Self -Lubricating Sintered Metal Bearings at Elevated Temperatures

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Deva.metal® is a product group of self-lubricating sintered bronze, steel or nickel based bearings. Graphite is used as most common solid lubricant, but also others such as Molybdenum disulfide. The solid lubricant is embedded into the metal matrix in different sizes, amounts and allocations. These different bearing materials can be used up to a temperature of 350°C (bronze) and 800°C (steel).

The goal of this investigation is to show the COF and wear at rising temperatures and see the impact between amount, size and allocation of the embedded lubricant. The tests are executed on a tribometer Tribolab-UMT from Bruker as pin-on-disc setup. The tests include different loading conditions, rotational and oscillating movement as well the comparison of the different temperatures. In addition, reference tests are done on a big scale test rig at room temperature with bushings with an inner diameter of 70 mm. The tests on the test rig at room temperature shall provide the basis for future calculations, while the tests on the tribometer are providing information regarding the temperature impact. The results from the tribometer shall be transformed into correction graphs, which need to be considered, when wear and lifetime shall be estimated for applications.

The wear and COF of the different materials change when the temperature is rising. For the most materials, the wear and friction increases. To provide a reliable lifetime to customers, such information needs to be considered.

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