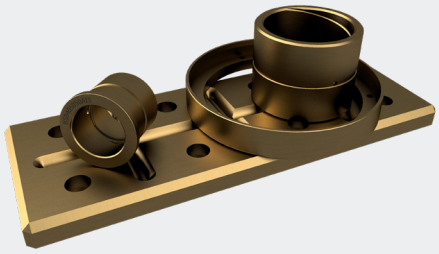
BRO-MAS® CuZn25Al5*

Turned bronze sliding bearing | Requiring maintenance | DIN 1850 / ISO 4379



Bearing properties

BRO-MAS® is a sliding bearing requiring maintenance, suitable for operation in contaminated environments, good corrosion resistance, insensitive to shock loads. An oil or grease lubrication is required. By means of additional lubrication grooves or lubrication holes, the relubrication intervals are greatly reduced and the lubricant distribution is improved.

Materials

CuZn25Al5 (Standard alloy)

RoHS

Material properties

Maintenance	Requiring maintenance
spec. static load capacity	≤ 200 N/mm²
spec. dynamic load capacity	≤ 150 N/mm²
Sliding speed	≤ 10 m/s
Friction value	0,09 to 0,15
Temperature strain	- 40 to + 300 °C
Max. Pv - value	1,8 N/mm² x m/s
Hardness	190 - 220 HB

Tolerance specifications

Housing bore-ø	H7
Bushing inner-ø after mounting	E7 / s6 (from 120 ø r6)
Shaft tolerance	f7

Shaft material

The difference in hardness to the bearing should be at least 100 HB, if possible hardened and ground, surface roughness ≤ Rz 6.3

Mounting instructions

Housing bore	Installation chamfer, approx.1,5 mm x 15 to 45°
Shaft	Installation chamfer, 5 mm x 15°, edges rounded.
Fitting mandrel	For assembly, we suggest to use an adequate fitting mandrel. Grease lubrication of the outer surface may be necessary when mounting.

* This bearing is available in other metal alloys. Please refer to our data sheet with the comparative overview of the material properties.

BRO-MAS® is available as:

Cylindrical bushing **BSZ**

Other common designations:
PBM

Flanged bushing **BSB**

Other common designations:
PBMF

Thrust washer **BSA**

Strips **BSS**

Formed Parts **BSF**

BRO-MAS® is manufactured to order without exception, no stocks available. All special dimensions are available.

Comparison of different bronze alloys in the portfolio of GLT Bearings GmbH

Material properties	RG7 DIN 2.1090.03	CuSn12 DIN 2.1052.03	CuZn34Al2 DIN 2.0596.03	CuZn37Al2 DIN 2.0550.03, before CuZn40Al2	CuAl10Ni DIN 2.0975.03	CuZn25Al5 DIN 2.0598.03	SWB-1069	LHG155	LHG157
Max. static load in N/mm²	110	120	160	170	180	200	550	680	...
...as maintenance-free design in N/mm²	75	80	100	140	120	150	n/a	440	...
Max. dynamic load in N/mm²	60	80	120	130	150	150	195	370	...
...as maintenance-free design in N/mm²	30	40	60	90	80	100	n/a	260	...
Tensile strength R_m in N/mm²	260	280	620	640	650	750	655	877	...
Yield strength $R_{p0,2}$ in N/mm²	120	150	260	350	280	480	345	661	...
Elongation at break in %	12	5	14	5	13	5	10	20	...
Brinell hardness in HB	70	90	150	155	150	190	202	260	...
Flexural strength R_{bw} in N/mm²	110	90	170	160	185	150	248	220	...
Elastic modulus in N/mm²	98.000	90.000	90.000	93.000	110.000	105.000	110.000	130.000	...
Density in g/cm³	8,8	8,6	8,6	8,12	7,6	8,2	7,45	7,64	...
Thermal expansion coefficient in 10^{-6} / K	18,5	18,5	20	20,4	16	18	16,2	17	...

Important note:

We have determined the bearing material for the respective application to the best of our knowledge and belief. The selection is based on mathematical principles and empirical values, which, however, cannot cover all influencing factors of the actual applications in use. For this reason, tests under operating conditions are often necessary for critical applications, or it is only possible to identify the optimum suitability of the material in direct use.

Information on sliding bearings

Sliding bearings are the most commonly used bearings in mechanical engineering. In the following, we would like to inform you about various properties of sliding bearings to give you the best possible insight. Our extensive range of bearings offers products for every need.

Advantages of sliding bearings

Due to the largely completely different application properties of sliding bearings, even the most difficult requirements can usually be optimally fulfilled. Some sliding bearings are relatively insensitive to impacts, vibrations and shocks due to the material and the damping properties of the bearing surface.

Sliding bearings run predominantly quietly, are robust, usually also very impervious to dirt and only rarely require additional seals.

Bushings are also available in split versions, which serve their requisite purpose in certain constructions.

Disadvantages of sliding bearings

With some types of sliding bearings, a higher starting torque is inevitable. Non-maintenance-free sliding bearings always require adequate maintenance and lubrication.

The efficiency of sliding bearings can generally be assumed to be somewhat lower than that of rolling bearings.

PV value

The PV value has a significant influence on the service life. It is the product of specific bearing load (p) and speed (v). The service life decreases as the PV value increases.

Friction

The friction value depends on the following factors:

- Selection of the material pairing
- Roughness of the counter surfaces
- Specific bearing load
- Sliding speed
- Bearing temperature
- Type of lubrication

Preferred use

For bearing arrangements with low speeds, for pivoting or axial movements, for shock loads and dirt loads. Also for bearing arrangements with all-purpose requirements, in agricultural machinery, construction machinery, vehicle construction, etc.

Mechanical engineering sliding bearings are also used in applications that require a simple design and a low price.

The sliding bearings are also suitable for bearing arrangements at high or low temperatures and with special corrosion resistance. They are also used for bearing arrangements in long-term applications that require a long service life and where wear-free running is required, usually in the area of liquid friction. These include water and steam turbines, generators, centrifugal pumps, heavy ship shaft bearings and the like.

Service life factors:

- Specific bearing load
- Sliding speed
- PV value
- Material and surface roughness of the sliding partners
- Load zone allocation
- Duty cycle
- Temperature
- Lubrication
- Operating conditions (e.g. dirt)

etc.

Delivery condition of the sliding bearings

Our sliding bearings (as well as brass bushings or sliding bearing bushings) are mainly delivered in a ready-to-install condition. As to a few types of bearings, specifications suitable for post-machining are possible. Please do not hesitate to ask us!

Proper storage of sliding bearings

Bronze, stainless steel and plastic sliding bearings are corrosion-resistant and do not require any special storage. Steel sliding bearings should be stored in dry rooms with low humidity. It is recommended to remove these bearings from their packaging only immediately before installation.

What you should consider when choosing a plain bearing

It is particularly important to note that the material and lubricant must be matched to each other. It is important that the material has good emergency running properties, high wear resistance and high thermal conductivity. The lubricant must coat the friction surface well.

Mounting of sliding bearings

In the case of wrapped sliding bearing bushes, slight deviations in the round shape as well as an open butt joint due to the manufacturing process cannot be prevented. These differences have been anchored in the applicable standards.

The circumference of these bearing bushes is dimensioned so that they are round and have a sufficient press fit after installation in a housing bore.

The press-fitting of sliding bearings should always be carried out with an fitting mandrel. For rolled plain bearing bushes with a diameter larger than 50 mm, it is recommended to additionally use a mounting ring (see supplementary sheet).

For easier installation of bearing bushes, a chamfer of 15° - 30° is required on the housing.

For flanged bushings, an additional chamfer of 1.0 x 45° (for larger bushings 1.5 to 2 x 45°) should be provided so that the flange rests completely and flat on the housing surface.

To ensure proper assembly of the bolt, the shaft ends must also be chamfered or rounded. Sharp edges can damage the sliding surface during assembly and reduce the function of the sliding bearing.

The tolerances of the inner diameter stated in the respective data sheets, in assembled condition, can only be guaranteed if the assembly has been carried out correctly and a locating hole has been made in the middle of the required tolerance field.

Gluing of bearing bushes and more

Bushings, thrust washers, strips and special parts made of metal or plastic can be secured not only by screwing or pinning but also by gluing.

Plastic bushings in particular are very often additionally secured by gluing them into the housing. This is often used when plastic bushings are exposed to high temperature fluctuations.

Lubrication (oil lubrication, grease lubrication, dry lubricant)

Oil lubrication

This type is preferable for high rotational speeds and loads, but also applicable for low rotation speeds. The type of lubricating oil depends on the particular application of the sliding bearing. Additives of molybdenum disulphide or graphite can improve the lubrication properties by increasing the adhesion and smoothing the sliding surfaces.

Grease lubrication

Grease lubrication of sliding bearings is mainly used for low speeds, oscillating movements and shock loads or when floating friction cannot be achieved.

Only high-quality plain bearing greases should be used for grease lubrication.

Lubricants with a solid additive of more than 2 % are not recommended, as these can cause premature wear. Under no circumstances should greases containing molybdenum sulphide be used to lubricate plastic sliding bearings. (e.g. Molicote grease)

Dry lubricant

Solid bronze bearing bushes with solid lubricant inserts in the sliding surface can also be used maintenance-free. All-plastic sliding bearings can increasingly be provided for demanding dry bearings and are often a better solution than bronze or steel sliding bearings. The application limits of these plastic sliding bearings are usually set by the specific thermal conductivity and thermal expansion.

However, specially developed plastics are also available for these applications. Dry lubricants such as molybdenum disulphide (MoS2) or graphite are used at high temperatures or for emergency running and one-time lubrication.

Running-in process of sliding bearings

During the running-in process, the lubricant or parts of the dry sliding layer are transferred to the mating surface. This fills and compensates for the surface roughness in the running surface. This results in a sliding pairing that has a very low friction coefficient. Only after this process can a positive sliding behaviour with low operating values develop.