



CLEMENTS ENGINEERING
PERFORMANCE IN MOTION

RUDDER ASSEMBLIES AND RUDDER TUBES



Rudder Tubes, Bearings and Tiller Arms

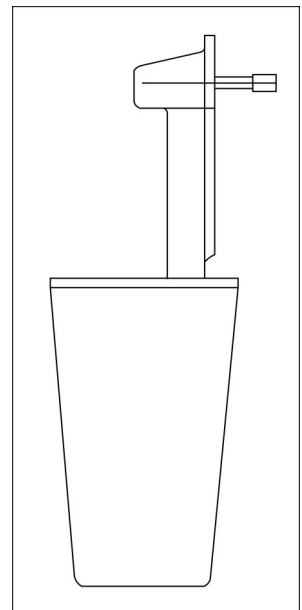
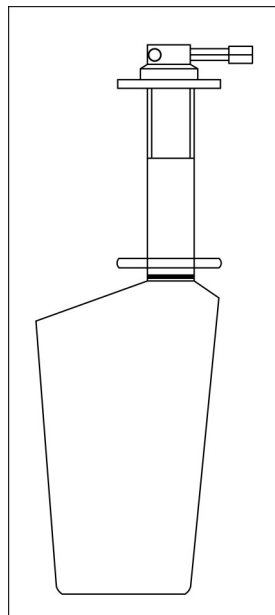
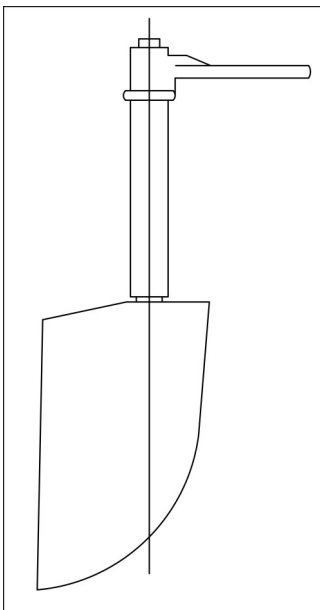
Clements Engineering manufactures a number of rudder profiles to suit individual hulls, ranging from slow speed displacement boats to 'deep v' planing designs and many other applications. The principal designs are shown below and include dagger type, conventional spade and wedge profile rudders.

Rudder design is of paramount importance to the performance of the boat, especially for high speed craft. Steering performance must be optimised, whilst drag is kept to a minimum. Clements Engineering's experience helps the boat designer optimise conditions both in terms of high speed directional sensitivity and low speed manoeuvrability.

Through-hull mounted rudders - generally cast in one piece from either AB2 (nickel aluminium bronze) or HTB1 (high tensile brass) and mounted through the hull in a rudder tube fixed to the inside of the hull. Bearing and sealing arrangements depend on the design selected.

Transom mounted rudder assemblies - precision machined from one piece castings in HTB1 or AB2 and are fitted with seals to prevent ingress of water. Backing plates can be supplied with fixing bolts and greasers for lubricating bearings. These can include an integrally cast, anti-cavitation plate at the top of the blade.

On request Clements Engineering manufacture bespoke plate rudder profiles from either mild steel, type 316 stainless steel or F51 Duplex. Alternatively, hollow aerofoil type 316 stainless rudder/ stock assemblies are available from in-house designs or to customers' drawings. All rudder/ rudder stock assemblies can be supplied to order.



RUDDER ASSEMBLIES AND RUDDER TUBES

Clement Engineering manufacture various types of rudder tubes ranging from GRP glass in tubes, Bronze tubes and steel fabricated tubes.

GRP

Polyester resin tubes, turned to exact required diameter. Internal bore and tube ends are gel coated.

Bronze

Bronze tubes are available in HTB1, LG2 and to be either bonded or bolted in.

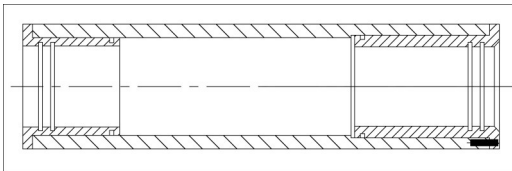
Fabricated

Stainless steel, mild steel and aluminium tubes are available to be welded directly into the boat or chock fasted into a larger diameter tube.

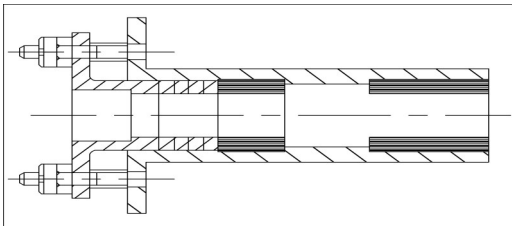
All the above tubes come complete with the following options for bearings

- Polyacetal
- Cutless
- Packed gland
- Class approved material

Sealing arrangements are dependent on the application.

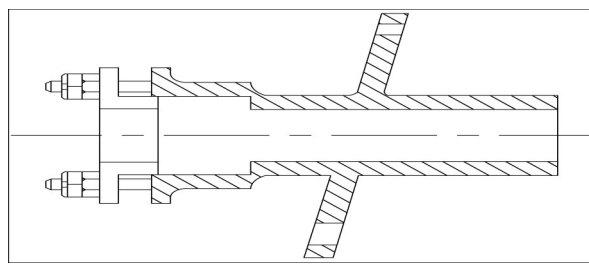
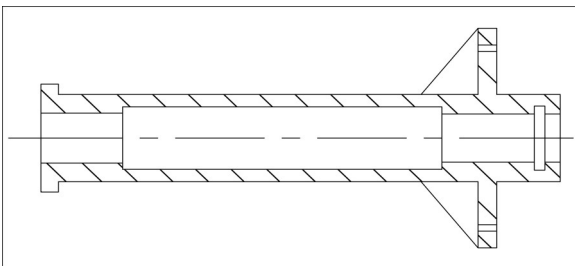


Standard Rudder Tube – manufactured from marine grade GRP, incorporating precision machined bearings.



GRP Rudder Tube – constructed from a cast LG2 gunmetal housing, GRP tube, polyacetal bearings and a packed gland.

Gunmetal rudder tubes. Made from cast LG2 (Gunmetal) with different flange arrangements machined and assembled using polyacetal bearings and a packed gland.



Alternative rudder bearing systems are now available to the more conventional metal and GRP methods of rudders installations.