

Ceramic Hybrid Super Precision Bearings

TIMKEN

Where You Turn

A ceramic hybrid bearing is a combination of ceramic balls and bearing quality steel rings.

Present day applications place demands on machinery that could not be imagined as little as a decade ago.

Machinery is expected to be more efficient, reliable, faster and last longer with less maintenance. Timken is constantly developing new and improved bearing materials designed to anticipate the challenges of the machine tool industry.

Ground, honed and super-finished steel rings combined with ceramic rolling elements can help meet and exceed machining expectations.

When properly applied: life can be extended up to 5 times; wear is lessened; heat generation is reduced; spindle stiffness and accuracy is increased up to 50% and corrosion is minimized with inert ceramics.

Ceramic Hybrid Bearing Benefits

High speed – oil mist lubricates up to two million dN with reduced skidding, wear and heat generation; grease-lubricated hybrids up to one million dN.

Extended operating life – three to five times greater than steel when properly applied.

Marginal lubrication – unique tribological features enhance operation under low lubrication conditions and help extend life and speed capabilities of lubricants.

Corrosion resistance – ceramic material resists corrosion and galling while the optional thin-dense-chrome coating option may be used to enhance hybrid results.

High stiffness – modulus of elasticity 50 percent greater than steel increases bearing rigidity.

Lower torque – low friction, even under marginal lubrication, with extremely fine surface finishes.

Longer wear life – high hardness of Rc 78 greatly extends bearing wear characteristics.

Light weight – 60 percent lighter than steel, reducing centrifugal forces and overall system weight.

Special properties – all ceramic components are:

- Non-magnetic
- Electrically insulative

Applications

- Machine Tools
 - Ultra and high-speed milling spindles
 - Ultra and high-speed grinding spindles
- Instruments
 - Gyro, gimbal and platform
 - Spectroscopy
- Biotechnology
 - Medical centrifuge
 - Rotating anode
- Defense
 - Space
 - Radar
 - Missiles
- Automotive
 - Turbochargers
- General industry
 - Pumps and compressors
 - Chemical processing
 - Cryogenic
 - Reactors and mixers

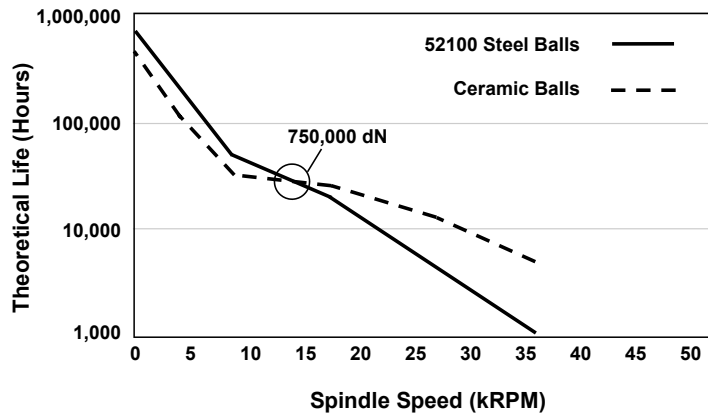


Timken® ceramic hybrid bearings combine the best of proven bearing technology and the latest material developments.



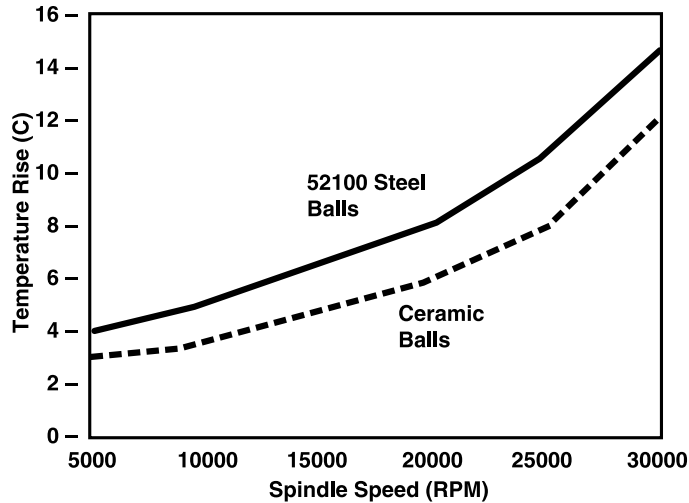
LIFE VS BALL MATERIAL

2MMV99110WN (50mm bore). Spring-preloaded single bearing.

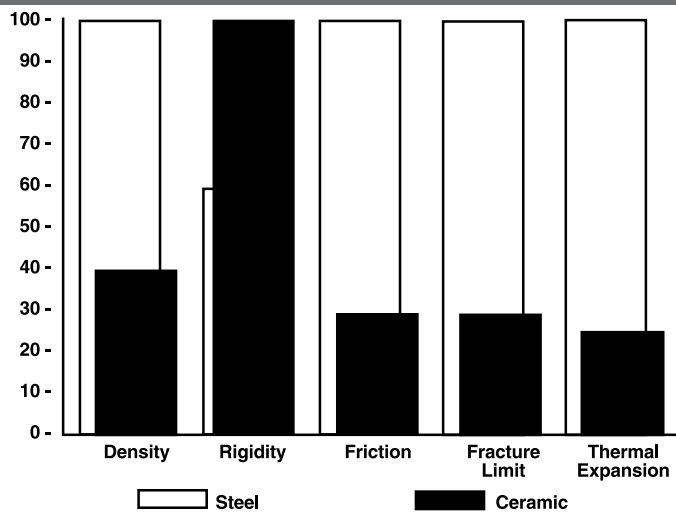


TEMPERATURE VS SPEED

2MMV99110WN (50 mm bore). Grease lubrication.



MATERIAL PROPERTIES



Bearing design

Timken is dedicated to the research and development of new bearing technologies and improving present designs.

By incorporating ceramic and state-of-the-art bearing technology, Timken has developed advanced capabilities. Timken hybrid ceramic bearings feature a higher elastic modulus for greater stiffness. Its lower friction characteristics result in less skidding than all-steel bearings.

Ordering Information

The Timken Sales Engineering professional in your area can assist you in determining if the hybrid ceramic bearing is suitable for your application. When ordering a ceramic hybrid bearing add "C" to the part number after the prefix that specifies precision type, i.e. 2MMVC99100WN.

Special requests, such as ceramic hybrid tapered roller bearings and full ceramic bearings are also available. Contact your Timken sales representative for more information.



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Bearings • Steel • Precision Components • Lubrication • Seals • Remanufacture and Repair • Industrial Services

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