



# Miniature Series Catalogue

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## **Wichtig / Important**

### **\* Max. Drehzahlen:**

Die im Katalog angegebenen Werte sind ungefähre Werte. Abhängig von der Toleranzklasse, Werkstoff, Einbautoleranzen, Befettung, Käfigtype, Umgebungstemperatur, etc., können unterschiedliche Werte realisiert werden. Die maximalen Drehzahlen für RS- und TS-gedichtete Lager sind deutlich geringer. Bitte erfragen Sie die Werte in besonderen Fällen.

### **\* Limiting Speeds :**

The values shown in the catalogue are approximated values. Depending on the tolerance class, material, mounting tolerances, lubrication, cage, surrounding temperature, etc., different values can be obtained. The limiting speeds for RS- and TS-shielded bearings are significant lower. Please contact Engineering for special cases.

### **\* Tragzahlen:**

Die Tragzahlen und Drehzahlen beziehen sich auf 100Cr6 (Chromstahl), falls nicht anders spezifiziert. Die Werte für rostfreien Stahl sind ungefähr 20% niedriger.

### **\* Load Ratings:**

Load ratings and Limiting Speeds are calculated based on material 100Cr6 (Chrome Steel), if not stated different. The rates are approximately 20% lower for stainless steel.

**Material**

S = Rostfreier Stahl / **Stainless Steel**  
Kein Präfix / **No Prefix** = Chromstahl / **Chrome Steel**

**Referenz / Bearing type**

MF = Metrisch mit Flansch / **Metric with Flange**  
MR = Metrisch / **Metric**  
R = Zöllig / **Inch**  
FR = Zöllig mit Flansch / **Inch with Flange**  
F = Metrisch mit Flansch / **Metric with Flange**  
Kein Präfix / **No Prefix** = Metrisch / **Metric**

**Typenbezeichnung / Bearing Part Number**

**Dichtscheiben / Shields**

2Z = Metalleichtscheiben / **Metal Shields**  
2RS = Gummidichtscheiben / **Rubber Seals**  
2TS = Teflonlichtscheiben / **Teflon Seals**  
Kein Suffix / **No Suffix** = offen / **open**

S	FR	144	-2Z	. . . Abm./Dimen. . . .
	FR	85		..
		635	-2RS	..
S		682X		..

**Spezifikationen / Specifications**

**Allgemeine Merkmale / General Details**

Material	Komponenten <b>Components</b>		Merkmale <b>Details</b>	Anwendungsbereiche <b>Application</b>
	Ringe <b>Rings</b>	Kugeln <b>Balls</b>		
Kugellagerchromstahl <b>Ball Bearing Chrome Steel</b> 100 Cr6 (Nr. 1.3505)	X	X	Gute Verschleißfestigkeit <b>Hard wearing</b> Schlag- und Korrosionsbeständigkeit <b>Good shock and corrosive resistance</b>	Standard <b>Standard</b>
Rostfreier Stahl <b>Stainless Steel</b> AISI 440 C (Nr. 1.4125)†	X	X	Sehr gute Korrosionsbeständigkeit <b>Very good corrosion resistance</b>	Nahrungsmittel, Pharma, Schiffsbau und andere korrosive Umgebungen <b>Food industry, pharmaceutical industry, ship building and other corrosive surroundings</b>

†Die statische und dynamische Belastung von AISI 440 C-Lagern liegt bei ca. 75-80% von 100 Cr6-Lagern.

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

**Technische Merkmale / Technical Details**

Material	Härte <b>Hardness</b>	Max. Temp. <b>Max. Temp.</b>	C	Si	Mn	P	S	Cr	Mo
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

**Toleranzklassen / Tolerance Class**

Toleranzklassen <b>Tolerance class</b>	Äquivalenzen / <b>Equivalences</b>	
	ISO	AFBMA
DIN P0	Klasse <b>class</b> 0	ABEC 1
DIN P6	Klasse <b>class</b> 6	ABEC 3
DIN P5	Klasse <b>class</b> 5	ABEC 5

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**Tolerance of inner ring (ISO)**

d(mm)		Δdmp				Δds		Vdp					Vdmp				Unit μm					
		P0		P6	P5	P4	P0		P6		P5		P4		P0	P6			P5	P4		
		Diameter series		Diameter series	Diameter series	Diameter series	Diameter series	Diameter series	Diameter series	Diameter series	Diameter series	Diameter series	Diameter series									
Over	incl.	Upper	Lower	Lower	Lower	Upper	Lower	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.					
0.6(1)	2.5	0	-8	-7	-5	-4	0	-4	10	8	6	9	7	5	5	4	4	3	6	5	3	2
2.5	10	0	-8	-7	-5	-4	0	-4	10	8	6	9	7	5	5	4	4	3	6	5	3	2
10	18	0	-8	-7	-5	-4	0	-4	10	8	6	9	7	5	5	4	4	3	6	5	3	2
18	30	0	-10	-8	-6	-5	0	-5	13	10	8	10	8	6	6	5	5	4	8	6	3	2.5
30	50	0	-12	-10	-8	-6	0	-6	15	12	9	13	10	8	8	6	6	5	9	8	4	3

Note 1: The upper value of the bore diameter in this table is not applicable when the distance from the bearing ring face is less than 1.2 times the chamferdimension.  
 Note 2: According to the revision of ANSI/ABMA Std.20-1996, the classes ABEC1-ABEC3-ABEC5-ABEC7 are equivalent to SS0-CLASS6-CLASS5-CLASS4.

**Tolerance of outer ring (ISO)**

D(mm)		ΔDmp				ΔDs		VDp					VDmp				Unit μm							
		P0		P6	P5	P4	P0		P6		P5		P4		P0	P6			P5	P4				
		Diameter series		Diameter series	Diameter series	Diameter series	Diameter series	Diameter series	Diameter series	Diameter series	Diameter series	Diameter series	Diameter series											
Over	incl.	Upper	Lower	Lower	Lower	Upper	Lower	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.							
2.5(1)	6	0	-8	-7	-5	-4	0	-4	10	8	6	10	9	7	5	9	5	4	4	3	6	5	3	2
6	18	0	-8	-7	-5	-4	0	-4	10	8	6	10	9	7	5	9	5	4	4	3	6	5	3	2
18	30	0	-9	-8	-6	-5	0	-5	12	9	7	12	10	8	6	10	6	5	5	4	7	6	3	2.5
30	50	0	-11	-9	-7	-6	0	-6	14	11	8	16	11	9	7	13	7	5	6	5	8	7	4	3
50	80	0	-13	-11	-9	-7	0	-7	16	13	10	20	14	11	8	16	9	7	7	5	10	8	5	3.5

Note(1) : Size 2.5mm is included in this classification.  
 Note(2) : The outer ring width variations for CLASS0 and CLASS6 are the same as for the inner ring of the same bearing size.

**Radial internal clearance of standard radial ball bearings**

*NOMINAL BORE DIAMETER d(mm)		CLEARANCE										Unit μm
		C2		CN(C0)		C3		C4		C5		
OVER	INCL.	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	
10(ONLY)		0	7	2	13	8	23	14	29	20	37	
10	18	0	9	3	18	11	25	18	33	25	45	
18	24	0	10	5	20	13	28	20	36	28	48	
24	30	1	11	5	20	13	28	23	41	30	53	
30	40	1	11	6	20	15	33	28	46	40	64	
40	50	1	11	6	23	18	36	30	51	45	73	

d(mm)		ΔBs(ΔCs) <sup>(2)</sup>		VBs(VCs) <sup>(2)</sup>				Kia				Sd		Sia		Unit μm	
		Single bearing		Inner/outer ring		Inner ring		P0		P6		P5		P4			
		P0	P6	P0	P6	P5	P4	P0	P6	P5	P4	P5	P4	P5	P4		
Upper	Lower	Lower	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.
0	-40	-40	12	12	5	2.5	10	5	4	2.5	7	3	7	3	0.6(1)	2.5	
0	-120	-40	15	15	5	2.5	10	6	4	2.5	7	3	7	3	2.5	10	
0	-120	-80	20	20	5	2.5	10	7	4	2.5	7	3	7	3	10	18	
0	-120	-120	20	20	5	2.5	13	8	4	3	8	4	8	4	18	30	
0	-120	-120	20	20	5	3	15	10	5	4	8	4	8	4	30	50	

Note(1) : 0.6mm is included in this classification.  
 Note(2) : The inner ring width variation is the same for the outer ring of the same bearing size, CLASS5 and CLASS4 referring to outer ring only.

D(mm)		Kca				SD		Sea		VCs <sup>(2)</sup>		D(mm)		ΔDis				ΔCis				Unit μm	
		P0		P6		P5		P4		P5		P4		Flanged type									
		P0	P6	P5	P4	P5	P4	P5	P4	P5	P4	P0	P6	P5	P4	P0	P6	P5	P4				
Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Max.	Over	Incl.	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower		
15	8	5	3	8	4	8	5	5	2.5	2.5(1)	6	+125	-50	0	-25	0	-50	0	-50	0	-50		
15	8	5	3	8	4	8	5	5	2.5	6	18	+125	-50	0	-25	0	-50	0	-50	0	-50		
15	9	6	4	8	4	8	5	5	2.5	18	30	+125	-50	0	-25	0	-50	0	-50	0	-50		
20	10	7	5	8	4	8	5	5	2.5	30	50	+125	-50	0	-25	0	-50	0	-50	0	-50		
25	13	8	5	8	4	10	5	6	3	50	80	+125	-50	0	-25	0	-50	0	-50	0	-50		

Note 1 : The lower value of the outside diameter in this table is not applicable when the distance from the bearing ring face is less than 1.2 times the chamfer dimension.  
 Note 2 : According to the revision of AFBMA Std20-1978, the classes ABEC1 ABEC3 ABEC5 ABEC7 are equivalent to CLASS0 • CLASS6 • CLASS5 • CLASS4

- d : Nominal bore diameter
- Δdmp : Single plane mean bore diameter deviation
- Δds : Deviation of a single bore diameter
- Vdp : Bore diameter variation in a single radial plane
- Vdmp : Mean bore diameter variation
- ΔBs (ΔCs) : Deviation of a single inner and outer ring width from the nominal dimension
- VBs (VCs) : Variation of a inner and outer ring width
- Kia : Radial runout of assembled bearing inner ring
- Sd : Face runout with bore
- Sia : Assembled bearing inner ring face runout with raceway
- D : Nominal outside diameter
- ΔDmp : Single plane mean outside diameter deviation
- ΔDs : Deviation of a single outside diameter
- VDp : Outside diameter variation in a single radial plane
- VDmp : Mean outside diameter variation
- Kea : Radial runout of assembled bearing outer ring
- SD : Variation of a outside surface generatrix inclination with face
- Sea : Assembled bearing outer ring face runout with raceway
- VCs : Variation of the outer ring width
- ΔDis : Flange outside diameter deviation
- ΔCis : Flange width deviation






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**\* Load Ratings:**  
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	Design Design	Spezifikation Specification	Vorteile/Nachteile Advantage/Disadvantage
	- Keine Dichtung No seals	Offen Open	Kein Reibungswiderstand No friction Einfache Nachschmierung Easy to relube Starke Verschmutzung No protection against contamination
	2Z Metalldichtscheiben Metal shields	Nichtschleifende Dichtung Non contact seals	Kein Reibungswiderstand No friction Gute Abdichtung gegen Schmutz Good protection against contamination
	2RS Gummidichtscheiben Rubber seals	Schleifende Dichtung aus Kunststoff Contact seals made of synthetic rubber	Erhöhter Reibungswiderstand Higher friction Ausgezeichnete Abdichtung gegen Schmutz Very good protection against contamination
	2TS Teflondichtscheiben Teflon seals	Schleifende Dichtung aus Teflon Contact seals made of teflon	Geringer Reibungswiderstand Low friction Ausgezeichnete Abdichtung gegen Schmutz Very good protection against contamination Gute chemische Eigenschaften Good chemical characteristics
	2TZ Metalldichtscheibe mit Teflondichtscheibe Teflon seals with metal shields	Schleifende Dichtung aus Teflon Contact seals made of teflon	Geringer Reibungswiderstand Low friction Ausgezeichnete Abdichtung gegen Schmutz Very good protection against contamination Gute chemische Eigenschaften Good chemical characteristics

Schmierung / Lubrication

Schmiermittel Lubricant	Anmerkung Remarks	Vorteile/Anwendung Advantages/Applications
Kein Schmiermittel No lubricant	Nur bei Edelstahlagern oder mit Verwendung von Korrosionsschutz Only with stainless steel bearings or with the use of corrosion preventive fluid	Wenn Schmierung vom Kunden gestellt wird When the lubrication is provided by the customer
Fett Grease	Standardfüllung 30-40% Standard filling 30-40%	Lebenslange Schmierung möglich Life-time lubrication is possible Guter Korrosionsschutz Good protection against corrosion Differenzierte Anwendungsmöglichkeiten je nach Fett According to the application a variety of greases can be used
Öl Oil	-	Geringer Reibungswiderstand Low friction Hohe Drehzahlen High revolution

	Referenz Reference	Käfigtype Cage type	Anmerkung Remarks
	FC	Vollkugelig / ohne Käfig Full Complement / No Cage	Geringe Drehzahlen, hohe Belastungswerte Low Revolution high load rating
	W	Kronenkäfig Crown Cage	Geringes Gewicht, geringe Reibung Light weight, smooth, low friction
	J	Lappenkäfig Ribbon Cage	Standardkäfig, hohe Lebensdauer Standard cage, good durability
	T9H	Kronenkäfig aus Kunststoff T9H Cage	Geringes Gewicht, hohe Lebensdauer, hohe Drehzahlen Light weight, strong, high speed
		Massivkäfig aus Kunststoff Phenolic cage	Geringes Gewicht, hohe Lebensdauer, hohe Drehzahlen Light weight, strong, high speed

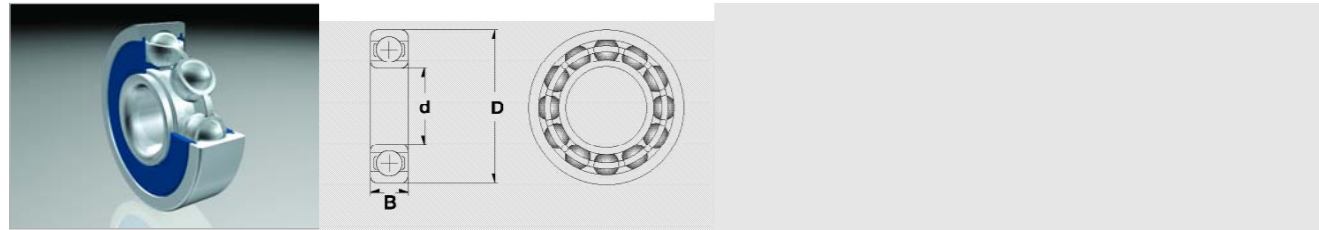
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Metrische Miniaturrillenkugellager / Miniature Metric Series

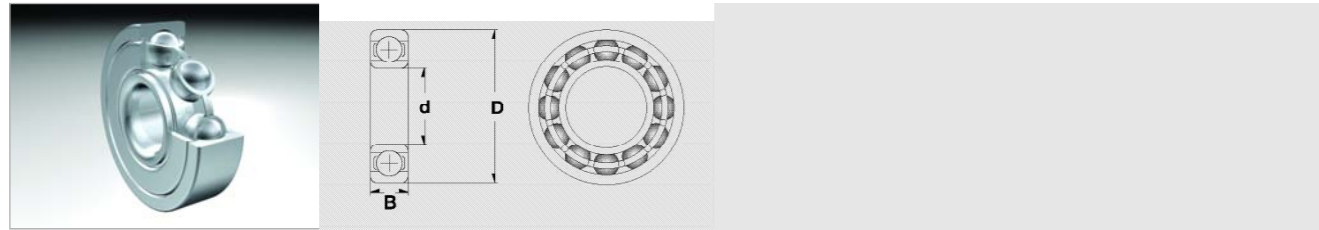


standard or flanged	Dimension (mm)			Designation/Type					
	d	D	B	open		2Z		2RS/2TS	
				Chrome Steel	Stainless	Chrome Steel	Stainless	Chrome Steel	Stainless
standard	1.0	3.0	1.0	681	S681	-	-	-	-
flanged	1.0	3.0	1.0	F 681	SF 681	-	-	-	-
standard	1.0	4.0	1.6	691	S691	-	-	-	-
flanged	1.0	4.0	1.6	F 691	SF 691	-	-	-	-
standard	1.2	4.0	2.5	-	-	MR 41X-2Z	SMR 41X-2Z	-	-
standard	1.5	4.0	1.2	681X	S681X	-	-	-	-
flanged	1.5	4.0	1.2	F 681X	SF 681X	-	-	-	-
standard	1.5	4.0	2.0	-	-	681X-2Z	S681X-2Z	-	-
flanged	1.5	4.0	2.0	-	-	F 681X-2Z	SF 681X-2Z	-	-
standard	1.5	5.0	1.7	X 1.5	SX 1.5	-	-	-	-
standard	1.5	5.0	2.0	691X	S691X	-	-	-	-
flanged	1.5	5.0	2.0	F 691X	SF 691X	-	-	-	-
standard	1.5	5.0	2.6	-	-	691X-2Z	S691X-2Z	-	-
flanged	1.5	5.0	2.6	-	-	F 691X-2Z	SF 691X-2Z	-	-
standard	1.5	6.0	2.5	601X	S601X	-	-	-	-
flanged	1.5	6.0	2.5	F 601X	SF 601X	-	-	-	-
standard	1.5	6.0	3.0	-	-	601X-2Z	S601X-2Z	-	-
flanged	1.5	6.0	3.0	-	-	F 601X-2Z	SF 601X-2Z	-	-
standard	2.0	4.0	1.2	672	S672	-	-	-	-
standard	2.0	5.0	1.5	682	S682	-	-	-	-
flanged	2.0	5.0	1.5	F 682	SF 682	-	-	-	-
standard	2.0	5.0	2.0	MR 52	SMR 52	-	-	-	-
standard	2.0	5.0	2.3	-	-	682-2Z	S682-2Z	-	-
flanged	2.0	5.0	2.3	-	-	F 682-2Z	SF 682-2Z	-	-
standard	2.0	5.0	2.5	-	-	MR 52-2Z	SMR 52-2Z	-	-
flanged	2.0	5.0	2.5	-	-	MF 52-2Z	SMF 52-2Z	-	-
standard	2.0	6.0	2.3	692	S692	692-2ZW2.3	S692-2ZW2.3	-	-
flanged	2.0	6.0	2.3	F 692	SF 692	F 692-2ZW2.3	SF 692-2ZW2.3	-	-
standard	2.0	6.0	2.5	MR 62	SMR 62	MR 62-2Z	SMR 62-2Z	-	-
flanged	2.0	6.0	2.5	MF 62	SMF 62	MF 62-2Z	SMF 62-2Z	-	-
standard	2.0	6.0	3.0	-	-	692-2Z	S692-2Z	-	-
flanged	2.0	6.0	3.0	-	-	F 692-2Z	SF 692-2Z	-	-

* Load Rating (only 100 Cr6)		* Limiting Speed x1000rpm (open & 2Z)		Standard cage type Others on request	Mass (g) approx.
C, dyn. N	C, stat. N	Grease	Oil		
96	26	130.0	150.0	W	< 1 g
96	26	130.0	150.0	W	< 1 g
141	37	100.0	120.0	W	< 1 g
141	37	100.0	120.0	W	< 1 g
112	33	110.0	130.0	W	< 1 g
112	33	100.0	120.0	W	< 1 g
112	33	100.0	120.0	W	< 1 g
112	33	100.0	120.0	W	< 1 g
112	33	100.0	120.0	W	< 1 g
169	50	85.0	100.0	W	< 1 g
169	50	85.0	100.0	W	< 1 g
169	50	85.0	100.0	W	< 1 g
169	50	85.0	100.0	W	< 1 g
330	99	75.0	90.0	W	< 1 g
330	99	75.0	90.0	W	< 1 g
330	99	75.0	90.0	W	< 1 g
330	99	75.0	90.0	W	< 1 g
124	40	91.0	104.0	W	< 1 g
169	50	85.0	100.0	W,J	< 1 g
169	50	85.0	100.0	W,J	< 1 g
169	50	85.0	100.0	W,J	< 1 g
169	50	85.0	100.0	W,J	< 1 g
169	50	85.0	100.0	W	< 1 g
169	50	85.0	100.0	W	< 1 g
330	99	75.0	90.0	W	< 1 g
330	99	75.0	90.0	W	< 1 g
330	99	75.0	90.0	W	< 1 g
330	99	75.0	90.0	W	< 1 g
330	99	75.0	90.0	W	< 1 g
330	99	75.0	90.0	W	< 1 g

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Metrische Miniaturrillenkugellager / Miniature Metric Series

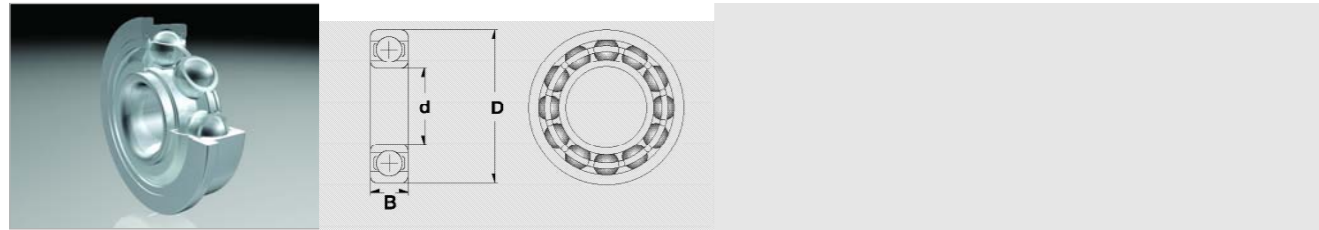


standard or flanged	Dimension (mm)			Designation/Type					
	d	D	B	open		2Z		2RS/2TS	
				Chrome Steel	Stainless	Chrome Steel	Stainless	Chrome Steel	Stainless
standard	2.0	7.0	2.5	602	S602	-	-	-	-
standard	2.0	7.0	2.8	MR 72	SMR 72	-	-	-	-
standard	2.0	7.0	3.5	-	-	602-2Z	S602-2Z	-	-
flanged	2.0	7.0	3.5	-	-	F 602-2Z	SF 602-2Z	-	-
standard	2.0	7.0	3.0	-	-	MR 72-2Z	SMR 72-2Z	-	-
flanged	2.0	7.0	3.0	-	-	MF 72-2Z	SMF 72-2Z	-	-
standard	2.5	6.0	1.8	682X	S682X	-	-	-	-
flanged	2.5	6.0	1.8	F 682X	SF 682X	-	-	-	-
standard	2.5	6.0	2.6	-	-	682X-2Z	S682X-2Z	-	-
flanged	2.5	6.0	2.6	-	-	F 682X-2Z	SF 682X-2Z	-	-
standard	2.5	7.0	2.5	692X	S692X	-	-	-	-
flanged	2.5	7.0	2.5	F 692X	SF 692X	-	-	-	-
standard	2.5	7.0	3.0	-	-	X 2.5-2Z	SX 2.5-2Z	-	-
standard	2.5	7.0	3.5	-	-	692X-2Z	S692X-2Z	-	-
flanged	2.5	7.0	3.5	-	-	F 692X-2Z	SF 692X-2Z	-	-
standard	2.5	8.0	2.5	MR 82X	SMR 82X	-	-	-	-
standard	2.5	8.0	2.8	602X	S602X	-	-	-	-
flanged	2.5	8.0	2.8	F 602X	SF602X	-	-	-	-
standard	2.5	8.0	4.0	-	-	602X-2Z	S602X-2Z	-	-
flanged	2.5	8.0	4.0	-	-	F602X-2Z	SF 602X-2Z	-	-
standard	3.0	6.0	2.0	MR 63	SMR 63	-	-	-	-
flanged	3.0	6.0	2.0	MF 63	SMF 63	-	-	-	-
standard	3.0	6.0	2.5	-	-	MR 63-2Z	SMR 63-2Z	-	-
flanged	3.0	6.0	2.5	-	-	MF 63-2Z	SMF 63-2Z	-	-
standard	3.0	7.0	2.0	683	S683	-	-	-	-
flanged	3.0	7.0	2.0	F683	SF 683	-	-	-	-
standard	3.0	7.0	3.0	-	-	683-2Z	S683-2Z	683-2TS	S683-2TS
flanged	3.0	7.0	3.0	-	-	F 683-2Z	SF 683-2Z	-	-
standard	3.0	8.0	2.5	MR 83	SMR 83	-	-	-	-
flanged	3.0	8.0	2.5	MF 83	SMF 83	-	-	-	-
standard	3.0	8.0	3.0	693	693	-	-	-	-
flanged	3.0	8.0	3.0	F 693	SF 693	-	-	-	-

* Load Rating (only 100 Cr6)		* Limiting Speed x1000rpm (open & 2Z)		Standard cage type Others on request	Mass (g) approx.
C, dyn. N	C, stat. N	Grease	Oil		
386	129	60.0	71.0	W	< 1 g
386	129	63.0	75.0	W	< 1 g
386	129	60.0	71.0	W	< 1 g
386	129	60.0	71.0	W	< 1 g
386	129	63.0	75.0	W	< 1 g
386	129	63.0	75.0	W	< 1 g
209	74	71.0	80.0	W	< 1 g
209	74	71.0	80.0	W	< 1 g
209	74	71.0	80.0	W	< 1 g
209	74	71.0	80.0	W	< 1 g
386	129	63.0	75.0	W	< 1 g
386	129	63.0	75.0	W	< 1 g
386	129	63.0	75.0	W	< 1 g
386	129	63.0	75.0	W	< 1 g
558	180	60.0	67.0	W	< 1 g
552	177	60.0	71.0	W	< 1 g
552	177	60.0	71.0	W	< 1 g
552	177	60.0	71.0	W	< 1 g
552	177	60.0	71.0	W	< 1 g
209	74	71.0	80.0	W	< 1 g
209	74	71.0	80.0	W	< 1 g
209	74	71.0	80.0	W	< 1 g
209	74	71.0	80.0	W	< 1 g
311	112	63.0	75.0	W,J	< 1 g
311	112	63.0	75.0	W,J	< 1 g
311	112	63.0	75.0	W,J	< 1 g
311	112	63.0	75.0	W,J	< 1 g
395	141	60.0	67.0	W	< 1 g
395	141	60.0	67.0	W	< 1 g
558	180	60.0	67.0	W	< 1 g
558	180	60.0	67.0	W	< 1 g

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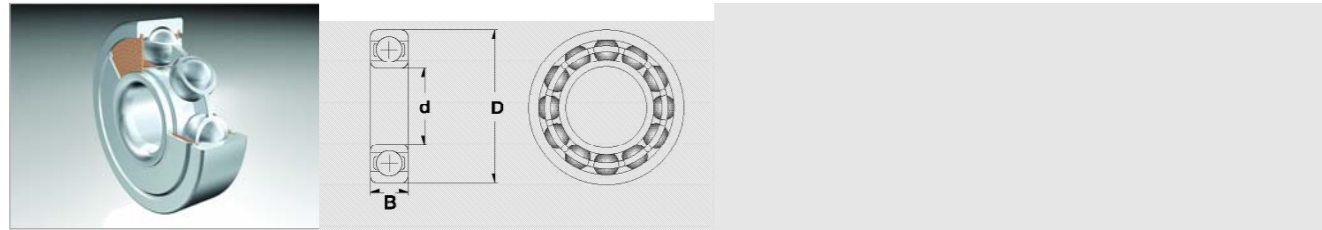
Metrische Miniaturrillenkugellager / Miniature Metric Series



standard or flanged	Dimension (mm)			Designation/Type					
	d	D	B	open		2Z		2RS/2TS	
				Chrome Steel	Stainless	Chrome Steel	Stainless	Chrome Steel	Stainless
standard	3.0	8.0	3.0	-	-	MR 83-2Z	SMR 83-2Z	-	-
flanged	3.0	8.0	3.0	-	-	MF 83-2Z	SMF 83-2Z	-	-
standard	3.0	8.0	4.0	-	-	693-2Z	S693-2Z	-	-
flanged	3.0	8.0	4.0	-	-	F 693-2Z	SF 693-2Z	-	-
standard	3.0	9.0	2.5	MR 93	SMR 93	-	-	-	-
flanged	3.0	9.0	2.5	MF 93	SMF 93	-	-	-	-
standard	3.0	9.0	3.0	603	S603	-	-	-	-
flanged	3.0	9.0	3.0	F 603	SF 603	-	-	-	-
standard	3.0	9.0	4.0	-	-	MR 93-2Z	SMR 93-2Z	-	-
flanged	3.0	9.0	4.0	-	-	MF 93-2Z	SMF 93-2Z	-	-
standard	3.0	9.0	5.0	-	-	603-2Z	S603-2Z	-	-
flanged	3.0	9.0	5.0	-	-	F 603-2Z	SF 603-2Z	-	-
standard	3.0	10.0	4.0	623	S623	623-2Z	S623-2Z	623-2RS	S623-2RS
flanged	3.0	10.0	4.0	F 623	SF 623	F 623-2Z	SF 623-2Z	F 623-2RS	SF 623-2RS
standard	3.0	13.0	5.0	-	-	633-2Z	S633-2Z	-	-
standard	3.5	9.0	4.0	-	-	MR 93X-2Z	SMR 93X-2Z	-	-
standard	4.0	7.0	2.0	MR 74	SMR 74	-	-	-	-
flanged	4.0	7.0	2.0	MF 74	SMF 74	-	-	-	-
standard	4.0	7.0	2.5	-	-	MR 74-2Z	SMR 74-2Z	-	-
flanged	4.0	7.0	2.5	-	-	MF 74-2Z	SMF 74-2Z	-	-
standard	4.0	8.0	2.0	MR 84	SMR 84	-	-	-	-
flanged	4.0	8.0	2.0	MF 84	SMF 84	-	-	-	-
standard	4.0	8.0	3.0	-	-	MR 84-2Z	SMR 84-2Z	MR 84-2RS	SMR 84-2RS
flanged	4.0	8.0	3.0	-	-	MF 84-2Z	SMF 84-2Z	MF 84-2RS	SMF 84-2RS
standard	4.0	9.0	2.5	684	S684	-	-	-	-
flanged	4.0	9.0	2.5	F 684	SF 684	-	-	-	-
standard	4.0	9.0	4.0	-	-	684-2Z	S684-2Z	684-2RS	S684-2RS
flanged	4.0	9.0	4.0	-	-	F 684-2Z	SF 684-2Z	F 684-2RS	SF 684-2RS
standard	4.0	10.0	3.0	MR 104	SMR 104	-	-	-	-
flanged	4.0	10.0	3.0	MF 104	SMF 104	-	-	-	-
standard	4.0	10.0	4.0	-	-	MR 104-2Z	SMR 104-2Z	MR 104-2TS	SMR 104-2TS
flanged	4.0	10.0	4.0	-	-	MF 104-2Z	SMF 104-2Z	MF 104-2TS	SMF 104-2TS

* Load Rating (only 100 Cr6)		* Limiting Speed x1000rpm (open & 2Z)		Standard cage type Others on request	Mass (g) approx.
C, dyn. N	C, stat. N	Grease	Oil		
395	141	60.0	67.0	W	< 1 g
395	141	60.0	67.0	W	< 1 g
558	180	60.0	67.0	W	< 1 g
558	180	60.0	67.0	W	< 1 g
571	189	56.0	67.0	W	< 1 g
571	189	56.0	67.0	W	< 1 g
571	189	56.0	67.0	W	< 2 g
571	189	56.0	67.0	W	< 2 g
571	189	56.0	67.0	W	< 2 g
571	189	56.0	67.0	W	< 2 g
631	219	50.0	60.0	W,J	< 2 g
631	219	50.0	60.0	W,J	< 2 g
1301	488	40.0	48.0	J	< 4 g
571	189	56.0	67.0	W	< 3 g
255	108	60.0	67.0	W	< 1 g
255	108	60.0	67.0	W	< 1 g
255	108	60.0	67.0	W	< 1 g
255	108	60.0	67.0	W	< 1 g
395	141	56.0	67.0	W	< 1 g
395	141	56.0	67.0	W	< 1 g
395	141	56.0	67.0	W	< 2 g
395	141	56.0	67.0	W	< 2 g
641	227	53.0	63.0	W,J	< 2 g
641	227	53.0	63.0	W,J	< 2 g
641	227	53.0	63.0	W,J	< 2 g
641	227	53.0	63.0	W,J	< 2 g
711	272	48.0	56.0	W,J	< 2 g
711	272	48.0	56.0	W,J	< 2 g
711	272	48.0	56.0	W,J	< 2 g
711	272	48.0	56.0	W,J	< 2 g

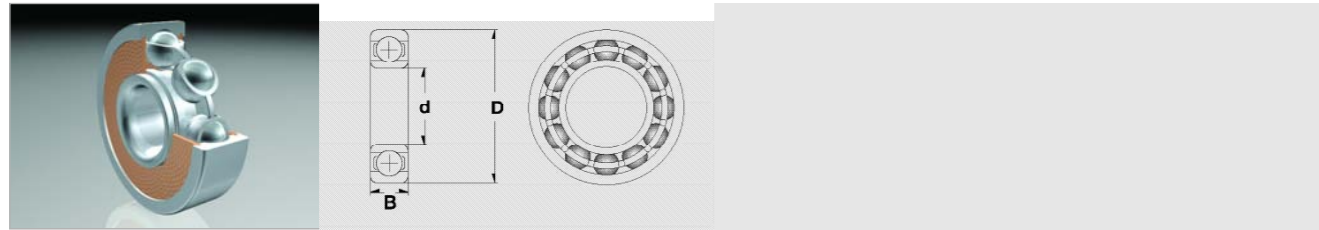
Metrische Miniaturrillenkugellager / Miniature Metric Series



standard or flanged	Dimension (mm)			Designation/Type					
	d	D	B	open		2Z		2RS/2TS	
				Chrome Steel	Stainless	Chrome Steel	Stainless	Chrome Steel	Stainless
standard	4.0	11.0	4.0	694	S694	694-2Z	S694-2Z	694-2RS	S694-2RS
flanged	4.0	11.0	4.0	F 694	SF 694	F 694-2Z	SF 694-2Z	F 694-2RS	SF 694-2RS
standard	4.0	12.0	4.0	604	S604	604-2Z	S604-2Z	604-2RS	S604-2RS
flanged	4.0	12.0	4.0	F 604	SF 604	F 604-2Z	SF 604-2Z	F 604-2RS	SF 604-2RS
standard	4.0	13.0	5.0	624	S624	624-2Z	S624-2Z	624-2RS	S624-2RS
flanged	4.0	13.0	5.0	F 624	SF 624	F 624-2Z	SF 624-2Z	F 624-2RS	SF 624-2RS
standard	4.0	16.0	5.0	634	S634	634-2Z	S634-2Z	634-2RS	S634-2RS
flanged	4.0	16.0	5.0	F 634	SF 634	F 634-2Z	SF 634-2Z	F 634-2RS	SF 634-2RS
standard	5.0	8.0	2.0	MR 85	SMR 85	-	-	-	-
flanged	5.0	8.0	2.0	MF 85	SMF 85	-	-	-	-
standard	5.0	8.0	2.5	-	-	MR 85-2Z	SMR 85-2Z	-	-
flanged	5.0	8.0	2.5	-	-	MF 85-2Z	SMF 85-2Z	-	-
standard	5.0	9.0	2.5	MR 95	SMR 95	-	-	-	-
flanged	5.0	9.0	2.5	MF 95	SMF 95	-	-	-	-
standard	5.0	9.0	3.0	-	-	MR 95-2Z	SMR 95-2Z	MR 95-2TS	SMR 95-2TS
flanged	5.0	9.0	3.0	-	-	MF 95-2Z	SMF 95-2Z	MF 95-2TS	SMF 95-2TS
standard	5.0	10.0	3.0	MR 105	SMR 105	-	-	-	-
flanged	5.0	10.0	3.0	MF 105	SMF 105	-	-	-	-
standard	5.0	10.0	4.0	-	-	MR 105-2Z	SMR 105-2Z	MR 105-2RS	SMR 105-2RS
flanged	5.0	10.0	4.0	-	-	MF 105-2Z	SMF 105-2Z	MF 105-2RS	SMF 105-2RS
standard	5.0	11.0	3.0	S685	S685	-	-	-	-
flanged	5.0	11.0	3.0	F 685	SF 685	-	-	-	-
standard	5.0	11.0	4.0	-	-	MR 115-2Z	SMR 115-2Z	MR 115-2RS	SMR 115-2RS
flanged	5.0	11.0	4.0	-	-	MF 115-2Z	SMF 115-2Z	MF 115-2RS	SMF 115-2RS
standard	5.0	11.0	5.0	-	-	685-2Z	S685-2Z	685-2RS	S685-2RS
flanged	5.0	11.0	5.0	-	-	F 685-2Z	SF 685-2Z	F 685-2RS	SF 685-2RS
standard	5.0	13.0	4.0	695	S695	-	-	-	-
flanged	5.0	13.0	4.0	F 695	SF 695	-	-	-	-
standard	5.0	13.0	5.0	695W5	S695W5	695-2Z	S695-2Z	695-2RS	S695-2RS
flanged	5.0	13.0	5.0	-	-	F 695-2Z	SF 695-2Z	F 695-2RS	SF 695-2RS
standard	5.0	14.0	5.0	605	S605	605-2Z	S605-2Z	605-2RS	S605-2RS
flanged	5.0	14.0	5.0	F 605	SF 605	F 605-2Z	SF 605-2Z	F 605-2RS	SF 605-2RS

* Load Rating (only 100 Cr6)		* Limiting Speed x1000rpm (open & 2Z)		Standard cage type Others on request	Mass (g) approx.
C, dyn. N	C, stat. N	Grease	Oil		
957	350	48.0	56.0	W,J	< 2 g
957	350	48.0	56.0	W,J	< 2 g
957	350	48.0	56.0	W,J	< 3 g
957	350	48.0	56.0	W,J	< 3 g
1301	488	40.0	48.0	W,J	< 4 g
1301	488	40.0	48.0	W,J	< 4 g
1340	523	36.0	43.0	W,J	< 6 g
1340	523	36.0	43.0	W,J	< 6 g
218	90	53.0	63.0	W	< 1 g
218	90	53.0	63.0	W	< 1 g
218	90	53.0	63.0	W	< 1 g
218	90	53.0	63.0	W	< 1 g
431	169	50.0	60.0	W	< 1 g
431	169	50.0	60.0	W	< 1 g
431	169	50.0	60.0	W	< 1 g
431	169	50.0	60.0	W	< 1 g
431	169	50.0	60.0	W,J	< 2 g
431	169	50.0	60.0	W,J	< 2 g
431	169	50.0	60.0	W,J	< 2 g
431	169	50.0	60.0	W,J	< 2 g
716	282	45.0	53.0	W	< 2 g
716	282	45.0	53.0	W	< 2 g
716	282	45.0	53.0	W,J	< 1 g
716	282	45.0	53.0	W,J	< 1 g
716	282	45.0	53.0	W	< 2 g
716	282	45.0	53.0	W	< 2 g
1077	432	43.0	50.0	W,J	< 3 g
1077	432	43.0	50.0	W,J	< 3 g
1077	432	43.0	50.0	W,J	< 3 g
1077	432	43.0	50.0	W,J	< 3 g
1329	507	40.0	50.0	W,J	< 5 g
1329	507	40.0	50.0	W,J	< 5 g

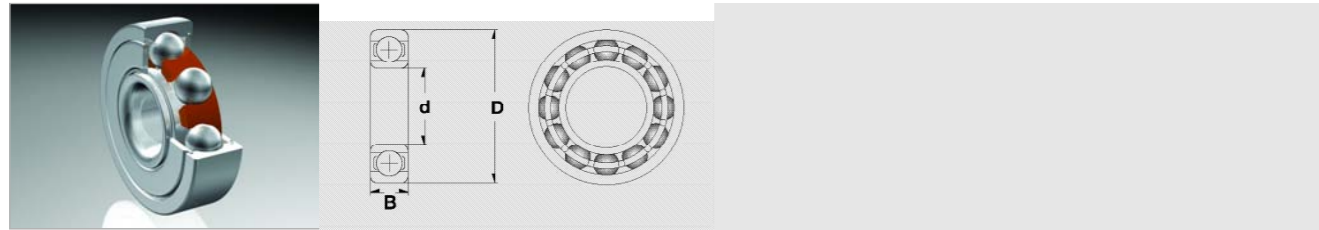
Metrische Miniaturrillenkugellager / Miniature Metric Series



standard or flanged	Dimension (mm)			Designation/Type					
	d	D	B	open		2Z		2RS/2TS	
				Chrome Steel	Stainless	Chrome Steel	Stainless	Chrome Steel	Stainless
standard	5.0	16.0	5.0	625	S625	625-2Z	S625-2Z	625-2RS	S625-2RS
flanged	5.0	16.0	5.0	F 625	SF 625	F 625-2Z	SF 625-2Z	F 625-2RS	SF 625-2RS
standard	5.0	19.0	6.0	635	S635	635-2Z	S635-2Z	635-2RS	S635-2RS
flanged	5.0	19.0	6.0	F 635	SF 635	F 635-2Z	SF 635-2Z	F 635-2RS	SF 635-2RS
standard	6.0	10.0	2.5	MR 106	SMR 106	-	-	-	-
flanged	6.0	10.0	2.5	MF 106	SMF 106	-	-	-	-
standard	6.0	10.0	3.0	-	-	MR 106-2Z	SMR 106-2Z	MR 106-2RS	SMR 106-2RS
flanged	6.0	10.0	3.0	-	-	MF 106-2Z	SMF 106-2Z	MF 106-2RS	SMF 106-2RS
standard	6.0	12.0	3.0	MR 126	SMR 126	-	-	-	-
flanged	6.0	12.0	3.0	MF 126	SMF 126	-	-	-	-
standard	6.0	12.0	4.0	-	-	MR 126-2Z	SMR 126-2Z	MR 126-2RS	SMR 126-2RS
flanged	6.0	12.0	4.0	-	-	MF 126-2Z	SMF 126-2Z	MF 126-2RS	SMF 126-2RS
standard	6.0	13.0	3.5	686	S686	-	-	-	-
flanged	6.0	13.0	3.5	F 686	SF 686	-	-	-	-
standard	6.0	13.0	4.5	-	-	686-2ZW4.5	S686-2ZW4.5	686-2TS4.5	S686-2TS4.5
standard	6.0	13.0	5.0	686W5	S686W5	686-2Z	S686-2Z	686-2RS	S686-2RS
flanged	6.0	13.0	5.0	-	-	F 686-2Z	SF 686-2Z	F 686-2RS	SF 686-2RS
standard	6.0	15.0	5.0	696	S696	696-2Z	S696-2Z	696-2RS	S696-2RS
flanged	6.0	15.0	5.0	F 696	SF 696	F 696-2Z	SF 696-2Z	F 696-2RS	SF 696-2RS
standard	6.0	16.0	5.0	696A	S696A	696A-2Z	S696A-2Z	696A-2RS	S696A-2RS
flanged	6.0	16.0	5.0	F 696A	SF 696A	F 696A-2Z	SF 696A-2Z	F 696A-RS	SF 696A-2RS
standard	6.0	17.0	6.0	606	S606	606-2Z	S606-2Z	606-2RS	S606-2RS
flanged	6.0	17.0	6.0	F 606	SF 606	F 606-2Z	SF 606-2Z	F 606-2RS	SF 606-2RS
standard	6.0	19.0	6.0	626	S626	626-2Z	S626-2Z	626-2RS	S626-2RS
flanged	6.0	19.0	6.0	F 626	SF 626	F 626-2Z	SF 626-2Z	F 626-2RS	SF 626-2RS
standard	6.0	22.0	7.0	636	S636	636-2Z	S636-2Z	636-2RS	S636-2RS
standard	7.0	11.0	2.5	MR 117	SMR 117	-	-	-	-
flanged	7.0	11.0	2.5	MF 117	SMF 117	-	-	-	-
standard	7.0	11.0	3.0	-	-	MR 117-2Z	SMR 117-2Z	MR 117-2RS	SMR 117-2RS
flanged	7.0	11.0	3.0	-	-	MF 117-2Z	SMF 117-2Z	MF 117-2RS	SMF 117-2RS
standard	7.0	13.0	3.0	MR 137	SMR 137	-	-	-	-
flanged	7.0	13.0	3.0	MF 137	SMF 137	-	-	-	-

* Load Rating (only 100 Cr6)		* Limiting Speed x1000rpm (open & 2Z)		Standard cage type Others on request	Mass (g) approx.
C, dyn. N	C, stat. N	Grease	Oil		
1729	675	36.0	43.0	W,J	< 6 g
1729	675	36.0	43.0	W,J	< 6 g
2336	896	32.0	40.0	J	< 8 g
2336	896	32.0	40.0	J	< 10 g
496	218	45.0	53.0	W	< 1 g
496	218	45.0	53.0	W	< 1 g
496	218	45.0	53.0	W	< 1 g
496	218	45.0	53.0	W	< 1 g
716	295	43.0	50.0	W,J	< 2 g
716	295	43.0	50.0	W,J	< 2 g
716	295	43.0	50.0	W,J	< 2 g
716	295	43.0	50.0	W,J	< 2 g
1082	442	40.0	50.0	W,J	< 3 g
1082	442	40.0	50.0	W,J	< 4 g
1082	442	40.0	50.0	W,J	< 4 g
1082	442	40.0	50.0	W,J	< 4 g
1340	523	40.0	45.0	W,J	< 4 g
1340	523	40.0	45.0	W,J	< 4 g
1340	523	40.0	45.0	J	< 7 g
1340	523	40.0	45.0	J	< 7 g
2263	846	38.0	45.0	J	< 7 g
2263	846	38.0	45.0	J	< 8 g
2336	896	32.0	40.0	J	< 8 g
2336	896	32.0	40.0	J	< 10 g
3333	1423	30.0	36.0	J	< 5 g
455	202	43.0	50.0	W	< 1 g
455	202	43.0	50.0	W	< 1 g
455	202	43.0	50.0	W	< 1 g
455	202	43.0	50.0	W	< 1 g
541	276	40.0	48.0	W	< 3 g
541	276	40.0	48.0	W	< 3 g

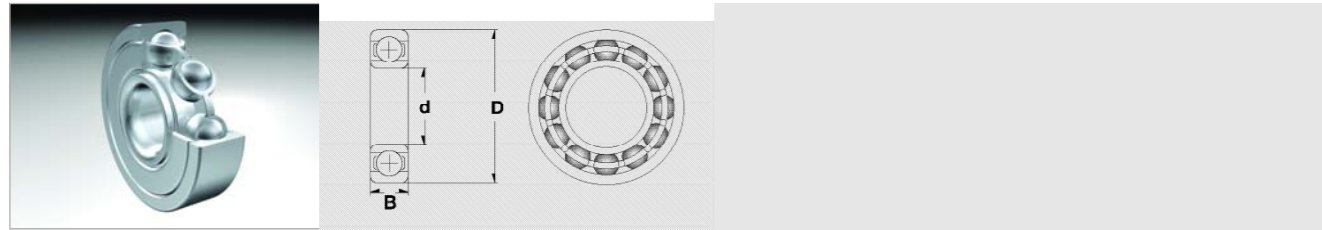
Metrische Miniaturrillenkugellager / Miniature Metric Series



standard or flanged	Dimension (mm)			Designation/Type					
	d	D	B	open		2Z		2RS/2TS	
				Chrome Steel	Stainless	Chrome Steel	Stainless	Chrome Steel	Stainless
standard	7.0	13.0	4.0	-	-	MR 137-2Z	SMR 137-2Z	MR 137-2RS	SMR 137-2RS
flanged	7.0	13.0	4.0	-	-	MF 137-2Z	SMF 137-2Z	MF 137-2RS	SMF 137-2RS
standard	7.0	14.0	3.5	687	S687	-	-	-	-
flanged	7.0	14.0	3.5	F 687	SF 687	-	-	-	-
standard	7.0	14.0	5.0	-	-	687-2Z	S687-2Z	687-2RS	S687-2RS
flanged	7.0	14.0	5.0	-	-	F 687-2Z	SF 687-2Z	F 687-2RS	SF 687-2RS
standard	7.0	17.0	5.0	697	S697	697-2Z	S697-2Z	697-2RS	S697-2RS
flanged	7.0	17.0	5.0	F 697	SF 697	F 697-2Z	SF 697-2Z	F 697-2RS	SF 697-2RS
standard	7.0	19.0	6.0	607	S607	607-2Z	S607-2Z	607-2RS	S607-2RS
flanged	7.0	19.0	6.0	F 607	SF 607	F 607-2Z	SF 607-2Z	F 607-2RS	SF 607-2RS
standard	7.0	22.0	7.0	627	S627	627-2Z	S627-2Z	627-2RS	S627-2RS
flanged	7.0	22.0	7.0	F 627	SF 627	F 627-2Z	SF 627-2Z	F 627-2RS	SF 627-2RS
standard	8.0	12.0	2.5	MR 128	SMR 128	-	-	-	-
flanged	8.0	12.0	2.5	MF 128	SMF 128	-	-	-	-
standard	8.0	12.0	3.5	-	-	MR 128-2Z	SMR 128-2Z	MR 128-2RS	SMR 128-2RS
flanged	8.0	12.0	3.5	-	-	MF 128-2Z	SMF 128-2Z	MF 128-2RS	SMF 128-2RS
standard	8.0	14.0	3.5	MR 148	SMR 148	-	-	-	-
flanged	8.0	14.0	3.5	MF 148	SMF 148	-	-	-	-
standard	8.0	14.0	4.0	-	-	MR 148-2Z	SMR 148-2Z	MR 148-2RS	SMR 148-2RS
flanged	8.0	14.0	4.0	-	-	MF 148-2Z	SMF 148-2Z	MF 148-2RS	SMF 148-2RS
standard	8.0	16.0	4.0	688	S688	688-2ZW4	S688-2ZW4	688-2RSW4	S688-2RSW4
flanged	8.0	16.0	4.0	F 688	SF 688	F 688-2ZW4	SF 688-2ZW4	F 688-2RSW4	SF 688-2RSW4
standard	8.0	16.0	5.0	688W5	S688W5	688-2Z	S688-2Z	688-2RS	S688-2RS
flanged	8.0	16.0	5.0	F 688W5	SF 688W5	F 688-2Z	SF 688-2Z	F 688-2RS	SF 688-2RS
standard	8.0	16.0	6.0	688W6	S688W6	688-2ZW6	S688-2ZW6	688-2RSW6	S688-2RSW6
flanged	8.0	16.0	6.0	F 688W6	SF 688W6	F 688-2ZW6	SF 688-2ZW6	F 688-2RSW6	SF 688-2RSW6
standard	8.0	19.0	6.0	698	S698	698-2Z	S698-2Z	698-2RS	S698-2RS
flanged	8.0	19.0	6.0	F 698	SF 698	F 698-2Z	SF 698-2Z	F 698-2RS	SF 698-2RS
standard	8.0	22.0	6.0	608W6	S608W6	608-2ZW6	S608-2ZW6	608-2RSW6	S608-2RSW6
standard	8.0	22.0	7.0	608	S608	608-2Z	S608-2Z	608-2RS	S608-2RS
flanged	8.0	22.0	7.0	F 608	SF 608	F 608-2Z	SF 608-2Z	F 608-2RS	SF 608-2RS
standard	8.0	22.0	11.0	-	-	630/8-2Z	-	630/8-2RS	-

* Load Rating (only 100 Cr6)		* Limiting Speed x1000rpm (open & 2Z)		Standard cage type Others on request	Mass (g) approx.
C, dyn. N	C, stat. N	Grease	Oil		
541	276	40.0	48.0	W	< 3 g
541	276	40.0	48.0	W	< 3 g
1173	513	40.0	50.0	W,J	< 4 g
1173	513	40.0	50.0	W,J	< 4 g
1173	513	40.0	50.0	W,J	< 4 g
1173	513	40.0	50.0	W,J	< 4 g
1605	719	36.0	43.0	J	< 6 g
1605	719	36.0	43.0	J	< 6 g
2336	896	36.0	43.0	J	< 8 g
2336	896	36.0	43.0	J	< 10 g
3287	1379	30.0	36.0	J	< 14 g
3287	1379	30.0	36.0	J	< 15 g
543	274	40.0	48.0	W	< 1 g
543	274	40.0	48.0	W	< 2 g
543	274	40.0	48.0	W	< 2 g
543	274	40.0	48.0	W	< 2 g
817	386	38.0	45.0	W	< 3 g
817	386	38.0	45.0	W	< 3 g
817	386	38.0	45.0	W	< 3 g
817	386	38.0	45.0	W	< 3 g
1252	592	36.0	43.0	W,J	< 4 g
1252	592	36.0	43.0	W,J	< 4 g
1252	592	36.0	43.0	W,J	< 4 g
1252	592	36.0	43.0	W,J	< 4 g
1252	592	36.0	43.0	W,J	< 5 g
1252	592	36.0	43.0	W,J	< 5 g
2237	917	36.0	43.0	J	< 8 g
2237	917	36.0	43.0	J	< 8 g
3293	1379	34.0	40.0	J	< 13 g
3293	1379	34.0	40.0	J	< 14 g
3293	1379	34.0	40.0	J	< 15 g
3293	1379	34.0	40.0	J	< 19 g

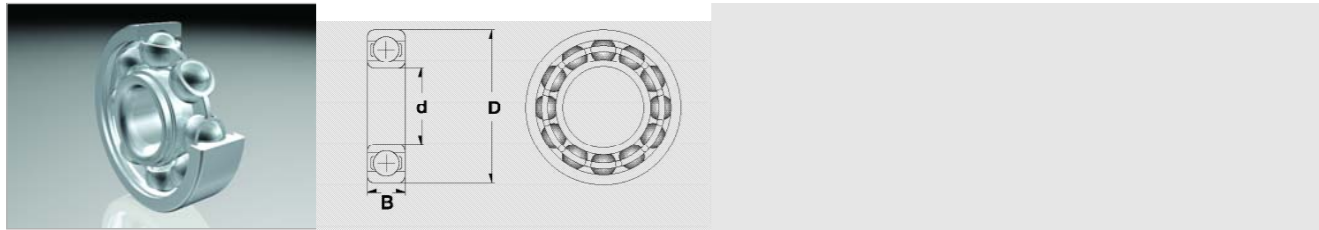
Metrische Miniaturrillenkugellager / Miniature Metric Series



standard or flanged	Dimension (mm)			Designation/Type					
	d	D	B	open		2Z		2RS/2TS	
				Chrome Steel	Stainless	Chrome Steel	Stainless	Chrome Steel	Stainless
standard	8.0	22.0	11.0	Zweihiges Radiallager	Double Row Bearing	30/8-2Z	-	30/8-2RS	-
standard	8.0	24.0	7.0	608/24	S608/24	608/24-2Z	S608/24-2Z	608/24-2RS	S608/24-2RS
standard	8.0	24.0	8.0	628	S628	628-2Z	S628-2Z	628-2RS	S628-2RS
flanged	8.0	24.0	8.0	F 628	SF 628	F 628-2Z	SF 628-2Z	F 628-2RS	SF 628-2RS
standard	8.0	26.0	7.0	608/26	S608/26	608/26-2Z	S608/26-2Z	608/26-2RS	S608/26-2RS
standard	8.0	28.0	9.0	638	S638	638-2Z	S638-2Z	638-2RS	S638-2RS
standard	9.0	14.0	3.0	679	S679	-	-	-	-
standard	9.0	17.0	4.0	689	S689	-	-	-	-
flanged	9.0	17.0	4.0	F 689	SF 689	-	-	-	-
standard	9.0	17.0	5.0	-	-	689-2Z	S689-2Z	689-2RS	S689-2RS
flanged	9.0	17.0	5.0	-	-	F 689-2Z	SF 689-2Z	F 689-2RS	SF 689-2RS
standard	9.0	17.0	6.0	689W6	S689W6	689-2ZW6	S689-2ZW6	689-2RSW6	S689-2RSW6
standard	9.0	20.0	6.0	699	S699	699-2Z	S699-2Z	699-2RS	S699-2RS
flanged	9.0	20.0	6.0	F 699	SF 699	F 699-2Z	SF 699-2Z	F 699-2RS	SF 699-2RS
standard	9.0	24.0	7.0	609	S609	609-2Z	S609-2Z	609-2RS	S609-2RS
flanged	9.0	24.0	7.0	F 609	SF 609	F 609-2Z	SF 609-2Z	F 609-2RS	SF 609-2RS
standard	9.0	26.0	8.0	629	S629	629-2Z	S629-2Z	629-2RS	S629-2RS
flanged	9.0	26.0	8.0	F 629	SF 629	F 629-2Z	SF 629-2Z	F 629-2RS	SF 629-2RS

* Load Rating (only 100 Cr6)		* Limiting Speed x1000rpm (open & 2Z)		Standard cage type Others on request	Mass (g) approx.
C, dyn. N	C, stat. N	Grease	Oil		
5070	2580	30.0	36.0	J	< 20 g
3293	1379	34.0	40.0	J	< 25 g
3333	1423	28.0	34.0	J	< 18 g
3333	1423	28.0	34.0	J	< 20 g
3293	1379	34.0	40.0	J	< 28 g
4563	1983	28.0	34.0	J	< 31 g
919	468	36.0	42.0	W	< 3 g
1327	668	36.0	43.0	J	< 5 g
1327	668	36.0	43.0	J	< 5 g
1327	668	36.0	43.0	J	< 5 g
1327	668	36.0	43.0	J	< 5 g
2467	1081	34.0	40.0	J	< 8 g
2467	1081	34.0	40.0	J	< 10 g
3356	1444	32.0	38.0	J	< 16 g
3356	1444	32.0	38.0	J	< 18 g
4575	1983	28.0	34.0	J	< 22 g
4575	1983	28.0	34.0	J	< 24 g

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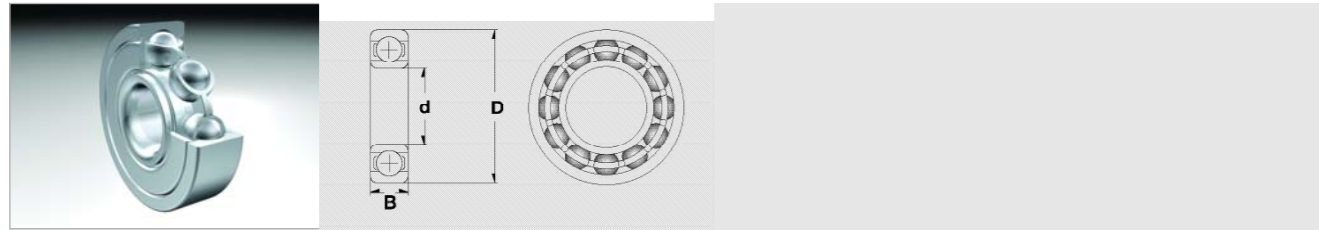


	Dimension (mm)			Dimension (inch)			Dimension (inch)		
	d	D	B	d	D	B	d	D	B
standard	1.984	6.350	2.380	0.0781	0.2500	0.0937	5/64	1/4	3/32
standard	1.984	6.350	3.571	0.0781	0.2500	0.1406	5/64	1/4	9/64
flanged	1.984	6.350	3.571	0.0781	0.2500	0.1406	5/64	1/4	9/64
standard	2.380	4.763	1.588	0.0937	0.1875	0.0625	3/32	3/16	1/16
flanged	2.380	4.763	1.588	0.0937	0.1875	0.0625	3/32	3/16	1/16
standard	2.380	4.763	2.380	0.0937	0.1875	0.0937	3/32	3/16	3/32
flanged	2.380	4.763	2.380	0.0937	0.1875	0.0937	3/32	3/16	3/32
standard	2.380	7.938	2.779	0.0937	0.3125	0.1094	3/32	5/16	7/64
standard	2.380	7.938	3.571	0.0937	0.3125	0.1406	3/32	5/16	9/64
flanged	2.380	7.938	3.571	0.0937	0.3125	0.1406	3/32	5/16	9/64
standard	3.175	6.350	2.380	0.1250	0.2500	0.0937	1/8	1/4	3/32
flanged	3.175	6.350	2.380	0.1250	0.2500	0.0937	1/8	1/4	3/32
standard	3.175	6.350	2.779	0.1250	0.2500	0.1094	1/8	1/4	7/64
flanged	3.175	6.350	2.779	0.1250	0.2500	0.1094	1/8	1/4	7/64
standard	3.175	7.938	2.779	0.1250	0.3125	0.1094	1/8	5/16	7/64
flanged	3.175	7.938	2.779	0.1250	0.3125	0.1094	1/8	5/16	7/64
standard	3.175	7.938	3.571	0.1250	0.3125	0.1406	1/8	5/16	9/64
flanged	3.175	7.938	3.571	0.1250	0.3125	0.1406	1/8	5/16	9/64
standard	3.175	9.525	2.779	0.1250	0.3750	0.1094	1/8	3/8	7/64
flanged	3.175	9.525	2.779	0.1250	0.3750	0.1094	1/8	3/8	7/64
standard	3.175	9.525	3.571	0.1250	0.3750	0.1406	1/8	3/8	9/64
flanged	3.175	9.525	3.571	0.1250	0.3750	0.1406	1/8	3/8	9/64
standard	3.175	9.525	3.967	0.1250	0.3750	0.1562	1/8	3/8	5/32
flanged	3.175	9.525	3.967	0.1250	0.3750	0.1562	1/8	3/8	5/32
standard	3.175	12.700	4.366	0.1250	0.5000	0.1719	1/8	1/2	11/64
flanged	3.175	12.700	4.366	0.1250	0.5000	0.1719	1/8	1/2	11/64
standard	3.967	7.938	2.779	0.1562	0.3125	0.1094	5/32	5/16	7/64
standard	3.967	7.938	3.175	0.1562	0.3125	0.1250	5/32	5/16	1/8
flanged	3.967	7.938	3.175	0.1562	0.3125	0.1250	5/32	5/16	1/8
standard	4.763	7.938	2.779	0.1875	0.3125	0.1094	3/16	5/16	7/64
standard	4.763	7.938	3.175	0.1875	0.3125	0.1250	3/16	5/16	1/8
flanged	4.763	7.938	3.175	0.1875	0.3125	0.1250	3/16	5/16	1/8
standard	4.763	9.525	3.175	0.1875	0.3750	0.1250	3/16	3/8	1/8
flanged	4.763	9.525	3.175	0.1875	0.3750	0.1250	3/16	3/8	1/8
standard	4.763	12.700	3.967	0.1875	0.5000	0.1562	3/16	1/2	5/32
flanged	4.763	12.700	3.967	0.1875	0.5000	0.1562	3/16	1/2	5/32
standard	4.763	12.700	4.978	0.1875	0.5000	0.1960	3/16	1/2	10/51
flanged	4.763	12.700	4.978	0.1875	0.5000	0.1960	3/16	1/2	10/51

Designation/Type						* Load Rating (only 100 Cr6)		* Limiting Speed x1000rpm (open & 2Z)		Mass (g) approx.
open		2Z		2RS/2TS		C, dyn. N	C, stat. N	Grease	Oil	
Chrome Steel	Stainless	Chrome Steel	Stainless	Chrome Steel	Stainless					
R 1-4	SR 1-4	-	-	-	-	284	96	67.0	80.0	< 1 g
-	-	R 1-4-2Z	SR 1-4-2Z	-	-	284	96	67.0	80.0	< 1 g
-	-	FR 1-4-2Z	SFR 1-4-2Z	-	-	284	96	67.0	80.0	< 1 g
R 133	SR 133	-	-	-	-	144	53	80.0	95.0	< 1 g
FR 133	SFR 133	-	-	-	-	144	53	80.0	95.0	< 1 g
-	-	R 133-2Z	SR 133-2Z	-	-	144	53	80.0	95.0	< 1 g
-	-	FR 133-2Z	SFR 133-2Z	-	-	144	53	80.0	95.0	< 1 g
R 1-5	SR 1-5	-	-	-	-	552	176	60.0	71.0	< 1 g
-	-	R 1-5-2Z	SR 1-5-2Z	-	-	552	176	60.0	71.0	< 1 g
-	-	FR 1-5-2Z	SFR 1-5-2Z	-	-	552	176	60.0	71.0	< 1 g
R 144	SR 144	-	-	-	-	284	96	67.0	80.0	< 1 g
FR 144	SFR 144	-	-	-	-	284	96	67.0	80.0	< 1 g
-	-	R 144-2Z	SR 144-2Z	-	-	284	96	67.0	80.0	< 1 g
-	-	FR 144-2Z	SFR 144-2Z	-	-	284	96	67.0	80.0	< 1 g
R 2-5	SR 2-5	-	-	-	-	558	180	60.0	67.0	< 1 g
FR 2-5	SFR 2-5	-	-	-	-	558	180	60.0	67.0	< 1 g
-	-	R 2-5-2Z	SR 2-5-2Z	-	-	558	180	60.0	67.0	< 1 g
-	-	FR 2-5-2Z	SFR 2-5-2Z	-	-	558	180	60.0	67.0	< 1 g
R 2-6	SR 2-6	-	-	-	-	640	227	53.0	63.0	< 2 g
FR 2-6	SFR 2-6	-	-	-	-	640	227	53.0	63.0	< 2 g
-	-	R 2-6-2Z	SR 2-6-2Z	-	-	640	227	53.0	63.0	< 2 g
-	-	FR 2-6-2Z	SFR 2-6-2Z	-	-	640	227	53.0	63.0	< 2 g
R 2	SR 2	R 2-2Z	SR 2-2Z	R 2-2RS	SR 2-2RS	631	219	56.0	67.0	< 2 g
FR 2	SFR 2	FR 2-2Z	SFR 2-2Z	FR 2-2RS	SFR 2-2RS	631	219	56.0	67.0	< 2 g
R 2A	SR 2A	R 2A-2Z	SR 2A-2Z	R 2A-2RS	SR 2A -2RS	640	227	53.0	63.0	< 3 g
FR 2A	SFR 2A	FR 2A-2Z	SFR 2A-2Z	FR 2A-2RS	SFR 2A -2RS	640	227	53.0	63.0	< 3 g
R 155	SR 155	-	-	-	-	359	150	53.0	63.0	< 1 g
-	-	R 155-2Z	SR 155-2Z	-	-	359	150	53.0	63.0	< 1 g
-	-	FR 155-2Z	SFR 155-2Z	-	-	359	150	53.0	63.0	< 1 g
R 156	SR 156	-	-	-	-	359	150	53.0	63.0	< 1 g
-	-	R 156-2Z	SR 156-2Z	R 156-2TS	SR 156-2TS	359	150	53.0	63.0	< 1 g
-	-	FR 156-2Z	SFR 156-2Z	FR 156-2TS	SFR 156-2TS	359	150	53.0	63.0	< 1 g
R 166	SR 166	R 166-2Z	SR 166-2Z	R 166-2TS	SR 166-2TS	709	272	50.0	60.0	< 1 g
FR 166	SFR 166	FR 166-2Z	SFR 166-2Z	FR 166-2TS	SFR 166-2TS	709	272	50.0	60.0	< 1 g
R 3	SR 3	R 3-2ZW.15	-	-	-	1301	488	43.0	53.0	< 3 g
FR 3	SFR 3	-	-	-	-	1301	488	43.0	53.0	< 3 g
-	-	R 3-2Z	SR 3-2Z	R 3-2RS	SR 3-2RS	1301	488	43.0	53.0	< 3 g
-	-	FR 3-2Z	SFR 3-2Z	FR 3-2RS	SFR 3-2RS	1301	488	43.0	53.0	< 5 g

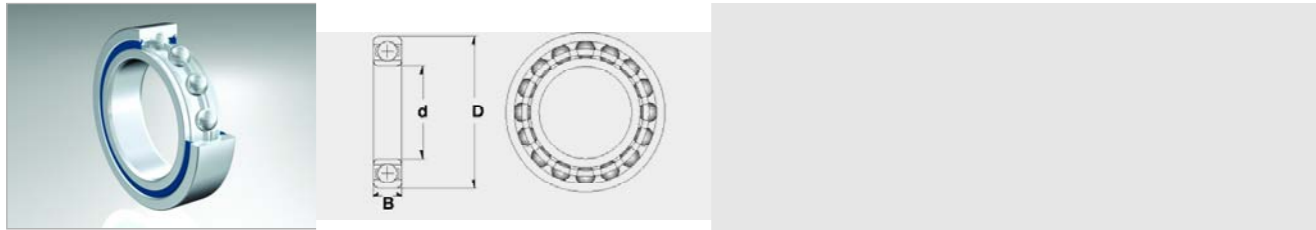
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Zöllige Miniaturrillenkugellager / Miniature Inch Series



standard or flanged	Dimension (mm)			Dimension (inch)			Dimension (inch)		
	d	D	B	d	D	B	d	D	B
standard	4.763	15.875	4.978	0.1875	0.6250	0.1960	3/16	5/8	10/51
flanged	4.763	15.875	4.978	0.1875	0.6250	0.1960	3/16	5/8	10/51
standard	6.350	9.525	3.175	0.2500	0.3750	0.1250	1/4	3/8	1/8
flanged	6.350	9.525	3.175	0.2500	0.3750	0.1250	1/4	3/8	1/8
standard	6.350	12.700	3.175	0.2500	0.5000	0.1250	1/4	1/2	1/8
flanged	6.350	12.700	3.175	0.2500	0.5000	0.1250	1/4	1/2	1/8
standard	6.350	12.700	4.763	0.2500	0.5000	0.1875	1/4	1/2	3/16
flanged	6.350	12.700	4.763	0.2500	0.5000	0.1875	1/4	1/2	3/16
standard	6.350	15.875	4.978	0.2500	0.6250	0.1960	1/4	5/8	10/51
flanged	6.350	15.875	4.978	0.2500	0.6250	0.1960	1/4	5/8	10/51
standard	6.350	15.875	8.733	0.2500	0.6250	0.3438	1/4	5/8	11/32
standard	6.350	19.050	5.558	0.2500	0.7500	0.2188	1/4	3/4	7/32
standard	6.350	19.050	7.142	0.2500	0.7500	0.2812	1/4	3/4	9/32
standard	7.938	12.700	3.967	0.3125	0.5000	0.1562	5/16	1/2	5/32
flanged	7.938	12.700	3.967	0.3125	0.5000	0.1562	5/16	1/2	5/32
standard	9.525	22.225	5.558	0.3750	0.8750	0.2188	3/8	7/8	7/32
flanged	9.525	22.225	5.558	0.3750	0.8750	0.2188	3/8	7/8	7/32
standard	9.525	22.225	7.142	0.3750	0.8750	0.2812	3/8	7/8	9/32
flanged	9.525	22.225	7.142	0.3750	0.8750	0.2812	3/8	7/8	9/32
standard	9.525	22.225	9.525	0.3750	0.8750	0.3750	3/8	7/8	3/8

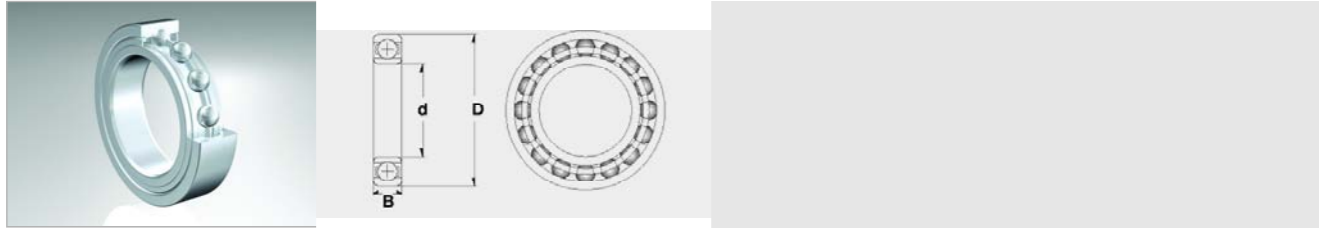
Designation/Type						* Load Rating (only 100 Cr6)		* Limiting Speed x1000rpm (open & 2Z)		Mass (g) approx.
open		2Z		2RS/2TS		C, dyn. N	C, stat. N	Grease	Oil	
Chrome Steel	Stainless	Chrome Steel	Stainless	Chrome Steel	Stainless					
R 3A	SR 3A	R 3A-2Z	SR 3A-2Z	-	-	1480	621	38.0	45.0	< 5 g
FR 3A	SFR 3A	FR 3A-2Z	SFR 3A-2Z	-	-	1480	621	38.0	45.0	< 5 g
R 168	SR 168	R 168-2Z	SR 168-2Z	R 168-2TS	SR 168-2TS	373	172	48.0	56.0	< 1 g
FR 168	SFR 168	FR 168-2Z	SFR 168-2Z	FR 168-2TS	SFR 168-2TS	373	172	48.0	56.0	< 1 g
R 188	SR 188	-	-	-	-	1082	442	40.0	50.0	< 3 g
FR 188	SFR 188	-	-	-	-	1082	442	40.0	50.0	< 3 g
-	-	R 188-2Z	SR 188-2Z	-	-	1082	442	40.0	50.0	< 3 g
-	-	FR 188-2Z	SFR 188-2Z	-	-	1082	442	40.0	50.0	< 3 g
R 4	SR 4	R 4-2Z	SR 4-2Z	R 4-2RS	SR 4-2RS	1480	621	38.0	45.0	< 5 g
FR 4	SFR 4	FR 4-2Z	SFR 4-2Z	FR 4-2RS	SFR 4-2RS	1480	621	38.0	45.0	< 5 g
-	-	WR 4-2Z	WSR 4-2Z	-	-	-	-	-	-	< 8 g
R 4A	SR 4A	-	-	-	-	2336	896	36.0	43.0	< 10 g
-	-	R 4A-2Z	SR 4A-2Z	R 4A-2RS	SR 4A-2RS	2336	896	36.0	43.0	< 10 g
-	-	R 1810-2Z	SR 1810-2Z	-	-	542	276	40.0	48.0	< 2 g
-	-	FR 1810-2Z	SFR 1810-2Z	-	-	542	276	40.0	48.0	< 2 g
R 6	SR 6	-	-	-	-	3332	1422	32.0	38.0	12 g
FR 6	SFR 6	-	-	-	-	3332	1422	32.0	38.0	12 g
-	-	R 6-2Z	SR 6-2Z	R 6-2RS	SR 6-2RS	3332	1422	32.0	38.0	12 g
-	-	FR 6-2Z	SFR 6-2Z	FR 6-2RS	SFR 6-2RS	3332	1422	32.0	38.0	12 g
-	-	WR 6-2Z	WSR 6-2Z	-	-	-	-	-	-	20 g



standard or flanged	Dimension (mm)			Designation/Type					
	d	D	B	open		2Z		2RS/2TS	
				Chrome Steel	Stainless	Chrome Steel	Stainless	Chrome Steel	Stainless
standard	10.0	15.0	3.0	61700	S61700	-	-	-	-
standard	10.0	15.0	4.0	-	-	61700-2Z	S61700-2Z	61700-2RS	S61700-2RS
standard	10.0	19.0	5.0	61800	S61800	61800-2Z	S61800-2Z	61800-2RS	S61800-2RS
flanged	10.0	19.0	5.0	F 61800	SF 61800	F 61800-2Z	SF 61800-2Z	F 61800-2RS	SF 61800-2RS
standard	10.0	19.0	6.0	62800	-	62800-2Z	-	62800-2RS	-
standard	10.0	19.0	7.0	63800	-	63800-2Z	S63800-2Z	63800-2RS	-
flanged	10.0	19.0	7.0	F 63800	SF 63800	F 63800-2Z	SF 63800-2Z	-	-
standard	10.0	22.0	6.0	61900	S61900	61900-2Z	S61900-2Z	61900-2RS	S61900-2RS
flanged	10.0	22.0	6.0	F 61900	SF 61900	F 61900-2Z	SF 61900-2Z	F 61900-2RS	SF 61900-2RS
standard	11.0	22.0	6.0	-	-	619/11-2Z	-	-	-
standard	12.0	18.0	4.0	61701	S61701	61701-2Z	S61701-2Z	61701-2RS	S61701-2RS
standard	12.0	21.0	5.0	61801	S61801	61801-2Z	S61801-2Z	61801-2RS	S61801-2RS
flanged	12.0	21.0	5.0	F 61801	-	F 61801-2Z	-	F 61801-2RS	-
standard	12.0	21.0	6.0	62801	-	62801-2Z	-	62801-2RS	-
standard	12.0	21.0	7.0	63801	-	63801-2Z	-	63801-2RS	-
standard	12.0	24.0	6.0	61901	S61901	61901-2Z	S61901-2Z	61901-2RS	S61901-2RS
flanged	12.0	24.0	6.0	F 61901	-	F 61901-2Z	-	F 61901-2RS	-
standard	12.0	24.0	6.0	61901.T9H	-	-	-	-	-
standard	13.0	24.0	6.0	619/13	-	-	-	-	-
standard	13.0	24.0	6.0	619/13.TNH	-	-	-	-	-
standard	15.0	21.0	4.0	61702	S61702	61702-2Z	S61702-2Z	61702-2RS	S61702-2RS
standard	15.0	24.0	5.0	61802	S61802	61802-2Z	S61802-2Z	61802-2RS	S61802-2RS
flanged	15.0	24.0	5.0	F61802	-	F 61802-2Z	-	F 61802-2RS	-
standard	15.0	24.0	7.0	63802	-	63802-2Z	-	63802-2RS	-
standard	15.0	28.0	7.0	61902	S61902	61902-2Z	S61902-2Z	61902-2RS	S61902-2RS
flanged	15.0	28.0	7.0	F 61902	-	F 61902-2Z	-	F 61902-2RS	-
standard	17.0	23.0	4.0	61703	S61703	61703-2Z	S61703-2Z	61703-2RS	S61703-2RS
standard	17.0	26.0	5.0	61803	S61803	61803-2Z	S61803-2Z	61803-2RS	S61803-2RS
flanged	17.0	26.0	5.0	F 61803	-	F 61803-2Z	-	F 61803-2RS	-

* Load Rating (only 100 Cr6)		* Limiting Speed x1000rpm (open & 2Z)		Standard cage type Others on request	Mass (g) approx.
C, dyn. N	C, stat. N	Grease	Oil		
855	435	15.0	17.0	W	< 2 g
855	435	15.0	17.0	W	< 2 g
1716	840	37.0	43.0	J	< 6 g
1716	840	37.0	43.0	J	< 6 g
-	-	-	-	J	< 7 g
1716	840	37.0	43.0	J	< 8 g
1716	840	37.0	43.0	J	< 8 g
2695	1273	34.0	41.0	J	10 g
2695	1273	34.0	41.0	J	11 g
-	-	-	-	J	14 g
926	530	13.0	15.0	W	< 4 g
1915	1041	33.0	39.0	J	< 7 g
1915	1041	33.0	39.0	J	< 9 g
-	-	-	-	J	< 9 g
1915	1041	33.0	39.0	J	10 g
2886	1466	31.0	36.0	J	10 g
2886	1466	31.0	36.0	J	12 g
2886	1466	31.0	36.0	J	10 g
2886	1466	31.0	36.0	J	10 g
2886	1466	31.0	36.0	J	10 g
2886	1466	31.0	36.0	J	10 g
937	582	11.0	13.0	W	< 4 g
2073	1253	28.0	33.0	J	< 9 g
2073	1253	28.0	33.0	J	10 g
2073	1253	28.0	33.0	J	11 g
4321	2259	26.0	30.0	J	15 g
4321	2259	26.0	30.0	J	18 g
1000	658	9.5	11.0	W	< 5 g
2233	1456	26.0	30.0	J	< 9 g
2233	1456	26.0	30.0	J	10 g

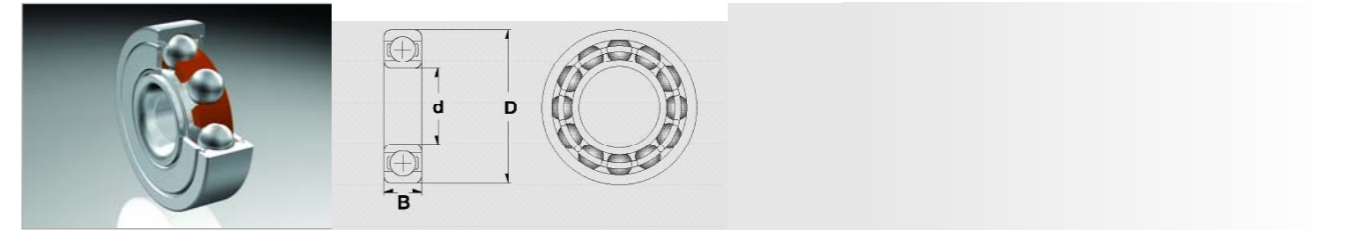
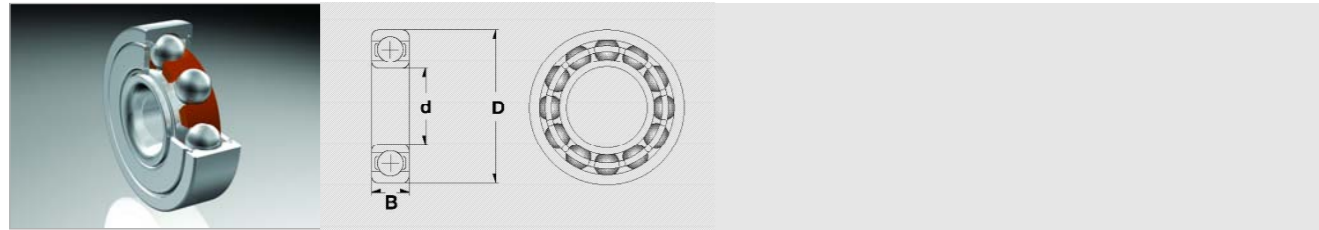
28 | Dünnringlager / Thin Section Series



standard or flanged	Dimension (mm)			Designation/Type					
	d	D	B	open		2Z		2RS/2TS	
				Chrome Steel	Stainless	Chrome Steel	Stainless	Chrome Steel	Stainless
standard	17.0	26.0	7.0	-	-	63803-2Z	-	63803-2RS	-
standard	17.0	30.0	7.0	61903	S61903	61903-2Z	S61903-2Z	61903-2RS	S61903-2RS
flanged	17.0	30.0	7.0	F 61903	-	F 61903-2Z	-	F 61903-2RS	-
standard	17.0	32.0	8.0	Y 17-2Z	-	-	-	-	-
standard	17.0	32.0	8.0	Y 17.C3	-	-	-	-	-
standard	20.0	27.0	4.0	61704	S61704	61704-2Z	S61704-2RS	61704-2Z	S61704-2RS
standard	20.0	32.0	7.0	61804	S61804	61804-2Z	S61804-2Z	61804-2RS	S61804-2RS
flanged	20.0	32.0	7.0	F 61804	-	F 61804-2Z	-	F 61804-2RS	-
standard	20.0	37.0	9.0	61904	S61904	61904-2Z	S61904-2Z	61904-2RS	S61904-2RS
flanged	20.0	37.0	9.0	F 61904	-	F 61904-2Z	-	F 61904-2RS	-

* Load Rating (only 100 Cr6)		* Limiting Speed x1000rpm (open & 2Z)		Standard cage type Others on request	Mass (g) approx.
C, dyn. N	C, stat. N	Grease	Oil		
2233	1456	26.0	30.0	J	11 g
4588	2565	23.0	38.0	J	10 g
4588	2565	23.0	38.0	J	12 g
-	-	-	-	J	14 g
-	-	-	-	J	14 g
1402	729	8.5	10.0	W	< 6 g
4015	2462	21.0	25.0	J	18 g
4015	2462	21.0	25.0	J	20 g
6381	3682	19.0	23.0	J	40 g
6381	3682	19.0	23.0	J	43 g

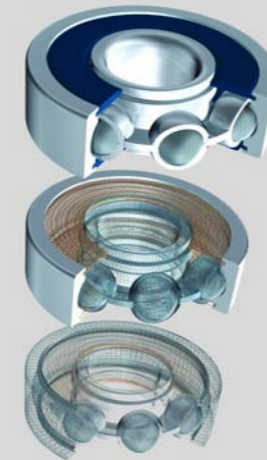
Radialkugellager mit Kunststoffkäfig / Ball Bearings with Plastic Cage



Dimension (mm)			Designation/Type	* Limiting Speed x1000rpm	* Load Rating		Lubrication	Mass (g) approx.
d	D	B			C, dyn. N	C, stat. N		
4.0	13.0	5.0	624-2Z.T9H.C3	40.0	1300	485	Oil	4 g
5.0	16.0	5.0	625-2Z.T9H.C3	36.0	1730	670	Oil	6 g
6.0	13.0	5.0	686-2Z.T9H.C3	40.0	1080	440	Oil	4 g
6.0	19.0	6.0	626-2Z.T9H.C3	32.0	2340	885	Oil	10 g
7.0	14.0	5.0	687-2Z.T9H.C3	40.0	1170	510	Oil	4 g
7.0	19.0	6.0	607-2Z.T9H.C3	36.0	2340	885	Oil	8 g
7.0	22.0	7.0	627-2Z.T9H.C3	30.0	3300	1370	Oil	14 g
8.0	16.0	5.0	688-2Z.T9H.C3	36.0	1260	590	Oil	4 g
8.0	22.0	7.0	608-2Z.T9H.C3	34.0	3300	1370	Oil	14 g
8.0	24.0	8.0	628-2Z.T9H.C3	28.0	3350	1430	Oil	18 g
9.0	17.0	5.0	689-2Z.T9H.C3	36.0	1330	665	Oil	5 g
9.0	26.0	8.0	629-2Z.T9H.C3	28.0	4550	1970	Oil	22 g
10.0	26.0	8.0	6000-2Z.T9H.C3	30.0	4550	1970	Oil	18 g
10.0	30.0	9.0	6200-2Z.T9H.C3	24.0	5100	2390	Oil	32 g
10.0	19.0	5.0	61800-Z.T9H.C3	34.0	1720	840	Oil	6 g

Dimension (mm)			Designation/Type	* Limiting Speed x1000rpm	* Load Rating		Lubrication	Mass (g) approx.
d	D	B			C, dyn. N	C, stat. N		
10.0	22.0	6.0	61900-Z.T9H.C3	32.0	2700	1270	Oil	9 g
12.0	28.0	8.0	6001-2Z.T9H.C3	28.0	5100	2370	Oil	22 g
12.0	32.0	10.0	6201-2Z.T9H.C3	22.0	6800	3050	Oil	37 g
12.0	21.0	5.0	61801-Z.T9H.C3	32.0	1920	1040	Oil	7 g
12.0	24.0	6.0	61901-Z.T9H.C3	30.0	2890	1460	Oil	10 g
15.0	32.0	9.0	6002-2Z.T9H.C3	24.0	5600	2830	Oil	31 g
15.0	35.0	11.0	6202-2Z.T9H.C3	20.0	7650	3750	Oil	45 g
15.0	24.0	5.0	61802-Z.T9H.C3	28.0	2070	1260	Oil	8 g
15.0	28.0	7.0	61902-Z.T9H.C3	26.0	4350	2260	Oil	15 g
17.0	35.0	10.0	6003-2Z.T9H.C3	22.0	6000	3250	Oil	41 g
17.0	40.0	12.0	6203-2Z.T9H.C3	17.0	9550	4800	Oil	67 g
17.0	26.0	5.0	61803-Z.T9H.C3	26.0	2630	1570	Oil	9 g
17.0	30.0	7.0	61903-Z.T9H.C3	24.0	4600	2550	Oil	10 g
20.0	42.0	12.0	6004-2Z.T9H.C3	18.0	9400	5000	Oil	68 g
20.0	47.0	14.0	6204-2Z.T9H.C3	15.0	12800	6600	Oil	107 g

Fraction	Inch	mm	Fraction	Inch	mm	Fraction	Inch	mm
1/64	0.0156	0.3969		0.2883	7.3228	11/16	0.6875	17.4625
	0.0250	0.6350	19/64	0.2969	7.5406	45/64	0.7031	17.8594
1/32	0.0312	0.7937	5/16	0.3125	7.9375		0.7087	18.0000
	0.0394	1.0000		0.3150	8.0000	23/32	0.7187	18.2562
	0.0400	1.0160	21/64	0.3281	8.3344	47/64	0.7344	18.6532
3/64	0.0469	1.1906	11/32	0.3437	8.7312		0.7435	18.8849
	0.0472	1.2000		0.3543	9.0000		0.7480	19.0000
	0.0550	1.3970	23/64	0.3594	9.1281	3/4	0.7500	19.0500
	0.0591	1.5000	3/8	0.3750	9.5250	49/64	0.7656	19.4469
1/16	0.0625	1.5875	25/64	0.3906	9.2919		0.7717	19.6012
	0.0709	1.8000		0.3937	10.0000	25/32	0.7812	19.8433
5/64	0.0781	1.9844	13/32	0.4062	10.3187		0.7874	20.0000
	0.0787	2.0000		0.4100	10.4140	51/64	0.7969	20.2402
	0.0906	2.3012	27/64	0.4219	10.7156	13/16	0.8125	20.6375
3/32	0.0937	2.3812		0.4250	10.7950		0.8268	21.0000
	0.0984	2.5000		0.4331	11.0000	53/64	0.8281	21.0344
	0.1000	2.5400	7/16	0.4375	11.1125	27/32	0.8437	21.4312
	0.1024	2.6000	29/64	0.4531	11.5094	55/64	0.8594	21.8281
7/64	0.1094	2.7781		0.4600	11.6840		0.8661	22.0000
	0.1100	2.7940	15/32	0.4687	11.9062	7/8	0.8750	22.2250
	0.1102	2.8000		0.4724	12.0000	57/64	0.8906	22.6219
	0.1181	3.0000	31/64	0.4844	12.3031		0.9055	23.0000
1/8	0.1250	3.1750	1/2	0.5000	12.7000	29/32	0.9062	23.0187
	0.1256	3.1902		0.5118	13.0000	59/64	0.9219	23.4156
	0.1378	3.5000	33/64	0.5156	13.0968	15/16	0.9375	23.8125
9/64	0.1406	3.5719	17/32	0.5312	13.4937		0.9449	24.0000
5/32	0.1562	3.9687	35/64	0.5469	13.8906	61/64	0.9531	24.2094
	0.1575	4.0000		0.5512	14.0000	31/32	0.9687	24.6062
11/64	0.1719	4.3656	9/16	0.5625	14.2875		0.9843	25.0000
3/16	0.1875	4.7625	37/64	0.5781	14.6844	63/64	0.9844	25.0031
	0.1892	4.8057		0.5906	15.0000		1.0000	25.4000
	0.1969	5.0000	19/32	0.5937	15.0812		1.0236	26.0000
13/64	0.2031	5.1594	39/64	0.6094	15.4781		1.0415	26.4541
	0.2165	5.4991	5/8	0.6250	15.8750		1.0480	26.6192
7/32	0.2187	5.5562		0.6299	16.0000	1-1/16	1.0625	26.9875
15/64	0.2344	5.9531	41/64	0.6406	16.2719		1.0630	27.0000
	0.2362	6.0000		0.6500	16.5100		1.1025	28.0000
1/4	0.2500	6.3500	21/32	0.6562	16.6687	1-1/8	1.1250	28.5750
17/64	0.2656	6.7469		0.6620	16.8148		1.1417	29.0000
	0.2756	7.0000		0.6693	17.0000		1.1812	30.0000
9/32	0.2812	7.1437	43/64	0.6719	17.0656	1-3/16	1.1875	30.1625
							1-1/4	31.7500
							1-1/2	38.1000



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