PLASTIC SUPERCONDUCTOR BEARINGS
ANY SIZE - ANY SHAPE
77 k AND UP

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ABSTRACT

"Friction free" bearings at 77 k or higher are possible using the high
Tc copper oxide ceramic superconductors. (1), (2)

The conventional method for making such bearings is to use a sintered
ceramic monolith. This puts great restraints on size, shape and post-
forming machining. The material is hard and abrasive.

It's possible to grind up ceramic superconductors and suspend the granules
in a suitable matrix. Mechanical properties improve and are largely dependent
on the binder. The Meissner effect is confined to individual grains
containing electron vortices. (3)

Tracks, rails, levitation areas and bearings can be made this way with
conventional plastic molding and extruding machines or by painting. The
parts are easily machined. The sacrifice is in bulk electrical conductivity.

A percolating wick feel for LN2 can be used to cool remote superconductors
and large areas quite effectively. A hollow spheroid or cylinder of super-
conductor material can be molded with the internal surfaces shielded by the
Meissner effect. It might be thought of as the DC magnetic analogue of
the Faraday cage and the inside can be called the Meissner space."

It's selective. AC fields are transmitted with minor attenuation. Particle
size and distribution have a profound effect on final magnetic and electrical
characteristics.

