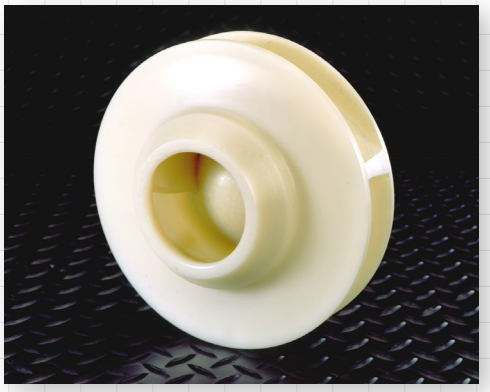
INTECH Power-Core

Power of knowledge engineering®



Impeller made from Power-Core polymer to resist cavitation wear.

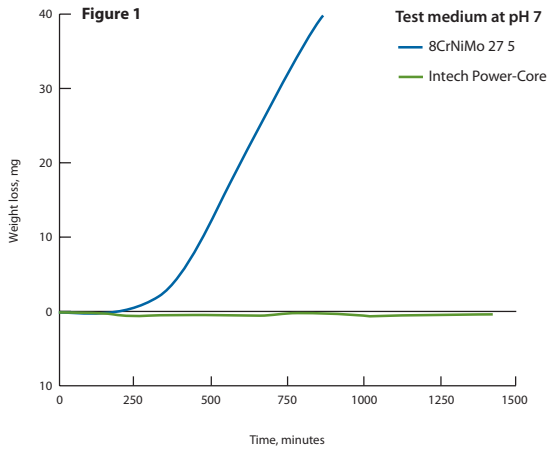
A Polymer Solution To Cavitation Wear Problems

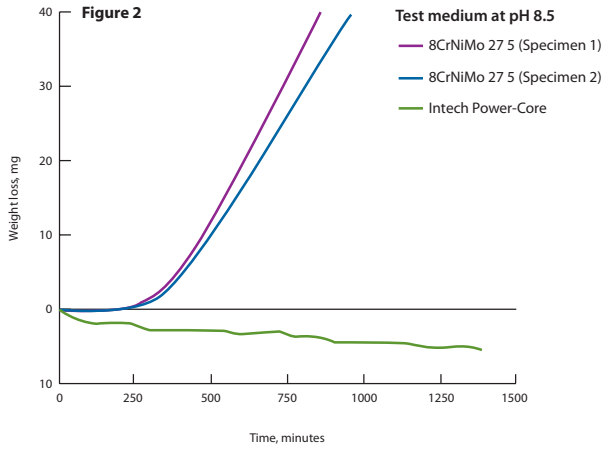
You might not think that bubbles are much of threat to solid surfaces. But engineers who have encountered cavitation wear know otherwise.

Common within pumps, valves and hydraulic components, cavitation occurs when sudden changes in liquid pressure create voids or bubbles. Typically, these bubbles form in response to and in close proximity to moving surfaces within a liquid medium.

When the bubbles eventually collapse, they generate enough energy to induce a pitting-type wear on nearby surfaces. This wear doesn't happen instantly, since the energy released by the collapsing bubbles is relatively low. Over time, however, the collapsing bubbles do produce localized, cyclic impacts that can fatigue even the strongest of steel surfaces. A pump impeller is a classic example of a moving component that can both cause cavitation—and suffer the consequences of cavitation wear.

CAVIATION TESTING





Polymers Resist Cavitation Wear

It may be counterintuitive, but polymers can actually do a better job than seemingly stronger metals when it comes to enduring cavitation wear. The reason is that inherent elasticity of polymers allows them to absorb the energy released by the collapsing bubbles.

Yet, not all polymers should be considered a good fit for applications that suffer from cavitation wear. Keep in mind that cavitation implies a continuous exposure to liquid. And many types of polymers simply will not tolerate liquid exposure for long periods of time—not without dimensional changes or degradation in physical properties.

One polymer that can tolerate the long-term exposure to many types of liquids is the nylon–12 that serves as the base polymer for Intech Power-Core™. We've theorized for years that it would be an outstanding choice for pump impellers, hydraulic valves and other components that are subject to cavitation wear.

Recently, we backed up our theories with cavitation tests that compared Power-Core to various chromium-nickel alloy steels under conditions that simulate those found in high-pressure pumps. The results show that the steel alloy loses significant weight over time, which is an indication of the pitting caused by cavitation. The Power-Core, by contrast, exhibits no weight loss, or wear, whatsoever.