

## Built to endure.



## Temperature resistant, high load capacity bearings for electric submersible pumps.

3M™ Hydrodynamic Thrust Bearings are process fluid lubricated and sealed bearing packs designed for electric submersible pumps (ESPs). 3M hydrodynamic thrust bearings provide high load capacity and can help increase equipment service life in the most challenging conditions – including high temperature, misalignment and high impact environments.

- High temperature capability
- Superior shock and wear resistance
- Process fluid lubricated



## Increasing pump service life in demanding conditions.

3M hydrodynamic thrust bearings are made from silicon carbide, a high-strength technical ceramic with excellent resistance to high temperatures, corrosion and abrasion. The intrinsic strength of this material, coupled with patented spring mount technology, delivers outstanding shock absorption and high load capacity.

In addition, 3M technologies maximize load capacity by allowing pads to both tilt at an optimal angle and flex axially, equally distributing thrust load among pads. Stacking of these bearing elements allows an almost unlimited thrust load capacity.

- High temperature capability (>650°F)
- Operate in oil, water, process fluid or contaminated lubricants
- Maintain high continuous load capacity
- Self-aligning, load equalizing and shock absorbing pad support design
- Ideal for geothermal pumping
- Allow bi-directional operation
- Increase pump system operating life

# The power of ceramics

The high abrasion resistance of silicon carbide allows manufacturers to design process lubricated systems where environmental concerns restrict the use of oil lubrication. This same capability, when used in oil lubricated applications, increases equipment reliability in the event of seal failure.

3M™ Hydrodynamic Thrust Bearings offer a number of advantages over conventional polymer and metal bearing packs, including:

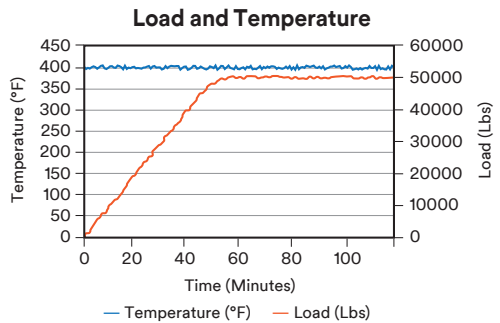
- High shock and wear resistance
- Higher load capacity
- Extended bearing service life
- Misalignment handling



## 3M Bearing Test Rig

3M thrust bearing systems undergo strenuous testing at our fully equipped, in-house bearing test facilities. Our experienced technical personnel conduct a number of evaluations for different test profiles, including max load failure, start/stop or hold.

Property Tested	Test Parameters
Operating speed	0–5,000 RPM
Process fluids	A variety of test lubricants
Thrust load	0–60,000 lbs
Temperature	Up to 400°F (204°C)
Motor current	–



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