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Nota di contenuto	Historical background -- Basics of laser powder bed fusion -- A step-by-step guide to the L-PBF process -- Physics and modeling -- Design principles -- Porosity in laser powder bed fusion -- Surface roughness -- Microstructure of L-PBF alloys -- Residual stress in laser powder bed fusion -- Non-destructive testing of parts produced by laser powder bed fusion -- Process monitoring of laser powder bed fusion -- Post-processing -- Structural integrity I -- Structural integrity II -- Structural integrity III -- Lattice structures made by laser powder bed fusion -- Bio-inspired design -- Powder characterization--methods, standards, and state of the art -- New materials development -- Recent progress on global standardization -- Industrial applications -- Economic feasibility and cost-benefit analysis -- Current state and future trends in laser powder bed fusion technology -- Case study -- Index.
Sommario/riassunto	Laser powder bed fusion of metals is a technology that makes use of a

laser beam to selectively melt metal powder layer-by-layer in order to fabricate complex geometries in high performance materials. The technology is currently transforming aerospace and biomedical manufacturing and its adoption is widening into other industries as well, including automotive, energy, and traditional manufacturing. With an increase in design freedom brought to bear by additive manufacturing, new opportunities are emerging for designs not possible previously and in material systems that now provide sufficient performance to be qualified in end-use mission-critical applications. After decades of research and development, laser powder bed fusion is now enabling a new era of digitally driven manufacturing. Fundamentals of Laser Powder Bed Fusion of Metals will provide the fundamental principles in a broad range of topics relating to metal laser powder bed fusion. The target audience includes new users, focusing on graduate and undergraduate students; however, this book can also serve as a reference for experienced users as well, including senior researchers and engineers in industry. The current best practices are discussed in detail, as well as the limitations, challenges, and potential research and commercial opportunities moving forward.