HIMON BEARINGS

Product Data Sheet
Advance Information

MDS.26.00

MX
SELF LUBRICATED SLIDING BEARINGS

CuSn11 Sintered Connecting Layer →
Protective Layer (Sn/Zn/Oil) →

← Pom-C
← Low Carbon Steel DC-04

Sliding Layer	Intermediate Layer	Connecting Layer	Supporting Shell
Pom-C (DIN7728) Thickness 250 ÷ 450µm. Colour black/gray.	CuSn11 Sintered Thickness 200 ÷ 350µm. Avarage Peak.	Cu < 1µm	C 0.17 % Max Mn 1.40 % Max P 0.04 % Max S 0.04 % Max

Characteristics

MX structure combines in the best way the mechanical strength of the steel, the bronze thermal conductivity and POM-grease low friction. The performance are the following:

Working surface acceptable specific static pressure	Max 140 N/mm^2
Working surface acceptable specific dynamic pressure	Max 140 N/mm^2
Maximum sliding speed (grease)	2,50 m/s (500 fpm)
Working temperature	From -40°C to +130° C

MX is produced in coils of various thicknesses from which the sliding bearings such as bushes, thrust washers, strips and special parts for lubricated applications are manufactured. MX bearings can be used in a wide range of applications, from civil and industrial vehicles to machine tools and wherever there are articulated joints that require minimum periodic lubrication. The lubricant guarantees very low coefficients of friction and consequently, a reduced amount of wear with an anti-corrosive protection of the mechanical parts.
Use of the MX bearings is continuing to expand because of a need both to overcome problems of wear between two metal mating surfaces and to reduce costs by substituting rolling bearings wherever possible. MX provides an answer to these requirements while offering greater compactness and ease of fitting at the same time.
Lubrication is always necessary and if grease is used, it is essential to establish beforehand whether the grease will be applied only initially or if regular maintenance operations will be carried out. Further details concerning maintenance are provided further on.

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Performance

The load capacity of MX bearings is expressed by the load factor p x v (N/mm² x m/s) where p is the specific load and v is the speed. The maximum value of the specific load that can be applied under static and ideal conditions is 140 x N/mm². For the bushes, the internal semi-surface, which is given by the result of the internal diameter multiplied by the length Di x L, must be considered.
Higher temperatures reduce the load factor by 20% at 50°C, by 50% at 70°C and by 80% at 90°C. The performance of the bearings in the MX range is improved with grease lubrication that allows for P x V factors of up to 5 N/mm² x m/s with maximum speed of 2.5 m/s.
The MX series of bearings can be used without maintenance and with just a first initial greasing. However, where possible, re-greasing should be carried out to increase the operating life of the bearing.
The outside of the bearings is protected with a Tin Plating or Zinc Plating.

Friction

The particular characteristic of the acetal co-polymer sliding lining of MX bearings is that it creates a pseudo-binding with the lubricants to form an excellent and very long-lasting sliding surface. Apart from the considerations referred to above, the dynamic coefficient of friction under lubricated operating conditions is greatly influenced, both positively and negatively, by the same factors that determine the operating life of the bearing. With a grease based lubrication, the coefficient of friction varies between the values of 0,03 - 0,10. The lowest values are reached with a high specific load. Oil lubrication further reduces friction and at high speeds hydrodynamic lubrication is attained that lowers the coefficient of friction to values close to 0,02. For MX bearings, the static coefficient of friction is not much higher than the dynamic one and therefore, the annoying “stick-slip” phenomenon, i.e. the sticking of the bearing when still, does not occur.

Wear

The wear rate of MX bearings for greased applications is difficult to calculate in advance owing to other factors that must be taken into consideration apart from the temperature, such as the roughness of the mating surface, the alignment of the mating, the presence of pollutants in the lubricant and other elements.
The operating life is also affected by the way in which the load is applied. With an equal specific load, the operating life is longer if the application has a rotating load, while it is shorter (-30% approximately) with a unidirectional load, while thrust washers have the shortest operating life (-50% approximately).
The amount of wear on MX bearings is very small especially for specific loads from 10 to 40 N/mm². Even for loads of up to 120 N/mm², the amount of wear remains low as long as the lubricant is well-distributed, but the amount of wear increases enormously as soon as the lubricant runs dry. The bearing must be regreased before wear begins due to a lack of lubricant and, generally, the amount of wear between one lubrication and the next should not exceed 0,025 mm. When the amount of wear reaches 0,20 mm, the bearing is normally considered to have exceeded its operating life. Where possible, MX bushing preliminary tests have to be carried out to make sure about the influencing factors of each application; our technical department is willing to supply additional information and data request.

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