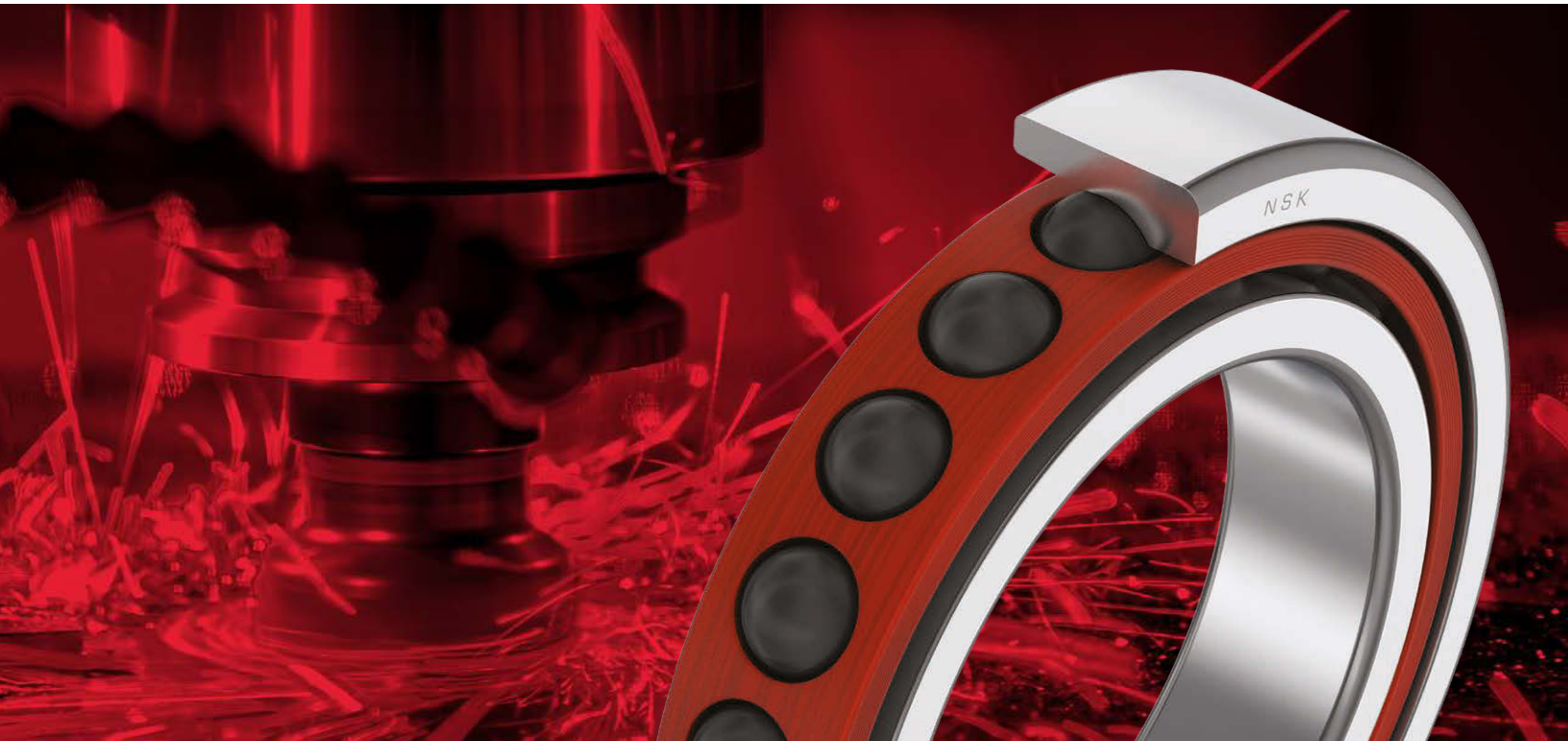


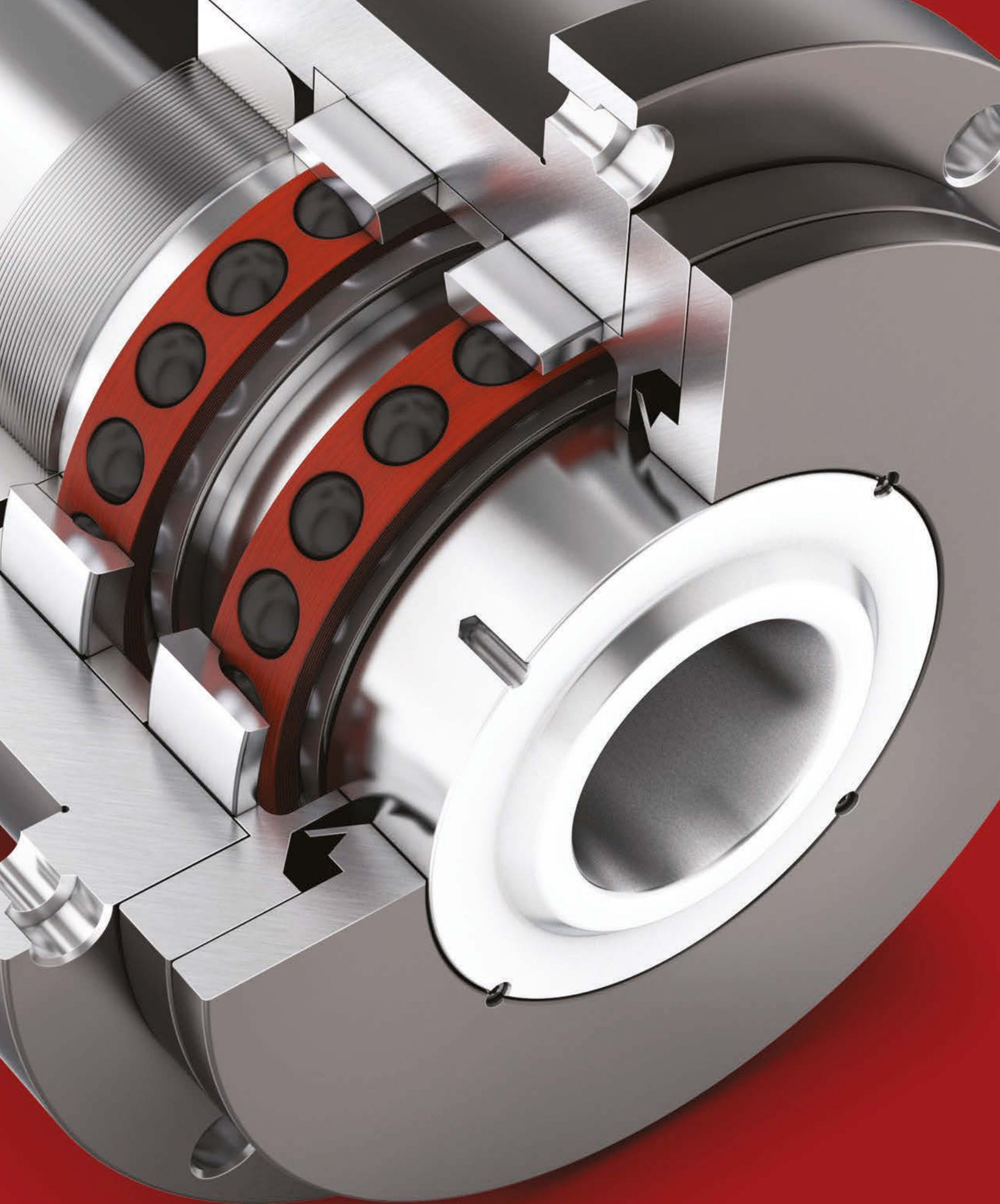
**NSK**

**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 ( $\text{Si}_3\text{N}_4$ ) 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
- NSKROBUST X-type SHX steel rings
- ROBUSTDYNA J-type SHJ 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	
<b>70</b>	<b>BNRD</b>	<b>10</b>	<b>X</b>	<b>TR</b>	<b>E34</b>	<b>SU</b>	<b>EL</b>	<b>P4Y</b> <b>+Y3</b>
Type - Contact Angle	Type - Materials		Lubrication Feature		Preload		Accessories	

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

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

**NSK**



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