

The Design of Acoustic Horns for Ultrasonic Aided Tube Double Side Flange Making

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Abstract : Encapsulated O-rings are specifically designed to address the problem of sealing the most hostile chemicals and extreme temperature applications. Ultrasonic vibration hot embossing and ultrasonic welding techniques provide a fast and reliable method to fabricate encapsulated O-ring. This paper performs the design and analysis method of the acoustic horns with double extrusion to process tube double side flange simultaneously. The paper deals with study through Finite Element Method (FEM) of ultrasonic stepped horn used to process a capsulated O-ring, the theoretical dimensions of horns, and their natural frequencies and amplitudes are obtained through the simulations of COMOSOL software. Furthermore, real horns were fabricated, tested and verified to proof the practical utility of these horns.

Keywords : encapsulated O-rings, ultrasonic vibration hot embossing, flange making, acoustic horn, finite element analysis

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