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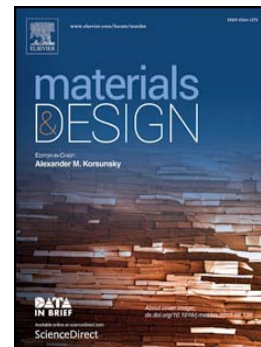
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S.M. Saghaian, H.E. Karaca, M. Souri, A.S. Turabi, R.D. Noebe

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Tensile shape memory behavior of $\text{Ni}_{50.3}\text{Ti}_{29.7}\text{Hf}_{20}$ high temperature shape memory alloys

S.M. Saghaian¹, H.E. Karaca^{1,*}, M. Souri¹, A.S. Turabi¹, R.D. Noebe²

¹*Department of Mechanical Engineering, University of Kentucky, Lexington, KY, USA*

²*NASA Glenn Research Center, Materials & Structures Division, Cleveland OH, USA*

The effects of heat treatment on the shape memory characteristics of a polycrystalline $\text{Ni}_{50.3}\text{Ti}_{29.7}\text{Hf}_{20}$ alloy were studied via thermal cycling under stress and isothermal stress cycling experiments in tension. It was revealed that transformation temperatures could be increased above 100 °C with aging at temperature above 500 °C and in particular were stabilized against stress-free thermal cycling after aging at 500 °C. Recoverable strain of ~5% was observed for the as-extruded samples and decreased to ~4% after aging due to the formation of non-transformable precipitates. The aged alloys demonstrated near perfect shape memory effect under tensile stresses as high as 700 MPa and perfect superelasticity at temperatures up to 230 °C. Finally, the tension-compression asymmetry observed in NiTiHf alloys was discussed.

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