

Quietly building Z-drives in Texas

Thrustmaster - ITS 2004 Booths 3 & 4

It is a common belief that thrusters and Z-drives are only manufactured in Europe and Japan. Few are aware that one of the world's largest thruster manufacturers is actually based in the USA - for more than 20 years, Thrustmaster of Texas, Inc. has quietly been building Z-drives and thrusters in Houston, the heart of the offshore industry. Most of the company's products are used in offshore support applications on supply boats, crew boats, pipe-lay barges, crane barges and construction vessels. The United States Department of Defense is also a regular user and neither are tugboat operators strangers to the company's products.

Azimuthstern drive tugs (ASD tugs) continue to gain popularity worldwide and Thrustmaster drives can be found on tugboats operating in the ports of Puerto Rico, Venezuela, Mexico and the United States. In Hawaii, ASD tugs with its Z-drives are working at Chevron's refinery loading terminals as well as in the US Navy Port of Pearl Harbor, where they are on contract for ship handling and docking of nuclear aircraft carriers, submarines and battleships.

According to Bert Ault, the company's sales manager, the product configuration for each



Thrustmaster's plant in Houston, Texas

individual customer application is optimised. "Furthermore our application engineers are easily accessible by telephone or e-mail and are very responsive."

"The Z-drives offer some unique advantages for ASD tugs," says Ault. "The drive has a low profile and the input shaft is at a very low elevation. This allows the vessel designer to place the drives higher in the hull with space for larger propeller diameters, without the need to raise the aft deck. The low input shaft elevation results in lower cardan shaft angles allowing smoother operation with less vibration. This

translates into less noise, less maintenance and better longevity."

The company is ISO 9001:2000 certified registered through ABS. Designs are verified through extensive use of finite element analysis (FEA) with 3-D modelling and strain gauge testing. They are heavy and robust, true to the American tradition of conservative and generous design standards. Manufacturing is done completely in Thrustmaster's plant in Houston and all products are tested extensively, including full load contact pattern checks of gears and full speed running tests.

New Voith blades tested on sea trials

Voith Turbo - ITS 2004 Booth 67

Although the development of new profile Voith Schneider cycloidal propulsor blades has already been well publicised, proof of increased efficiency awaited satisfactory full-scale testing. With the commissioning and sea trials of the Norwegian tractor tug *Baut*, built for the Norwegian shipping company Bukser og Berging, the improved characteristics of the new VSP blades were impressively demonstrated during December. Bollard pull improved by 9 per cent, while the input power remains unchanged - measurements carried out under the supervision of the Norwegian classification society DNV.

Voith water tractors are renowned in tug circles for precise, efficient and safe ship assistance. They have accurate, stepless and extremely swift thrust variations in accordance with XY co-ordinates. In order to improve the hydrodynamic characteristics even further, a new generation of blades has been developed. The basis for the successful development is the numeric simulation of the fluid dynamics (CFD = computational fluid dynamics). The CFD method initially serves to optimise the shape of the propeller blade; it also provides the exact

loads for the structural and mechanical optimisation by using the finite element method (FEM).

The new blades have an improved propeller

blade profile, increased, uniform profile thickness across the entire blade length, reduced weight due to hollow drills and rectangular blade geometry with optimised end plates.

*Inset: CAD illustration of new VSP size 36R6/255-2
Below: Blade after machining*

