

CREATING BETTER FUTURE FOR OCEAN, SHIPS AND HUMANS

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Creating Beautiful Curves of a Ship Body...

Gyotetsu : Steel Plate Bending

A Japanese word "Gyotetsu" means bending steel. Every part of a ship body, including a stem, a stern, waterline or a bottom, has curved lines. A ship is so huge that it needs to be built in units or blocks and then welded together to form a ship. Generally speaking, approx. 250 to 400 steel panels are used to build a ship body, though it varies depending on a size or a shape of a ship. "Gyotetsu" is a technique of bending steel panels of 20mm to 90mm thickness. Accuracy of "Gyotetsu" process directly affects the welding work, engine speed or fuel consumption. The reason why ships have beautiful curved lines is that the shape is deeply related to their performance.

We hope you have a better understanding of steel bending process.

Forming curves of the tip of bow and following bulbous bow is the most difficult work that requires a skillful craftsmanship. Our specialty "Gyotetsu" is playing an important role in shipbuilding, especially in creating beautiful curves.

We support shipbuilding with our sophisticated craftsmanship.

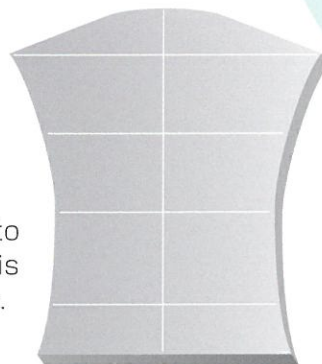
Many steel plates are welded, like making a plastic model, to form a ship body. Most of ship bodies are formed with intricate curves. A projective shape called bulbous bow is adopted in the bow in order to reduce water resistance. This shape largely affects the engine speed, fuel consumption and solidity of the ship. Three-dimensional bending of steel requires the highest technique.

Process of shipbuilding

Let us explain how a steel plate for the bow is processed.



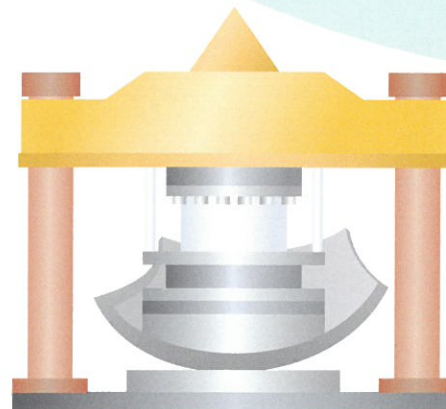
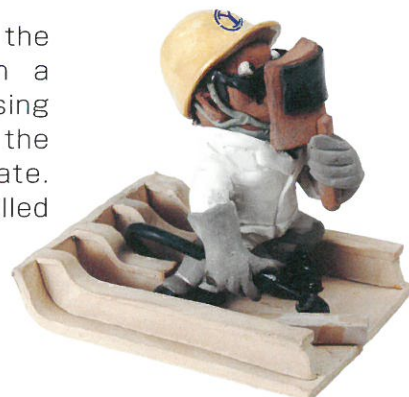
The plate of 20 to 90mm thickness is bent to make curves.



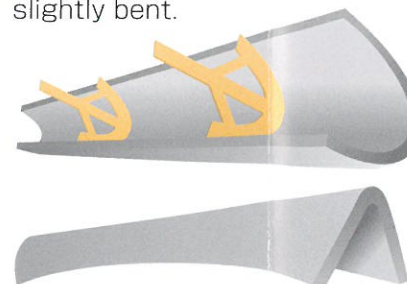
First, we mark and cut the material by numerical control according to the plan.

● The plate is still flat in this stage.

Then we bend the steel plate with a large-sized pressing machine along the wooden template. This work is called the first bending.



The plate is now slightly bent.



Then, we bend the plate further according to the line called "Tate"※. The second bending begins here.



In this stage, we use a gas burner and water to do line heating and water cooling. Be careful about controlling the gas and water!



※ "Tate" is the datum line along which steel plates should be bent.

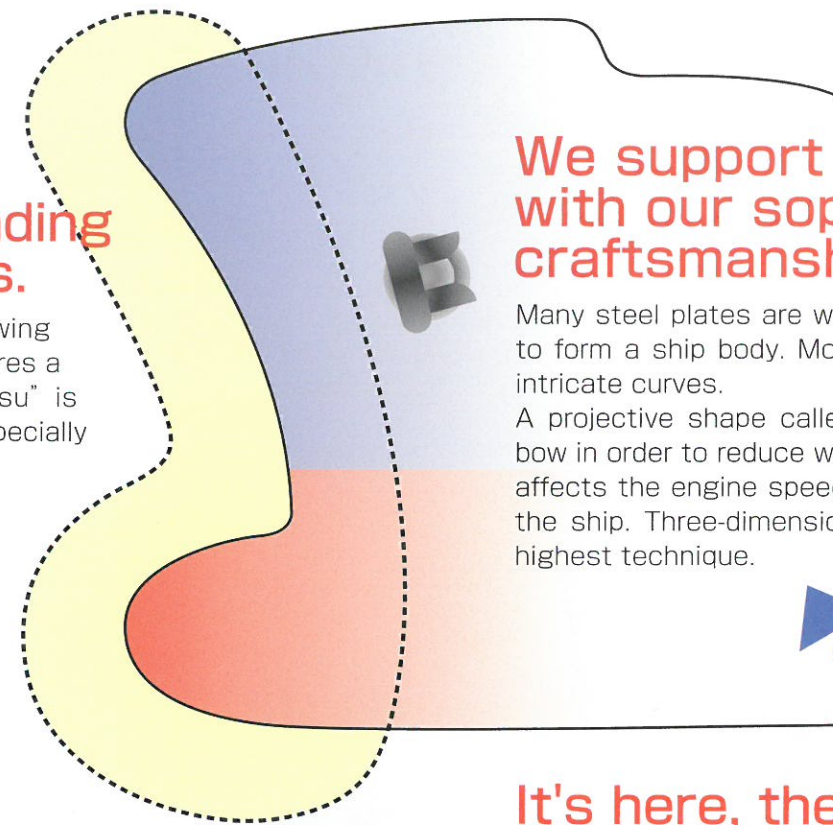
Guess where this piece is incorporated.



We continue this work carefully until the plate has a deep arch as designed. Please compare the curve of this plate with that in the first bending stage.



STORY OF "GYOTETSU" IN SHIPBUILDING



It's here, the tip of upper center.

The prefabricated assemblies that are accurately processed according to the plan are welded and finished up in a shipyard. As the ship is so huge, the incorporated part does not seem to have a deep curve as it really has.

