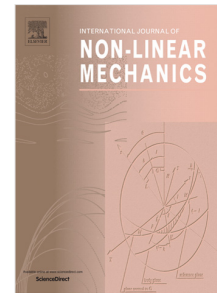


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Experimental and theoretical studies on axially crushed corrugated metal tubes

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Abstract

In this paper, crushing behaviors of tube with shallow and deep corrugation are experimentally and theoretically examined under axial loading condition. Three types of specimens were tested under quasi static axial loading. Their failure mechanism and failure history are presented and discussed. The experimental result showed that corrugated metal tubes demonstrate perfect energy absorption characteristics in terms of uniformity of load-displacement diagram, reduction of initial peak load and controlling failure mechanism. The theoretical solution based on experiment and modified simplified super folding element theory is proposed that depends on the number of plastic hinge line, wall thickness, length of structure and flow stress of material. The comparison between theoretical solution and experiment shows a good agreement with acceptable errors.

Keywords: Axial crushing behavior; Theoretical analysis; Crushing force efficiency; Corrugated tubes.

1. Introduction

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