Your Partner for Self-lubricating
Bearing Application

Self-lubricating Bearings
Low-Maintenance












2016 General Catalogue

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CSB Bearing Technologies

Self-lubricating Bearing Solution

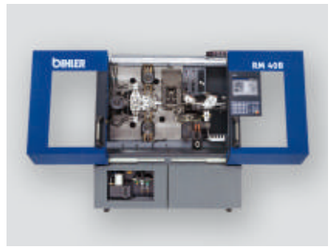
Benefit from more than 20 years of experience with Self-lubricating bearings, CSB provides you not only with quality guaranteed products, but also with the excellent services covering material recommendation, simulating tests, engineering designation and assembly assistance etc.

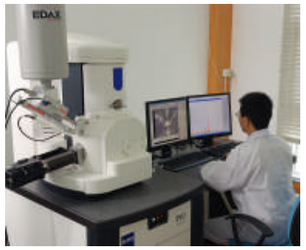
- Various of wearing and friction test facilities for different simulation tests.
- Analysis any problems during the operation.
- Optimize suitable materials by advanced tests and material analysis.
- Project designation on tolerance recommendation and assembly suggestions.
- Test jig designation and making for the duration test.
- Optimization of lubricating solutions for customers with practical cases analysis.

- ISO9001:2008 certificated and ISO9001:2015 is being updated
- ISO/TS16949:2008 certificated and ISO/TS16949:2015 is being updated
- ISO14001:2004 certificated and ISO14001:2015 is being updated

Content

Our History

1995



July of 1995, CSB was founded in Jiashan, starting from making and marketing of metal-polymer composite bushings

1997

As the first Chinese company developed the solid lubricant embedded bronze bearings

1999

ISO9002 Quality management system certified

2000


The first time expansion of plant area to increase the capacity. Successfully contracted with the Three Gorges Project for supplying self-lubricating bearings.

2001


Successful launch of bronze mesh with PTFE self lubrication bearing and CSB-40 hydrodynamic lubrication bearing

2002


Established CSB bearing material branch company, had ISO9001 quality management system certificated, started OEM customer supplying.

2003

Successfully developed and promoted CSB850S metallic self-lubricating bearing to the market.

2004

ISO/TS 16949 certificated, successfully developed CSB850BM metallic self-lubricating bearing

2005

Started supplying large metallic self-lubricating bearings to Water project in India.

2006



Began to supply PEEK based metal-polymer bearing, steel backed bronze casted self-lubricating bearing, Successfully promoted the bi-metal swash plate to OEM market.

2007


New plant construction in Changsheng Road and successfully developed EPB engineering plastic bearings and filament wound bearings.

2008

The whole company was moved to new location. Established the province governed material researching center

2009


ISO14001 certificated, plastic bearing branch established and light weight 2 layer composite bushing is developed.

2010

CSB Bearing Technologies was set up. Door hinge bushing CSB-50DH material was promoted to the market, Second generation of swash plate was developed with better friction performance

2011

Completed the share holding reform of the group. Time belt tensioner bushing (CSB-50MP)was promoted to the automotive market.

2012

Awarded the titles of Provincial Innovative Pilot Enterprises and National High-tech Enterprises. Lead free bi-metal bushing CSB-820 was promoted to the market.

2013



Another new plant construction was started with 120000 M^2 of field area. Successfully supply special bushings for Shanghai Tower and Singapore Sports Hub.

2014

3rd generation of high performance swash plate was promoted and supplied with batch quantities .

2015

CSB Enterprise Research Institute was qualified by Provincial Government. Special self-lubricating material used for nuclear power station was developed and approved.

2016

The whole company transferring to the new location and the second innovation is coming.....

Our contribution on the environment protection

CSB contribution on the environment protection

- Reduce bushing weight to minimize material and energy consumption.
- Stable and low friction factor to reduce the equipment energy consumption.
- Provide longer maintenance period or maintenance free feature of the bushing to help reducing the maintenance cost.
- Multiple metal and nonmetal materials combination can improve the mechanical performance with optimized wear resistance thereafter to provide longer service life of machine.
- Suitable to be used under the conditions with dust, vacuum, high and low temperature or with radiations, therefore to reduce the difficulties of machine manufacturing.
- Materials CSB uses for the bushings are conformed with ROHS and REACH regulations.
- Help to reduce the mating part manufacturing difficulties. The heat treatment or surface treatment of the mating parts could be unnecessary and lower tolerance grade could be applicable, thus it helps to reduce energy consumption and manufacturing cost.
- Comparing with the traditional bearings, the self-lubricated bearings manufacturing processes are much easier and simpler so that energy consumption is much less.

Environment management in CSB Self-lubricating Bearing manufacturing process

During the manufacturing process, CSB strictly control all the activities under the rules and regulations of ISO14001. Reduce possible cost by means of technical and management improvement in order to reduce carbon emissions.

- Increase automatic lines to reduce process cost.
- To save water consumption by improving cleaning technology.
- To terminate the surface plating process by special technology improvement in order to reduce environment pollution.
- Applying the recycling technology to reduce the consumption of oil and raw material.
- Reduce paper consumption by using advanced management software system.
- Technical improvement helps to reduce previously abundant works for saving office supplies.
- Internal reviewing of water, power and oil consumption control to enhance the environment protection activities.
- Strictly control of waste gas, water and industrial residue disposal.
- Introducing the concept of OHSAS 18001 management system to support the management policy of the company.

CSB declaration of hazardous substances management regulations

We declare that all the materials with the symbol of RoHS are conformed to the regulations of RoHS (2011/65/EU) and ELV(2000/53/EC) as well as REACH(2006/12/18).

RoHS

Material with this symbol conforms to the European RoHS directive.

RoHS (2011/65/EU)

On June 4,2015, The European Union officially issued the latest regulation (EU) 2015/863 and added another four HS in Annex II of (2011/65/EU) as the updated RoHS 2.0. They are DEHP,BBP,DBP and DIBP. The updated regulation limited the four mentioned HS should be not over 0.1% in weight of a single part of the material used for manufacturing the electronic devices.

ELV(2000/53/EC)

ELV is a regulation issued by the European Parliament and Council concerning end-of life vehicles should be harmonized in order to minimize the impact of end-of life vehicles on the environment, thus contributing to the protection, preservation and improvement of the quality of the environment and energy conservation. The regulation clearly states that the following heavy metals are forbidden to be used in the manufacturing of new vehicles from the date of July, 2003.

Among of all the materials, the four heavy metals are limited as below:

- Cd≤100ppm (0.01%)
- Hg≤1000ppm (0.1%)
- Pb≤1000ppm (0.1%)
- CrVI≤1000ppm (0.1%)

Metal-Polymer Composite Bearings

Bi-metallic Composite Bearings

Bronze Wrapped Bearings

Metallic Self-lubricating Bearings

Non-Metallic Self-lubricating Bearings

The Other Bearings

Compressor Swash Plate

Hardened Steel Bearings

Spherical Plain Bearings

Solid Bronze Turned Bearings

Lead-free Steel-Aluminum Composite Bearings

Escalator Rotary Chain

Steering Rack Bearings

Automotive Applications

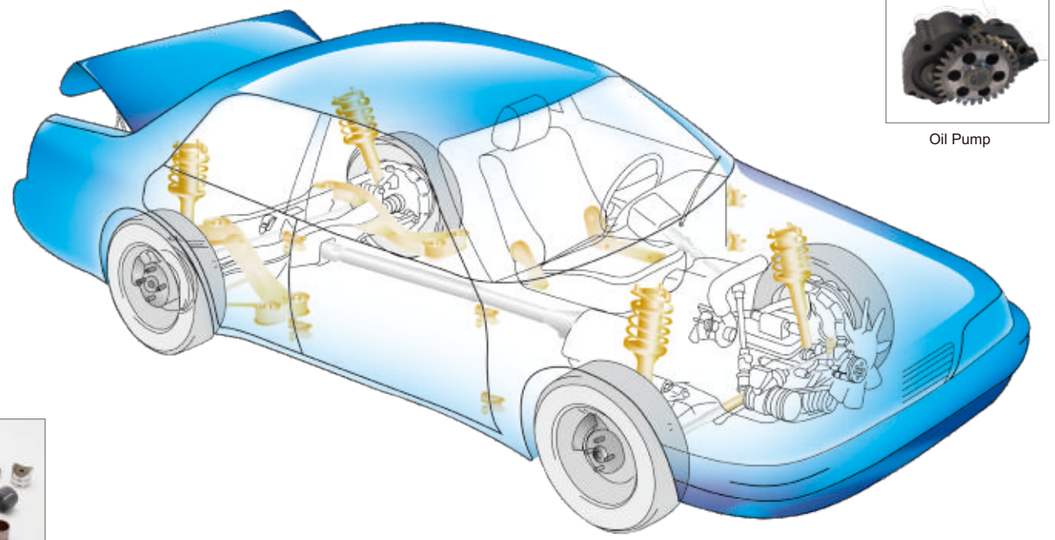
With the advantages of light weight, low noise and self-lubricating features, CSB bearings are widely used in the automotive industrial and the applications are still under fast developing. Currently, there are over 50 bushings being used in each of the passenger cars and more and more traditional needle bearing, sintered bearings are been replacing by the self-lubricating bearings. In addition to the bushing, the self-lubricating materials are applied to the other non-bearing parts such as the new resin coated air conditioner swash plate and other structure parts CSB had already developed. CSB self-lubricating materials provide not only functional parts to the automotive industry but also provide a solution to this industry for environment protection with the materials conform with RoHS and REACH regulations.

Steering & suspension system


Shock absorber


Steering


Booster pump



Power Transmission System


Damper


DMF


Pulley


Compressor

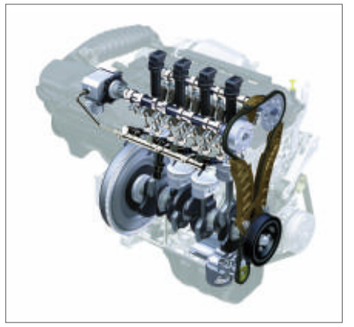

Tensioner


Oil Pump


Throttle


Connecting rod


Starter



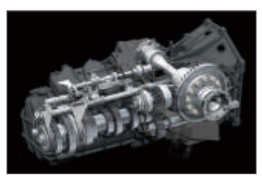
Other


Tyre Mould


Front Lamp Adjust


Pedal


Magnet valve


Transmission


Gear Shift Fork

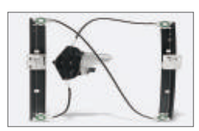

Brake


Shifting gears

Body system


Seat system


Mirror adjust


Window Regulator


Wiper


Trunk hinge


Door hinge


Chair frame


Recliner


Height adjuster

Civil Engineering Machinery Applications

CSB strengthen self-lubricating bearing with impact resistance, dust resistance not only solved the lubricating difficulties but also reduced the running noise and therefore provided a longer service life of the bearing especially under critical environment such as the applications in mining field and outdoor operations. So these bearings are widely used in the lift arms, undercarriage wheels and hydraulic cylinders of different excavators.

Backhoe Loader

Bulldozer

Excavator

Undercarriage

Municipal Facilities Application

Self-lubricating bushing advantages:

Maintenance free feature helps to reduce operation cost and minimize waisted oil pollutions;

Light weight design helps to reduce total weight of the buildings and minimize carbon emission;

The weather resistance of high molecular material helps to prolong the lifetime of municipal facilities;

Stabilized friction factor helps to maintain similar friction of the starting operation and normal running period which could avoid possible vibration damages to the facilities;

Dust resistance feature helps to the outdoor and dust exposure applications;

Chemical resistance feature helps the application under the high or low temperature area, seaside or radiation exposure environment;

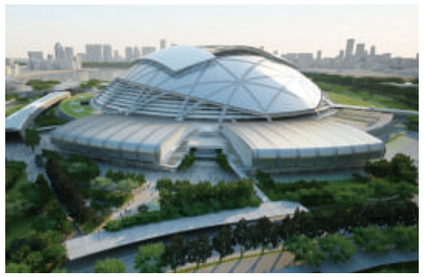
High load feature helps to decrease facilities unit loading area and thus to reduce the size of structure;

Low noise feature helps to minimize noise generating with the applications even under dry condition.

Escalator

Bridge

Water treatment facility

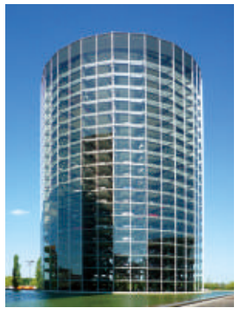


Gymnasium

Building

Municipal Transportation

Automatic smoke exhaust system



Parking garage

Automatic sun shading system

Logistic and Transportation Vehicles Application

By using traditional bearings, the noise generated and frequent maintenance as well as the short lifetime are the main concerns for the working continuity of the equipment especially those operated outdoors and the transportation vehicles on the road. CSB self-lubricating bearing has those difficulties solved perfectly and at the same time brings more comfort of those equipment and vehicles. With no requirement of lubricating oil or grease, the periodically maintenance is unnecessary. As well as the operation cost is reduced, it also prevents the pollution to the soil.

Truck

Axial

Brake System

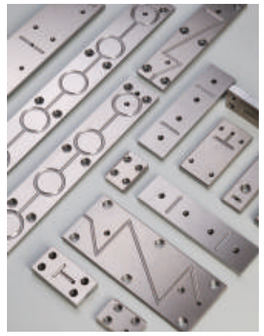
Port Machinery

Forest Machine

Forklifts

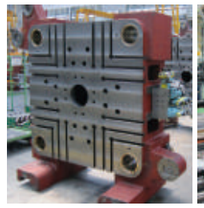
Machine Tools Applications

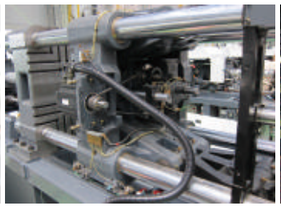
While the high efficiency and high precision requirements of modernized industry are the basic demanding, more and more concerning of environment protection and safety assurance is considered genetically. CSB bearing performance has the advantage of minimizing maintenance frequency and consumption of oil as well as of improving working condition by reducing the machine operating noise level. Even under the condition of oil missing, CSB self-lubricating bearings can make the machine operation in a stable status with its excellent friction resistance feature, therefore to provide an economic solution to the mechanical operations.



Presser

Robot





Plastic Injection Machine

New Energy Application

The feature of weather adaptive, high load capability and maintenance free of the self-lubricating bearings enable to be used under critical application conditions such as outdoor, high attitude, and underwater where the lubricating is not able to be accessed. Where some outdoor applications, such as the hydropower station emergency overhaul gate and turbines, that traditional rolling bearings are not suitable due to the maintenance difficulties, self-lubricating bearings has the advantages of being used with the maintenance free characteristics.

Wind Power Generattion

Offshore Drilling Platform

Nuclear Powerstation

Solar Tracking System

Hydro Power Station / Dam Gates

General Industry Application

The application of self-lubricating bearing will protect the environment from pollution and reduce the oil/grease pollution. It is important for the food machinery, beverage manufacturing machines, packing machines and medical machines. The designed low friction and wear resistance of the self-lubricating bearings can also simplify the mechanic designation and energy consumption of machines.

Textile Machine

Vessel

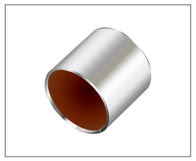
Beverage Filling Machine

Smelting Furnace

Combined Harvester

Fitness and Entertainment Application





The bicycle

Motorcycle


All terrain vehicle


Snowmobile

Fitness Equipment

Ferris Wheel

Telpher

Home Appliance and OA machinery Application

Copier

Printers

Shredder

Massage chair

Medical Electric Bed

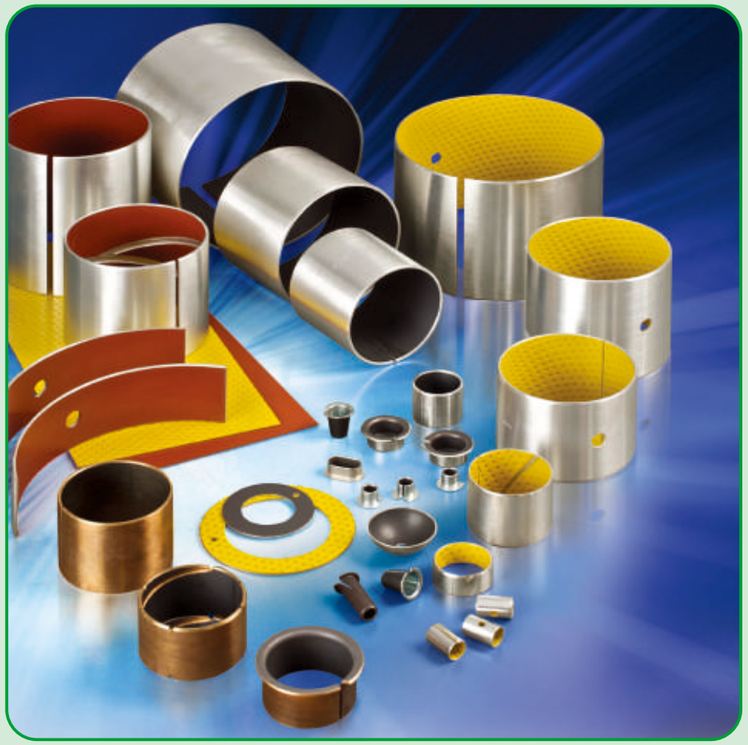
Air Compressor

Home Appliance, Entertainment and body fit equipment are designed with comfort, safety, light weight and environment protection concept which is the CSB self-lubricating bearing's basic feature. The application of self-lubricating bearing can also improve the lifetime of the equipment and the appearance of them.

Food Processor

Electronic Tools

Metal-Polymer Composite Bearings



These materials consist of metal backing bonded to a porous bronze sinter layer with PTFE or thermoplastic based Polymer bearing layer. The metal backing provides mechanical strength, while the bronze sinter layer provides a strong mechanical bonding between the backing and the bearing lining, the PTFE based polymer offers exceptional low friction even under dry condition and the thermoplastic based polymer is generally designed to operate with marginal lubrication. This construction promotes dimensional stability and improves the thermal conductivity.

CSB-50 Steel Bronze Powder with PTFE/Fibre

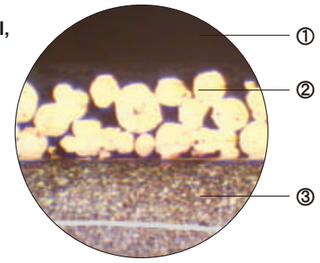
RoHS

Structure

1. PTFE/Fibre mixture thickness 0.01~0.03mm, provides an excellent initial transfer film, which effectively coats the mating surfaces of the bearing assembly, forming an oxide type solid lubricant film.

2. Sintered bronze powder thickness 0.20-0.35mm, provides Max. thermal conductivity away from the bearing surface, also serves as a reservoir for the PTFE-Fibre mixture.

3. Low-carbon steel, gives exceptionally high load carrying capacity, excellent heat dissipation.



Features

Suitable for dry running with a low coefficient of friction, low wear rate, good sliding characteristics, the transfer film created will protect the mating metal surface. Suitable for rotary and oscillating movement, high chemical resistance, lower absorption of water and reduced swelling. Also performs well with lubrication.

Tech. Data

Max. load	Static	250N/mm^2	Friction coefficient		0.03~0.20
	Very low speed	140N/mm^2	Max. speed	Dry running	2m/s
	Rotating oscillating	60N/mm^2		Hydrodynamic operation	>2m/s
Max. PV dry running	Short-term operation	3.6N/mm^2*m/s	Thermal conductivity		42 W(m*K)$^{-1}$
	Continuous operation	1.8N/mm^2*m/s	Coefficient of thermal expansion		11*10^{-6}*K^{-1}
Temp. limit		-195℃~+280℃			

Typical Applications

This material meets the demanding criteria for long life and maintenance free performance with or without lubrication.

Automotive: tractors, combines, crop sprayers, earth-movers, graders and other construction, auto machines, specific uses in power steering cylinders, steering gear thrust washers, disc brakes, calipers and pistons, shock absorbers, governor linkage, windshield wiper motor, tilt gear assemblies...

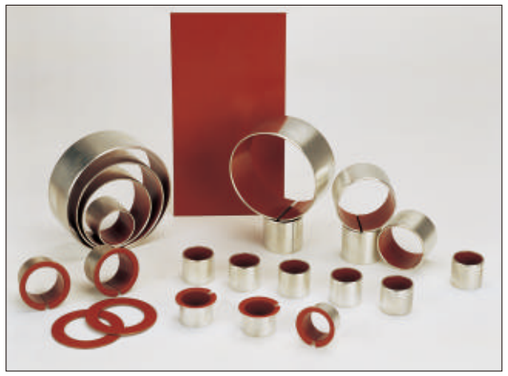
Business machines: photocopy machines, typewriters, mail sorters, postage meter systems, computer terminal printers and peripheral equipment, automatic printing devices, mail processing machinery...

Hydraulics and valves: pumps including gear, rotary, water, axial piston, and other types, ball, butterfly, poppet steam, and other valves and valve trunnions...

Home appliances: tape recorders, refrigerators, air conditioners, cleaners, polishers, sewing machines, ovens, dishwashers, clothes washing machines...And materials handling, marine engine, packaging, textile equipment, tools...etc.

CSB-40 Steel Bronze Powder with PTFE/Fibre

RoHS

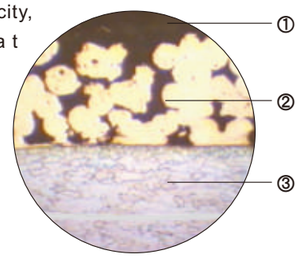


Structure

1. PTFE/Polymer fibres mixture thickness 0.01~0.03mm. Lead-free bearing layer provides an excellent initial transfer film, which effectively coats the mating surfaces of the bearing assembly, forming an oxide type solid lubricant film.

2. Sintered bronze powder thickness 0.20-0.35mm, provides max. thermal conductivity away from the bearing surface, also serves as a reservoir for the PTFE mixture.

3. Steel backing, provides high load carrying capacity, excellent heat dissipation.



Features

Suitable for dry running, low coefficient of friction, lower wear, good sliding characteristics, the transfer film created can protect the mating metal surfaces, suitable for rotating and oscillating movement, high chemical resistance, low absorption of water and swelling. The CSB-40 improved the friction and much good wear resistance over the common CSB-50 range under lubricated operation.

Tech. Data

Max. load	Static	250N/mm^2	Temp. limit		-195°C~+280°C
	Very low speed	140N/mm^2	Max. speed	Dry running	2m/s
	Rotating oscillating	60N/mm^2		Hydrodynamic operation	>2m/s
Max. PV dry running	Short-term operation	3.6N/mm^2*m/s	Thermal conductivity		42 W(m*K)$^{-1}$
	Continuous operation	1.8N/mm^2*m/s	Coefficient of thermal expansion		11*10^{-6}*K^{-1}
PV max. hydrodynamic		30N/mm^2*m/s	Friction coefficient	Dry	0.08~0.20
				Hydrodynamic	0.03~0.08

Typical Applications

CSB-40 is developed for high duty, oil lubricated, hydraulic applications...Automotive suspension struts, shock absorbers guide bushing, hydraulic cylinders, gear pumps, motors, axial and radial piston pumps & motors. CSB-40 is designed mainly for using under lubricated conditions and it performs excellent wear resistance and low static/dynamic friction coefficient.

CSB-11 Bronze Backed with Bronze Powder PTFE/Fibre

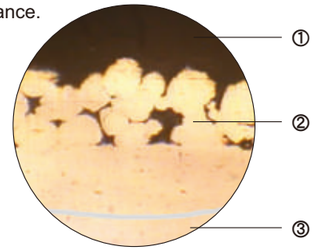
Order RoHS

Structure

1. PTFE/fibre mixture thickness 0.01~0.03mm, provides an excellent initial transfer film, which effectively coats the mating surfaces of the bearing assembly, forming an oxide type solid lubricant film.

2. Sintered bronze powder thickness 0.20-0.35mm, provides max. thermal conductivity away from the bearing surface, also serves as a reservoir for the PTFE/Fibre mixture.

3. Bronze backing, provides exceptionally high load carrying capacity, excellent heat dissipation and very good corrosion resistance.



Features

Suitable for dry running, low coefficient of friction, lower wear, good sliding characteristics, the transfer film created can protect the mating metal surface, suitable for rotary and oscillating movement. Very high chemical resistance, low absorption of water and swelling, also performs very good lubrication feature, the bronze backing provides the improved corrosion resistance comparing with CSB-50.

Tech. Data

Max. load	Static	250N/mm^2	Friction coefficient		0.03~0.20
	Very low speed	140N/mm^2	Max. speed	Dry running	2m/s
	Rotating oscillating	60N/mm^2		Hydrodynamic operation	>2m/s
Max. PV dry running	Short-term operation	3.6N/mm^2*m/s	Thermal conductivity		60W(m*K)$^{-1}$
	Continuous operation	1.8N/mm^2*m/s	Coefficient of thermal expansion		18*10^{-6}*K^{-1}
Temp. limit		-195℃~+280℃			

Typical Applications

This material meets the demanding criteria for long life and trouble-free performance with or without lubricant, of high safety factor even.

The bronze backing provides a high corrosion resistance, anti magnetic properties and a good thermal conductivity, The bearings are particularly appropriate for high temperature environment where no oil is efficient and the machine must be under successive long period working condition. The typical applications covered Steel metallurgy industry such as bushes for roller grooves of successive casting machines, cement grouting pumps and screw conveyers for cement and so on.

CSB-50DH Steel Bronze Powder with PTFE/Fibre

Order RoHS

Features

Comparing with the standard CSB-50 material, CSB-50DH has a thicker sliding layer which allows a further resizing process after the assembly in order to obtain a better clearance fit or interference fit so that a longer time of stable operation of the parts under a certain range of torque. Furthermore, with this material, the torque attenuation could be controlled within a favorable range.

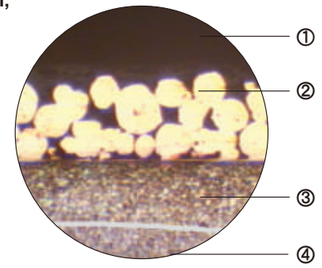
Structure

1. PTFE/Fibre mixture thickness 0.03-0.08mm, provides an excellent initial transfer film, which effectively coats the mating surfaces of the bearing assembly, forming an oxide type solid lubricant film.

2. Sintered bronze powder thickness 0.20-0.35mm, provides max. thermal conductivity away from the bearing surface, also serves as a reservoir for the PTFE mixture.

3. Low-carbon steel, gives exceptionally high load carrying capacity, excellent heat dissipation.

4. Plating , provides good corrosion resistance.



Tech. Data

Max. load	Static	250N/mm^2	Friction coefficient		0.05~0.20
	Very low speed	140N/mm^2	Max. speed	Dry running	2m/s
	Rotating oscillating	60N/mm^2		Hydrodynamic operation	>2m/s
Max. PV dry running	Short-term operation	3.6N/mm^2*m/s	Thermal conductivity		42 W(m*K)$^{-1}$
	Continuous operation	1.8N/mm^2*m/s	Coefficient of thermal expansion		11*10^{-6}*K^{-1}
Temp. limit		-195℃~+280℃			

Typical Applications

The application of this material is similar with of normal CSB-50 material, but it is an optimized material for the application of automotive industry like door hinges, trunk hinges, bonnet hinges, dampers and seats etc.

Available

- Cylindrical Bushes
- Flanged Bushes
- Thrust Washers
- Non-standard parts as design

CSB-50DH is available against customer order, the tolerance is according to CSB-50 standard dimension.

CSB-50HP Steel Bronze Powder with PTFE/Fibre

Order RoHS

Features

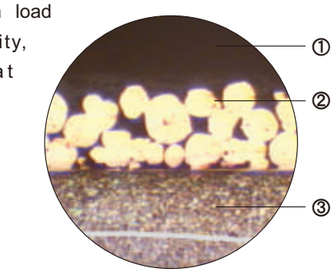
The new material CSB-50HP is developed for high load with high speed under lubrication. The special resin can support high PV value with lower friction and good wear resistance. The speed can be up to 5m/s, PV up to 60N/mm^2*m/s.

Structure

1. PTFE/Fibre mixture 0.01~0.03mm, provides an excellent initial transfer film, which effectively coats the mating surface of the bearing assembly, forming an oxide type solid lubricant film.

2. Sintered bronze powder 0.20-0.35mm,provides Max. thermal conductivity away from the bearing surface, also serves as a reservoir for the PTFE layer mixture.

3. Low-carbon steel, gives exceptionally high load carrying capacity, excellent heat dissipation.

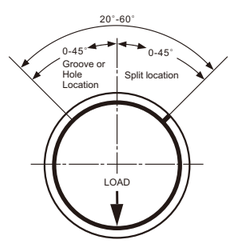


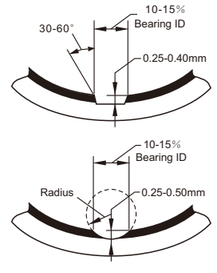
Tech. Data

Max. Load	Static	250N/mm^2	Temp. limit		-195℃~+280℃
	Very low speed	140N/mm^2	Friction coefficient		0.03~0.20
	Rotating oscillating	60N/mm^2	Max. speed	Dry running	2m/s
Max. PV dry running	Short-term operation	3.6N/mm^2*m/s		Hydrodynamic operation	>5m/s
	Continuous operation	1.8N/mm^2*m/s	Thermal conductivity		42 W(m*K)$^{-1}$
PV hydrodynamic		60 N/mm^2*m/s	Coefficient of thermal expansion		11*10^{-6}*K^{-1}

Typical Application

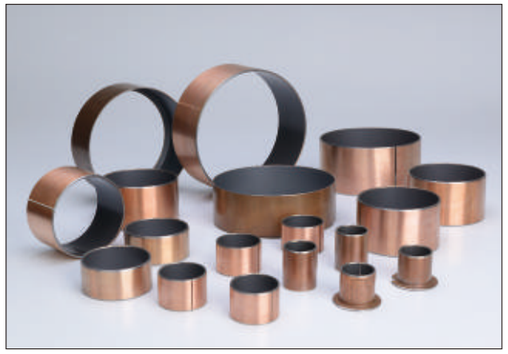
This new material is suitable for high PV value application with oil lubrication, The typical applications are: gear pump, vane pump, shock absorber, gear motor, axial and radial piston pumps and so on. Oil grooves or oil holes design are available (for details, please refer to CSB notice).





CSB-50MP Steel Bronze Powder with PTFE/Fluoropolymer

Order RoHS

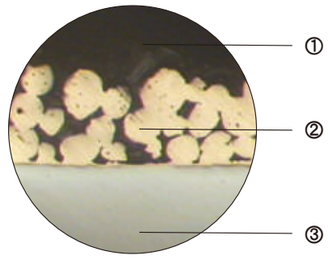


Structure

1. PTFE/Fluoropolymer thickness 0.05~0.10mm , dry bearing performance supply with machinable solution to get tight tolerance.

2. Sintered bronze powder thickness 0.20~0.35mm, provides max. thermal conductivity away from the bearing surface, also serves as reservoir for PTFE layer.

3. Low-carbon steel, gives exceptionally high load carrying capacity, excellent heat dissipation.



Features

This material is designated for the purpose of re-machining after bushing is assembled to improve the required higher tolerance requirement. PTFE layer is remained working and functional after re-machining. In addition, because a special high temperature resistance additive is imbedded in the material , the bushing can work under high temperature working condition.

Tech. Data

Max. load	Static	250N/mm^2	Friction coefficient		0.03~0.20
	Very low speed	140N/mm^2	Max. speed	Dry running	2m/s
	Rotating oscillating	60N/mm^2		Hydrodynamic operation	>2m/s
Max. PV dry running	Short-term operation	3.6N/mm^2*m/s	Thermal conductivity		42 W(m*K)$^{-1}$
	Continuous operation	1.8N/mm^2*m/s	Coefficient of thermal expansion		11*10^{-6}*K^{-1}
Temp. limit		-195℃~+280℃			

Typical Applications

With machinable thick PTFE layer structure, the bearing could applied in: Belt tensioner, idler pulley, magnetic valves, compressor, pump etc.

CSB-12 Steel with PTFE Tape

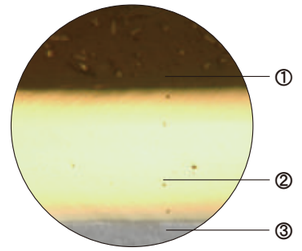
Order RoHS

Structure

1. PTFE tape, the very thick PTFE layer isolates noise and allows the design of clearance free application.

2. Low-carbon steel, gives exceptionally high load carrying capacity, excellent heat dissipation.

3. Plating thickness, provides good corrosion resistance according to requirements.



Features

This material is designed with simple structure and light weight for the applications which require such. The thin wall design enables easy assembly either with pressing line or manually press and at the same time the thick wall design enables resizing after assembly to obtain a better fitness and higher accuracy grade of the mating. This kind of bearing is designed for clearance fit and interference fit. PTFE layer provides the good performance when running at the dry condition.

Tech. Data

Standard Thick. mm	Backing Material	Max. Load	Static	120N/mm^2
	CSB-12		Dynamic	80N/mm^2
	Carbon steel	Max. Seepd	Dry	1m/s
0.50	*		Oil	>1m/s
0.75	*	Temp.		-65℃~+260℃
1.00	*	Friction coefficient		0.05~0.20
1.50	*			

Typical Applications

With its low friction factor, wear resistance and good lubricating characteristics, this material is widely used in chemical industries, medical industries, food industries, textile machines, OA machines and door/trunk hinges and so on.

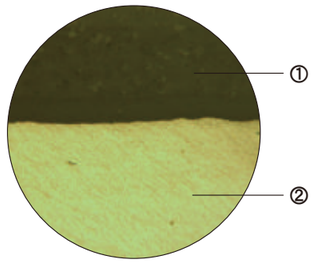
CSB-25 Aluminum Alloy with PTFE Tape

Order RoHS

Structure

1. PTFE tape，the very thick PTFE layer isolates noise and allows the design of clearance free application.

2. Aluminum alloy backing, gives exceptionally high load carrying capacity, excellent heat dissipation and light solution.



Features

This material structure enables the final parts to be lighter and easier for installation. Suitable for dry running, low coefficient of friction, lower wear, good sliding characteristics, the transfer film created can protect the mating metal surface, suitable for rotary, linear and oscillating movement.

Tech. Data

Max. load	Static	80N/mm^2	Friction coefficient		0.05~0.20
	Very low speed	40N/mm^2	Max. speed	Dry running	1m/s
	Rotating oscillating	20N/mm^2		Hydrodynamic operation	>1m/s
Max. PV dry running	Short-term operation	2.8N/mm^2*m/s	Thermal conductivity		230W(m*K)$^{-1}$
	Continuous operation	1.8N/mm^2*m/s	Coefficient of thermal expansion		24*10^{-6}*K^{-1}
Temp. limit		-65℃~+260℃			

Typical Applications

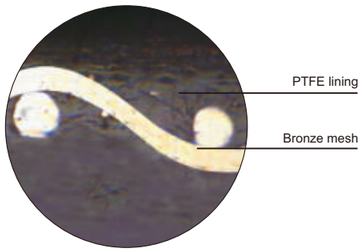
With aluminum metal backing, the bearing could be applied for OA machines, fitness equipment, bicycle, motorcycle, food industry machinery and package machinery, which need light design.

CSB-FR Bronze Mesh + PTFE/Solid Lubricants

Order RoHS

Structure

CSB-FR consists of a bronze mesh shell, filled with PTFE and solid lubricants. This material structure enables the bearing to be lighter and easier to install. It is widely used for light load and lower speed applications such as chemical industries, medical industries, food industries, textile machines, OA machines, door and window hinges, valve controllers etc.



Features

CSB-FR provides flexible feature enable easy assembly and good fittness for the door hinge installation. It ensures a wide range of torque during the operation.

Tech. Data

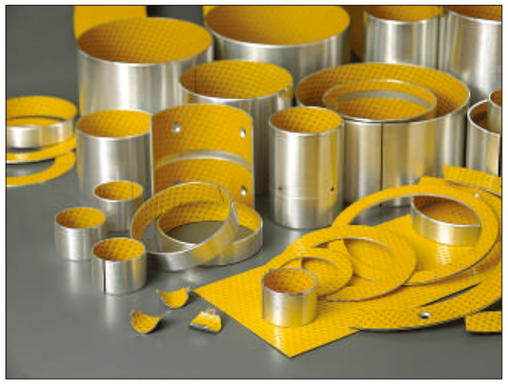
Max. Load	Static	80N/mm^2
	Dynamic	40N/mm^2
Max. Speed	Dry	1m/s
	Oil	>1m/s
Temp. Limit ℃		-195℃~+260℃
Coefficient of friction		0.03~0.20

Typical Application

This material is widely used in the applications where light weight requirement is considered such as vehicle door hinges, valves, OA machines.

CSB-20 Steel Bronze Powder with POM

RoHS

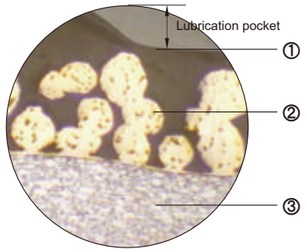


Structure

1.POM thickness 0.30~0.50 mm, it provides high wear resistance and low friction even with only minute volume of lubricant are supplied, this bearing surface carries a pattern of circular indents which should be filled with grease on assembly of the bearing.

2. Sintered bronze powder thickness 0.20-0.35mm, provides max. thermal conductivity away from the bearing surface, also serves as a reservoir for the resin mixture.

3. Low-carbon steel, provides exceptionally high load carrying capacity, excellent heat dissipation.



Features

Suitable for rotating and oscillating movement, less maintenance requirements due to the long re-lubrication intervals, lower wear, lower susceptibility to edge loading, no absorption of water and therefore no swelling, good damping behaviours, good resistance to shock loads.

Tech. Data

Max. load	Static	250N/mm^2	Temp. limit		-40°C~+110°C
	Very low speed	140N/mm^2	Max. speed	Pre-lubricated	2m/s
	Rotating oscillating	70N/mm^2		Oiling Grease Continuous	>2m/s
Max. PV		3N/mm^2*m/s	Thermal conductivity		50W(m*K)$^{-1}$
Coefficient of thermal expansion		11*10^{-6}*K^{-1}	Friction coefficient		0.05~0.20
Initial pre-lubrication at assembly is strongly recommended.					

Typical Applications

Recommended for applications involving intermittent operation or boundary lubrication...

Automotive: suspension joints, kingpin assemblies and stub axles of trucks, automobile driving joint hinges, steering and other linkages, articulation joints, rear chassis hinges, fair leader rollers...

Machine tool building industry: spindles in drill, grinding, and milling machines, ram guide plates in multi-ram presses...

Agricultural equipment: gearbox, clutch, bale trips and wheel caster swivels for bale accumulators, front axle pivot bearings, steering idler box bearings and kingpin bearings for harvesters...

It is especially well-suited for applications where lubricant can not be supplied continuously or repeatedly.

CSB-22 Steel Bronze Powder with PVDF/PTFE

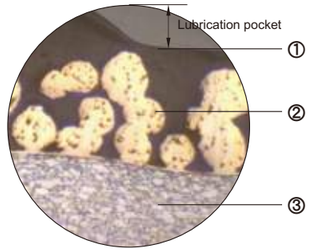
Order

Structure

1.PVDF/PTFE 0.30~0.50mm, has high wear resistance and low friction even only minute quantities of lubricant are supplied, this bearing surface carries a pattern of circular indents which should be filled with grease on assembly of the bearing.

2.Sintered bronze powder 0.20-0.35mm, provides max. thermal conductivity away from the bearing surface, also serves as a reservoir for the resin mixture.

3.Low-carbon steel, gives exceptionally high load carrying capacity, excellent heat dissipation.



Features

The special resin has excellent wear resistance and low friction. Oil/grease pockets are available for the bushing design. The resin surface could be machined again after assembly in order to obtain higher tolerance requirement.

Comparing with POM, the application range of PVDF material better.

Tech. Data

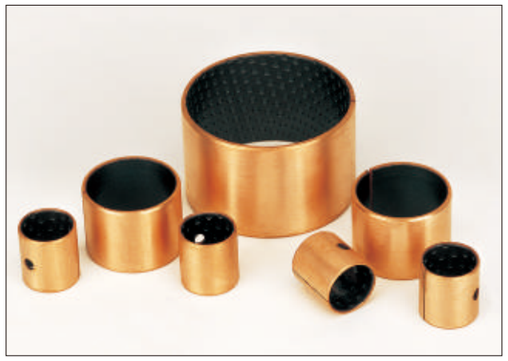
Max. Load	Static	250N/mm^2	Temp. limit		-50°C~+160°C
	Very low speed	140N/mm^2	Max. speed	Pre-lubricated	2m/s
	Rotating oscillating	70N/mm^2		Oiling Grease continuous	>3m/s
Max. PV		3.6N/mm^2*m/s	Thermal conductivity		50W(m*K)$^{-1}$
Coefficient of thermal expansion		11*10^{-6}*K^{-1}	Friction coefficient		0.03~0.20
Initial pre-lubrication at assembly required...					

Typical Application

The recommended application conditions are the high load, high temperature and high polluted environment with grease or oil lubrication. It has excellent wear resistance. This material is widely used in the kingpin bushing, piston pump, agricultural machinery. It is especially well-suited for applications where lubricant can not be supplied continuously or repeatedly.

CSB-80 Steel Bronze Powder with PEEK/PTFE

Order RoHS

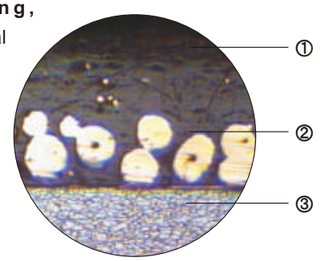


Structure

1.PEEK+PTFE 0.30~0.50mm, gives high wear resistance and low friction even only minute quantities of lubricant are supplied. This bearing surface carries a pattern of circular indents which should be filled with grease on assembly of the bearing.

2.Bronze layer 0.20~0.35mm, provides max. thermal conductivity away from the bearing surface, also serves as a reservoir for the PTFE/PEEK mixture.

3.Steel backing, provides mechanical strength and high load carrying capacity.



Features

1. CSB-80 provides maintenance-free operation
2. Operate satisfactorily without lubrication under light duty and low speed
3. CSB-80 has a high PV capability under high temperature
4. Temperature allowance is from -150℃~+250℃
5. Good chemical resistance
6. High static and dynamic load capacity
7. No water absorption
8. Suitable for rotating, oscillating, reciprocating and sliding movement.

Tech. Data

Max. load	Static	250N/mm²	Friction coefficient		0.08~0.15
	Very low speed	140N/mm²	Max. speed	Pre-lubricated	2m/s
	Rotating oscillating	60N/mm²		Oiling Grease Continuous	>2m/s
Max. PV	Short-term operation	3.6N/mm²*m/s	Thermal conductivity		50 W(m*K)$^{-1}$
	Continuous operation	1.8N/mm²*m/s	Coefficient of thermal expansion		11*10^{-6}*K^{-1}
Temp. limit		-150℃~+250℃			

Typical Applications

CSB-80 bearings application covers gear pump, ABS system, piston pump, gear motor, machine tools, agricultural machinery and so on. The materials is recommended with initial pre-lubrication at assembly.

Available

- Cylindrical Bushes
- Thrust Washers
- Non-standard parts as design

CSB-80 is supplied by customer order, the tolerance is according to CSB-20 standard dimension.

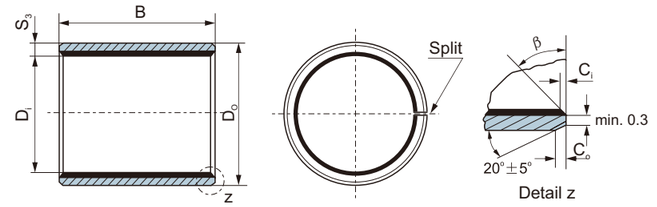
CSB-50 / CSB-40 / CSB-11 (Metric Size)

Order Spec.

CSB-50 — 40 — 20

Material — Ds — B

Materials: CSB-50,CSB-40, CSB-11



ID and OD chamfers

S_3	C_O	C_I	α	β
0.75	0.5±0.3	0.5±0.3	20° ±8°	30° ±8°
1.00	0.6±0.4	0.6±0.3	20° ±8°	30° ±8°
1.50	0.6±0.4	0.7±0.3	20° ±8°	30° ±8°

S_3	C_O	C_I	α	β
2.00	1.2±0.4	0.7±0.3	20° ±8°	30° ±8°
2.50	1.8±0.6	0.8±0.3	20° ±8°	30° ±8°

Unit:mm

Shaft D_S	Housing H7 D_H	OD tolerance D_O	ID after fixed $D_{i,a}$	Clearance C_D	Wall thickness S_3	B $^{0}_{-0.40}$ (d≤φ30 B -0.3 / d>φ30 B -0.4)									
						6	8	10	12	15	20	25	30	40	50
6 -0.010 -0.022	8 +0.015	8 +0.055 +0.025	6.055 5.990	0.077 0.000	1.005 0.980	0606	0608	0610							
8 -0.013 -0.028	10 +0.015	10 +0.055 +0.025	8.055 7.990	0.083 0.003		0806	0808	0810	0812	0815					
10 -0.013 -0.028	12 +0.018	12 +0.065 +0.030	10.058 9.990	0.086 0.003		1006	1008	1010	1012	1015	1020				
12 -0.016 -0.034	14 +0.018	14 +0.065 +0.030	12.058 11.990	0.092 0.006		1206	1208	1210	1212	1215	1220	1225			
13 -0.016 -0.034	15 +0.018	15 +0.065 +0.030	13.058 12.990					1310			1320				
14 -0.016 -0.034	16 +0.018	16 +0.065 +0.030	14.058 13.990					1410	1412	1415	1420	1425			
15 -0.016 -0.034	17 +0.018	17 +0.065 +0.030	15.058 14.990					1510	1512	1515	1520	1525			
16 -0.016 -0.034	18 +0.018	18 +0.065 +0.030	16.058 15.990					1610	1612	1615	1620	1625			
17 -0.016 -0.034	19 +0.021	19 +0.075 +0.035	17.061 16.990	0.095 0.006				1710	1712		1720				
18 -0.016 -0.034	20 +0.021	20 +0.075 +0.035	18.061 17.990					1810	1812	1815	1820	1825			
20 -0.020 -0.041	23 +0.021	23 +0.075 +0.035	20.071 19.990	0.112 0.010	1.505 1.475			2010	2012	2015	2020	2025	2030		
22 -0.020 -0.041	25 +0.021	25 +0.075 +0.035	22.071 21.990					2210	2212	2215	2220	2225	2230		
24 -0.020 -0.041	27 +0.021	27 +0.075 +0.035	24.071 23.990							2415	2420	2425	2430		
25 -0.020 -0.041	28 +0.021	28 +0.075 +0.035	25.071 24.990					2510	2512	2515	2520	2525	2530	2540	2550
28 -0.020 -0.041	32 +0.025	32 +0.085 +0.045	28.085 27.990	0.126 0.010	2.005 1.970					2815	2820	2825	2830	2840	
30 -0.020 -0.041	34 +0.025	34 +0.085 +0.045	30.085 29.990						3012	3015	3020	3025	3030	3040	
32 -0.025 -0.050	36 +0.025	36 +0.085 +0.045	32.085 31.990	0.135 0.015							3220		3230	3240	
35 -0.025 -0.050	39 +0.025	39 +0.085 +0.045	35.085 34.990						3512	3515	3520	3525	3530	3540	3550
38 -0.025 -0.050	42 +0.025	42 +0.085 +0.045	38.085 37.990							3815			3830	3840	
40 -0.025 -0.050	44 +0.025	44 +0.085 +0.045	40.085 39.990						4012		4020	4025	4030	4040	4050

CSB-50 / CSB-40 / CSB-11 (Metric Size)

Unit:mm

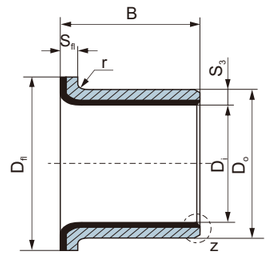
Shaft D_S	Housing H7 D_H	OD tolerance D_O	ID after fixed $D_{i,a}$	Clearance C_D	Wall thick-ness S_3	B $^{0}_{-0.40}$									
						20	25	30	40	50	60	70	80	100	115
45 $^{-0.050}_{-0.025}$	50 $^{+0.025}$	50 $^{+0.085}_{+0.045}$	45.105 44.990	0.155 0.015	2.505 2.460	4520	4525	4530	4540	4550					
50 $^{-0.050}_{-0.025}$	55	55 $^{+0.100}_{+0.055}$	50.110 49.990	0.160 0.015		5020		5030	5040	5050	5060				
55 $^{-0.060}_{-0.030}$	60 $^{+0.030}$	60 $^{+0.100}_{+0.055}$	55.110 54.990	0.170 0.020				5530	5540	5550	5560				
60 $^{-0.060}_{-0.030}$	65	65 $^{+0.100}_{+0.055}$	60.110 59.990					6030	6040	6050	6060	6070			
65 $^{-0.060}_{-0.030}$	70 $^{+0.030}$	70 $^{+0.100}_{+0.055}$	65.110 64.990					6530	6540	6550	6560	6570			
70 $^{-0.060}_{-0.030}$	75	75 $^{+0.100}_{+0.055}$	70.110 69.990						7040	7050	7060	7070	7080		
75 $^{-0.060}_{-0.030}$	80 $^{+0.030}$	80 $^{+0.100}_{+0.055}$	75.110 74.990					7530	7540	7550	7560	7570	7580		
80 $_{-0.046}$	85	85 $^{+0.120}_{+0.070}$	80.155 80.020	0.201 0.020					8040	8050	8060	8070	8080	80100	
85 $_{-0.054}$	90 $^{+0.035}$	90 $^{+0.120}_{+0.070}$	85.155 85.020	0.209 0.020	2.490 2.440				8540		8560		8580	85100	
90 $_{-0.054}$	95	95 $^{+0.120}_{+0.070}$	90.155 90.020						9040	9050	9060		9080	90100	
95 $_{-0.054}$	100 $^{+0.035}$	100 $^{+0.120}_{+0.070}$	95.155 95.020							9550	9560		9580	95100	
100 $_{-0.054}$	105	105 $^{+0.120}_{+0.070}$	100.155 100.020							10050	10060		10080		100115
105 $_{-0.054}$	110 $^{+0.035}$	110 $^{+0.120}_{+0.070}$	105.155 105.020								10560		10580		105115
110 $_{-0.054}$	115	115 $^{+0.120}_{+0.070}$	110.155 110.020								11060		11080		110115
120 $_{-0.054}$	125 $^{+0.040}$	125 $^{+0.170}_{+0.100}$	120.210 120.070	0.264 0.070							12060		12080	120100	
125 $_{-0.063}$	130	130 $^{+0.170}_{+0.100}$	125.210 125.070	0.273 0.070	2.465 2.415						12560			125100	125115
130 $_{-0.063}$	135 $^{+0.040}$	135 $^{+0.170}_{+0.100}$	130.210 130.070								13060		13080	130100	
140 $_{-0.063}$	145	145 $^{+0.170}_{+0.100}$	140.210 140.070								14060		14080	140100	
150 $_{-0.063}$	155 $^{+0.040}$	155 $^{+0.170}_{+0.100}$	150.210 150.070								15060		15080	150100	
160 $_{-0.063}$	165	165 $^{+0.170}_{+0.100}$	160.210 160.070								16060		16080	160100	160115
180 $_{-0.063}$	185 $^{+0.046}$	185 $^{+0.210}_{+0.130}$	180.216 180.070	0.279 0.070									18080	180100	
190 $_{-0.072}$	195	195 $^{+0.210}_{+0.130}$	190.216 190.070	0.288 0.070	2.465 2.415								19080	190100	
200 $_{-0.072}$	205 $^{+0.046}$	205 $^{+0.210}_{+0.130}$	200.216 200.070								20060		20080	200100	
220 $_{-0.072}$	225	225 $^{+0.210}_{+0.130}$	220.216 220.070										22080	220100	
250 $_{-0.072}$	255 $^{+0.052}$	255 $^{+0.260}_{+0.170}$	250.222 250.070	0.294 0.070									25080	250100	
260 $_{-0.081}$	265	265 $^{+0.260}_{+0.170}$	260.222 260.070	0.303 0.070	2.465 2.415								26080	260100	
280 $_{-0.081}$	285 $^{+0.052}$	285 $^{+0.260}_{+0.170}$	280.222 280.070										28080	280100	
300 $_{-0.081}$	305	305 $^{+0.260}_{+0.170}$	300.222 300.070										30080	300100	

CSB-50 / CSB-40 / CSB-11 (Metric Size)

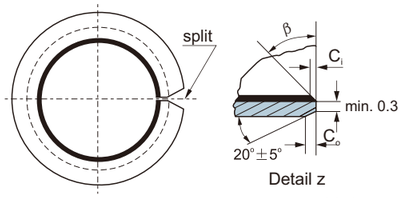
Order Spec.

CSB-50 (Material) F (Flange) 25 (Ds) 115 (B)

Materials: CSB-50,CSB-40, CSB-11



S_3	1.0	1.5	2.0	2.5
r	$1^{-0.5}$	1±0.5	1.5±0.5	2±0.5



Unit:mm

Shaft D_S	Housing H7 D_H	OD tolerance D_O	ID after fixed $D_{i,a}$	Clearance C_D	Designation	Wall thickness S_3	Dimension				
							D_i	D_o	D_{fl}± 0.5	B±0.25	S_{fl}-0.2
6 $^{-0.013}_{-0.028}$	8 $^{+0.015}$	8 $^{+0.055}_{+0.025}$	6.055 5.990	0.077 0.000	F06040	1.005 0.980	6	8	12	4	1
					F06070					7	
8 $^{-0.013}_{-0.028}$	10 $^{+0.015}$	10 $^{+0.055}_{+0.025}$	8.055 7.990	0.083 0.003	F08055		8	10	15	5.5	
					F08075					7.5	
10 $^{-0.016}_{-0.034}$	12 $^{+0.018}$	12 $^{+0.055}_{+0.025}$	10.058 9.990	0.086 0.003	F10070		10	12	18	7	
					F10090					9	
					F10120					12	
12 $^{-0.016}_{-0.034}$	14 $^{+0.018}$	14 $^{+0.065}_{+0.030}$	12.058 11.990	0.092 0.006	F12070		12	14	20	7	
					F12090					9	
					F12120					12	
14 $^{-0.016}_{-0.034}$	16 $^{+0.018}$	16 $^{+0.065}_{+0.030}$	14.058 13.990		F14120		14	16	22	12	
					F14170					17	
15 $^{-0.016}_{-0.034}$	17 $^{+0.018}$	17 $^{+0.065}_{+0.030}$	15.058 14.990		F15090		15	17	23	9	
					F15120					12	
					F15170					17	
16 $^{-0.016}_{-0.034}$	18 $^{+0.018}$	18 $^{+0.065}_{+0.030}$	16.058 15.990		F16120		16	18	24	12	
					F16170					17	
18 $^{-0.016}_{-0.034}$	20 $^{+0.021}$	20 $^{+0.075}_{+0.035}$	18.061 17.990	0.095 0.006	F18120		18	20	26	12	
					F18170					17	
					F18200					20	
20 $^{-0.020}_{-0.041}$	23 $^{+0.021}$	23 $^{+0.075}_{+0.035}$	20.071 19.990	0.112 0.010	F20115	1.505 1.475	20	23	30	11.5	1.5
					F20165					16.5	
					F20215					21.5	
22 $^{-0.020}_{-0.041}$	25 $^{+0.021}$	25 $^{+0.075}_{+0.035}$	22.071 21.990		F22150		22	25	32	15	
					F22200					20	
25 $^{-0.020}_{-0.041}$	28 $^{+0.021}$	28 $^{+0.075}_{+0.035}$	25.071 24.990		F25115		25	28	35	11.5	
					F25165					16.5	
					F25215					21.5	
30 $^{-0.025}_{-0.050}$	34 $^{+0.025}$	34 $^{+0.075}_{+0.035}$	30.085 29.990	0.126 0.010	F30160	2.005 1.970	30	34	42	16	2
					F30260					26	
35 $^{-0.025}_{-0.050}$	39 $^{+0.025}$	39 $^{+0.085}_{+0.045}$	35.085 34.990	0.135 0.015	F35160		35	39	47	16	
					F35260					26	
40 $^{-0.025}_{-0.050}$	44 $^{+0.025}$	44 $^{+0.085}_{+0.045}$	40.085 39.990		F40260		40	44	53	26	
					F40400					40	

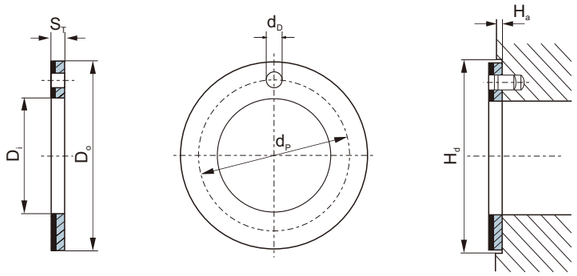
CSB-50 / CSB-40 / CSB-11 (Metric Size)

Metric thrust washer

Order Spec.

CSB-50 — Material
WC — Washer
22 — Di

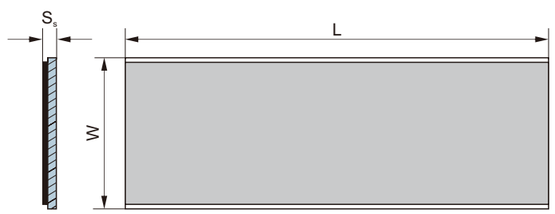
Materials: CSB-50,CSB-40, CSB-11



Unit:mm

Shaft D_S	Designation	Washer dimension				Installation size		H_d+0.12
		D_i +0.25	D_o -0.25	S_T $^{-0.01}_{-0.06}$	d_P±0.125	$d_{D+0.1}^{+0.4}$	H_a±0.2	
8	WC10	10	20	1.5	15	1.5	1	20
10	WC12	12	24		18			24
12	WC14	14	26		20	2		26
14	WC16	16	30		23			30
16	WC18	18	32		25			32
18	WC20	20	36		28	3		36
20	WC22	22	38		30			38
22	WC24	24	42		33			42
24	WC26	26	44		35			44
26	WC28	28	48		38	4		48
30	WC32	32	54		43			54
36	WC38	38	62		50			62
40	WC42	42	66		54			66
46	WC48	48	74	2	61		1.5	74
50	WC52	52	78		65			78
60	WC62	62	90		76			90

Metric standard strip



Unit:mm

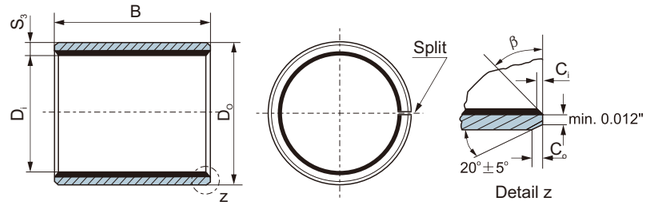
Type	Length±1	Width±1	Thickness -0.05
SP	500	150	1.0
SP	500	150	1.5
SP	500	150	2.0
SP	500	150	2.5

CSB-50 / CSB-40 / CSB-11 (Inch Size)

Order Spec.

CSB-50 — Material
08 — DsX16
IB — Inch Bearing
16 — Bx16

Materials: CSB-50,CSB-40, CSB-11



ID and OD chamfers

S_3	C_O	C_I	α	β
0.0315	0.008-0.031	0.008-0.031	20° ±8°	30° ±8°
0.0472	0.008-0.039	0.012-0.035	20° ±8°	30° ±8°
0.0630	0.008-0.039	0.016-0.039	20° ±8°	30° ±8°

S_3	C_O	C_I	α	β
0.0787	0.031-0.063	0.016-0.039	20° ±8°	30° ±8°
0.0945	0.047-0.094	0.020-0.043	20° ±8°	30° ±8°

Unit: inch"

Shaft D_S	Housing H7 D_H	ID after fixed $D_{i,a}$	Clearance C_D	Length±0.010					
0.1243 0.1236	0.1878 0.1873	0.1268 0.1243	0.0032 0.0000	02IB02	02IB03				
0.1554 0.1547	0.2191 0.2186	0.1581 0.1556	0.0034 0.0002	025IB025	025IB04				
0.1865 0.1858	0.2503 0.2497	0.1893 0.1867	0.0035 0.0002	03IB03	03IB04	03IB06			
0.2490 0.2481	0.3128 0.3122	0.2518 0.2492	0.0037 0.0002	04IB04	04IB06				
0.3115 0.3106	0.3753 0.3747	0.3143 0.3117		05IB06	05IB08				
0.3740 0.3731	0.4691 0.4684	0.3769 0.3742	0.0038 0.0002	06IB03	06IB04	06IB06	06IB08	06IB10	06IB12
0.4365 0.4355	0.5316 0.5309	0.4394 0.4367	0.0039 0.0002	07IB08	07IB12				
0.4990 0.4980	0.5941 0.5934	0.5019 0.4992		08IB04	08IB06	08IB08	08IB10	08IB12	08IB14
0.5615 0.5605	0.6566 0.6559	0.5644 0.5617		09IB06	09IB08	09IB10	09IB12		
0.6240 0.6230	0.7192 0.7184	0.6270 0.6242	0.0040 0.0002	10IB04	10IB08	10IB10	10IB12	10IB14	10IB16
0.6865 0.6855	0.7817 0.7809	0.6895 0.6867		11IB14					
0.7491 0.7479	0.8755 0.8747	0.7525 0.7493	0.0046 0.0002	12IB04	12IB06	12IB08	12IB10	12IB12	12IB16
0.8116 0.8104	0.9380 0.9372	0.8150 0.8118		13IB12	13IB18				
0.8741 0.8729	1.0005 0.9997	0.8775 0.8743		14IB04	14IB06	14IB12	14IB16	14IB20	
0.9991 0.9979	1.1255 1.1247	1.0025 0.9993		16IB06	16IB08	16IB12	16IB16	16IB20	16IB24
1.1238 1.1226	1.2818 1.2808	1.1278 1.1240	0.0052 0.0002	18IB06	18IB10	18IB12	18IB16		
1.2488 1.2472	1.4068 1.4058	1.2528 1.2490	0.0056 0.0002	20IB06	20IB12	20IB14	20IB16	20IB20	20IB28
1.3738 1.3722	1.5318 1.5308	1.3778 1.3740		22IB12	22IB12	22IB24	22IB28		
1.4988 1.4972	1.6568 1.6558	1.5028 1.4990		24IB08	24IB16	24IB18	24IB20	24IB24	24IB32
1.6238 1.6222	1.7818 1.7808	1.6278 1.6240		26IB16	26IB24				
1.7487 1.7471	1.9381 1.9371	1.7535 1.7489	0.0064 0.0002	28IB16	28IB24	28IB32			

CSB-50 / CSB-40 / CSB-11 (Inch Size)

Unit: inch"

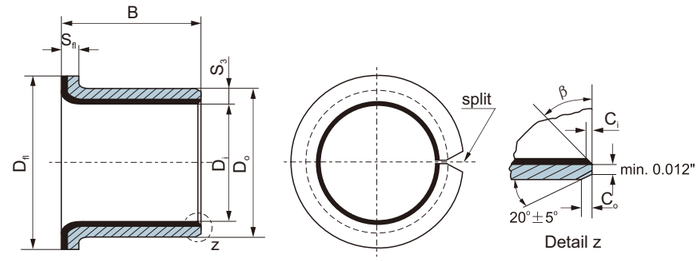
Shaft D_S	Housing H7 D_H	ID after fixed D_{La}	Clearance C_D	Length ±0.010								
1.8737 1.8721	2.0633 2.0621	1.8787 1.8739	0.0066 0.0002	30IB12	30IB16	30IB36						
1.9987 1.9969	2.1883 2.1871	2.0037 1.9989	0.0068 0.0002	32IB08	32IB16	32IB24	32IB28	32IB32	32IB40			
2.1257 2.1239	2.3130 2.3118	2.1326 2.1262		34IB48								
2.2507 2.2489	2.4377 2.4365	2.2573 2.2509		36IB28	36IB32	36IB40	36IB48	36IB56	36IB60	36IB64	36IB72	
2.5011 2.4993	2.6881 2.6869	2.5077 2.5013		40IB16	40IB26	40IB32	40IB40	40IB48	40IB56	40IB60	40IB64	40IB72
2.7500 2.7482	2.9370 2.9358	2.7566 2.7502		44IB32	44IB36	44IB40	44IB48	44IB56	44IB60	44IB64	44IB72	44IB76
2.8752 2.8734	3.0623 3.0610	2.8819 2.8754	0.0085 0.0002	46IB32	46IB36	46IB40	46IB48	46IB56	46IB60	46IB64	46IB72	46IB76
3.0000 2.9982	3.1872 3.1858	3.0068 3.0002	0.0086 0.0002	48IB32	48IB36	48IB40	48IB48	48IB56	48IB60	48IB64	48IB72	48IB76
3.2500 3.2480	3.4372 3.4358	3.2568 3.2502	0.0088 0.0002	52IB32	52IB36	52IB40	52IB48	52IB56	52IB60	52IB64	52IB72	52IB76
3.5000 3.4978	3.6872 3.6858	3.5068 3.5002		56IB32	56IB36	56IB40	56IB48	56IB56	56IB60	56IB64	56IB72	56IB76
3.6250 3.6228	3.8122 3.8108	3.6318 3.6252		58IB32	58IB36	58IB40	58IB48	58IB56	58IB60	58IB64	58IB72	58IB76
3.7500 3.7478	3.9372 3.9358	3.7568 3.7502	0.0090 0.0002	60IB32	60IB36	60IB40	60IB48	60IB56	60IB60	60IB64	60IB72	60IB76
4.0000 3.9978	4.1872 4.1858	4.0068 4.0002		64IB32	64IB36	64IB40	64IB48	64IB56	64IB60	64IB64	64IB72	64IB76
4.2500 4.2478	4.4372 4.4358	4.2568 4.2502		68IB32	68IB36	68IB40	68IB48	68IB56	68IB60	68IB64	68IB72	68IB76
4.3750 4.3728	4.5622 4.5608	4.3818 4.3752		70IB32	70IB36	70IB40	70IB48	70IB56	70IB60	70IB64	70IB72	70IB76
4.5000 4.4978	4.6872 4.6858	4.5068 4.5002		72IB32	72IB36	72IB40	72IB48	72IB56	72IB60	72IB64	72IB72	72IB76
4.7500 4.7478	4.9374 4.9358	4.7572 4.7502	0.0094 0.0002	76IB32	76IB36	76IB40	76IB48	76IB56	76IB60	76IB64	76IB72	76IB76
4.9986 4.9961	5.1860 5.1844	5.0056 4.9988		80IB32	80IB36	80IB40	80IB48	80IB56	80IB60	80IB64	80IB72	80IB76
5.2500 5.2475	5.4374 5.4358	5.2570 5.2502		84IB32	84IB36	84IB40	84IB48	84IB56	84IB60	84IB64	84IB72	84IB76
5.5000 5.4975	5.6874 5.6858	5.5070 5.5002		88IB32	88IB36	88IB40	88IB48	88IB56	88IB60	88IB64	88IB72	88IB76
5.7500 5.7475	5.9374 5.9358	5.7570 5.7502	0.0095 0.0002	92IB32	92IB36	92IB40	92IB48	92IB56	92IB60	92IB64	92IB72	92IB76
6.0000 5.9975	6.1874 6.1858	6.0070 6.0002		96IB32	96IB36	96IB40	96IB48	96IB56	96IB60	96IB64	96IB72	96IB76
6.2500 6.2475	6.4374 6.4358	6.2570 6.2502		100IB32	100IB36	100IB40	100IB48	100IB56	100IB60	100IB64	100IB72	100IB76
6.5000 6.4975	6.6874 6.6858	6.5070 6.5002		104IB32	104IB36	104IB40	104IB48	104IB56	104IB60	104IB64	104IB72	104IB76
6.7500 6.7475	6.9374 6.9358	6.7570 6.7502		108IB32	108IB36	108IB40	108IB48	108IB56	108IB60	108IB64	108IB72	108IB76
6.9954 6.9929	7.1830 7.1812	7.0026 6.9956	0.0097 0.0002	112IB32	112IB36	112IB40	112IB48	112IB56	112IB60	112IB64	112IB72	112IB76

CSB-50 / CSB-40 / CSB-11 (Inch Size)

Order Spec.

CSB-50 — Material
08 — DsX16
FIB — Flanged Inch Bearing
16 — Bx16

Materials: CSB-50,CSB-40, CSB-11



Unit: inch"

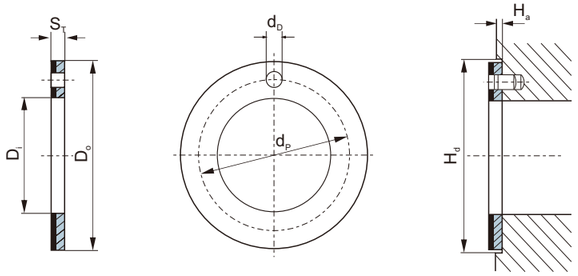
Shaft D_S	Housing H7 D_H	ID after fixed D_{La}	Clearance C_D	Nominal Flange D_{fl}	Flange Thickness S_{fl}	Length ±0.010			
0.3750 0.3740	0.4691 0.4684	0.3779 0.3752	0.0039 0.0002	0.7075 0.6675	0.052 0.044	06FIB04	06FIB06	06FIB08	06FIB12
0.5000 0.4990	0.5941 0.5934	0.5029 0.5002	0.0039 0.0002	0.8325 0.7925	0.052 0.044	08FIB04	08FIB06	08FIB08	08FIB12
0.6250 0.6240	0.7192 0.7184	0.6280 0.6252	0.0040 0.0002	0.9575 0.9175	0.052 0.044	10FIB06	10FIB08	10FIB10	10FIB12
0.7500 0.7488	0.8755 0.8747	0.7534 0.7502	0.0046 0.0002	1.1450 1.1050	0.068 0.060	12FIB06	12FIB08	12FIB12	12FIB16
0.8750 0.8738	1.0005 0.9997	0.8784 0.8752	0.0046 0.0002	1.2200 1.1800	0.068 0.060	14FIB08	14FIB12	14FIB16	14FIB20
1.0000 0.9988	1.1255 1.1247	1.0034 1.0002	0.0046 0.0002	1.3950 1.3550	0.068 0.060	16FIB08	16FIB12	16FIB16	16FIB20
1.2500 1.2484	1.4068 1.4058	1.2540 1.2502	0.0056 0.0002	1.7700 1.7300	0.083 0.075	20FIB16	20FIB20	20FIB24	
1.5000 1.4984	1.6568 1.6558	1.5040 1.5002	0.0056 0.0002	2.0200 1.9800	0.083 0.075	24FIB16	24FIB24	24FIB32	
1.7500 1.7484	1.9381 1.9371	1.7548 1.7502	0.0064 0.0002	2.3950 2.3550	0.098 0.090	28FIB16	28FIB24	28FIB32	

CSB-50 / CSB-40 / CSB-11 (Inch Size)

Order Spec.

CSB-50	WC	22	IB
Material	Washer	shaft ODX16	Inch

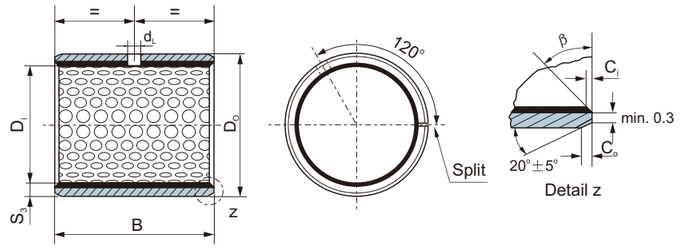
Materials: CSB-50,CSB-40, CSB-11



Unit: inch"

Designation	Washer dimension				Installation size		
	Inner side D_I+0.010	Outside D_o-0.010	S_T	d_P -0.01	d_D +0.010	H_a±0.010	H_d+0.010
WC06IB	0.500	0.875		0.692	0.067		0.875
WC07IB	0.562	1.000		0.786			1.000
WC08IB	0.625	1.125		0.880	0.099		1.125
WC09IB	0.687	1.187		0.942			1.187
WC10IB	0.750	1.250		1.005			1.250
WC11IB	0.812	1.375		1.099		0.04	1.375
WC12IB	0.875	1.500	0.0630	1.192	0.130		1.500
WC13IB	0.937	1.625	0.0610	1.286			1.625
WC14IB	1.000	1.750		1.380			1.750
WC16IB	1.125	2.000		1.567	0.161		2.000
WC18IB	1.250	2.125		1.692			2.125
WC20IB	1.375	2.250		1.817			2.250
WC22IB	1.500	2.500		2.005	0.192		2.500
WC24IB	1.625	2.625		2.130		0.07	2.625
WC26IB	1.750	2.750		2.255			2.750
WC28IB	2.000	3.000	0.0930	2.505			3.000
WC30IB	2.125	3.125	0.0910	2.630			3.125
WC32IB	2.250	3.250		2.755			3.250

CSB-20 (Metric Size)



ID and OD chamfers

S_3	C_O	C_1	α	β
1.00	0.6±0.4	0.6±0.3	20° ±8°	30° ±8°
1.50	0.6±0.4	0.7±0.3	20° ±8°	30° ±8°

S_3	C_O	C_1	α	β
2.00	1.2±0.4	0.7±0.3	20° ±8°	30° ±8°
2.50	1.8±0.6	0.8±0.3	20° ±8°	30° ±8°

Unit:mm

Shaft D_S h8	Housing H7 D_H	OD tolerance D_O	ID after fixed $D_{I,a}$	Clearance C_D	Wall thickness S_3	Oil hole d_L	B $^{0}_{-0.40}$									
							10	15	20	25	30	35	40	45	50	60
$10_{-0.022}$	$12^{+0.018}$	$12^{+0.065}_{+0.030}$	10.108 10.040	0.130 0.040	0.980 0.955	4	1010	1015	1020							
$12_{-0.027}$	$14^{+0.018}$	$14^{+0.065}_{+0.030}$	12.108 12.040	0.135 0.040			1210	1215	1220							
$14_{-0.027}$	$16^{+0.018}$	$16^{+0.065}_{+0.030}$	14.108 14.040					1415	1420							
$15_{-0.027}$	$17^{+0.018}$	$17^{+0.065}_{+0.030}$	15.108 15.040					1515	1520	1525						
$16_{-0.027}$	$18^{+0.018}$	$18^{+0.065}_{+0.030}$	16.108 16.040					1615	1620	1625						
$18_{-0.027}$	$20^{+0.021}$	$20^{+0.075}_{+0.035}$	18.111 18.040	0.138 0.040				1815	1820	1825						
$20_{-0.033}$	$23^{+0.021}$	$23^{+0.075}_{+0.035}$	20.131 20.050	0.164 0.050	1.475 1.445			2015	2020	2025	2030					
$22_{-0.033}$	$25^{+0.021}$	$25^{+0.075}_{+0.035}$	22.131 22.050					2215		2225						
$25_{-0.033}$	$28^{+0.021}$	$28^{+0.075}_{+0.035}$	25.131 25.050			6		2515	2520	2525	2530					
$28_{-0.033}$	$32^{+0.025}$	$32^{+0.085}_{+0.045}$	28.155 28.060	0.188 0.060	1.970 1.935				2820		2830					
$30_{-0.033}$	$34^{+0.025}$	$34^{+0.085}_{+0.045}$	30.155 30.060						3020	3025	3030		3040			
$35_{-0.039}$	$39^{+0.025}$	$39^{+0.085}_{+0.045}$	35.155 35.060	0.194 0.060					3520		3530	3535	3540			
$40_{-0.039}$	$44^{+0.025}$	$44^{+0.085}_{+0.045}$	40.155 40.060			8			4020		4030		4040		4050	
$45_{-0.039}$	$50^{+0.025}$	$50^{+0.085}_{+0.045}$	45.195 45.080	0.234 0.080	2.460 2.415				4520		4530		4540	4545	4550	
$50_{-0.039}$	$55^{+0.030}$	$55^{+0.100}_{+0.055}$	50.200 50.080	0.239 0.080							5030		5040		5050	5060
$55_{-0.046}$	$60^{+0.030}$	$60^{+0.100}_{+0.055}$	55.200 55.080	0.246 0.080							5530		5540		5550	5560
$60_{-0.046}$	$65^{+0.030}$	$65^{+0.100}_{+0.055}$	60.200 60.080								6030		6040		6050	6060

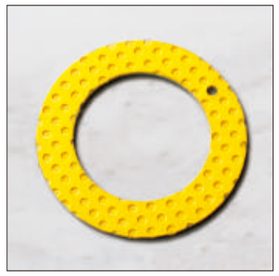
CSB-20 (Metric Size)

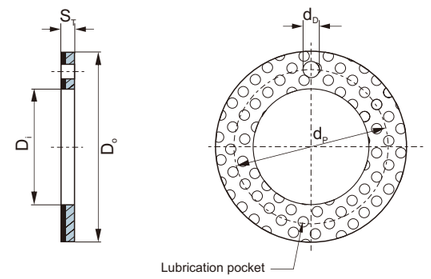
Unit:mm

Shaft D_S h8	Housing H7 D_H	OD tolerance D_O	ID after fixed $D_{i,a}$	Clearance C_D	Wall thickness S_3	Oil hole d_L	B $^{0}_{-0.40}$ 40	50	60	80	90	95	100	110	120
$65_{-0.046}$	$70^{+0.030}$	$70^{+0.100}_{+0.055}$	65.200 65.080	0.246 0.080	2.460 2.415	8	6540		6560						
$70_{-0.046}$	$75^{+0.030}$	$75^{+0.100}_{+0.055}$	70.200 70.080				7040	7050		7080					
$75_{-0.046}$	$80^{+0.030}$	$80^{+0.100}_{+0.055}$	75.200 75.080				7540		7560	7580					
$80_{-0.046}$	$85^{+0.035}$	$85^{+0.120}_{+0.070}$	80.265 80.100	0.313 0.100	2.450 2.385	9.5	8040		8060	8080					
$85_{-0.054}$	$90^{+0.035}$	$90^{+0.120}_{+0.070}$	85.265 85.100	0.321 0.100			8540		8560	8580					
$90_{-0.054}$	$95^{+0.035}$	$95^{+0.120}_{+0.070}$	90.265 90.100				9040		9060	9080	9090				
$100_{0.054}$	$105^{+0.035}$	$105^{+0.120}_{+0.070}$	100.265 100.100					10050		10080		10095			
$105_{0.054}$	$110^{+0.035}$	$110^{+0.120}_{+0.070}$	105.265 105.110						10560	10580		10595		105110	
$110_{-0.054}$	$115^{+0.035}$	$115^{+0.120}_{+0.070}$	110.265 110.110						11060	11080		11095		110110	
$120_{-0.054}$	$125^{+0.040}$	$125^{+0.170}_{+0.100}$	120.270 120.110	0.324 0.110					12060	12080				120110	
$125_{0.063}$	$130^{+0.040}$	$130^{+0.170}_{+0.100}$	125.270 125.110						12560					125110	
$130_{0.063}$	$135^{+0.040}$	$135^{+0.170}_{+0.100}$	130.270 130.110					13050	13060	13080			130100		
$140_{0.063}$	$145^{+0.040}$	$145^{+0.170}_{+0.100}$	140.270 140.110					14050	14060	14080			140100		
$150_{0.063}$	$155^{+0.040}$	$155^{+0.170}_{+0.100}$	150.270 150.110					15050	15060	15080			150100		
$160_{0.063}$	$165^{+0.040}$	$165^{+0.170}_{+0.100}$	160.270 160.110			9.5		16050	16060	16080			160100		
$170_{0.063}$	$175^{+0.040}$	$175^{+0.170}_{+0.100}$	170.270 170.110					17050		17080			170100		
$180_{0.063}$	$185^{+0.046}$	$185^{+0.210}_{+0.130}$	180.276 180.110	0.339 0.110				18050	18060	18080			180100		
$190_{0.072}$	$195^{+0.046}$	$195^{+0.210}_{+0.130}$	190.276 190.110					19050	19060	19080			190100		190120
$200_{0.072}$	$205^{+0.046}$	$205^{+0.210}_{+0.130}$	200.276 200.110					20050	20060	20080			200100		200120
$220_{0.072}$	$225^{+0.046}$	$225^{+0.210}_{+0.130}$	220.276 220.110					22050	22060	22080			220100		220120
$240_{0.072}$	$245^{+0.046}$	$245^{+0.210}_{+0.130}$	240.276 240.110					24050	24060	24080			240100		240120
$250_{0.072}$	$255^{+0.052}$	$255^{+0.260}_{+0.170}$	250.282 250.110	0.354 0.110		9.5		25050	25060	25080			250100		250120
$260_{0.081}$	$265^{+0.052}$	$265^{+0.260}_{+0.170}$	260.282 260.110					26050	26060	26080			260100		260120
$280_{0.081}$	$285^{+0.052}$	$285^{+0.260}_{+0.170}$	280.282 280.110					28050	28060	28080			280100		280120
$300_{0.081}$	$305^{+0.052}$	$305^{+0.260}_{+0.170}$	300.282 300.110					30050	30060	30080			300100		300120

CSB-20 (Metric Size)

Metric thrust washer

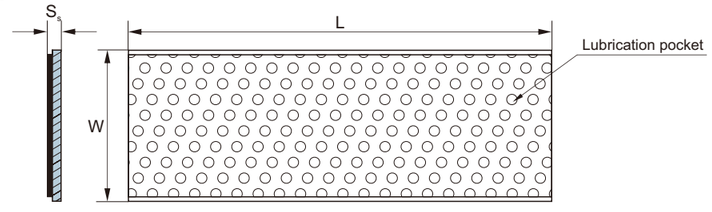




Unit:mm

Shaft D_S	Designation	Washer dimension D_i +0.25	D_o -0.25	S_T $^{-0.01}_{-0.06}$	d_P ±0.125	Installation size d_D $^{+0.4}_{+0.1}$	H_a ±0.2	H_d +0.12
8	WC10	10	20	1.5	15	1.5	1	20
10	WC12	12	24		18			24
12	WC14	14	26		20	2		26
14	WC16	16	30		23			30
16	WC18	18	32		25			32
18	WC20	20	36		28	3		36
20	WC22	22	38		30			38
22	WC24	24	42		33			42
24	WC26	26	44		35			44
26	WC28	28	48		38	4		48
30	WC32	32	54		43			54
36	WC38	38	62		50			62
40	WC42	42	66		54			66
46	WC48	48	74	2	61	1.5		74
50	WC52	52	78		65			78
60	WC62	62	90		76			90

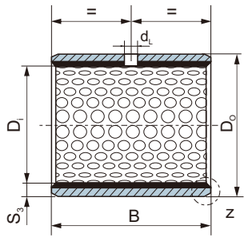
Metric standard strip

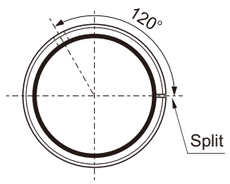


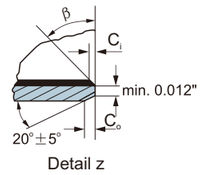
Unit:mm

Type	Length ±1	Width ±1	Thickness -0.05
CSB-20SP	500	150	1.0
CSB-20SP	500	150	1.5
CSB-20SP	500	150	2.0
CSB-20SP	500	150	2.5

CSB-20 (Inch Size)







ID and OD chamfers

S_3	C_O	C_I	α	β
0.0472	0.008-0.039	0.012-0.035	20° ±8°	30° ±8°
0.0630	0.008-0.039	0.016-0.039	20° ±8°	30° ±8°

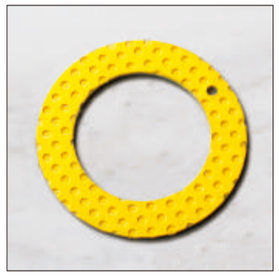
S_3	C_O	C_I	α	β
0.0787	0.031-0.063	0.016-0.039	20° ±8°	30° ±8°
0.0945	0.047-0.094	0.020-0.043	20° ±8°	30° ±8°

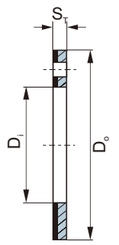
Unit:inch"

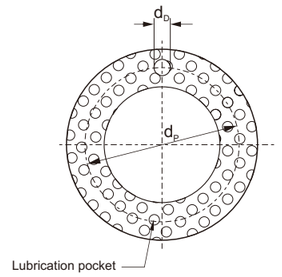
D_i	D_O	Shaft D_S	Housing H7 D_H	ID after fixed $D_{i,a}$	Clearance C_D	Wall thickness S_3	Oil hole d_L	Length±0.010			
3/8	15/32	0.3648 0.3639	0.4694 0.4687	0.3694 0.3667	0.0055 0.0019	0.0510 0.0500	—	06IB06	06IB08	06IB12	
7/16	17/32	0.4273 0.4263	0.5319 0.5312	0.4319 0.4292	0.0056 0.0019			07IB08	07IB12		
1/2	19/32	0.4897 0.4887	0.5944 0.5937	0.4944 0.4917	0.0057 0.0020			08IB06	08IB08	08IB10	08IB14
9/16	21/32	0.5522 0.5512	0.6569 0.6562	0.5569 0.5542	0.0057 0.0020		5/32	09IB08	09IB12		
5/8	23/32	0.6146 0.6136	0.7195 0.7178	0.6195 0.6167	0.0059 0.0021			10IB08	10IB10	10IB12	10IB14
11/16	25/32	0.6770 0.6760	0.7820 0.7812	0.6820 0.6792	0.0060 0.0022			11IB14			
3/4	7/8	0.7390 0.7378	0.8758 0.8750	0.7444 0.7412	0.0066 0.0022	0.0669 0.0657		12IB08	12IB12	12IB16	
7/8	1	0.8639 0.8627	1.0008 1.0000	0.8694 0.8662	0.0067 0.0023		1/4	14IB12	14IB14	14IB16	
1	1 1/8	0.9888 0.9876	1.1258 1.1250	0.9944 0.9912	0.0068 0.0024			16IB12	16IB16	16IB24	
1 1/8	1 9/32	1.1138 1.1126	1.2822 1.2812	1.1202 1.1164	0.0076 0.0026	0.0824 0.0810		18IB12	18IB16		
1 1/4	1 13/32	1.2387 1.2371	1.4072 1.4062	1.2452 1.2414	0.0081 0.0027			20IB12	20IB16	20IB20	20IB28
1 3/8	1 17/32	1.3635 1.3619	1.5322 1.5312	1.3702 1.3664	0.0083 0.0029			22IB16	22IB22	22IB28	
1 1/2	1 21/32	1.4884 1.4868	1.6572 1.6562	1.4952 1.4914	0.0084 0.0030		5/16	24IB16	24IB20	24IB24	
1 5/8	1 25/32	1.6133 1.6117	1.7822 1.7812	1.6202 1.6164	0.0085 0.0031			26IB16	26IB24		24IB32
1 3/4	1 15/16	1.7383 1.7367	1.9385 1.9375	1.7461 1.7415	0.0094 0.0032	0.0980 0.0962		28IB16	28IB24	28IB28	
1 7/8	2 1/16	1.8632 1.8616	2.0637 2.0625	1.8713 1.8665	0.0097 0.0033			30IB16	30IB30	30IB36	28IB32
2	2 3/16	1.9881 1.9863	2.1887 2.1875	1.9963 1.9915	0.0100 0.0034			32IB16	32IB24	32IB32	
2 1/4	2 7/16	2.2378 2.2360	2.4387 2.4375	2.2463 2.2415	0.0103 0.0037			36IB32	36IB36	36IB40	32IB40
2 1/2	2 11/16	2.4875 2.4857	2.6887 2.6875	2.4963 2.4915	0.0106 0.0040			40IB32	40IB40		
2 3/4	2 15/16	2.7351 2.7333	2.9387 2.9375	2.7457 2.7393	0.0124 0.0042	0.0991 0.0965		44IB32	44IB40	44IB48	
3	3 3/16	2.9849 2.9831	3.1889 3.1875	2.9959 2.9893	0.0128 0.0044		3/8	48IB32	48IB48	48IB60	
3 1/2	3 11/16	3.4844 3.4822	3.6889 3.6875	3.4959 3.4893	0.0137 0.0049			56IB40	56IB48	56IB60	44IB56
4	4 3/16	3.9839 3.9817	4.1889 4.1875	3.9959 3.9893	0.0142 0.0054			64IB48	64IB60	64IB76	

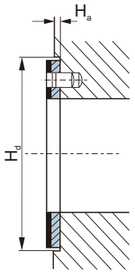
CSB-20 (Inch Size)

Inch Thrust washer









Unit:inch"

Specification	Dimension				installation size		
	inner side D_i+0.010	outside D_o-0.010	S_T	d_P -0.010	d_D +0.010	H_a ±0.010	H_d +0.010
WC06IB	0.500	0.875	0.0660 0.0625	0.692	0.067	0.04	0.875
WC07IB	0.562	1.000		0.786			1.000
WC08IB	0.625	1.125		0.880	0.099		1.125
WC09IB	0.687	1.187		0.942			1.187
WC10IB	0.750	1.250		1.005			1.250
WC11IB	0.812	1.375		1.099			1.375
WC12IB	0.875	1.500		1.192	0.130		1.500
WC13IB	0.937	1.625		1.286			1.625
WC14IB	1.000	1.750		1.380			1.750
WC16IB	1.125	2.000		1.567	0.161		2.000
WC18IB	1.250	2.125		1.692			2.125
WC20IB	1.375	2.250		1.817			2.250
WC22IB	1.500	2.500		2.005	0.192		2.500
WC24IB	1.625	2.625		2.130			2.625
WC26IB	1.750	2.750		2.255			2.750
WC28IB	2.000	3.000	0.0970 0.0935	2.505		0.07	3.000
WC30IB	2.125	3.125		2.630			3.125
WC32IB	2.250	3.250		2.755			3.250

Bi-metallic Composite Bearings

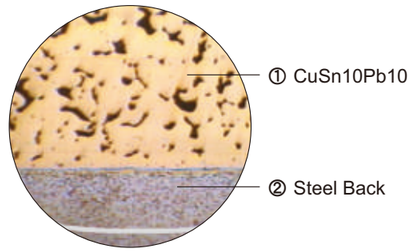
CSB Bi-metallic composite bearing material is steel shell backed with low friction and excellent wear resistance bonze powder as bearing layer, the designed oil pocket, groove and holes are suitable for lubricated application to improve the PV value. The bearing layer include lead bronze, lead-free bronze and lead-free with solid lubricant for high performance.

CSB-800 Steel with Lead Bronze Powder

Structure

1. Sinter bronze powder: good wear resistance and excellent load carrying capacity.

2. Steel backing: provides exceptionally high load carrying capacity, excellent heat dissipation.



Features

Steel shell backed with a lead bronze lining bearing material for oil lubricated applications. This material has high load capacity and good fatigue properties. It is widely used in automotive applications such as compressors, steering gear, power steering, pedal bearings, king-pin bushes, tailgate pivots, mechanical handling and lifting equipment, hydraulic motors, agricultural machinery etc.

Tech. Data

Max. load	Static	250N/mm^2	Alloy hardness	≥HB70
	Dynamic	140N/mm^2	Temp.	-40℃~+250℃
Max. speed (Lubricated)		2.5m/s	Friction coefficient	0.05~0.20
Max. PV		2.8N/mm^2*m/s	Thermal conductivity	60W(m*k)$^{-1}$
Breaking Load		350N/mm^2	Coef. of thermal expansion	14*10^{-6}*K^{-1}

Typical Applications

This material is recommended to be used under the medium speed and medium load condition with oil or grease lubricating. It is widely used for motor rod ends, Kingpin bushing, undercarriage rollers, hydraulic cylinder rod eyes of construction machines and spherical joint bearings of agricultural machines. Because this material is with lead, the specific parts are not allowed to be used according to certain laws or regulations.

CSB-820 Steel with Lead-free Bronze Powder

RoHS

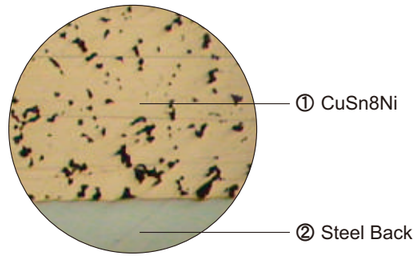
Features

Steel backing lead-free bronze layer provides high specific loads, excellent fatigue strength under dynamic and shock load application, superior performance under oscillating movement, indents and grooves in the bearing lining provide a reservoir for grease and thus allow extended re-greasing intervals. Lead free bearing lining can meet EC directive of 2000/53/EC.

Structure

1. Sinter lead-free bronze powder, provides bearing performance, have good wear resistance and excellent load carrying capacity.

2. Steel backing, provides exceptionally high load carrying capacity and excellent heat dissipation.



Tech. Data

Max. load	Static	250N/mm^2		Alloy hardness	≥HB70
	Dynamic	140N/mm^2		Temp.	-40℃~+250℃
Max. speed (Lubricated)		2.5m/s		Friction coefficient	0.05~0.20
Max. PV		2.8N/mm^2*m/s		Thermal conductivity	60W(m*k)$^{-1}$
Breaking Load		350N/mm^2		Coef. of thermal expansion	14*10^{-6}*K^{-1}

Typical Applications

This material is recommended to be used under the medium speed and medium load condition with oil or grease lubricating. It is widely used for motor rod ends, Kingpin bushing, undercarriage rollers, hydraulic cylinder rod eyes of construction machines and spherical joint bearings of agricultural machines.

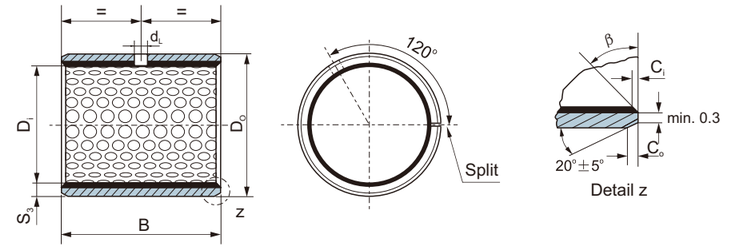
CSB-800 / CSB-820 (Metric Size)

Order Spec.

CSB-800 — 90 — 80

CSB-800: Material; 90: Di; 80: B

Materials: CSB-800, CSB820



ID and OD chamfers

S_3	C_O	C_i	β
1.00	0.6±0.3	0.30±0.2	35° ±5°
1.50	0.7±0.3	0.50±0.3	35° ±5°

S_3	C_O	C_i	β
2.00	1.2±0.4	0.50±0.3	35° ±5°
2.50	1.8±0.6	0.60±0.3	45° ±5°

Unit:mm

D_i	D_O	Shaft D_S h8	Housing H7 D_H	ID after fixed $D_{i\,a}$	Clearance C_D	Wall thickness S_3	Oil hole d_L	B $^{0}_{-0.40}$ 10	15	20	25	30	40	50
10	12	$10_{-0.022}$	$12^{+0.018}$	+0.148 +0.010	0.170 0.010	0.995 0.935	4	1010	1015	1020				
12	14	$12_{-0.027}$	$14^{+0.018}$					1210	1215	1220				
14	16	$14_{-0.027}$	$16^{+0.018}$		0.175 0.010			1410	1415	1420				
15	17	$15_{-0.027}$	$17^{+0.018}$					1510	1515	1520				
16	18	$16_{-0.027}$	$18^{+0.018}$					1610	1615	1620				
18	20	$18_{-0.027}$	$20^{+0.021}$	+0.151 +0.010	0.178 0.010			1810	1815	1820	1825			
20	23	$20_{-0.033}$	$23^{+0.021}$	+0.161 +0.020	0.194 0.020	1.490 1.430		2010	2015	2020	2025			
22	25	$22_{-0.033}$	$25^{+0.021}$				6	2210	2215	2220	2225			
24	27	$24_{-0.033}$	$27^{+0.021}$					2410	2415	2420	2425	2430		
25	28	$25_{-0.033}$	$28^{+0.021}$						2515	2520	2525	2530		
26	30	$26_{-0.033}$	$30^{+0.021}$	+0.181 +0.040	0.214 0.040	1.980 1.920			2615	2620	2625	2630		
28	32	$28_{-0.033}$	$32^{+0.025}$	+0.185 +0.040	0.218 0.040				2815	2820	2825	2830	2840	
30	34	$30_{-0.033}$	$34^{+0.025}$						3015	3020	3025	3030	3040	
32	36	$32_{-0.039}$	$36^{+0.025}$		0.224 0.040				3215	3220	3225	3230	3240	
35	39	$35_{-0.039}$	$39^{+0.025}$							3520	3525	3530	3540	3550
38	42	$38_{-0.039}$	$42^{+0.025}$				8			3820	3825	3830	3840	3850
40	44	$40_{-0.039}$	$44^{+0.025}$							4020	4025	4030	4040	4050

CSB-800 / CSB-820 (Metric Size)

Unit:mm

D_i	D_O	Shaft D_S h8	Housing H7 D_H	ID after fixed D_{La}	Clearance C_D	Wall thickness S_3	Oil hole d_L	B $^{0}_{-0.40}$							
								25	30	40	50	60	80	90	100
45	50	$45_{-0.039}$	$50^{+0.025}$	+0.225 +0.080	0.264 0.080	2.460 2.400	8	4525	4530	4540	4550				
50	55	$50_{-0.039}$	$55^{+0.030}$	+0.230 +0.080	0.269 0.080				5030	5040	5050	5060			
55	60	$55_{-0.046}$	$60^{+0.030}$		0.276 0.080				5530	5540	5550	5560			
60	65	$60_{-0.046}$	$65^{+0.030}$						6030	6040	6050	6060			
65	70	$65_{-0.046}$	$70^{+0.030}$						6530	6540	6550	6560			
70	75	$70_{-0.046}$	$75^{+0.030}$						7030	7040	7050	7060	7080		
75	80	$75_{-0.046}$	$80^{+0.030}$				9.5		7530	7540	7550	7560			
80	85	$80_{-0.046}$	$85^{+0.035}$	+0.235 +0.080	0.281 0.080					8040	8050	8060	8080		
85	90	$85_{-0.054}$	$90^{+0.035}$		0.289 0.080				8530		8550	8560	8580		85100
90	95	$90_{-0.054}$	$95^{+0.035}$								9050	9060	9080		90100
95	100	$95_{-0.054}$	$100^{+0.035}$									9560	9580	9590	95100
100	105	$100_{-0.054}$	$105^{+0.035}$									10060	10080	10090	100100
105	110	$105_{-0.054}$	$110^{+0.035}$									10560	10580		105100
110	115	$110_{-0.054}$	$115^{+0.035}$									11060	11080		110100
115	120	$115_{-0.054}$	$120^{+0.035}$								11550		11580		
120	125	$120_{-0.054}$	$125^{+0.040}$	+0.240 +0.080	0.303 0.080						12050	12060			120100
125	130	$125_{-0.063}$	$130^{+0.040}$												125100
130	135	$130_{-0.063}$	$135^{+0.040}$									13060			130100
135	140	$135_{-0.063}$	$140^{+0.040}$									13560	13580		
140	145	$140_{-0.063}$	$145^{+0.040}$									14060	14080		140100
150	155	$150_{-0.063}$	$155^{+0.040}$									15060	15080		150100

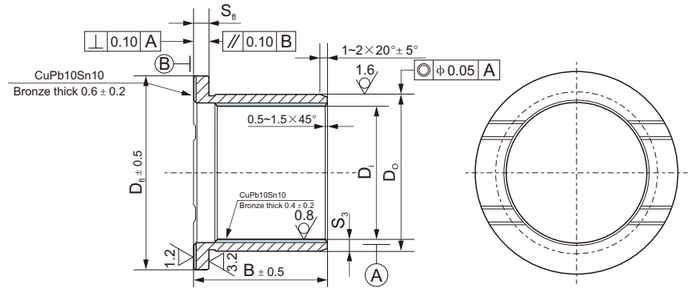
MJF-800 / MJF-820 (Metric Size)

Order Spec.

CSB-800 70 × 2 / 54 × 50 × 53

Material Di B Di B B

Materials: CSB-800, CSB820



Unit:mm

D_{fl} ± 0.5	S_3 ± 0.05	D_O		D_i	S_{fl}		B ± 0.5
44	3.5	36	+0.15 +0.10	30	3	-0.05 -0.10	40
45	4					-0.03 -0.08	30
60	3.5	41	+0.13 +0.08	35		-0.09 -0.15	42
52	4					0 -0.05	35
54	3.5	42	+0.10 +0.05		3.5	-0.02 -0.07	30
60	4.52	44	+0.14 +0.09	40	2	-0.03 -0.08	39.5
53	4.5						40
60	4						39.5
66	4	45			2.4		40
60	4.5	46	+0.12 +0.07		3		39.5
61	4					0 -0.05	40
62	4	47	+0.13 +0.07		3.5	-0.08 -0.13	49
70	4.5	54	+0.19 +0.14	50	2	-0.03 -0.08	53
68	4.52	54.9	+0.045 -0.005	48	3.5	-0.045 -0.095	41.3
70	3.5	56	+0.16 +0.11	50	3	-0.09 -0.14	48
76	3.5	57	+0.10 +0.05		3.5	+0.01 -0.04	54
70.5	8	58	+0.14 +0.09		4	-0.11 -0.16	46
92	4.52	60.6	+0.03 -0.02	54.4	3.1	+0.02 -0.03	59
87	4.5	67	+0.15 +0.10	60	3.5	-0.06 -0.11	60
77	4.5					-0.08 -0.13	65
88	8	68			4	-0.075 -0.125	58

D_{fl} ± 0.5	S_3 ± 0.05	D_O		D_i	S_{fl}		B ± 0.5
88	4.5	68	+0.15 +0.10	60	4	-0.07 -0.12	60
87	4.5	69	+0.19 +0.14	65	2	-0.03 -0.08	64.5
103	4.52	70.7	+0.09 +0.04	63.7	3.5	0 -0.05	65
103	4.52			63.3	3.7	+0.01 -0.04	73
86.4	4.5	72	+0.15 +0.09	65	3.5	-0.08 -0.13	64.5
95	4.52		+0.27 +0.21			-0.045 -0.095	71.5
95	3.5		+0.09 +0.03			-0.015 -0.065	64
108	3.5					-0.03 -0.08	75
87	4.5		+0.11 +0.06			+0.01 -0.04	53
95	4.52		+0.27 +0.21			-0.045 -0.095	67.5
99	4.5	74	+0.19 +0.14	70	2	-0.03 -0.08	74
112	4.6		+0.27 +0.21		3.5		89.5
95	4.5	77	+0.14 +0.09			-0.04 -0.10	72
112	4.52		+0.27 +0.21			-0.005 -0.055	89.7
93	6	78	+0.15 +0.09		4	-0.09 -0.14	71
93	8	80	+0.16 +0.10		5	-0.075 -0.125	70
107	4.5	83		75	4	-0.07 -0.13	74
97	10	85	+0.17 +0.12		5	-0.10 -0.16	79.5
97	5		+0.155 +0.095				70
120	3.8	92.6	+0.16 +0.09	85	3.8	+0.06 0	93
120	6	93			4	-0.11 -0.17	94

The above mentioned sizes are only for reference, CSB can produce the parts according to the customers drawings.

Bronze Wrapped Bearings

These bearings are wrapped from a cold formed homogenous bronze (CuSn8), which can achieve exceptional material properties. According to various lubrication conditions, we can provide diamond shaped lubrication indents (grease) and incorporate holes (oil), these designs can rapidly build up a lubrication film at the start of movement and thereafter reduce the running friction.

CSB-090 Bronze Wrapped Bearings with Oil Pockets

RoHS

Structure

The bearings are wrapped from a cold formed homogenous bronze (CuSn8) with exceptional material properties. The standard sizes are fitted with diamond shaped lubrication indents in the bearing surface. These indents serve as lubricant reservoirs to rapidly build up a lubrication film at the start of movement and thereafter reduce the running friction. The material is suitable for construction and agricultural machinery applications.

Chemical Compositions

Material type	Cu%	Sn%	P%	Pb%	Zn%
CSB-090	91.3	8.5	0.2	/	/

Tech. Data

Max. load	Static	120N/mm^2	Elongation	40%
	Dynamic	40N/mm^2	Temp.	-100℃~+200℃
Max. speed (Lubrication)		2m/s	Friction coefficient	0.08~0.25
Max. PV		2.8N/mm^2*m/s	Thermal conductivity	58W(m*k)$^{-1}$
Tensile strength		450N/mm^2	Coef. of thermal expansion	18.5*10^{-6}*K^{-1}
Hardness		HB 110-150		

Feature

1. Easy for fitting and lubricating
2. High load capacity
3. Inner Diameter machineable parts are available against order
4. High level thermal conductivity
5. Minimum overall dimensions
6. Chemical resistance.

Initial pre-lubrication at assembly required...

Typical Applications

This type of bushing is widely applied in hoisting machines and other construction machines, automobiles, tractors, trucks, machines tools and some mineral engines. It can be fabricated into bushes, half bearings, flanged bushes, trust washers, spherical bearing and so on.

CSB-T90 Bronze Wrapped Bearings with Through Holes

RoHS

Structure

The bearings are wrapped from a cold formed homogenous bronze (CuSn8) with exceptional material properties. The standard sizes incorporate holes, which are dispersed in a special way over the whole bearing surface. These holes serve as lubricant reservoirs to rapidly build up a lubrication film at the start of movement and thereafter reduce the running friction. The material is suitable for construction and agricultural machinery etc. where high load and slow movement occur.

Chemical Compositions

Material type	Cu%	Sn%	P%	Pb%	Zn%
CSB-T90	91.3	8.5	0.2	/	/

Tech. Data

Max. load	Static	120N/mm^2	Elongation	40%
	Dynamic	40N/mm^2	Temp.	-100℃~+200℃
Max. speed (Lubrication)		2.5m/s	Friction coefficient	0.08~0.25
Max. PV		2.8N/mm^2*m/s	Thermal conductivity	58W(m*k)$^{-1}$
Tensile strength		450N/mm^2	Coef. of thermal expansion	18.5*10^{-6}*K^{-1}
Hardness		HB 110-150		

Features

1. Easy of fitting and lubricate
2. High load capacity
3. Excellent wear resistance with lower friction
4. High level thermal conductivity
5. Minimum overall dimensions
6. Chemical resistance
7. Extended service life and lubrication intervals than normal CSB-090 type bearings
8. Free selection of lubricants
9. Collection of dust and rub off particles in the holes

Initial pre-lubrication at assembly is required...

Typical Applications

This type of bushing is widely applied in hoisting machines and other construction machines, automobiles, tractors, trucks, machines tools and some mineral engines. It can be fabricated into bushes, half bearings, flanged bushes, thrust washers, spherical bearing and so on.

CSB-09G Bronze Wrapped Bearings with Graphite

Order RoHS

Structure

These are similar to the CSB-090 range, except there are solid lubricants embedded into the diamond shaped lubrication indents on the bearing surface, which provide good lubrication conditions at the start up stage, even with a lack of oil. It can be used in construction machinery, gear boxes, automotive clutch parts etc.

Chemical Compositions

Material type	Cu%	Sn%	P%	Pb%	Zn%
CSB-09G	91.3	8.5	0.2	/	/

Tech. Data

Max. load	Static	120N/mm^2	Elongation	40%
	Dynamic	40N/mm^2	Temp.	-100℃~+200℃
Max. speed (Lubrication)		2.5m/s	Friction coefficient	0.05~0.25
Max. PV		2.8N/mm^2*m/s	Thermal conductivity	58W(m*k)$^{-1}$
Tensile strength		450N/mm^2	Coef. of thermal expansion	18.5*10^{-6}*K^{-1}
Hardness		HB＞110		

Feature

1. Easy of fitting and lubrication
2. High load capacity
3. Excellent wear resistance with lower friction
4. High level thermal conductivity
5. Minimum overall dimensions
6. Chemical resistance
7. Can work under dry/marginal lubrication for short period, lower friction factor at initial moving

Initial pre-lubrication at assembly is required...

Typical Applications

This type of bushing is widely applied in hoisting machines and other construction machines, automobiles, tractors, trucks, machines tools and some mineral engines.

Available

- Cylindrical Bushes
- Thrust Washers
- Non-standard parts as design

CSB-09G supplied by customer ordering, the tolerance is according to CSB-090 standard dimension.

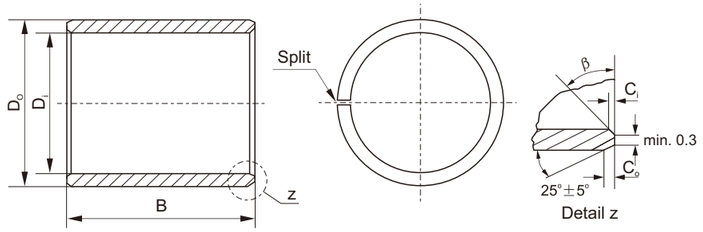
CSB-090 / CSB-T90 (Metric Size)

Order Spec.

CSB-090 — 25 — 15

Material — Di — B

Materials: CSB-090, CSB-T90



ID and OD chamfers

S_3	C_O	C_I	β
0.75	0.5±0.3	0.25±0.2	35° ±5°
1.00	0.6±0.3	0.30±0.2	35° ±5°
1.50	0.7±0.3	0.50±0.3	35° ±5°

S_3	C_O	C_I	β
2.00	1.2±0.4	0.50±0.3	35° ±5°
2.50	1.8±0.6	0.60±0.3	45° ±5°

Unit:mm

D_i	D_O	$B\ ^{0}_{-0.40}$												
		10	15	20	25	30	35	40	50	60	70	80	90	100
10	12	1010	1015	1020										
12	14	1210	1215	1220										
14	16	1410	1415	1420	1425									
15	17	1510	1515	1520	1525									
16	18	1610	1615	1620	1625									
18	20	1810	1815	1820	1825									
20	23	2010	2015	2020	2025									
22	25	2210	2215	2220	2225	2230								
24	27		2415	2420	2425	2430								
25	28		2515	2520	2525	2530								
28	31		2815	2820	2825	2830								
30	34		3015	3020	3025	3030	3035	3040						
32	36		3215	3220	3225	3230	3235	3240						
35	39		3515	3520	3525	3530	3535	3540						
40	44			4020	4025	4030	4035	4040	4050					
45	50			4520	4525	4530	4535	4540	4550					
50	55			5020	5025	5030	5035	5040	5050	5060				
55	60			5520	5525	5530	5535	5540	5550	5560				
60	65				6025	6030	6035	6040	6050	6060	6070			
65	70					6530	6535	6540	6550	6560	6570			
70	75					7030	7035	7040	7050	7060	7070	7080		
75	80					7530	7535	7540	7550	7560	7570	7580		
80	85					8030	8035	8040	8050	8060	8070	8080		
85	90					8530	8535	8540	8550	8560	8570	8580	8590	
90	95					9030	9035	9040	9050	9060	9070	9080	9090	
95	100							9540	9550	9560	9570	9580	9590	95100

CSB-090 / CSB-T90 (Metric Size)

Unit:mm

D_i	D_O	$B\ ^{0}_{-0.40}$									
		25	30	35	40	50	60	70	80	90	100
100	105					10050	10060	10070	10080	10090	100100
105	110					10550	10560	10570	10580	10590	105100
110	115					11050	11060	11070	11080	11090	110100
115	120					11550	11560	11570	11580	11590	115100
120	125						12060	12070	12080	12090	120100
125	130						12560	12570	12580	12590	125100
130	135						13060	13070	13080	13090	130100
135	140						13560	13570	13580	13590	135100
140	145						14060	14070	14080	14090	140100
145	150						14560	14570	14580	14590	145100
150	155						15060	15070	15080	15090	150100
155	160						15560	15570	15580	15590	155100
160	165						16060	16070	16080	16090	160100
165	170						16560	16570	16580	16590	165100
170	175						17060	17070	17080	17090	170100
175	180						17560	17570	17580	17590	175100
180	185						18060	18070	18080	18090	180100
185	190						18560	18570	18580	18590	185100
190	195						19060	19070	19080	19090	190100
195	200						19560	19570	19580	19590	195100
200	205						20060	20070	20080	20090	200100
205	210						20560	20570	20580	20590	205100
215	220						21560	21570	21580	21590	215100
225	230						22560	22570	22580	22590	225100
230	235						23060	23070	23080	23090	230100
240	245						24060	24070	24080	24090	240100
250	255						25060	25070	25080	25090	250100
260	265						26060	26070	26080	26090	260100
270	275						27060	27070	27080	27090	270100
280	285						28060	28070	28080	28090	280100
290	295						29060	29070	29080	29090	290100
300	305						30060	30070	30080	30090	300100

CSB-B90 / CSB-TB90 (Metric Size)

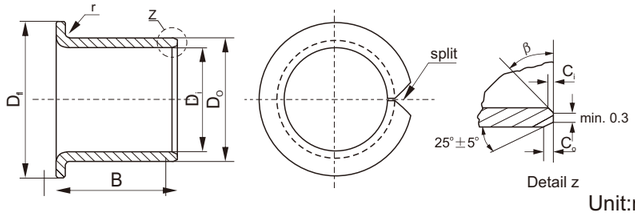
Order Spec.

CSB – B90 45 350

Material: CSB | Flanged Bushing: B90 | Di: 45 | B: 350

Materials: CSB-B90, CSB-TB90

S_3	1.0	1.5	2.0	2.5
r	$1^{-0.5}$	1±0.5	1.5±0.5	2±0.5



Unit:mm

D_i	D_o	D_{fl}	$B^{0}_{-0.40}$										
			15	20	25	30	35	40	50	60	70	80	90
25	28	35	25150	25200	25250								
30	34	45		30200	30250	30300							
35	39	50		35200	35250	35300	35350						
40	44	55			40250	40300	40350	40400					
45	50	60				45300	45350	45400	45500				
50	55	65				50300	50350	50400	50500				
55	60	70				55300	55350	55400	55500				
60	65	75				60300	60350	60400	60500	60600			
65	70	80				65300	65350	65400	65500	65600			
70	75	85					70350	70400	70500	70600	70700		
75	80	90					75350	75400	75500	75600	75700		
80	85	100					80350	80400	80500	80600	80700	80800	
90	95	110							90500	90600	90700	90800	90900
100	105	120							100500	100600	100700	100800	100900
110	115	130							110500	110600	110700	110800	110900
120	125	140							120500	120600	120700	120800	120900
130	135	155								130600	130700	130800	130900
140	145	165								140600	140700	140800	140900
150	155	180								150600	150700	150800	150900
160	165	190								160600	160700	160800	160900
170	175	200								170600	170700	170800	170900
180	185	215								180600	180700	180800	180900
190	195	225								190600	190700	190800	190900
200	205	235								200600	200700	200800	200900
225	230	260								225600	225700	225800	225900
250	255	290								250600	250700	250800	250900
265	270	305								265600	265700	265800	265900
285	290	325								285600	285700	285800	285900
300	305	340								300600	300700	300800	300900

CSB-090 / CSB-T90 (Metric Size)

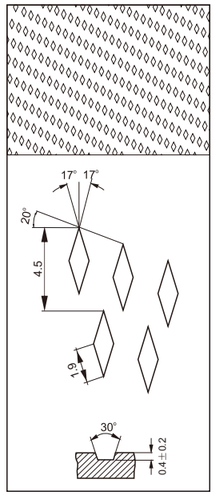
Bushes tolerance

Unit:mm

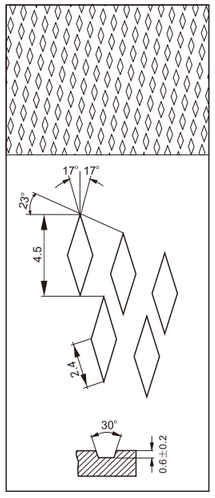
I.D.	10<d≤18	18<d≤30	30<d≤50	50<d≤80	80<d≤120	120<d≤180
O.D. tolerance	+0.080 +0.050	+0.095 +0.055	+0.120 +0.065	+0.135 +0.075	+0.150 +0.090	+0.200 +0.120
Installed I.D.H9	+0.043 0	+0.052 0	+0.062 0	+0.074 0	+0.087 0	+0.100 0
Housing: H7, Shaft: d7						

CSB-090
Oil pocket type

Inside Dia. ＜ Φ22

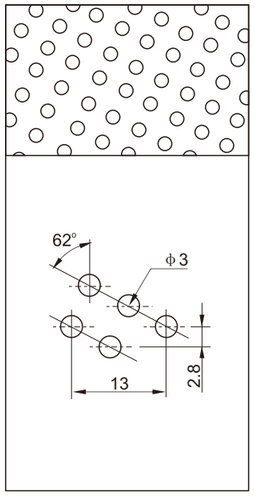


Inside Dia. ≥ Φ22

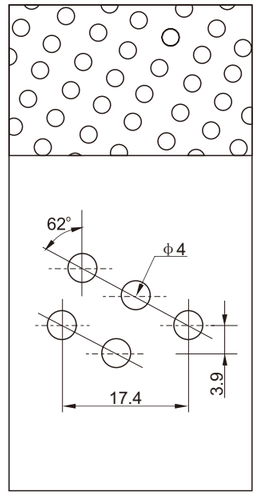


CSB-T90
Oil hole type

Inside Dia.≤ Φ25



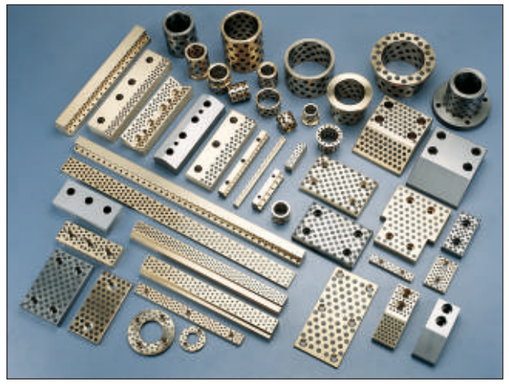
Inside Dia.≥ Φ28



Solid Bronze Bearing

The wear resistance metal back with the solid lubricants can continuously provide lubricating source during the bearing operation to achieve the self-lubricating feature. With the combination of heavy load and impact resistance of the metal and low friction factor of the non-metal, this material is good for the various working conditions. According to the alignment matrix of the lubricants, there are two different kinds of lubricating methods: one is embedded solid lubricants by a certain percentage of covering area and another is the uniformly dispersed lubricants into the working surface of the alloyed metal. The former one is suitable for low speed and medium to high load application while the latter is suitable for low friction requirement of micro movement and medium to high speed application.

CSB650 Cast Bronze Bearings with Graphite Plugs



Structure

CSB650 material is made of strong cast bronze based metal with special solid lubricants embedded. The base metal withstands high load and the solid lubricants provide self-lubrication. The bearing shows excellent performance without pre-lubrication under conditions of extreme high/low temperature with low speed. This material provides a maintenance-free bearing solution, particularly for high load, intermittent of oscillating motion.

Features

1. May work without any oil for long period
2. Extremely high load capacity, good anti-wear and lower friction
3. Particularly appropriate for low speed and high load
4. Suitable for reciprocating, oscillation or intermittent motion where oil film is hard to be formed
5. Good chemical resistant and anti-corrosion characteristics
6. Can be used in wide range of temperature from -40℃ ~+300℃

Typical Applications

This kind of bearing can be applied under dry, high temperature, high pressure, corrosive, water or other chemical environments when no oil can be introduced. It is widely used in automotive products line, water engineering, dam gate, plastic industries, successive casting machines, steel rollers in metallurgy industry, mineral machines, ships, turbo generators, hydraulic turbines and injection molding machines...

CSB650 Cast Bronze Bearings with Graphite Plugs

Main Metal Type

Grade		650	650S5	650W1	650W3	650S1	650S2	650S3
Material		CuZn25Al5Mn4				CuSn5Pb5Zn5	CuAl10Ni5Fe5	CuSn12
Density		7.8				8.9	7.8	8.9
HB hardness		⩾210	⩾240	⩾210	⩾235	⩾70	⩾100	⩾75
Tensile strength Mpa		⩾750	⩾800	⩾755	⩾755	⩾250	⩾500	⩾270
Yeild strength Mpa		⩾450	⩾450	⩾400	⩾400	⩾90	⩾260	⩾150
Elongation %		⩾12	⩾8	⩾12	⩾12	⩾13	⩾10	⩾5
Coefficient of linear expansion		$1.9x10^{-5}$/℃				$1.8x10^{-5}$/℃	$1.6x10^{-5}$/℃	$1.8x10^{-5}$/℃
Max. temp.		-40~+250℃				-40~+400℃		
Max. load Mpa		50	75	75	100	50		
Max. speed m/s	Dry	0.5	0.1	0.5	0.1	0.5		
	Lubrication	1	0.25	1	0.25	2.5		
Max. PV (N/mm^2*m/s)	Dry	1.65				1		
	Lubrication	3.25				1.65		

The above technical data is recommend from CSB, better to test under detail condition.

Solid Lubricants

Lubricant	Features	Typical application
SL1 Graphite+add	Excellent resistance against chemical attacks and low friction. Temp limit 400℃	Suite for general machines and under atmosphere
SL4 PTFE+MOS_2+add	Lower in friction and good for water lubrication, Temp. limit 300℃	Suite for water/sea lubrication, like ship, hydraulic turbine, gas turbine etc.

CSB650GT Steel Shell Cast Bronze Bearings with Graphite Plugs

Order

Structure

Steel shell with cast bronze bearing material liner with specially formulated solid lubricants embedded into the holes in the liner material. The process of casting bronze on steel achieves an integral metallurgical structure between bronze and steel with an increased carrying capacity while the material cost is considerably reduced. The solid lubricant can reduce the coefficient of friction and performs the self-lubricating function.

Features

CSB650GT combines the advantages of a metallic bearing and the self lubricating of graphite. It is particularly good for low-speed and high load applications, where external lubrication is not practical. The new based material provides economic solution and even good resistance to shock loads.

Available

- Cylindrical bushes
- Thrust washers
- Flange bushes
- Non-standard parts as design

CSB650GT supplied by customer ordering, the tolerance is according to CSB650 standard dimension.

Tech. Data

Max. load	Static	250N/mm^2		Temp.	-100℃~+300℃
	Dynamic	100N/mm^2		Friction coefficient	0.03~0.20
Max. speed	Dry	0.5m/s		Thermal conductivity	60W(m*k)$^{-1}$
	Lubrication	1.0m/s		Coef. of thermal expansion	19*10^{-6}*K^{-1}
Max. PV		3.25N/mm^2*m/s		Interlay bonding strength	150N/mm^2
Bronze alloy hardness		HB>210			

Typical Applications

This type of products can be widely used under high temperature and high load with low speed conditions, such as successive casting machinery, mineral machinery, injection molding machinery, dock machinery and so on.

CSB850S Metal Backed Fe-Ni Sintered Alloy with Solid Lubricants

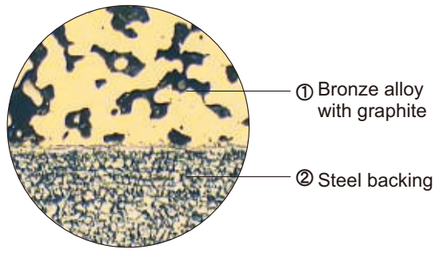
Order RoHS

Features

Pertinence for motions of any direction due to solid lubricant dispersed evenly, with high performance even for micro-range motions. It is suitable for self-lubrication work condition, to aid lower start friction, we recommend pre-lubricated if possible, oiling would be drastically reduced. It has very good load capacity, good wear resistance and lower friction. The bearing can be machined again after the parts fixed to get tighter tolerance.

Structure

CSB850 is a composite multi-layer bearing composed of a special sintered material which forms the sliding surface and steel material forms the backing. Sintered layers are of a special copper-nickel alloy containing uniformly dispersed solid lubricant, the main component of which is graphite. The solid lubricants will be released at the bearing surface as wear occurs. This ensures a lower coefficient of friction during operation. In addition, these sintered layers are oil impregnated. Applications covered are automotive die wear plates, industrial robots, plastic injection moulding machine wear plates and tie-bar bearings, construction machines etc.



Tech. Data

Max. load	Static	100N/mm^2		Temp.	-40℃~+120℃
	Dynamic	50N/mm^2		Friction coefficient	0.03~0.20
Max. speed	Dry	0.5m/s		Alloy hardness	>45HB
	Lubrication	＞1m/s		Coefficient of thermal expansion	14*10^{-6}*K^{-1}
Max. PV	Dry	1.5N/mm^2*m/s			
	Lubrication	2.5N/mm^2*m/s		Oil volume	>10%

Typical Applications

This material has been widely used in high load with lower friction and good wear resistance requested mechanical parts where oil given is difficult such as automotive die wear plate, industrial robots, injection wear plate, injection tie-bar bushes, construction machines self-lubricating bearings etc.

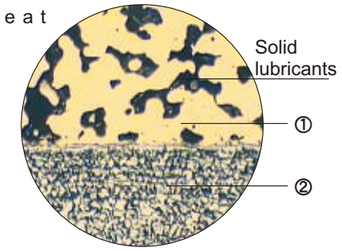
CSB850BM Metal Backed Bronze Powder with Solid Lubricants

Order

Structure

1.Sinter bronze powder with PTFE + graphite: good wear resistance with lower friction and excellent load carrying capacity. The material could be machined after fitting to get precision tolerance. CSB also can supply the bearings with PTFE or graphite sprayed layer on the work surface to get much lower start friction.

2. Metal backing: provides exceptionally high load carrying capacity and excellent heat dissipation.



Features

CSB850BM comprises a metal shell backed with sintered copper alloy which is uniformly dispersed with graphite and PTFE solid lubricants. The machined layer can not be exceeding the sintered layer thickness.

1. Suitable for hostile environments and high loads and where lubrication is difficult.
2. Suitable for rotary, oscillating and linear movements.
3. Suitable for micro-range movements.
4. No electrostatic charging.
5. Has low coefficient of friction without stick-slip effects.
6. Maintenance free operation.

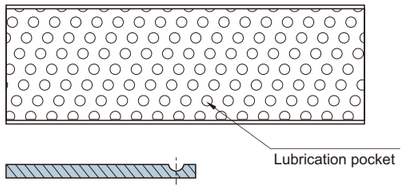
CSB850BM Metal Backed Bronze Powder with Solid Lubricants

Tech. Data

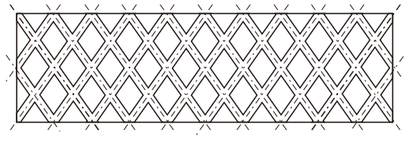
CSB standard material		CSB850BM1	CSB850BM2	CSB850BM1P	CSB850BM2P
Backing metal		Steel	Steel	Steel	Steel
Lining layer	Composition	CuSn13+SL	CuSn10Pb10+SL	CuSn12+SL	CuSn10Pb10+SL
	Solid lubricants	6%	6%	10~15%	10~15%
	Hardness	＞40HB	＞40HB	＞40HB	＞40HB
	Compression deformation 150Mpa	＜0.005mm	＜0.005mm	＜0.005mm	＜0.005mm
Max. load	Static	150N/mm^2	120N/mm^2	120N/mm^2	120N/mm^2
	Dynamic	100N/mm^2	80N/mm^2	80N/mm^2	80N/mm^2
Max. speed		0.5m/s	0.5m/s	1m/s	1m/s
Max. PV		1.5	1.5	1.5	1.5
Friction coefficient		0.05~0.2	0.03~0.2	0.03~0.15	0.03~0.15
Temp.℃		-195~+280	-195~+280	-195~+280	-195~+280

Bearing Surface

The standard bearings we supply are usually with plain surface, also we can supply the products with cleaning grooves for small angular movements or in the presence of abrasive media or dirt, and indented surface for grease lubricated applications.



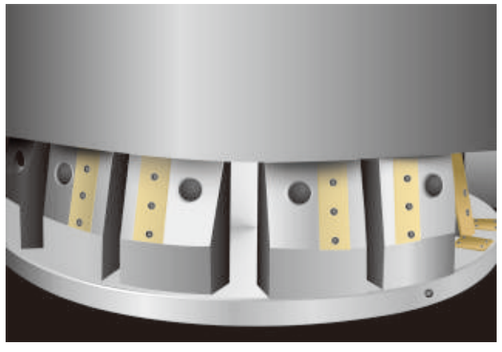
Indented surface for grease lubricated applications.



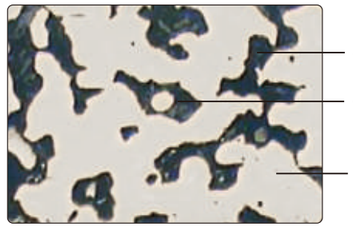
Cleaning grooves for small angular movements or in the presence of abrasive media or dirt.

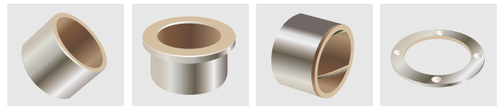
Typical Applications

CSB850BM has been widely used in water turbines, vane controls, injection moulding machinery, packing machines, construction equipment, tire moulds, paper production machinery, furnace expansion plates, automotive transmission, heavy lifting chain linkage, food production equipment etc.



CSB85H Powder Metallurgy Sintered with Solid Lubricants





Structure

Designed with iron copper alloy as base material and processed by powder metallurgy sintering technology. The graphite uniformly dispersed in the material and impregnated with oil provides an almost same dynamic and static friction factor. When the friction occures, these solid lubricants will be released to the bearing and the mating surface, easily form a firmly adhensive solid lubricant film, thus to keep the friction only act inside the lubricant in order to keep a relatively low wear rate.

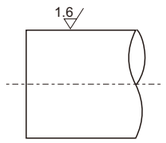
Tech. Data

Material code			Unit	CSB85HFL	CSB85HFH
Structure			----	Sintered alloy	Sintered alloy
Bearing alloy			----	Fe+Cu+SL	Fe+Cu+SL
Bearing alloy hardness			----	HB>80	HRB>70
Bearing alloy density			g/cm^3	6.0~6.3	6.0~6.3
Oil impregnate			vol%	12%	12%
Max. Load	Static load		Mpa	50	75
	Dynamic load	Dry		20	25
		Lubrication		30	50
Max. V	Dry		m/s	0.5	0.5
	Lubricated			1.5	1.0
Max. PV	Dry		N/mm^2*m/s	1.6	1.6
	Lubricated			2.5	2.5
Service temperature			℃	-40~+120	-40~+120

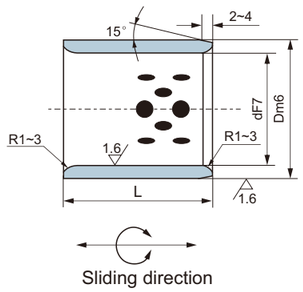
Typical Applications

- Joint bushes for excavator
- Pin bushes for hydraulic cylinder
- Link bushes for construction and heavy industry machinery, like wheel loader, dump truck, forklift, crane etc.
- Tie-bar, Cross guide bar bushes for Injection molding machinery, die casting machinery
- Industrial robot joint bushes
- Guide bushes for mold

CSB650 (Metric Size)

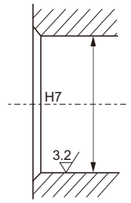


Mating shaft
d8 High load
e7 light load
f7 High precision



Sliding direction

Material 650# + Graphite



Mating housing

Unit:mm

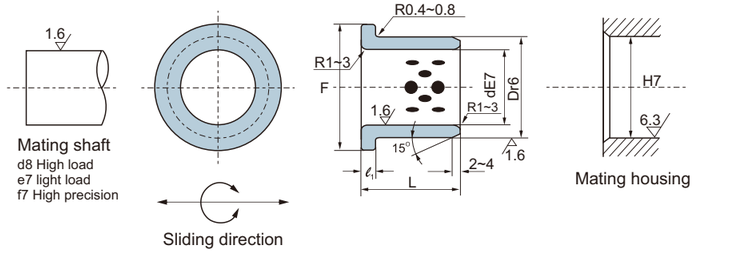
dF7		Dm6		L -0.10 -0.30												
				8	10	12	15	16	20	25	30	35	40	50	60	70	80
8	+0.028 +0.013	12	+0.018 +0.007	081208	081210	081212	081215										
10		14		101408	101410	101412	101415		101420								
12		18			121810	121812	121815	121816	121820	121825	121830						
13		19			131910		131915	131916									
14	+0.034 +0.016	20			142010	142012	142015		142020	142025	142030						
15		21	+0.021 +0.008		152110	152112	152115	152116	152120	152125	152130						
16		22			162210	162212	162215	162216	162220	162225	162230	162235	162240				
18		24				182412	182415	182416	182420	182425	182430	182435	182440				
20		28			202810	202812	202815	202816	202820	202825	202830	202835	202840	202850			
22	+0.041 +0.020	32				223212	223215		223220	223225							
25		33				253312	253315	253316	253320	253325	253330	253335	253340	253350	253360		
30		38	+0.025 +0.009			303812	303815		303820	303825	303830	303835	303840	303850	303860		
35	+0.050 +0.025	45							354520	354525	354530	354535	354540	354550	354560		
40		50							405020	405025	405030	405035	405040	405050	405060	405070	405080
45		55	+0.030 +0.011								455530	455535	455540	455550	455560		
50		60									506030	506035	506040	506050	506060	506070	506080

CSB650 (Metric Size)

Unit:mm

dF7		Dm6		L -0.10 -0.30									
				30	35	40	50	60	70	80	100	120	140	150
50	+0.050 +0.025	62	+0.030 +0.011	506230	506235	506240	506250	506260	506270					
50		65		506530		506540	506550	506560	506570	506580	5065100			
55	+0.060 +0.030	70				557040	557050	557060	557070					
60		74		607430	607435	607440	607450	607460	607470	607480				
60		75		607530	607535	607540	607550	607560	607570	607580	6075100			
63		75						637560	637570	637580				
65		80					658050	658060	658070	658080				
70		85	+0.035 +0.013		708535	708540	708550	708560	708570	708580	7085100			
70		90					709050	709060	709070	709080				
75		90						759060	759070	759080	7590100			
75		95						759560	759570	759580	7595100			
80		96				809640	809650	809660	809670	809680	8096100	8096120		
80		100			8010040	8010050	8010060	8010070	8010080	80100100	80100120	80100140		
90	+0.071 +0.036	110		9011030			9011050	9011060	9011070	9011080	90110100	90110120		
100		120						10012060	10012070	10012080	100120100	100120120	100120140	
110		130	+0.040 +0.015							11013080	110130100	110130120		
120		140								12014080	120140100	120140120	120140140	
125	+0.083 +0.043	145									125145100	125145120	125145140	
130		150									130150100	130150120	130150140	
140		160									140160100	140160120	140160140	
150		170									150170100	150170120	150170140	150170150
160		180									160180100	160180120	160180140	160180150

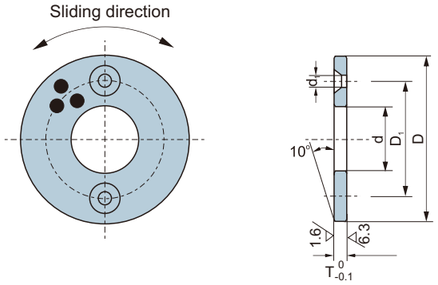
JFB650 (Metric Size)



Unit:mm

d	D	IDE7		ODr6		F	ℓ_1 -0.10	L -0.10 -0.30									
								15	20	25	30	35	40	50	60	80	100
10	14	10	+0.040 +0.025	14	+0.034 +0.023	22	2	1015	1020								
12	18	12		18		25		1215	1220								
13	19	13		19		26		1315	1320								
14	20	14	+0.050 +0.032	20		27	3	1415	1420								
15	21	15		21	+0.041 +0.028	28		1515	1520	1525	1530						
16	22	16		22		29		1615	1620	1625	1630						
20	30	20	+0.061 +0.040	30		40	5	2015	2020	2025	2030		2040				
25	35	25		35		45		2515	2520	2525	2530		2540				
30	40	30		40	+0.050 +0.034	50			3020	3025	3030	3035	3040	3050			
31.5	40	31.5	+0.075 +0.050	40					3120			3135					
35	45	35		45		60			3520		3530		3540	3550			
40	50	40		50		65			4020		4030		4040	4050			
45	55	45		55	+0.060 +0.041	70					4530		4540	4550	4560		
50	60	50		60		75					5030		5040	5050	5060		
55	65	55	+0.090 +0.060	65		80							5540		5560		
60	75	60		75	+0.062 +0.043	90	7.5						6040	6050		6080	
63	75	63		75		85										6380	
70	85	70		85	+0.073 +0.051	105								7050		7080	
75	90	75		90		110									7560		
80	100	80		100		120	10								8060	8080	80100
90	110	90	+0.107 +0.072	110	+0.076 +0.054	130									9060	9080	
100	120	100		120		150										10080	100100
120	140	120		140	+0.088 +0.063	170										12080	120100

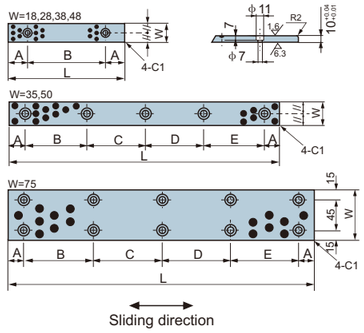
JTW650 (Metric Size)

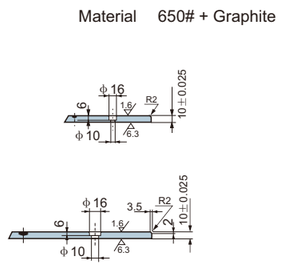


Unit:mm

Stanard No.	d	D	$T^{0}_{-0.1}$	Bolt			
				D_1	Q'ty	Size	d_1
JTW650 -10	10.2	30	3	20	2	M 3	3.5
JTW650 -10N				------	------	------	------
JTW650 -12	12.2	40		28	2	M 3	3.5
JTW650 -12N				------	------	------	------
JTW650 -13	13.2			28	2	M 3	3.5
JTW650 -14	14.2						
JTW650 -15	15.2	50		35			
JTW650 -16	16.2						
JTW650 -16N				------	------	------	------
JTW650 -18	18.2			35	2	M 3	3.5
JTW650 -20	20.2		5			M 5	6
JTW650 -20N				------	------	------	------
JTW650 -25	25.2	55		40	2	M 5	6
JTW650 -25N				------	------	------	------
JTW650 -30	30.2	60		45	2	M 5	6
JTW650 -35	35.2	70		50			
JTW650 -40	40.2	80	7	60		M 6	7
JTW650 -45	45.2	90		67.5			
JTW650 -50	50.3	100	8	75	4	M 8	9
JTW650 -55	55.3	110		85			
JTW650 -60	60.3	120		90			
JTW650 -65	65.3	125		95			
JTW650 -70	70.3	130	10	100			
JTW650 -75	75.3	140		110			
JTW650 -80	80.3	150		120			
JTW650 -90	90.5	170		140		M 10	11
JTW650 -100	100.5	190		160			
JTW650 -120	120.5	200		175			

JSP650 (Metric Size)





Material 650# + Graphite

Unit:mm

Standard No.	W	L	A	B	C	D	E	Flat head screw	No.of holes
JSP650 -1875	18	75	15	45				M 6	2
JSP650 -18100		100	25	50					
JSP650 -18125		125		75					
JSP650 -18150		150		100					
JSP650 -2875	28	75	15	45					
JSP650 -28100		100	25	50					
JSP650 -28125		125		75					
JSP650 -28150		150		100					
JSP650 -35100	35	100	20	60				M 8	
JSP650 -35150		150		55	55				3
JSP650 -35200		200		55	50	55			4
JSP650 -35250		250		70	70	70			4
JSP650 -35300		300		65	65	65	65		5
JSP650 -35350		350		80	75	75	80		5
JSP650 -3875	38	75	15	45				M 6	2
JSP650 -38100		100	25	50					
JSP650 -38125		125		75					
JSP650 -38150		150		100					
JSP650 -4875	48	75	15	45					
JSP650 -48100		100	25	50					
JSP650 -48125		125		75					
JSP650 -48150		150		100					
JSP650 -50100	50	100	20	60				M 8	
JSP650 -50150		150		55	55				3
JSP650 -50200		200		55	50	55			4
JSP650 -50250		250		70	70	70			4
JSP650 -50300		300		65	65	65	65		5
JSP650 -50400		400		90	90	90	90		5
JSP650 -75150	75	150		110					4
JSP650 -75200		200		80	80				6
JSP650 -75250		250		105	105				6
JSP650 -75300		300		85	90	85			8
JSP650 -75400		400		120	120	120			8
JSP650 -75500		500		115	115	115	115		10

Non-Metallic Self-lubricating Bearings

Non-ferrous self-lubricating bearing include the CSB-EPB plastic bearings and CSB-CR series filament wound bearings, they are suitable for the dry lubrication applications. CSB-EPB series bearings are made by injection with high performance engineering plastic mixed with proper intensifier and lubricants which could significantly improve the bearing load capacity and impact resistance of the bearing. Included lubricants can reduce the friction factor considerably. CSB-CR series bearing are made with high strength epoxy impregnated with PTFE and high strength fiber as the working surface. The material structure provides both the non-ferrous features and the heavy load capacity of metal.

CSB-CR ---------- P.71
CSB-EPB ---------- P.74

CSB-CR Filament Wound Self-lubricating Bearings

Order RoHS

Structure

The backing of CSB-CR series material is high strength glass fiber with epoxy resin and the lubricating layer of it is PTFE wound fiber or special lubricating fiber. Therefore, this special structure performs an outstanding anti-wear feature and low friction coefficient under high load and low speed condition. Furthermore, this absolutely new idea gives better solution for high load and excellent wear resistance under dry condition possibility.

Typical Applications

With the excellent features above mentioned, CSB-CR series filament wound composite bearings could be widely used to the frequently start and stop positions with rotating, oscillating and linear motion. The application of this new material is more popular than that of the previously developed engineering plastic bushings (EPB series).

1. Construction machineries
2. Agriculture machineries
3. Lifting machines
4. Cranes
5. Material handling machineries and transmission parts.
6. Water craft machineries
7. Civil project
8. Packing machineries
9. Port machineries
10. Valves, Hydraulic transmission parts

Tech. Data

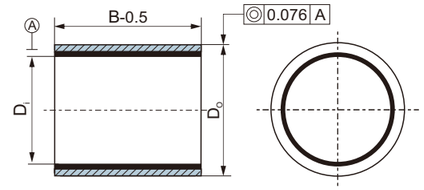
Designation	Unit	CSB-CRM	CSB-CRB	CSB-CRG	CSB-CRP	CSB-CRW
Basic type		Universal type	Standard	High load	High speed	Under water
Density	g/cm³	2.00	2.00	2.00	2.00	2.00
Max. PV	MPa*m/s	1.8	1.8	2.0	1.6	1.8
Coefficient of friction	–	0.05～0.15	0.03～0.12	0.03～0.12	0.02～0.12	0.02～0.10
Working temp.	℃	-100～+160	-100～+160	-100～+160	-100～+160	-100～+100
Max. speed	m/s	0.20	0.20	0.20	0.40	0.40
Max. load	MPa	420	420	420	420	420
Static load	MPa	240	240	240	240	240
Dynamic load	MPa	100	140	160	30	100
Radial compressive strength	MPa	550	550	550	550	550
Hardness	HRM	95	95	95	95	95
Linear thermal expansion factor	Um/m℃	13×10^{-6}	13×10^{-6}	13×10^{-6}	13×10^{-6}	13×10^{-6}
Color		Blue	Coffee	Black	White	Green

CSB-CR Bearings Size Table (Wall 2.5mm)

Order Spec. CRG – 20 25 – 30

20 = D_i, 25 = D_O, 30 = Length

Materials:
CRM, CRB, CRG, CRP, CRW



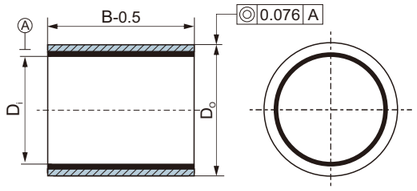
Langth tolerance table		B		
		≤75 mm	> 75 to < 150 mm	≥150 mm
D_i	≤75 mm	-0.50 mm	-1.00 mm	-1.50 mm
	> 75 to ≤120 mm	-1.00 mm	-1.00 mm	-1.50 mm
	> 120 to ≤150 mm	-1.00 mm	-1.50 mm	-1.50 mm

Order P/N	Bearing Size		Recommend		Assembly Interference	Running Clearance	Standard Length L
	D_i	D_O	Shaft D_S h7	Housing H7 D_H			
CRB-2025-L	$20^{+0.196}_{+0.116}$	$25^{+0.096}_{+0.046}$	$20^{0}_{-0.021}$	$25^{+0.021}_{0}$	0.025-0.096	0.020-0.192	15、20、30
CRB-2227-L	$22^{+0.196}_{+0.116}$	$27^{+0.096}_{+0.046}$	$22^{0}_{-0.021}$	$27^{+0.021}_{0}$	0.025-0.096	0.020-0.192	15、20、30
CRB-2530-L	$25^{+0.196}_{+0.116}$	$30^{+0.096}_{+0.046}$	$25^{0}_{-0.021}$	$30^{+0.021}_{0}$	0.025-0.096	0.020-0.192	20、30、40
CRB-2833-L	$28^{+0.200}_{+0.120}$	$33^{+0.100}_{+0.050}$	$28^{0}_{-0.021}$	$33^{+0.025}_{0}$	0.025-0.100	0.020-0.196	20、30、40
CRB-3035-L	$30^{+0.200}_{+0.120}$	$35^{+0.100}_{+0.050}$	$30^{0}_{-0.021}$	$35^{+0.025}_{0}$	0.025-0.100	0.020-0.196	20、30、40
CRB-3540-L	$35^{+0.200}_{+0.120}$	$40^{+0.100}_{+0.050}$	$35^{0}_{-0.025}$	$40^{+0.025}_{0}$	0.025-0.100	0.020-0.200	30、40、50
CRB-4045-L	$40^{+0.200}_{+0.120}$	$45^{+0.100}_{+0.050}$	$40^{0}_{-0.025}$	$45^{+0.025}_{0}$	0.025-0.100	0.020-0.200	30、40、60
CRB-4550-L	$45^{+0.230}_{+0.130}$	$50^{+0.105}_{+0.055}$	$45^{0}_{-0.025}$	$50^{+0.025}_{0}$	0.025-0.105	0.025-0.230	30、40、60
CRB-5055-L	$50^{+0.230}_{+0.130}$	$55^{+0.105}_{+0.055}$	$50^{0}_{-0.025}$	$55^{+0.030}_{0}$	0.025-0.105	0.025-0.230	40、50、60
CRB-5560-L	$55^{+0.245}_{+0.145}$	$60^{+0.120}_{+0.070}$	$55^{0}_{-0.030}$	$60^{+0.030}_{0}$	0.040-0.120	0.025-0.235	40、55、70
CRB-6065-L	$60^{+0.245}_{+0.145}$	$65^{+0.120}_{+0.070}$	$60^{0}_{-0.030}$	$65^{+0.030}_{0}$	0.040-0.120	0.025-0.235	40、60、80
CRB-6570-L	$65^{+0.245}_{+0.145}$	$70^{+0.120}_{+0.070}$	$65^{0}_{-0.030}$	$70^{+0.030}_{0}$	0.040-0.120	0.025-0.235	50、60、80
CRB-7075-L	$70^{+0.245}_{+0.145}$	$75^{+0.120}_{+0.070}$	$70^{0}_{-0.030}$	$75^{+0.030}_{0}$	0.040-0.120	0.025-0.235	50、70、90
CRB-7580-L	$75^{+0.275}_{+0.175}$	$80^{+0.120}_{+0.070}$	$75^{0}_{-0.030}$	$80^{+0.030}_{0}$	0.040-0.125	0.050-0.265	50、70、90
CRB-8085-L	$80^{+0.275}_{+0.175}$	$85^{+0.125}_{+0.075}$	$80^{0}_{-0.030}$	$85^{+0.035}_{0}$	0.040-0.125	0.050-0.265	60、80、100
CRB-8590-L	$85^{+0.275}_{+0.175}$	$90^{+0.125}_{+0.075}$	$85^{0}_{-0.035}$	$90^{+0.035}_{0}$	0.040-0.125	0.050-0.270	60、80、100
CRB-9095-L	$90^{+0.275}_{+0.175}$	$95^{+0.125}_{+0.075}$	$90^{0}_{-0.035}$	$95^{+0.035}_{0}$	0.050-0.135	0.050-0.270	60、80、120
CRB-95100-L	$95^{+0.310}_{+0.185}$	$100^{+0.125}_{+0.075}$	$95^{0}_{-0.035}$	$100^{+0.035}_{0}$	0.050-0.135	0.050-0.295	60、80、120
CRB-100105-L	$100^{+0.310}_{+0.185}$	$105^{+0.125}_{+0.075}$	$100^{0}_{-0.035}$	$105^{+0.035}_{0}$	0.050-0.135	0.050-0.295	80、100、120
CRB-110115-L	$110^{+0.315}_{+0.190}$	$15\ 1\ ^{+0.135}_{+0.085}$	$10\ 1\ ^{0}_{-0.035}$	$15\ ^{+0.035}_{0}$	0.050-0.140	0.050-0.300	80、100、120
CRB-120125-L	$120^{+0.340}_{+0.215}$	$125^{+0.135}_{+0.085}$	$120^{0}_{-0.035}$	$125^{+0.040}_{0}$	0.050-0.165	0.050-0.325	100、120、150
CRB-130135-L	$130^{+0.340}_{+0.215}$	$135^{+0.165}_{+0.090}$	$130^{0}_{-0.040}$	$135^{+0.040}_{0}$	0.050-0.165	0.050-0.330	100、120、150
CRB-140145-L	$140^{+0.340}_{+0.215}$	$145^{+0.165}_{+0.090}$	$140^{0}_{-0.040}$	$145^{+0.040}_{0}$	0.050-0.165	0.050-0.330	100、150、180
CRB-150155-L	$150^{+0.340}_{+0.215}$	$155^{+0.165}_{+0.090}$	$150^{0}_{-0.040}$	$155^{+0.040}_{0}$	0.050-0.165	0.050-0.330	120、150、180

CSB-CR Bearings Size Table (Wall 5mm)

Order Spec. CRG — 20 — 30 — 30

- CRG: Materials: CRM, CRB, CRG, CRP, CRW
- 20: D_i
- 30: D_O
- 30: Length



Langth tolerance table		B		
		≤75 mm	> 75 to < 150 mm	≥150 mm
D_i	≤75 mm	-0.50 mm	-1.00 mm	-1.50 mm
	> 75 to ≤120 mm	-1.00 mm	-1.00 mm	-1.50 mm
	> 120 to ≤150 mm	-1.00 mm	-1.50 mm	-1.50 mm

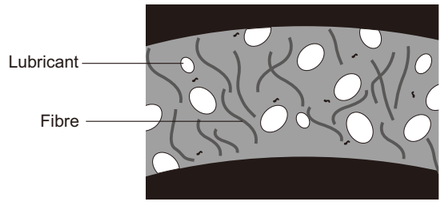
Order P/N	Bearing Size		Recommend		Assembly Interference	Running Clearance	Standard Length L
	D_i	D_O	Shaft D_S h7	Housing H7 D_H			
CRB-2030-L	20 $^{+0.196}_{+0.116}$	30 $^{+0.096}_{+0.046}$	20 $^{0}_{-0.021}$	30 $^{+0.021}_{0}$	0.025-0.096	0.020-0.192	15、20、30
CRB-2232-L	22 $^{+0.196}_{+0.116}$	32 $^{+0.096}_{+0.046}$	22 $^{0}_{-0.021}$	32 $^{+0.021}_{0}$	0.025-0.096	0.020-0.192	15、20、30
CRB-2535-L	25 $^{+0.196}_{+0.116}$	35 $^{+0.096}_{+0.046}$	25 $^{0}_{-0.021}$	35 $^{+0.021}_{0}$	0.025-0.096	0.020-0.192	20、30、40
CRB-2838-L	28 $^{+0.200}_{+0.120}$	38 $^{+0.100}_{+0.050}$	28 $^{0}_{-0.021}$	38 $^{+0.025}_{0}$	0.025-0.100	0.020-0.196	20、30、40
CRB-3040-L	30 $^{+0.200}_{+0.120}$	40 $^{+0.100}_{+0.050}$	30 $^{0}_{-0.021}$	40 $^{+0.025}_{0}$	0.025-0.100	0.020-0.196	20、30、40
CRB-3545-L	35 $^{+0.200}_{+0.120}$	45 $^{+0.100}_{+0.050}$	35 $^{0}_{-0.025}$	45 $^{+0.025}_{0}$	0.025-0.100	0.020-0.200	30、40、50
CRB-4050-L	40 $^{+0.200}_{+0.120}$	50 $^{+0.100}_{+0.050}$	40 $^{0}_{-0.025}$	50 $^{+0.025}_{0}$	0.025-0.100	0.020-0.200	30、40、60
CRB-4555-L	45 $^{+0.230}_{+0.130}$	55 $^{+0.105}_{+0.055}$	45 $^{0}_{-0.025}$	55 $^{+0.030}_{0}$	0.025-0.105	0.025-0.230	30、40、60
CRB-5060-L	50 $^{+0.230}_{+0.130}$	60 $^{+0.105}_{+0.055}$	50 $^{0}_{-0.025}$	60 $^{+0.030}_{0}$	0.025-0.105	0.025-0.230	40、50、60
CRB-5565-L	55 $^{+0.245}_{+0.145}$	65 $^{+0.120}_{+0.070}$	55 $^{0}_{-0.030}$	65 $^{+0.030}_{0}$	0.040-0.120	0.025-0.235	40、55、70
CRB-6070-L	60 $^{+0.245}_{+0.145}$	70 $^{+0.120}_{+0.070}$	60 $^{0}_{-0.030}$	70 $^{+0.030}_{0}$	0.040-0.120	0.025-0.235	40、60、80
CRB-6575-L	65 $^{+0.245}_{+0.145}$	75 $^{+0.120}_{+0.070}$	65 $^{0}_{-0.030}$	75 $^{+0.030}_{0}$	0.040-0.120	0.025-0.235	50、60、80
CRB-7080-L	70 $^{+0.245}_{+0.145}$	80 $^{+0.120}_{+0.070}$	70 $^{0}_{-0.030}$	80 $^{+0.030}_{0}$	0.040-0.120	0.025-0.235	50、70、90
CRB-7585-L	75 $^{+0.275}_{+0.175}$	85 $^{+0.125}_{+0.075}$	75 $^{0}_{-0.030}$	85 $^{+0.035}_{0}$	0.040-0.125	0.050-0.265	50、70、90
CRB-8090-L	80 $^{+0.275}_{+0.175}$	90 $^{+0.125}_{+0.075}$	80 $^{0}_{-0.030}$	90 $^{+0.035}_{0}$	0.040-0.125	0.050-0.265	60、80、100
CRB-8595-L	85 $^{+0.275}_{+0.175}$	95 $^{+0.125}_{+0.075}$	85 $^{0}_{-0.035}$	95 $^{+0.035}_{0}$	0.040-0.125	0.050-0.270	60、80、100
CRB-90100-L	90 $^{+0.275}_{+0.175}$	100 $^{+0.125}_{+0.075}$	90 $^{0}_{-0.035}$	100 $^{+0.035}_{0}$	0.050-0.135	0.050-0.270	60、80、120
CRB-95105-L	95 $^{+0.310}_{+0.185}$	105 $^{+0.125}_{+0.075}$	95 $^{0}_{-0.035}$	105 $^{+0.035}_{0}$	0.050-0.135	0.050-0.295	60、80、120
CRB-100110-L	100 $^{+0.310}_{+0.185}$	10 1 $^{+0.135}_{+0.085}$	100 $^{0}_{-0.035}$	10 1 $^{+0.035}_{0}$	0.050-0.135	0.050-0.295	80、100、120
CRB-110120-L	110 $^{+0.315}_{+0.190}$	120 $^{+0.135}_{+0.085}$	10 1 $^{0}_{-0.035}$	120 $^{+0.040}_{0}$	0.050-0.140	0.050-0.300	80、100、120
CRB-120130-L	120 $^{+0.340}_{+0.215}$	130 $^{+0.165}_{+0.095}$	120 $^{0}_{-0.035}$	130 $^{+0.040}_{0}$	0.050-0.165	0.050-0.325	100、120、150
CRB-130140-L	130 $^{+0.340}_{+0.215}$	140 $^{+0.165}_{+0.090}$	130 $^{0}_{-0.040}$	140 $^{+0.040}_{0}$	0.050-0.165	0.050-0.330	100、120、150
CRB-140150-L	140 $^{+0.340}_{+0.215}$	150 $^{+0.165}_{+0.090}$	140 $^{0}_{-0.040}$	150 $^{+0.040}_{0}$	0.050-0.165	0.050-0.330	100、150、180
CRB-150160-L	150 $^{+0.340}_{+0.215}$	160 $^{+0.165}_{+0.090}$	150 $^{0}_{-0.040}$	160 $^{+0.040}_{0}$	0.050-0.165	0.050-0.330	120、150、180

CSB-EPB Plastic Compound Bearings

Order RoHS

Structure

CSB-EPB series material is a thermal mould character plastic processed by crystal engineering plastic as basic material with proper intensifier and lubricant. The rigidity and high temperature engineer capability is greatly improved because of the use of intensifier, at the same time, the coefficient of thermal expansion, moulding shrinking rate and wriggle capability decreases, consequently, the size stability is improved, and EPB series material range is enlarged and keeps the intrinsic anti-wear capability and anti-drug capability.



☐ CSB-EPB structure

Features

- Maintenance-free dry operation
- Excellent wear resistance
- Lower friction
- Lower moisture absorption
- Chemical solvent resistance
- Nice insulated
- Save space and light
- Mass production with lower cost
- Can meet RoHS standard

Typical Applications

- Office machinery
- Electronic products
- Textile machinery
- Fitness machinery
- Agricultural machinery
- Packaging machinery
- Automotive industry

CSB-EPB Main Materials Supply

RoHS

Material / Designation	Standard	Unit	CSB-EPB	CSB-EPB1	CSB-EPB3	CSB-EPB4
Color			Dark grey	Red brown	Dark grey	Black
Density	ISO1183	g/cm^3	1.46	1.51	1.46	1.65
Coefficient of sliding friction(steel)			0.05-0.15	0.08-0.20	0.08-0.18	0.07-0.20
Max. PV value		$N/mm^2*m/s$	0.4	0.6	0.5	1.4
Tensile strength		MPa	80	80	200	180
Compressive strength	ISO527	MPa	65	75	80	80
Modulus of elasticity	ISO527	MPa	2300	2500	7700	12000
Max. static surface pressure(20℃)	ISO527	MPa	35	70	80	90
Hardness, Rockwell		HRR	108	115	112	118
Long-time application temperature	ISO2039-2	℃	-40/80	-50/110	-40/130	-40/200
Short-time application temperature		℃	-40/120	-50/170	-40/220	-40/260
Thermal conductivity	ASTME1461	W/m*k	0.2	0.3	0.25	0.6
Coefficient of thermal expansion	ASTMD696	$K^{-1}*10^{-5}$	10	8	9	4
Moisture absorption RH50/ 23℃	ASTMD570	%	0.2	0.2	0.7	<0.1
Volume resistivity	IEC60093	Ωcm	$>10^{12}$	$>10^{14}$	$>10^{13}$	$>10^{4}$
Surface resistivity	IEC60093	Ω	$>10^{15}$	$>10^{15}$	$>10^{11}$	$>10^{5}$
Basic characteristic			Economic	Reinforce	General	Anti-corrosive
						

CSB-EPB5	CSB-EPB7	CSB-EPB8	CSB-EPB13	CSB-EPB19	CSB-EPB22	CSB-EPB25
Black	Cream	Crey	Yellow	Dark grey	Dark yellow	Yellow
1.44	1.25	1.60	1.48	1.32	1.46	1.44
0.09-0.25	0.09-0.20	0.07-0.18	0.05-0.15	0.05-0.20	0.15-0.35	0.08-0.20
1.5	0.5	0.8	0.4	0.7	0.7	0.45
170	120	135	75	100	240	55
100	60	80	60	60	130	60
7900	3500	11000	2400	3500	9000	2200
150	60	75	35	60	120	60
120	108	115	107	112	112	112
-100/250	-40/100	-40/200	-50/90	-40/150	-40/150	-100/180
-100/315	-40/180	-40/260	-50/120	-40/200	-40/220	-100/210
0.6	0.2	0.5	0.25	0.25	0.24	0.24
5	9	5	9	5	8	7
0.1	1.3	＜0.1	0.2	1.3	1.1	0.3
$>10^{8}$	$>10^{12}$	$>10^{5}$	$>10^{13}$	$>10^{15}$	$>10^{13}$	$>10^{13}$
$>10^{7}$	$>10^{12}$	$>10^{5}$	$>10^{12}$	$>10^{12}$	$>10^{11}$	$>10^{10}$
High temperature	Anti-wear	Anti-wear	Lower friction	Conductive	High load	High load
						

CSB reserves the right to change tech-data without notice

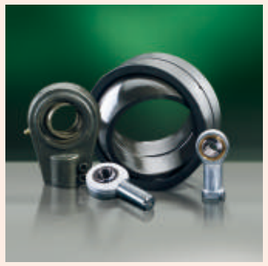
The Other Bearings

Compressor swash plate

The swash plate is a special part used in the vehicle air conditioner compressor. The basic material could be bronze alloy sintered onto steel back or a special polymer coating on the steel plate. Full bronze version is also available for particular application.

Hardened steel bearings

The hardened steel bearings are made of C45 steel or 100Cr6 steel. These parts are for heavy duty application on the construction engineering machineries. For better performance, the hardening of the bushing could be treated with normal hardening process or special QPQ process to achieve an excellent hardness requirement and lubricating characteristics.



Spherical plain bearings

Spherical plain bearings are ISO standard parts. All metric and inch series of standard and non-standard parts are available from CSB. These parts could be ordered with international standard type numbers.

Lead-free steel-aluminum composite Bearings

Steel backing with aluminum/Tin/copper as bearing layer, this running layer have 30-50HB hardness with 0.2-0.5mm thickness, provides excellent Anti-seizing property, good embedding capability and adaptability. This type material is suited for application in engines from low to medium loads.

The Other Bearings

Solid bronze turned bearings

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

Main Metal Type

Grade		600	600S5	600W1	600W3	600S1	600S2	600S3
Material		CuZn25Al5Mn4				CuSn5Pb5Zn5	CuAl10Ni5Fe5	CuSn12
Density		7.8				8.9	7.8	8.9
HB hardness		⩾210	⩾240	⩾210	⩾235	⩾70	⩾100	⩾75
Tensile strength Mpa		⩾750	⩾800	⩾755	⩾755	⩾250	⩾500	⩾270
Yeild strength Mpa		⩾450	⩾450	⩾400	⩾400	⩾90	⩾260	⩾150
Elongation %		⩾12	⩾8	⩾12	⩾12	⩾13	⩾10	⩾5
Coefficient of linear expansion		$1.9x10^{-5}/℃$				$1.8x10^{-5}/℃$	$1.6x10^{-5}/℃$	$1.8x10^{-5}/℃$
Max. temp.		-40~+250℃				-40~+400℃		
Max. load Mpa		50	75	75	100	50		
Max. speed m/s	Dry	0.5	0.1	0.5	0.1	0.5		
	Lubrication	1	0.25	1	0.25	2.5		
Max. PV ($N/mm^2*m/s$)	Dry	1.65				1		
	Lubrication	3.25				1.65		

The above technical data is recommend from CSB, better to test under detail condition.

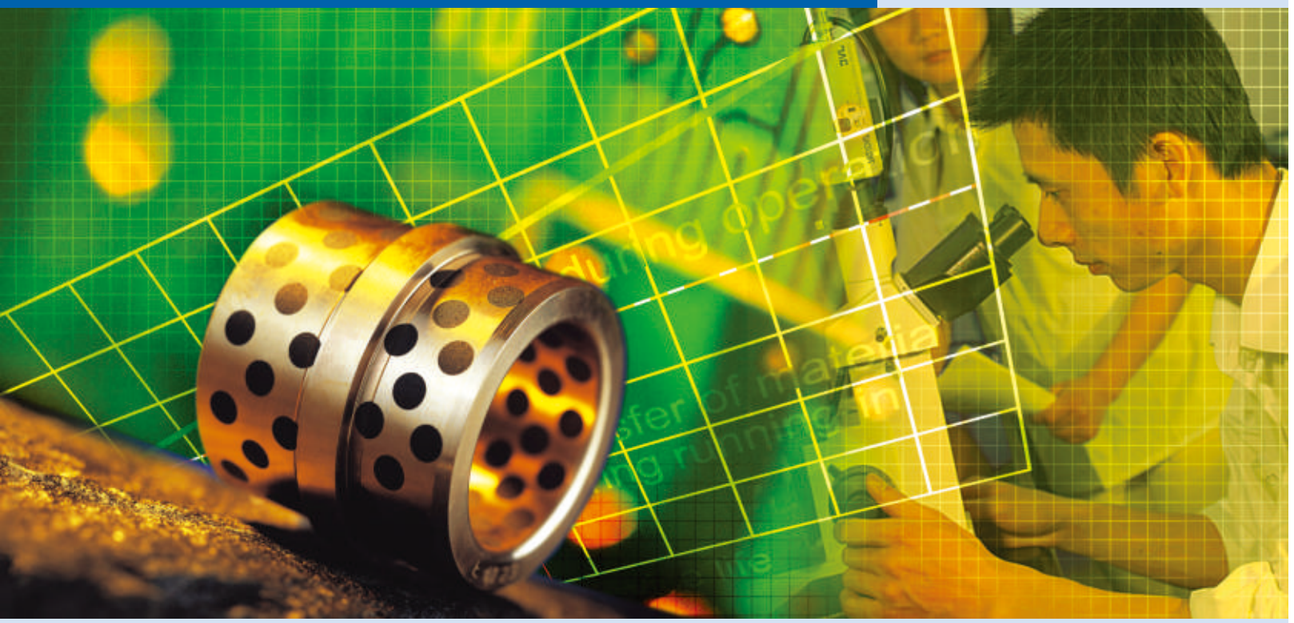
Escalator rotary chain

The rotation parts of CSB-PEC series rotary chain are with self-lubricated plastic bearings,the material CSB-EPB15 used in the plastic bearings provides maintenance free feature of the chain system and with the anti-dust and anti-corrosion feature of the bearing material, the chain system could be free to operate under critical conditions. The long term stable operation with low noise design of PEC chain prevent the chain system from stuck and operation failure comparing with the traditional rolling bearing design. The metal parts of the PEC chain are specially treated for the long term outdoor operation.

Steering Rack Bearings

The bearing specially designed for the automotive steering system. The designation is with the advantages of combining high elastic material and high wear resistance material CSB-EPB7. This perfect design provides the solution of ensuring both elastic resistance duration and wear resistance could be both guranteed.

The Technical Data



DESIGN NOTES

Lubrication mechanism

When lubrication film exists between two relatively moving surfaces, friction conditions of two contact surfaces can be classified in three steps as below:

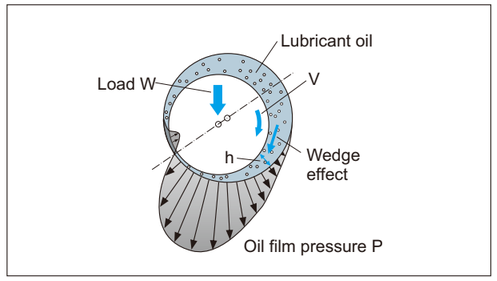
- **Hydrodynamic lubrication**
- **Boundary lubrication**
- **Solid lubrication**

Hydrodynamic lubrication

Hydrodynamic lubrication

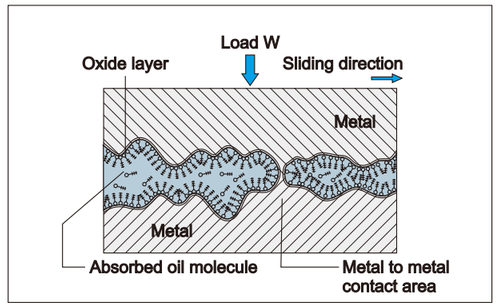
Lubrication film between the two contact surfaces is thick enough and two contact surfaces are separated completely by viscous oil film. At this time, frictional force of two contact surfaces are determined by viscous resistance of lubricant and it can be take a very small value (coefficients of friction can be 0.0001~0.01). Under this condition, when shaft is rotated, the oil around the shaft also rotates due to the viscosity of the lubricant oil and generates oil pressure at the load area. This phenomenon is called wedge effect.

The oil pressure P generated within lubricating oil film is affected by change of temperature and viscosity of lubricating oil, surface roughness, clearance and rotational speed of the shaft.



Boundary lubrication

Lubricating oil film between the two contact surfaces is extremely thin and no viscous hydrodynamic oil film exists between the two contact areas, only film of absorbed oil molecules exists. Absorptive oil film is arranged oil molecules that are adhered onto the solid surfaces and its shear resistance is greater than hydrodynamic oil film. Frictional force in this area is greater compare to hydrodynamic lubrication. In the frictional contact points, oil film is frequently broken. The lubrication condition that generates a frictional condition such as this is called "boundary lubrication", in order to decrease the friction under this condition, selection of self-lubricating bearing may be desirable.



Solid lubrication (Dry friction)

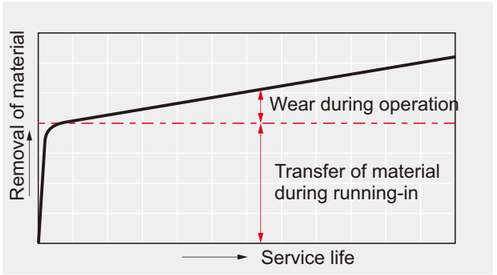
Under this work condition, the two solid surfaces contact directly with each other, there is no lubricating film such as hydrodynamic film or absorptive oil film. The frictional force is proportional only to the vertical load applied to the contact surface of the solid body, coefficient of friction is independent of the sliding velocity and the static friction is greater than kinetic friction. Thus the self-lubricating bearing material selection is critical to performance.

DESIGN NOTES

Influences on the service life:

Wear and service life of the CSB slide bearings are dependent on the following:

- Specific bearing load
- Sliding speed
- PV value
- Roughness depth of the mating surface
- Mating surface material and Temperature etc.

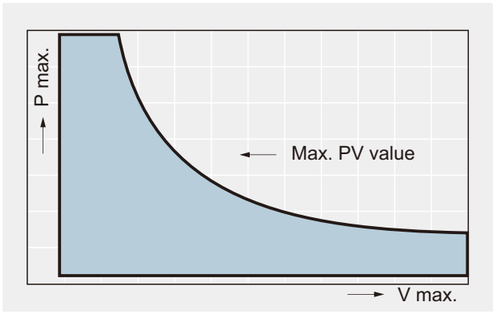


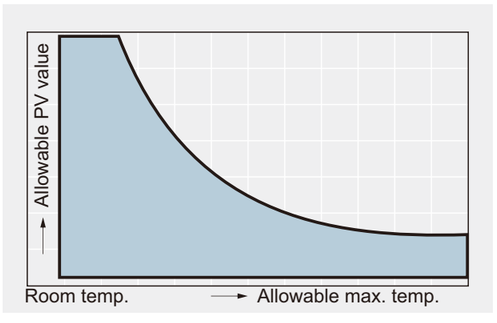
PV value

The PV value has a considerable influence on the bearing service life. It is the product of the specific load P and the sliding speed V and the PV is one of the most important design data, it is recommended a PV value lower than the required specification will leads to a longer service life.

PV value listed in this catalogues is allowable PV value for radial journal rotational operation. In many cases, engineers need to take into account the actual bearing work situation, designing small PV values as far as possible so as to extend the service life of bearing, of course the suitable data will need a lot of experiments to verify.

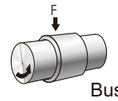
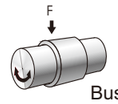
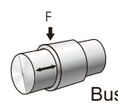
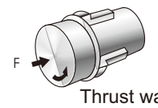
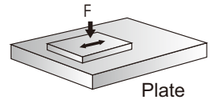
Also, the environmental temperature is necessary to consideration, the clearance can be changed caused by the dimensional change of the bearing and housing, the mating material hardness change from the environment temperature, the interference and so on.





DESIGN NOTES

Direction of motion and PV value

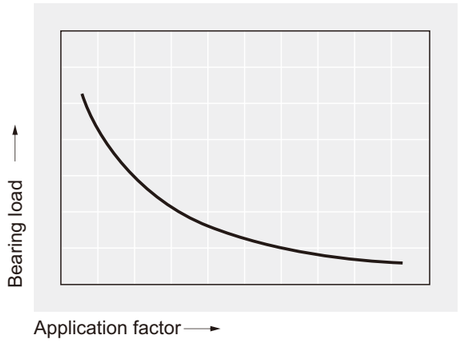
		Bearing Pressure P N/mm^2 {kgf/cm^2}	Velocity V m/s {m/min}	PV Value $N/mm^2*m/s$ {$kgf/cm^2*m/min$}
1. Rotating motion in single direction of radial journal		$\frac{F}{dL}$ $\left\{\frac{10^2F}{dL}\right\}$	$\frac{\pi dn}{10^3}$ $\left\{\frac{\pi dn}{10^3}\right\}$	$\frac{\pi Fn}{10^3L}$ $\left\{\frac{\pi Fn}{10L}\right\}$
2. Oscillating motion		$\frac{F}{dL}$ $\left\{\frac{10^2F}{dL}\right\}$	$\frac{dc\,\theta}{10^3}$ $\left\{\frac{\pi dc\,\theta}{180\times10^3}\right\}$	$\frac{Fc\,\theta}{10^3L}$ $\left\{\frac{\pi Fc\,\theta}{180\times10^2L}\right\}$
3. Reciprocating motion		$\frac{F}{dL}$ $\left\{\frac{10^2F}{dL}\right\}$	$\frac{2cS}{10^3}$ $\left\{\frac{2cS}{10^3}\right\}$	$\frac{2FcS}{10^3dL}$ $\left\{\frac{FcS}{5dL}\right\}$
4. Thrust motion	 Rotation	$\frac{4F}{\pi(D^2-d^2)}$ $\left\{\frac{400F}{\pi(D^2-d^2)}\right\}$	$\frac{\pi Dn}{10^3}$ $\left\{\frac{\pi Dn}{10^3}\right\}$	$\frac{4FDn}{10^3(D^2-d^2)}$ $\left\{\frac{4FDn}{10(D^2-d^2)}\right\}$
	Oscillation	$\frac{4F}{\pi(D^2-d^2)}$ $\left\{\frac{400F}{\pi(D^2-d^2)}\right\}$	$\frac{Dc\,\theta}{10^3}$ $\left\{\frac{\pi Dc\,\theta}{180\times10^3}\right\}$	$\frac{4FDc\,\theta}{10^3\pi(D^2-d^2)}$ $\left\{\frac{4FDc\,\theta}{180\times10(D^2-d^2)}\right\}$
	Thrust washer			
5. Plane reciprocating motion		$\frac{F}{BL}$ $\left\{\frac{10^2F}{WL}\right\}$	$\frac{2cS}{10^3}$ $\left\{\frac{2cS}{10^3}\right\}$	$\frac{2FcS}{10^3BL}$ $\left\{\frac{FcS}{5WL}\right\}$

F : Vertical load ..... N {kgf}
N : Number of rotation ..... S^{-1} {rpm}
c : Cylic velocity of reciprocating or oscillating motion ..... S^{-1} {cpm}
S : Stroke distance ..... m {mm}
θ : Oscillating angle ..... rad
d : Bearing ID ..... mm {mm}
D : Bearing OD ..... mm {mm}
L : Bearing length ..... mm {mm}
W : Bearing width ..... mm {mm}

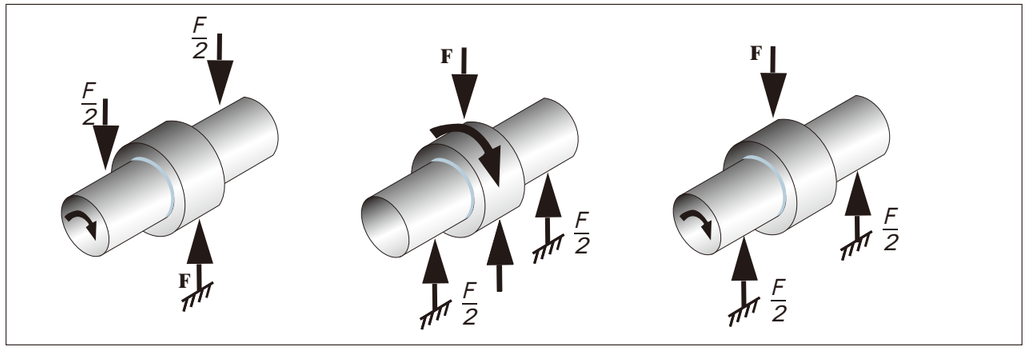
DESIGN NOTES

Bearing load

In general, the bearing pressure is obtained by dividing the max. load imposed on the bearing by the pressure supporting area of the bearing. The pressure supporting area is defined as the projected loading area which contacts with the shaft, projected in the direction of the load in cases of a cylindrical and spherical bearings.

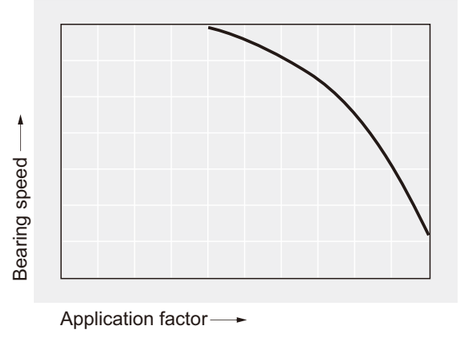


Type of load



Velocity

The main cause of generated heat is the work done at the friction surface of the bearing. It is known from experience that the rise in temperature at the friction surface is affected more by the velocity than by the pressure. With the same PV value, the larger V value is, the high bearing temperature will be. When used in a high velocity operation, it is recommended that the bearings should be designed and used in such a manner that the co-efficient of friction be reduced by positive supply of oil to enhance both cooling and lubricating effectiveness, in order to take advantage of their wear resistance.



DESIGN NOTES

Oscillating motion

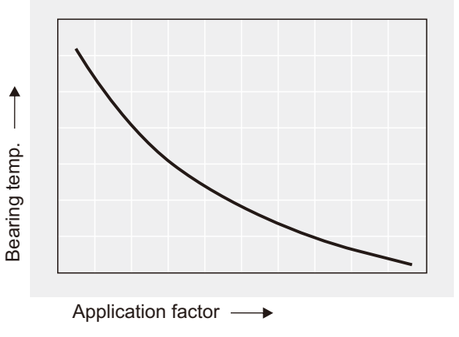
The oscillating motion is considered to be one of the most severe conditions to bearings zero velocity in each cycle of motion. Oil film is liable to be disrupted, fatigue and wear of material be accelerated and wear particles tend to remain longer. The ball bearing which are designed mainly for rotational motion have a very small contact area causing, extremely high contact stress to develop at their pressure supporting areas. They are, thus, unsuitable for oscillating motion because the contact area of the sleeve bearings are larger than that of the ball bearings, the sleeve bearings are generally considered better for this application. CSB self-lubricating bearings are the most adequate bearings for oscillating motion having a very tough sliding surface which generates little wear particles, and being an oil-containing type which will not cause noise due to disruption of oil film.

Operation intervals

Operation may either be continuous or intermittent. Intermittent operations can be advantageous for general type bearings because of intervals which allow generated friction heat to cool down. This enables a PV value to remain relatively high. The disadvantage of intermittent operations is that frequent operational interruptions tend to cause inadequate amount. Moreover, resulting in increasing wear occur when restarting. The heavy load imposed in an intermittent operation is liable to cause boundary lubrication condition. A bearing should be selected which safely endures friction and wear in that condition. Oil-containing bearings self-supply lubricant oil to the sliding surface, and exhibit excellent lubricant maintaining capability. CSB650# in particular has a high load carrying capacity and displays excellent performance in intermittent operations with high load because of the tough film of solid lubricants covers the sliding surface.

Bearing temperature

The life of a bearing is greatly influenced by environment temperature and friction heat that is generated from oscillating and reciprocating motion. For a high temperature application, the PV value of the bearing should be limited to a small value. The heat resistance of plastic bearings is generally inferior to that of metallic bearings. In particular thermoplastic resins are poor resistance to heat. Also the thermal expansion rate of them is relatively high. Consequently, in order to maintain a minimum required clearance, it is important to emphasis on the dimensional control during the designation of bearings made by these materials.



BEARINGS DIMENSIONAL INSPECTION

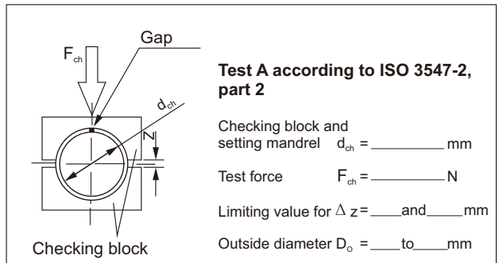
Measurement of wrapped bushes

It is not possible to accurately measure the external and internal diameters of a wrapped bush in its free condition. At the free state, a wrapped bush will not be perfectly cylindrical. The bush will conform to the housing when the butt joint is tightly closed. For this reason the OD & ID of a wrapped bush can only be checked with special gauges and test equipment. The checking methods are defined in ISO3547 Part 1 and 2 and ISO 12306 respectively.

Checking the external diameter

- **Test A of ISO 3547 Part 2**

  Check the outside diameter of a wrapped bush using measuring equipment as shown in left sketch, with a checking block consisting of upper and lower halves and setting plugs, at a determined checking load of F_{ch}, during the test the outside diameter of the bush is made smaller by the elastic reduction, however there is no permanent deformation. The bushes outside diameter can be calculated from the difference in the value of z ($\triangle z$)



Test A according to ISO 3547-2, part 2

Checking block and setting mandrel d_{ch} = _____ mm

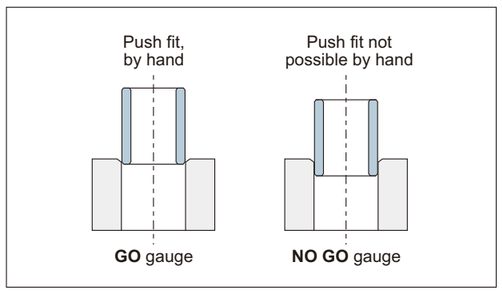
Test force F_{ch} = _____ N

Limiting value for $\triangle z$ = ____and____mm

Outside diameter D_o = ____to____mm

- **Test B**

  The test is carried out with two ring gauges, a GO ring gauge and a NO GO ring gauge whose diameter shall be chosen empirically from with Table 6 of ISO3547-1:1999 and agreed upon. It shall be possible to press the bushes into the GO ring gauge and then push them through with hand pressure (maximum force 250N). On the other hand with the same force, it shall not be possible for them to go into the NO GO ring gauge (See ISO 12307-1)



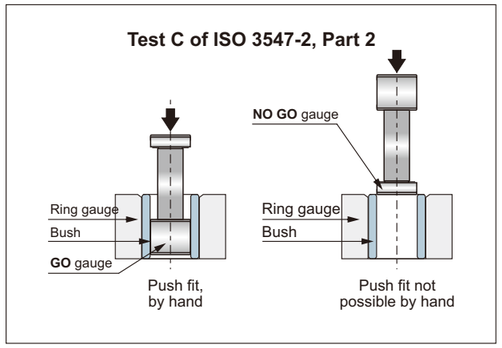
- **Test D**

  The test is carried out by means of a precision measuring tape.

Checking the inside diameter

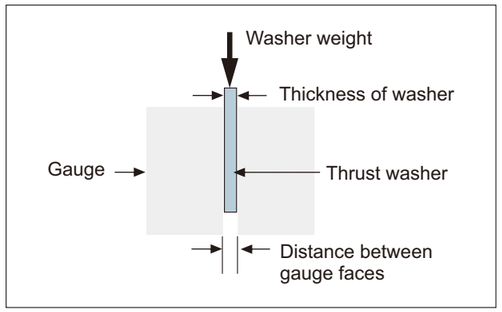
- **Test C**

  To check the inside diameter, the bush is to be pressed into a ring gauge, whose nominal diameter corresponds to the dimension specified in ISO3547-1:999. The inside diameter shall be measured with a 3-point measuring instrument or checked with a GO and NO GO plug gauge. The GO plug gauge shall be inserted by a minimum effort; the NO GO plug gauge shall not be inserted by manual pressure (maximum force 250N). In order to enable the manufacturer and the customer to compare results of this test it should be agreed whether results should be obtained by measuring or by gauging.



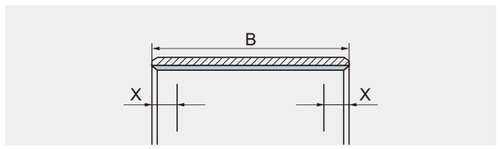
Checking the thrust washer

Beside the thickness, the flatness of a washer is of particular importance as it has impact on the life of both the washer and its mate. We use very helpful test in which the washer falls through the gap between two plain parallel plates of a gauge under its dead weight. The plates must be big enough to cover the whole washer.



- **Measurement of wall thickness (alternatively to Test C)**

  The wall thickness is measured at one, two or three positions axially according to the bearing dimensions. The wall thickness and the inside diameter shall not be specified together on the same drawing.

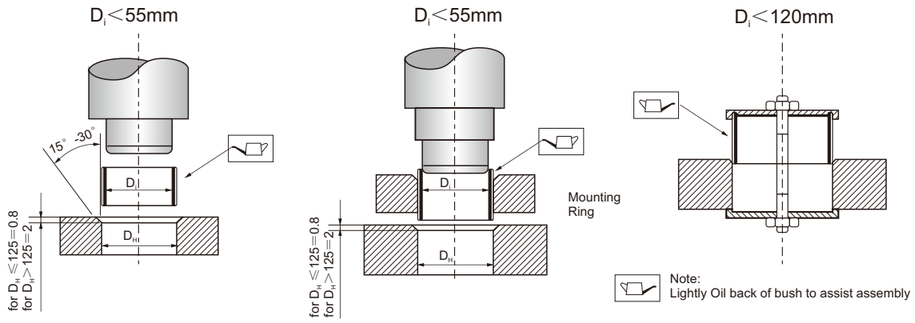


Measurement position

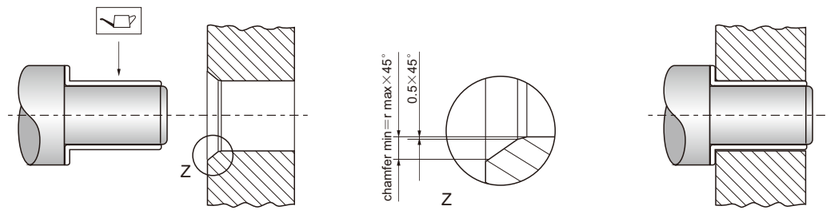
B(mm)	X(mm)	measurement position
B≤15	B/2	1
15<B≤50	4	2
50<B≤90	6 and B/2	3
B>90	8 and B/2	3

BEARINGS INSTALLATION

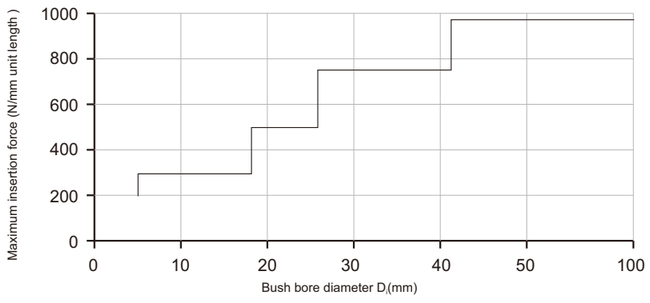
Fitting of cylindrical bushes



Fitting of flanged bushes



Insertion forces



For some special application like CSB650# bushes for injection moulding machines, the shrinking fitting method could be take into consideration. This is the preferred method for inserting a bush in its housing providing an optimum interference fit wihtout risking bearing damage during press fitting. Frozen carbon dioxide (Co2) should be packed around the bearing for up to 2 hours, depending on the cross section of bush to be cooled. Once removed from the Co2, the bush should be offered to its housing without delay. It should fit without force, gravity will usually be adequate for a vertical installation.

BEARINGS INSTALLATION

At the run-in operation period, contact surfaces of shaft and bearings are smooth enough, however, microscopic irregularities are inevitable to be developed after continuously running for a certain period. A deviation from true center alignment may also exist. Thus, the partial initial contact between sliding surfaces could happen. It is not recommended an immediately start of a regular loaded operation, it may result in damaging the bearing surface, leading to a shorter service life. On the other hand, it is suggested a gradually break-in operations to sweep out the microscopic irregularities, and allow the entire pressure support area slowly get into contact without causing any damages to the bearing and shaft.

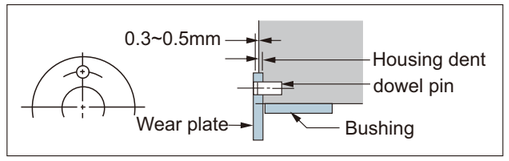
Storage

CSB slide bearings are supplied with bulk pack into cartons or in plastic bags before enter the carton. The bearings should be stored in clean, rust proof place. The thin wall bearings like EPB should be protected from deformation during storage. Do not store in locations exposed to high temperatures, high humidity, or the direct rays of the sun. Heavy load piles are prohibited during the storage.

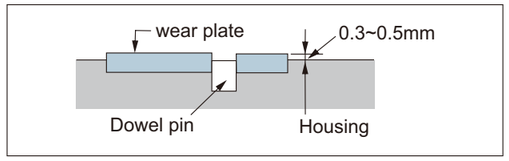
Thrust washers and plate

It is recommended to install the thrust washers and sliding plates with the hollow indented housings. To avoid the moving of such parts, a Dowel pins is recommended to be installed.

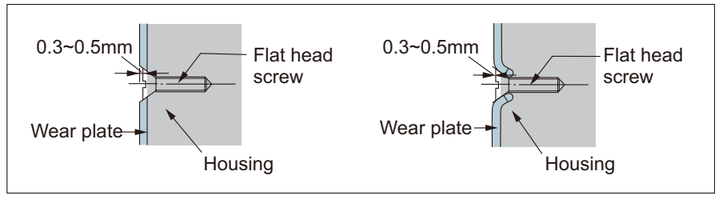
1. Dowel pin application(thrust washer)



2. Inlaid installation(plate)



3. Flat head screw application



Alternative fixing methods

Laser welding, adhesive fixing or soft soldering method could be the optional methods for the fixing of the washers or plate if the Dowel pin will not be considered. Please pay attention to control the temperature should not be exceeded to the limited temperature that the parts could bear when using laser welding or other higher temperature fixing methods. The sliding layer must always be kept free from adhesives.

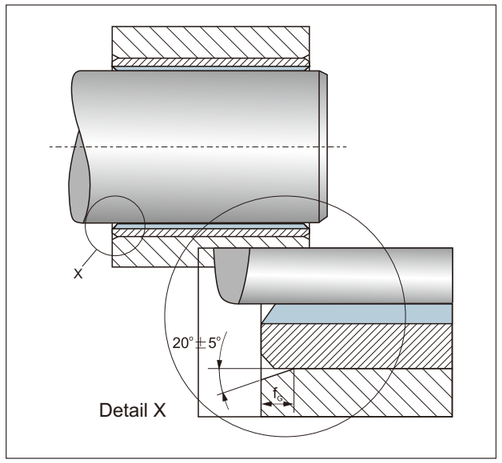
DESIGN OF BEARING ARRANGEMENTS

Housing

Bushes

There should be chamfers on the housing bore during the assembly. A chamfer $F_g \times 25° \pm 5°$ is important for the easier pressing of the bushing into the housing

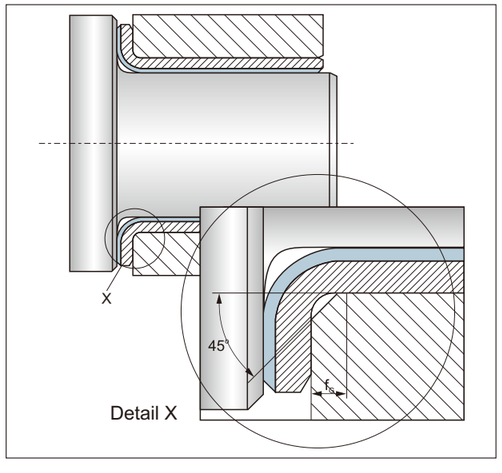
Housing bore diameter d_G	Chamfer with f_G
$d_G \leqslant 30$	0.8±0.3
$30 < d_G \leqslant 80$	1.2±0.4
$80 < d_G \leqslant 180$	1.8±0.8
$180 < d_G$	2.5±1.0



Flange bushes

The radius at the transition from the radial to the axial component must be taken into consideration for flange bushes. A sufficiently large chamfer must be provided on the housing to prevent the flanged bushes fouling in the area of the radius. Sufficient support must be provided for the flange in applications with axial loading.

Housing bore diameter d_G	Chamfer with f_G
$d_G \leqslant 10$	1.2±0.2
$10 < d_G$	1.7±0.2



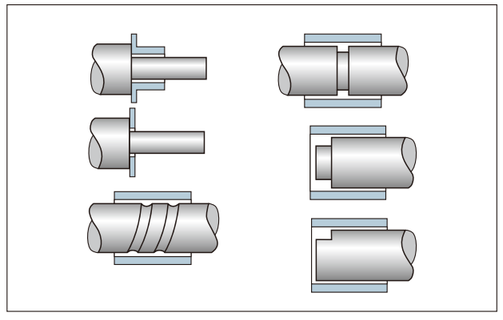
DESIGN OF BEARING ARRANGEMENTS

Shaft

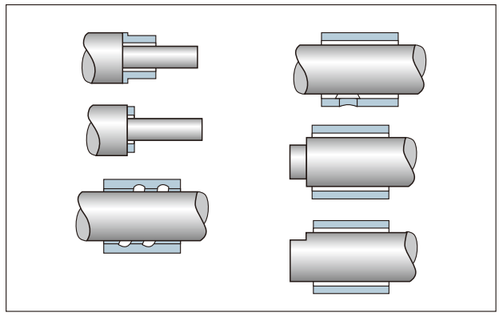
Bearing performance is influenced by the material, hardness, surface roughness and surface treatment of the mating shaft. If used in a corrosive environment such as in the seawater, or in the chemical liquid, double or triple chrome plating should be consideration.

Bearing material	Bearing load	Shaft material recommend	Hardness	Roughness
Metallic Bearing	<25Mpa	Carbon steel, structure alloy steel (S45C,SNC415,SCM435), In corrosive environment, corrosion resistant steel (SUS304,SUS403,SUS420)	>HB150	<1.6a
	25~49Mpa	Surface hardening treatment such as induction hardening and carburizing should be implemented for the above materials.	>HB250	<1.6a
	49~98Mpa	In addition to surface hardening treatment as above, additional surface treatment such as nitride treatment and hard chrome plating for above material.	>HRC50	<1.6a
Plastic and Metal polymer Bearings	<49Mpa	Carbon steel, structure alloy steel (S45C,SNC415,SCM435), in corrosive environment, corrosion resistant steel (SUS304,SUS403,SUS420)	>HB120	<0.8a
	49~98Mpa	Surface treatment such as induction hardening, quenching by carburizing and hard chrome plating for above material	>HRC50	<0.8a

Incorrect

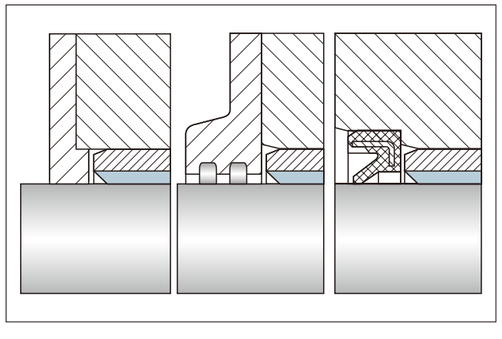


Correct



Seals

If increased levels of contamination occur or the bearing is used in an aggressive environment, the bearing section should be protected from dust and containment. The normal solution is to re-design the surrounding structure so that the contamination cannot reach the bearing section. If the contamination is critical, a collar of grease or a shaft seal is recommended.



SHAFT TOLERANCE TABLE (ISO)

Unit:mm

⩾	<	c9	d8	e7	e8	f7	g6	h5	h6	h7	h8	js6	js7	k6	m6	n6	p6	p7	r6	s6
—	3	-60 -85	-20 -34	-14 -24	-14 -28	-6 -16	-2 -8	0 -4	0 -6	0 -10	0 -14	±3	±5	+6 0	+8 +2	+10 +4	+12 +6	+16 +6	+16 +10	+20 +14
3	6	-70 -100	-30 -48	-20 -32	-20 -38	-10 -22	-4 -12	0 -5	0 -8	0 -12	0 -18	±4	±6	+9 +1	+12 +4	+16 +8	+20 +12	+24 +12	+23 +15	+27 +19
6	10	-80 -116	-40 -62	-25 -40	-25 -47	-13 -28	-5 -14	0 -6	0 -9	0 -15	0 -22	±4.5	±7	+10 +1	+15 +6	+19 +10	+24 +15	+30 +15	+28 +19	+32 +23
10	18	-95 -138	-50 -77	-32 -50	-32 -59	-16 -34	-6 -17	0 -8	0 -11	0 -18	0 -27	±5.5	±9	+12 +1	+18 +7	+23 +12	+29 +18	+36 +18	+34 +23	+39 +28
18	24	-110 -162	-65 -98	-40 -61	-40 -73	-20 -41	-7 -20	0 -9	0 -13	0 -21	0 -33	±6.5	±10	+15 +2	+21 +8	+28 +15	+35 +22	+43 +22	+41 +28	+48 +35
30	40	-120 -182	-80 -119	-50 -75	-50 -89	-25 -50	-9 -25	0 -11	0 -16	0 -25	0 -39	±8	±12	+18 +2	+25 +9	+33 +17	+42 +26	+51 +26	+50 +34	+59 +43
50	65	-140 -214	-100 -146	-60 -90	-60 -106	-30 -60	-10 -29	0 -13	0 -19	0 -30	0 -46	±9.5	±15	+21 +2	+30 +11	+39 +20	+51 +32	+62 +32	+60 +41	+72 +53
65	80	-150 -224																	+62 +43	+78 +59
80	100	-170 -257	-120 -174	-72 -107	-72 -126	-36 -71	-12 -34	0 -15	0 -22	0 -35	0 -54	±11	±17	+25 +3	+35 +13	+45 +23	+59 +37	+72 +37	+73 +51	+93 +71
100	120	-180 -267																	+76 +54	+101 +79
120	140	-200 -300	-145 -208	-85 -125	-85 -148	-43 -83	-14 -39	0 -18	0 -25	0 -40	0 -63	±12.5	±20	+28 +3	+40 +15	+52 +27	+68 +43	+83 +43	+88 +63	+117 +92
140	160	-210 -310																	+90 +65	+125 +100
160	180	-230 -330																	+93 +68	+133 +108
180	200	-240 -355	-170 -242	-100 -146	-100 -172	-50 -96	-15 -44	0 -20	0 -29	0 -46	0 -72	±14.5	±23	+33 +14	+46 +17	+60 +31	+79 +50	+96 +50	+106 +77	+151 +122
200	225	-260 -375																	+109 +80	+159 +130
225	250	-280 -395																	+113 +84	+169 +140
250	280	-300 -430	-190 -271	-110 -162	-110 -191	-56 -108	-17 -49	0 -23	0 -32	0 -52	0 -81	±16	±26	+36 +4	+52 +20	+66 +34	+88 +56	+108 +56	+126 +94	+190 +158
280	315	-330 -460																	+130 +98	+202 +170
315	355	-360 -500	-210 -299	-125 -182	-125 -214	-62 -119	-18 -54	0 -25	0 -36	0 -57	0 -89	±18	±28	+40 +4	+57 +21	+73 +37	+98 +62	+119 +62	+114 +108	+226 +190
355	400	-400 -540																	+150 +114	+244 +208
400	450	-440 -595	-230 -327	-135 -198	-135 -232	-68 -131	-20 -60	0 -27	0 -40	0 -63	0 -97	±20	±31	+45 +5	+63 +23	+80 +40	+108 +68	+131 +68	+166 +126	+272 +232
450	500	-480 -635																	+172 +132	+292 +252

HOUSING TOLERANCE TABLE(ISO)

Unit:mm

⩾	<	B10	C9	D8	E7	E8	F7	G7	H6	H7	H8	JS7	K7	M7	N7	P7	R7	S7	T7
—	3	+180 +140	+85 +60	+34 +20	+24 +14	+28 +14	+16 +6	+12 +2	+6 0	+10 0	+14 0	±5	0 -10	-2 -12	-4 -14	-6 -16	-10 -20	-14 -24	—
3	6	+188 +140	+100 +70	+48 +30	+32 +20	+38 +20	+22 +10	+16 +4	+8 0	+12 0	+18 0	±6	+3 -9	0 -12	-4 -16	-8 -20	-11 -23	-15 -27	—
6	10	+208 +150	+116 +80	+62 +40	+40 +25	+47 +25	+28 +13	+20 +5	+9 0	+15 0	+22 0	±7	+5 -10	0 -15	-4 -19	-9 -24	-13 -28	-17 -32	—
10	14	+200 +150	+138 +95	+77 +50	+50 +32	+59 +32	+34 +16	+24 +6	+11 0	+18 0	+27 0	±9	+6 -12	0 -18	-5 -23	-11 -29	-16 -34	-21 -39	—
14	18																		
18	24	+244 +160	+162 +110	+98 +65	+61 +40	+73 +40	+41 +20	+28 +7	+13 0	+21 0	+33 0	±10	+6 -15	0 -21	-7 -28	-14 -35	-20 -41	-27 -48	—
24	30																		-33 -54
30	40	+270 +170	+182 +120	+119 +80	+75 +50	+89 +50	+50 +25	+34 +9	+16 0	+25 0	+39 0	±12	+7 -18	0 -25	-8 -33	-17 -42	-25 -50	-34 -59	-39 -64
40	50	+280 +180	+192 +130																-45 -70
50	65	+310 +190	+214 +140	+146 +100	+90 +60	+106 +60	+60 +30	+40 +10	+19 0	+30 0	+46 0	±15	+9 -21	0 -30	-9 -39	-21 -51	-30 -60	-42 -72	-55 -85
65	80	+320 +200	+224 +150														-32 -62	-48 -78	-64 -94
80	100	+360 +220	+257 +170	+174 +120	+107 +72	+125 +72	+71 +36	+47 +12	+22 0	+35 0	+54 0	±17	+10 -25	0 -35	-10 -45	-24 -59	-38 -73	-58 -93	-78 -113
100	120	+380 +240	+267 +180														-41 -76	-66 -101	-91 -126
120	140	+420 +260	+300 +200	+208 +145	+125 +85	+148 +85	+83 +43	+54 +14	+25 0	+40 0	+63 0	±20	+12 -28	0 -40	-12 -52	-28 -68	-48 -88	-77 -117	-107 -147
140	160	+440 +280	+310 +210														-50 -90	-85 -125	-119 -159
160	180	+470 +310	+330 +230														-53 -93	-93 -133	-131 -171
180	200	+525 +340	+355 +240	+242 +170	+146 +100	+172 +100	+96 +50	+61 +15	+29 0	+46 0	+72 0	±23	+13 -33	0 -46	-14 -60	-33 -79	-60 -106	-105 -151	-149 -195
200	225	+565 +380	+375 +260														-63 -109	-113 -159	-163 -209
225	250	+605 +420	+395 +280														-67 -113	-123 -169	-179 -225
250	280	+690 +480	+430 +300	+271 +190	+162 +110	+191 +110	+108 +56	+69 +17	+32 0	+52 0	+81 0	±26	+16 -36	0 -52	-14 -66	-36 -88	-74 -126	-138 -190	-198 -250
280	315	+750 +540	+460 +330														-78 -130	-150 -202	-220 -272
315	355	+830 +600	+500 +360	+299 +210	+182 +125	+214 +125	+119 +62	+75 +18	+36 0	+57 0	+89 0	±28	+17 -40	0 -57	-16 -73	-41 -98	-87 -144	-169 -226	-247 -304
355	400	+910 +680	+540 +400														-93 -150	-187 -244	-273 -330
400	450	+1010 +760	+595 +440	+327 +230	+198 +135	+232 +135	+131 +68	+83 +20	+40 0	+63 0	+97 0	±31	+18 -45	0 -63	-17 -80	-45 -108	-103 -166	-209 -272	-307 -370
450	500	+1090 +840	+635 +480														-109 -172	-229 -292	-337 -400

EQUIVALENT HARDNESS TABLE FOR STEEL

Approximate, Equivalent Hardness Numbers for Diamond Pyramid Hardness for Steel

Diamond pyramid hardness No.	Brinell hardness No.10 mm ball, 3000 kg load			Rockwell hardness No.				Rockwell superficial hardness No., Superficial brale penetrator			Shore scleroscope hardness No.	Tensil strength (approx), 1000 PSI
	Standard ball	Hultgreen ball	Tungsten carbide ball	A-scale, 60 kg load, brale penetration	B-scale, 100 kg load, 1/16" diam ball	C-scale 150 kg load, brale penetration	D-scale 100 kg load, brale penetration	15-N scale, 15 kg load	30-N scale, 30 kg load	45-N scale, 45 kg load		
940	···	···	···	85.6	···	68,0	76.9	93.2	84.4	75.4	97	···
920	···	···	···	85.3	···	67.5	76.5	93	84	74.8	96	···
900	···	···	···	85	···	67	76.1	92.9	83.6	74.2	95	···
880	···	···	767	84.7	···	66.4	75.7	92.7	83.1	73.6	93	···
860	···	···	757	84.4	···	65.9	75.3	92.5	82.7	13.1	92	···
840	···	···	745	84.1	···	65.3	74.8	92.3	82.2	72.2	91	···
820	···	···	733	83.8	···	64.7	74.3	92.1	81.7	71.8	90	···
800	···	···	722	83.4	···	64	73.8	91.8	81.1	71	88	···
780	···	···	710	83	···	63.3	73.3	91.5	80.4	70.2	87	···
760	···	···	698	82.6	···	62.5	72.6	91.2	79.7	69.4	86	···
740	···	····	684	82.2	···	61.8	72.1	91	79.1	68.6	84	···
720	···	···	670	81.8	···	61	71.5	90.7	78.4	67.7	83	···
700	···	615	656	81.3	···	60.1	70.8	90.3	77.6	66.7	81	···
690	···	610	647	81.1	···	59.7	70.5	90.1	77.2	66.2	···	···
680	···	603	638	80.8	···	59.2	70.1	89.8	76.8	65.7	80	329
670	···	597	630	80.6	···	58.8	69.8	89.7	76.4	65.3	···	324
660	···	590	620	80.3	···	58.3	69.4	89.5	75.9	64.7	79	319
650	···	585	611	80	···	57.8	69	89.2	75.5	64.1	···	314
640	···	578	601	79.8	···	57.3	68.7	89	75.1	63.5	77	309
630	···	571	591	79.5	···	56.8	68.3	88.8	74.6	63	···	304
620	···	564	582	79.2	···	56.3	67.9	88.5	74.2	62.4	75	299
610	···	557	573	78.9	···	55.7	67.5	88.2	73.6	61.7	···	294
600	···	550	564	78.6	···	55.2	67	88	73.2	61.2	74	289
590	···	542	554	78.4	···	54.7	66.7	87.8	72.7	60.5	···	284
580	···	535	545	78	···	54.1	66.2	87.5	72.1	59.9	72	279
570	···	527	535	77.8	···	53.6	65.8	87.2	71.7	59.3	···	274
560	···	519	525	77.4	···	53	65.4	86.9	71.2	58.6	71	269
550	505	512	517	77	···	52.3	64.8	86.6	70.5	57.8	···	264
540	496	503	507	76.7	···	51.7	64.4	86.3	70	57	69	260
530	488	495	497	76.4	···	51.1	63.9	86	69.5	56.2	···	254
520	480	487	488	76.1	···	50.5	63.5	85.7	69	55.6	67	250
510	473	479	479	75.7	···	49.8	62.9	85.4	68.3	54.7	···	244
500	465	471	471	75.3	···	49.1	62.2	85	67.7	53.9	66	240
490	456	460	460	74.9	····	48.4	61.6	84.7	67.1	53.1	···	234
480	448	452	452	74.5	···	47.7	61.3	84.3	66.4	52.2	64	230
470	441	442	442	74.1	···	46.9	60.7	83.9	65.7	51.3	···	224
460	433	433	433	73.6	···	46.1	60.1	83.6	64.9	50.4	62	220
450	425	425	425	73.3	···	45.3	59.4	83.2	64.3	49.4	···	214
440	415	415	415	72.8	···	44.5	58.8	82.8	63.5	48.4	59	210
430	405	405	405	72.3	···	43.6	58.2	82.3	62.7	47.4	···	204
420	397	397	397	71.8	···	42.7	57.5	81.8	61.9	46.4	57	200
410	388	388	388	71.4	···	41.8	56.8	81.4	61.1	45.3	···	195
400	379	379	379	70.8	···	40.8	56	81	60.2	44.1	55	190
390	369	369	369	70.3	···	39.8	55.2.	80.3	59.3	42.9	···	185
380	360	360	360	69.8	-110	38.8	54.4	79.8	58.4	41.7	52	180
370	350	350	350	69.2	···	37.7	53.6	79.2	57.4	40.4	···	175
360	341	341	341	68.7	-109	36.6	52.8	78.6	56.4	39.1	50	170
350	331	331	331	68.1	···	35.5	51.9	78	55.4	37.8	···	166
340	322	322	322	67.6	-108	34.4	51.1	77.4	54.4	36.5	47	161
330	313	313	313	67	···	33.3	50.2	76.8	53.6	35.2	···	156
320	303	303	303	66.4	-107	32.2	49.4	76.2	52.3	33.9	45	151
310	294	294	294	65.8	···	31	48.4	75.6	51.3	32.5	···	146
300	284	284	284	65.2	-105.5	29.8	47.5	74.9	50.2	31.1	42	141
295	280	280	280	64.8	···	29.2	47.1	74.6	49.7	30.4	···	139
290	275	275	275	64.5	-104.5	28.5	46.5	74.2	49	29.5	41	136
285	270	270	270	64.2	···	27.8	46	73.8	48.4	28.7	···	134
280	265	265	265	63.8	-103.5	27.1	45.3	73.4	47.8	27.9	40	131
275	261	261	261	63.5	···	26.4	44.9	73	47.2	27.1	···	129
270	256	256	256	63.1	-102	25.6	44.3	72.6	46.4	26.2	38	126
265	252	252	252	62.7	···	24.8	43.7	72.1	45.7	25.2	···	124
260	247	247	247	62.4	-101	24	43.1	71.6	45	24.3	37	121
255	243	243	243	62	···	23.1	42.2	71.1	44.2	23.2	···	119
250	238	238	238	61.6	99.5	22.2	41.7	70.6	43.4	22.2	36	116
245	233	233	233	61.2	···	21.3	41.1	70.1	42.5	21.1	···	114
240	228	228	228	60.7	98.1	20.3	40.3	69.6	41.7	19.9	34	111
230	219	219	219	···	96.7	-18	···	···	···	···	33	106
220	209	209	209	···	95	-15.7	···	···	···	···	32	101
210	200	200	200	···	93.4	-13.4	···	···	···	····	30	97
200	190	190	190	···	91.5	-11	···	···	···	···	29	92
190	181	181	181	···	89.5	-8.5	···	···	···	···	28	88
180	171	171	171	···	87.1	-6	···	···	···	···	26	84
170	162	162	162	···	85	-3	···	···	···	···	25	79
160	152	152	152	···	81.7	0	···	···	···	···	24	75
150	143	143	143	···	78.7	···	···	···	···	···	22	71
140	133	133	133	···	75	···	···	···	···	···	21	66
130	124	124	124	···	71.2	···	···	···	···	···	20	62
120	114	114	114	···	66.7	···	···	···	···	···	···	57
110	105	105	105	···	62.3	···	···	···	···	···	···	···
100	95	95	95	···	56.2	···	···	···	···	···	···	···
95	90	90	90	···	52	···	···	···	···	···	···	···
90	86	86	86	···	48	···	···	···	···	···	···	90
85	81	81	81	···	41	···	···	···	···	···	···	85

SURFACE ROUGHNESS TABLE

CHINA GB 1031-83 ≈ISO 468-83			UK BS 1134-61		USA ASAB 46.1-62		GERMANY DIN4763-60			SWITZERLAND VSM 10321-62		ITALY UNI 13963-60	POLAND PN 58/M 042-51			CZECH CSNo 14450-61			JAPAN JIS B0601-70			
Ra (μ)	Rz Ry (μ)	Code	Ra (μ in)(μ)	Code	Ra (μ in)(μ)	Code	Ra (μ)	Rz (μ)	Code	Ra (μ)	Code	Ra (μ)	Ra (μ)	Rz (μ)	Code	Ra (μ)	Rz (μ)	Code	Ra (μ)	Rz (μ)	Rmax (μ)	Code
0.008	0.032																					
0.01	0.04	0.012 0.008					0.01	0.04					0.01	0.05	√14							
0.012	0.05															0.012	0.05		(0.0125a)		(0.05S)	
0.016	0.063						0.016	0.063					0.02	0.10	√13							
0.02	0.08	0.025																				
0.025	0.10		1(0.025)		1(0.025)		0.025	0.10		0.025	N1	0.025				0.025	0.10			0.1Z	0.1S	
0.032	0.125												0.04	0.20	√12							
0.04	0.16	0.05					0.04	0.16														
0.05	0.20		2(0.05)		2(0.05)					0.05	N2	0.05				0.05	0.20		0.05a	0.2Z	0.2S	
0.063	0.25						0.063	0.25					0.08	0.40	√11							
0.08	0.32	0.10			3(0.08)							0.08										
0.10	0.40		4(0.10)		4(0.10)		0.10	0.40		0.1	N3	0.1				0.10	0.40		0.1a	0.4Z	0.4S	
0.125	0.50				5(0.125)							0.12	0.16	0.80	√10							
0.16	0.63	Rz0.8			6(0.16)		0.16	0.63				0.16										
0.20	0.80		8(0.2)		8(0.2)					0.2	N4	0.2				0.20	0.80		0.2a	0.8Z	0.8S	
0.25	1				10(0.25)		0.25	1				0.25	0.32	1.60	√9							
0.32	1.25	Rz1.6		√16	13(0.32)							0.3						6.3				
0.40	1.6		16(0.4)		16(0.4)		0.40	1.60		0.4	N5	0.4				0.40	1.60		0.4a	1.6Z	1.6S	
0.50	2			16 C LA	20(0.5)					0.5	N6	0.5	0.63	3.20	√8							
0.63	2.5	0.80			25(0.63)		0.63	2.5				0.6										
0.8	3.2		32(0.8)		32(0.8)							0.8				0.80	3.2		0.8a	3.2Z	3.2S	
1	4				40(1)		1	4				1	1.25	6.30	√7							
1.25	5	1.60			50(1.25)							1.2										
1.6	6.3		63(1.6)		63(1.6)		1.6	6.3		1.6	N7	1.6				1.6	6.3		1.6a	6.3Z	6.3S	
2	8				80(2)							2	2.5	10	√6							
2.5	10	3.2			100(2.5)		2.5	10				2.5										
3.2	12.5		125(3.2)		125(3.2)					3.2	N8	3				3.2	12.5		3.2a	12.5Z	12.5S	
4	16				160(4)		4	16				4	5	20	√5					(18Z)	(18S)	
5	20	6.3			200(5)							5										
6.3	25		250(6.3)		250(6.3)		6.3	25		6.3	N9	6				6.3	25		6.3a	25Z	25S	
8	32											8	10	40	√4					35Z	35S	
10	40	Rz50					10	40				10										
12.5	50		500(12.5)		500(12.5)					12.5	N10	12				12.5	50		12.5a	50Z	50S	
16	63						16	63					20	80	√3							
20	80	25			800(20)															(70Z)	(70S)	
25	100		1000(25)		1000(25)		25	100		25	N11	25				25	100		25a	100Z	100S	
32	125												40	160	√2					140Z	140S	
40	160	Rz200					40	160														
125	200									50	N12					50	200		(50a)	200Z	200S	S
63	250						63	250					80	320	√1					280Z	280S	
80	320	100																				
250	400						100	400								100	400		(100a)	400Z	400S	
							160	630	S											560Z	560S	
							250	1000														
								1600														
								2500														

16 C LA 8-16 C LA or 8.16 C LA

16 / 8√

μ=0.000001m=0.001mm

μin=0.000001 in=0.0254μ

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CSB Bearing France

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Tel:+33-232-433276
Fax:+33-970-063257
Web: www.csb-bearings.fr
E-mail: p.mouclier@csb-bearings.fr

CSB in UK

KRF UK LTD

Address: 6 Bilton Road Rugby, CV22 7AB,UK
Tel: +44-1788 541551
Fax: +44-1788 541368
Web: www.krfukltd.co.uk
E-mail:marksmith@krfukltd.co.uk

CSB in India

CSB Sliding Bearing (India) PVT. LTD.

Address: Akash Deep Building Suite 206, Second Floor 26-A, Barakkhamba Road New Delhi-110001, India
Tel: +91-11-66302220/21
Fax: 011-23715557
Web: www.csbslidingbearings.com
Email: csbindia@bol.net.in

CSB in Swedan

D&E Trading AB

Address: Himmelsbodavagen 9, SE-147 39 Tumba, Sweden
Tel: +46 8 4474050
Fax: +46 8 4474060
Web-site: www.detrading.se
E-mail: johan@detrading.se

CSB in Finland

D&E Trading OY

Address: Takasenkatu 55 08150 Lohja, Finland
Tel: +358 9682 3240
Fax: +358 9682 2662
Web-site: www.detrading.se
E-mail: juhani@detrading.se

CSB in Turkey

O-Pak Ithalat ve Ihracat Ltd. Sti.

Address:Perpa Ticaret Merkezi A-Blok Kat 5 No: 282-284-286 okmeydanl 34384 istanbul Turkey
Tel: +90-212-222 57 00 / 221 53 15
Fax: +90-212-222 56 99 / 221 23 18
Web-site: www.o-pak.com.tr
E-mail: a.arevyan@o-pak.com.tr

CSB in Switzerland

GGT Gleit-Technik AG

Address: Meierskappelstr. 3, CH-6403 Kuessnacht am Rigi, Switzerland
Tel:+41-418541530
Fax:+41-418541532
web-site: www.gleitlager.ch
E-mail: info@gleitlager.ch

CSB in Canada(Quebec)

Global Bear Inc.

Address: 2064 Chartier Avenue , Dorval, Quebec, Canada H9P 1H2
Tel:1-866-631-1110 (Toll free in North America)
+1-514-631-1110
Fax: +1-514-636-7737
Web: www.globalbear.ca
E-mail:sales@globalbear.ca

CSB in Canada(Ontario)

Global Bear Inc.

Address: 21601 Matheson Blvd. Unit 10, Mississauga, Ontario, Canada L4W 1H9
Tel:1-877-820-4865 (Toll free in North America)
+1-905-624-0612
Fax: +1-905-624-0612
Web: www.globalbear.ca
E-mail:sales@globalbear.ca

CSB Bearing Technologies

Data For Sliding Bearing Design Calculations

Applied Machinery | Applied part name | ☐Exist Design ☐New Design

Bearing Specification (Size, tolerance, please attachment the drawings)

Shape and Tolerance	☐ Cylindrical Bush		☐ FlangeBush		☐ Slide plate		☐ Thrustwasher		☐ Others	
	Flange		OD		ID		Length		Wall thick.	
	Length		Width		Thickness					
Mating	Material		Surface finish		Roughness		Hardness		Tolerance	
Housing	Material		Housing wall thick.		ID Roughness		Chamfer		Tolerance	
Movement	☐ Rotation		☐ Oscillating		☐ Reciprocating					
	rpm		Angle ±		Stroke	mm	Cycle	cpm		
Load	N	Pressure	Mpa	☐ Staticload ☐ Dynamicload ☐ Rotatingload ☐ Impact						
Speed	m/s		PV	N/mm²*m/s						
Service hours per day		☐ Continuous ☐ Intermittent		Service day per year		Distance total	km			
Environment: ☐ atmosphere ☐ Seawater ☐ Freshwater ☐ Turbid ☐ Chemical (name: PH:) ☐ Others										
Temp.: ℃	Impurity Incursion ☐ Yes ( ) ☐ No			Seal ☐ Yes ☐ No						
Lubricate:	☐ Dry ☐ Initial ☐ Regular giving ☐ lubrication ☐ Others ( )									
lubricant	☐ Oil ( ) ☐ Grease ( ) ☐ Others ( )									

Others description: （the technical problem, the exist material etc.）

Required Service Life		Allowed wear lost mm	

Judgment of Bearing Failure:

Company Name: _____ Web: _____

Address: _____

Department: _____ Contact person: _____

E-mail: _____ Telephone: _____ FAX: _____

Any questions of self-lubricating bearing material during your design please contact us Fax: +86 573 84183450