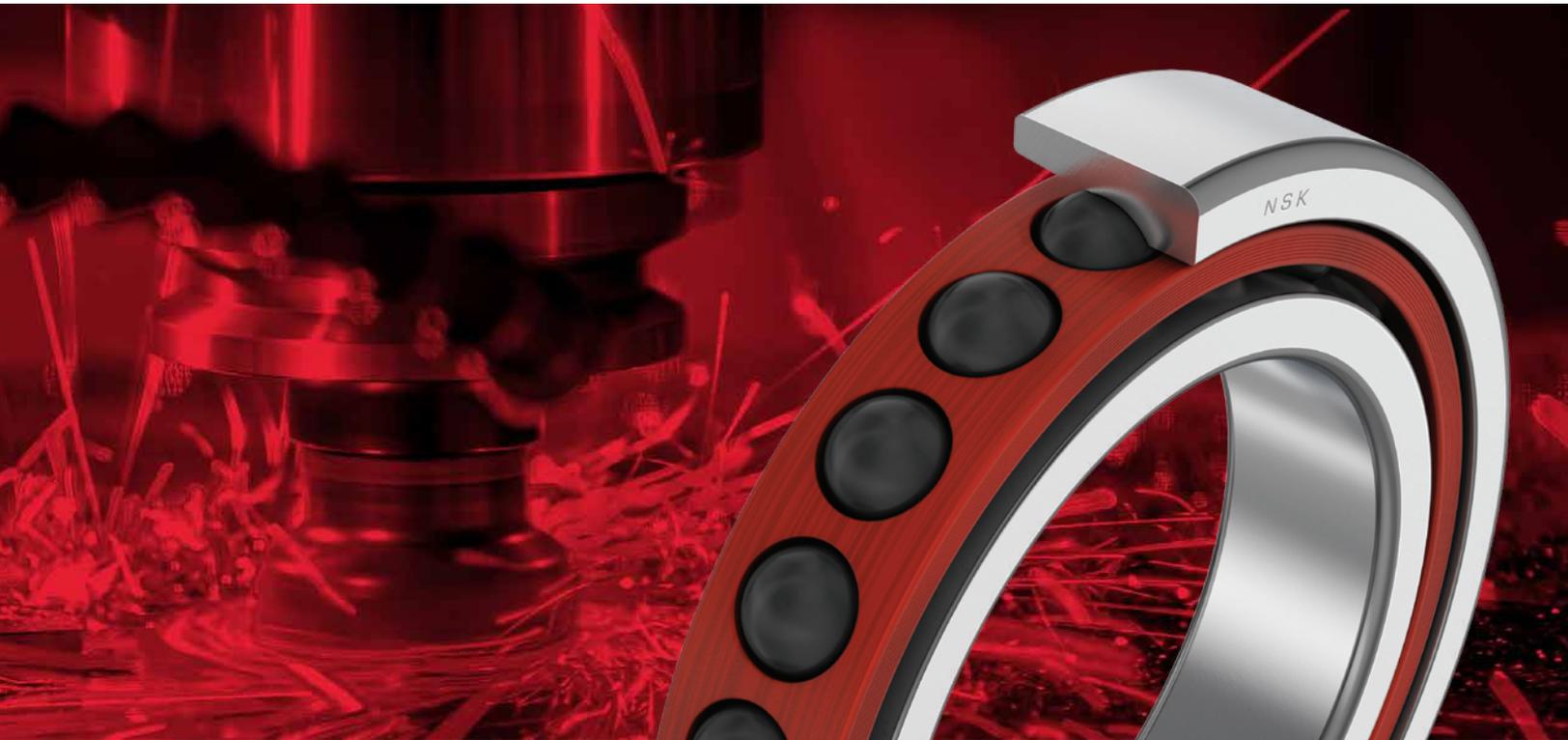


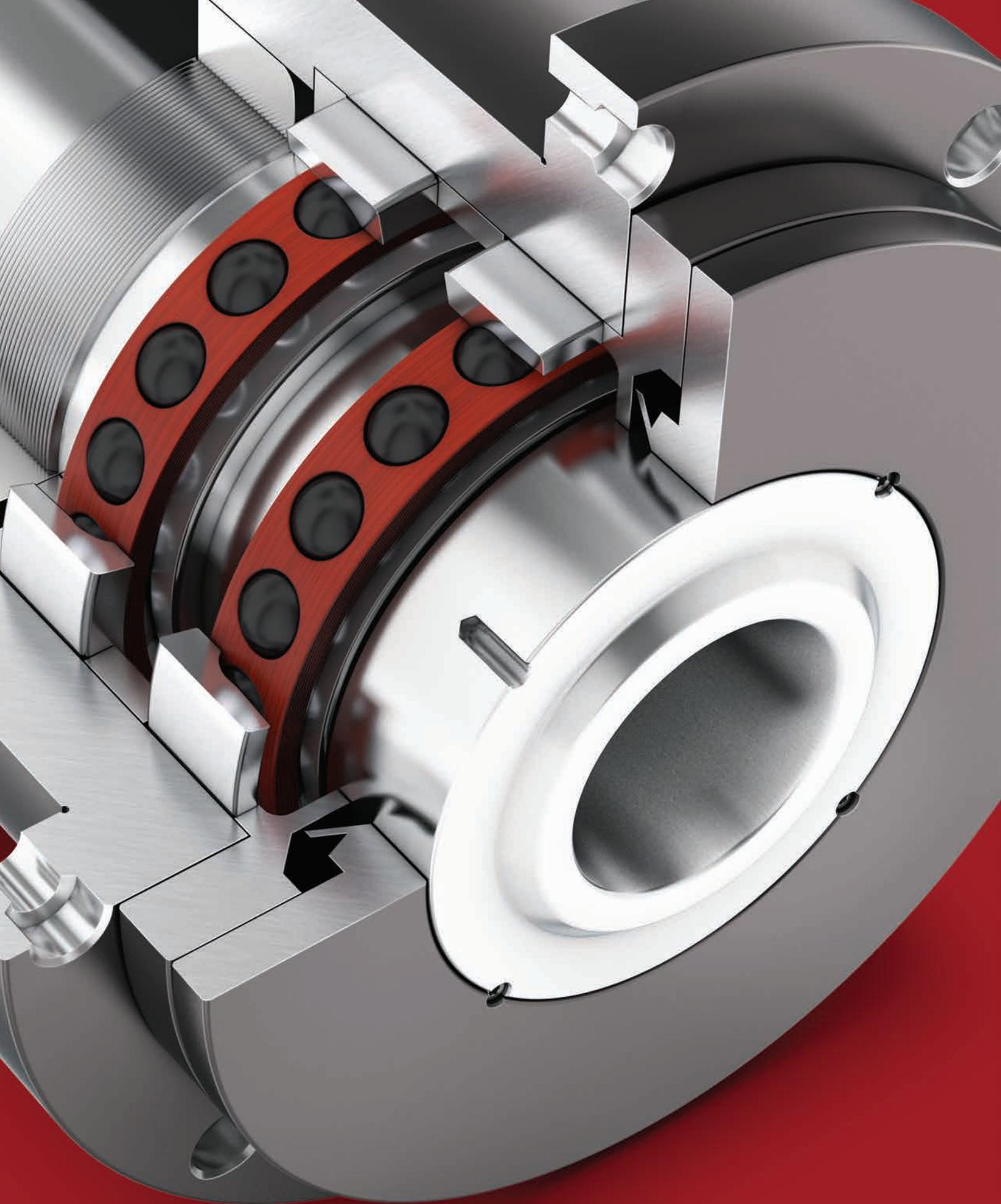
NSK

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



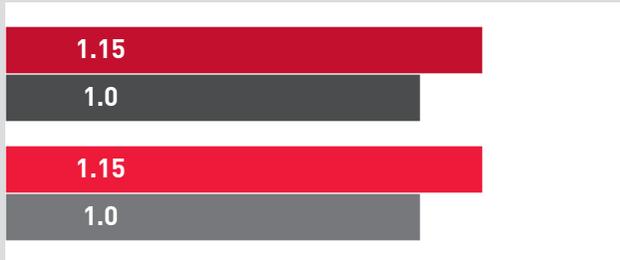
Left: ROBUSTDYNA with phenolic resin cage

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 of 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



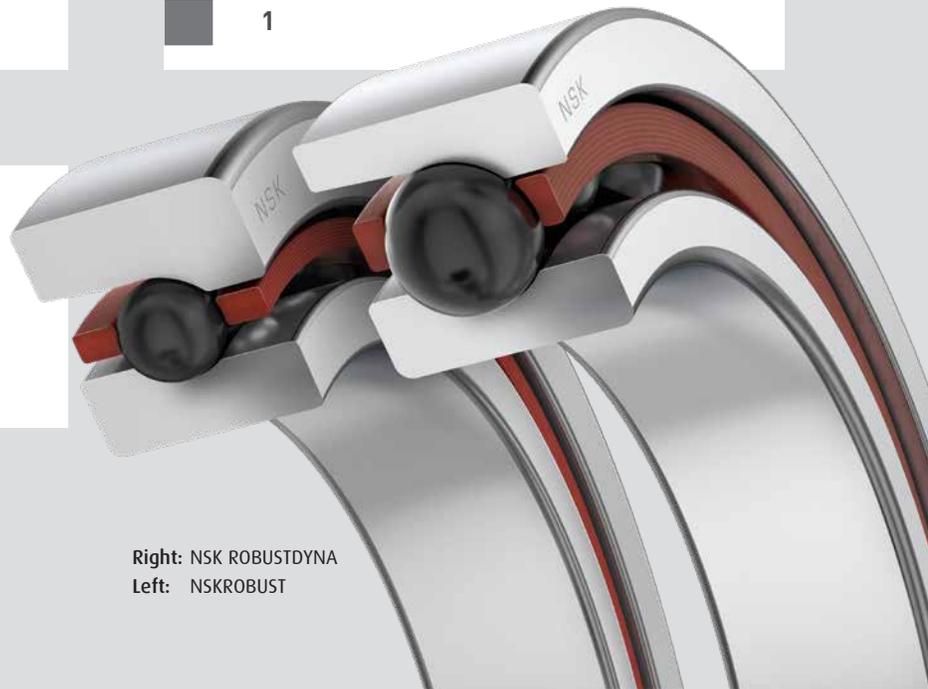
Rolling fatigue life, ROBUSTDYNA v. NSKROBUST



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



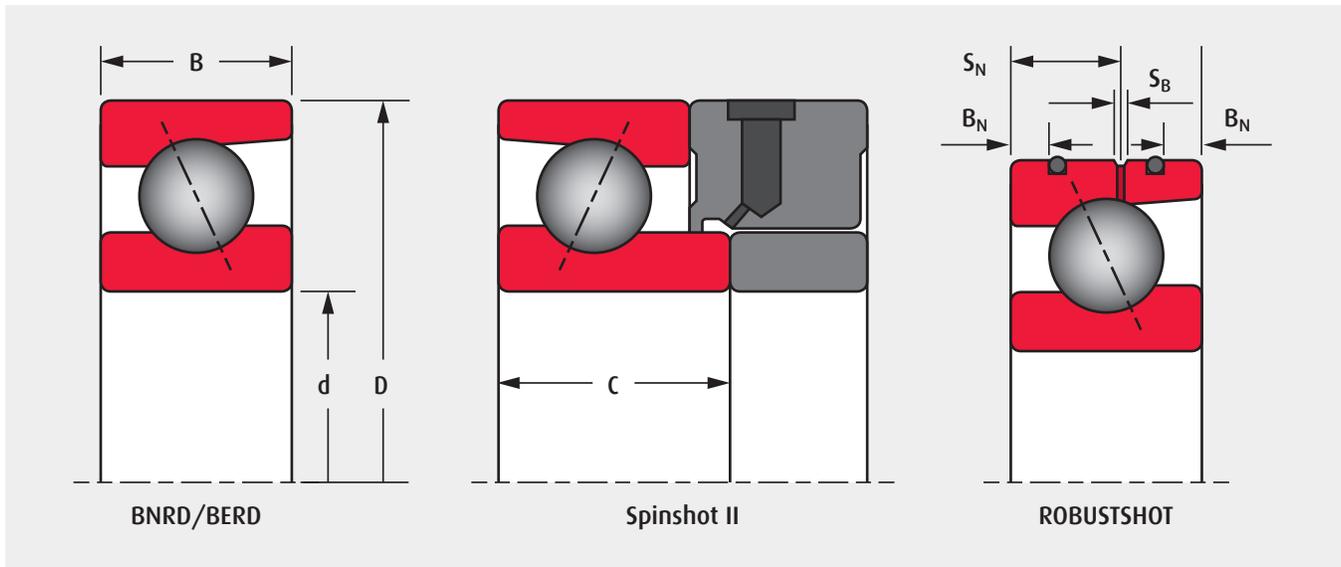
Right: NSK ROBUSTDYNA
Left: NSKROBUST

Design Variants and Features

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

BEARING DIMENSIONS AND OPERATING VALUES

BORE DIAMETER: 40 - 75 MM

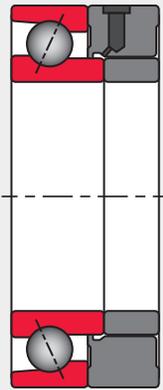


BOUNDARY DIMENSIONS							BASIC BEARING No.	CONTACT ANGLE °	BASIC LOAD RATINGS		PERMISSIBLE AXIAL LOAD	LIMITING SPEED, min ⁻¹		
mm									N			N	Grease	Oil
d	D	B	C	B _N	S _N	S _B			Dynamic	Static				
40	68	15	--	2.8	8.8	1.4	40BNRD10J	18	22 600	8 000	7 700	33 400	51 900	
	68	15	20	2.8	8.8	1.4	40BNRD10X	18	28 500	8 000	7 700	38 900	61 200	
	68	15	--	2.8	8.8	1.4	40BERD10J	25	21 800	7 700	9 450	29 700	46 300	
	68	15	20	2.8	8.8	1.4	40BERD10X	25	27 400	7 700	9 450	35 200	55 600	
45	75	16	--	3.4	9.3	1.4	45BNRD10J	18	26 900	9 750	9 400	30 000	46 700	
	75	16	21	3.4	9.3	1.4	45BNRD10X	18	34 000	9 750	9 400	35 000	55 000	
	75	16	--	3.4	9.3	1.4	45BERD10J	25	25 900	9 350	11 500	26 700	41 700	
	75	16	21	3.4	9.3	1.4	45BERD10X	25	32 500	9 350	11 500	31 700	50 000	
50	80	16	--	3.4	9.3	1.4	50BNRD10J	18	28 700	11 100	10 700	27 700	43 100	
	80	16	21	3.4	9.3	1.4	50BNRD10X	18	36 000	11 100	10 700	32 400	50 800	
	80	16	--	3.4	9.3	1.4	50BERD10J	25	27 600	10 600	13 100	24 700	38 500	
	80	16	21	3.4	9.3	1.4	50BERD10X	25	35 000	10 600	13 100	29 300	46 200	
55	90	18	--	4.3	10	1.4	55BNRD10J	18	37 500	14 500	13 900	24 900	38 700	
	90	18	23	4.3	10	1.4	55BNRD10X	18	47 500	14 500	13 900	29 000	45 600	
	90	18	--	4.3	10	1.4	55BERD10J	25	36 000	13 900	17 100	22 100	34 500	
	90	18	23	4.3	10	1.4	55BERD10X	25	45 500	13 900	17 100	26 300	41 400	

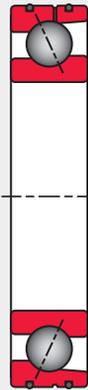
All types and sizes are available with V1V non-contact seals.



BNRD/BERD



Spinshot II

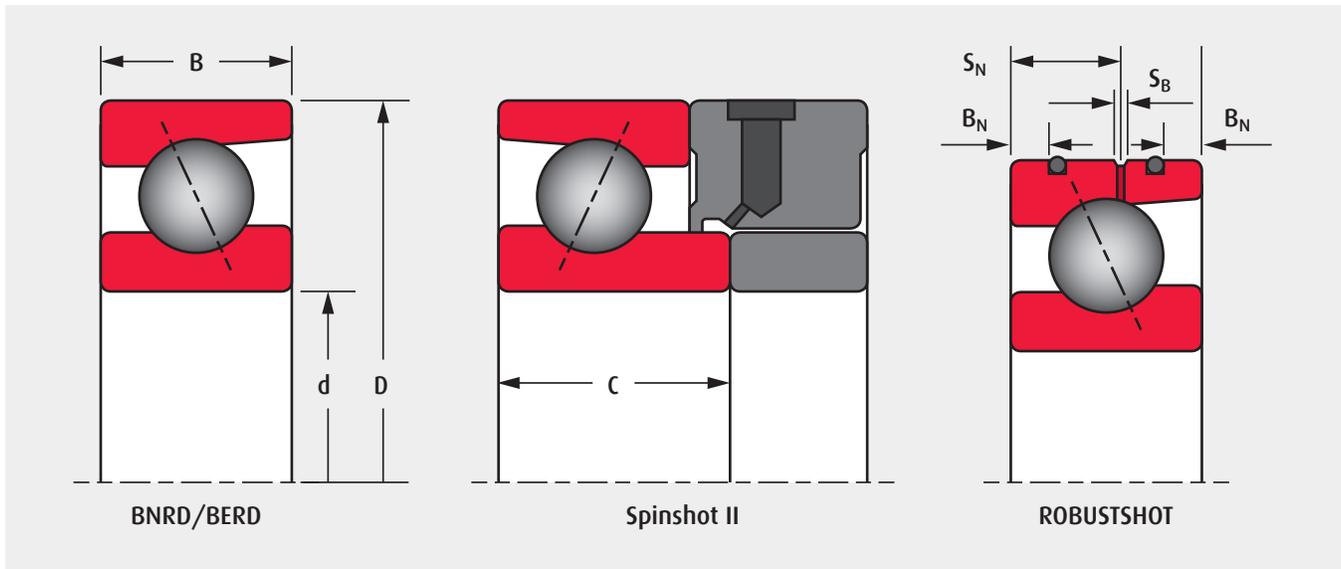


ROBUSTSHOT

BOUNDARY DIMENSIONS							BASIC BEARING No.	CONTACT ANGLE °	BASIC LOAD RATINGS		PERMISSIBLE AXIAL LOAD	LIMITING SPEED, min ⁻¹		
mm									N			N	Grease	Oil
d	D	B	C	B _N	S _N	S _B			Dynamic	Static				
60	95	18	--	4.3	10	1.4	60BNRD10J	18	39 000	15 500	14 900	23 300	36 200	
	95	18	23	4.3	10	1.4	60BNRD10X	18	49 000	15 500	14 900	27 100	42 600	
	95	18	--	4.3	10	1.4	60BERD10J	25	37 500	14 900	18 300	20 700	32 300	
	95	18	23	4.3	10	1.4	60BERD10X	25	47 000	14 900	18 300	24 600	38 800	
65	100	18	--	4	10.4	1.4	65BNRD10J	18	41 000	17 300	16 700	21 900	34 000	
	100	18	23	4	10.4	1.4	65BNRD10X	18	52 000	17 300	16 700	25 500	40 000	
	100	18	--	4	10.4	1.4	65BERD10J	25	39 500	16 700	20 500	19 400	30 400	
	100	18	23	4	10.4	1.4	65BERD10X	25	50 000	16 700	20 500	23 100	36 400	
70	110	20	--	4	11.6	1.4	70BNRD10J	18	52 000	21 800	21 100	20 000	31 200	
	110	20	25	4	11.6	1.4	70BNRD10X	18	65 500	21 800	21 100	23 400	36 700	
	110	20	--	4	11.6	1.4	70BERD10J	25	50 000	20 900	25 900	17 800	27 800	
	110	20	25	4	11.6	1.4	70BERD10X	25	63 000	20 900	25 900	21 200	33 400	
75	115	20	--	4	11.6	1.4	75BNRD10J	18	53 500	23 100	22 400	19 000	29 500	
	115	20	27	4	11.6	1.4	75BNRD10X	18	67 000	23 100	22 400	22 200	34 800	
	115	20	--	4	11.6	1.4	75BERD10J	25	51 500	22 200	27 400	16 900	26 400	
	115	20	27	4	11.6	1.4	75BERD10X	25	64 500	22 200	27 400	20 000	31 600	

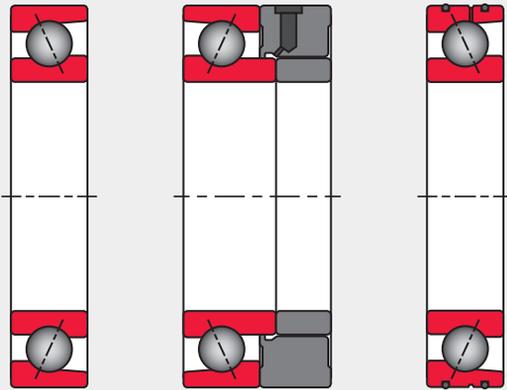
BEARING DIMENSIONS AND OPERATING VALUES

BORE DIAMETER: 80 - 110 MM



BOUNDARY DIMENSIONS							BASIC BEARING No.	CONTACT ANGLE °	BASIC LOAD RATINGS		PERMISSIBLE AXIAL LOAD	LIMITING SPEED, min ⁻¹		
mm									N			N	Grease	Oil
d	D	B	C	B _N	S _N	S _B			Dynamic	Static				
80	125	22	--	4.7	12.2	2.2	80BNRD10J	18	65 000	28 000	27 300	17 600	27 400	
	125	22	27	4.7	12.2	2.2	80BNRD10X	18	82 000	28 000	27 300	20 500	32 200	
	125	22	--	4.7	12.2	2.2	80BERD10J	25	62 500	27 000	33 500	15 700	24 400	
	125	22	27	4.7	12.2	2.2	80BERD10X	25	79 000	27 000	33 500	18 600	29 300	
85	130	22	--	4.7	12.2	2.2	85BNRD10J	18	67 000	29 700	28 900	16 800	26 100	
	130	22	27	4.7	12.2	2.2	85BNRD10X	18	84 500	29 700	28 900	19 600	30 700	
	130	22	--	4.7	12.2	2.2	85BERD10J	25	64 500	28 500	35 500	14 900	23 300	
	130	22	27	4.7	12.2	2.2	85BERD10X	25	81 000	28 500	35 500	17 700	28 000	
90	140	24	--	5.5	14.5	2.2	90BNRD10J	18	79 500	35 000	34 000	15 700	24 400	
	140	24	29	5.5	14.5	2.2	90BNRD10X	18	100 000	35 000	34 000	18 300	28 700	
	140	24	--	5.5	14.5	2.2	90BERD10J	25	76 500	33 500	41 500	14 000	21 800	
	140	24	29	5.5	14.5	2.2	90BERD10X	25	96 500	33 500	41 500	16 600	26 100	

All types and sizes are available with V1V non-contact seals.



BNRD/BERD

Spinshot II

ROBUSTSHOT

BOUNDARY DIMENSIONS							BASIC BEARING No.	CONTACT ANGLE °	BASIC LOAD RATINGS		PERMISSIBLE AXIAL LOAD	LIMITING SPEED, min ⁻¹	
mm									N			N	Grease Oil
d	D	B	C	B _N	S _N	S _B			Dynamic	Static			
100	150	24	--	5.5	14.5	2.2	100BNRD10J	18	84 000	39 000	38 000	14 400	22 400
	150	24	29	5.5	14.5	2.2	100BNRD10X	18	106 000	39 000	38 000	16 800	26 400
	150	24	--	5.5	14.5	2.2	100BERD10J	25	80 500	37 500	46 500	12 800	20 000
	150	24	29	5.5	14.5	2.2	100BERD10X	25	102 000	37 500	46 500	15 200	24 000
110	170	28	--	--	--	--	110BNRD10J	18	118 000	53 000	51 000	12 900	20 000
	170	28	--	6	16.2	2.2	110BNRD10X	18	148 000	53 000	51 000	15 000	23 600
	170	28	--	--	--	--	110BERD10J	25	113 000	51 000	63 000	11 500	17 900
	170	28	--	6	16.2	2.2	110BERD10X	25	142 000	51 000	63 000	13 600	21 500

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 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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