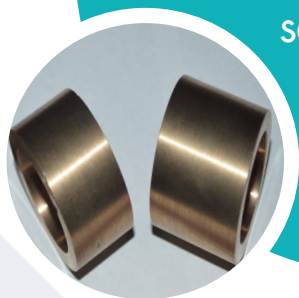


Focus on CSIR research Copper-based bushings

The CSIR's Powder Metallurgy Technologies platform aims to enhance the competitiveness of our South African industry through efficient and low-energy manufacturing of industrial engineering products. The platform is especially geared towards supporting new small, medium and micro enterprises with intellectual property and technical expertise. In one such endeavour, it, in partnership with Metals Innovations (Pty) Ltd, locally manufactured oil-impregnated copper-based bushings that conform to international standards, notably the ASTM B438 Powdered Metal Bronze Sleeve Bearing Oil Impregnated Bronze, as well as equivalent international standards, including the MPIF; SAE 841; Mil-B-5687 and AMS 4805.

Oil-impregnated copper-based bushings are intended to preserve and extend the lifespan of machinery in various industries by reducing friction and wear. They are found in agricultural machines (e.g. tractors), domestic appliances (e.g. vacuum cleaners and washing machines), food industry (in equipment used for food preparation, etc.), the textile industry (in equipment used for making yarns),

“The oil-based bushings have various advantages, chief among them being that they are self-lubricating and maintenance-free in application.”

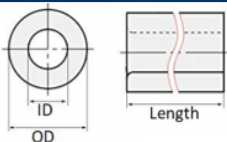
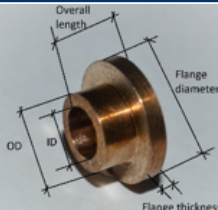


medical industry (in surgical and medical apparatus) and electrical machines (such as motors used in automobiles).

The chemical composition (in weight %) of the copper-based bushings is stipulated as:

- Copper – 87.5 – 90.5
- Tin – 9.5 – 10.5
- Graphite – 0 – 0.3 (low); 0.5 – 1.8 (medium); 3.0 – 5.0 (high)
- Other elements – less than 2.0

The copper-based bushings available at the CSIR and produced in partnership with Metals Innovations (Pty) Ltd are solid and hollow plain, and flanged oil-impregnated bushings. They can be produced to standard and customised dimensions, as shown:

Bushing Type	Schematic	Dimensions (Range)
Plain		ID – Internal Diameter – 4 to 32 (mm) OD – Outside Diameter – 6 to 44 (mm) Length – 6 to 52 (mm)
FlangedType		ID – Internal Diameter – 3 to 40 (mm) OD – Outside Diameter – 6 to 50 (mm) Flange Diameter – 9 to 60 (mm) Flange Thickness – 1.5 to 5 (mm) Overall Length – 4 to 40 (mm)

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