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Nota di contenuto	Titanium and Titanium Alloys; Foreword; Contents; List of Contributors; 1 Structure and Properties of Titanium and Titanium Alloys; 1.1 Introduction; 1.2 The Metallurgy of Titanium; 1.2.1 Crystal Structure; 1.2.2 Plastic Deformation; 1.2.3 /-Transformation; 1.2.4 Diffusion; 1.3 The Classification of Titanium Alloys; 1.4 Metallographic Preparation of the Microstructure; 1.5 The Microstructure of Titanium Alloys; 1.6 Property Profiles of the Titanium Alloy Classes; 1.7 The Alloying Elements of Titanium; 1.8 The Conventional Titanium Alloys; 1.8.1 Alloys; 1.8.2 Near- Alloys 1.8.3 + Alloys1.8.4 Metastable Alloys; 1.9 Textures in Titanium Alloys; 1.10 Mechanical Properties of Titanium Alloys; 1.10.1 Strength; 1.10.2 Stiffness; 1.10.3 Elevated Temperature Strength; 1.10.4 Damage Tolerance and Fatigue; 1.11 Referenced Literature and Further Reading; 2 Beta Titanium Alloys; 2.1 Introduction; 2.2 Metallurgy and Processing; 2.3 Mechanical Properties; 2.3.1 Tensile Properties; 2.3.2 Fracture

Toughness; 2.3.3 Fatigue (HCF); 2.3.4 Fatigue Crack Propagation (FCP); 2.4 Applications; 2.5 Referenced Literature and Further Reading
3 Orthorhombic Titanium Aluminides: Intermetallics with Improved Damage Tolerance3.1 Introduction; 3.2 Physical Metallurgy: Crystal Structures, Phase Equilibria, and Alloy Chemistry; 3.3 Properties of Orthorhombic Titanium Aluminides; 3.3.1 Physical Properties; 3.3.2 Microstructures; 3.3.3 Mechanical Properties; 3.3.3.1 Tensile Properties; 3.3.3.2 Creep Behavior; 3.3.3.3 Fatigue Strength, Crack Growth Behavior, and Fracture Toughness; 3.4 Oxidation and Environmental Embrittlement; 3.5 Concluding Remarks; 3.6 Referenced Literature and Further Reading
4 -Titanium Aluminide Alloys: Alloy Design and Properties4.1 Introduction; 4.2 Constitution of -Titanium Aluminide Alloys; 4.3 Phase Transformations and Microstructure; 4.4 Micromechanisms of Deformation; 4.4.1 Slip and Twinning Systems; 4.4.2 Dislocation Multiplication; 4.4.3 Twin Nucleation; 4.4.4 Glide Resistance and Dislocation Mobility; 4.5 Mechanical Properties; 4.5.1 Grain Refinement; 4.5.2 Effects of Alloy Composition; 4.5.3 Solid Solution Effects due to Nb Additions; 4.5.4 Precipitation Hardening; 4.5.5 Creep Resistance; 4.5.6 Crack Propagation and Fracture Toughness
4.5.7 Fatigue Behavior4.6 Basic Aspects of Processing; 4.6.1 Manufacture of Ingots; 4.6.2 Casting; 4.6.3 Dynamic Recrystallization on Hot Working; 4.6.4 Development of Hot Working Routes; 4.7 Conclusions; 4.8 Acknowledgments; 4.9 Referenced Literature and Further Reading; 5 Fatigue of Titanium Alloys; 5.1 Introduction; 5.2 Influence of Microstructure; 5.2.1 Commercially Pure Titanium, Alloys; 5.2.2 Near- and + Alloys; 5.2.3 Alloys; 5.3 Influence of Crystallographic Texture on Fatigue Life; 5.4 Influence of Mean Stress on Fatigue Life; 5.5 Influence of Mechanical Surface Treatments
5.6 Influence of Thermomechanical Surface Treatments

Sommario/riassunto

This handbook is an excellent reference for materials scientists and engineers needing to gain more knowledge about these engineering materials. Following introductory chapters on the fundamental materials properties of titanium, readers will find comprehensive descriptions of the development, processing and properties of modern titanium alloys. There then follows detailed discussion of the applications of titanium and its alloys in aerospace, medicine, energy and automotive technology.