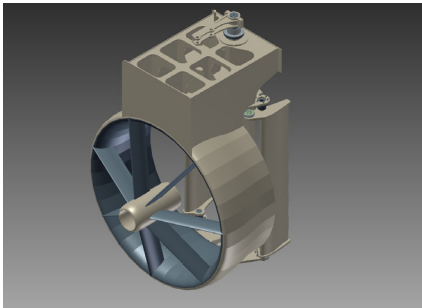


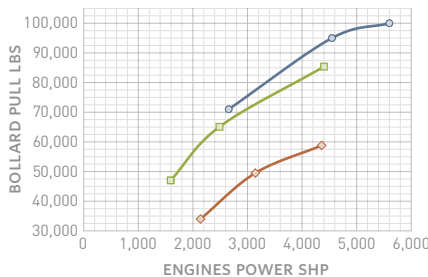
## HIGH EFFICIENCY NOZZLES

### Greater Fuel Efficiency with More Available Power



The advanced airfoil design of the patented Nautican High Efficiency Nozzle has less drag and greater lift components than a conventional 19a KORT nozzle, giving a better lift to drag ratio. This allows the Nautican Nozzle to achieve higher speeds for the same power input as well as producing greater bollard pull.

#### BOLLARD PULL TRIALS



- Henry C - Open Propellers
- Kelly O. - "Kort" Nozzles
- Edgar K - Nautican Nozzles

*The Edgar Kotokak's Captain Whittaker says: "With the open propellers, the boat had a rooster tail; after the refit, [the nozzles] were putting the power into the water. We added two knots to the top-end speed and now we get 14 knots. And the maneuverability is great. We can turn on a dime. The Edgar K can stop 6000 tons of freight and turn in its own length, all while going down stream."*

The major difference between the Nautican nozzle and a standard KORT is the cross-sectional profile of the nozzle itself. The Nautican nozzle is manufactured out of 36 airfoil sections, which are optimized for turbulent flow.

In addition, the inside surface of the Nautican nozzle is made entirely of stainless steel - which eliminates the costly welding repairs that can occur with conventional nozzles. This advanced construction completely eliminates plug welds and greatly adds to the structural strength and integrity of the product.

In sea trials and client applications the nozzles help achieve:

- Fuel-efficiency gains of up to 30 percent
- Speed gains of up to two knots
- Bollard-pull gains of up to 60 percent over an open propeller, or 12 percent over typical 19a nozzles.

As an example, when Northern Transportation Company Ltd. of Hay River, Canada, conducted a major refit of a quad screw, pusher-towing tug, the *Edgar Kotokak*, they installed customized Nautican High-Efficiency Nozzles and Triple Rudders. The figure below shows that the Nautican Nozzles produced more thrust at the same horsepower, almost 60 percent over the open propeller and 10 percent over Kort nozzles at 4400 hp.

Thrust can be further increased by up to four to six percent by combining the High Efficiency Nozzle with a Pre-Swirl Stator. Nautican nozzles have improved performance of variety of vessels; including tugboats, fishing vessels, cable ships and yachts.

#### REQUEST AN OPERATIONAL ANALYSIS

We are happy to partner with you to help you determine the best solution for optimizing performance and reducing fuel consumption. By analyzing your fleet's operational needs, we can help you identify vessels that are the best candidates and assist you in determining the return on investment. Please fill out a form at <http://nautican.com/operational-analysis/> for each vessel you would like us to analyze.