

iBec

BEARING SOLUTIONS

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A part of OEM INTERNATIONAL
Listed on the Stockholm Stock Exchange



Jun Geng
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COST EFFICIENCY AND QUALITY ASSURANCE

Standardized procedural management is adopted in the whole IBEC base to assure the realization of IBEC's aims and continuous improvements.

- In order to provide optimized bearing solutions, customer demands are analyzed and IBEC expects to be involved together with customer in their product developments.
- Certified supplier evaluation system assures quality and efficient production.
- Documented inspections and advanced equipments secure high quality.
- Strong company culture and working environment to obtain highly qualified staff.
- Environmental protective measures are firmly implemented to minimize the impact to our environment.

EXCELLENCE IN BEARING SOLUTIONS

IBEC Bearings, established at Maasdijk, the Netherlands in 2000, is specialized in the development and sales of Chinese bearing productions to European market.

Since 2001 we have our own quality center in Cixi, China who has the roll to secure the quality of our contracted producers. IBEC Bearings China is ISO9001 certified and has TS 16949 quality management system.

IBEC Bearings, through the brother company Internordic Bearings in Sweden and Finland, offers both standard and customized bearings of high quality to competitive prices.

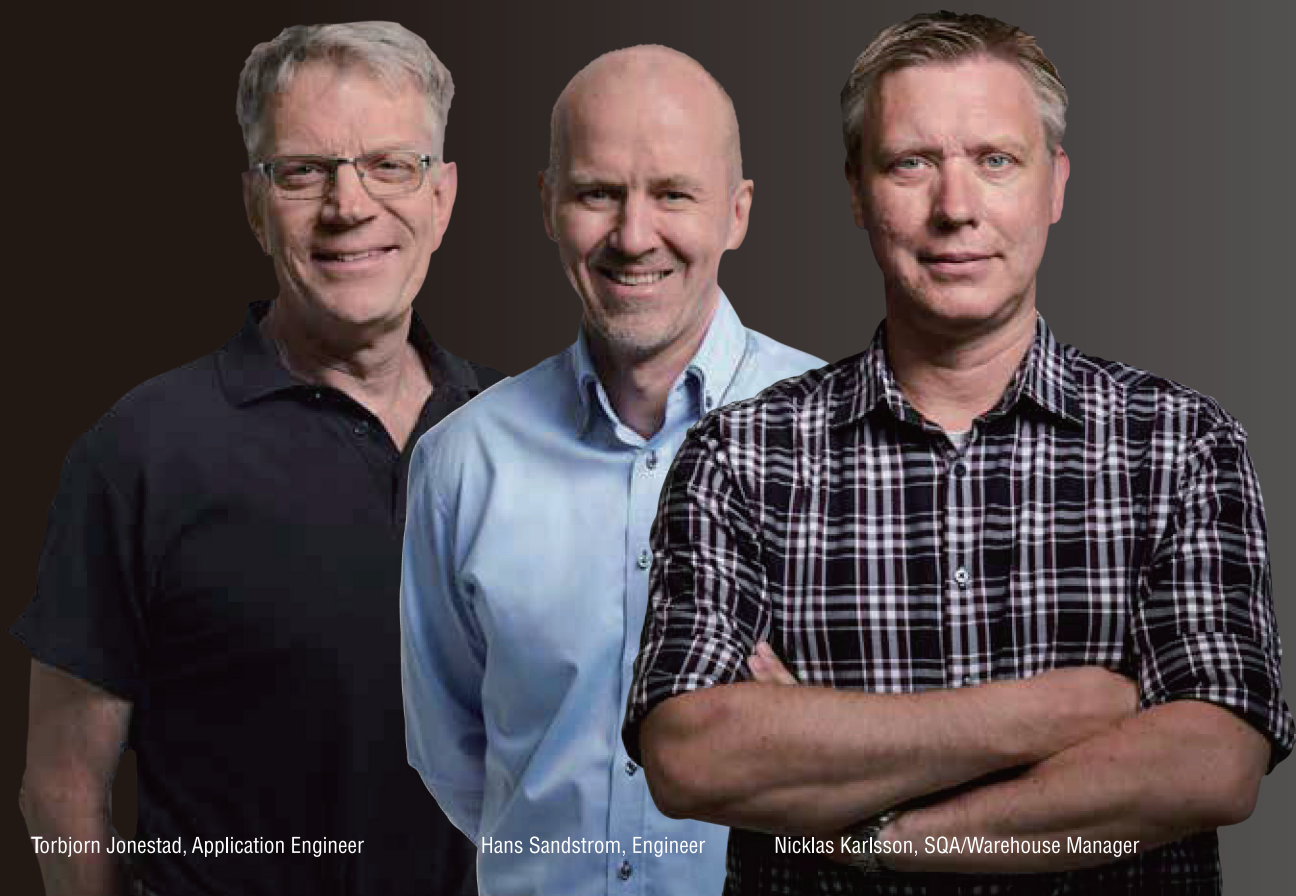
IBEC Bearings is owned by OEM International AB that is listed on the Stockholm Stock Exchange.

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IBEC Bearings facility in China



Torbjorn Jonestad, Application Engineer

Hans Sandstrom, Engineer

Nicklas Karlsson, SQA/Warehouse Manager

SEVEN STEPS TO A REWARDING BEARING SOLUTION

In order for the customer to obtain the optimal solution we work using a well documented process in seven steps. The process means that we can offer what the customer needs for every bearing or application. We can often provide a solution which exceeds the function that you request.



1. Feasibility study

The requirement analysis is central to the feasibility study and is carried out in close collaboration with the customer and is documented to be the basis for the design phase of the project.

2. Design

With the starting point in the feasibility study, the need for version, material and precision is evaluated. This is documented in CAD designs with the aim of transferring to prototype manufacture.

3. Prototypes

The first examples of a possible end product are manufactured. They are measured and inspected according to the specification which has been agreed with customer.

4. Tests

After the inspection, if the samples are confirmed with the agreed specification, the samples will be sent to the customer for further evaluation and different tests including field application test. This is a very crucial step, it might take months or even years.

5. Pre-production

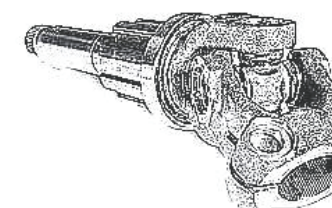
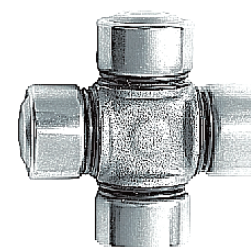
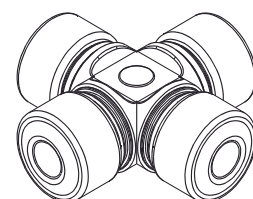
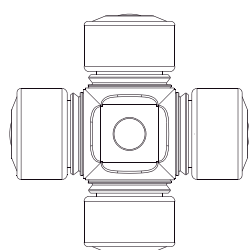
When the prototypes are tested and approved, the project will move to pre-production. Bigger quantities are manufactured for quality assurance of the production process.

6. Production

Here the project moves to standard production.

7. Control

Every step is controlled from samples to standard production and before shipments are sent out. Traceability is well documented.



SAFE AND PROFITABLE ROUTE TO CHINESE PRODUCTION

With a wide network of evaluated and approved suppliers, IBEC is the right partner for quality assured productions in China.

IBEC has the experience and knowledge in Chinese productions. Together with the customer, this provides valuable opportunities.

All IBEC suppliers are carefully evaluated by IBEC Supplier Evaluation System. All IBEC products are controlled continuously during the complete process.

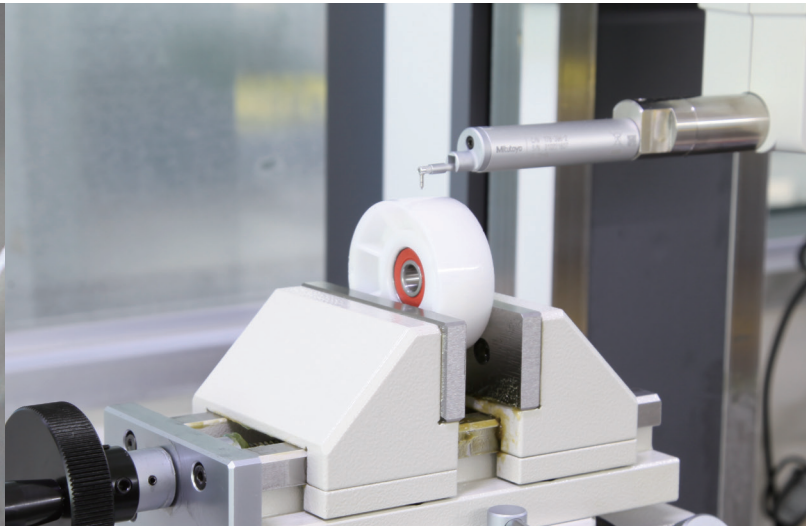
This is the IBEC way, this is how we provide our customers with the desired results.



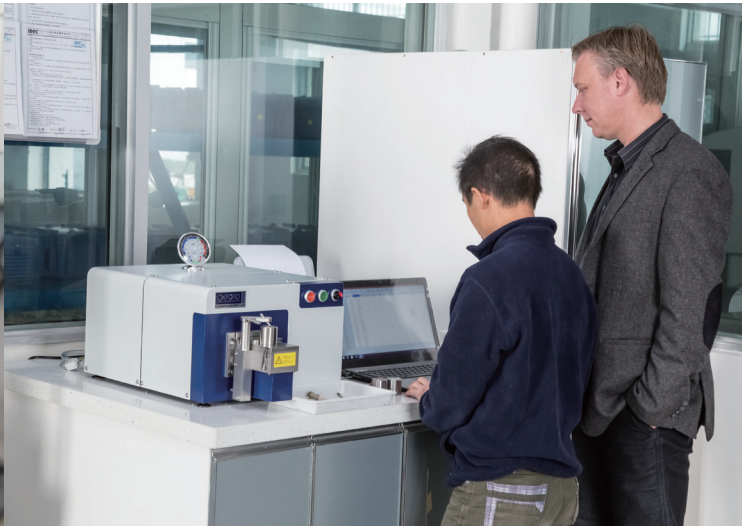
HEIGHT INSPECTION



INNER DIAMETER INSPECTION



SURFACE ROUGHNESS INSPECTION



MATERIAL INSPECTION



WELL PLANNED CONTROL AND LOGISTICS AREA



SEPARATE AREA FOR UNQUALIFIED PARTS



INSPECTING THE SHIPMENTS BEFORE DELIVERY



PRECISION INSPECTION



CONSTRUCTION EQUIPMENT

Application examples:

- Excavators
- Bulldozers
- Asphalt machines
- Agriculture machines



VEHICLE INDUSTRY

Application examples:

- Trucks
- Buses
- Railways
- Passenger cars



HEALTH CARE

Application examples:

- Wheelchairs
- Patient-lift equipment
- Walkers
- Gym-equipment



DOORS & GATEWAYS

Application examples:

- Industrial doors
- Sliding doors
- Safe doors
- Airport terminal doors



GARDEN PRODUCTS

Application examples:

- Lawn mowers
- Trimmers
- Tillers
- Scarifiers



WHITE GOODS

Application examples:

- Washing machines
- Dishwashers
- Tumble driers
- Vacuum cleaners



FURNITURE/WHEELS

Application examples:

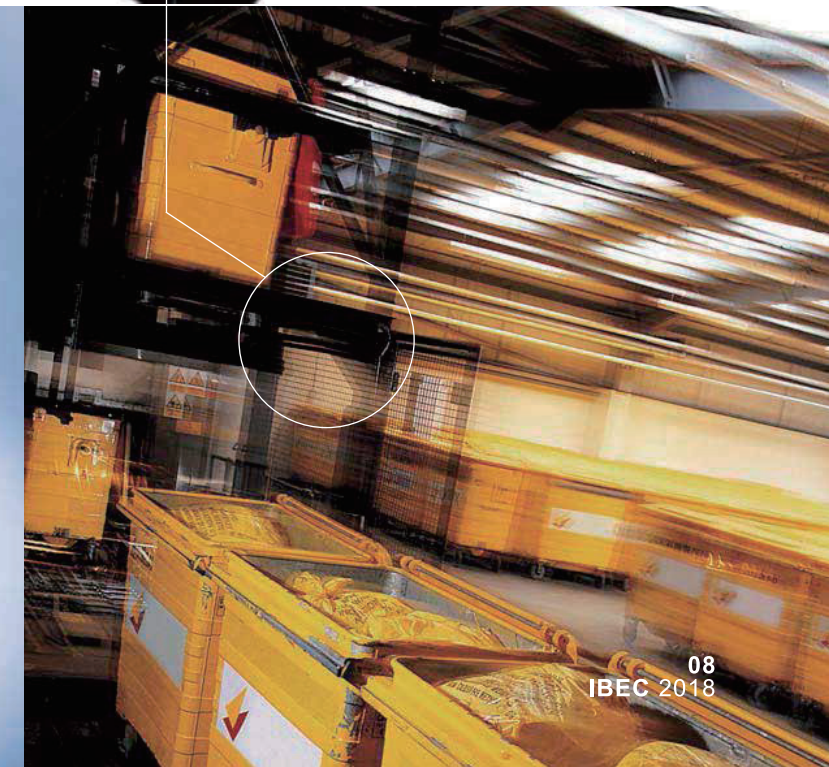
- Chairs
- Windows and balconies
- Department store vehicles
- Writing desks


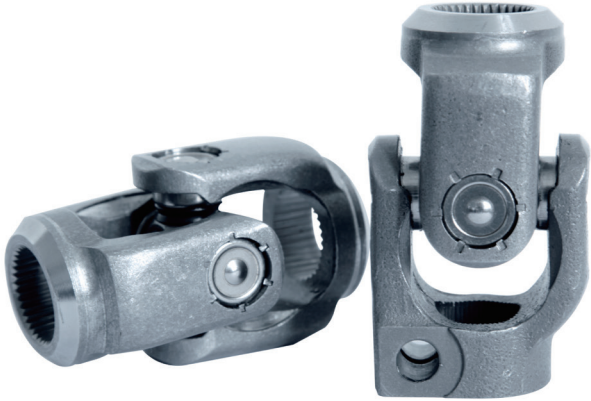












MATERIAL HANDLING

Application examples:

- Conveyors
- Pallet systems
- Lift equipment
- Fork lifters



			
➤ BEARINGS COVERED WITH PLASTIC	➤ U-JOINT ASSY	➤ BEARING TUBES	➤ ROLLER END BEARINGS
			
➤ BEARING UNITS	➤ BELT TENSIONERS	➤ BEARINGS WITH SHAFT	➤ WHEELS
			
➤ BEARINGS FOR WINDOWS	➤ PLASTIC ROLLERS	➤ ROLLER WAGONS	➤ YOUR NEEDS

MATERIAL FOR RINGS, RETAINERS AND SHIELDS

• BEARING STEEL

As material for our standard bearing rings we use high carbon chromium steel GCr15. Our standard material for corrosive environment is martensitic stainless steel 9Cr18. For high corrosive environments we use austenic stainless steel 0Cr18Ni9 or 0Cr17Ni12Mo2.

• RETAINERS

Retainers are normally produced from cold rolled carbon steel Q195. Alternatives to this material are stainless steel or plastic (nylon).

• SHIELDS

Standard material for shields is Q195 with the alternative of stainless steel when needed.

• BALLS AND ROLLERS

Standard material for balls and rollers is GCr15. Besides all other steel materials additional alternative is ceramic balls. Ceramic balls have lower thermal expansion, are harder and can dramatically extend the life time in some high speed application.

• OTHER COMPONENTS

Our normal construction steel is low carbon steel 10.

Material	Specification	Equivalence	Chemical composition in %									
			C	Si	Mn	P	S	Cr	Ni	Mo	Cu	HRC
High carbon Chrome alloy	GCr15	AISI 52100	0,95-1,05	0,15-0,35	0,2-0,4	<0,027	<0,02	1,3-1,65	<0,3	-	-	60-67
Stainless steel (Martensitic)	9Cr18	AISI 440 C	0,9-1,0	<0,8	<0,8	<0,035	<0,03	17-19	<0,06	-	-	57-60
Stainless steel (Austenitic)	0Cr18Ni9	AISI 304	<0,08	<1,0	<2,0	<0,035	<0,03	17-19	8-11	-	-	25-39
Stainless steel (Austenitic)	0Cr17Ni12Mo2	AISI 316	<0,05	<1,0	<2,0	<0,035	<0,03	16-18,5	10-14	2,0-3,0		25-39
Steelplate	Q195	JIS 3141 SPCC	0,06-0,12	<0,3	0,25-0,5	<0,045	<0,05	-	-	-		-
Carbon steel	10	AISI 1010	0,07-0,13	0,17-0,37	0,35-0,65	-	-	<0,15	<0,3	-	<0,25	>60

SEAL MATERIAL

Normal rubber seals (-RS) are produced in Nitril. For certain applications we produce bearings with Viton, Silicone or EPDM seals.

Material	Code	Operating temperature	Peak temperature	Characteristics/used for:
Nitril	NBR	-30–100°C	120°C	Wear resistant, mineral oils
Viton	FPM	-15–200°C	250°C	High temperature, ozon, petroleum products
Silicone	MVQ	-70–200°C	250°C	Broad temperature range resistant, ozon, food contact
Etenpropen	EPDM	-60–130°C	150°C	Weather resistant, steam, alkalies, diluted acids

PLASTIC MATERIAL

Plastic material is used for different components, retainers, to cover the outer ring on bearings, wheels and pulleys. Basic difference on our normal plastic is shown in the chart below.

Material	Specification	Characteristics
Polyamides	PA66	Wear resistant
	PA66 + GF	Increased load, less risk for flat-point
Polyacetal	POM	Flexible, workable, isolating
Polyurethanes	PUR Shore A/D	Variable hardness, silent, impact resistant
	PUR Vulkollane - PUV	Heavy duty PUR
Others	Rubber	Soft, silent

GREASE

Our standard grease is Great Wall Low Noise Bearing Grease 2 (LNBG 2). If the application requires other performance from the grease we normally use the following greases with characteristics:

Manufacturer	Brand	Suffix	Application	Viscosity	Base Oil	(Penetration) Consistency	Drop Point °C	Temperature range °C
Shell	Alvania R2	L01	General purpose	Lithium	Mineral	265–295	180	-20–130
Esso	Beacon 325	L02	Low temperature, low torque	Lithium	Diester	285	180	-50–120
Chevron	SRI-2	L19	Water resistant	Urea	Mineral	255–280	243	-30–177
Klüber	Isoflex LDS18	L03	Dynamically light, long-term	Lithium	Diester	265–295	>=190	-50–120
Kyodo Yushi	Multemp SRL	L04	Wide range	Lithium	Polyolester+diester	250	190	-50–150
Sinopec	LNBG 2	Blank	Low noise	Lithium	Mineral	281	196	-20–120

BEARING VIBRATION NOISE CLASS

All our standard bearings are produced in noise class Z1 according to JB/T 7047-2006. Our normal electro motor quality production is carried out in vibration class V2 according to JB/T 10187-2011.

● VIBRATION VALUES FOR SINGLE BALL BEARINGS (dB)

● VIBRATION VALUES FOR SINGLE BALL BEARINGS (µm/s)

Nominal bore diameter (d) in mm	Diameter series 0		Diameter series 2		Diameter series 3		V2			V3		
	Z1	Z2	Z1	Z2	Z1	Z2	low band	mid band	high band	low band	mid band	high band
3	34	32	35	32	36	33	48	26	22	31	16	15
4	34	32	35	32	36	33	48	26	22	31	16	15
5	36	34	37	34	37	35	58	36	30	35	21	18
6	36	34	37	34	37	35	58	36	30	35	21	18
7	38	35	38	36	39	36	72	48	40	44	28	24
8	38	35	38	36	39	36	72	48	40	44	28	24
9	40	36	40	37	42	38	72	48	40	44	28	24
10	42	38	42	39	44	40	90	60	50	55	35	30
12	43	39	43	39	45	40	90	60	50	55	35	30
15	44	40	44	41	46	42	110	78	60	65	46	35
17	44	40	45	41	47	42	110	78	60	65	46	35
20	45	41	46	42	48	43	130	100	75	80	60	45
22	45	41	46	42	48	43	130	100	75	80	60	45
25	46	42	47	43	49	44	130	100	75	80	60	45
28	47	43	44	44	50	45	130	100	75	80	60	45
30	47	43	48	44	50	45	150	120	100	90	75	60
32	48	44	49	45	51	46	150	120	100	90	75	60
35	49	45	50	46	52	47	150	120	100	90	75	60
40	51	46	52	47	54	49	180	150	130	110	90	80
45	53	48	54	49	56	51	180	150	130	110	90	80
50	54	50	55	51	57	53	210	160	160	125	100	100
55	56	52	57	53	59	54	210	180	180	125	110	110
60	58	54	59	54	61	56	240	180	200	145	110	130
65	48	46	49	47	50	48	130	100	150	105	80	105
70	49	47	50	48	51	49	150	120	200	110	90	135
75	50	48	51	49	52	50	150	120	200	110	90	135
80	51	49	52	50	53	51	180	120	240	130	110	160
85	52	50	53	51	55	52	180	150	240	130	110	160
90	53	52	55	53	57	54	210	180	270	145	125	180
95	55	54	57	55	59	56	210	180	270	145	125	180
100	57	56	59	57	61	58	250	215	310	170	145	200

BEARING TOLERANCES ON RADIAL BEARINGS

Our normal production is carried out in class 0 (P0) according to GB 307.1-2005, which is equal to ISO 492-2002.

● INNER RINGS

Nominal bore diameter (d) in mm		Dimensional tolerance of mean bore diameter within plane Δd_{mp}										Maximum bore diameter variation Vdp										Inner ring width deviation ΔB_s						Inner ring width variation VBs									
		P0 (normal)		P6		P5		P4		P2		diameter series 9					diameter series 0, 1					diameter series 2, 3, 4					P0, P6		P5, P4		P2		P0	P6	P5	P4	P2
min	max	high	low	high	low	high	low	high	low	high	low	P0	P6	P5	P4	P2	P0	P6	P5	P4	P2	P0	P6	P5	P4	P2	high	low	high	low	high	low	max	max	max	max	max
0,6	2,5	0	-8	0	-7	0	-5	0	-4	0	-2,5	10	9	5	4	2,5	8	7	4	3	2,5	6	5	4	3	2,5	0	-40	0	-40	0	-40	12	12	5	2,5	1,5
2,5	10	0	-8	0	-7	0	-5	0	-4	0	-2,5	10	9	5	4	2,5	8	7	4	3	2,5	6	5	4	3	2,5	0	-120	0	-40	0	-40	15	15	5	2,5	1,5
10	18	0	-8	0	-7	0	-5	0	-4	0	-2,5	10	9	5	4	2,5	8	7	4	3	2,5	6	5	4	3	2,5	0	-120	0	-80	0	-80	20	20	5	2,5	1,5
18	30	0	-10	0	-8	0	-6	0	-5	0	-2,5	13	10	6	5	2,5	10	8	5	4	2,5	8	6	5	4	2,5	0	-120	0	-120	0	-120	20	20	5	2,5	1,5
30	50	0	-12	0	-10	0	-8	0	-6	0	-2,5	15	13	8	6	2,5	12	10	6	5	2,5	9	8	6	5	2,5	0	-120	0	-120	0	-120	20	20	5	3	1,5
50	80	0	-15	0	-12	0	-9	0	-7	0	-4	19	15	9	7	4	19	15	7	5	4	11	9	7	5	4	0	-150	0	-150	0	-150	25	25	6	4	1,5
80	120	0	-20	0	-15	0	-10	0	-8	0	-5	25	19	10	8	5	25	19	8	6	5	15	11	8	6	5	0	-200	0	-200	0	-200	25	25	7	4	2,5
120	150	0	-25	0	-18	0	-13	0	-10	0	-7	31	23	13	10	7	31	23	10	8	7	19	14	10	8	7	0	-250	0	-250	0	-250	30	30	8	5	2,5
150	180	0	-25	0	-18	0	-13	0	-10	0	-7	31	23	13	10	7	31	23	10	8	7	19	14	10	8	7	0	-250	0	-250	0	-250	30	30	8	5	4
180	250	0	-30	0	-22	0	-15	0	-12	0	-8	38	28	15	12	8	38	28	12	9	8	23	17	12	9	8	0	-300	0	-300	0	-300	30	30	10	6	5

● OUTER RINGS

Nominal outside diameter (D) in mm		Dimensional tolerance of mean outside diameter within plane ΔD_{mp}										Outside diameter variation VD_p										Outside diameter variation VD_p on sealed/shield bearings									
		P0 (normal)		P6		P5		P4		P2		diameter series 9					diameter series 0,1					diameter series 2, 3, 4					diameter series 2, 3, 4		diameter series 1, 2, 3, 4		
min	max	high	low	high	low	high	low	high	low	high	low	P0	P6	P5	P4	P2	P0	P6	P5	P4	P2	P0	P6	P5	P4	P2	P0	P6	P5	P4	P2
2,5	6	0	-8	0	-7	0	-5	0	-4	0	-2,5	10	9	5	4	2,5	8	7	4	3	2,5	6	5	4	3	2,5	10			9	
6	18	0	-8	0	-7	0	-5	0	-4	0	-2,5	10	9	5	4	2,5	8	7	4	3	2,5	6	5	4	3	2,5	10			9	
18	30	0	-9	0	-8	0	-6	0	-5	0	-4	12	10	6	5	4	9	8	5	4	4	7	6	5	4	4	12			10	
30	50	0	-11	0	-9	0	-7	0	-6	0	-4	14	11	7	6	4	11	9	5	5	4	8	7	5	5	4	16			13	
50	80	0	-13	0	-11	0	-9	0	-7	0	-4	16	14	9	7	4	13	11	7	5	4	10	8	7	5	4	20			16	
80	120	0	-15	0	-13	0	-10	0	-8	0	-5	19	16	10	8	5	19	16	8	6	5	11	10	8	6	5	26			20	
120	150	0	-18	0	-15	0	-11	0	-9	0	-5	23	19	11	9	5	23	19	8	7	5	14	11	8	7	5	20			25	
150	180	0	-25	0	-18	0	-13	0	-10	0	-7	31	23	13	10	7	31	23	10	8	7	19	14	10	8	7	38			30	
180	250	0	-30	0	-20	0	-15	0	-11	0	-8	38	25	15	11	8	38	25	11	8	8	23	15	11	8	8					
250	315	0	-35	0	-25	0	-18	0	-13	0	-8	44	31	18	13	8	44	31	14	10	8	26	19	14	10	8					
315	400	0	-40	0	-28	0	-20	0	-15	0	-10	50	35	20	15	10	50	35	15	11	10	30	21	15	11	10					

INTERNAL CLEARANCE ON DEEP GROOVE BALL BEARINGS

IBEC bearings are normally produced with C0 clearance according to GB/T 4604-2012 which is equal to ISO 5753-2009. The radial internal clearance between the inner and outer ring for different sizes are according to the following chart:

● INTERNAL CLEARANCE ON SINGLE BALL BEARINGS (μm)

Nominal bore Diameter (d) in mm		C2		C0 (normal)		C3		C4		C5	
min	max	min	max	min	max	min	max	min	max	min	max
2,5	6	0	7	2	13	8	23				
6	10	0	7	2	13	8	23	14	29	20	37
10	18	0	9	3	18	11	25	18	33	25	45
18	24	0	10	5	20	13	28	20	36	28	48
24	30	1	11	5	20	13	28	23	41	30	53
30	40	1	11	6	20	15	33	28	46	40	64
40	50	1	11	6	23	18	36	30	51	45	73
50	65	1	15	8	28	23	43	38	61	55	90
65	80	1	15	10	30	25	51	46	71	65	105
80	100	1	18	12	36	30	58	53	84	75	120
100	120	2	20	15	41	36	66	61	97	90	140
120	140	2	23	18	48	41	81	71	114	105	160
140	160	2	23	18	53	46	91	81	130	120	180
160	180	2	25	20	61	53	102	91	147	135	200
180	200	2	30	25	71	63	117	107	163	150	230
200	225	2	35	25	85	75	140	125	195	175	265
225	250	2	40	30	95	85	160	145	225	205	300

