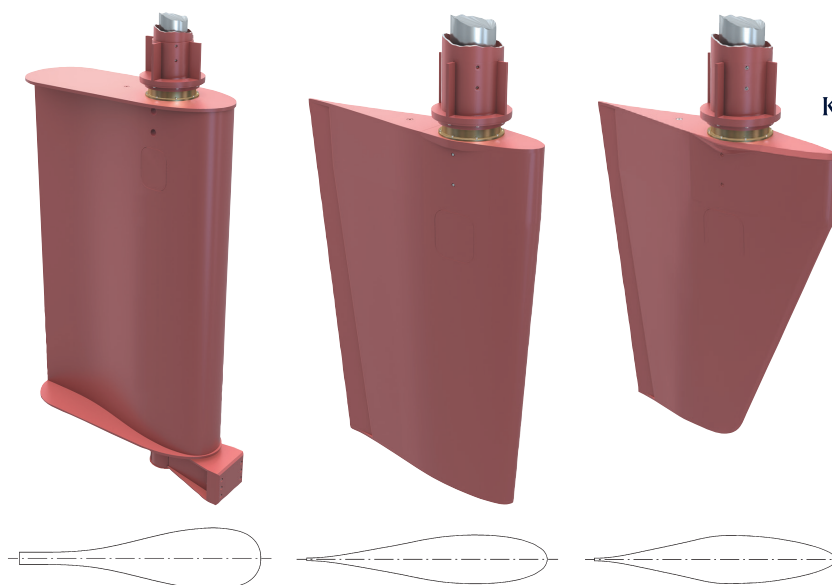


CLASSIC RUDDERS C SERIES



KONGSBERG



KONGSBERG CLASSIC RUDDERS - C SERIES

Rudders for all vessel speeds and configurations

Years of experience in ship design and hydrodynamics makes Kongsberg Maritime's expertise a skilled collaborator, also when special rudder designs are required.

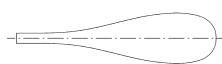
Kongsberg Maritime classic rudders are based on well proven rudder profiles and offers reliability and safe operation in all sailing conditions. Standard solutions for easy installation and maintenance are applicable for most vessel speeds and aft ship configurations.

Three rudder profiles with different qualities and speed range match a wide range of vessels, such as merchant- and fishing vessels.

Also available, for other requirements, operation or configurations; Kongsberg Maritime flap rudders.

OPTIONS AVAILABLE

- Automatic lubrication system
- Cathodic corrosion protection
- Heel module
- Hydraulic nut for steering gear
- Rudder carrier and bearings
- Special bearings
- Stainless steel liners
- Wire guard
- Special rudder design



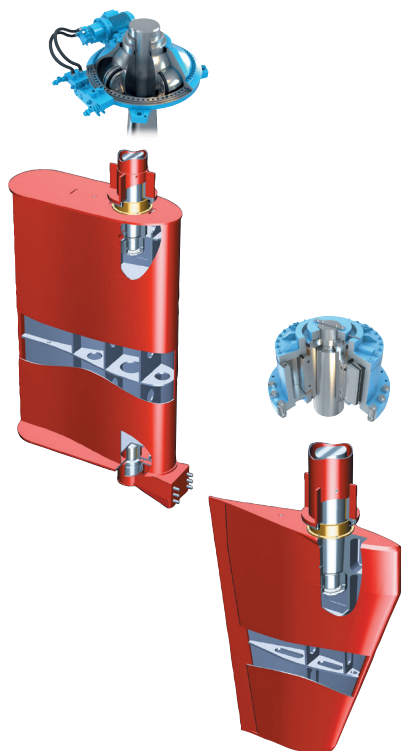
CB rudder for lower speed. Bulbous profile and large vane end-plates improves low speed manoeuvring. Heel module optional.



CM rudder for medium speed. Medium profile optimises the proportion between manoeuvrability and propulsive efficiency. Tapered or rectangular blade.



CS rudder for higher speed. Slim profile increases overall propulsive efficiency and reduces cavitation risk. Tapered blade, rounded corners and smooth surface.



Rudder blade

Welded construction of certified steel and castings. Drain plugs of stainless steel. Lifting holes arranged.

Rudder trunk

Individually designed to fit hull structure and ease steering gear installation. Available solutions:

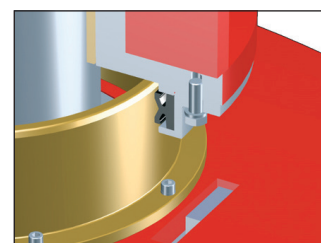
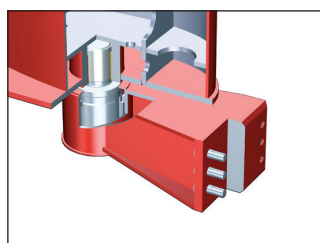
- Standard
- With SG foundation
- Extended

Rudder stock

Manufactured to fit any steering gear. Hydraulic taper coupling to rudder, tested and approved by classification societies. Includes; hydraulic nut and lifting eye.

Bearing

Bronze neck bearing with grooves for grease lubrication.

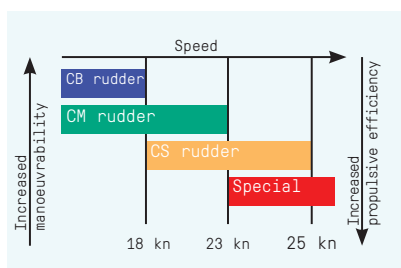
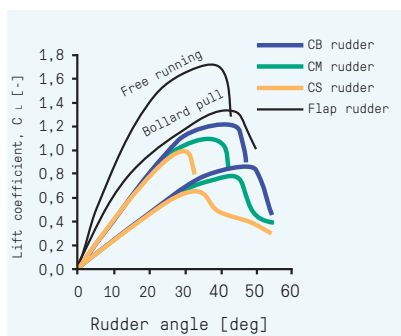
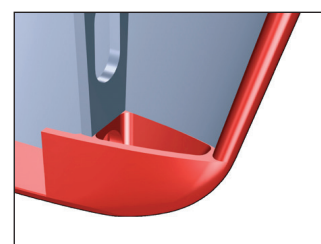
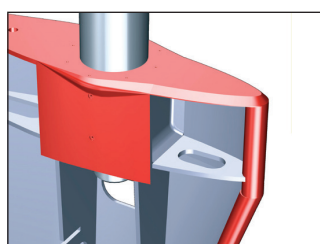


Heel module (optional)

Bolted flange connection to hull. Includes; pintle, housing, flange and bearing.

Sealing

Double sealing system with bronze seal-ring protects from grease leakage. Gaskets can be maintained and replaced at sea without loosening the rudder.



Cone block, casting

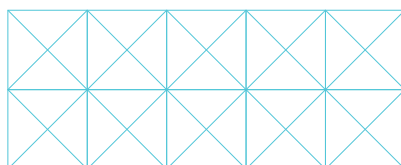
Hydraulic cone coupling between rudder- stock and blade. Eliminates stress concentrations in blade structure around rudder coupling.

Corner block, casting

Shaped with smooth curves to minimise cavitation risk. Cavitation may lead to severe erosion damages.

Basis of comparison:

- 1) Lift coefficient is dimensionless with mean propeller slipstream velocity.
- 2) Equal aspect-, taper- and thickness- ratio.
- 3) Rudder height equal to propeller diameter.
- 4) Rudders are placed in the propeller centre line.
- 5) Rudders are without vane end plates.



PRINCIPAL SPECIFICATION

Rudder support	spade or heel type
Rudder helm angle	no limit
Ice class	all
Speed range*	up to ~ 25 knots
Rudder balance	~ 27%
Rudder area	up to ~ 40m ²
Chord steps	1.3/1.5/1.7/1.9/2.2/2.5/2.9/3.3/3.8/4.3/4.9

(*for standard designs)