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Conclusions and future trends; 4.6 Sources of further information and advice; 4.7 References; 5 Alloying behavior of magnesium and alloy design; 5.1 Introduction; 5.2 Alloy design: solid solution alloying of magnesium; 5.3 Alloy design: compound formation in magnesium alloys; 5.4 The effects of second phases on the mechanical behavior of magnesium; 5.5 Alloying with surface-active elements 5.6 Alloying elements and their effects 5.7 Summary: magnesium alloy design to enhance properties; 5.8 References; 6 Forming of magnesium and its alloys; 6.1 Introduction; 6.2 Testing for formability; 6.3 Deformation mechanisms and formability; 6.4 Yield characteristics and drawability; 6.5 Work hardening and stretching; 6.6 Failure strain behaviour, compression, rolling and bending; 6.7 Superplastic deformation and hot forming; 6.8 Hot cracking and extrusion; 6.9 Conclusions: key issues affecting the formability of magnesium; 6.10 Future trends; 6.11 References 7 Corrosion and surface finishing of magnesium and its alloys 7.1 Introduction; 7.2 Magnesium corrosion in aqueous media; 7.3 Surface finishing; 7.4 Implications for improving corrosion resistance and future trends; 7.5 Conclusions; 7.6 References; 8 Applications: aerospace, automotive and other structural applications of magnesium; 8.1 Introduction; 8.2 Material properties; 8.3 Alloy development; 8.4 Manufacturing process development; 8.5 Aerospace applications; 8.6 Automotive applications; 8.7 Other applications; 8.8 Future trends; 8.9 Acknowledgements; 8.10 References 9 Applications: magnesium-based metal matrix composites (MMCs)

Sommario/riassunto

Magnesium and magnesium alloys offer a wealth of valuable properties, making them of great interest for use across a wide range of fields. This has led to extensive research focused on understanding the properties of magnesium and how these can be controlled during processing. Fundamentals of magnesium alloy metallurgy presents an authoritative overview of all aspects of magnesium alloy metallurgy, including physical metallurgy, deformation, corrosion and applications. Beginning with an introduction to the primary production of magnesium, the book goes on to discuss physical metallurgy
