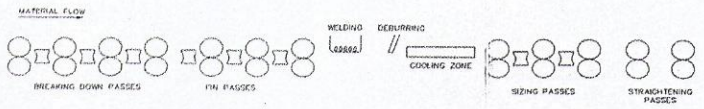
ROLLFORMING Vs. TUBE MAKING

A.S.Shetty

In this Thirtythird series of articles on **Rollforming** we will discuss about the differences between Rollforming technology vs Tubemaking technology. The initial growth of rollforming technology could be traced to the evolution in the welded Tube Technology. Tubular shaped components have the highest strength to weight ratio in terms of bending and torsional rigidity. The nature itself is the real teacher how the material could be used economically. For example, the human bones are in the shape of tubes. Bamboo plants which grow to great heights are in the shape of tubes.

In the case of tube making, initially ways and means of making seamless tubes were developed and later various methods of making jointed/welded tubes were developed. The latest welding method for tube making is High Frequency Induction welding. Pipes which are used for carrying gases and liquids are threaded at the ends and designated by nominal bore in inch sizes. Whereas tubes which are used as structural members are designated by outside diameter sizes. In tube/pipe making usually three methods of forming are used as shown in Fig.1. They are- single radius forming, edge forming and S/W forming. Here the final shape is progressively formed. Each method of forming have their advantages and disadvantages. Depending on the particular situation a particular forming method is adopted.

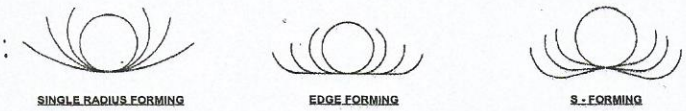
Although the traditional tube/pipe making and rollforming processes are simmilar and some of the equipment may be common there are differences in the tooling layout and set-up of the machine. Both rollforming and tube/pipe forming involve forming of the



strip mateial using roller dies and progressively forming to the required final shape. Fig.2 shows the roll set-up for Tube/Pipe mills. In these set-ups there are 3 to 5 break-down passes with idlers between the driven passes. After the break-down passes 2 to 3 Fin passes with idlers are used. After that a guide, weld sqeeze station and then a welding station comes. In the welding station a slightly oversize diameter tube/pipe is produced which will be finally sized to the required diameter in the sizing station.Next to the welding station a scarfing stand is provided to remove the outside weld burrs. Next comes the cooling station which removes the heat produced during welding.

Then the tube is guided into the sizing station with 2 to 3 driven passes with idlers in between. During sizing the tube is slightly elongated and the wall thickness is increased marginally.After sizing of the tube it goes into one to two straightening stands. After straightening the tube/pipe is cut into the required lengths using a flying cut-off system or flying saw.

A typical rollformer doesnt have idler stands and hence they require more number of



driven passes. The driven passes could go upto as much as 40 or even more depending upon the shape and intricacy of the section. Tube making speed is much more than rollforming speed. If pre-punching or notching system is introduced the speed could come even less. All metals, both ferrous and nonferrous could be rollformed or made into tubes. Prepainted steels could be rollformed but not welded. Tubing from prepainted mateiral could be usually formed with a lock joint.Tube mills normally roll round shaped sections. In order to produce non circular sections

(usually symmetrical sections) like square, rectangle and oval they are reshaped using turk-heads as the tube comes out of the sizing stands in the rolling mill itself. In rollforming practically there is no limit to the shape of the sections that could be produced.The required strip widths are calculated differently for tube and rollforming machines. For making tubes a fin-pass allowance and welding allowance is added to the strip width. Because in tube making inside is hollow and to get a proper forward traction both the top and bottom rollers will have to be driven necessarily whereas in the open section rollforming only bottom driven roller arrangements could be used. If the thickness of the section to be rolled is very much on the higher side both the top and bottom rollers are driven.Presently rollforming machines are used mostly for producing open sections.The future trend in rollforming is going to be to produce more and more of different shaped welded closed sectionsas they have high strength to weight ratios and material utilisation is optimum.

The author **A.S.Shetty can be contacted at 080-25452669 or email at sedvik@vsnl.com**