

# Principal Dimensions and Terms Relating to Fishing Boats

Dr. Leela Edwin

Scientist (Sr. Scale)

## Length

There are various ways of defining the length of a ship, but first the length between perpendiculars is usually considered. The length between perpendiculars is the distance measured parallel to the base at the level of the summer load water line from the after perpendicular to the forward perpendicular. The after perpendicular is taken as the after side of the rudder post where there is such a post and the forward perpendicular is the vertical line drawn through the intersection of the stem through the summer load water line. In the ships where there is no rudder post the after perpendicular is taken as the line passing through the centre line of the rudder pintles. It does not represent the greatest length of the ship. The length is defined as the length overall and is defined simply as the distance from the extreme point of the aft end to a similar point at the forward end. In most ships the LOA will exceed by a considerable amount the length between perpendiculars. A third length, which is often used, is the length of waterline. This is the distance measured on the waterline at which the ship is floating from the intersection of the stern to the waterline. The length depends on the waterline at which the ship is floating and on the trim of the ship.

## Breadth

The midpoint of the length between perpendiculars is called amidships and the ship is usually broadest at this point. The breadth is measured at this position as the breadth moulded. It may be defined simply as the distance from the inside of plating on one side measured at the broadest part of this ship. The breadth extreme is the breadth moulded plus the thickness of the shell plating on each

side of the ship. This may be much greater in some ships since it is the distance from the extreme overhang on one side of the ship to a similar point on the other side.

### Depth

The third principal dimension is the depth which varies along the length of the ship but is usually measured amidships. The depth is known as depth moulded and is measured from the underside of the plating of the deck at side amidships the base line. It is usually greatest at the ends. The value of sheer forward is twice as much as the sheer aft in these standard formulae. The value of sheer specially sheer forward was to increase the height of the deck above water and this helped to prevent water being shipped when the vessel was moving through rough sea. The reason for the abolition of sheer in some modern ships is that their depths are so great that additional height of the deck above the water at the fore end is unnecessary.

### Camber

Camber or round of beam is defined as the rise of the deck of the ship from the side to the centre. Camber is usually stated as its value on the moulded breadth of the ship and standard camber was taken as one fiftieth of the breadth. The camber on the deck diminishes towards the ends of the ships as the deck breadths become smaller and smaller. Nowadays straight line camber curves are used or there may not be a camber at all.

### Bilge radius

Bilge is the underwater part of a ship's hull where the bottom plating meets the sides. On small boats, the area along the centre line inside. The shape is often circular at this position. The radius of the circular arc forming the bilge is called the bilge radius. Some designs prefer to make the section some curve other than a circle in the way of the bilge. The curve would have a radius of curvature which increases as it approaches the straight parts of the section with which it has to link up.

## Rise of floor

The bottom of a ship at amidships is usually flat but is not necessarily horizontal. If the line of the flat bottom is continued towards it will intersect the breadth moulded line. The height of this intersection above base is called the rise of floor. The rise of floor is very much dependent on the ship form. In ships of full form such as cargo ships the rise of floor may be only a few centimeters. Where there is no rise of floor the bottom is flat from the centre line to the point where the curve of the bilge starts. If there was a rise of floor it was customary for the line of the bottom to intersect the base line some distance sometimes quoted as a depth moulded to upper deck' or depth moulded to second deck etc. Where no deck is specified it can be taken the depth is measured to the upper most continuous deck.

The three principal dimensions give a general idea of the size of a ship but there are several other features, which have to be considered and which could be different in two ships having the same length, breadth and depth.

## Draught

The draught at which a ship float is simply the distance from the bottom of the ship to the waterline. If the waterline is parallel to the keel of the ship is said to be floating on an even keel, but if the waterline is not parallel then the ship is said to be trimmed. The draft can be measured in two ways, either as moulded draft, which is the distance from the base line to the water line, or as an extreme draught which is the distance from the bottom, of the ship to the waterline. In modern welded ships these two draughts differ only by one thickness of plating, but in certain types of ships where say, a bar keel is fitted the extreme draught would be measured to be underside of the keel and may exceed the moulded draught by 15 - 23 cm. (Draught marks are in the stern. These figure the distance from the bottom of the ship. In metric units the bottom of the ship. In metric units the figure are 10 cm high with a space of 10 cm between the top of one figure and the bottom of the next one. When the

water level is upto the bottom of a particular figure the draught in meters has the value of that figure. When use is made of amidships draught it is necessary to measure the draught on both sides of the ship and take the mean of two reading in case the ship should be heeled to one side or the other. The difference between the forward and after draught of a ship is called the trim, so that trim  $T = d_a - d_f$  and as previously stated the ship will be said to be trimming by the stern or the draught forward is in excess. Usually a ship should be designed to float on an even keel in the fully loaded condition and if it is not attainable, a small trim by the stern is aimed at.

### Sheer

Sheer is the height of the deck at side above a line drawn parallel to the base and tangent to the deck line at amid ships. The sheer can vary along the length of the ship and is from the the centre line so that on either side of the centreboard was small portion of the bottom which was horizontal. This was known as the flat of bottom.

### Rake of stern

In ships which have straight stems formed by a stem bar or a plate the inclination of the stem to the vertical is called rake. It may be defined as either by the angle to the vertical or the distance between the intersection of the stem produced with the base line and the forward perpendicular.

### Freeboard

Freeboard may be defined as the distance which the ship projects above the surface of the water or the distance measured form the deck to the water line. Freeboard has an important influence on the seaworthiness of a vessel. The greater the freeboard the greater is the above water volume and this volume assists the ship to rise when it goes through the waves. The above water volume can also help the ship to remain afloat in the event of any damage. Minimum freeboards are laid down for ships under International Law in the form of load line regulation.