

IMPACT OF DENSITY OF POLYURETHANE FOAM ON ABSORPTION POWER OF ENERGY ABSORBER

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Abstract

Safety of railway vehicles is one of the most importance steps in developing and design of them. Passive safety elements have a role to reduce consequences of collision to a minimal by absorbing collision kinetic energy. Applying a proper standard and adequate design of railway vehicle structure has a direct impact on safety of railway traffic. One of many ways for collision energy absorption is the tube energy absorber which works on the principle of shrinking the foam filled tube passing through special cone bushing. Fill made from high density polyurethane has a role to increase deformation resistance during elastic-plastic deformation of the tube. Seamless tube was made from low carbon steel while the cone bushing was made from quench and tempered carbon steel. This type of absorber is designed to install in a line (behind) with standard buffer. Using this type of absorber energy absorption occurs by elastic-plastic deformation of the tube, friction between the tube and cone bushing and pressing of the foam. With the aim to show influence of the density of the foam on absorption power, experimental investigations of tubes filled by polyurethane foam of different density were done. Results of experimental investigations show that increase of density gives higher deformation resistance as well as higher absorption power. Further investigations will be directed to improve of absorption characteristics by chose a most acceptable density of foam.

Keywords

Railway Safety, Passive Safety, Foam Filled Seamless Tube, Experimental Investigations, Polyurethane Foam

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