

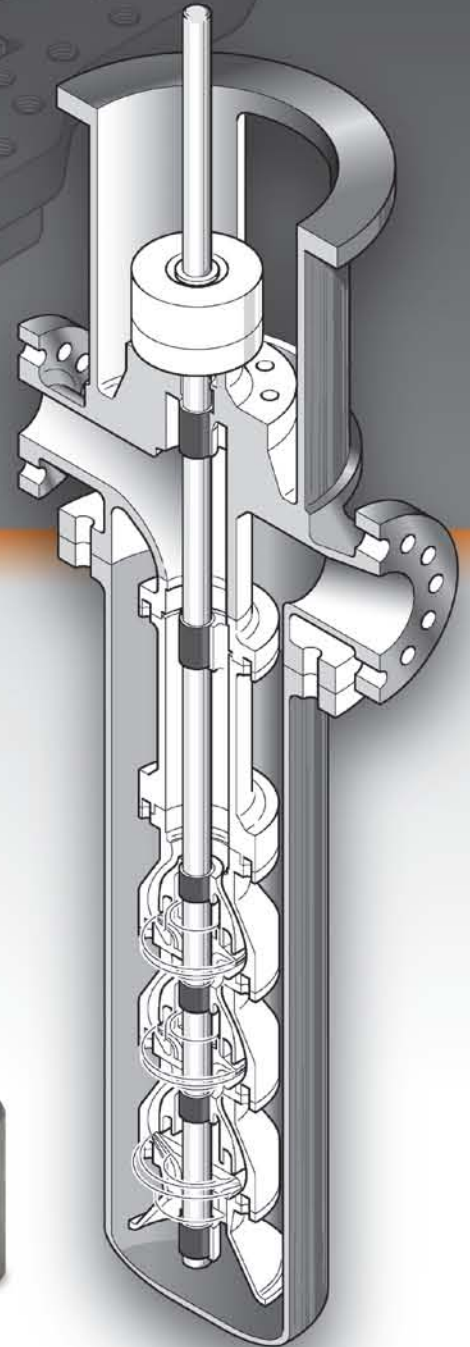
GRAPHALLOY®

BEARINGS FOR HORIZONTAL AND VERTICAL PUMPS

Improve Pump Efficiency
& Reduce Vibration

Survive:

- Dry Running, Dry Starts, Flashing
- Low Lubricity Fluids
- Extreme Temperatures



WORKS WHERE OTHERS WON'T





GRAPHALLOY® Bearings for Pump Survival

What is GRAPHALLOY?

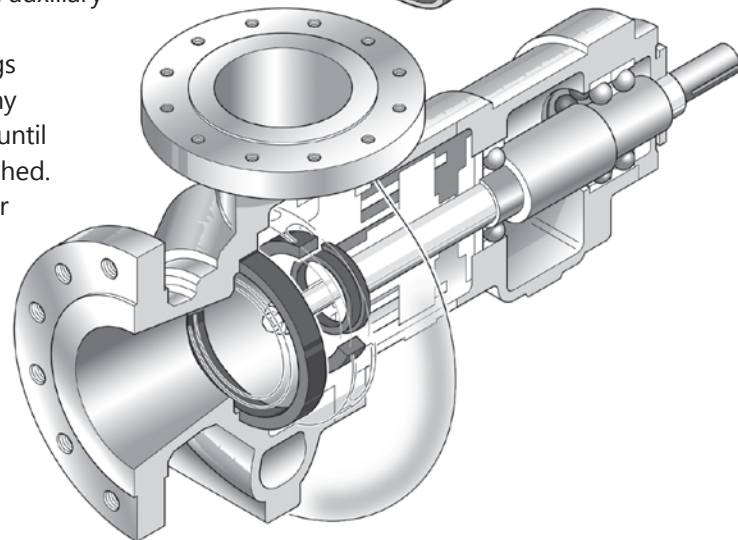
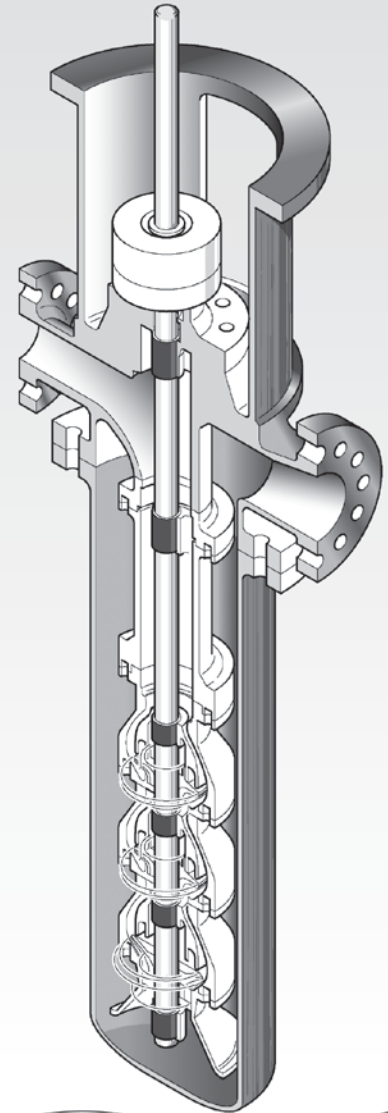
- ◆ Graphite-metal alloy material
- ◆ Self-lubricating
- ◆ Non-galling
- ◆ Corrosion resistant
- ◆ Dimensionally stable
- ◆ Performs in cryogenic temperatures
- ◆ Performs at higher than 1000° F (535° C)
- ◆ Allows run dry
- ◆ Works in low lubricity
- ◆ Works in corrosive & sour liquids
- ◆ Prevents catastrophic failures
- ◆ Lowers operating/repair costs
- ◆ NSF certified and WRAS approved grades available
- ◆ Allows tighter clearances for significant efficiency gains

GRAPHALLOY Reduces Vibration, Improves Efficiency

Pump vibration is a frequent cause of mechanical seal failures. Upgrades to non-galling GRAPHALLOY case rings and throat bushings allow tighter clearances, which reduce vibration levels — in one specific case from 1.2 to less than .05 ips. The result is fewer seal and bearing failures and increased MTBR. Tighter clearances with Graphalloy materials can also improve pump efficiency and pump output, a benefit recognized in the latest API 610.

GRAPHALLOY Permits Dry Starts

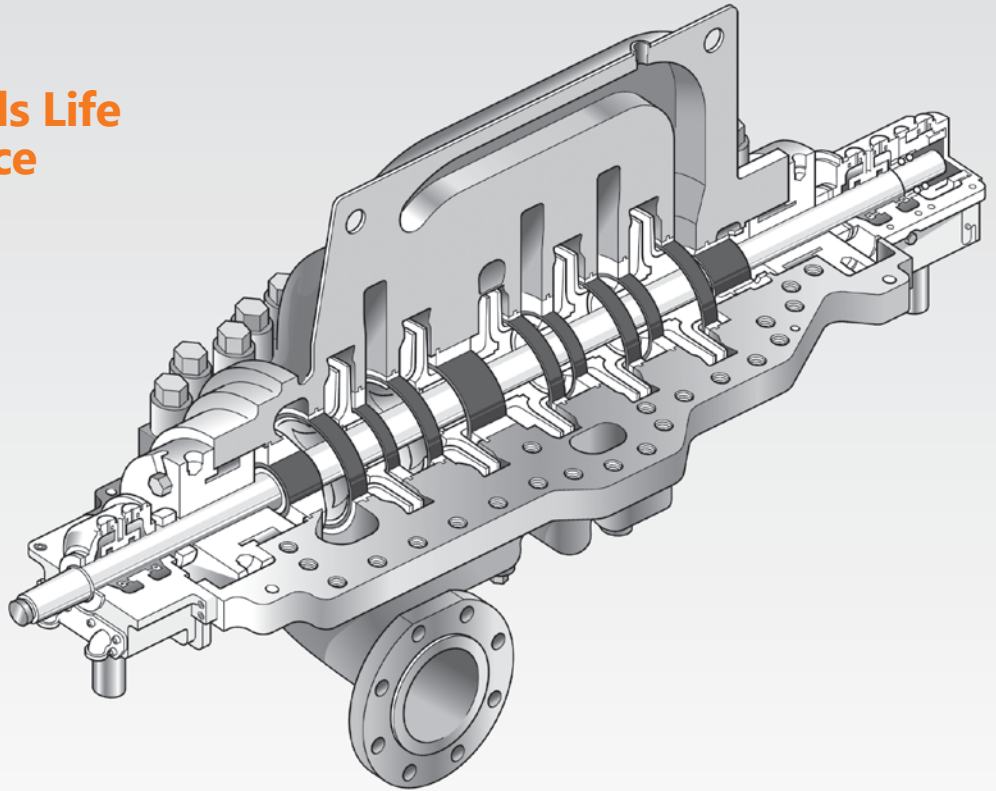
Deep setting vertical turbine well pumps require pre-lubrication of the standard bronze or rubber bearings between the low water level and the discharge surface. Environmental concerns have now restricted the use of oil and grease. The alternate of water from a local source for start-up requires a complicated auxiliary system. The solution is to use GRAPHALLOY lineshaft bushings which eliminate the need for any pre-lubrication by running dry until pump discharge flow is established. At one installation, the engineer estimated that it would take more than five minutes for the pumpage to reach the surface discharge from lower water level. GRAPHALLOY survived this duration with margin to spare.



THE QUESTION . . . HOW MUCH CAN GRAPHALLOY® IMPROVE PUMP OPERATION? THE ANSWER . . . SPECIFYING GRAPHALLOY® PROVIDES REAL ADVANTAGES.

GRAPHALLOY Extends Life for Continuous Service

Self-lubricating GRAPHALLOY has long been the standard bearing in vertical “can” pumps in the refinery tank farm area. The typical light hydrocarbon products have poor lubricity and tendency to “flash”. This, combined with recurring “run dry” operation when the tanks emptied, motivated designers and operators to search for a replacement of the usual bronze bearing and plastic materials. GRAPHALLOY is the overwhelming choice for lower wear rates and “run dry” survival.



GRAPHALLOY Survives Frequent Loss of Suction

Boiler Feed pumps for industrial steam generators are frequently subjected to loss of suction flow during transient switch over. Pumps fitted with metal and plastic wear parts fail in a few minutes of dry running, while those fitted with GRAPHALLOY will survive and resume pumping when flow returns without wear parts damage. At a chemical plant, three pumps experienced 25 failures in eight years at a cost of \$15,000 per failure. Following a GRAPHALLOY retrofit of all pumps, failures were reduced by 68% and the average repair cost by over 90% during the next five years.

WHAT MAKES IT WORK BETTER

FEATURES

BENEFITS

Self-Lubricating

Handles low lubricity fluids such as light hydrocarbons, liquefied gases and hot water in which metallic bearings wear excessively.

Hot

Runs at temperatures well above the limit of plastic – even in molten metals above 1000° F – and survives thermal shocks of 22 degrees per second down to ambient.

Cold

Performs in cryogenic temperatures to -400° F (-240° C).

Dry Running

Survives “loss of pumpage” operation for prolonged periods without either damage or preventing pump re-start.

Wet

Resists attack by most corrosive liquids including sulfuric acid, chlorine water, and caustics.

Non-Galling

Permits closer running clearances between rotating parts resulting in higher pump efficiency and lower shaft vibration.

Dimensionally Stable

Maintains dimensional stability when submerged, under static pressure loading, and over wide temperature swings, providing constant running clearance for all operating conditions.



GRAPHALLOY

A graphite-metal alloy, is a dry, self-lubricating material with a low coefficient of friction. Available in over 100 grades impregnated with...

- Babbitt
- Tin Babbitt
- Copper
- Bronze
- Silver
- Nickel
- NSF Certified and WRAS Approved Grades
- And Others

