

# Aker ARC 104 Shallow draught Icebreaking tug for Caspian Offshore Construction

Aker Arctic



## Shallow Draught Ice Class Tug

STX Europe is building five icebreaking Tugs for Caspian Offshore Construction (COC). Designed by Aker Arctic the vessels are for independent year round operation in the Northern Caspian Sea.

The ARC 104 icebreaker features only 2.5 meter draught combined with ability to break level ice up to 60 cm and to clear ice rubble formations in the Caspian Sea fresh waters. Her bollard pull is 50 tons.

The vessel is an icebreaking tug for very shallow waters, intended especially for pushing barges in open water and in ice conditions, but towing equipment is also provided to aft.

The first of the series of five, Mangystau-I, was delivered in August 2010.

In addition to towing and pushing she is intended for ice management operations in astern working mode in ice rubbles reaching the sea floor.

In addition, the tug is provided with arrangements and equipment for evacuation up to 300

people in environment where Hydrogen Sulphide (H<sub>2</sub>S) risk is present, rescue operations, fire fighting and oil recovery.

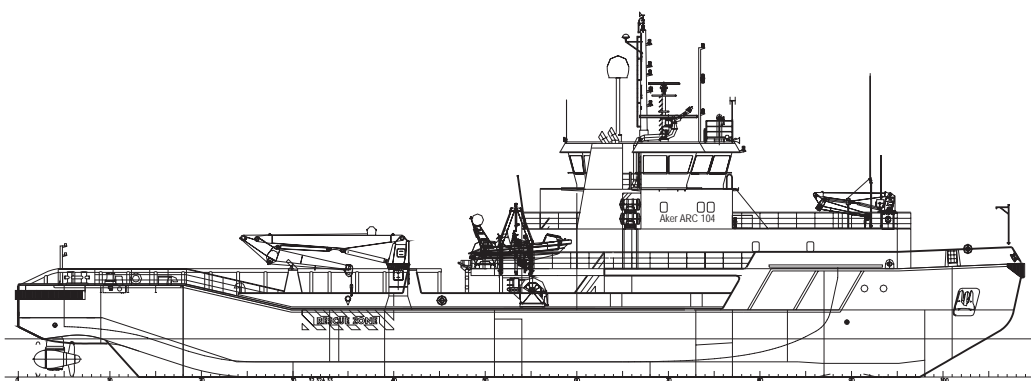
At the Summer Load Line draught she is able to carry up to 300 tonnes cargo on deck.

The machinery is diesel electric with azimuthing thrusters for propulsion.

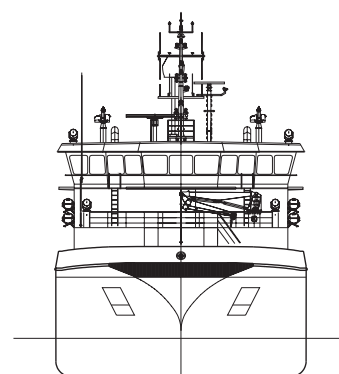
The vessel is designed environmentally friendly, has no pollutant tanks adjacent to sea, has provisions for zero dumping, no waste emissions, etc.

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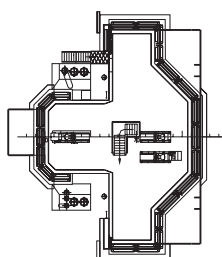
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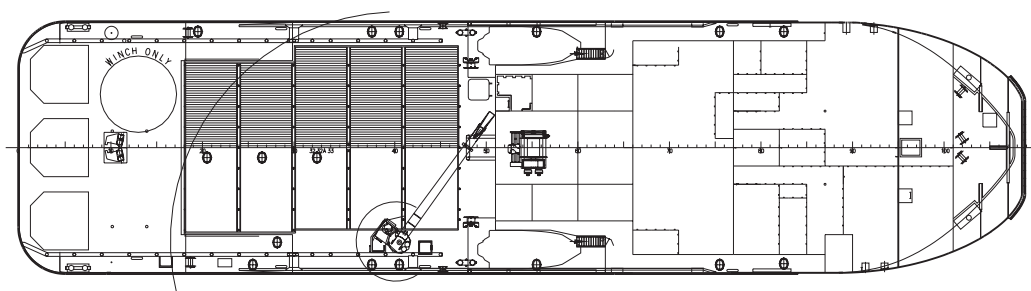
Profile



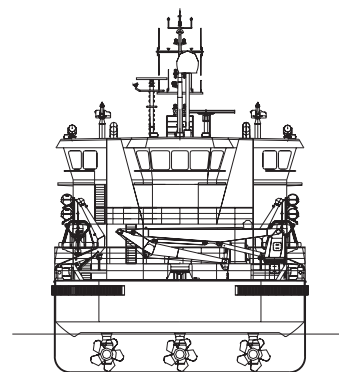
Front view



Wheel house



Main deck



Stern view

## Aker ARC 104 main particulars

Length oa abt.	66.0 m
Length dwl abt.	63.7 m
Width abt.	16.4 m
Depth abt.	4.4 m
Draught dwl, moulded	3.0 m
Minimum operating draught, moulded	2.5 m
Air draught to highest fixed point max. 17 m above base line	
Bollard pull	over 50 tons

### Main diesel engines

Main engines are four (4) high speed Caterpillar 3512 C turbocharged, after cooled diesel engines driving generators, total power abt. 7 160 kW.  
Max. continuous output: abt. 1 790 kW with nominal speed of 1 800 rpm

### Main propulsion plant motors

The main propulsion is arranged by three (3) asynchronous squirrel cage Novenco AC motors connected by couplings to the azimuthing Schottel SPR 2020 propeller units.  
Rated output power: 1 600 kW per unit

The motors are cooled by closed air circulation provided with air to water heat exchangers.

### Classification

The vessel shall be designed and built under initial survey of Bureau Veritas, and receive the following notations:  
I XHULL XMACHINERY, Tug / Fire - Fighting Ship 1, ICE CLASS IA SUPER, SPECIAL SERVICE – NORTH CASPIAN SEA ICE-BREAKER with ice breaking capability up to 0.6 m level ice thickness, UNRESTRICTED NAVIGATION, XAUT-UMS  
Ice Class to be 1A Super according to Finnish-Swedish Ice Rules, but ice strengthening shall be made beyond that, according to the extraordinary conditions and operation of the vessel.

### Environmental conditions etc.:

Design criteria for the vessel and its equipment shall be the following ambient temperature conditions:

Air temperature + 40 °C to -35 °C  
Water temperature + 32 °C to -1 °C  
Max. current velocity 1 kn  
Relative humidity 80 % max.

The vessel shall be able to withstand 50 knot wind, and hold station under that condition.

The vessel is intended to operate under environmental conditions where H<sub>2</sub>S risk occurs.

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