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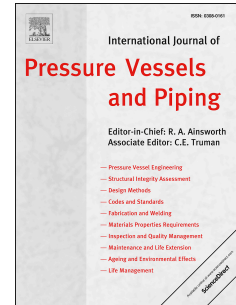
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Threaded Connectors for Sandwich Pipes – Part 1: Parametric & Comparative Studies

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Abstract

A concept for using snap-fit connectors in sandwich pipes is investigated numerically in two companion papers using a combination of 2D axisymmetric and 3D finite element models in Abaqus.

In the Part 1 paper, results of key parametric studies related to the installation of sandwich pipes in deepwater are reported. The modification of the nib groove to include variable radii, the use of an elastomeric seal coupled with compressive pre-stress and an optimum resin-to-core ratio all proved to enhance the performance of the sandwich pipe snap-fit connectors. The influence of the interlayer adhesion configuration on the stress concentration experienced in the connector is also studied. Furthermore, a comparative study is performed to investigate the mechanical behaviour of the snap-fit connector concept in sandwich pipes and conventional pipe-in-pipe.

In the Part 2 paper, an optimisation study is carried out for the stress relief groove (SRG) in the pin of the snap-fit connector. A combined parameter is proposed to capture the relationship between the investigated geometric properties and the stress concentration factor at the SRG. It is established that the fillet radius could indeed be used to offset the drop in performance associated with increasing the SRG depth while improving the fatigue characteristics of the connector threads.

Keywords

Pipe joining, finite element modelling, snap-fit connector

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