

# Buckling Texturing Technology for Increase in Stability of thin Sheet Metal Structures - Simulation and Application

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**Abstract.** Embossing is a well known method to improve the transverse rigidity of thin sheet metal plates. This paper deals with a special embossing method where bulges get embossed into the surface of a cranked workpiece by hydrostatic pressure. The base for describing the production process is the elementary bulge structuring process at which a bionic bulge pattern gets embossed into the surface of a cylindrical shell. This structure enables highest amount of stiffness. By FEM-simulations the main process parameters and the optimal dimensions of the bulges are ascertained. The identified bulge geometry is the base for the design of the structuring tool. In industrial applications the structuring process will be a rolling process with an elastomere coated pressure roll, followed by a rebending operation. The simulation of this complex process demands an analogous model based on a half shell, which is virtually straightened. Then the bending resistance of a so achieved bulge structured plate is calculated under a three-point-bending load. Using the same computing procedure a realistic automotive body part is investigated. The whole process combines CAD & FEM techniques in a new and efficient way.