ZEN™

BEARINGS FOR YOUR FUTURE

Rodamientos híbridos y cerámicos

TÜVRheinland® CERT
Certified ISO 2008
Certified Management System according to ISO 9001:2008

ZEN™

BEARINGS FOR YOUR FUTURE

Los Rodamientos de Bolas Zen están fabricados con los niveles más exigentes de calidad, tanto para aplicaciones standard como para aplicaciones especiales.

Además de nuestra extensa gama de más de 10000 tipos diferentes de Rodamientos de Bolas en Miniatura, entre 1 mm. y 10 mm., nuestro Catalogo de Productos también incluye Rodamientos de Sección Estrecha, Rodamientos Axiales, Rodamientos Rígidos de Bolas Populares y un sinfín de Rodamientos no standard. Podemos diseñar rodamientos adaptados de acuerdo a sus necesidades utilizando materiales cerámicos o Aceros especiales para diferentes aplicaciones Industriales, médicas, químicas o de procesamiento de alimentos.

Nuestro Departamento Técnico puede diseñar cualquier pieza no standard para adaptarse a sus necesidades, sin importar la cantidad mínima.

Si no encuentra algún producto en nuestro catálogo, contacte con nuestro experto equipo de ventas.

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www.tuv.com ID:9105051800 TÜVRheinland® CERT Certified ISO 2008 Certified Management System according to ISO 9001:2008

Zen Ball Bearings Shanghai, ha obtenido la Certificación Alemana ISO TUV Rheinland para la Inspección de los productos ZEN.

Esta Certificación es el reconocimiento mas elevado que una empresa de nuestra industria puede conseguir. Se reconoce internacionalmente como garantía de calidad, atención al cliente y mejora continua.

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www.zen.biz

Rodamientos híbridos y cerámicos

- Resistente a la intemperie
- Adecuado para trabajar a bajas temperaturas
- Adecuado para trabajar a altas temperaturas
- Resistente a disolventes químicos
- Adecuado para aplicaciones de alta velocidad
- Sin lubricante*
- Lubricación por Aceite
- Lubricación por grasa
- Version con obturaciones de goma disponible
- Versión con obturaciones metálicas disponible

*Solamente Completamente Ceramico

Specifications

General Details

Material	Components		Details	Application
	Rings	Balls		
Ball Bearing Chrome Steel 100 Cr6 (Nr. 1.3505)	X	X	Hard wearing Good shock and corrosive resistance	Standard
Stainless Steel AISI 440 C (Nr. 1.4125) †	X	X	Very good corrosive resistance	Food industry, pharmaceutical industry, ship building and other corrosive surroundings
AISI304	X	X	Very good corrosive resistance	Corrosive surroundings
AISI316	X	X	Excellent corrosive resistance	Corrosive surroundings
AISI 316L	X	X	Excellent corrosive resistance	Corrosive surroundings
Si3N4	X	X	High temperature Insulation Excellent corrosive resistance	Chemistry, electronic, food, marine, medical
Zr02	X	X	High temperature Insulation Excellent corrosive resistance	Chemistry, electronic, food, marine, medical
Al203		X	High temperature Insulation Excellent corrosive resistance	Chemistry, electronic, food, marine, medical

†The static and dynamic load rating of AISI 440 C - ball bearings is approximatly 75-80% of the 100 Cr6 - ball bearings.

Technical Details

Material	Hardness	Max. Temp.	C	Si	Mn	P	S	Cr	Mo	Ni
100 Cr6 (Nr. 1.3505)	60-64HRC	max. 150°C	0,5~1,10	0,15~0,35	≤0,5	≤0,025	≤0,025	1,3~1,6	≤0,08	
AISI 440 C (Nr. 1.4125)	≥58HRC	Max. 230°C	0,95~1,2	≤1,1	≤1,0	≤0,04	≤0,03	16,0~18,0	≤0,75	
AISI304	15~20HRC	900	≤0.07	≤1.00	≤2.00	≤0.035	≤0.030	17.0~19.0		8,0~10,0
AISI316	15~20HRC	900	≤0.08	≤1.00	≤2.00	≤0.035	≤0.030	16,0~19,0	1.80-2.50	10,0~14,0
AISI 316L	15~20HRC	450	≤0.03	≤1.00	≤2.00	≤0.035	≤0.030	16,0~18,0	2.00-3.00	12,0~15,0

Material	Hardness	Max. Temp	Component
Si3N4	75~80HRC	1050	88% Si3N4 / 4% Al2O3 / 4% Y2O3 / 4% other
Zr02	70HRC	750	95% ZrO2 / 5% Y2O3
Al203	80HRC	1750	99.5% Al2O3 / 0.5% others

Tolerance Class

Tolerance class	Equivalences	
ISO / AFBMA	ISO	AFBMA
DIN P0	class 0	ABEC 1
DIN P6	class 6	ABEC 3
DIN P5	class 5	ABEC 5
DIN P4	class 4	ABEC 7
DIN P2	class 2	ABEC 9

Seals & Shields

	Design	Specification	Temp	Advantage/Disadvantage
-	No seals	Open	-	No friction Easy to re-lube No protection against contamination
2Z	Metal shields	Non contact seals	Min. temp -35°C Max. temp 250°C	No friction Good protection against contamination
2RS	Rubber seals	Contact seals made of synthetic rubber	Min. temp -20°C Max. temp 110°C	Higher friction Very good protection against contamination
2TS	PTFE seals	Contact seals made of Teflon	Min. temp -40°C Max. temp 250°C	Low friction Very good protection against contamination Good chemical characteristics
2TZ	PTFE seals with metal shields	Contact seals made of Teflon	Min. temp -40°C Max. temp 250°C	Low friction Very good protection against contamination Good chemical characteristics
2VS	Viton seals	Seals made of Viton	Min. temp -30°C Max. temp 230°C	Higher friction High temperature Good chemical characteristics Very good protection against contamination
2DU	Rubber seals	Non contact seal made of synthetic rubber	Min. temp -20°C Max. temp 110°C	No friction Very good protection against contamination

Important

The author reserves the right not to be responsible for the topicality, correctness, completeness or quality of the information provided. Liability claims regarding damage caused by the use of any information provided, including any kind of information which is incomplete or incorrect, will therefore be rejected.

Cages

	Reference	Cage type	Remarks
	FC	Full Complement / No Cage	Low revolution high load rating
	W	Crown Cage	Light weight, smooth, low friction
	J	Ribbon Cage	Standard cage, good durability
	T9H	Glass Fibre Reinforced Cage	Light weight, strong, high speed
		Phenolic Cage	Light weight, strong, high speed
	M	Brass Cage	Low friction, good durability
	PEEK	PEEK	High temperature Good durability Corrosion resistant Insulated
	PTFE	PTFE	High temperature Good durability Corrosion resistant Insulated

Lubrication

Lubricant	Remarks	Advantages/Applications
No lubricant	Only with stainless steel bearings or with the use of corrosion preventive fluid	When the lubrication is provided by the customer
Grease	Standard filling 30-40%	Life-time lubrication is possible Good protection against corrosion According to the application a variety of greases can be used
Oil		Low friction High revolution

Popular Greases

Mfg	Brand	Thickener	Base oil	Drop Point °C	Consistency	Operating temperature range	Application
Exxon	Beacon 325	Lithium	Diester	193	290	-60~+120	low temp
	Andok B	Nathium	Mineral	260	280	-40~+120	general purpose
	Andok C	Nathium	Mineral	≥ 260	205	-20~+120	general purpose
Kyodo Yushi	Andok 260	Nathium	Mineral	200	250	-30~+150	general purpose
	Multemp PS2	Lithium	Diester	189	280	-50~+110	low temp
	Multemp SRL	Lithium	Ester	191	245	-40~+150	low temp
	Multemp SRH	Lithium	Ester	250	201	-40~+150	low temp
	Multemp SB-M	Diurea	Synthetic oil	220	260	-40~+200	high speed/temp
	ET-K	Diurea	Synthetic oil/ester"	260	300	-40~+200	high temp/ speed alternator
Kluber	Asonic GLY32	Lithium	Synthetic	190	265-295	-50~+140	low temp
	Asonic GHY72	Polyhamstoff	Ester Mineral	250	250-280	-40~+180	high temp/low noise
	Isoflex Super						
	LDS18	Lithium	Diester	190	280	-60~+130	low temp
	Isoflex LDS18						
	Special A	Lithium	Diester	190	280	-60~+130	low temp
	Isoflex Topas						
	NB52"	Barium	Synthetic hydrocarbon	204	280	-60~+170	low/high temp
	Barrierta L55/2	PTFE	Fluorinated		280	-35~+260	low/high temp
	Barrierta TK44N2	Na-Komples	Silicone			-60~+230	low/high temp
	Isoflex NCA15	Special Ca	Ester Mineral	180	265-295	-40~+130	high speed
	Asonic						
	HQ72-102"	Urea	Ester	240	250-280	-40~+180	low/high temp & low noise
Dow Corning	Molykote 33M	Lithium	Silicone	210	260	-70~+180	low/high temp
	Molykote 44M	Lithium	Silicone	204	260	-40~+200	high temp
	Molykote 55M	Lithium	Silicone			-55~+165	low temp
	Molykete BR2 plus	Lithium	Silicone		280	-30~+150	high speed
	Molykete FS1292	PTFE	Phlorosilicon	≥ 232	310	-40~+200	hight speed
	Molykete FS3451	PTFE	Phlorosilicon	≥ 260	285	-40~+230	chemical solvent resistant
Shell	Alvania No.2	Lithium	Mineral	182	272	-25~+120	general purpose
	Alvania No.3	Lithium	Mineral	183	233	-20~+135	general purpose
	Alvania RA	Lithium	Mineral	183	252	-25~+120	general purpose
	Alvania EP2	Lithium	Mineral	185	276	-10~+100	general purpose
	Dolium R		Mineral	238	281	-20~+140	general purpose
	Aero Shell NO.5	Microgel	Mineral	≥ 260	282	-10~+130	general purpose
	Aero Shell NO.7	Microgel	Mineral	≥ 260	288	-70~+150	low temp
	Aero Shell RLQ2	Lithium	Mineral	195	266	-50~+150	low noise/ high speed"
Mobil Oil	Mobilux2	Lithium	Mineral	190	280	-20~+120	general purpose
	Mobil 22	Lithium	Diester Mineral	192	274	-50~+140	low temp
	Mobil 28	Bentonite	syntheic hydrocarbon	≥ 260	280	-60~+180	low/high temp
	Mobilitemp						
	SHC22	Glue-earth	Synthetic oil	250	265-295	-50~+180	high speed/temp
	Mobiitemp						
	SHC100	Glue-earth	Synthetic oil	250	265-295	-40~+200	high speed/temp
Du Pont	Krytox240AC	PTFE	Fluorinated		282	-35~+280	high speed/temp
Caltex	Chevron SRI-2	Urea	Mineral		293	-30~+175	high temp
Hangu	Hangu#2	-	Mineral	-	-	-20~+120	general purpose
Great Wall	Great Wall BLE	Urea	Mineral	260	280	-30~+200	low noise/ high temp"
Yiping	YP7201	Synthetic	Mineral	272	272	-20~+120	low noise/anti-rust

Ceramic Balls

Material:
Silicon Nitride (Si3N4), Zirconia (ZrO2) and Alumina (A12O3)

Specification:
1/64” ~ 3/2” with different gauge

Precision:
G3 ~ G20

Usage:
For bearings, inspection and other rolling conditions.

Advantages of ceramic balls compared to steel:

1. Lighter than steel
2. Larger elastic modulus
3. Lower friction coefficient, rolls more freely
4. Lower coefficient of thermal expansion
5. Suoerior surface finish
6. Higher high temperature hardness
7. Rust proof, rolls without oil or grease
8. Corrosion resistant than steel

Black Silicon Nitride Balls

Grey Silicon Nitride Balls

Zirconia Balls

Alumina Balls

Ceramic Bearings

Bearing class

ZEN Ball Bearings can produce both complete ceramic ball bearings and hybrid stainless steel or chrome steel ball bearings.

Complete ceramic bearing = The inner ring, outer ring and balls are composed of ceramic materials, including zirconia and silicon nitride.

Hybrid bearings = The balls are ceramic, while the outer ring and inner ring are chrome/stainless steel. Hybrid ball bearings, normally have the identical structure as steel bearings.

Properties advantages, compared with steel ball bearing

1. Higher limiting speeds: Ceramic is lighter than steel and can effectively restrain the centrifugal force, therefore enhances the limiting speeds.

2. Higher precision usage: Ceramic has a higher hardness and elastic modulus than steel, which means ceramic bearings are more rigid than steel bearings, so therefore can be used in higher precision conditions.

3. Longer life: Lighter ceramic leads to a lower centrifugal force, this will extend the life of the bearing. Furthermore, friction coefficient of ceramic is lower than steel, which also extends the life of the bearing.

4. Higher temperature usage: Ceramic is more mechanically stable at elevated temperatures, therefore they could be used under higher temperatures.

5. Temperature-variation usage: Ceramic has a lower thermal expansion coefficient, the clearance and the tolerance variation is lower than those of steel bearings, which leads to a greater variation in temperature range.

6. Better seizure resistance: Ceramic has a smaller thermal expansion coefficient; indicating less thermal deformation, therefore enhancing seizure resistance.

7. Could run without oil or grease: Ceramic never rusts and is self-lubricated, therefore can be used in applications that require no oil or grease.

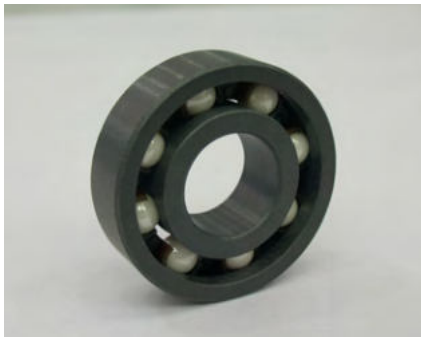
8. Resistant to acid, alkali and salt: The chemical industry is the largest potential application industry of ceramic bearings to be exploited.

9. More suitable for magnetic applications: Our ceramic bearings are non-magnetic, which means it is difficult for magnetic particles to adhere on the race, therfore reducing particle-abrasion.

Full Zirconia Bearing

Full Zirconia Bearing

Full Silicon Nitride Bearing



Full Ceramic Bearing
Silicon nitride inner and outer ring. Silicon nitride rolling element. Zirconia ball.

Full Ceramic Bearing
Zirconia inner and outer ring. Zirconia rolling element. Silicon nitride ball

Full Ceramic Bearing
Zirconia inner ring, outer ring and rolling element. Silicon nitride ball

Ceramic Bearings

Bearing class

ZEN Ball Bearings can produce full ceramic bearing and hybrid ball bearing.

Full ceramic bearing = The inner ring, out ring and ball is composed of ceramic materials, including zirconia and silicon nitride.

Hybrid bearing = The ball is ceramic, while the out ring and inner ring are steel. Hybrid ball bearing, normally have the identical structure as steel bearing.

Cages used in Ceramic bearings

- Beside the standard steel cages, TPFE and PEEK cages are used for full ceramic or hybrid ball bearings.
- Both cages types are temperature resistant up to 260 C.
- The Peek material is a harder material and its advantage is high temperature resistance, good mechanical properties, self-lubricating, and anti-chemical properties. The advantage of PTFE is low friction, high temperature, and good wearable.

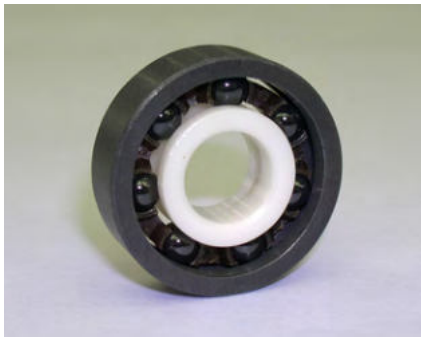
Facts

Full ceramic bearings have only a load rating (including hybrid ceramic bearing) of about 60% of chrome steel bearing.

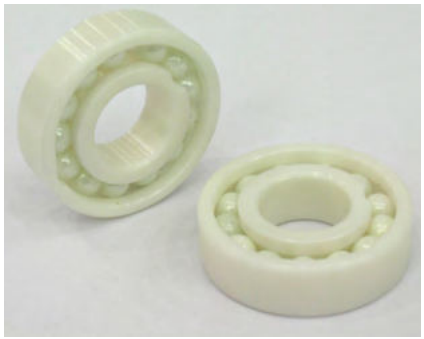
Usage

For rough service environment, such as chemical, metallurgy, food, electric, medical industry etc. Our bearing products have been used as high-speed motor spindle bearing, high precision machine sprindle bearing, dental drill bearing, high speed wheel head bearing, instrument bearing, hard drive bearing, skating bearing, fishing bearing, etc.

Item	Unit	Steel	Si3N4	Zr0_	Al_0_
Destiny	g/cm_	7.85	3.20~3.30	6.05	3.95
Thermal Expansion Coefficient	10-6/k	10	3.2	10.5	9.1
Elastic Modulus	Gpa	208	300~320	210	380
Passion Ratio		0.3	0.26	0.3	0.27
Hardness	(HV)	700	1500~1800	1200	1800
	(HRC)	62	75~80	70	80
Bending Strength (800°C)	Mpa	2400	200	300	220
Crushing Strength (800°C)	Mpa	/	1400	2100	1500
Fracture Toughness	MPa-m_	25	6.0~7.0	10	3.5
Thermal Conductivity (500°C)	W/mk	30~40	18	2	25
Specific Resistivity (600°C)	_.mm2/m	0.1~1	1018	1015	108
Max Usage Temperature	°C	300	800	550	1850
Corrosion Resistance		Worse	Better	Better	Better
Fatigue Stress Recycles (50%Fail)	Times	107	107~109	105	/
Dimension Stability with Temperature		Large	Little	/	/
Centrifugal Force		Large	Little	Large	Medium
Non-lubrication Friction		Large	Little	Little	Little
Magnetism		Exist	Naught	Naught	Naught



Full Ceramic Bearing
Silicon nitride outer ring and rolling element.
Zirconia inner ring.



Full Zirconia Bearing without retainer

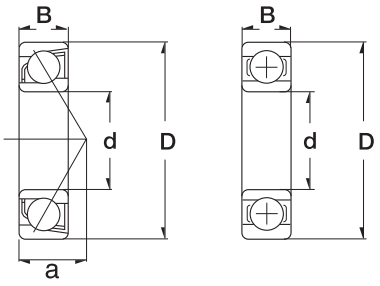
UC204. Full Zirconia Bearing

UC205. Full Ceramic Bearing
Zirconia inner ring, outer ring and rolling element.
Silicon nitride ball

Hybrid Ball Bearing

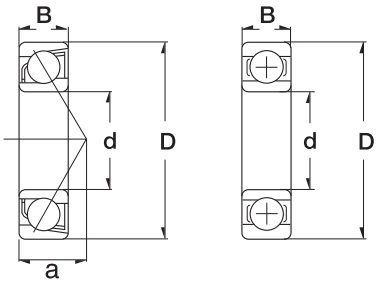
Hybrid Ball Bearing

Rodamientos Completamente Cerámicos



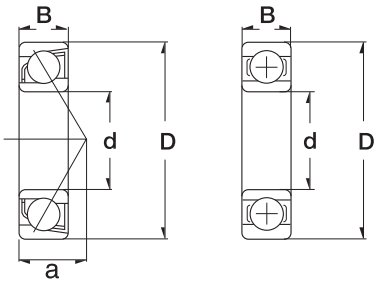
Dimension (mm)			Designation/Type	* Load Rating		Weight (g) approx.
d	D	B		C, dyn. N	C, stat. N	
8.0	22.0	7.0	608	1976	827	14 g
9.0	24.0	7.0	609	2014	866	16 g
8.0	24.0	8.0	628	2000	854	18 g
9.0	26.0	8.0	629	2745	1190	22 g
8.0	16.0	5.0	688	751	355	4 g
9.0	17.0	5.0	689	796	401	5 g
8.0	19.0	6.0	698	1342	550	8 g
9.0	20.0	6.0	699	1480	649	8 g
10.0	26.0	8.0	6000	2730	1182	18 g
10.0	30.0	9.0	6200	3060	1434	32 g
10.0	35.0	11.0	6300	4860	2070	52 g
12.0	28.0	8.0	6001	3060	1422	22 g
12.0	32.0	10.0	6201	4080	1830	37 g
12.0	37.0	12.0	6301	5820	2520	60 g
15.0	32.0	9.0	6002	3360	1698	31 g
15.0	35.0	11.0	6202	4590	2250	45 g
15.0	42.0	13.0	6302	6840	3270	83 g
17.0	35.0	10.0	6003	3600	1950	41 g
17.0	40.0	12.0	6203	5730	2880	67 g
17.0	47.0	14.0	6303	8160	3990	113 g
17.0	62.0	17.0	6403	13740	6480	270 g
20.0	42.0	12.0	6004	5640	3000	68 g
20.0	47.0	14.0	6204	7680	3960	107 g
20.0	52.0	15.0	6304	9540	4740	145 g

Rodamientos Completamente Cerámicos



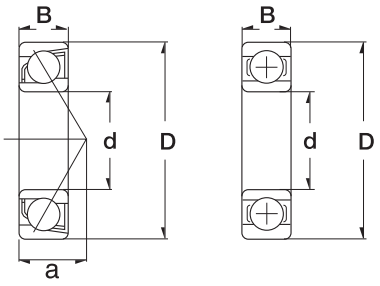
Dimension (mm)			Designation/Type	* Load Rating		Weight (g) approx.
d	D	B		C, dyn. N	C, stat. N	
20.0	72.0	19.0	6404	18420	9000	400 g
25.0	47.0	12.0	6005	6060	3510	79 g
25.0	52.0	15.0	6205	840	4710	129 g
25.0	62.0	17.0	6305	12360	6720	235 g
25.0	80.0	21.0	6405	21000	11460	530 g
30.0	55.0	13.0	6006	7920	4980	116 g
30.0	62.0	16.0	6206	11700	6780	199 g
30.0	72.0	19.0	6306	16020	9000	345 g
30.0	90.0	23.0	6406	26100	14280	740 g
35.0	62.0	14.0	6007	9600	6180	151 g
35.0	72.0	17.0	6207	15420	9180	284 g
35.0	80.0	21.0	6307	20100	11520	464 g
35.0	100.0	25.0	6407	33120	18900	950 g
40.0	68.0	15.0	6008	10080	6900	190 g
40.0	80.0	18.0	6208	17460	10740	366 g
40.0	90.0	23.0	6308	24300	14400	636 g
40.0	110.0	27.0	6408	37800	21600	1250 g
10.0	19.0	5.0	6800	1030	504	5.5 g
10.0	22.0	6.0	6900	1617	764	10 g
12.0	21.0	5.0	6801	1149	625	6.3 g
12.0	24.0	6.0	6901	1732	880	11 g
15.0	24.0	5.0	6802	1244	752	7.4 g
15.0	28.0	7.0	6902	2593	1355	16 g
17.0	26.0	5.0	6803	1340	874	8.2 g

Rodamientos Completamente Cerámicos



Dimension (mm)			Designation/Type	* Load Rating		Weight (g) approx.
d	D	B		C, dyn. N	C, stat. N	
17.0	30.0	7.0	6903	2753	1539	18 g
20.0	32.0	7.0	6804	2409	1477	18 g
20.0	37.0	9.0	6904	3829	2209	38 g
25.0	37.0	7.0	6805	2582	1759	22 g
25.0	42.0	9.0	6905	4201	2724	45 g
30.0	42.0	7.0	6806	2723	2041	27 g
30.0	47.0	9.0	6906	4345	3002	51 g
35.0	47.0	7.0	6807	2837	2293	30 g
35.0	55.0	10.0	6907	6540	4691	80 g
40.0	52.0	7.0	6808	2954	2507	34 g
10.0	26.0	8.0	7000	2268	1290	18 g
10.0	30.0	9.0	7200	3120	1530	30 g
12.0	28.0	8.0	7001	2448	1452	20 g
12.0	32.0	10.0	7201	3390	1890	35 g
15.0	32.0	9.0	7002	2880	1770	28 g
15.0	35.0	11.0	7202	4980	2580	43 g
17.0	35.0	10.0	7003	3048	1932	36 g
17.0	40.0	12.0	7203	5028	3228	62 g
20.0	42.0	12.0	7004	6300	3612	67 g
20.0	47.0	14.0	7204	8760	4920	100 g
25.0	47.0	12.0	7005	5832	3750	89 g
25.0	52.0	15.0	7205	8400	5232	146 g
30.0	55.0	13.0	7006	7500	5172	130 g
30.0	62.0	16.0	7206	11700	7500	222 g

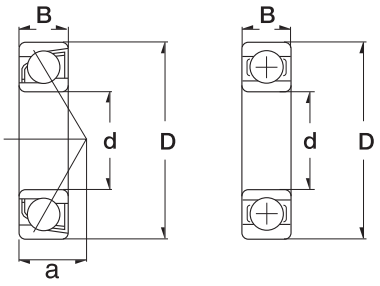
Rodamientos Completamente Cerámicos



Dimension (mm)			Designation/Type	* Load Rating		Weight (g) approx.
d	D	B		C, dyn. N	C, stat. N	
35.0	62.0	14.0	7007	9660	6960	173 g
35.0	72.0	17.0	7207	15420	10200	318 g
40.0	68.0	15.0	7008	10260	8040	215 g
40.0	80.0	18.0	7208	19500	13620	406 g
45.0	75.0	16.0	7009	12720	10140	271 g
45.0	85.0	19.0	7209	20340	14940	467 g
50.0	80.0	16.0	7010	14040	11400	288 g
50.0	90.0	20.0	7210	21420	16020	521 g

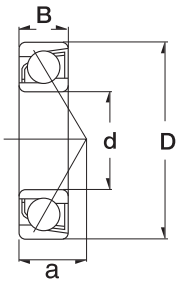
Dimension (mm)				Designation/Type	* Load Rating	
d	D	B1	B2		C, dyn. N	C, stat. N
12.00	47.00	17.00	31.00	UC 201	7500	4500
15.00	47.00	17.00	31.00	UC 202	7500	4500
17.00	47.00	17.00	31.00	UC 203	7500	4500
20.00	47.00	17.00	31.00	UC 204	10000	6300
25.00	52.00	17.00	34.10	UC 205	11000	7100
30.00	62.00	19.00	38.10	UC 206	15200	10200
35.00	72.00	20.00	42.90	UC 207	20100	18100

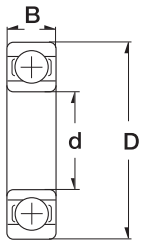
Rodamientos Híbridos



Dimension (mm)			Designation/Type	* Load Rating		Weight (g) approx.
d	D	B		C, dyn. N	C, stat. N	
3.0	7.0	2.0	HYB 683	187	67	1 g
3.0	8.0	3.0	HYB 693	335	108	1 g
4.0	8.0	2.0	HYB MR 84	237	85	1 g
4.0	9.0	2.5	HYB 684	385	136	2 g
4.0	10.0	3.0	HYB MR 104	427	163	2 g
4.0	11.0	4.0	HYB 694	574	210	2 g
5.0	8.0	2.0	HYB MR 85	131	54	1 g
5.0	10.0	3.0	HYB MR 105	259	101	2 g
5.0	11.0	3.0	HYB 685	430	169	2 g
5.0	11.0	4.0	HYB MR 115	430	169	1 g
5.0	13.0	4.0	HYB 695	646	259	3 g
6.0	10.0	2.5	HYB MR 106	298	131	1 g
6.0	12.0	3.0	HYB MR 126	430	177	2 g
6.0	13.0	3.5	HYB 686	649	265	3 g
6.0	15.0	5.0	HYB 696	804	314	4 g
7.0	14.0	3.5	HYB 687	704	308	4 g
7.0	17.0	5.0	HYB 697	963	431	6 g
8.0	12.0	2.5	HYB MR 128	326	164	1 g
8.0	14.0	3.5	HYB MR 148	490	232	3 g
8.0	16.0	4.0	HYB 688	751	355	4 g
8.0	19.0	6.0	HYB 698	1342	550	8 g
2.38	4.763	1.588	HYB R 133	86	32	1 g
3.175	6.35	2.38	HYB R 144	170	58	1 g
3.175	7.938	2.779	HYB R 2-5	335	108	1 g

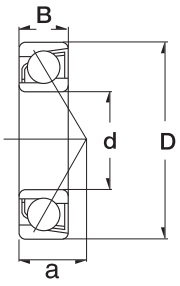
Rodamientos Híbridos

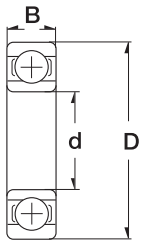




Dimension (mm)			Designation/Type	* Load Rating		Weight (g) approx.
d	D	B		C, dyn. N	C, stat. N	
3.175	9.525	3.967	HYB R 2	379	131	2 g
3.967	7.938	2.779	HYB R 155	215	90	1 g
4.763	9.525	3.175	HYB R 166	425	163	1 g
4.763	12.7	3.967	HYB R 3	781	293	3 g
6.35	9.525	3.175	HYB R 168	224	103	1 g
6.35	12.7	3.175	HYB R 188	649	265	3 g
6.35	15.875	4.978	HYB R 4	888	373	5 g
9.525	22.225	5.558	HYB R 6	1994	853	12 g
8.0	22.0	7.0	HYB 608	1976	827	14 g
9.0	24.0	7.0	HYB 609	2014	866	16 g
8.0	24.0	8.0	HYB 628	2000	854	18 g
9.0	26.0	8.0	HYB 629	2745	1190	22 g
8.0	16.0	5.0	HYB 688	751	355	4 g
9.0	17.0	5.0	HYB 689	796	401	5 g
8.0	19.0	6.0	HYB 698	1342	550	8 g
9.0	20.0	6.0	HYB 699	1480	649	8 g
10.0	26.0	8.0	HYB 6000	2730	1182	18 g
10.0	30.0	9.0	HYB 6200	3060	1434	32 g
10.0	35.0	11.0	HYB 6300	4860	2070	52 g
12.0	28.0	8.0	HYB 6001	3060	1422	22 g
12.0	32.0	10.0	HYB 6201	4080	1830	37 g
12.0	37.0	12.0	HYB 6301	5820	2520	60 g
15.0	32.0	9.0	HYB 6002	3360	1698	31 g

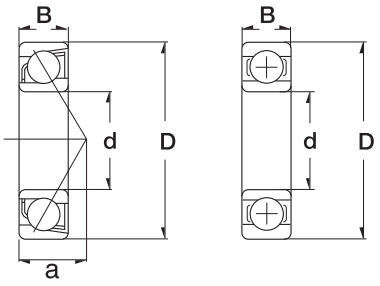
Rodamientos Híbridos





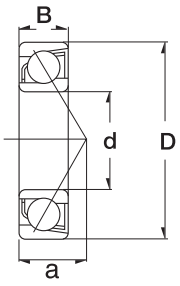
Dimension (mm)			Designation/Type	* Load Rating		Weight (g) approx.
d	D	B		C, dyn. N	C, stat. N	
15.0	35.0	11.0	HYB 6202	4590	2250	45 g
15.0	42.0	13.0	HYB 6302	6840	3270	83 g
17.0	35.0	10.0	HYB 6003	3600	1950	41 g
17.0	40.0	12.0	HYB 6203	5730	2880	67 g
17.0	47.0	14.0	HYB 6303	8160	3990	113 g
17.0	62.0	17.0	HYB 6403	13740	6480	270 g
20.0	42.0	12.0	HYB 6004	5640	3000	68 g
20.0	47.0	14.0	HYB 6204	7680	3960	107 g
20.0	52.0	15.0	HYB 6304	9540	4740	145 g
20.0	72.0	19.0	HYB 6404	18420	9000	400 g
25.0	47.0	12.0	HYB 6005	6060	3510	79 g
25.0	52.0	15.0	HYB 6205	840	4710	129 g
25.0	62.0	17.0	HYB 6305	12360	6720	235 g
25.0	80.0	21.0	HYB 6405	21000	11460	530 g
30.0	55.0	13.0	HYB 6006	7920	4980	116 g
30.0	62.0	16.0	HYB 6206	11700	6780	199 g
30.0	72.0	19.0	HYB 6306	16020	9000	345 g
30.0	90.0	23.0	HYB 6406	26100	14280	740 g
35.0	62.0	14.0	HYB 6007	9600	6180	151 g
35.0	72.0	17.0	HYB 6207	15420	9180	284 g
35.0	80.0	21.0	HYB 6307	20100	11520	464 g
35.0	100.0	25.0	HYB 6407	33120	18900	950 g
40.0	68.0	15.0	HYB 6008	10080	6900	190 g
40.0	80.0	18.0	HYB 6208	17460	10740	366 g

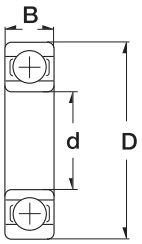
Rodamientos Híbridos



Dimension (mm)			Designation/Type	* Load Rating		Weight (g) approx.
d	D	B		C, dyn. N	C, stat. N	
40.0	90.0	23.0	HYB 6308	24300	14400	636 g
40.0	110.0	27.0	HYB 6408	37800	21600	1250 g
10.0	19.0	5.0	HYB 6800	1030	504	5.5 g
10.0	22.0	6.0	HYB 6900	1617	764	10 g
12.0	21.0	5.0	HYB 6801	1149	625	6.3 g
12.0	24.0	6.0	HYB 6901	1732	880	11 g
15.0	24.0	5.0	HYB 6802	1244	752	7.4 g
15.0	28.0	7.0	HYB 6902	2593	1355	16 g
17.0	26.0	5.0	HYB 6803	1340	874	8.2 g
17.0	30.0	7.0	HYB 6903	2753	1539	18 g
20.0	32.0	7.0	HYB 6804	2409	1477	18 g
20.0	37.0	9.0	HYB 6904	3829	2209	38 g
25.0	37.0	7.0	HYB 6805	2582	1759	22 g
25.0	42.0	9.0	HYB 6905	4201	2724	45 g
30.0	42.0	7.0	HYB 6806	2723	2041	27 g
30.0	47.0	9.0	HYB 6906	4345	3002	51 g
35.0	47.0	7.0	HYB 6807	2837	2293	30 g
35.0	55.0	10.0	HYB 6907	6540	4691	80 g
40.0	52.0	7.0	HYB 6808	2954	2507	34 g
10.0	26.0	8.0	HYB 7000	2268	1290	18 g
10.0	30.0	9.0	HYB 7200	3120	1530	30 g
12.0	28.0	8.0	HYB 7001	2448	1452	20 g
12.0	32.0	10.0	HYB 7201	3390	1890	35 g

Rodamientos Híbridos





Dimension (mm)			Designation/Type	* Load Rating		Weight (g) approx.
d	D	B		C, dyn. N	C, stat. N	
15.0	32.0	9.0	HYB 7002	2880	1770	28 g
15.0	35.0	11.0	HYB 7202	4980	2580	43 g
17.0	35.0	10.0	HYB 7003	3048	1932	36 g
17.0	40.0	12.0	HYB 7203	5028	3228	62 g
20.0	42.0	12.0	HYB 7004	6300	3612	67 g
20.0	47.0	14.0	HYB 7204	8760	4920	100 g
25.0	47.0	12.0	HYB 7005	5832	3750	89 g
25.0	52.0	15.0	HYB 7205	8400	5232	146 g
30.0	55.0	13.0	HYB 7006	7500	5172	130 g
30.0	62.0	16.0	HYB 7206	11700	7500	222 g
35.0	62.0	14.0	HYB 7007	9660	6960	173 g
35.0	72.0	17.0	HYB 7207	15420	10200	318 g
40.0	68.0	15.0	HYB 7008	10260	8040	215 g
40.0	80.0	18.0	HYB 7208	19500	13620	406 g
45.0	75.0	16.0	HYB 7009	12720	10140	271 g
45.0	85.0	19.0	HYB 7209	20340	14940	467 g
50.0	80.0	16.0	HYB 7010	14040	11400	288 g
50.0	90.0	20.0	HYB 7210	21420	16020	521 g

Material properties

Item		Unit	Steel	Si_3N_4	ZrO_2	Al_2O_3
Destiny		g/cm_	7.85	3.20~3.30	6.05	3.95
Thermal Expansion Coefficient		10-6/k	10	3.2	10.5	9.1
Elastic Modulus		Gpa	208	300~320	210	380
Passion Ratio			0.3	0.26	0.3	0.27
Hardness	(HV)		700	1500~1800	1200	1800
	(HRC)		62	75~80	70	80
Bending Strength (800°C)		Mpa	2400	200	300	220
Crushing strength(800°C)		Mpa	-	1400	2100	1500
Fracture Toughness		MPa-m	25	6.0~7.0	10	3.5
Thermal Conductivity(500°C)		W/mk	30~40	18	2	25
Specific Resistivity(600°C)		_.mm2/m	0.1~1	1018	1015	108
Max Usage Temperature		°C	300	800	550	1850
Corrosion Resistance			Worse	Better	Better	Better
Fatigue Stress Recycles(50%Fail)		Times	107	107~109	105	-
Dimension Stability with Temperature			Large	Little	-	-
Centrifugal Force			Large	Little	Large	Medium
Non-lubrication Friction			Large	Little	Little	Little
Magnetism			Exist	Naught	Naught	Naught

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