

A Comparative Study of Force Prediction Models during Static Bending Stage for 3-Roller Cone Frustum Bending

Authors : Mahesh Chudasama, Harit Raval

Abstract : Conical sections and shells of metal plates manufactured by 3-roller conical bending process are widely used in the industries. The process is completed by first bending the metal plates statically and then dynamic roller bending sequentially. It is required to have an analytical model to get maximum bending force, for optimum design of the machine, for static bending stage. Analytical models assuming various stress conditions are considered and these analytical models are compared considering various parameters and reported in this paper. It is concluded from the study that for higher bottom roller inclination, the shear stress affects greatly to the static bending force whereas for lower bottom roller inclination it can be neglected.

Keywords : roller-bending, static-bending, stress-conditions, analytical-modeling

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