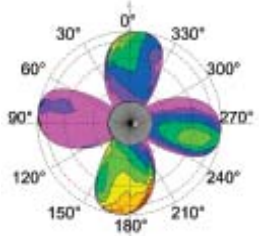
DESIGN AND OPTIMIZATION OF PROPULSION SYSTEMS

To support the design of domestic and foreign vessels, the Krylov Institute has completed a large scope of investigations associated with design and optimization of propulsors and propulsion systems.

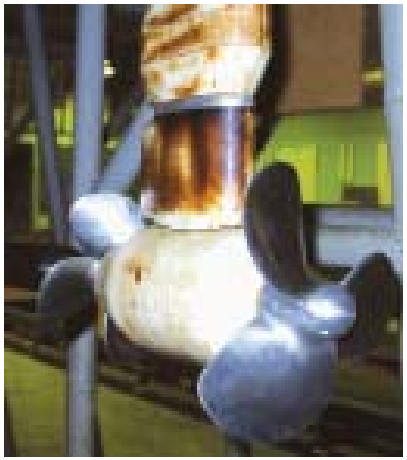


Designed propeller

AZIPOD compact type podded propulsor

Design of propellers for AZIPOD units has been completed for three projects of icebreakers, two projects of vessels with AZIPOD compact units, as well as for two projects of tankers.

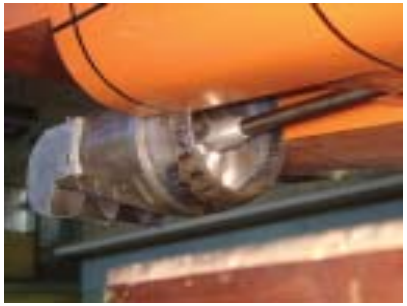
A series of propellers has been designed for electric thrusters of AZIPOD Compact type manufactured by ABB Oy company (Finland). The power range of these podded propulsors being from 1500 to 4500 kW at propeller diameter from 1.7 to 4.5 m allows to use them for a wide range of vessels under construction. A series of propellers designed by the Krylov Institute enables to perform design optimization very rapidly identifying geometrical and hydrodynamic characteristics of designed propellers. A series of model tests for coaxial propulsion system with podded unit SP10CRP has been completed.



Model of coaxial propulsion system SP10CRP

R&D ASSISTANCE TO DESIGN, CONSTRUCTION & OPERATION FOR NAVAL SHIPS, COMMERCIAL VESSELS & OCEAN ENGINEERING STRUCTURES

AEROHYDRODYNAMICS



A model of small-size water-jet propulsor with RSG and its arrangement on the self-propelled model of "Buyan" craft

The Krylov Institute has designed an advanced small-size water-jet propulsor (SWJP) for speed crafts. The full test cycle has been completed in a towing tank and cavitation tunnel for establishing SWJP steering and thruster characteristics.

A new type of propulsion system, i.e. SWJP possesses propulsion and maneuvering characteristics not inferior to traditional axial water-jet propulsors. At the same type it has some advantages: small weight and dimensions, low loads applied to drives of reversible steering gear (RSG), retention of optimum body configuration without displacement losses. High propulsive and service characteristics have been validated by the full-scale tests.
Vented water-jet propulsor (VWJP) has been designed for a speed craft. A full cycle of tests has been completed: towing and self-propelled tests of craft model in the towing tank and hydrodynamic tests of VWJP model in the cavitation tunnel behind the craft hull mockup.

The tests have confirmed the high propulsion characteristics of VWJP and stability of hydrodynamic parameters at operation close to the water surface.

Model of craft hull and VWJP induced jets during self-propelled tests