

Table of Contents

Preface and Committees

Chapter 1: Materials, Phase Transformation and Microstructure

From Dual-Shape/Temperature Memory Effect to Triple-Shape Memory Effect in NiTi Shape Memory Alloys

C. Tang, W.M. Huang and C.C. Wang 1

Theoretical Study of Magnetic Properties and Twin Boundary Motion in Heusler Ni-Mn-X Shape Memory Alloys Using First Principles and Monte Carlo Method

K.I. Kostromitin, V.D. Buchelnikov, V.V. Sokolovskiy and P. Entel 7

The Effect of Pressure on Martensitic Phase Transformations

V. Paidar, A. Ostapovets and O. Hardouin Duparc 13

Heat-Treatment Processing for MnBi in High Magnetic Fields

K. Watanabe, Y. Mitsui and K. Koyama 19

Composition Dependence of Compatibility in Self-Accommodation Microstructure of β -Titanium Shape Memory Alloy

T. Teramoto, M. Tahara, T. Inamura, H. Hosoda and S. Miyazaki 25

Chapter 2: Engineering

CuZnAl Shape Memory Alloys Foams

A. Tuissi, P. Bassani and C.A. Biffi 31

Functional Fatigue of NiTi Shape Memory Wires under Assorted Loading Conditions

G. Scire' Mammano and E. Dragoni 40

Transformation Behavior of Shape Memory Alloys in Multiaxial Stress State

T. Yamamoto, A. Suzuki, H. Cho and T. Sakuma 46

Modelling of Shape Memory Alloy Negator Springs for Long-Stroke Constant-Force Actuators

A. Spaggiari and E. Dragoni 52

Design and Simulation of a Magnetic Shape Memory (MSM) Alloy Energy Harvester

A.J. Niskanen and I. Laitinen 58

Phase Field Dynamic Modelling of Shape Memory Alloys Based on Isogeometric Analysis

R. Dhote, H. Gomez, R. Melnik and J. Zu 63

Effect of Repeated Heat-Treatment under Constrained Strain on Mechanical Properties of Ti-Ni Shape Memory Alloy

H. Cho, T. Yamamoto, A. Suzuki, T. Sakuma and K. Yamauchi 69

Digital Image-Based Method for Quality Control of Residual Bending Deformation in Slender Pseudoelastic NiTi Devices

S. Viscuso, L. Garavaglia and S. Pittaccio 75

Chapter 3: Low Dimensionality

Low Temperature Crystallization of Sputter-Deposited TiNi Films

Y. Kishi, N. Ikenaga, N. Sakudo and Z. Yajima 81

Synthesis of Crystallized TiNi Films by Ion Irradiation

N. Ikenaga, Y. Kishi, Z. Yajima and N. Sakudo 87

Chapter 4: Applications

SMA Dampers for Cable Vibration: An Available Solution for Oscillation Mitigation of Stayed Cables in Bridges

V. Torra, A. Isalgue, C. Auguet, F. Casciati, S. Casciati and P. Terriault 92

Devices for Rehabilitation Applications

S. Pittaccio, S. Viscuso and L. Garavaglia 103

Design of a Solid State Shape-Memory-Actuator with Guidance Functionality

K. Pagel, A. Bucht, W.G. Drossel and R. Neugebauer 113

An Open-Loop Control Approach for Magnetic Shape Memory Actuators Considering Temperature Variations

K. Schlüter, L. Riccardi and A. Raatz

119

Studies on Internal Friction of a High Temperature Cu-Al-Mn-Zn Shape Memory Alloy

V. Sampath and P. Chandran

125