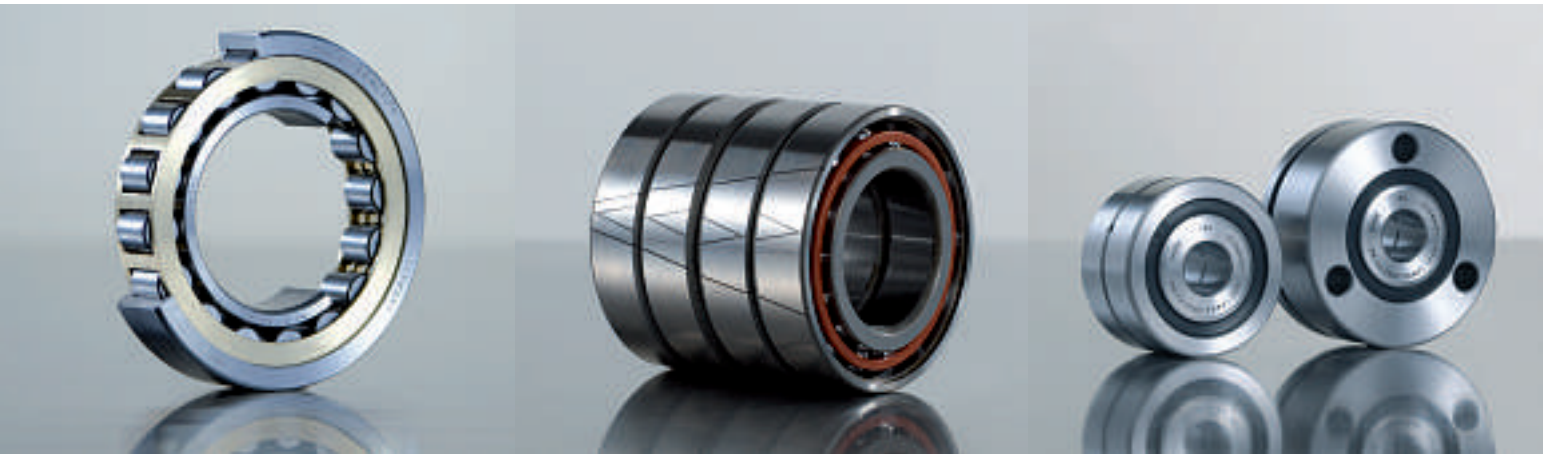


# IBC



**Product Range**

**Lieferprogramm**

TI-I-5000.1/E







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# 1. Introduction

IBC Wälzlager GmbH, Industrial Bearings and Components, is proud to continue in the tradition of Robert Kling Wetzlar GmbH, a company founded in 1918. IBC is widely known for producing high precision rolling bearings that are used in machine tools, separators, centrifuges, compressors, gear boxes, printing machines, textile machines and high speed units. IBC, founded in 1972, is also a brand in the field of drive engineering, special-purpose mechanical engineering and general mechanical engineering. The company's distinguishing features are its efficient and high-precision production of small and medium sized batches and its innovative realisation of customer's solutions.

By keeping our communication channels with the customer open at all times we define objectives and consistently pursue our common objectives; as a result, even very specific customer requirements are swiftly and purposefully converted into commercial solutions. Being the partner of our customers in terms of design engineering we recognize that innovation in the field of bearings is driven by being close to the customer's application.

We have developed, and use, a rolling bearings data base and employ modern calculation software. The use of such data and applications allows us to offer an attractive and professional package of services for bearing dimensioning. Vibration analysis is also part of our service package. We were able to create, and continuously develop, these services by constantly communicating with our customers. Our customers can be sure of our ability to realise customer-specific special solutions. Of course we also supply standard rolling bearings in various batch sizes. Our business is characterised by the outstanding availability of our products and services, and our customers are guaranteed solutions that are a perfect fit, both for prototyping and for serial production.

We have also been traditionally involved in academic work: We are in close working partnerships with colleges and universities, both in the field of research and development and as our point of reference for vocational training.

Apart from its use in research and development, our modern production equipment also forms the foundation which enables us, together with our skilled staff, to produce rolling bearings to the highest quality specifications. It also ensures our quality in the long term. And because we use such sophisticated machinery, we pay special attention to the people who are part of the process.

Ever higher demands are being made on bearing systems, and a variety of techniques and new materials have been developed that are designed to meet the needs of today's demanding and extremely varied technical and commercial applications.

IBC rises to the challenge by constantly enhancing its performance, continuously optimising its products and processes and by expanding its product range.

The **TI-I-5000** catalogue you have in your hand contains a summary of our products and services. You will find more specific technical information, especially with regard to rotational speeds and load ratings, in the more detailed IBC product catalogues.

**IBC high precision angular contact ball bearings** have been designed for all rolling bearing applications that make great demands on reliability, stiffness, speed capability and running accuracy; the bearings may be used as single bearings or as bearing combinations. The many different types available allow spindle manufacturers across different sectors of industry as well as special-purpose mechanical engineering firms to optimise their spindles by focusing on the criteria that are most important to them. Technology and economic efficiency thus meet to form a winning combination.

As the bearing of your choice will depend on the application you are designing, IBC offers a variety of bearing series with many different versions, sizes and diverse design characteristics. This wide range of products enables the bearing user to achieve a higher performance at a lower cost. **Angular contact ball bearings** for example can be supplied with contact angles of **15°, 25°, 30°, 40°** and **60°** and with various rolling element diameters as well as with rolling elements made of steel or ceramics. This makes them a very popular choice. Our product and services range also includes



the possibility of choosing an ATCoat thin dense chromium coating for special types of application.

High precision bearings that are grease-lubricated in our factory and additionally sealed with contact or non-contact seals are maintenance-free, meaning that for “life lubrication” becomes a reality. This fact contributes both to simpler, customer-friendly designs and to simpler assembly.

IBC also offers many different cage materials for high precision angular contact ball bearings that can be matched to each specific application.

Single IBC angular contact ball bearings which carry a V-marking may be used as single bearings, or they may be put together to form bearing sets. The customer will thus find it much easier to procure spare parts and keep parts in stock. We recommend customers use bearing sets consisting of multiple precision angular contact ball bearings if they have special requirements with regard to stiffness and bearing load. Another area where IBC excels is the manufacture of angular contact ball bearing sets that match the customer's requirement and are ready delivered for assembly. Not only does each bearing carry its individual V-marking, but these sets also display a V-marking that spans the whole set (**High Precision Bearings TI-I-5050; 40° Angular Contact Ball Bearings TI-I-4044**).

IBC is proud to present its new **DTB (Driven Tool Bearings)** high precision bearing series. As the name indicates, the contact angle, inner geometry and running accuracy of this type of high precision angular contact ball bearing have been specially optimised for driven tools. This benefits the user, because the deployment of such bearings leads to greatly enhanced machine tool productivity.

The use of high precision rolling bearings in machine tools makes great demands on the running accuracy of each component used. In order to meet these requirements, IBC has developed **high precision cylindrical roller bearings** that combine running accuracy characteristics with great stiffness and load carrying capacity while at the same time providing for a high speed-capacity with a smaller cross section. This smaller cross section is especially suited to multi-spindle arrangements because it allows for smaller centre distances. High precision cylindrical roller bearings make for ideal floating bearings because they are able to compensate for heat-related changes in length that occur in adjacent parts.

In addition to **single row 60° ball screw support bearings (BS...)**, IBC also manufactures **double row 60° ball screw support bearings** that are designated as **BSD...** (for use in housings) and



**BSDF...** (flange version). These bearings enable the user to mount the ball screw spindle with high precision, high load carrying capacity and low friction. The bearing is easy to install and requires little maintenance, thereby providing a cost-effective solution. The end result is that the user is able to benefit from an optimised overall machine tool system (**Ball Screw Support Bearings TI-I-5010**).

IBC also manufactures an extensive range of **high precision bearing units**. The great variety of possible applications along with their diverse bearing requirements led us to develop a modular system that provides the design engineer with great flexibility when designing different versions. These bearing requirements include axial stiffness and load rating, low heat generation through low friction as well as rotational speeds and running accuracy. Bearing units that are ready for assembly have become a very popular choice, because they simplify the assembly of modules that belong together and also speed up the assembly process. Moreover, because there is no axial contact surface in the locating bores, the adjacent parts can be of a much simpler design. IBC high precision bearing units are lubricated for life and are sealed with labyrinth seals. They are designed for ball screws that are most commonly used in machine tools as well as in handling and measuring devices and in sheet-metal processing,

woodworking and special-purpose machines. Apart from offering a standard range of high precision cartridge or pillow block units, IBC also manufactures all kinds of special solutions according to customer's specifications (**Ball Screw Support Bearings TI-I-5010**).

Additional components used in rolling bearing systems, e.g. **high precision locknuts and labyrinth seals**, have been an integral part of IBC's range of products for many years.

IBC high precision locknuts with fine thread are used with precision applications like rolling bearings for ball screws.

The securing systems integrated into the various locknuts permit simple and accurate mounting and provide for lasting stability. There is no need to provide for a retaining facility within the thread, e.g. grooves, that hold locking washers. As a result, the full material cross-section of the shaft is preserved, and a notch effect does not occur either. By substituting imprecise locking washers by clamping devices you will be able to achieve greater axial accuracy (reduced axial runout). A further alternative to fitting separate seals is the use of an integrated labyrinth seal. This range of technical possibilities



allows the user to realise a whole variety of options. And the result here is increased efficiency (**Precision Locknuts TI-I-5020**).

**Deep groove ball bearings** have many applications and a simple design, and because of their low friction they are suited to high rotational speeds. Their use has many advantages: they are robust, easy to maintain and economical. As deep groove ball bearings can be produced with high precision and in a low noise version, they are often used in electric motors. The extremely wide range of dimensions and versions available makes it the most commonly used type of rolling bearing.

IBC is also well known for the many different cage materials and lubricants it offers. In a competitive environment, this wide range of products enables customers to realise their applications exactly as planned. Furthermore, as they are able to order from stock, customers enjoy the advantage of easy availability – procurement lead time is shortened and own stock keeping reduced.

**IBC high precision cylindrical roller bearings** are the right choice if the bearing has to be suited to high rotational speeds, minimal frictional loss, high radial loads and heat-induced changes in length in the adjacent parts. Cylindrical roller bearings that are equipped with a cage can bear very high loads in the radial direction, and due to line contact between the roller and the raceway they have the advantage of great stiffness. They are also designed for high rotational speeds. IBC manufactures cylindrical roller bearings of various designs and in a variety of dimensional series and sizes. As this type of bearing is able to permit axial displacement, it is the ideal choice for the floating bearings of working spindles in machine tools. Cylindrical roller bearings are also used in pumps and compressors. The range of bearings designed for general mechanical engineering includes both **single and double row cylindrical roller bearings with cage and single as well as double row full complement cylindrical roller bearings**. Cylindrical roller bearings with cage can achieve reasonably high rotational speeds even under heavy loads. Full complement cylindrical roller bearings, on the other hand, are designed for low rotational speeds and pivoting. This type of bearing can bear very heavy radial loads, because it contains the greatest possible number of rolling elements. Great stiffness is also one of its characteristics. Full complement cylindrical roller bearings are very often chosen in space-saving designs, and are used in slow-rotating bearing applications that are heavily loaded (**Cylindrical Roller Bearings TI-I-4010**).

**Spherical roller bearings, tapered roller bearings and special bearings** complete the full IBC product range. The choice of the right **lubricant** has a very great impact on the operational safety of precision bearings, because lubricants reduce friction and wear.

The majority of rolling bearings that do not reach their scheduled life time fail because of faulty lubrication.

In order to enable the best possible lubrication to be achieved, IBC keeps a wide range of high-quality lubricants in stock and supplies these to its customers. High precision rolling bearings that are ready-greased during manufacture can be ordered from IBC by specifying the relevant suffix. For such high precision rolling bearings, the only thing the customer needs to do is to carry out the grease distribution run.

In addition to its well known and time-tested range of rotational rolling bearings IBC also produces **linear motion bearings** that are guided in rails that have an X- or U-profile and an internal raceway. This technology allows for very compact and space-saving systems. The most common choices are **telescope linear motion bearings** and **linear motion bearing carriage systems**. Typical uses include the housings of machine tools as well as pullouts, e.g. those used in the railway supply industry, in medical technology or in warehouse logistics.

IBC's product range includes **ATCoat thin dense chromium coated high precision rolling bearings** that are designed for special applications. The advantage of this type of bearing drives from characteristics that increase the service life of rolling bearings and from its very good resistance to wear and corrosion (**ATC-Coated Bearings, ATC Technology Coatings**).



Our comprehensive product range and the ability to support our customers on-site all over the world via our service and technical departments enable us, to develop specific and efficient bearing solutions for our customers, and in partnership with our customers.

Companies increasingly rely on global sourcing and the localisation of market-specific products for their business. That is why being able to **service a company's operations all over the world** is becoming increasingly important. IBC Wälzlager has production facilities and sales locations in Oberbühl (Germany), Aßlar (Germany), Grenchen (Switzerland), Taichung (Taiwan), Mumbai (India) as well as a sales base in Guangzhou (China). This arrangement is the basis for servicing European markets as well as giving access to the future Global markets.

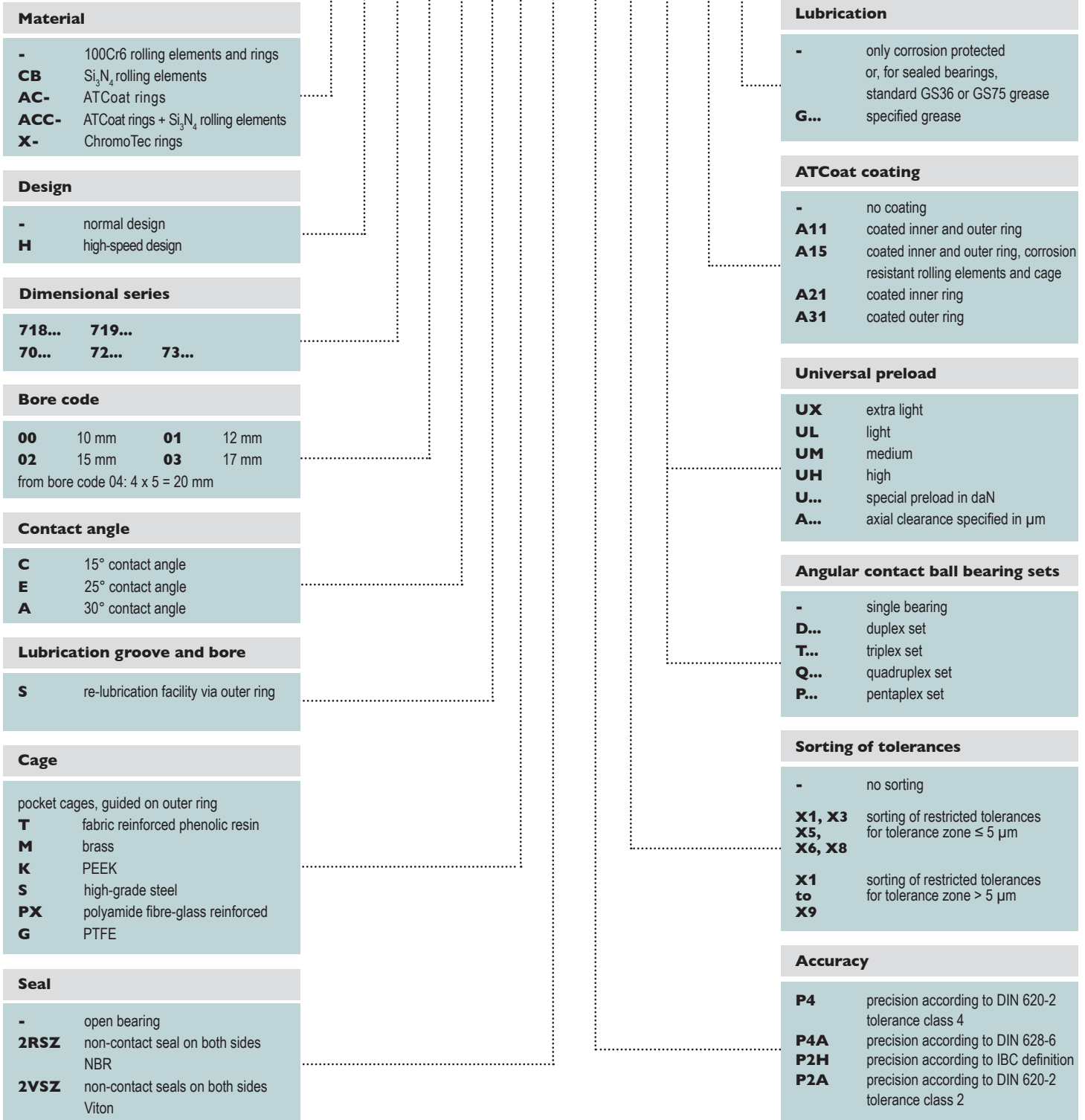
IBC is committed to precision technology - and to you as its customer. We will be glad to support you at an early stage of application engineering and will be happy to discuss any plans you may have.



## 2. IBC High Precision Angular Contact Ball Bearings Designation system

### Examples:

CB H 719 14 .E .T .2RSZ .P4A .X2 .UL  
 X- 70 00 .E .T .P4A .X5 .UL  
 70 14 .C S .T .P2A .UL  
 70 16 .E .T .P4A .X5 .QBTM .GS32  
 CB H 70 12 .C .T .2RSZ .P2H .X6 .UL  
 AC- 72 13 .E .M .P4A .X2 .U40 .A11





# IBC High Precision Rolling Bearings

**IBC high precision angular contact ball bearings** meet the highest demands for reliability, stiffness, speed capability, running accuracy and vibration characteristics in any given installation space. This achievement calls for a whole variety of bearing series, each providing different versions and dimensions that have different design characteristics in order to achieve both improved performance and reduced costs for rolling bearings. The great number of bearing types available permit the customer to make the best possible choice, allowing for both superior technology and economical solutions.

The light 18, 19 and 10 dimensional series are suited to high rotational speeds. Rolling bearings whose designation includes the suffix X have been further improved to accomplish very high speeds. The H design was designed almost exclusively with a view to achieving the highest speeds. The heavy 02 and 03 dimensional series, by contrast, are focused on achieving high load ratings and great stiffness.

IBC has tailored the internal design of its high precision angular contact ball bearings to the diverse requirements of the machine tool industry. IBC therefore offers as standard high precision angular contact ball bearings with a contact angle of 15°, 25° or 30°. The high-speed H design has a contact angle of 18°. The different contact angles meet individual requirements for combined loads with regard to stiffness and rotational speed characteristics. IBC also manufactures precision angular contact ball bearings with contact angles of 35°, 40° and 60°. You will find further information on these bearings in the publications **40° Angular Contact Ball Bearings TI-I-4044, Ball Screw Support Bearings TI-I-5010 and High Precision Bearings TI-I-5050**.

Hybrid bearings equipped with a combination of ceramic rolling elements and steel rings are used not only in high-speed applications; their many advantages also include their reliability and their extended grease service life. The harder and lighter ceramic rolling elements reduce the rolling bearing's friction and the wear of the lubricant by improving rolling conditions even in an unfavourable lubrication environment.

As a result of the increased demand for grease-lubricated high precision angular contact ball bearings, IBC has added to its versions that include types fitted with seals and greased ready for use. The standard lubrication fill, implemented during the manufacturing process, ensures the optimal grease type and quantity are applied, which has a positive effect on bearing life and machine performance. IBC high precision ball bearings that are filled with grease during the manufacturing process are ready for immediate installation and operation, subject to normal grease running-in procedure. As they are optionally sealed

on one or both sides with non-contact seals (2RSZ) that do not limit the suitability of the bearings for high rotational speeds, sealed high precision angular contact ball bearings are ideally protected against contamination and air currents. And in the case of vertical or pivoting spindles the seals additionally act as grease retention washers.

If grease-lubricated bearings are required to run at or above their limits, open bearings may be lubricated laterally with oil or an oil/air mist via spacer rings. IBC high precision angular contact ball bearings with outer ring lubrication are an option in this case. No changes need to be made to the design of the rolling bearings themselves. They have the suffix S and have a circumferential groove and radial lubrication holes for an oil jet lubrication in the outer ring. Integrated O-rings in the outer ring function as a seal in the housing.

Not only single row high precision angular contact ball bearings are used in machine tools, **IBC high precision cylindrical roller bearings** are used as well. This kind of bearing is characterised by its great stiffness and load carrying capacity, while at the same time providing for high running accuracy, high speed-capacity and a small cross section. They are manufactured as single row bearings in the 19 and 10 dimensional series, and as double row bearings in dimensional series 30 and 49.

IBC high precision cylindrical roller bearings with the HN designation have an enhanced inner geometry enabling them to achieve the highest speeds. Further options provided by IBC include ceramic rollers (CR) and bearings that only have half the number of rollers (Q852).

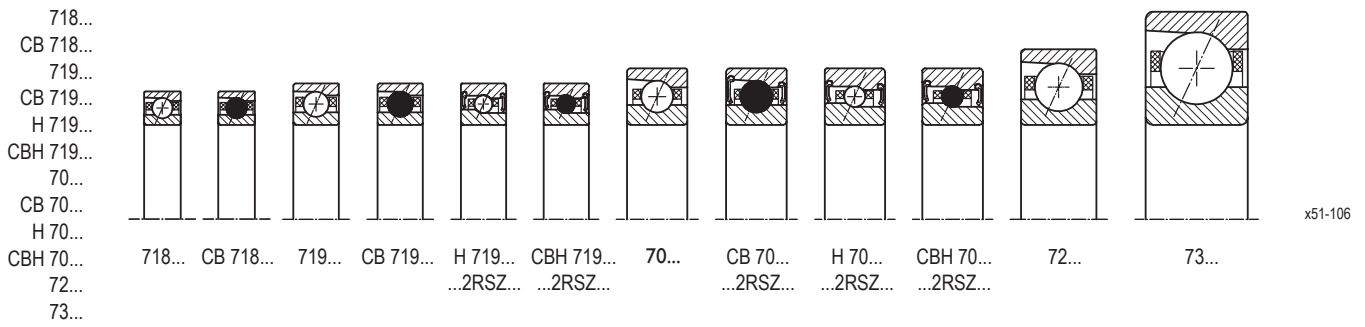
There are two different designs: either the rolling elements are axially guided by the outer ring (NNU) or the inner ring (N and NN). The set of rolling elements and the cage both remain between the shoulders when the ring without shoulder is removed from the rolling bearing. This fact allows the inner and outer rings to be mounted separately and in a much simpler manner. All double row IBC high precision cylindrical roller bearings are fitted with a lubrication groove with three holes on the outer ring (designation W33, 120° arrangement) in order to guarantee effective lubrication.

IBC manufactures special designs of high precision cylindrical roller bearings for specialised applications. Please contact our applications engineers in this case. They will be glad to help you find a solution to your special application requirements and bearing designs.

**IBC High precision tapered roller bearings** for spindles and tables complete the product range of IBC.

# IBC High Precision Angular Contact Ball Bearings

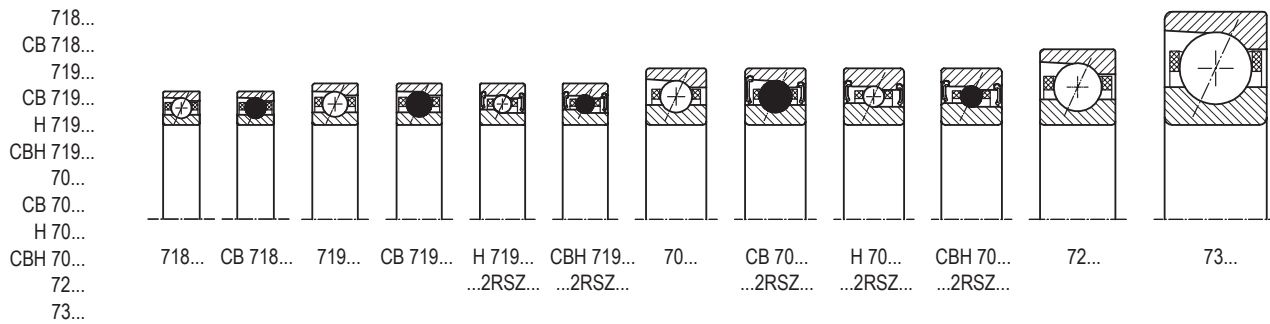
## Manufacturing overview



x51-106

Production series															
d mm	718...			719...			719...X			H 719...					
	D mm	B mm	Di*	D mm	B mm	Di*	D mm	B mm	Di*	D mm	B mm	Di*			
6				X-719/6	15	5									
7				X-719/7	17	5									
8				X-719/8	19	6									
9				X-719/9	20	6									
10				X-71900	22	6									
12				X-71901	24	6									
15				X-71902	28	7									
17				71903	30	7									
20				71904	37	9									
25				71905	42	9	o								
30				71906	47	9	o	71906.X	47	9	o				
35				71907	55	10	o	71907.X	55	10	o				
40				71908	62	12	o	71908.X	62	12	o	H 71908	62	12	o
45				71909	68	12	o	71909.X	68	12	o	H 71909	68	12	o
50	71810	65	7	71910	72	12	o	71910.X	72	12	o	H 71910	72	12	o
55	71811	72	9	71911	80	13	o	71911.X	80	13	o	H 71911	80	13	o
60	71812	78	10	71912	85	13	o	71912.X	85	13	o	H 71912	85	13	o
65	71813	85	10	71913	90	13	o	71913.X	90	13	o	H 71913	90	13	o
70	71814	90	10	71914	100	16	o	71914.X	100	16	o	H 71914	100	16	o
75	71815	95	10	71915	105	16	o	71915.X	105	16	o				
80	71816	100	10	71916	110	16	o	71916.X	110	16	o				
85	71817	110	13	71917	120	18	o	71917.X	120	18	o				
90	71818	115	13	71918	125	18	o	71918.X	125	18	o				
95	71819	120	13	71919	130	18	o	71919.X	130	18	o				
100	71820	125	13	71920	140	20	o	71920.X	140	20	o				
105	71821	130	13	71921	145	20	o	71921.X	145	20	o				
110	71822	140	16	71922	150	20	o	71922.X	150	20	o				
120	71824	150	16	71924	165	22	o	71924.X	165	22	o				
130	71826	165	18	71926	180	24	o								
140	71828	175	18	71928	190	24	o								
150	71830	190	20	71930	210	28	o								
160	71832	200	20	71932	220	28	o								
170	71834	215	22	71934	230	28	o								
180	71836	225	22	71936	250	33	o								
190	71838	240	24	71938	260	33	o								
200	71840	250	24	71940	280	38									
220	71844	270	24	71944	300	38									
240	71848	300	28	71948	320	38									
260	71852	320	28	71952	360	46									
280	71856	350	33	71956	380	46									
300	71860	380	38	71960	420	56									
320	71864	400	38	71964	440	56									
340				71968	460	56									
360				71972	480	56									

\*Di: sealed version



x51-106

Production series																		
70...				70...X				H 70...				72...			73...			
D	B			D	B			D	B			D	B		D	B		
mm	mm		Di'	mm	mm		Di'	mm	mm		Di'	mm	mm	Di'	mm	mm		
X-706	17	6																
X-707	19	6																
X-708	22	7																
X-709	24	7																
X-7000	26	8										7200	30	9	o			
X-7001	28	8										7201	32	10	o			
7002	32	9		7002.X	32	9						7202	35	11	o			
7003	35	10		7003.X	35	10						7203	40	12	o			
7004	42	12		7004.X	42	12						7204	47	14	o	7304	52	15
7005	47	12	o	7005.X	47	12	o					7205	52	15	o	7305	62	17
7006	55	13	o	7006.X	55	13	o					7206	62	16	o	7306	72	19
7007	62	14	o	7007.X	62	14	o					7207	72	17	o	7307	80	21
7008	68	15	o	7008.X	68	15	o	H 7008	68	15	o	7208	80	18	o	7308	90	23
7009	75	16	o	7009.X	75	16	o	H 7009	75	16	o	7209	85	19	o	7309	100	25
7010	80	16	o	7010.X	80	16	o	H 7010	80	16	o	7210	90	20	o			
7011	90	18	o	7011.X	90	18	o	H 7011	90	18	o	7211	100	21	o	7311	120	29
7012	95	18	o	7012.X	95	18	o	H 7012	95	18	o	7212	110	22	o			
7013	100	18	o	7013.X	100	18	o	H 7013	100	18	o	7213	120	23	o			
7014	110	20	o	7014.X	110	20	o	H 7014	110	20	o	7214	125	24	o			
7015	115	20	o	7015.X	115	20	o	H 7015	115	20	o	7215	130	25	o	7315	160	37
7016	125	22	o	7016.X	125	22	o	H 7016	125	22	o	7216	140	26				
7017	130	22	o	7017.X	130	22	o	H 7017	130	22	o	7217	150	28				
7018	140	24	o	7018.X	140	24	o	H 7018	140	24	o	7218	160	30				
7019	145	24	o	7019.X	145	24	o					7219	170	32				
7020	150	24	o	7020.X	150	24	o	H 7020	150	24	o	7220	180	34				
7021	160	26	o	7021.X	160	26	o					7221	190	36				
7022	170	28	o					H 7022	170	28	o	7222	200	38				
7024	180	28	o					H 7024	180	28	o	7224	215	40				
7026	200	33	o									7226	230	40				
7028	210	33	o									7228	250	42				
7030	225	35	o															
7032	240	38	o															
7034	260	42																
7036	280	46																
7038	290	46																
7040	310	51																
7044	340	56																
7048	360	56																

\*Di: sealed version

### 3. IBC High Precision Angular Contact Ball Bearings for stub spindles

#### Designation system



**Examples:**

DTB 04/10 .A  
 CB DTB 04/19 .A .2RSZ  
 ACC- DTB 05/19 .E .2RSZ .A15  
 DTB 06/18 .E .2RSZ .GS32

**Material**

- 100Cr6 rolling elements and rings
- CB** Si<sub>3</sub>N<sub>4</sub> rolling elements
- AC-** ATCoat rings
- ACC-** ATCoat rings + Si<sub>3</sub>N<sub>4</sub> rolling elements

**Design**

- DTB** normal design

**Bore code**

- 00** 10 mm      **01** 12 mm
- 02** 15 mm      **03** 17 mm
- from bore code 04: 4 x 5 = 20 mm

**Dimensional series**

- /19...**    **/10...**

**Contact angle**

- E**      25° contact angle
- A**      30° contact angle

**Lubrication**

- only corrosion protected or, for sealed bearings, standard GS36 or GS75 grease
- G...** specified grease

**ATCoat coating**

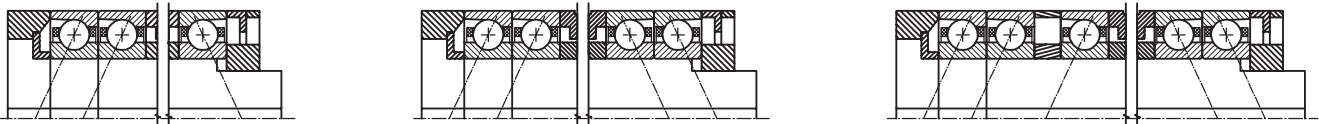
- no coating
- A11** coated inner and outer ring
- A15** coated inner and outer ring, corrosion resistant rolling elements and cage
- A21** coated inner ring
- A31** coated outer ring

**Seal**

- open bearing
- 2RSZ** non-contact seal on both sides NBR

# IBC High Precision Angular Contact Ball Bearings for stub spindles

## Manufacturing overview



x51-121

d mm	Production series					
	DTB.../19	D	B	DTB.../10	D	B
		mm			mm	
17	DTB 03/19	30	7	DTB 03/10	35	10
20	DTB 04/19	37	9	DTB 04/10	42	12
25	DTB 05/19	42	9	DTB 05/10	47	12
30	DTB 06/19	47	9	DTB 06/10	55	13
35	DTB 07/19	55	10	DTB 07/10	62	14
40	DTB 08/19	62	12			
45	DTB 09/19	68	12			
50	DTB 10/19	72	12			
55	DTB 11/19	80	13			
75	DTB 15/19	105	16			

### Driven Tool Bearings (DTB)

The DTB (Driven Tool Bearings) high precision bearing series has been specially designed for driven tools that carry out milling and drilling work in state-of-the-art high precision machine tools. This sort of work is typically performed in a confined installation space under conditions that include short cycle times and great machining forces. It is therefore essential in today's precision machining environment that the bearing provides great stiffness, very high running accuracy and the ability to operate with high rotational speed. Only then can the operator achieve high-precision machining results, increased cutting performance as well as increased system availability with the minimum of maintenance.

IBC's customers may now choose from the DTB (Driven Tool Bearings) precision bearing series. As the name indicates, the contact angle, inner geometry and running accuracy of this type

of precision angular contact ball bearing have been specially optimised for driven tools. The use of such bearings has a number of advantages for the operator, chiefly among them more accurate machining results and enhanced machine tool productivity.

DTB rolling bearings are manufactured in the 19... and 10... production series and with contact angles of 25° (E) or 30° (A). They have an altogether improved axial load capacity and stiffness and can potentially absorb high combined radial and axial loads. In cases where it is the end user who decides on the final deployment of a tool, this type of IBC bearing offers the ideal combination of characteristics suited to driven tools. All DTB precision angular contact ball bearing production series conform to tolerance class P4, and preloads are matched to the typical loading of the different kinds of application.

# 4. IBC High Precision Cylindrical Roller Bearings Designation system



**Examples:**

CR	HN	10	15	.K	.KPA	.SP	.Q852
	NN	30	18	.K	.W33	.PYB	.SP .Q851
	NNU	49	24	.K	.W33	.M	.P5
AC-	HN	10	20		.KPA	.SP	.Q852.A11
CR	N	10	08		.MCB	.P5	

**Material**

- 100Cr6 rolling elements and rings
- CR** Si<sub>3</sub>N<sub>4</sub> rolling elements
- AC-** ATCoat rings
- ACC-** ATCoat rings + Si<sub>3</sub>N<sub>4</sub> rolling elements

**Design**

- N...**    **HN...**
- NN...**
- NNU...**

**Dimensional series**

- 19...**    **10...**
- 30...**
- 49...**

**Bore code**

from bore code 04: 4 x 5 = 20 mm

**Design**

- cylindrical bore
- K** tapered bore 1:12

**Lubrication groove**

- W33** lubrication groove with three holes in the outer ring  
NN 30 and NNU 49

**ATCoat coating**

- no coating
- A11** coated inner and outer ring
- A15** coated inner and outer ring, corrosion resistant rolling elements and cage
- A21** coated inner ring
- A31** coated outer ring

**Special specifications**

- Q851** smaller bearing clearance
- Q852** reduced number of rolling elements, smaller bearing clearance

**Combined accuracy & bearing clearance**

- SPC2X** precision class SP  
bearing clearance C2X
- SP(C1)** precision class SP  
bearing clearance C1 (standard)
- P5** precision according to DIN 620-2  
tolerance class 5

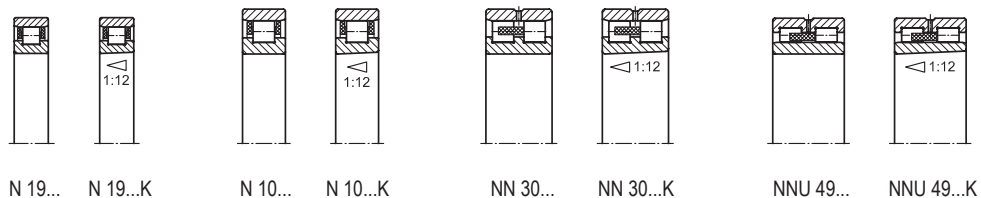
**Cage**

- M** solid brass, roller guided
- PYB** polyphenylene, guided on inner ring
- M1** solid brass, roller guided, cage riveted
- MCB** solid brass, guided on inner ring
- KPA** pocket cage, PEEK, guided on outer ring

# IBC High Precision Cylindrical Roller Bearings

## Manufacturing overview

N 19...  
 N 19...K  
 N 10...  
 N 10...K  
 NN 30...  
 NN 30...K  
 NNU 49...  
 NNU 49...K



x52-102

Production series												
d mm	N 19... / N 19...K			N 10... / N 10...K			NN 30... / NN 30...K			NNU 49... / NNU 49...K		
	D mm	B mm		D mm	B mm		D mm	B mm		D mm	B mm	
25							NN 3005	47	16			
30							NN 3006	55	19			
35							NN 3007	62	20			
40				N 1008	68	15	NN 3008	68	21			
45				N 1009	75	16	NN 3009	75	23			
50	N 1910	72	12	N 1010	80	16	NN 3010	80	23			
55	N 1911	80	13	N 1011	90	18	NN 3011	90	26			
60	N 1912	85	13	N 1012	95	18	NN 3012	95	26			
65	N 1913	90	13	N 1013	100	18	NN 3013	100	26			
70	N 1914	100	16	N 1014	110	20	NN 3014	110	30			
75	N 1915	105	16	N 1015	115	20	NN 3015	115	30			
80	N 1916	110	16	N 1016	125	22	NN 3016	125	34			
85	N 1917	120	18	N 1017	130	22	NN 3017	130	34			
90	N 1918	125	18	N 1018	140	24	NN 3018	140	37			
95	N 1919	130	18	N 1019	145	24	NN 3019	145	37			
100	N 1920	140	20	N 1020	150	24	NN 3020	150	37	NNU 4920	140	40
105	N 1921	145	20	N 1021	160	26	NN 3021	160	41	NNU 4921	145	40
110	N 1922	150	20	N 1022	170	28	NN 3022	170	45	NNU 4922	150	40
120	N 1924	165	22	N 1024	180	28	NN 3024	180	46	NNU 4924	165	45
130	N 1926	180	24	N 1026	200	33	NN 3026	200	52	NNU 4926	180	50
140	N 1928	190	24	N 1028	210	33	NN 3028	210	53	NNU 4928	190	50
150	N 1930	210	28	N 1030	225	35	NN 3030	225	56	NNU 4930	210	60
160	N 1932	220	28	N 1032	240	38	NN 3032	240	60	NNU 4932	220	60
170	N 1934	120	28	N 1034	260	42	NN 3034	260	67	NNU 4934	230	60
180	N 1936	250	33	N 1036	280	46	NN 3036	280	74	NNU 4936	250	69
190	N 1938	260	33	N 1038	290	46	NN 3038	290	75	NNU 4938	260	69
200	N 1940	280	38	N 1040	310	51	NN 3040	310	82	NNU 4940	280	80
220	N 1944	300	38	N 1044	340	56	NN 3044	340	90	NNU 4944	300	80
240	N 1948	320	38	N 1048	360	56	NN 3048	360	92	NNU 4948	320	80
260	N 1952	360	46	N 1052	400	65	NN 3052	400	104	NNU 4952	360	100
280	N 1956	380	46	N 1056	420	65	NN 3056	420	106	NNU 4956	380	100
300	N 1960	420	56							NNU 4960	420	118
320	N 1964	440	56							NNU 4964	440	118
340	N 1968	460	56									
360	N 1972	480	56									

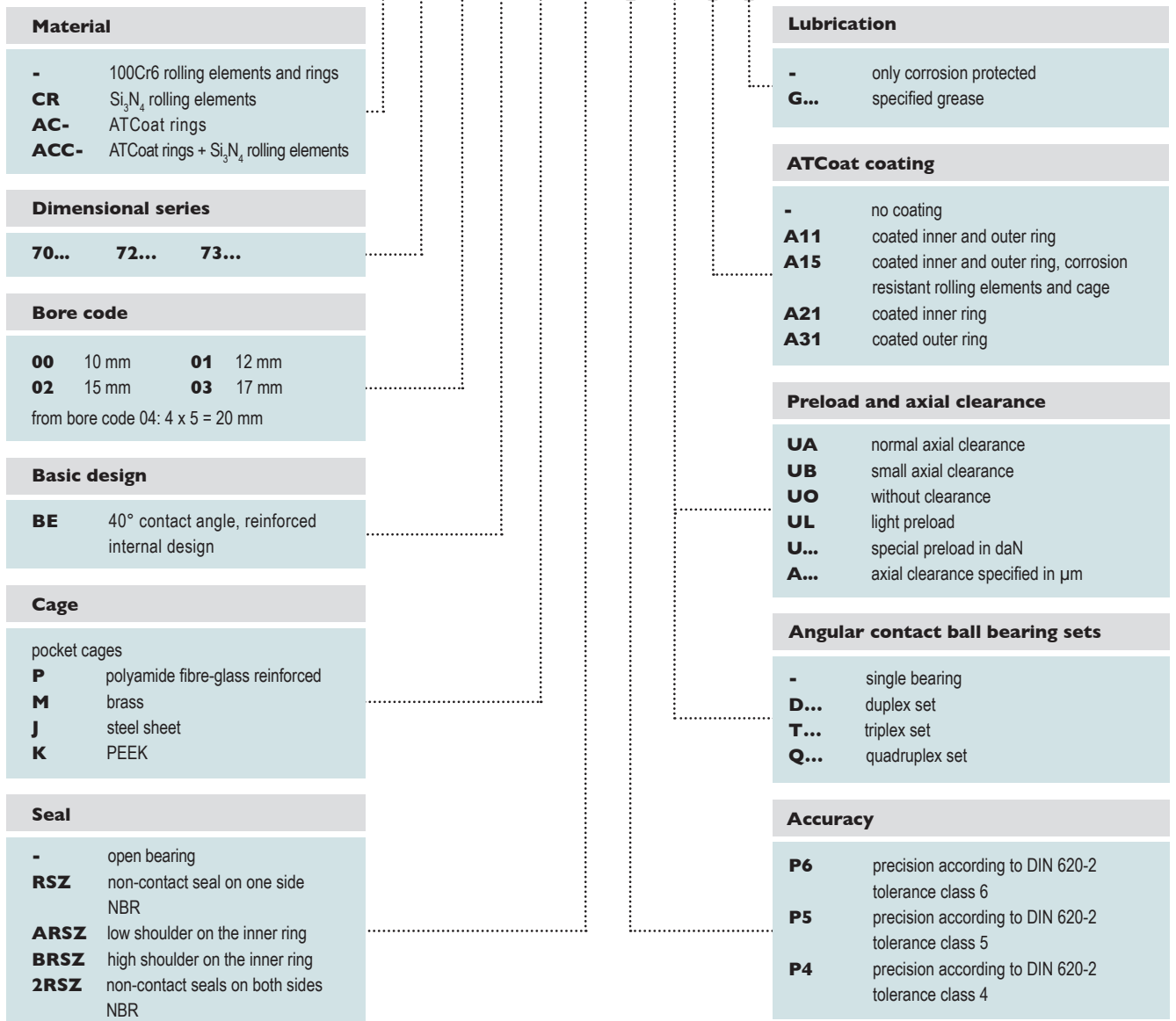
On page 9 you will find further information about the scope of supply and about the way these special high precision cylindrical roller bearings are used in tool spindles.

# 5. IBC 40° Angular Contact Ball Bearings Designation system



**Examples:**

70 05 .BE .P .P6 .DBA  
 72 06 .BE .K .P5 .UL  
 73 05 .BE .P .2RSZ .P5 .UO  
 72 05 .BE .J .UA  
 73 07 .BE .M .P6 .UA  
 ACC- 73 08 .BE .M .P5 .UO .A15 .GH62

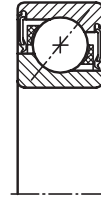
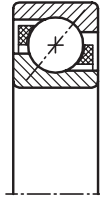




# IBC 40° Angular Contact Ball Bearings

## Manufacturing overview

70...BE  
 CB 70...BE  
 72...BE  
 CB 72...BE  
 73...BE  
 CB 73...BE



x51-217

...2RSZ...

Production series												
d mm	70...				72...				73...			
	D mm	B mm	Di*		D mm	B mm	Di*		D mm	B mm	Di*	
10					7200	30	9	o				
12					7201	32	10	o	7301	37	12	o
15					7202	35	11	o	7302	42	13	o
17					7203	40	12	o	7303	47	14	o
20	7004	42	12	o	7204	46	14	o	7304	52	15	o
25	7005	46	12	o	7205	52	15	o	7305	62	16	o
30	7006	55	13	o	7206	62	16	o	7306	62	19	o
35	7007	62	14	o	7207	62	16	o	7307	80	21	o
40	7008	68	15	o	7208	80	18	o	7308	90	23	
45					7209	85	19		7309	100	25	
50					7210	90	20		7310	110	26	
55					7211	100	21		7311	120	29	
60					7212	110	22		7312	130	31	
65					7213	120	23		7313	140	33	
70					7214	125	24		7314	150	35	
75					7215	130	25		7315	160	36	
80					7216	140	26		7316	170	39	
85					7217	150	28		7317	180	41	
90					7218	160	30		7318	190	43	
95					7219	160	32		7319	200	45	
100					7220	180	34		7320	215	47	
105					7221	190	36		7321	225	43	
110					7222	200	38		7322	240	50	
120					7224	215	40		7324	260	55	
130					7226	230	40		7326	280	58	
140					7228	250	42		7328	300	62	
150					7230	270	45		7330	320	65	
160					7232	290	48					
170					7234	310	52					

\*Di: sealed version. More sealed versions on request.

A whole range of precise solutions will be needed to meet the requirements of the diverse technical applications and operating conditions in the mechanical engineering industry. Requirements for instance include high rotational speeds and load carrying capacity, precise running accuracy, stiffness, or combined radial and axial load in combination with low heat generation. These needs can only be met with the aid of an extensive range of angular contact ball bearings.

Single row 40° angular contact ball bearings only absorb axial forces in the direction in which the rolling elements are loaded as a result of pressure brought to bear between the high shoulders of the inner and outer ring. Because of the contact angle, any

radial forces that take effect produce an axial force; the design must therefore make allowances for this axial force elsewhere.

Single row angular contact ball bearings produced in a universal version are designated with the suffixes UA, UB, UL and UO. They are suited for mounting in sets in X-arrangement, O-arrangement or tandem mounting, and can be used in any arrangement desired.

There are many areas of application that require the shaft to be guided without clearance, e.g. gear boxes, gear motors, blowers, ventilators, pumps as well as textile and printing machines that all may have combined radial and axial loads.

## 6. IBC Cylindrical Roller Bearings Designation system N, NU, NJ, NUP



### Examples:

	NU	10	13		.M1		
	N	2	13	.EA	.M1	.P6	
AC-	NU	2	10	.EA	P	.P53	.A15
	NJ	3	08	.EA	.MCA	.C3	
	NUP	22	05	.EA	.M1A	.P6	

#### Material

- 100Cr6 rolling elements and rings  
**AC-** ATCoat rings

#### Design

**N...**  
**NU...**    **NJ...**    **NUP...**

#### Dimensional series

<b>10...</b>	<b>2...</b>
<b>30...</b>	<b>3...</b>
<b>29...</b>	<b>22...</b>
	<b>23...</b>

#### Bore code

<b>00</b>	10 mm	<b>01</b>	12 mm
<b>02</b>	15 mm	<b>03</b>	17 mm

from bore code 04: 4 x 5 = 20 mm

#### Basic design

**EA...** EXAD  
**V** full complement  
**VH** full complement + self retaining set of rollers

#### ATCoat coating

- no coating  
**A11** coated inner and outer ring  
**A15** coated inner and outer ring, corrosion resistant rolling elements and cage  
**A21** coated inner ring  
**A31** coated outer ring

#### Combined accuracy & bearing clearance

**P6** precision according to DIN 620-2 tolerance class 6  
**P63** precision according to DIN 620-2 tolerance class 6 and bearing clearance C3  
**P53** precision according to DIN 620-2 tolerance class 5 and bearing clearance C3

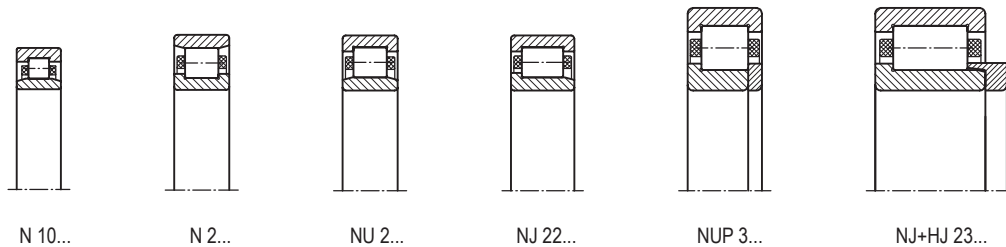
#### Cage

**MC** solid brass, roller guided  
**MCA** solid brass, guided on outer ring  
**M1** solid brass, roller guided, cage riveted  
**M1A** solid brass, guided on outer ring, cage riveted  
**P** pocket cage, PA6.6 fibre-glass reinforced  
**J** steel sheet cage  
**K** pocket cage, PEEK

# IBC Cylindrical Roller Bearings

## Manufacturing overview N, NU, NJ, NUP

N 10...  
N 2...  
NU 2...  
NJ 22...  
NUP 3...  
NJ+HJ 23...



x52-118

d mm	Production series													
	NU		N, NU, NJ, NUP			NU, NJ, NUP			NU, NJ, NUP			NU, NJ, NUP		
	D	B	D	B	D	B	D	B	D	B	D	B		
	mm		mm			mm			mm			mm		
15			... 202	35	11									
17			... 203	40	12					... 303	47	14		
20			... 204	47	14					... 304	52	15	... 2304	52 21
25	NU 1005	47	12	... 205	52	15	... 2205	52	18	... 305	62	16	... 2305	62 24
30	NU 1006	55	13	... 206	62	16	... 2206	62	20	... 306	72	19	... 2306	72 27
35	NU 1007	62	14	... 207	62	16	... 2207	72	23	... 307	80	21	... 2307	80 31
40	NU 1008	68	15	... 208	80	18	... 2208	80	23	... 308	90	23	... 2308	90 33
45	NU 1009	75	16	... 209	85	19	... 2209	85	23	... 309	100	25	... 2309	100 36
50	NU 1010	80	16	... 210	90	20	... 2210	90	23	... 310	110	27	... 2310	110 40
55	NU 1011	90	18	... 211	100	21	... 2211	100	25	... 311	120	29	... 2311	120 43
60	NU 1012	95	18	... 212	110	22	... 2212	110	28	... 312	130	31	... 2312	130 46
65	NU 1013	100	18	... 213	120	23	... 2213	120	31	... 313	140	33	... 2313	140 48
70	NU 1014	110	20	... 214	125	24	... 2214	125	31	... 314	150	35	... 2314	150 51
75	NU 1015	115	20	... 215	130	25	... 2215	130	31	... 315	160	37	... 2315	160 55
80	NU 1016	125	22	... 216	140	26	... 2216	140	33	... 316	170	39	... 2316	170 58
85	NU 1017	130	22	... 217	150	28	... 2217	150	36	... 317	180	41	... 2317	180 60
90	NU 1018	140	24	... 218	160	30	... 2218	160	40	... 318	190	43	... 2318	190 64
95	NU 1019	145	24	... 219	160	32	... 2219	170	43	... 319	200	45	... 2319	200 67
100	NU 1020	150	24	... 220	180	34	... 2220	180	46	... 320	215	47	... 2320	215 73
105	NU 1021	160	26	... 221	190	36				... 321	225	49		
110	NU 1022	170	28	... 222	200	38	... 2222	240	53	... 322	240	50	... 2322	240 80
120	NU 1024	180	28	... 224	215	40	... 2224	260	58	... 324	260	55	... 2324	260 86
130	NU 1026	200	33	... 226	230	40	... 2226	280	64	... 326	280	58	... 2326	280 93
140	NU 1028	210	33	... 228	250	42	... 2228	300	68	... 328	300	62	... 2328	300 102
150	NU 1030	225	35	... 230	270	45	... 2230	320	73	... 330	320	65	... 2330	320 108

**Extended Capacity and Advanced Application** characteristics are a distinguishing mark of the EXAD cylindrical roller bearings production series. Due to their improved design, better materials and enhanced production processes, these bearings have been greatly improved with regard to service life, reliability, greater load carrying capacity, smoother running characteristics as well as reduced friction and, as a consequence, less heat generation. The innovative EXAD technology has become the standard for the types mentioned above.

IBC's product range of rolling bearings contains a whole variety of innovative solutions that guarantee secure functioning of floating, supporting or locating bearings. These solutions include cylind-

rical roller bearings. IBC manufactures cylindrical roller bearings with various designs, and in a variety of dimensional series and sizes, but the majority of these bearings come in the form of single row cylindrical roller bearings with cage, as described in this catalogue. Because the N and NU designs allow for axial displacement they are the ideal solution for the type of floating bearing that is for instance used in pumps and compressors. The NUP, NJ and HJ designs are used as locating bearings.

The range of bearings designed for general mechanical engineering includes both single and double row cylindrical roller bearings with cage as well as single and double row full complement cylindrical roller bearings.

# IBC Cylindrical Roller Bearings

## Designation system NCF, NJG



**Examples:** AC- NCF 29 14 .V .P53 .A11  
 NJG 23 24 .VH

**Material**

- 100Cr6 rolling elements and rings  
**AC-** ATCoat rings

**Design**

**NCF...**  
**NJG...**

**Dimensional series**

**29...**    **30...**  
**22...**    **23...**

**Bore code**

**00** 10 mm    **01** 12 mm  
**02** 15 mm    **03** 17 mm  
 from bore code 04: 4 x 5 = 20 mm

**Basic design**

**V** full complement  
**VH** full complement + self retaining set of rollers

**ATCoat coating**

- no coating  
**A11** coated inner and outer ring  
**A15** coated inner and outer ring, corrosion resistant rolling elements  
**A21** coated inner ring  
**A31** coated outer ring

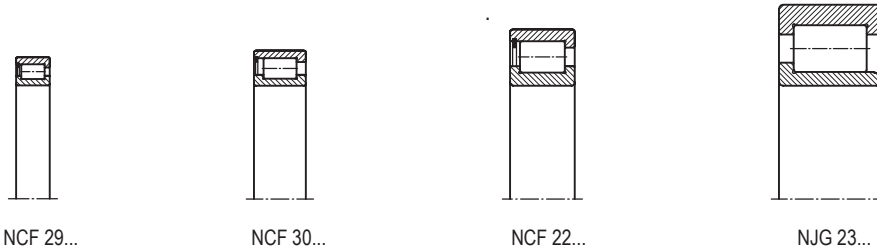
**Combined accuracy & bearing clearance**

**P6** precision according to DIN 620-2 tolerance class 6  
**P63** precision according to DIN 620-2 tolerance class 6 and bearing clearance C3  
**P53** precision according to DIN 620-2 tolerance class 5 and bearing clearance C3

# IBC Cylindrical Roller Bearings

## Manufacturing overview NCF, NJG

NCF 29...  
NCF 30...  
NCF 22...  
NJG 23...



x52-117

Production series												
d mm	NCF 29...			NCF 30...			NCF 22...			NJG 23...		
	D mm	B mm		D mm	B mm		D mm	B mm		D mm	B mm	
20				NCF 3004	42	16	NCF 2204	47	18			
25				NCF 3005	47	16	NCF 2205	52	18	NJG 2305	62 24	
30				NCF 3006	55	19	NCF 2206	62	20	NJG 2306	72 27	
35				NCF 3007	62	20	NCF 2207	72	23	NJG 2307	80 31	
40				NCF 3008	68	21	NCF 2208	80	23	NJG 2308	90 33	
45				NCF 3009	75	23	NCF 2209	85	23	NJG 2309	100 36	
50				NCF 3010	80	23	NCF 2210	90	23	NJG 2310	110 40	
55				NCF 3011	90	26	NCF 2211	100	25	NJG 2311	120 43	
60	NCF 2912	85	16	NCF 3012	95	26	NCF 2212	110	28	NJG 2312	130 46	
65	NCF 2913	90	16	NCF 3013	100	26	NCF 2213	120	31	NJG 2313	140 48	
70	NCF 2914	100	19	NCF 3014	110	30	NCF 2214	125	31	NJG 2314	150 51	
75	NCF 2915	105	19	NCF 3015	115	30	NCF 2215	130	31	NJG 2315	160 55	
80	NCF 2916	110	19	NCF 3016	125	34	NCF 2216	140	33	NJG 2316	170 58	
85	NCF 2917	120	22	NCF 3017	130	34	NCF 2217	150	36	NJG 2317	180 60	
90	NCF 2918	120	22	NCF 3018	140	37	NCF 2218	160	40	NJG 2318	190 64	
95							NCF 2219	170	43	NJG 2319	200 67	
100	NCF 2920	140	24	NCF 3020	150	37	NCF 2220	180	46	NJG 2320	215 73	
105	NCF 2922	150	24	NCF 3022	170	45	NCF 2222	200	53	NJG 2322	240 80	
110	NCF 2924	165	27	NCF 3024	180	46	NCF 2224	215	58	NJG 2324	260 86	
120	NCF 2926	180	30	NCF 3026	200	52	NCF 2226	230	64	NJG 2326	280 93	
130	NCF 2928	190	30	NCF 3028	210	53	NCF 2228	250	68	NJG 2328	300 102	
140	NCF 2930	210	36	NCF 3030	225	56	NCF 2230	270	73	NJG 2330	320 108	

Single row full complement cylindrical roller bearings are manufactured as NCF and NJG designs.

Full complement cylindrical roller bearings are not sealed and are not greased during manufacture. They can be supplied with oil or grease lubrication via the front side during assembly or even while they are in operation.

NCF design cylindrical roller bearings have an inner ring with two fixed shoulders and an outer ring with one fixed shoulder that is able to axially guide the shaft in one direction. The cylindrical roller bearing is held together by a snap ring located on the side of the outer ring that does not have a shoulder. Bearings of this design are able to absorb axial loads in one di-

rection; the production series of these bearings are designated by the numbers 29, 30 and 22.

NJG design single row full complement cylindrical roller bearings have a self retaining set of rollers. This means that the outer ring, which has two fixed shoulders and contains the set of rollers, can be retracted from the inner ring that has one fixed shoulder. A special securing mechanism to prevent the rolling elements from falling out is not required; this makes mounting and dismounting much easier. These bearings, too, are able to absorb axial loads in one direction.

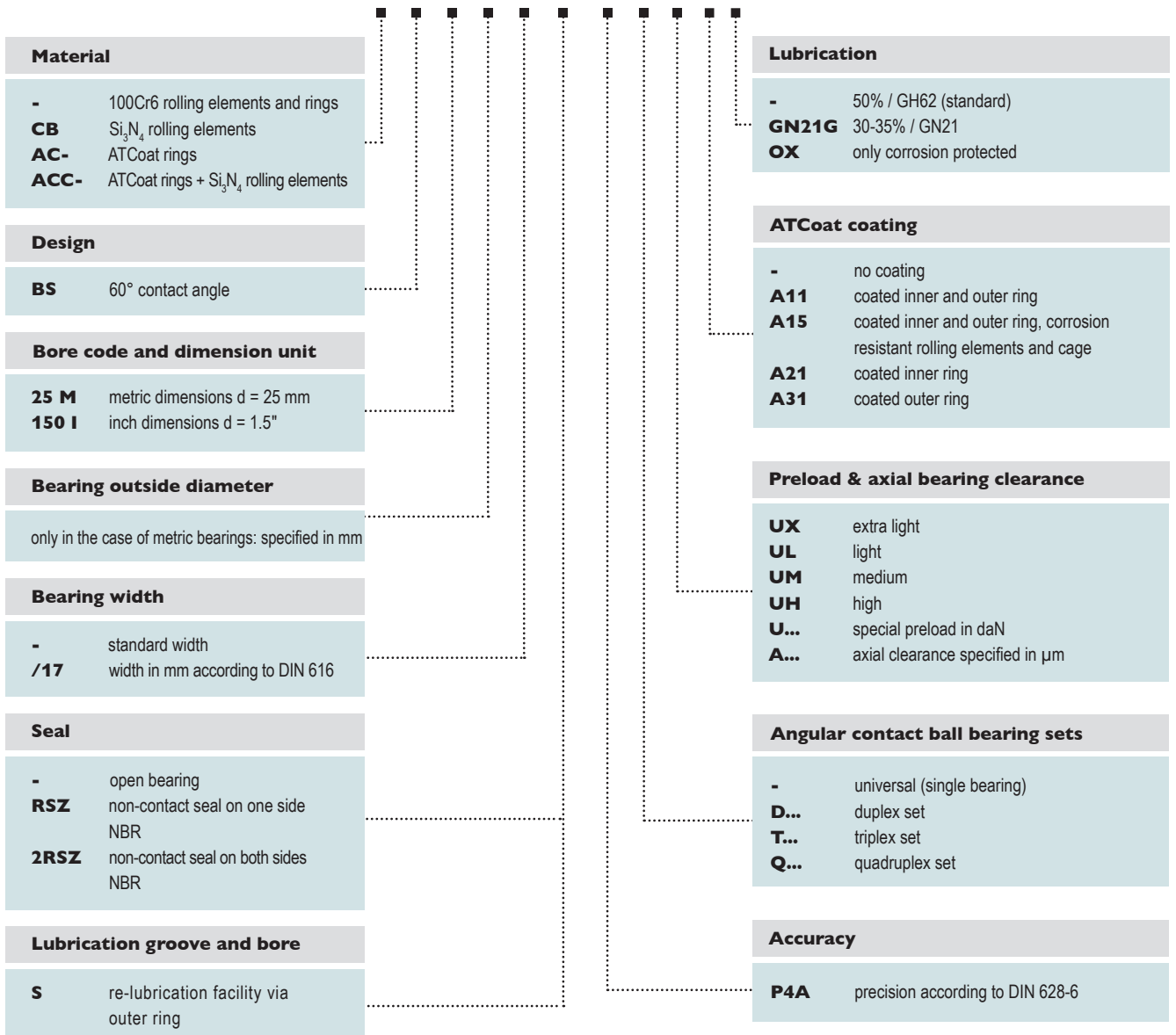
NJG design bearings are designed for slow moving, very heavily loaded or pivoting applications and are manufactured in the heavy 23 production series.

# 7. IBC Single Row Precision 60° Ball Screw Support Bearings

## Designation system



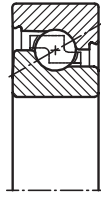
**Examples:** CB BS 75 M 110 .S .P4A .D UM .OX  
 BS 30 M 62 /16 .2RSZ .P4A .UM  
 AC- BS 50 M 100 .P4A .Q UM  
 BS 25 M 62 /17 .P4A .D UM .A15 .GH62G



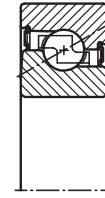
# IBC Single Row Precision 60° Ball Screw Support Bearings

## Manufacturing overview

BS... M...



BS... M...



...2RSZ...

x51-218

d mm	Production series						
	BS...M...	D	B	d	BS...I	D	B
		mm	mm	mm		mm	mm
17	BS 17M47	47	15	20	BS 078 I	47	15,875
20	BS 20M47	47	15	23,838	BS 093 I	62	15,875
20	BS 20M47/14*	47	14	38,1	BS 150 I	72	15,875
20	BS 20M52	52	15	44,475	BS 175 I	76,2	15,875
25	BS 25M52	52	15				
25	BS 25M62	62	15				
25	BS 25M62/17*	62	17				
30	BS 30M62	62	15				
30	BS 30M62/16*	62	16				
30	BS 30M72	72	15				
30	BS 30M72/19*	72	19				
30	BS 30M90	90	20				
35	BS 35M72	72	15				
35	BS 35M72/17*	72	17				
35	BS 35M100	100	20				
40	BS 40M72	72	15				
40	BS 40M90	90	20				
40	BS 40M90/23*	90	23				
40	BS 40M100	100	20				
45	BS 45M75	75	15				
45	BS 45M100	100	20				
50	BS 50M90	90	20				
50	BS 50M100	100	20				
55	BS 55M90	90	15				
55	BS 55M100	100	20				
55	BS 55M120	120	20				
60	BS 60M120	120	20				

\*Do not use in new designs.

Unilaterally effective precision ball screw support bearings only absorb axial forces in the direction in which the rolling elements are loaded as a result of pressure brought to bear between the high shoulders of the inner and outer ring. In most cases, these bearings are set against each other in pairs. A common type of application is the bearing of a ball screw.

Ball screw support bearings are universally face ground. They can be mounted in a flexible manner at each bearing location, either as a single bearing or as a bearing set put together during manufacture; sets may be arranged according to the customer's needs. Sets put together during manufacture display an overall V-mark across the outer rings of the bearings. This V-mark spans the entire set of ball screw support bearings.

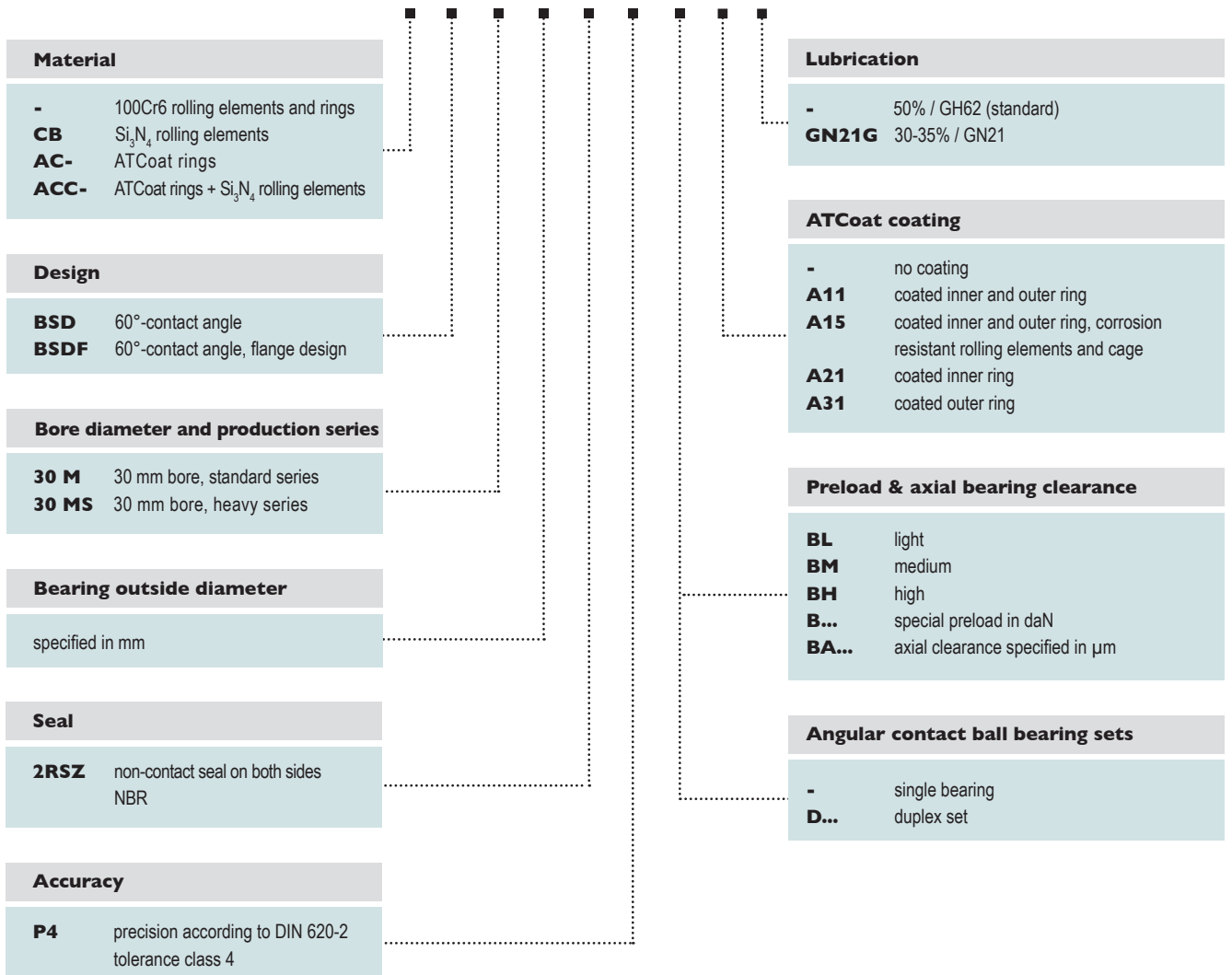
The customer benefits from these bearings because they are easy to install, have a long service life without needing maintenance and allow for the possibility of being provided with for life grease lubrication or circulating oil lubrication. Additional benefits include high positioning accuracy and low energy consumption during operation; the bearings also operate safely during fast acceleration and high rotational speeds of the ball screw. The use of ceramic rolling elements or of bearing rings coated with ATC thin dense chromium coating are further options if you want to achieve even higher rotational speeds. In addition to 60° ball screw support bearings that are open, we also offer versions that have seals on both sides. The sealed versions help to achieve good operational safety even in difficult environments.

# 8. IBC Double Row Precision 60° Ball Screw Support Bearings

## Designation system



**Examples:**      CB BSD 30 M 62 .2RSZ .P4 .BM  
                          BSD 30 MS 72 .2RSZ .P4 .BM  
                          BSDF 30 M 80 .2RSZ .P4 .DBM .A11  
                          BSDF 30 MS 100 .2RSZ .P4 .DBM .GN21G

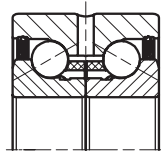




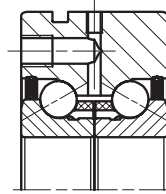
# IBC Double Row Precision 60° Ball Screw Support Bearings

## Manufacturing overview

BSD...  
BSDF...



BSD...



BSDF...

x53-002

Production series						
d mm	BSD...M...			BSDF...M...		
	Standard series	D mm	B	Standard series	D mm	B
10	BSD 10M34	34	20			
12	BSD 12M42	42	25	BSDF 12M55	55	25
15	BSD 15M45	45	25	BSDF 15M60	60	25
17	BSD 17M47	47	25	BSDF 17M62	62	25
20	BSD 20M52	52	28	BSDF 20M68	68	28
25	BSD 25M57	57	28	BSDF 25M75	75	28
30	BSD 30M62	62	28	BSDF 30M80	80	28
35	BSD 35M72	72	34	BSDF 35M90	90	34
40	BSD 40M75	75	34	BSDF 40M100	100	34
50	BSD 50M90	90	34	BSDF 50M115	115	34

d mm	Heavy series			Heavy series		
	Heavy series	D mm	B	Heavy series	D mm	B
30	BSD 30MS72	72	38	BSDF 30MS100	100	38
40	BSD 40MS90	90	46	BSDF 40MS115	115	46
50	BSD 50MS110	110	54	BSDF 50MS140	140	54

Ball screws used in machine tools help to feed work pieces and machine parts quickly, efficiently and accurately. The BSD and BSDF bearing series have been designed for straightforward and easy mounting to ball screws.

A double row 60° ball screw support bearing enables the user to mount the ball screw spindle with high precision (P4), high load carrying capacity, low friction and great stiffness. The bearing is easy to install and requires little maintenance, thereby providing cost-effective use. The result is that the user is able to benefit from an optimised overall machine tool system.

The double row ball screw support bearing is available in a standard version and a heavy series. The heavy series has the same shaft diameter but a larger reference circle than the standard series; and because the rolling elements are bigger in

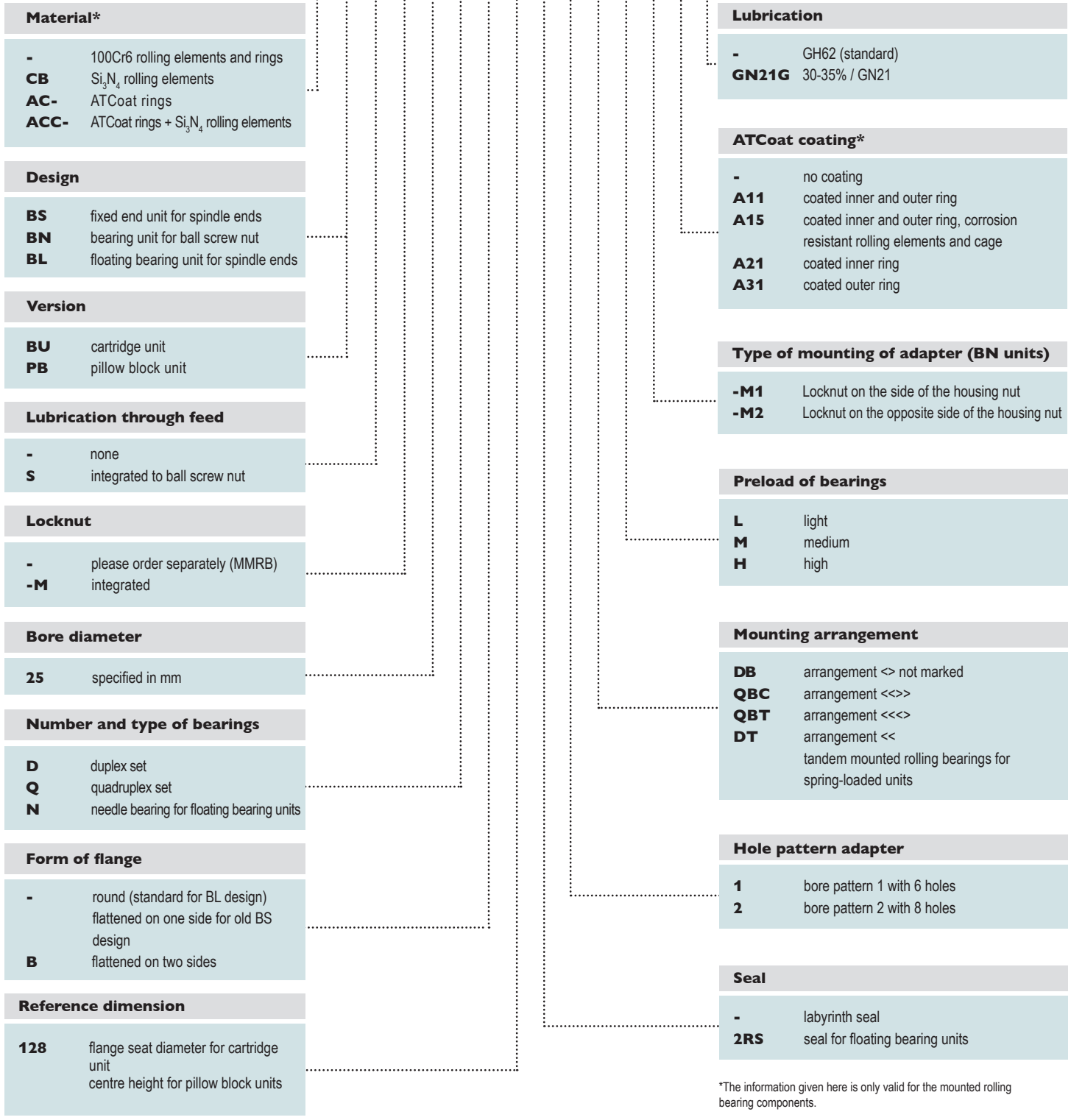
the heavy series, it enables greater load ratings to be achieved. As they come with a contact angle of 60°, both series accommodate loads made up mainly of axial forces. The bearing rings are matched so as to achieve a defined preload for the mounted bearing with the aid of a precision locknut. The double row 60° ball screw support bearing in BSDF design is suitable for mounting the bearing by screws directly on to the adjacent construction or into a radial locating bore, without the need of further housing parts. In addition, a circumferential extraction groove makes disassembly from a locating bore easier. The bearing also features re-lubrication channels that are sealed with detachable threaded pins.

As standard, both bearing series come sealed on both sides and ready-lubricated with high-performance grease whose lubricity in most cases will last for the entire service life of the bearing.

# 9. IBC High Precision Bearing Units Designation system

**Examples:**

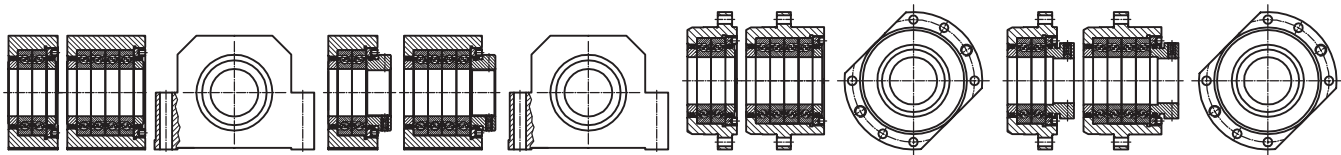
BSBU -M 25 D B 88 .QBT M  
 AC-BSBU -M 40 Q B 128 .QBT M  
 BNBU S 75 Q B 178 .DB L -M2  
 BLPB 20 N 32 .2RS 2 .A11



\*The information given here is only valid for the mounted rolling bearing components.

# IBC High Precision Bearing Units

## Manufacturing overview



BSPB..D.. BSPB..Q..

BSPB-M..D.. BSPB-M..Q..

BSBU..DB..BSBU..QB..

BSBU-M..DB.. BSBU-M..QB..

x57-121

Production series				
Ball screw shaft bearing, medium series				
for shaft mm	BSBU...	-M	BSPB...	-M
17	BSBU 17 DB 64	o	BSPB 17 D 32	o
17	BSBU 17 QB 64	o	BSPB 17 Q 32	o
20	BSBU 20 DB 64	o	BSPB 20 D 32	o
20	BSBU 20 QB 64	o	BSPB 20 Q 32	o
25	BSBU 25 DB 88	o	BSPB 25 D 42	o
25	BSBU 25 QB 88	o	BSPB 25 Q 42	o
30	BSBU 30 DB 88	o	BSPB 30 D 42	o
30	BSBU 30 QB 88	o	BSPB 30 Q 42	o
30	BSBU 30 DB 98	o	BSPB 30 D 50	o
30	BSBU 30 QB 98	o	BSPB 30 Q 50	o
35	BSBU 35 DB 98	o	BSPB 35 D 50	o
35	BSBU 35 QB 98	o	BSPB 35 Q 50	o
40	BSBU 40 DB 98	o	BSPB 40 D 50	o
40	BSBU 40 QB 98	o	BSPB 40 Q 50	o
45	BSBU 45 DB 98	o	BSPB 45 D 50	o
45	BSBU 45 QB 98	o	BSPB 45 Q 50	o
55	BSBU 55 DB 113	o	BSPB 55 D 65	o
55	BSBU 55 QB 113	o	BSPB 55 Q 65	o
75	BSBU 75 DB 138	o	BSPB 75 D 65	o
75	BSBU 75 QB 138	o	BSPB 75 Q 65	o

Production series		
Ball screw nut bearing		
for ball screw mm	BNBU...	BNPB...
16 x 5	BNBU 28 DB 98	BNPB 28 DB 50
20 x 5	BNBU 36 DB 98	BNPB 36 DB 50
25 x 5	BNBU 40 DB 113	BNPB 40 DB 65
25 x 10	BNBU 40 QB 113	BNPB 40 QB 65
32 x 5	BNBU 50 DB 138	BNPB 50 DB 65
32 x 10	BNBU 50 QB 138	BNPB 50 QB 65
40 x 5	BNBU 63 DB 138	BNPB 63 DB 65
40 x 10	BNBU 63 QB 138	BNPB 63 QB 65
50 x 5	BNBU 75 DB 178	BNPB 75 DB 85
50 x 10	BNBU 75 QB 178	BNPB 75 QB 85
63 x 5	BNBU 90 DB 210	BNPB 90 DB 105
63 x 10	BNBU 90 QB 210	BNPB 90 QB 105
63 x 20	BNBU 95 DB 210	BNPB 95 DB 105
	BNBU 95 QB 210	BNPB 95 QB 105
80 x 10	BNBU 105 DB 210	BNPB 105 DB 105
	BNBU 105 QB 210	BNPB 105 QB 105

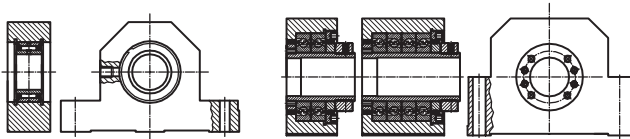
Production series				
Ball screw shaft bearing, heavy series				
for shaft mm	BSBU...	-M	BSPB...	-M
35	BSBU 35 DB 128	o	BSPB 35 D 65	o
35	BSBU 35 QB 128	o	BSPB 35 Q 65	o
40	BSBU 40 DB 128	o	BSPB 40 D 65	o
40	BSBU 40 QB 128	o	BSPB 40 Q 65	o
45	BSBU 45 DB 128	o	BSPB 45 D 65	o
45	BSBU 45 QB 128	o	BSPB 45 Q 65	o
50	BSBU 50 DB 128	o	BSPB 50 D 65	o
50	BSBU 50 QB 128	o	BSPB 50 Q 65	o
55	BSBU 55 DB 148	o	BSPB 55 D 85	o
55	BSBU 55 QB 148	o	BSPB 55 Q 85	o
60	BSBU 60 DB 148	o	BSPB 60 D 85	o
60	BSBU 60 QB 148	o	BSPB 60 Q 85	o

For a fast and easy installation procedure IBC recommends the use of precision bearing units that are ready for assembly. The main field of application for such bearing units is ball screws in machine tools; the units are lubricated for life and sealed with labyrinth seals. The many possible arrangements within a rolling bearing set (which are designed to meet the many different requirements the bearings have with regard to great axial stiffness and load rating, low friction, high running accuracy as well as high rotational speeds and fast acceleration) led us to develop a modular system that provides the design engineer with great flexibility when designing different versions.

Some precision bearing housings that have an identical installation space can be supplied with 60° ball screw support bearings that have different bores. This has proved beneficial in the case of machine tools that do not have the same shaft length. Where the shaft length is different, it is essential to choose a greater ball screw diameter for longer strokes if the critical bending speed of the spindle may be exceeded. In this case, bearings that have different bores, but otherwise share the same mounting dimensions, allow the user to design a uniform bearing ambience and thereby to achieve cost-efficiency.

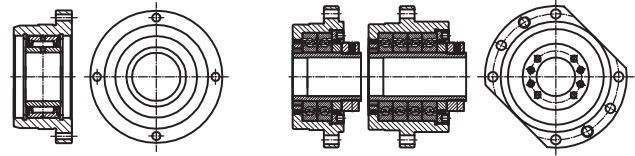
# IBC High Precision Bearing Units

## Manufacturing overview



BLPB..N...2RS

BNPB..D.. BNPB..Q..



BLBU..N...2RS

BNBU..DB.. BNBU..QB..

x57-103

Floating bearings		
for shaft mm	Cartridge units	Pillow block units
	BLBU	BLPB
10	BLBU 10 N 32	
15	BLBU 15 N 35	
17	BLBU 17 N 40	
20	BLBU 20 N 50	BLPB 20 N 32
25	BLBU 25 N 55	BLPB 25 N 42
30	BLBU 30 N 60	BLPB 30 N 50
35	BLBU 35 N 70	
40	BLBU 40 N 80	BLPB 40 N 65
45	BLBU 45 N 85	
50	BLBU 50 N 90	BLPB 50 N 85

Bearing units that are ready for assembly have become a very popular choice. The assembly of modules that belong together simplifies and speeds up the assembly process, resulting in greater efficiency. And because there is no axial contact surface in the locating bores, the adjacent parts can be of a much simpler design.

Bearings units come in two different types: precision cartridge units and precision pillow block units. As the IBC high precision cartridge units are flat on both sides they are low in overall height. This enhances their design, making them easier to handle during assembly.

The cartridge units may be fixed to the face-milled mounting space by way of two design solutions: they can either be precisely inserted into a calibrated bore and bolted down, or they can be bolted down in an overcalibrated bore in a friction-locked manner; this means that they can be radially adjusted during mounting.

Should the machine need servicing, the technicians on site will appreciate the simple way in which a module (bearing unit plus ball screw) may be replaced with a new module. Pre-assembled modules can also be quickly mounted, leading to shorter waiting periods and therefore shorter shutdown times.

The pre-integrated locknut with matching labyrinth seal is a feature of the BSBU-M series that provides for easy and secure preloading of the precision cartridge unit.

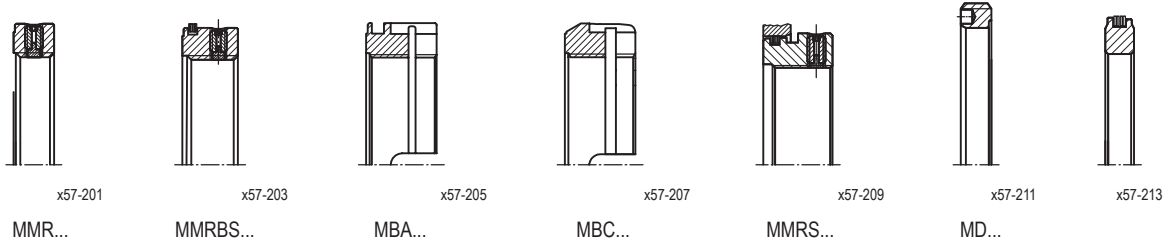
Whereas in the past, cartridge units had additionally to be accommodated by supports, IBC high precision pillow block units have the effect of reducing installation space and assembly time. Experience has confirmed the many advantages of having strict tolerance requirements for the contact surfaces of the locating and floating bearing units in the BSPB, BSPB-M and BLPB series that have the same reference dimensions. This means that the location face for the precision bearing units can be processed together with those of the guidance. The use of predrilled pinholes allows for precise fixing. Should you need bearings for ball screw nuts (according to DIN 69051), IBC will supply you with its high precision bearing units that come with an adapter. Such units are especially used for long ball screws. The standard IBC versions are suited to practically all types of application and are used as the basis for customer-specific special solutions.

IBC high precision locknuts with fine thread are used with high-precision applications because of their high accuracy. The securing systems integrated into the various locknuts permit simple and accurate mounting and provide for lasting stability. The securing systems do not change the circular cross-section of the shaft, and no additional changes occur, so the securing systems do not cause grooves to form on the shaft. Because of the superfinishing of the thread and the contact surface, IBC high precision locknuts attain an axial face runout that conforms to ISO standard tolerance class IT3.

The different designs of IBC high precision locknuts are suited to a wide range of applications. The high precision locknuts are manufactured in various widths suitable for different axial loads. The securing devices may be axially or radially accessible, depending on the design.

# 10. IBC High Precision Locknuts

MMR...  
MMRBS...  
MBA...  
MBC...  
MMRS...  
MD...  
S...



IBC High precision locknuts							
s	axial locking			radial locking			
	Des.	B		Des.	B	Des.	B
mm		mm			mm		mm
				MMR 6	8		
				MMR 8	8		
				MMR 10	8		
				MMR 12	8		
				MMR 15	8		
				MMR 17	10		
1,0	MBA 20	16	x	MMR 20	10	MMRB 20	16 z
1,5	MBA 25	18	x	MMR 25	12	MMRB 25	18 z
1,5	MBA 30	18	x	MMR 30	12	MMRB 30	18 z
1,5	MBA 35	18	x	MMR 35	12	MMRB 35	18 z
1,5	MBA 40	20	x	MMR 40	14	MMRB 40	20 z
1,5	MBA 45	20	x y	MMR 45	14	MMRB 45	20 z
1,5	MBA 50	20	x y	MMR 50	14	MMRB 50	20 z
2,0	MBA 55	22	x y	MMR 55	16	MMRB55	22 z
2,0	MBA 60	22	x y	MMR 60	16	MMRB 60	22 z
2,0	MBA 65	22	x y	MMR 65	16	MMRB 65	22 z
2,0	MBA 70	24	x y	MMR 70	18	MMRB 70	24 z
2,0	MBA 75	24	x y	MMR 75	18	MMRB 75	24 z
2,0	MBA 80	24	x y	MMR 80	18	MMRB 80	24 z
2,0	MBA 85	24	x y	MMR 85	18	MMRB 85	24 z
2,0	MBA 90	26	x y	MMR 90	20	MMRB 90	26 z
2,0	MBA 95	26	x y	MMR 95	20	MMRB 95	26 z
2,0	MBA 100	26	x y	MMR 100	20	MMRB 100	26 z
2,0	MBA 105	28	x y	MMR 105	22	MMRB 105	28 z
2,0	MBA 110	28	x y	MMR 110	22	MMRB 110	28 z
2,0	MBA 115	28	x y	MMR 115	22	MMRB 115	28 z
2,0	MBA 120	30	x y	MMR 120	24	MMRB 120	30 z
2,0	MBA 125	30	x y	MMR 125	24	MMRB 125	30 z
2,0	MBA 130	30	x y	MMR 130	24	MMRB 130	30 z
2,0	MBA 140	32	x y	MMR 140	26	MMRB 140	32 z
2,0	MBA 150	32	x y	MMR 150	26	MMRB 150	32 z
3,0	MBA 160	34	x y			MMRB 160	34 z
3,0	MBA 170	34	x y			MMRB 170	34 z
3,0	MBA 180	36	x y			MMRB 180	36 z
3,0	MBA 190	36	x y			MMRB 190	36 z
3,0	MBA 200	38	x y			MMRB 200	38 z
4,0	MBA 210	40				MMRB 210	40 z
4,0	MBA 220	40				MMRB 220	40 z
4,0	MBA 240	44				MMRB 240	44 z
4,0	MBA 260	44				MMRB 260	44 z
4,0	MBA 280	50				MMRB 280	50 z
5,0	MBA 300	50				MMRB 300	50 z

s thread pitch, B – width (overall height) of nut  
 x nut fitted with seal rings, MBAS... design from the MBA... series  
 y nut without seal ring groove, MBC... design  
 z nut fitted with seal rings, MMRBS... design

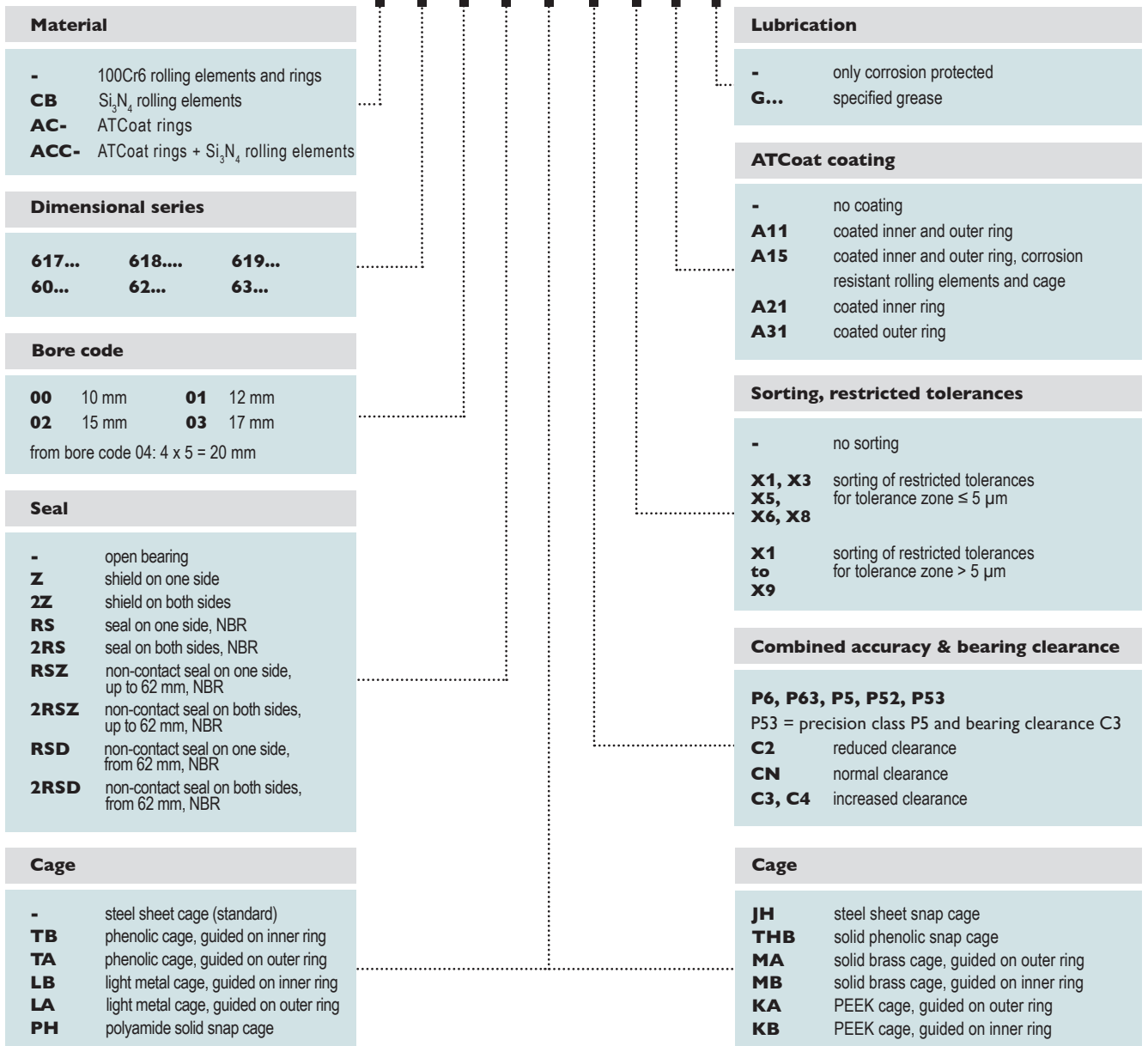
Nuts and components for cage units							
s	MMRS nuts		labyrinth seals		seal ring nuts		B
	Des.	B	B	s	Des.	B	
mm		mm	mm	mm		mm	mm
1,0	MMRS 17-36	20	S 17-36	7	1,5	MD 50-36	10
1,0	MMRS 20-36	20	S 20-36	7			
1,0	MMRS 22-36	20					
1,5	MMRS 25-40	20	S 25-40	7	1,5	MD 55-40	10
1,5	MMRS 25-50	25	S 25-50	10	1,5	MD 70-50	12
1,5	MMRS 27-50	25	S 30-50	10			
1,5	MMRS 30-50	25	S 35-50	10			
1,5	MMRS 30-60	28	S 30-60	10	1,5	MD 80-60	12
1,5	MMRS 35-60	28	S 35-60	10			
1,5	MMRS 40-60	28	S 40-60	10			
1,5	MMRS 45-60	28	S 45-60	10			
1,5	MMRS 35-76	30	S 35-76	12	2,0	MD 110-76	14
1,5	MMRS 40-76	30	S 40-76	12			
1,5	MMRS 45-76	30	S 45-76	12			
1,5	MMRS 50-76	30	S 50-76	12			
2,0	MMRS 55-76	30					
			S 40-76-10	10	2,0	MD 95-76	12
			S 50-76-10	10			
			S 55-76-10	10			
2,0	MMRS 55-99	30	S 55-99	12	2,0	MD 120-99	14
2,0	MMRS 60-99	30	S 60-99	12	2,0	MD 130-99	14
2,0	MMRS 65-99	30					
2,0	MMRS 75-99	30					
2,0	MMRS 100-132	35	S 100-132	14	3,0	MD 160-132	18
2,0	MMRS 125-162	35	S 127-162	14,5	3,0	MD 190-162	18

We recommend using our precision locknuts from the MMR series for applications with limited installation space, or if you want to save on weight. In the MBA and MBC series, the locking of a locknut which cannot be reached radially is secured axially with accessible clamping screws. This production series requires a greater width due to its specific design. The securing device in the MBA design can slightly increase the axial preload of the locknut, whereas in the MBC design it can slightly reduce the axial preload of the locknut. The MMRB version has a radial securing device, and its cross-section is the same as the MBA and MBC precision locknuts; it therefore permits higher loads and higher tightening torques. Under the designation MMRBS and MBAS, the MMRB and MBA production series are also manufactured with an integrated labyrinth seal.

# 11. IBC Deep Groove Ball Bearings Designation system

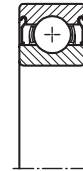
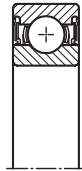
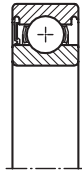
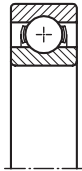


**Examples:** CB 60 14 .T .P63 .GH73  
 617 01 .2RS .Y  
 618 05 .ZZ .C3  
 63 08 .ZZ .P64  
 ACC- 60 10 .TB .P53 .X22 .A15 .GH62



# IBC Deep Groove Ball Bearings Manufacturing overview

617...  
618...  
619...  
60...  
CB 60...  
62...  
CB 62...  
63...  
CB 63...



...RS... /  
...RSZ...

...2RS... /  
...2RSZ...

...Z...

...2Z...

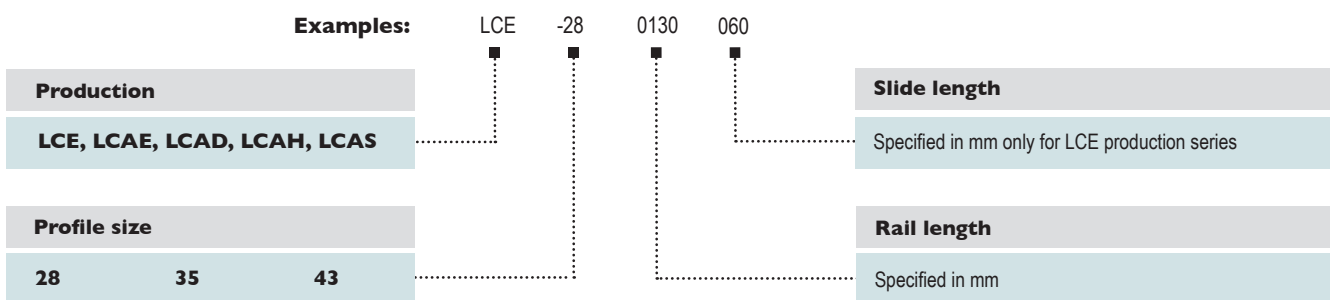
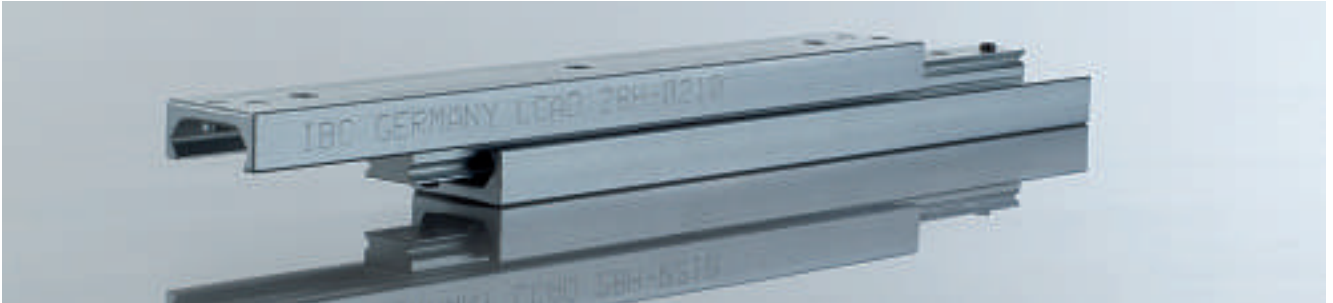
x40-103

Production series																					
d mm	617...		618...		619...		160...			60...			62...		63...						
	D	B	D	B	D	B	D	B	D	B	D	B	D	B	D	B					
	mm		mm		mm		mm			mm			mm		mm						
10	61700	15	3	61800	19	5	61900	22	6			6000	26	8	6200	30	9	6300	35	11	
12	61701	18	4	61801	21	5	61901	24	6			6001	28	8	6201	32	10	6301	37	12	
15	61702	21	4	61802	24	5	61902	28	6			6002	32	9	6202	35	11	6302	42	13	
17	61703	23	4	61803	26	5	61903	30	6	16003	35	8	6003	35	10	6203	40	12	6303	47	14
20	61704	27	4	61804	32	7	61904	36	9	16004	42	8	6004	42	12	6204	46	14	6304	52	15
25	61705	32	4	61805	37	7	61905	42	9	16005	47	8	6005	46	12	6205	52	15	6305	62	16
30	61706	37	4	61806	42	7	61906	46	9	16006	55	9	6006	55	13	6206	62	16	6306	62	19
35	61707	44	5	61807	47	7	61907	55	10	16007	62	9	6007	62	14	6207	62	16	6307	80	21
40				61808	52	7	61908	62	12	16008	68	9	6008	68	15	6208	80	18	6308	90	23
45				61809	58	7	61909	68	12	16009	75	10	6009	65	16	6209	85	19	6309	100	25
50				61810	65	7	61910	72	12	16010	80	10	6010	80	16	6210	90	20	6310	110	26
55				61811	72	9	61911	80	13	16011	90	11	6011	90	18	6211	100	21	6311	120	29
60				61812	78	10	61912	85	13	16012	95	11	6012	95	18	6212	110	22	6312	130	31
65				61813	85	10	61913	90	13	16013	100	11	6013	100	18	6213	120	23	6313	140	33
70				61814	90	10	61914	100	16	16014	110	13	6014	110	20	6214	125	24	6314	150	35
75				61815	95	10	61915	105	16	16015	115	13	6015	115	20	6215	130	25	6315	160	36
80				61816	100	10	61916	110	16	16016	125	14	6016	125	22	6216	140	26	6316	170	39
85				61817	110	13	61917	120	18	16017	130	14	6017	130	22	6217	150	28	6317	180	41
90				61818	115	13	61918	125	18	16018	140	16	6018	140	24	6218	160	30	6318	190	43
95				61819	120	13	61919	130	18	16019	145	16	6019	145	24	6219	160	32	6319	200	45
100				61820	125	13	61920	140	20	16020	150	16	6020	150	24	6220	180	34	6320	215	47
105				61821	130	13	61921	145	20	16021	160	18	6021	160	26	6221	190	36	6321	225	48
110				61822	140	16	61922	150	20	16022	170	19	6022	160	28	6222	200	38	6322	240	50
120				61824	150	16	61924	165	22	16024	180	19	6024	180	28	6224	215	40	6324	260	55
130				61826	165	18	61926	180	24	16026	200	22	6026	200	33	6226	230	40	6326	280	58
140				61828	165	18	61928	190	24	16028	210	22	6028	210	33	6228	250	42	6328	300	62
150				61830	190	20	61930	210	28	16030	225	24	6030	225	35	6230	270	45	6330	320	65
160				61832	200	20	61932	220	28	16032	240	25	6032	240	38						
170				61834	215	22	61934	120	28	16034	260	28	6034	260	42						
180				61836	225	22	61936	250	33	16036	280	31	6036	280	46						
190				61838	240	24	61938	260	33	16038	290	31	6038	290	46						
200				61840	250	24	61940	280	38	16040	310	34	6040	310	51						
220				61844	260	24	61944	300	38				6044	340	56						
240				61848	300	28	61948	320	38				6048	360	56						
260				61852	320	28	61952	360	46				6052	400	65						
280				61856	350	33	61956	380	46				6056	420	65						
300				61860	380	38	61960	420	56				6060	460	74						
320				61864	400	38	61964	440	56												
340				61868	420	38	61968	460	56												
360				61872	440	38	61972	480	56												

The sealed design is available for all types of deep groove ball bearings.

## 12. IBC Linear Motion Bearings and Telescopic Guides

### Telescopic Bearings



IBC linear motion bearings are a major addition to IBC's wide range of rotational rolling bearings. Two very different designs exist that are structurally suited to completely different requirements. These designs are called "telescopic bearing system" and "carriage systems".

IBC linear motion bearings are long-lasting and economical and show their strength in routine, everyday situations where machine parts or manually handled parts need to be smoothly moved either by hand or automatically, and heavy weights need to be guided precisely and energy-efficiently.

Stiffness, a smooth run and durability are important characteristics of IBC linear motion bearings. The bearings are also compact in their design and easy to assemble.

#### LCE production series

In this design, the short slide and the cage never leave the inside of the telescopic bearing's guiding rail. The greatest possible pullout is slightly more than half the length of the guiding rail.

#### LCAE production series

Here, the slide and the guideway are of the same length. The pullout is therefore longer, slightly more than the length of the guideway, and can be extended to both sides.

#### LCAD production series

In this design, two guideways are combined with two slides of the same length whose two inner rails have been bolted to one another. This allows for a stroke in both directions of slightly more than the length of the guideway.

#### LCAH production series

The LCAH design is characterised by two guideways whose two outer rails have been bolted to one another, and by two slides that are of the same length as the guideways. The pullout is slightly longer than the overall length for this design too.

#### LCAS / LCBS production series

In these series, the guideways have been placed one upon the other to form an S- or Z-shaped support profile. This enables a major reduction in the overall width, great load carrying capacity and great bending stiffness to be achieved. The different versions in these series are equipped with pullouts that can be extended either to one or both sides.

Production series	Profile size	Installation length range in (mm)	Stroke range in (mm)
LCE	28 35 43	130 - 180	30 - 1.160
LCAE	28 35 43	130 - 1.970	74 - 1.013
LCAD	28 35 43	130 - 1.970	148 - 2.026
LCAH	28 35 43	130 - 1.970	148 - 2.026
LCAS / LCBS	28 35 43	290 - 1.970	296 - 2.026

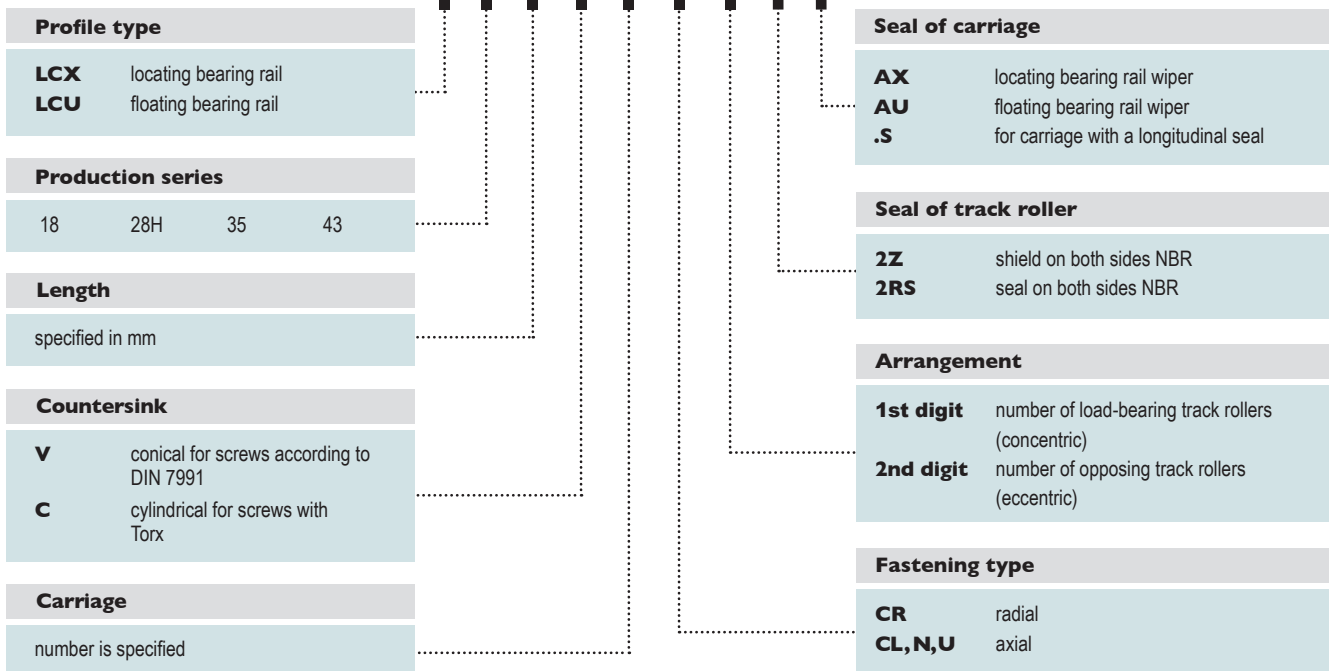


# IBC Linear Motion Bearings and Telescopic Guides

## Linear Motion Bearing with Carriage



**Examples:** LCX 28H-1280 .V /2/ CL- 21.2 .2RS AX



Production series		
Carriage fastening type		Number of track rollers
CR	CL	
CR 18-21	CL 18-21	3
CR 18-22	CL 18-22	4
CR 18-32	CL 18-32	5
CR 18-33	CL 18-33	6
CR 28H-21	CL 28H-21	3
CR 28H-22	CL 28H-22	4
CR 28H-32	CL 28H-32	5
CR 28H-33	CL 28H-33	6
CR 43-21	CL 43-21	3
CR 43-22	CL 43-22	4
CR 43-32	CL 43-32	5
CR 43-33	CL 43-33	6

Compared to telescopic linear motion bearings, carriage systems are able to realise much longer runways; these are measured as the length of the guideway minus the length of the carriage.

Sealing lips and wipers on the slide make sure that carriage systems enjoy a secure and long-lasting operation, even in a heavily contaminated environment.

As the guideway is available both as a locating and a floating bearing system, even designs that have multiple supports are able to include a structurally defined support and continue to function steadily in the case of unavoidable tolerances, or changes in temperature or the direction of force.

The great number of options available for the IBC carriage systems makes it easier for the user to design the adjacent parts, enabling efficient solutions to be designed.

## 13. IBC High Precision Rolling Bearings with ATCoat Coating



*Rolling bearing coated with ATCoat*

### Rolling bearings coated with ATCoat

The material surface of a rolling bearing is becoming more and more important to the overall performance of machines, power units and equipment. However, outside influences very often alter the surface quality of materials or corrode the surface material. A whole range of advantages is achieved by coating the material surface of a rolling bearing.

An ATC thin dense chromium coating protects the surface from outside environmental conditions and thereby increases the service life of rolling bearings and the life time of machines and equipment. The advantages of this coating also include energy saving and an efficient use of material. The ATCoat process permits the combination of a tough basic material with a firmly adhering, very thin and accurate chromium coat that is free of cracks. This is why, compared to bearings of the same size, those with an ATCoat coating offer very good resistance to wear and corrosion.

Rolling bearings coated with ATCoat are an alternative to rolling bearings made of corrosion resistant steel. A better protection against corrosion is achieved, especially with regard to the functional surfaces. The coating layer of 2-4  $\mu\text{m}$  has a cone-shaped surface texture and gives an especially good performance in extreme conditions. Especially if used in combination with ceramic rolling elements, ATCoat coating permits a significant increase in speed at lower operating temperatures. Fretting corrosion that may form on floating bearings, a phenomenon that occurs due to the micro displacement of the outer rings of the bearing during thermal expansion or vibration, is also avoided. In many cases this leads to a significantly longer and trouble-free operating of units. Because of the special surface topography, the emergency run properties of the bearings are substantially improved. Should the lubrication system fail for instance, the units are still able to run under part load for a certain period of time; they can also be shut down properly. This means that secondary damage can be limited or avoided altogether. IBC high precision rolling bearings with ATCoat coating are therefore often used in unfavourable lubrication conditions.

Such unfavourable conditions exist for example:

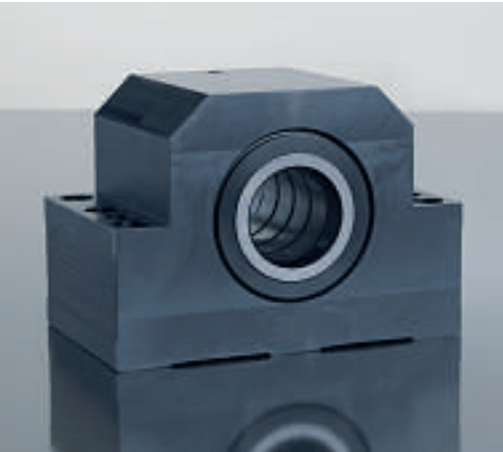
- if lubrication is impossible in a certain environment;
- if lubrication may only be effected with low-viscosity media that do not produce a separative lubrication film;
- if very low rotational speeds occur that do not allow an elasto-hydrodynamic lubrication film to develop;
- if oscillating movements without achieving a full revolution occur, and a separative lubrication film cannot be maintained at the reversal points;
- if sliding occurs in unloaded rolling bearings;
- if, during fast accelerations or decelerations, smearing occurs when bearing rolling elements slide due to the force of continuance that is caused by mass inertia in conjunction with an inadequate preload.



*Cross-section of ATCoat coating*



IBC



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