

Manuscript ID : 00000-46784

International Journal of Mechanical Engineering and Technology

Volume 8, Issue 11, November 2017, Pages 38-47, Page Count - 10



Source ID : 00000002

EXPERIMENTAL STUDIES ON THE ENERGY ABSORPTION CAPACITY OF AXIALLY COMPRESSED METAL TUBES

Manjunatha G ⁽¹⁾ Sharath G S ⁽²⁾ Srinivas S ⁽³⁾

⁽¹⁾ Research Scholar, Bangalore University, Bengaluru, India.

⁽²⁾ Assistant Professor, School of Mechanical Engineering, REVA University, Bengaluru, India.

⁽³⁾ Assistant Professor, School of Mechanical Engineering, REVA University, Bengaluru, India.

Abstract

Impact energy absorbers are expendable mechanical structural elements, which are brought into action to dissipate the kinetic energy in the event of an unwanted collision. These act as mechanical fuses to limit the loads, which may act on the main structure immediately after a collision. The use of aluminium tubes and tubular structures for use as impact energy absorbers in different engineering applications is encouraging. This is because of their ready availability in different cross sections and sizes, and also has high energy absorption capacity under quasi-static and dynamic loads. In this present study, experiments are conducted on circular aluminium tubes under quasi-static, axial compression. The different modes of deformation of these tubes are examined in two separate cases. Case 1: when the tubes compressed axially between a flat platen and shaped dies of different radii. Case 2: when the tubes compressed axially between two flat platens. Dies of different radii are used to evaluate the efficient mode of deformation. The energy absorption capacity under quasi-static loading conditions is evaluated in the above cases to evaluate the energy absorption capacity and to compare the energy absorption of aluminium tubes based on the different deformation modes. The results of the study are useful in the design of impact energy absorbers.

Author Keywords

Energy absorbers, aluminium tubes, quasi-static, flat platens, load displacement curves Introduction

Index Keywords

Impact energy absorbers, High specific, energy absorbing capacity

ISSN Print: 0976-6340

Source Type: Journals

Publication Language: English

Abbreviated Journal Title: IJMET

Publisher Name: IAEME Publication

Major Subject: Physical Sciences

Subject area: Mechanical Engineering

ISSN Online: 0976-6359

Document Type: Journal Article

DOI:

Access Type: Open Access

Resource Licence: CC BY-NC

Subject Area classification: Engineering and Technology

Source: SCOPE DATABASE