Case Study
Research and Development in Nanomaterials

CUSTOMER: U.S. Department of Defense (DoD)
CONTRACT #: N00421-03-P-0841
PROJECT NAME: SBIR Project, "Innovative and Scalable Near Net Shape Manufacturing for Shape Memory Alloy"
PROJECT DURATION: 2003

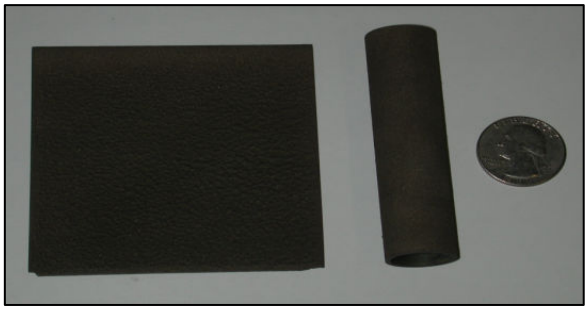
OVERVIEW

The US Department of Defense solicited a SBIR/STTR request for proposal (RFP) for new processes for the fabrication of NiTi (nickel titanium) SMAs (shape memory alloys) with particular "net-shapes". Aegis Technology developed two processes to meet DoD requirements: (1) spray forming and (2) laser engineered net shaping (LENS). The primary advantages of both processes are lower costs and homogeneous/dense microstructure, compared with conventional techniques including commercial ingot manufacturing and plasma vacuum deposition. Aegis Technology was awarded and completed the project in 2003.

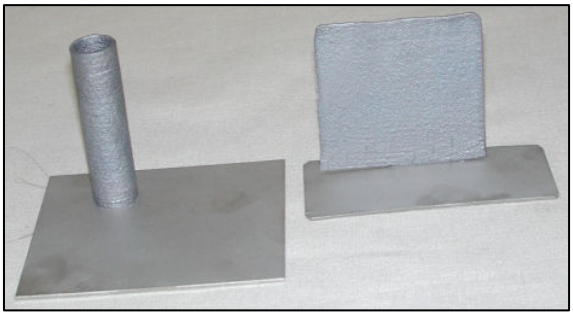
DELIVERABLES

Aegis Technology designed and delivered several net-shaped NiTi shape memory alloy components. In the process, Aegis Technology conducted:

- Processing
- Scanning Electron Microscope (SEM) Characterization
- Differential Scanning Calorimetry (DSC) Analysis
- Mechanical testing (stress vs. strain)
- Energy-dispersive X-ray spectroscopy (EDS) Analysis



(a)



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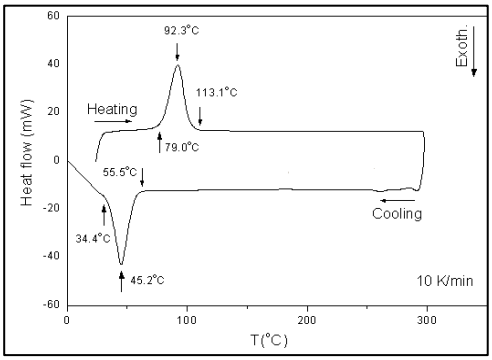

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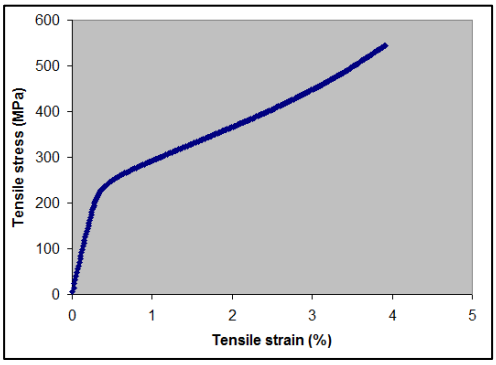

(d)

(a) NiTi SMA samples fabricated using spray forming, (b) NiTi SMA samples fabricated using LENS process (c) DSC analysis of phase transformation in NiTi sample, (d) Tensile stress vs. tensile strain using LENS

CONTACT

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