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ROLLFORMING --BASICS

In this Thirtysixth series of articles on Rollforming we will discuss about further aspects of rollforming basics. One great advantage of rollforming is that if a tooling is made for a section with some portion of the base horizontal and having a specific height the same tooling could be used for any number of base widths by simply changing the roll spacers.

Fig.1 shows a typical section where sections with variable base widths could be produced with the same basic tooling. Open section mills could be stopped any time without any wastage of rolled section whereas in the case of tube production once there is a stoppage of the machine a lot of open joint tube is produced leading to wastage of material.

Normally the toolings are designed to take up the maximum thickness of section required to be produced. The toolings cannot be used for higher thicknesses than it has been designed for. Using the same toolings lesser thickness material could be used, some times with a slight loss of accuracy of dimensions. However, the best tolerances would be achieved if the sections are produced for the thickness for which the toolings are designed. The same toolings could be used for rollforming different materials like GI, prepainted steel, aluminium, copper and SS material. However, in the case of SS material some extra forming stages might sometimes be required. The toolings may be made in one-piece or split into several pieces primarily to save roll material and machining time and to facilitate heat-treating. Such design also facilitates mounting the rolls on the rollshafts and permits a limited

amount of change or correction in the rolls if found necessary during try-out. For rollforming of thinner materials a slight tension condition has to be maintained during rolling. This could be achieved by properly maintaining the roll diameters in different forming stages.

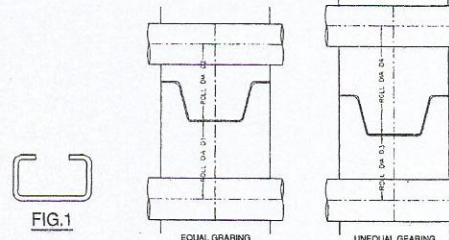


FIG.1

FIG.2

The selection of the rollforming machine is dependent upon several factors, the most important being the shape to be formed and the thickness and width of the strip. Tougher materials, such as the stainless steels, may require more forming stages than such materials as M.S. and may require a heavier forming machine. The amount of work that must be performed by any pair of rolls to form a specific product determines the number of forming stages required. The use of larger number of rolls will reduce the amount of work that must be performed by each and may thereby influence the selection of machine size.

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The speed ratio between top and bottom rollshafts in all types of roll forming machines may be equal or unequal depending on whether the rolls are of the same diameter or of different diameters. If the rolls are of different diameters, the rollshaft carrying the smaller rolls must run at a higher rotational speed than the rollshaft carrying bigger diameter rolls in order to equalize the surface speed of the two rolls. Normally the gear ratios between the top and bottom roll shafts is kept 1.3:1. This is true in most of the tube mills where hollow sections are to be driven. But in the case of rollforming machines for thinner gauges materials i.e for less than 3 mm material many a time the top rolls are not required to be driven. The machines with unequal gear ratios in which the upper or male rolls have a larger pitch diameter than the lower rolls are used to form sections having deep profiles such as the conventional channel sections. Fig. 2 shows the cross sections of two types of gearing systems. For rollforming predominantly shallow sections equal gear ratios are normally used. In some novel cases some portions of the rolls are mounted on bearings in order to equalize the differences in peripheral speeds which will increase the cost of toolings. There is a lot of scope for sophisticating the rollforming technology in India with more and more players entering into this field in the years to come.

Sedvik Industries, Bangalore has been in the field of manufacture of rollforming machines since 1986.

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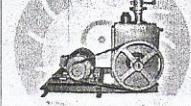
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