



Are there advantages to using ceramic balls?

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An alternative material used for ball bearing balls is silicone nitride (Si_3N_4). Silicone nitride balls have many advantages over the standard 52100 chrome steel balls. Ceramic balls possess a variety of characteristics that contribute towards improved wear resistance and performance.

Silicone nitride is a much harder material than steel, which translates into a higher load capacity. Silicone nitride is not as dense as steel, therefore there is less centrifugal force acting on the bearing ring, thus reducing wear. Silicone nitride balls typically have a much smoother surface finish and as a result, friction is reduced. The reduced friction reduces the amount of heat generated during operation, thereby decreasing the grease degradation during operation as well as allowing the bearing to operate at higher speeds. Ceramics, in general, are much more thermally stable than steel.

This behavior allows silicone nitride to retain its material properties at much higher temperatures than steel. Yet another benefit of using silicone nitride is its resistance to corrosion. Although silicone nitride balls have superior performance than steel ball, the cost is much higher. Despite the initial cost disadvantage, a growing number of customers dealing with specialized applications are investigating and requesting ceramic balls for their bearings.

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