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Microstructure and Microhardness of a Nanostructured Nickel-Iron Based Alloy; Mechanical and Functional Properties of Titanium Alloys Processed by Severe Plastic Deformation; Mechanical Properties and Fracture Behaviour of Nanostructured and Ultrafine Structured TiAl Alloys Synthesised by Mechanical Milling of Powders and Hot Isostatic Pressing; II. Deformation Mechanics of Bulk Nanostructured Materials; Structure Evolution and Deformation Resistance in Production and Application of Ultrafine-Grained Materials - the Concept of Steady-State Grains

Stages of Plastic Deformation in Metallic Nanocrystals; Tensile Deformation Behaviors of Ultra-Fine Subgrained Aluminum; Deformation Mechanisms in Nanocrystalline Nickel at Low Temperatures; Kinetic Modeling of the Deformation Behavior of High-Strength Nanostructured Al-Mg Alloys; Vortices and Mixing in Metals during Severe Plastic Deformation; Process Design Concepts for the Production of Ultrafine Grained Steels through Multi-Pass Warm Rolling; Bridging Science and Technology; Grain Refinement in Commercial Purity Titanium Sheets by Constrained Groove Pressing; Achievable Strength of Nanostructured Composites with Co-Deformable Components; Thermal Stability of Fine Grains as a Function of Process Parameters in FSW Butt Joints; Keywords Index; Authors Index

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Sommario/riassunto

Bulk nanostructured (NS) materials have emerged as a new class of materials having unusual structures and properties. As a result, they have attracted considerable attention in recent years. Bulk NS materials are single or multi-phase polycrystals with a nanoscale grain size and can usually be classified into nanocrystalline (<100nm) and ultrafine grain (<1000nm) materials. This book contains important papers on the mechanical properties and deformation mechanisms of bulk NS materials. The advanced properties include strength, ductility, strain-hardening, fatigue, dynamic, creep and toughness,

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