

Solid-lubricant-inlaid Bearings



Product Brief

B50 is made of strong cast bronze based metal with solid lubricants embedded. The base metal withstands high load and the solid lubricants provide self-lubrication. The strengthening brass backing has pretty good anti-erosion ability in air, fresh water and seawater. The surface is regularly and finely machined with sockets in which particular solid lubricant is filled.

Features

1. Maintenance free, particularly appropriate for high load and low speed
2. Suitable for reciprocating, oscillation, or intermittent motion where oil film is hard to be formed.
3. Good Chemical resistant and anti-corrosion characteristics.
4. Lower friction and good anti-wear ability.

Chemical Compositions

Product NO.	Chemical Compositions								
CuZn25Al6Mn4Fe3	Cu	Zn	Al	Fe	Mn	Si	Ni	Sn	Pb
	Remainder	22~28	5.0~7.5	2.0~4.0	2.5~5.0	<0.1	<0.5	<0.2	<0.2

Physical and Mechanical Performance

Density	g/cm ³	8.0	Hardness	≥HB	210	
Linear Expansion Coefficient	10 ⁻⁵ /°C	1.6~2.0	Flexibility Coefficient	KN/mm ²	100~140	
Heat-conducting Coefficient	W/(m.k)	38~55	Tensility		≥%	12
Tensile Strength	≥N/mm ²	755	Friction	Oil Lubrication	μ	0.03
Anti-compact Tenacity	≥KJ/m ³	400~500		Dry Friction		0.16

Application Condition Limits

Lubrication Conditions		Non-lubrication	Periodical Lubrication	Consecutive Lubrication
Working Temperature Limits	°C	-40~+300	-40~+150	-40~+150
Max Load Pressure	N/mm ²	100	100	100
Max Linear Velocity	m/s	0.50	1.00	1.50
Max PV Value	N/mm ² .m/s	1.65	3.25	3.25

Typical Applications

- Automotive products line
- Plastic industries
- Mineral machines
- Hydraulic turbines
- Injection molding machines
- Consecutive casting and rolling machines
- Mine-exploiting equipments
- Ships
- Steam engine
- Turbo generators
- Bridge oilless bearing
- Conveyors
- Wood handing machines
- Cranes
- Packing machines
- Port machines
- Construction machine

Solid-lubricant-inlaid Bearings



B51 Solid-lubricant-inlaid Bearings

It is backed with tin-bronze. The surface is regularly and finely machined with sockets in which particular solid lubricant is filled. It is mainly applied on the anti-abrasion and anti-erosion parts, which work in conditions with heavier load and mediate running velocity. Applications covered are light industrial machines, machine tools, moving belt in the drying machine, door of the fireplace, etc.



B52 Steel Shell Cast Bronze Bearing with Graphite

Steel shell with cast bronze bearing material liner with specially formulated solid lubricants embedded into the holes in the liner material. It achieves an integral metallurgical structure between bronze and steel with an increased carrying capacity while the material cost is reduced. The solid lubricant can reduce the coefficient of friction. It is particularly good for low-speed and high load applications, where external lubrication is not practical. Applications covered are successive casing machinery, mineral machinery, injection molding machinery, dock machinery, etc.



B53 Steel Bearing with Graphite

This material provides a maintenance-free design solution, particularly for high load, intermittent of oscillating motion with lower speed and excellent wear resistance required. It has stronger anti-pressure ability so they can be applied on the pro-up positions on auto molds, excavators and other similar conditions. As steel backing, so it is not suitable to water acid or alkali working conditions.

Standard No.	Base material	Linear expansion coef.	Temp. range°C	Hardness	Max. Load
B53 A	S45C	1.1×10 ⁻⁵ /°C	-100~+300	HRC≥40	100N/mm ²
B53 B	GCr15	1.1×10 ⁻⁵ /°C	-100~+300	HRC≥50	200N/mm ²



B54 Cast Iron Bearing with Graphite

It is made of cast iron based metal with special lubricants embedded. The base metal withstands high load and the solid lubricants provide for self-lubrication. The bearing shows excellent performance without pre-lubrication under conditions of extreme high or lower temperature with low speed. Applications covered are automotive production equipments, moulds & dies, plastic machinery industry etc.



B55 Solid-lubricant-inlaid Bearings

It is backed with aluminum-bronze alloy (CuAl10Fe3) with good capability of mechanics, castings and anti-erosion. The surface is regularly and finely machined with sockets in which particular solid lubricant is filled. The product is widely used in condition with mediate load but higher temperature and condition with mediate running velocity.

Solid-lubricant-inlaid Bearings

Tech. data

Type	B50	B51	B52	B53	B54	B55
Item						
Material	CuZn25Al6Mn4Fe3	CuSn6Zn6Pb3	Steel+CuSn6Zn6Pb3	GCr-15	HT250	CuAl10Fe3
Density	8.3	8.9	8.9	7.8	7.8	8.1
HB Hardness	220~260HB	80~100HB	60~90HB	HRC55~60	190~230HB	160~180HB
Max. Temp.	300°C	350°C	300°C	350°C	400°C	400°C
Max. Load	100N/mm ²	60N/mm ²	70N/mm ²	250N/mm ²	60N/mm ²	50N/mm ²
	22N/mm ²	15N/mm ²	25N/mm ²	70N/mm ²	15N/mm ²	20N/mm ²
Max. Speed	Dry0.4m/s Oil1m/s	2m/s	2m/s	0.1m/s	0.5m/s	1m/s
Friction Coefficient	< 0.16 μ	< 0.15 μ	< 0.15 μ	< 0.17 μ	< 0.18 μ	< 0.16 μ
Max PV Dry	1.8N/mm ² ·m/s	0.5N/mm ² ·m/s	0.6N/mm ² ·m/s	2.5N/mm ² ·m/s	0.8N/mm ² ·m/s	1.25N/mm ² ·m/s
Max PV Lubrication	3.8N/mm ² ·m/s	3.8N/mm ² ·m/s	3.8N/mm ² ·m/s	3.8N/mm ² ·m/s	3.8N/mm ² ·m/s	2.45N/mm ² ·m/s

Wear Performance (Compared with Traditional bronze bearing)

Load Applied		62N/mm ²		24.5N/mm ²		14.7N/mm ²	
Item	Lubrication	Wear depth (mm)	Time (hrs)	Wear depth (mm)	Time (hrs)	Wear depth (mm)	Time (hrs)
Traditional bronze bearing CuSn6Zn6Pb3	oil	0.098	10	0.125	100	0.10	100
B50	dry	0.075	100	0.015	100	0.012	100
B51	dry	0.025	30	0.065	100	0.025	100
B52	dry	0.03	30	0.12	100	0.015	100
B53	dry	0.022	10	0.013	100	0.01	100
B54	dry	0.03	10	0.25	20	0.011	100
B55	dry	0.055	80	0.035	100	0.018	100

Typical Application Examples



Excavating machinery



Wind power



Agricultural machine



Port machinery

Alloy International Code

Chiese Code GB1776-87	International Counterparts				Applications
	International ISO 1338	Japan JIS	USA ASTM(UNS)	German DIN	
CuZn25Al6FeMn3	CuZn25Al6FeMn3	H5102 CAC304	B30-92 C86300	DIN1709 G-CuZn25Al6FeMn3	High-load, low speed, general use
CuZn25Al6FeMn3	CuZn25Al6FeMn3	H3102 CAC304	B30-92 C86300	DIN1709 G-CuZn25Al6FeMn3	Super high load, low-speed, high duty
CuSn6Pb6Zn3	QSn6-6-3	H5111 CAC406	B92-92 C83600	DIN1705 G-Cu6Zn25Al6FeMn3	Medium load, medium-speed
CuSn5Pb5Zn5	QSn5-5-5	H5111 CAC406	B92-92 C83600	DIN1705 G-Cu5Zn25Al6FeMn3	Medium load, medium-speed
GCr-15	-	SUJ2	52100	100Cr6	High-load, high-speed
HT250	-	FC250	Class40	-	low-load, low-speed
CuAl10Fe3	CuAl10Fe3	H5114 CAC703	B30-92 C95500	DIN17656 G-CuAl10Ni2.1096	Medium load, medium-speed, general use

Solid Lubricants

Solid Lubricant	Features	Typical application
Graphite+add1#	Excellent resistance against chemical attacks and low friction. Temp limit 400°C	Suitable for general machines and under atmosphere
PTFE+add2#	Lowest in friction and good of water lubrication, Temp. limit 300°C	Suitable for ship, hydraulic turbine, gas turbine etc.



Logistic machinery



Injection molding machine

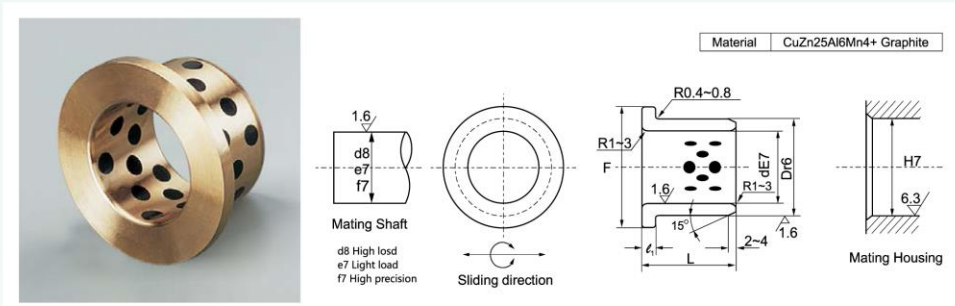


Truck



Hydropower Engineering

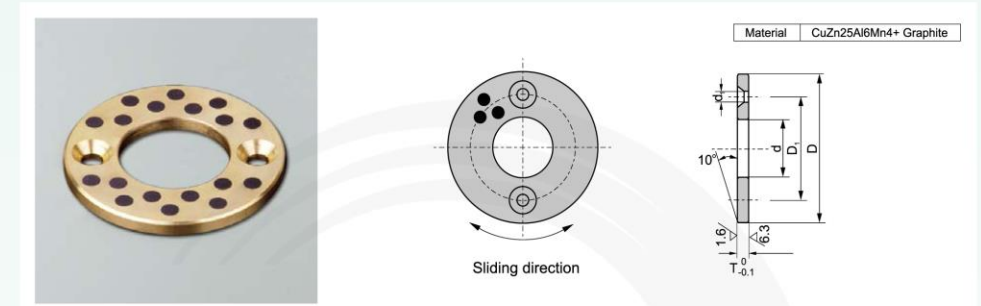
Metric Standard Flanged Bearings Size



Unit:mm

ID E7 φ d	OD r6 φ D	Flange		Length ^{-0.10} _{-0.30}													
		F	ℓ ₁ -0.10	15	20	25	30	35	40	50	60	80	100				
10	+0.040 +0.025	14	+0.034 +0.023	22	2	1015F	1020F										
12		18		25		1215F	1220F										
13		19		26		1315F	1320F										
14	+0.050 +0.032	20		27	3	1415F	1420F										
15		21	+0.041 +0.028	28		1515F	1520F	1525F	1530F								
16		22		29		1615F	1620F	1625F	1630F								
20		30		40		2015F	2020F	2025F	2030F		2040F						
25	+0.061 +0.040	35		45		2515F	2520F	2525F	2530F		2540F						
30		40		50			3020F	3025F	3030F	3035F	3040F	3050F					
31.5		40	+0.050 +0.034	50			3120F			3135F							
35		45		60	5		3520F		3530F		3540F	3550F					
40	+0.075 +0.050	50		65			4020F		4030F		4040F	4050F					
45		55		70					4530F		4540F	4550F	4560F				
50		60	+0.060 +0.041	75					5030F		5040F	5050F	5060F				
55		65		80							5540F		5560F				
60		75	+0.062 +0.043	90							6040F	6050F		6080F			
63	+0.090 +0.060	75		85	7.5									6367F			
70		85		105							7050F			7080F			
75		90	+0.073 +0.051	110									7560F				
80		100		120									8060F	8080F	80100F		
90		110	+0.076 +0.054	130	10								9060F	9080F			
100	+0.107 +0.072	120		150										10080F	100100F		
120		140	+0.088 +0.063	170										12080F	120100F		

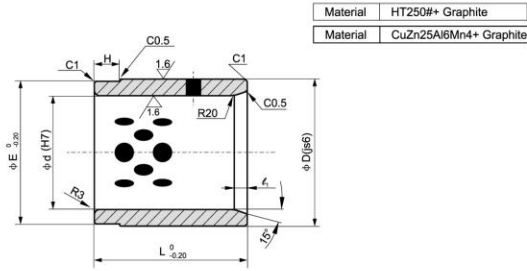
Metric Standard Thrust Washers Size



Unit:mm

Standard No.	d	D	T ⁰ _{-0.1}	Bolt								
				D ₁	Quantity	size	d ₁					
10	10.2	30	3	20	2	M3	3.5					
12	12.2	40		2	2	M3	3.5					
13	13.2											
14	14.2											
15	15.2											
16	16.2	50										
16N								5	---	---	---	---
18									18.2	35	2	M3
20	20.2								---	---	M5	6
20N	20.2								55	---	---	---
25			25.2							40	2	M5
25N			25.2	60	---	---	---			---		
30					30.2	45	2			M5	6	
35					35.2	50						
40					40.2	60						
45		45.3			67.5							
50		50.3			75	7		M6				7
55		55.3			85							
60		60.3			90							
65	65.3	95										
70	70.3	100			8				4			
75	75.3	110										
80	80.3	120										
90	90.5	140										
100	100.5	160										
120	120.5	175	10	M10			11					

Metric Standard Guide Post Bearings Size

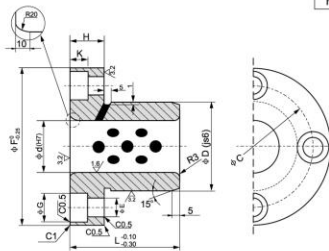


Material	HT250#+ Graphite
Material	CuZn25Al6Mn4+ Graphite

Standard No.	Dimension	ΦD	Φd	L	ΦE	H	ΦC ₁
30	50 x 30 x 50	50	30	50	49	10	10
40	60 x 40 x 50	60	40	60	59	10	
50	70 x 50 x 50	70	50	75	69	15	
60	80 x 60 x 90	80	60	90	79	20	
80	100 x 80 x 120	100	80	120	99	25	
100	120 x 100 x 130	120	100	150	119	25	
120	140 x 120 x 180	140	120	180	139	25	

B54 P

Self-lubricating Bearing Standard Metric Size



Material	HT250#+ Graphite
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Standard No.	Dimension	ΦF	ΦD	Φd	H	L	ΦC	ΦE	ΦG	K
30	90 x 50 x 30 x 50	90	50	30	20	50	70	11	17.5	10.8
40	100 x 60 x 40 x 65	100	60	40	20	65	80	11	17.5	10.8
50	125 x 75 x 50 x 80	125	75	50	20	80	100	11	17.5	10.8
60	135 x 85 x 60 x 100	135	85	60	20	100	110	11	17.5	10.8
80	170 x 110 x 80 x 130	170	110	80	25	130	140	14	20	13
100	190 x 130 x 100 x 160	190	130	100	25	160	160	14	20	13

Solid Bronze Turned Bearings



Product Brief

Machined cast bronze bearings offer technically and economically, low weight and economically favorable bearings solutions. It is with high load capability, low weight and good corrosion resistance. JINPO spol. s.r.o. can offer different types of bronze alloys according to the required life time, service etc. The tolerance is much tighter than wrapped bronze bushes.

Oil Groove



Tech. Data

Material	CuZn25Al6Mn4Fe3	CuSn6Pb6Zn3	CuAl10Ni5Fe5	CuSn12	CuSn10Pb10
Density	8.0	8.9	7.8	8.9	8.9
Yield point N/mm ²	>450	>124	>260	>150	>100
Tensile strength N/mm ²	>750	>241	>590	>295	>210
Elongation %	>12	>20	>10	>5	>8
Hardness HB	>210	>80	>160	>90	>75

Typical Applications

- Agricultural machines
- Cranes
- Electric motorcycles
- Spring bolts
- Transmission Systems

Availability

