

Simsite® Structural Graphite Composite Impellers and Rings Save 20% on Energy Consumption!

CASE STUDY: US Navy T-AKE Class Central Saltwater Cooling Pump Power Requirements

Sims Pump Valve Company was tasked to design & manufacture a **Simsite®** Structural Graphite Composite Impeller for the Central Saltwater Cooling Pump onboard the USNS Lewis and Clark. The original bronze impeller in addition to being inefficient was quickly wearing as a result of damage from corrosion, erosion and cavitation.



New Computer Designed and Engineered **Simsite®** Structural Graphite Composite Impeller & Rings manufactured using CFD to maximize efficiency and performance.

The new **Simsite®** Impeller was designed using computational fluid dynamic (CFD) to maximize, performance, efficiency and longevity. The **Simsite®** Impeller was machined from a solid block of the patented **Simsite®** structural graphite composite, SMS-302, as opposed to being cast or molded. As a result of the computerized robotic precision machining from the solid block of structural composite, the new **Simsite®** impeller was much stronger, perfectly balanced, more reliable, and more efficient. **Simsite®** Impellers and Casing Rings will not corrode at all in salt water! They are also much more resistant to erosion and cavitation damage.

The US Navy, and many other Navies around the world have been using **Simsite® Pumps** and **Pump Parts** for many years. All **Simsite®** Pumps and Pump Parts are US Navy Shock and Vibration qualified. (MIL-S-901-D and MIL-STD-167-1)

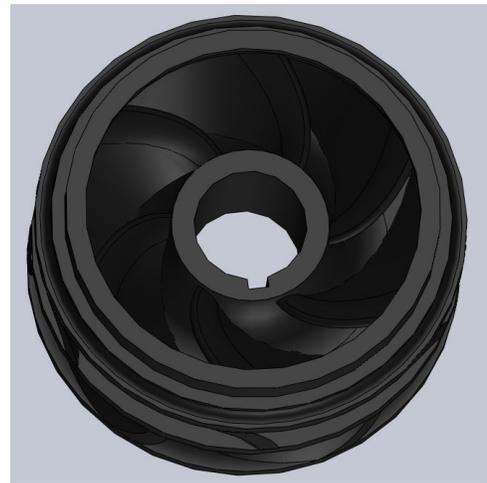
After the installation of the new **Simsite®** Impeller & Casing Rings, and extensive performance testing, the Navy determined that the **Simsite®** Impeller required nearly 20% less energy to operate at the same performance parameters. This improvement in efficiency was attributable to the decrease in cavitation, the increase in efficiency as a result of the new engineered computerized design, and the smoothness & accuracy of the **Simsite® Impeller and Rings**. Energy savings has been a major advantage of **Simsite®** Structural Composite Pumps and Pump Components for many years. This report was generated from data taken by ships personnel and historical data for the US Navy T-AKE Class vessels.

Pump Conditions:

Base Power Requirements, (i.e. Pier side operating self sustained)	65,000KW HR/DAY
Fuel Consumption at Base Load	6,300 Gallons per Day
Fuel Costs	\$2.77/Gallon
KW HR Cost=6300Gal/Day*\$2.77/Gal divided by 65,000KW HR/DAY	\$0.27/KW HR
Pump Operating Requirements with the original Bronze Impeller	192 Amps
Pump Operating Requirements with a new Simsite® Impeller	155 Amps
The Simsite® Impeller requires 37Amps fewer for operation – Savings:	37 Amps
Power Savings = 37Amps*480Volts*1.732/1000	30.72 KW
Cost Savings=30.7 KW*\$0.27/KW HR	\$8.51/HR
Savings Per Day	\$204.25
Savings Per Year	\$74,554.00



Original Bronze Impeller showing damage from Corrosion, Erosion, and Cavitation



The new **Simsite® Composite Impeller was designed & manufactured using computational fluid dynamics (CFD) to maximize efficiency and performance and reduce cavitation damage.**