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Filament wound Plastic Self-lubricating Bearings



Filament wound Plastic Self-lubricating Bearings

CSB-CRB: Glass fiber epoxy-impregnated with PTFE and high strength fibers

CSB-CRG: Glass fiber epoxy-impregnated with PTFE and high strength fibers

CSB-CRE: Glass fiber epoxy-impregnated with high strength fibers

CSB-CRP: Glass fiber epoxy-impregnated with PTFE tape

CSB-CRF: Woven cotton fabric with phenolic reinforced

P94-P97

CSB-CR Filament Wound Self-lubricating Bearings

RoHS



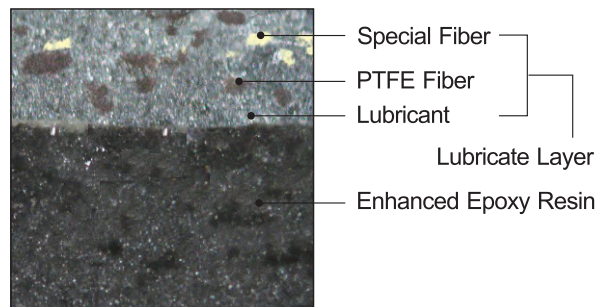
Structure

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

Features

1. The lubricating layer, which has very low friction coefficient, superior anti-wear feature and scratch resistance, is made by special PTFE fiber and high strength artificial fiber compound. It provides excellent self-lubricating features and good anti-wear feature during dry operation.
2. The back material comprises of high strength epoxy glass fiber with excellent erosion resistance feature make it possible to be used in water or sea.
3. The maxim dynamic load is 140Mpa and also certain impact load is permissible. It has good shock absorb feature and self-align characteristics.
4. The material could form an effective solid lubricating film to prevent the bearing stick to the shaft during operation.
5. The non-metallic material is isolated and light in mass. It is 75% lighter than steel and 30% lighter than Aluminum.
6. This filament wound composite bearing is suitable to be used at the frequently start and stop positions with rotating, oscillating and linear motion.
7. The CR material is recommended applied in dry condition only.

8. Comparing to oil lubricating bearings, the filament wound composite bearing is suitable for wider temperature range from -100°C to $+160^{\circ}\text{C}$.
9. Comparing to other non-metallic bearings, this kind of material could be used in different media including air, oil and water because of its low water absorption feature and linear expansion coefficient similar with of steel.
10. The thermal expansion factor of the material is similar with steel and cast iron.



CSB-CR Filament Wound Self-lubricating Bearings








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).

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

Tech. Data

Designation	Unit	CSB-CRG	CSB-CRB	CSB-CRE	CSB-CRP	CSB-CRF
Basic type		High load	Standard	General	High speed	Basic
Density	g/cm ³	2.00	2.00	2.00	2.00	1.30
Max. PV	MPa*m/s	2.0	1.8	1.6	1.6	1.2
Coefficient of friction	-	0.03~0.12	0.03~0.12	0.03~0.12	0.02~0.12	0.15~0.30
Working temp.	°C	-100~+160	-100~+160	-100~+160	-100~+160	-40~+130
Max. speed	m/s	0.20	0.20	0.20	0.40	0.13
Max. load	MPa	420	420	420	420	300
Static load	MPa	240	240	240	240	150
Dynamic load	MPa	160	140	100	30	45
Radial compressive strength	MPa	550	550	550	550	200
Hardness	HRM	95	95	95	95	90
Linear thermal expansion factor	Um/m°C	13×10 ⁻⁶	13×10 ⁻⁶	13×10 ⁻⁶	13×10 ⁻⁶	40×10 ⁻⁶
Color		Black 	Coffee 	White 	White 	Dark grey 

CSB-CR Filament Wound Self-lubricating Bearings

Material Chemical Resistance Property			
Alcohol	Resistance	Saline	Resistance
Methanol	Yes	Sodium Acetic acid	Yes
Ethanol	Yes	Sodium Carbonate	Yes
Allyl	No	Amine Nitric Acid	Yes
Butyl	No	Amine Chlorate	Yes
Propyl	Yes	Bitter Salt	Yes
Oxyhydrogen Acetone	Yes		
Solvent		Gas	
Acetone	Yes	Butane	Yes
Toluene	Yes	Ozone	Yes
Methyl Ethylic Ketone	Yes	Nitrogen	Yes
Trichloroethylene	No	Natural Gas	Yes
Benzene	No	Ethyne	Yes
10%) Acid		Hydrogen	Yes
Hydrochloric Acid	Yes	Fluorin	No
Boracic Acid	Yes	Chlorine	No
Acetic Acid	Yes		
Sulfuric Acid	Yes	Alkali (10%)	
Nitrogen Acid	No	Sodium Hydroxide	Yes
Carbonic Acid	No	Calcium Oxide	No
Hydrofluoric Acid	No	Aluminum Hydroxide	Yes
Oil			
Gear Oil	Yes	Others	
Engine Oil	Yes	Freon	Yes
Hydraulic Oil	Yes	Carbinol	Yes
Linseed Oil	Yes	Sodium Nitrate	Yes
Fuel		Ethylene Glycol	Yes
Gasoline	Yes	Ammonia	No
Jet Fuel	Yes	100°C Boiled Water	No
Diesel Oil	Yes		
Petroleum	Yes		
Sodium Hydroxide	Yes		

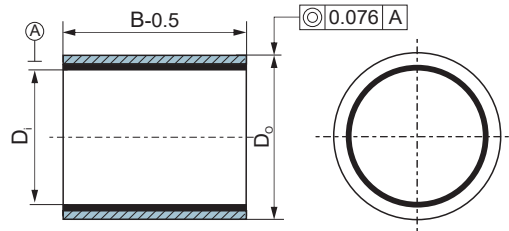
CSB-CR Filament Wound Self-lubricating Bearings

Order Spec. CRG — 35 41 — 30

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D_i D_o Length

Materials:
CRG, CRB, CRE, CRP, CRF



Order Spec.	Bearing Size		Recommend		Assembly interference	Running clearance	Standard length B
	D_i	D_o	Shaft D_s h7	Housing H7 D_H			
CRG-1520-L	15 ^{+0.145} / _{+0.095}	20 ^{+0.075} / _{+0.045}	15 ⁰ / _{-0.018}	20 ^{+0.021} / ₀	0.024-0.075	0.020-0.139	15, 20, 25
CRG-1621-L	16 ^{+0.145} / _{+0.095}	21 ^{+0.075} / _{+0.045}	16 ⁰ / _{-0.018}	21 ^{+0.021} / ₀	0.024-0.075	0.020-0.139	15, 20, 25
CRG-1823-L	18 ^{+0.195} / _{+0.115}	23 ^{+0.095} / _{+0.045}	18 ⁰ / _{-0.018}	23 ^{+0.021} / ₀	0.024-0.095	0.020-0.189	15, 20, 25
CRG-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
CRG-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
CRG-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
CRG-2834-L	28 ^{+0.200} / _{+0.120}	34 ^{+0.100} / _{+0.050}	28 ⁰ / _{-0.021}	34 ^{+0.025} / ₀	0.025-0.100	0.020-0.196	20, 30, 40
CRG-3036-L	30 ^{+0.200} / _{+0.120}	36 ^{+0.100} / _{+0.050}	30 ⁰ / _{-0.021}	36 ^{+0.025} / ₀	0.025-0.100	0.020-0.196	20, 30, 40
CRG-3541-L	35 ^{+0.200} / _{+0.120}	41 ^{+0.100} / _{+0.050}	35 ⁰ / _{-0.025}	41 ^{+0.025} / ₀	0.025-0.100	0.020-0.200	30, 40, 50
CRG-4048-L	40 ^{+0.200} / _{+0.120}	48 ^{+0.100} / _{+0.050}	40 ⁰ / _{-0.025}	48 ^{+0.025} / ₀	0.025-0.100	0.020-0.200	30, 40, 60
CRG-4553-L	45 ^{+0.230} / _{+0.130}	53 ^{+0.105} / _{+0.055}	45 ⁰ / _{-0.025}	53 ^{+0.030} / ₀	0.025-0.105	0.025-0.230	30, 40, 60
CRG-5058-L	50 ^{+0.230} / _{+0.130}	58 ^{+0.105} / _{+0.055}	50 ⁰ / _{-0.025}	58 ^{+0.030} / ₀	0.025-0.105	0.025-0.230	40, 50, 60
CRG-5563-L	55 ^{+0.245} / _{+0.145}	63 ^{+0.120} / _{+0.070}	55 ⁰ / _{-0.030}	63 ^{+0.030} / ₀	0.040-0.120	0.025-0.235	40, 55, 70
CRG-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
CRG-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
CRG-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
CRG-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
CRG-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
CRG-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
CRG-90105-L	90 ^{+0.275} / _{+0.175}	105 ^{+0.125} / _{+0.075}	90 ⁰ / _{-0.035}	105 ^{+0.035} / ₀	0.050-0.135	0.050-0.270	60, 80, 120
CRG-95110-L	95 ^{+0.310} / _{+0.185}	110 ^{+0.135} / _{+0.085}	95 ⁰ / _{-0.035}	110 ^{+0.035} / ₀	0.050-0.135	0.050-0.295	60, 80, 120
CRG-100115-L	100 ^{+0.310} / _{+0.185}	115 ^{+0.135} / _{+0.085}	100 ⁰ / _{-0.035}	115 ^{+0.035} / ₀	0.050-0.135	0.050-0.295	80, 100, 120
CRG-110125-L	110 ^{+0.315} / _{+0.190}	125 ^{+0.135} / _{+0.085}	110 ⁰ / _{-0.035}	125 ^{+0.040} / ₀	0.050-0.140	0.050-0.300	80, 100, 120
CRG-120135-L	120 ^{+0.340} / _{+0.215}	135 ^{+0.165} / _{+0.090}	120 ⁰ / _{-0.035}	135 ^{+0.040} / ₀	0.050-0.165	0.050-0.325	100, 120, 150
CRG-130145-L	130 ^{+0.340} / _{+0.215}	145 ^{+0.165} / _{+0.090}	130 ⁰ / _{-0.040}	145 ^{+0.040} / ₀	0.050-0.165	0.050-0.330	100, 120, 150
CRG-140155-L	140 ^{+0.340} / _{+0.215}	155 ^{+0.165} / _{+0.090}	140 ⁰ / _{-0.040}	155 ^{+0.040} / ₀	0.050-0.165	0.050-0.330	100, 150, 180
CRG-150165-L	150 ^{+0.340} / _{+0.215}	165 ^{+0.165} / _{+0.090}	150 ⁰ / _{-0.040}	165 ^{+0.040} / ₀	0.050-0.165	0.050-0.330	120, 150, 180