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NASA TECH BRIEF



This NASA Tech Brief is issued by the Technology Utilization Division to acquaint industry with the technical content of an innovation derived from the space program.

Lead Oxide Ceramic Makes Excellent High-Temperature Lubricant

The problem: Conventional lubricants tend to break down in high-temperature applications.

The solution: A dry lubricant in ceramic form made of 95 percent lead monoxide and 5 percent silicon dioxide.

How it's done: A mixture of 95-percent lead monoxide and 5-percent silicon dioxide is ground to a powder of about 200 mesh. The powder is then slurried in water to make it suitable for spraying—the consistency depending on the spray apparatus employed. The mixture is sprayed on the parts to be lubricated, such as the balls, cage, and race of a ball bearing, and the assembled bearing is fired in an electric resistance furnace at 1,650° F for 8 minutes. The spraying and firing are controlled to produce a smooth, coating approximately 0.001-inch thick.

Notes:

1. This dry lubricant coating withstood a temperature of 1,200° F, with the bearing operated at atmos-

pheric pressure in the following sequence: 44 hours at 6,000 rpm; 10 hours at 10,000 rpm; and approximately 1 hour at 23,000 rpm. Microscopic examination showed the bearing suffered no galling or metal transfer under these operating conditions.

2. This lead monoxide-silica compound is now commercially available and at least one prominent bearing manufacturer is an industrial user.
3. For further information about this innovation inquiries may be directed to:

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Reference: B64-10116

Patent status: NASA encourages commercial use of this innovation. No patent action is contemplated.

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