



TECHNOLOGY DESCRIPTION

Hybrid rolling-element bearings with balls and rollers made of ceramic silicon nitride (Si3N4) achieve higher speeds and longer service lives with less lubricant requirement. Made entirely from silicon nitride or partially stabilised zirconium oxide, the ceramic bearings can run dry or be lubricated, have a 50 % reduction in weight, a lower frictional torque, and are resistant to corrosion and extreme temperatures. Different bearing configurations have been used in a number of space applications, e.g. in actuators, mechanisms, turbo-pumps, and cryogenic valves.



INNOVATIVE ASPECTS

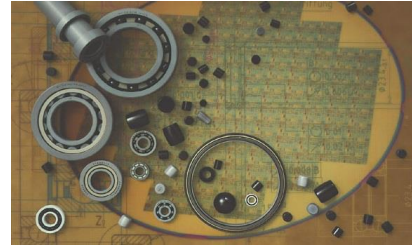
Ceramic as a material for the rolling elements, but also for the complete bearing, sets new standards in rolling bearing technology. The outstanding features are:

- extreme temperature stability (from near absolute zero up to 800°C)
- smooth running and outstanding corrosion resistance
- wear resistance due to the high material hardness of >76 HRC
- dry running possible (no adhesive wear)
- lightweight design due to 60% lower specific density than steel
- lack of magnetisability



TECHNOLOGY READINESS (in space application)

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COUNTRY OF ORIGIN

Germany

LATEST UPDATE

06/2024

TAGS #ball bearing #no lubrication #dry running #temperature #corrosion #lightweight

APPLICATION AREAS

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