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Autore	Milewski John O
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Nota di contenuto	Preface -- Acknowledgements -- List of Acronyms -- About the Author -- AM Road Map and Hitchhiker's Guide -- Chapter 1: Envision -- Chapter 2: Additive Manufacturing Metal, The Art of the Possible -- Chapter 3: On the Road to AM -- Chapter 4: Understanding Metal for Additive Manufacturing -- Chapter 5: Lasers, Electron Beams, Plasma Arcs -- Chapter 6: Computers, Solid Models, and Robots -- Chapter 7: Origins of 3D Metal Printing -- Chapter 8: Current System Configurations -- Chapter 9: Inspiration to 3D Design -- Chapter 10: Process Development -- Chapter 11: Building, Post Processing, and Inspecting -- Chapter 12: Trends in AM, Government, Industry, Research, Business -- Professional Society and Organization Links -- Glossary -- Bibliography -- AM Machine and Service Resource Links --

Appendix A: Safety in Configuring a 3D Metal Printing Shop -- Appendix B: Exercises in Metal Fusion -- Appendix C: OpenSCAD Programming Example -- Appendix D: 3D Printer Control Code Example -- Appendix E: Building an Arc-Based 3D Shape Welding System -- Appendix F: Exercises in 3D Printing -- Appendix G: Score Chart of AM Skills -- Index.

Sommario/riassunto

This engaging volume presents the exciting new technology of additive manufacturing (AM) of metal objects for a broad audience of academic and industry researchers, manufacturing professionals, undergraduate and graduate students, hobbyists, and artists. Innovative applications ranging from rocket nozzles to custom jewelry to medical implants illustrate a new world of freedom in design and fabrication, creating objects otherwise not possible by conventional means. The author describes the various methods and advanced metals used to create high value components, enabling readers to choose which process is best for them. Of particular interest is how harnessing the power of lasers, electron beams, and electric arcs, as directed by advanced computer models, robots, and 3D printing systems, can create otherwise unattainable objects. A timeline depicting the evolution of metalworking, accelerated by the computer and information age, ties AM metal technology to the rapid evolution of global technology trends. Charts, diagrams, and illustrations complement the text to describe the diverse set of technologies brought together in the AM processing of metal. Extensive listing of terms, definitions, and acronyms provides the reader with a quick reference guide to the language of AM metal processing. The book directs the reader to a wealth of internet sites providing further reading and resources, such as vendors and service providers, to jump start those interested in taking the first steps to establishing AM metal capability on whatever scale. The appendix provides hands-on example exercises for those ready to engage in experiential self-directed learning. Provides a solid introduction to the fundamental technologies utilized in AM metal processing, ranging from 3D computer models to lasers, electron beams, and computer controlled AM machines Offers the reader a guide to speaking the language of AM metal, with links to additional reading, references, resources, and service providers Illustrates how a new generation of designers and engineers are thinking outside the box to create the future of manufacturing through innovative applications and the use of advanced materials.