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Effect of filler on the impact characteristics of aluminium tubes

Abstract

This paper presents the behaviour of empty and foam-filled aluminium alloy (AA6061-T6) tubes under dynamic axial loading. The influence of geometrical and various densities of fillers was investigated by employing a finite element code, LS-DYNA. The critical effective point for fillers of different densities is identified in a foam-filled tube based on a specific energy absorption value at which the weight effectiveness of a foam-filled tube exceeds that of the empty tube. The combination of an aluminium tube and an aluminium foam filler successfully induced significant increase in specific energy absorption, proving that the assessment of critical effective point is vital in identifying proper combination of tube-filler on the effectiveness of foam-filled tubes.

Keywords; Conical tube, Foam-filled, Axial crushing, Finite element, Energy absorption,