

SPIN-LATTICE EFFECTS IN Ni—Mn—Ga
SHAPE-MEMORY ALLOYS

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S u m m a r y

The unusual magnetic properties and a recently discovered giant magnetically induced deformation of Ni—Mn—Ga shape-memory alloys have been considered. A magnetostrictive mechanism of the magnetic and magnetomechanical effects observed in Ni—Mn—Ga alloys has been substantiated, and a consistent theory of these effects has been developed starting from the fundamental conception of magnetoelasticity and commonly known principles of the theory of ferromagnetism. A quantitative agreement between the theoretical and experimental results has been achieved, and a complete adequacy of the developed theory has been proved in this way. A correspondence of the magnetostrictive mechanism to the crystallographic features of a giant magnetically induced deformation and the basic relationships of thermodynamics of solids has been discussed.