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Title: Energy - absorption and efficiency diagrams of rigid PUR foams

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Abstract: Polyurethane (PUR) foam materials represent a class of materials widely used for impact protection and energy absorption. This paper presents a characterization of different rigid PUR foams under compressive impact loading by means of energy absorption and efficiency diagrams. Compressive properties were investigated on cubic specimens on the foams' rise direction at room temperature with a loading rate of 3.09 m/s for three different closed-cell foams with densities of 100 kg/m(3), 160 kg/m(3) and 300 kg/m(3) respectively. Experimental results show that the compression modulus, yield stress and plateau stress increase with density. Most of the energy is absorbed in the plateau region because of the cell deformation associated with this phenomenon, allowing greater absorption of impact energy at nearly constant load. Authors have found that both the energy absorption and efficiency diagrams are consistent and present similar results for studied foams.

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