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ABSTRACT

PRESENTATION

PAPER

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TENSILE LOADING OF Ti-25Nb-0.7O SHAPE MEMORY ALLOY MONITORED BY INFRARED THERMOGRAPHY AND DIGITAL IMAGE CORRELATION

Ti-Nb shape memory alloys (SMAs) can exhibit shape memory effect or superelasticity associated with the martensitic transformation from β phase to α'' martensite. The mechanism of superelasticity in oxygen-added Ti-Nb SMAs is different due to a specific lattice modulation. It leads to a nonlinear superelastic behavior as in the case of Gum Metal with composition Ti-23Nb-0.7Ta-2Zr-1.2O (at.%). Infrared thermography (IRT) and digital image correlation (DIC) were already successfully applied to investigate the thermomechanical behavior of Gum Metal under tensile loadings. However, only average temperature change values could contribute to a better understanding of stress-strain curves of Gum Metal. No local effects were observed in strain or temperature fields determined at particular stages of the Gum Metal's deformation. The goal of this study was to investigate the thermomechanical characteristics of Ti–25Nb–0.7O (at.%) SMA, which has a lower oxygen content than Gum Metal, under tensile loading using IRT and DIC.