PART III
HULL FORM TYPES

The type of hull should select agree to the purpose of the ship. That purpose determines hull characteristics such as shape and form, accommodation, and machinery design. To optimize different parts of the ship, the type of hull selects earlier than others. The difference comes from the design of the bottom of the ship. Roundedness, in another saying meeting angle of both two sides, is different at the bow.

Hulls classified as:

- Displacement
- Semi-displacement
- Planing

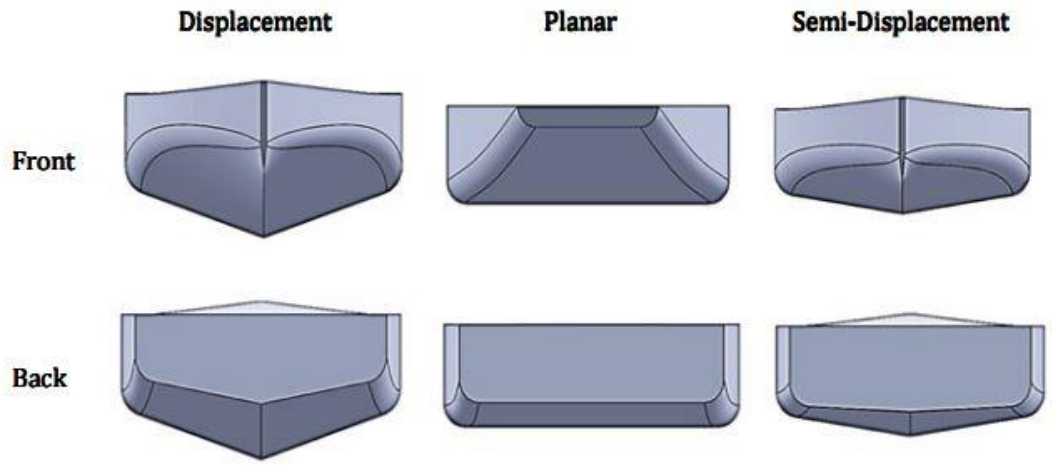

Figure 17 Different type of hulls

1. Displacement Hull

Displacement hulls push through the water as they have no hydrodynamic lift. They are seen in ships, which move through the water by 'cutting' through the water with very little propulsion. Still, these displacement hulls limit the ship to lower speeds. To put it simply, the length of a vessel puts a limit on its speed. The round-bottomed shape is an example of displacement hulls seen in many ships.

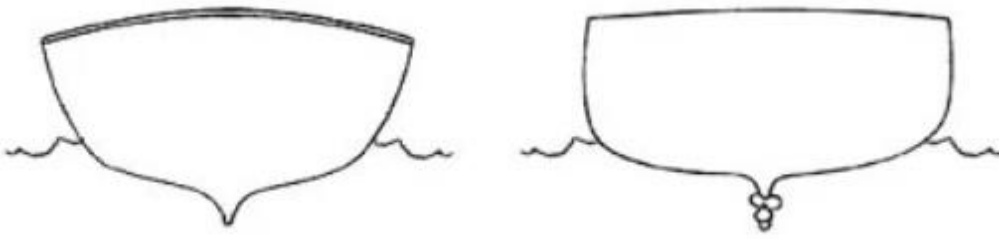

Figure 18 Displacement hull

2. Planing Hull

Planing hulls are designed to run on top of the water at high speeds. To achieve this, they typically are very flat at the tail. The hull design does not limit the maximum attainable speed but does affect the power required for it to get on a plane.

Figure 19 Planing hull

3. Semi-Displacement Hull

Semi-displacement or semi-planing hulls have features of both planning and displacement hulls. They have a maximum hull design speed. Exceeding this speed can result in erratic handling and unstable operation. There is not one hull design characteristic that differentiates semi-displacement from the semi-planing hull. The greater the hydrodynamic lift and the higher the hull design speed the more likely it will be referred to as a semi-planing hull.

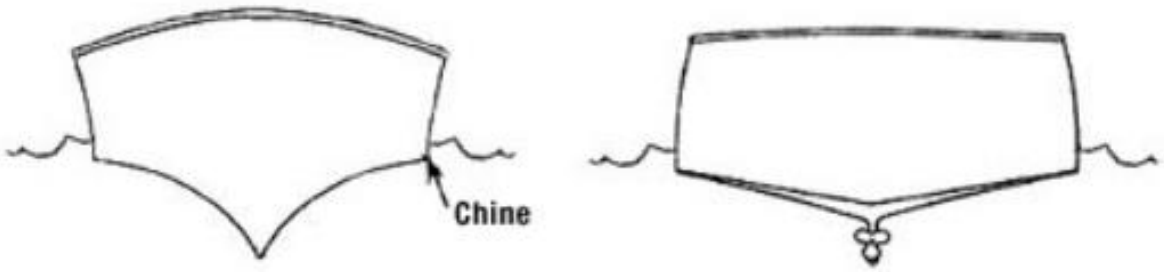

Figure 20 semi-displacement hull

They are different because their hydrodynamic lift forces, speed limits, cargo capacities, comforts, block coefficients, and many more are different. For example, cargo ships design over displacement hull usually because displacement hull ensures more capacity, more stability especially for longer ships, sufficient and enough speed. Also, comfort is an important part of the displacement hull for large cruise ships. Besides, planing hull ensures more speed, they can be chosen by high-speed crafts, coast guard boats, etc. A semi-planing hull ensures both of the two hulls benefit. They can be chosen by ships which one is important to carry cargo their fast. For example, high-speed ferries, etc.