

Fatigue behaviour of brazed joints for heat exchangers

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Abstract

The plate heat exchanger (PHE) is a component that provides heat to be transferred from hot water to domestic cold water without mixing them with high efficiency. Over the lifetime of the PHE, cyclic pressures act on the brazing points and the plates, and this may lead to fatigue failure. The fatigue behaviours of the PHEs, which are designed by using copper-brazed 316L (also known as 1.4404) stainless steel, were investigated in this study by performing fatigue tests to obtain the S-N curve of the analyzed brazed joint. The fatigue tests have been performed on the Vibrophore 100 testing machine under the load ratio $R = 0.1$ for different values of calculated amplitude stress. Based on the obtained experimental results, an appropriate material model of the analyzed brazed joint has been created, which was validated with numerical calculation in a program code Ansys. A validated material model can then be used for the subsequent numerical analysis of PHE.