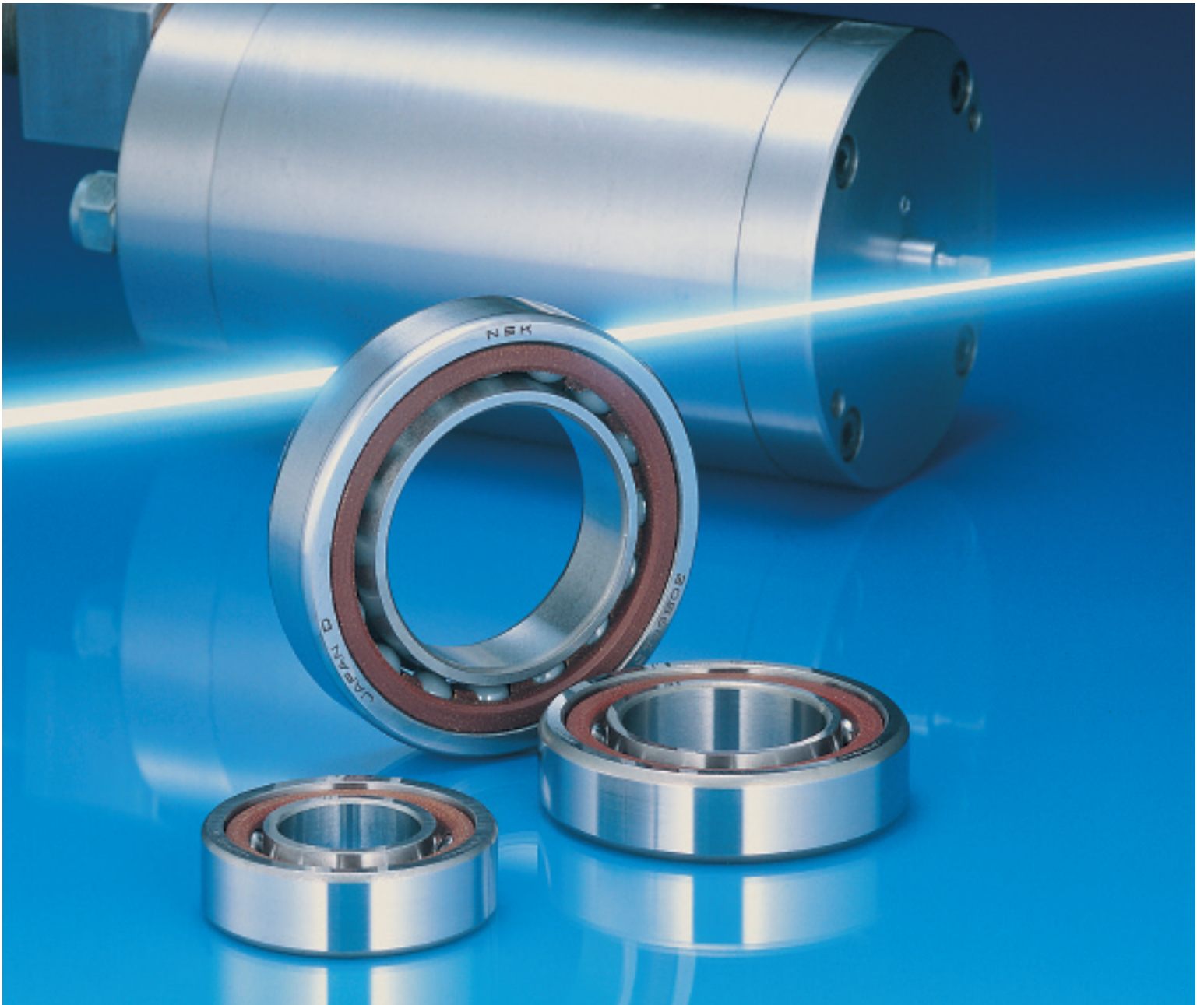


# BGR Series High Speed Super Precision Angular Contact Ball Bearings for High Speed Internal Grinders

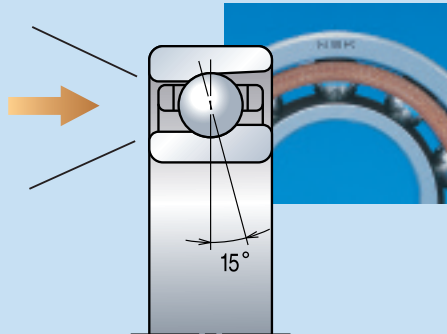
The new NSK BGR series is specially designed for internal grinders where high accuracy and high speed are critical. The BGR series enables solid and efficient grinding under oil-mist or oil-air lubrication.



## Features of BGR Series angular contact ball bearings

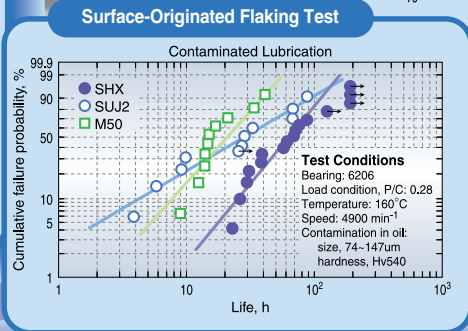
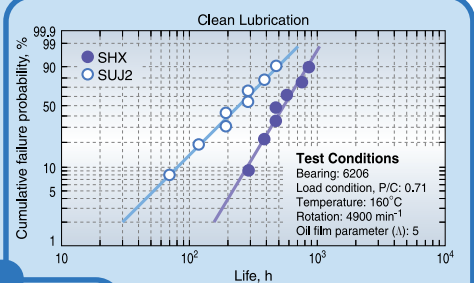
### Optimal Design

The outer ring guided phenolic cage is ideal for this application. In addition, the counter-bore inner ring design allows for more efficient oil delivery to the bearing.



### Longer Life

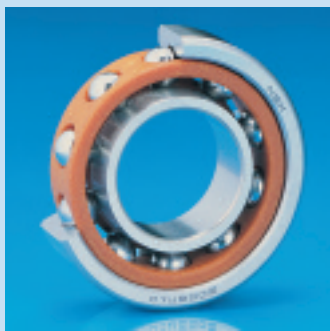
Special long-life materials (SHX) and ceramic balls combine to extend bearing life.



### Bearing Fatigue Life Test

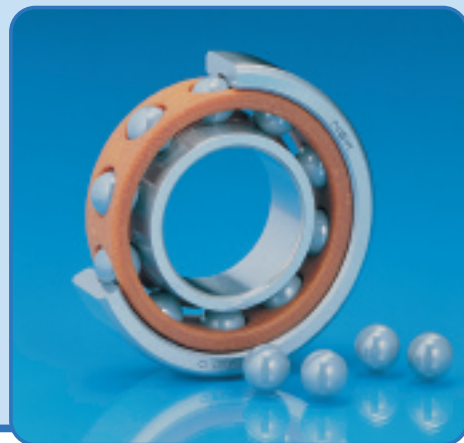
### Ease of Assembly

The non-separable inner ring design makes spindle assembly easier. In addition, the universal combination allows flexible use in any configuration.



### High Accuracy

Standard accuracy class is ISO Class 2 (AFBMA ABEC9).



### Designation System:

**8 BGR 10 S T DU EL P2**

Bore Size

Series Name: 15° contact angle

Dimension Series: 10 – Same bore, OD & width as 7000 series (ISO series 10)  
19 – Same bore, OD & width as 7900 series (ISO series 19)

Material Symbol S: Steel ball  
H: Ceramic ball  
X: Ceramic ball and SHX rings

Precision Class: ISO Class 2 (AFBMA ABEC9)

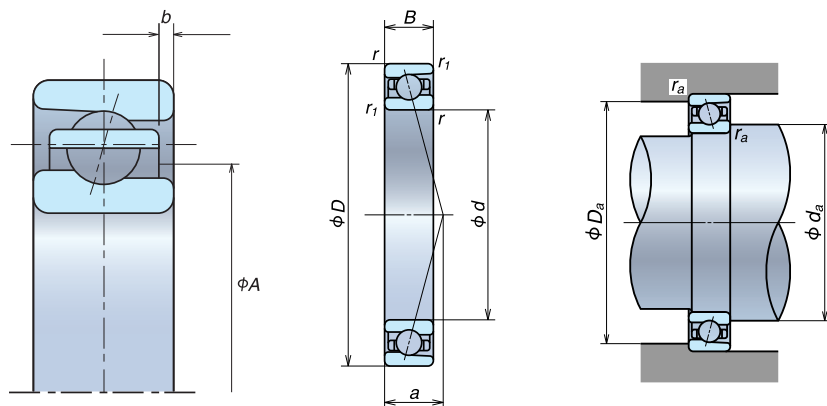
Preload: Extra light

Combination: Duplex universal

Cage material: Phenolic resin

## Super Precision Angular Contact Ball Bearings BGR10

Bearing Number	Boundary Dimensions (mm)					Basic Load Ratings (N)		Limiting Speed Grease (rpm)		Limiting Speed Oil-Air (rpm)		Nozzle Aim Point (mm)		Effective Load Centers(mm)	Abutment Fillet Dimensions (mm)			Mass (kg) <sup>2</sup>
	d	D	B	r <sub>1</sub> (min)	r <sub>1</sub> (min)	C <sub>r</sub> <sup>1</sup>	C <sub>or</sub> <sup>1</sup>	Steel Ball	Ceramic Ball	Steel Ball	Ceramic Ball	Diameter(A)	Distance(b)		a	d <sub>f</sub> (min)	D <sub>f</sub> (max)	
6BGR10	6	17	6	0.3	0.15	1 430	435	140 000	166 000	192 000	244 000	9	0.4	4.5	8.5	14.5	0.3	0.006
7BGR10	7	19	6	0.3	0.15	1 650	550	124 000	147 000	170 000	216 000	10.5	0.4	4.7	9.5	16.5	0.3	0.008
8BGR10	8	22	7	0.3	0.15	2 360	790	107 000	127 000	147 000	187 000	12.0	0.5	5.5	10.5	19.5	0.3	0.012
10BGR10	10	26	8	0.3	0.15	3 550	1 280	88 900	106 000	123 000	156 000	14.5	0.5	6.4	12.5	23.5	0.3	0.019
12BGR10	12	28	8	0.3	0.15	3 900	1 490	80 000	95 000	110 000	140 000	16.5	0.5	6.7	14.5	25.5	0.3	0.021
15BGR10	15	32	9	0.3	0.15	4 200	1 730	68 100	80 900	93 700	120 000	20	1	7.6	17.5	29.5	0.3	0.029
17BGR10	17	35	10	0.3	0.15	4 500	1 950	61 600	73 100	84 700	108 000	22.5	1.5	8.5	19.5	32.5	0.3	0.038
20BGR10	20	42	12	0.6	0.3	7 500	3 350	51 700	61 300	71 000	90 400	26.5	0.8	10.1	25	37	0.6	0.066
25BGR10	25	47	12	0.6	0.3	7 950	3 800	44 500	52 800	61 200	77 800	31.5	0.8	10.8	30	42	0.6	0.076



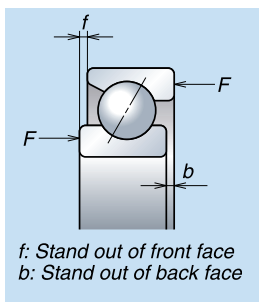
### Dynamic Equivalent Load $P = XF_r + YF_a$

Nominal Contact Angle	$f_0 F_a^*$	$C_{or}$	e	Single, DT			
				$F_r/F_r, e \leq$		$F_r/F_r, e >$	
				X	Y	X	Y
15°	0.178	0.38	1	0	0.44	1.47	
	0.357	0.40	1	0	0.44	1.40	
	0.714	0.43	1	0	0.44	1.30	
	1.07	0.46	1	0	0.44	1.23	
	1.43	0.47	1	0	0.44	1.19	
	2.14	0.50	1	0	0.44	1.12	
	3.57	0.55	1	0	0.44	1.02	
	5.35	0.56	1	0	0.44	1.00	

$\gamma$ : number of bearing

## Super Precision Angular Contact Ball Bearings BGR19

Bearing Number	Boundary Dimensions (mm)					Basic Load Ratings (N)		Limiting Speed Grease (rpm)		Limiting Speed Oil-Air (rpm)		Nozzle Aim Point (mm)		Effective Load Centers(mm)	Abutment Fillet Dimensions (mm)			Mass (kg) <sup>2</sup>
	d	D	B	r <sub>1</sub> (min)	r <sub>1</sub> (min)	C <sub>r</sub> <sup>1</sup>	C <sub>or</sub> <sup>1</sup>	Steel Ball	Ceramic Ball	Steel Ball	Ceramic Ball	Diameter (A)	Distance (b)		a	d <sub>f</sub> (min)	D <sub>f</sub> (max)	
10BGR19	10	22	6	0.3	0.15	2 030	775	100 000	119 000	138 000	175 000	13.5	0.4	5.1	12.5	19.5	0.3	0.010
12BGR19	12	24	6	0.3	0.15	2 280	950	88 900	106 000	123 000	156 000	15.5	0.4	5.4	14.5	21.5	0.3	0.011
15BGR19	15	28	7	0.3	0.15	3 250	1 350	74 500	88 400	103 000	131 000	18.5	0.5	6.4	17.5	25.5	0.3	0.016
17BGR19	17	30	7	0.3	0.15	3 400	1 500	68 100	80 900	93 700	120 000	20.5	0.5	6.6	19.5	27.5	0.3	0.017
20BGR19	20	37	9	0.3	0.15	4 750	2 160	56 200	66 700	77 200	98 300	25	0.75	8.3	22.5	34.5	0.3	0.036
25BGR19	25	42	9	0.3	0.15	5 400	2 760	47 800	56 800	65 700	83 600	30.0	0.75	9.0	27.5	39.5	0.3	0.043



### Universal Combination DU (Duplex Universal)

A single bearing has the same amount of stand out on both the front and back face (f=b) and it is a specified amount for each standard preload. The size variation of the bore and outside diameters of paired bearings is adjusted to less than 1/3 of the tolerance. Therefore, one pair of bearings can be used in any combination of DB, DT or DF.

### Preload

- Preload levels for single and tandem (DT) arrangements are determined by application and typically established by spring force.
- For all sizes listed, preload for a back-to-back (DB) arrangement is 25 N (2.55 kgf) (5.62 lbf)

### LIMITING SPEED

- For spring preload arrangements of single or tandem (DT) bearings, use the limiting speed guideline values shown in the tables.
- For back-to-back (DB) arrangements, multiply the single bearing limiting speed value in the table by 0.85 for extra-light (EL) preload bearings.
- The limiting speeds shown in the table are guideline values. The actual attainable speed of a bearing in a particular application is dependent upon many factors, so please consult NSK if your application exceeds the guideline values.

1. C<sub>r</sub>, C<sub>or</sub> values and L10 standards do not exist in ISO 281 for ceramic bearings. However, ceramic bearing life tends to be higher than that of conventional steel ball bearings under the same appropriate operating conditions. This may be especially true in situations where the centrifugal forces on the balls are significant.

2. Mass shown is for steel ball bearings; assume approximately 90% of this value for ceramic ball bearings.



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