

PBCF®

PROPELLER BOSS CAP FIN

5% FUEL OIL SAVINGS AND SPEED BOOSTS OF 2%

Actual ship measurements results, on over 60 ships, verified the following :

- **INCREASES THRUST OVER 1% AND REDUCES SHAFT TORQUE OVER 3%**

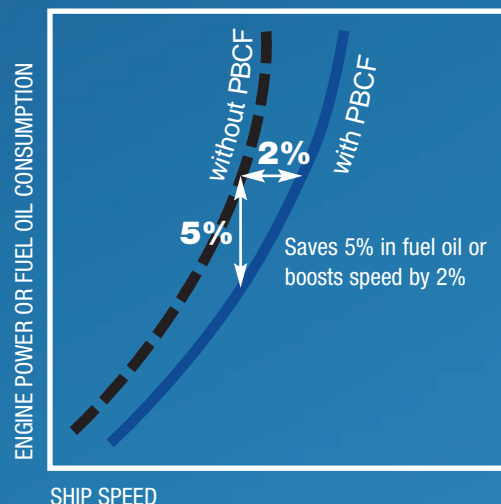
BENEFITS:

- Saves 5% in fuel oil
- Boosts speed by 2%
- Fixes torque rich problem

- **ELIMINATES HUB VORTEX**

BENEFITS:

- Reduces stern vibrations
- Reduces propeller noise
- Erases acoustic equipment noise
- Fixes rudder erosion problem



A SIMPLE SOLUTION

- **NO ADDED MAINTENANCE REQUIRED**

PBCF is a boss cap with fins, made of the same material as the boss cap and installed the same way as the boss cap. No additional maintenance is ever required.

EASILY INSTALLED

Can be replaced even at sea (photo at right). Replacement at shaft inspection saves shipyard fees. No design review required, except with CPP.

(Approved by the major classification societies).

EVEN EFFECTIVE WITH CPPs

Many PBCFs are installed on CPPs (controllable pitch propellers) used with fast ferries, RORO ships and oceanic research vessels. These vessels benefit from saved energy or a boost in ship speed and acoustic equipment noise is eliminated



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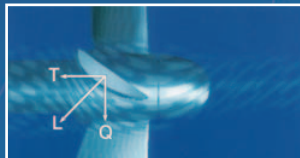
PROPELLER BOSS CAP FINS



HOW THE PBCF WORKS

WITHOUT PBCF

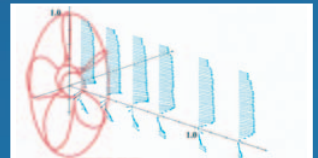
The boosted flows on the curved side of the blade force the stream up to form a hub vortex. That wastes almost 10% of the main engine's energy.



The streams pushed up behind the blades are blocked and turned into a straight slip-stream by the fins of the PBCF.



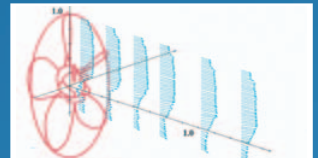
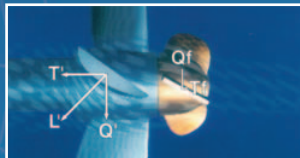
Cavitation tank tests clearly demonstrate how the PBCF breaks up the hub vortex.



3D velocimeter shows the hub vortex transformed to an axial stream by the PBCF.

WITH PBCF

The blocked flows force the fins up, reducing torque by over 3%. The ground effect of the blades, followed by the fins, boosts thrust by more than 1%.



An estimate of how the PBCF can boost your ship's efficiency is available at no cost.

In Japan, the PBCF has won awards from the Society of Naval Architects of Japan, The Marine Engineering Society of Japan, and the Japan Machinery Federation. The PBCF's effectiveness has been documented in many technical papers from international academies and reports on actual ship measurements by shipbuilders and operators. The PBCF is patented in 12 countries. It was developed jointly by Mitsui O.S.K. Lines, West Japan Fluid Engineering Laboratory Co. Ltd., and Mikado Propeller Co. Ltd.

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