

ULTIMATE
ENGINEERING
EQUALS
ULTIMATE
RESULTS

PMI creates high-end, custom engineered subsea cable hardware designed to guard against equipment damage, extend service life and maintain cable integrity in extreme underwater environments.

Our hardware is proven to reduce cost of maintaining subsea cables over time.

Hydrodynamic Efficiency

Author: Tyler Burger, PMI Product Engineer

It's simple math. Decrease drag, optimize performance. Even the smallest efficiencies can help you save big on fuel costs and repairs.

Two basic necessities are required for ships to tow massive cables and devices through the ocean: strength and power. Strength is required to hold devices or vessels securely in place. And power is needed to tow them through water.

Together strength and power are the forces which overcomes water resistance.

When force and power can be minimized, the cost of fuel is reduced. Overall, there is huge potential to save operating costs by simply considering the hydrodynamic efficiency of your cable hardware.

The Effects of Hydrodynamic Drag

The force of an object resisting its motion through a fluid is called hydrodynamic drag. Towed devices, offshore power generation, subsea and moored systems all encounter forces from the effects of drag.

Whether a body moves through a fluid, such as a ship in the water, or a fluid moves over a stationary body, like water on a pier, drag exists. And while the density and velocity of the fluid have an effect on drag, so does the shape of the object.

By simply making changes to shape of an object, the external flow creating drag can be altered and performance optimized.

PMI KNOWS
HOW TO
ANALYZE,
SIMULATE
AND TEST
EQUIPMENT
TO DETERMINE
METHODS FOR
MAXIMIZING
HYDRODYNAMIC
EFFICIENCY.

PMI is always looking to explore uncharted waters for our underwater cable hardware systems -- whether that happens in our test lab or in leading edge industries such as renewable energy.

We strive to make waves in the subsea industry and seek out projects that set the bar high.

Hydrodynamic Efficiency

In an effort to maximize hydrodynamic efficiency, drag force must be minimized. Optimization of the variables that determine drag force is the only way to realize this. When this is done, it requires less power/strength and achieves better results.

So what choices do you have to minimize drag? And how is it possible to minimize drag when you cannot reduce the density of water in the ocean or refrain from towing all your equipment?

What PMI has learned working side by side with our customers is, if you design to optimize the contour area of your cable hardware - specifically the cross-sectional area projected in the direction of the motion - you significantly reduce the power required to tow objects and can overcome drag by up to 40%.

Now multiply the power and fuel savings by 8, 16 or possibly 32 hardware components being towed behind a vessel and the resulting savings can be significant.

By making small changes in the design of your cable hardware you can realize big savings. That's what PMI can do for you.

Strength vs. Efficiency

While drag force can be minimized by changing the shape of a component, it should never compromise or jeopardize strength. Strength should always be the first priority to ensure a component performs to its rated levels and can be trusted to get the job done. PMI cable hardware is known for its strength.

The PMI Solution

Solutions exist but require planning to ensure success.

At PMI, in-depth hydrodynamic efficiency studies can be done on subsea devices for a complete cost analysis.

Discover how our ideation and exploration efforts in hydrodynamic design translate into cost savings.

Together we can help you develop a revolutionary solution.

Contact us today and find out more about our Hydrodynamic Efficiency efforts.

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