

# ROLLFORMING - BASICS

In this Thirtyfifth series of articles on Rollforming we will discuss about some more aspects of rollforming basics. In rollforming predominantly ( about 95% ) coiled back is rollformed. Strip material is initially produced in the steel plants as wide width coils only. They are further processed/slit to smaller required widths on a gang slitting machine. Whenever required these slitted coils are flattened and cut to the required lengths. Coil handling requires heavier material handling equipments and a decoiler to feed into the rollforming machine. However, rollforming of cut sheets requires more number of forming stages. The minimum length of cut sheets that could be roll formed is a little more than twice the horizontal distance between roll stands. The blank should always be in contact with at least two roll sets as it enters the next pass.

Rollforming technology is more complex than press braking/pressing technology.

In rollforming the quality of the sections produced depends on many variables. These variables are : a) strip width variations b.) strip material hardness variations and not consistent c.) Strip thickness variations d.) slitting burrs and camber on the strip e.) roll design. f.) condition of the rollforming machine i.e bearing conditions, straightness of the rollshafts. g.) roll design h.) centre line alignment of the rollers and tool set up. i.) speed of rolling. j.) lubrication of the rollers as well as strip. k.) roll pressure applied. l.) manufacturing problems and insufficient hardness of the rollers.

Clarifying some of the above mentioned points- the strip should not be too hard or soft.

Harder strip leads to cracking at the bends and higher spring back on the bends. The recommended hardness for

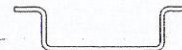


FIG.1

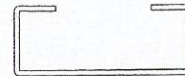


FIG.3

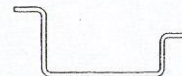


FIG.2

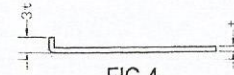


FIG.4

strips is quarter hard or 115 VPN to 135 VPN hardness.. Softer strip leads to too much of roll marks and stretcher strain marks after rollforming. Too much of slitting camber leads to twist on the sections. If the roll design is not proper excessive heat would be generated and the roll life would be drastically reduced as well as twist and camber results. If the machine bearings have too much of slackness and if the centre line alignment of the rollers is faulty twist and waviness would be induced. Operation of the rollforming machine requires proper training of the operators and maintenance personnel. To run the rollforming machine at higher optimum speeds the equipments and tooling should be in good condition, the strip material used should have proper thickness, width, camber and hardness tolerances maintained. Further, proper lubrication of the rollers is required. If the requirements are not upto the mark many a time slower speed production is resorted to.

Rollformed shapes should not be too deep. Profiles that are deep require larger diameter forming rolls which are expensive and require larger machines. Normally they go upto about 100 mm deep at the maximum.

Rollforming is a capital intensive mass production technology with great future potential. Compared to other forming methods there are several variables taken into consideration in order to achieve optimum performance. This technology is comparatively new in India and not yet widely popular and its potential not fully utilized. In this article **A.S. Shetty** discusses various aspects of rollforming aspects

In rollforming a symmetrical section as shown in Fig.1 produces the least amount of problems. If the section is non-symmetrical like as shown in Fig.2 there would a tendency for the section to come out slightly twisted unless proper remedial measures are taken. At the roll design stage itself precautions have to be taken such that left and right side formations about the centre line are uniformly distributed from pass to pass. Blind corners as shown in Fig.2 ( bottom two corners ) don't get full packing of top and bottom rollers in the normal method of formation of the section. As a result spring-back occurs. One method of overcoming this is to resort to overbending the section. The other method is to take the reverse bending route. While forming lips it is to be observed that the minimum lip length is kept three times the thickness of the strip material which is as shown in Fig.4. If the lip is less it is difficult to get a better bending leverage.

Rollforming is a capital intensive mass production technology with great future potential.

Compared to other forming methods there are several variables taken into consideration in order to achieve optimum performance. This technology is comparatively new in India and not yet widely popular and its potential not fully utilized. Sedvik Industries, Bangalore has been in the field of manufacture of rollforming machines since 1986.

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