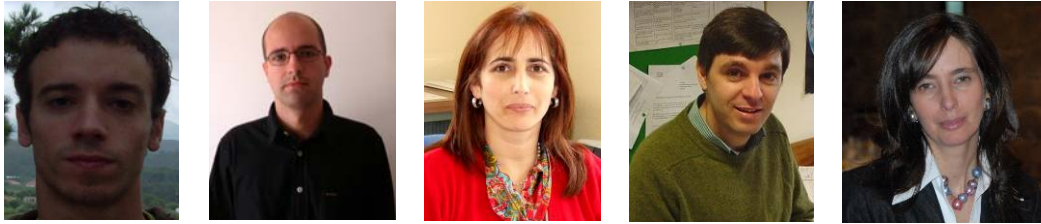


EXPERIMENTAL STUDY ON IMPACT ENERGY ABSORBING ELEMENTS USING CONFIGURABLE THERMAL TRIGGERS

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ABSTRACT

This study presents an approach for the improvement of crashworthiness properties of aluminium tubular structures using initiators introduced through localized heating. The main objective of this approach is to improve the ability to absorb impact energy in a progressive and controlled manner by local modification of material properties. Through localized heating in areas chosen for initiation and associated softening of the aluminium alloy the deformation can be introduced precisely, forcing the tubular structure to deform in a mode of high energy absorption and reducing the maximum load in a controlled manner. This study presents results of properties for an aluminium alloy 6060-T5 modified by thermal treatment and using laser beam. Experimental results of impact tests of tubular structures using the proposed approach were performed on a drop weight tower with quantitative analysis using a high speed video camera and tracking software.