel



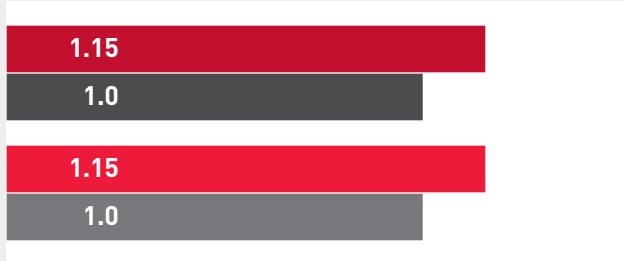
Left: ROBUSTDYNA with phenolic resin cage

Right: Sealed ROBUSTDYNA with polyamide resin cage

DESIGN FEATURES

- › **Optimized internal design** with larger sized rolling elements for increased load ratings
- › **Silicon nitride (Si_3N_4) ceramic balls** for outstanding speed and accuracy with low heat generation and high seizure resistance
- › **High-performance polyamide and phenolic resin cages** for stable, ultra-high speed operation
- › **J-type option with long-life SHJ steel rings** that deliver twice the fatigue life than standard SUJ2 bearing steel
- › **X-type option with heat-resistant SHX steel rings** that deliver 4 times longer fatigue life and 20% higher limiting speeds than standard SUJ2 bearing steel
- › **Non-contact seal option** prevents contamination and lubricant breakdown, extending grease life
- › **Optional oil-air lubrication features** for a continuous supply of lubrication to the bearing working surfaces
- › Available with 18° (BNRD type) and 25° (BERD type) contact angles

Load capacity, ROBUSTDYNA v. NSKROBUST



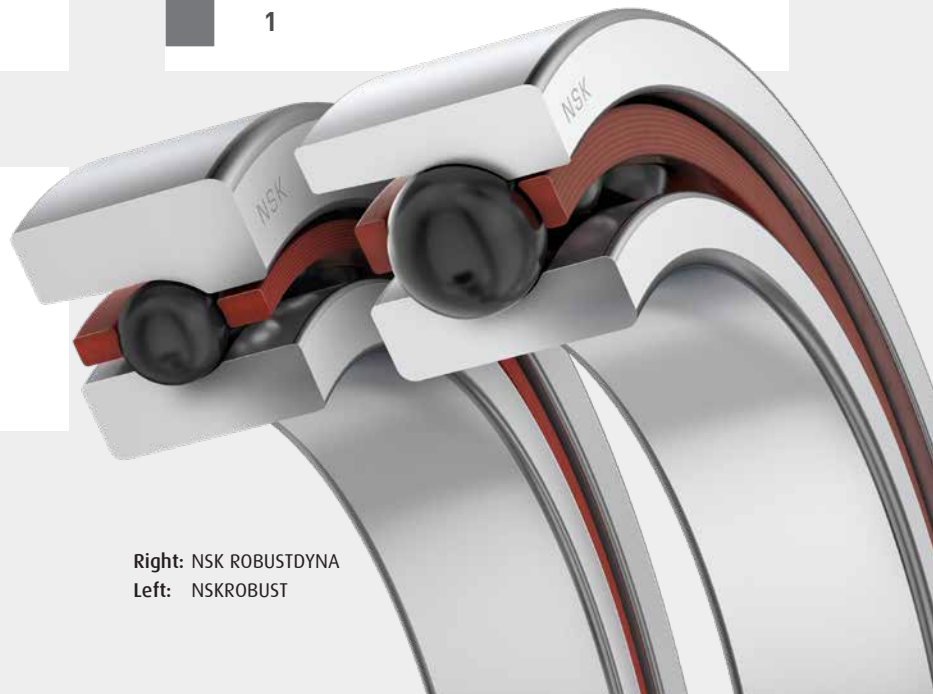
Rolling fatigue life, ROBUSTDYNA v. NSKROBUST



Limiting speed, ROBUSTDYNA v. NSKROBUST



- ROBUSTDYNA X-type SHX steel rings
- ROBUSTDYNA J-type SHJ steel rings
- NSKROBUST X-type SHX steel rings
- NSKROBUST H-type SUJ2 steel rings



Right: NSK ROBUSTDYNA
Left: NSKROBUST

ROBUSTDYNA types and design features

		Contact angle	BNRD	18° contact angle
			BERD	25° contact angle
		Type / material	J	SHJ steel rings with ceramic balls
			X	SHX steel rings with ceramic balls
XE	SHX steel rings with ceramic balls, Spinshot II type			
		Seal option	non-contact V1V seal	
		Lubrication feature option	outer ring lubrication groove, holes	
Open	Sealed	Direct lube	Spinshot™ II	

DESIGNATION SYSTEM

ROBUSTDYNA ANGULAR CONTACT BALL BEARINGS

Nominal Bore Diameter	Dimension Series		Cage	Closure	Arrangement		Accuracy	
70	BNRD	10	X	TR	E34	SU	EL	P4Y +Y3
Type - Contact Angle		Type - Materials		Lubrication Feature		Preload		Accessories

DESIGNATION	ATTRIBUTE	
Nominal bore diameter		expressed in millimeters
Type - contact angle	BNRD	18° contact angle
	BERD	25° contact angle
Dimension series	10	10 series
Type - materials	J	SHJ steel rings with ceramic balls
	X	SHX steel rings with ceramic balls
	XE	SHX steel rings with ceramic balls, Spinshot II type
Cage	TYN	ball guided, polyamide resin
	TR	outer ring guided, phenolic resin
Closure	blank	open bearing
	V1V	non-contact rubber seal
Arrangement	SU	single row, universal matching
	DU	double row, universal matching
	DUD	three row, universal matching
	QU	four row, universal matching

DESIGNATION	ATTRIBUTE	
Lubrication feature	blank	no lubrication features
	E34	outer ring lubrication groove, holes and 2 o-ring grooves
Preload	EL	extra-light preload
	L	light preload
Accuracy	P2	ISO class 2
	P3	dimensional accuracy ISO class 4, running accuracy ISO class 2
	P4	ISO class 4
	P4Y	special dimensional accuracy with running accuracy ISO class 4
Accessories	blank	standard outer ring
	+Y3	2 x o-rings mounted on the outer ring

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