

As a result of the increased tanker traffic in the Gulf of Finland and an innovation campaign Aker Arctic has developed a revolutionary new type of vessel, an asymmetric icebreaker. This oblique icebreaker takes further the already well known "double acting" stern working icebreaking method by being able to break an ice channel of 50 m width by proceeding with the side ahead. In addition to icebreaking, the vessel is excellent also during the ice season in oil spill combat operations, in escort and emergency towing, fire fighting and ecological monitoring. Thus the vessel by its performance replaces several traditional vessels in a compact, cost-efficient high performance unit.

The vessel is a compact size icebreaking vessel provided with diesel-electric propulsion with three azimuthing thruster propellers. The propulsion solution and the special hull form allow the vessel to operate efficiently ahead, astern and obliquely sideways, one of the propulsors is located in the bow, one aft and one on side in the aft part of the vessel. The vessel has a double bottom, continuous main deck and a tween deck, and forecastle. The superstructure for accommodation and work spaces is located to bow part of the Vessel.

#### Hull form

The hull form is designed for the triple screw azimuthing thruster propulsion, for favorable ice resistance can performance in ahead, astern and oblique operation modes, and for adequate seakeeping characteristics.

#### Performance

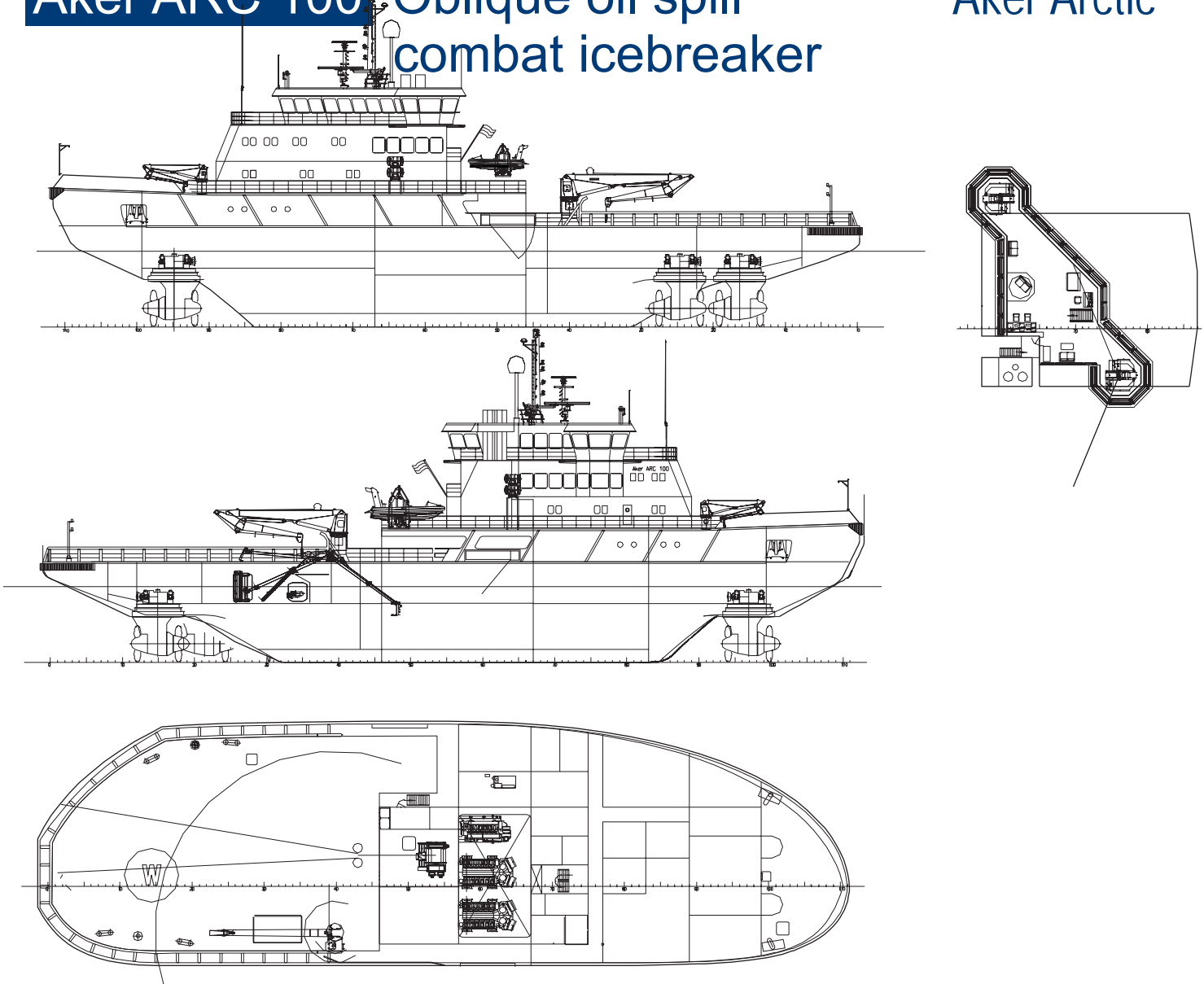
Trial speed at full power in deep calm water is at least 15 knots. Economy speed at half power is abt. 12 knots.

Steering is excellent in both directions. In addition the vessel is able to move at slower speed also sideways and any direction, of which the oblique mode astern for breaking wide channels for large vessels and oblique mode ahead for oil recovery are the most important.

In ice conditions the vessel is able to proceed at abt. 6 knots speed in 60 cm level ice both ahead and astern and 3 knots speed in 1.0 m thick level ice respectively in ahead and astern at design water line. Steering capability is excellent due to the propulsion arrangement and hull form in any situation and in any direction. In addition the capability to penetrate ice ridges and to operate in any direction and to turn inside ridge fields will be excellent. Bollard pull force ahead at full power is about 80 tonnes.

# Aker ARC 100 Oblique oil spill combat icebreaker

Aker Arctic



## Main particulars

Length over all 75.2 m  
 Length at dwl 70.9 m  
 Breadth over all 20.5 m  
 Breadth at dwl 19.2 m  
 Draught at design wl 6.3 m  
 Draught maximum 7.0 m  
 Depth to main deck 9.0 m  
 Propulsion power 3 x 2.5 MW  
 Autonomous time shall be 20 days at 75% power. Life supporting functions shall be dimensioned for 30 days operation.

### Living spaces

Crew is twelve (12) persons. Onboard there are 12 single cabins and six (6) spare cabins for temporary personnel onboard. All cabins are equipped with private WC/ shower-module.

### Cargo spaces

Cargo deck area is about 400 m<sup>2</sup>. There are no other real cargo spaces except storage space for oil recovery equipment. rest of

equipments may be carried on the open aft deck when needed. The hull contains large tank capacity, of which 1500 m<sup>3</sup> is used for the recovered oil.

### Hydrostatics

The stability of the vessel fulfills the stability requirements both at 6 m design draught and at 7 m maximum draught. Trim and list control in the varying loading cases is accomplished by using ballast and fuel transfer between the fuel tanks.

The seakeeping characteristics of the vessel are sufficient for good operability in the Gulf of Finland conditions.

### Classification and rules

The vessel is designed to Russian Maritime Register of Shipping or other IACS member class for the following notation: KM 0 Icebreaker6, [1], AUT1-ICS, OMBO, FF3WS, DYNPOS-1,

EPP, ECO-S, Oil recovery ship, Salvage ship, Tug. In addition, the vessel will meet the requirements of international rules and conventions.

### Ambient conditions

The vessel, machinery and accommodation will be designed for operation in following ambient conditions:

Air temperature +25°C to -30°C  
 Water temperature +20°C to - 2°C

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