

# AXIAL CRUSHING ANALYSIS OF CHARACTERISTICS OF EMPTY AND FOAM FILLED CIRCULAR TUBES

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## Abstract

*This paper describes experimental research of improved type of collision kinetic energy absorber. Absorber works on the principle of shrinking a foam filled tube of circular cross section. During collision, a seamless tube is passing through a special cone bush, extrusion the tube and compressing the foam. Energy is absorbed by the plastic deformation of the tube, friction between the tube and the cone bush and through deformation of the PU foam. The tubes were filled with PU foam higher density. This new type of absorber enables gradual increase of deformation resistance and greater absorption power with compact dimensions. Scaled samples have been tested in the laboratory conditions. The influence of the PU foam and different geometries on absorption characteristics, as well as the benefits of using such an absorber, are presented and discussed in this paper. The results show that the foam filled absorber has approximately 12% higher absorption power than the only extrusion absorber by itself.*

## Keywords

Circular tube, PU foam, Energy absorption, Experimental researches, Extrusion

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