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# Shape Memory Alloy Under Strain and Stress Controlled Conditions – Thermomechanical Aspects of Martensite and Reverse Transformations

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Thermomechanical aspects of martensite and reverse transformations in shape-memory alloy subjected to strain and stress control were investigated. The temperature distributions on the specimen's surface were determined by using an infrared camera. The results differ in mechanical behavior, however at both approaches, a heterogeneous temperature distributions, related to the nucleation and developing of the new phase, were observed. After the initial uniform temperature distribution, the temperature increased in the central area of the sample, followed by an inclined line of significantly higher temperature. Next lines, parallel to each other, developed towards the grips, as well as a second "family" of them, developing in perpendicular direction. At higher strain, the regions of increased temperature became less clearly defined, due to the martensite developing in the whole material volume and the heat flow. The similar heterogeneous effects were observed during unloading, while the reverse transformation took place, accompanied by significant temperature decrease.

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