Small Diameter NiTi Alloy Balls for Bearing Applications*

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Abstract

Nickel-rich Ni-Ti alloys are emerging as bearing materials that can impart enhanced resilience (high static load capability) for rolling element bearings. This is achieved because the high elastic range and relatively low elastic modulus of NiTi superelastic materials reduces stresses and increases the resiliency of ball-race contacts. Recent success in the manufacturing of small diameter NiTi-Hf alloy balls has enabled the assembly and testing of small (12.7mm) bore "hybrid" bearings which utilize steel races and NiTi alloy balls. These bearings can potentially exhibit static load (dent) capacity three to five times greater than an all steel bearing. In this presentation, the manufacturing and long term (10,000 hr) bearing life test results of "hybrid" steel-NiTi alloy bearings is reviewed and discussed.

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