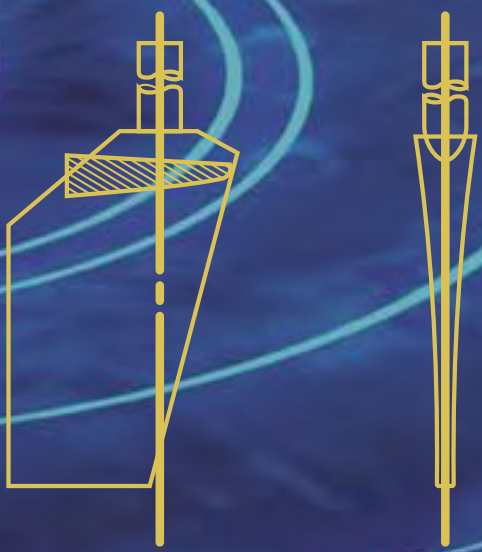
AQ-22
MARINE RUDDERS

WESTERN BRANCH METALS

High strength with superior corrosion resistance, AQ-22 rudders are hydrodynamically designed to provide excellent performance throughout the entire speed range.



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AQ-22 Rudders

AQ-22 Rudders™ represent a major advancement in the marine industry. Designed for boat speeds up to 40 knots, these wedge section rudders are made of high strength and superior corrosion resistant AQ-22 stainless steel. Seven rudder sizes have been standardized so that a combination of speed and displacement may be accommodated for most all modern boat and yacht designs. This standardization of rudder design results in the economy of large production runs while at the same time providing custom design benefits.

What Are the Special Features of the AQ-22 Rudder Design?

The AQ-22 Rudders have incorporated a number of features of hydrodynamic shape that make it a superior performer throughout the design speed range. The wedge sections were selected to give positive steering forces for a full range of port and starboard rudder angles when operating behind a propeller or in freestream. This rudder continues to generate increasing side forces with rudder angles as high as 25 degrees at 40 knots; a condition where typical air foil section rudders have stalled.

The AQ-22 Rudder is also designed to trail or track in the slip stream should the steering gear fail at high speeds, unlike an airfoil section rudder with a normal stock location which could cause a snap turn during high speed runs should steering failure occur.

In profile, the top trailing edge of the rudder is cut away to minimize ventilation of the rudder during high speed turns. Rudder ventilation may cause a vessel to almost stop turning, even with increasing rudder angles at high speed. When the trailing edge of the AQ-22 Rudder is installed slightly ahead of the transom, ventilation is not likely to occur as might be experienced with rudders having other profiles and section shapes.

The AQ-22 Rudders incorporate hydrodynamic features cast in stainless steel to provide the strength and positive steering control not likely to be found in other designs.

Rudder Selection

To select the correct AQ-22 rudder, an estimate of the maximum operating speed and displacement of the boat must be determined. If the displacement cannot be determined, boat length parameters for selecting the appropriate rudder are included in the charts.

The speed at which a boat is typically driven will impact the choice of rudder size. In general, the heavier and slower the boat, the larger the rudder required. Although the rudders have been designed to handle 40 knots, selecting a rudder which is too large will restrict the boat from achieving full speed, and one too small will lead to steering control difficulties.

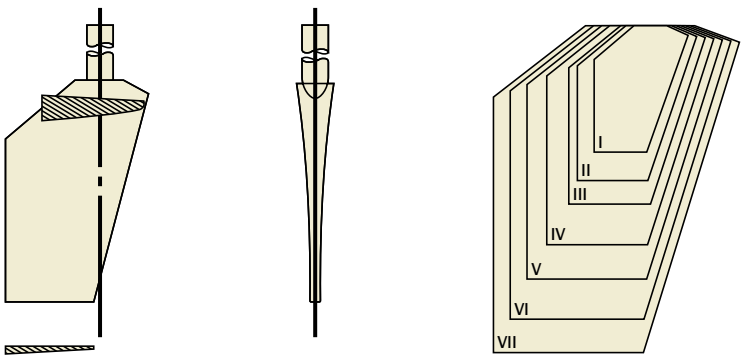
Typically a single rudder is required for each propeller. However, there are triple screw craft in service operating successfully with one centerline rudder, or with two rudders, one located behind each outboard propeller.

In selecting the length of the rudder stock, consideration must be given to mounting the steering system quadrant or arm at the correct height leaving some room for the installation of emergency steering equipment. If a specific length is required, it must be stated when ordering the rudder. Otherwise, the length noted in the catalog will be supplied.

The charts have been formulated to assist in making the appropriate selection for one, two, or three rudder options. In the event the requirements of a particular boat are outside the parameters of the stock AQ-22 rudders, please contact the manufacturer for further information.

The following examples demonstrate the manner in which rudder selection should be determined.

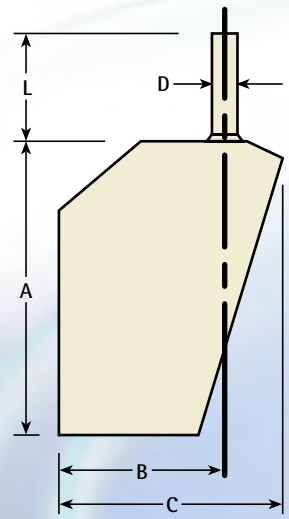
Boat Characteristics	AQ-22 Rudders
1. Assume speed of 25 knots, 28,000 lbs. displacement:	
One Rudder	Rudder V
Two Rudders	Rudder III
Three Rudders	Rudder II
2. Assume speed of 33 knots and a 38-foot boat:	
One Rudder	Rudder IV
Two Rudders	Rudder II
Three Rudders	Rudder I



Stock AQ-22 Rudder Specifications

Rudder Model	Diameter inch (D)	Length inch (L)	Wt. Stock Per Ft. lb./Ft.	Rudder Wt. Less Stock lb.	Rudder Length inch (A)	Stock Location inch (B)	Rudder Width inch (C)	Estimated* Rudder Torque 40 Knots inch/lb.
I	1¼	15	4.17	19	13½	6 11/16	9 13/16	4,400
II	1½	18	6.01	30	16½	8¼	12	8,100
III	1¾	21	8.18	47	19	9⅜	13¾	12,200
IV	2¼	24	13.52	82	23⅜	11⅝	17	22,300
V	2¾	30	20.19	125	27	13⅜	19½	34,300
VI	4	34	42.71	200	31	15⅜	22⅜	52,200
VII	4½	38	54.05	275	34½	17	25	71,900

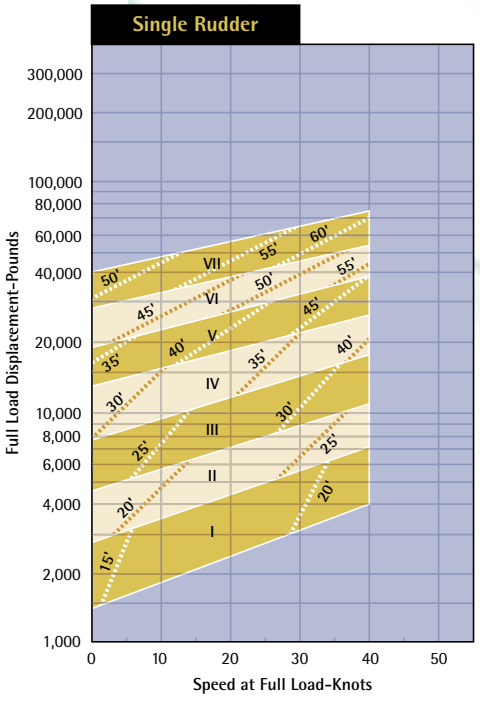
* Rudder torque has been increased 25% to allow for bearing friction.

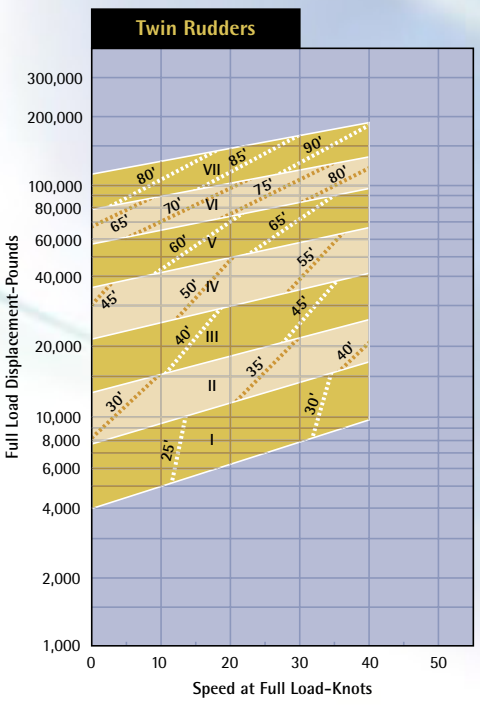


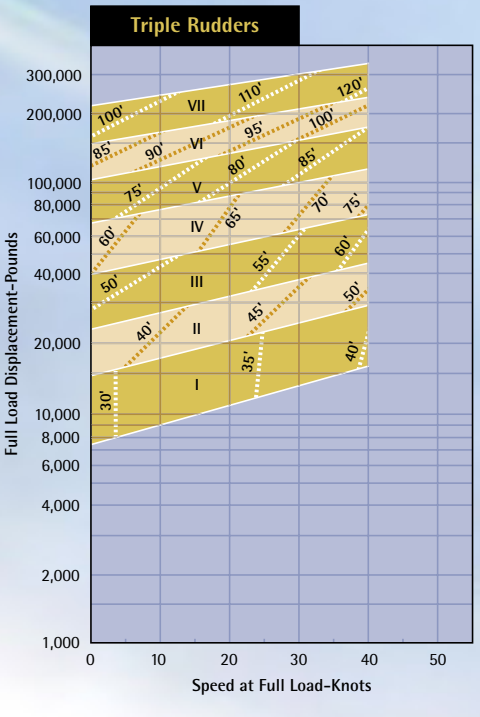
HIGH STRENGTH ▪ SUPERIOR CORROSION RESISTANCE ▪ EXCELLENT PERFORMANCE

Notes Relative to Tables and Charts

- The numerical value of the stock length (L) has been chosen arbitrarily.
- Rudder weights are estimated.
- Rudder torque is included so that the force required at the tiller arm may be estimated.
- Dashed lines indicate approximate boat length.
- Roman numerals indicate rudder model recommended.
- Consult the manufacturer for rudder requirements outside those of stock design.







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