

Prediction of stress distribution of pressure vessel shell using numerical simulation

*Estimarea distribuției tensiunii în mantaua unui vas sub presiune
folosind simularea numerică*

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Abstract

In this paper, a comparative analysis of stresses in the pressure vessel shell, using a numerical simulation in software package CATIA and analytical calculation has been represented. Material of the pressure vessel is stainless steel 304L, and it is intended for substances storing, that have corrosion effect.

Using the finite element method it was performed a modeling of the pressure vessel for a real geometry, where it has been considered a shape of shall and geometry of connections, supports and welded joints, because they might be places for the occurrence of stress concentration.

Based on the analysis results, the highest achieved stresses are in the torus part of the head and around the connections. It was observed a good accordance between the results obtained on the basis of analytical strength calculation, and results of numerical simulation. Shown methodology might have application of stress prediction in the similar industrial equipment.

Keywords

Nnumerical simulation, catia software packege, stainless steel, pressure vessel