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Nota di contenuto	BEAM TECHNOLOGIES FOR INTEGRATED PROCESSING -- Copyright -- ABSTRACT -- PREFACE -- ACKNOWLEDGMENTS -- Contents -- 1 Introduction -- 2 SUMMARY AND RECOMMENDATIONS -- SUMMARY -- Electronic Materials -- Engineered Materials -- Integrated Processing -- RECOMMENDATIONS -- 3 BEAM TECHNOLOGIES -- ATOMIC AND MOLECULAR MATERIAL BEAMS -- Physical Vapor Deposition -- Direct Evaporation Processes -- Direct Reactive Evaporation Processes -- Direct Sputtering Processes -- Reactive Sputtering Processes -- Ion Beam Sputtering Processes -- Molecular Beam Epitaxy -- Chemical Vapor Deposition Processes -- Microwave Electron Cyclotron Resonance Plasmas -- Ion Beams -- Energy Beams -- Laser Beams -- Electron Beams -- X-Ray Lithography -- Microwave Beams -- REFERENCES -- 4 BEAM APPLICATIONS IN MICROELECTRONICS -- BEAM APPLICATIONS IN SEMICONDUCTOR DEVICE MANUFACTURE -- Silicon Integrated Circuits -- Beam Technologies For Materials Deposition -- Beam Technologies For Patterning -- Beam Technologies For Etching -- BEAM TECHNOLOGIES FOR COMPOUND SEMICONDUCTOR ICS -- Beam Technologies For Materials Deposition -- Beam Technologies For Heating -- OPTOELECTRONICS -- REFERENCES -- 5 BEAM APPLICATIONS IN ENGINEERED MATERIALS -- COATINGS -- Diamond, Diamond-Like Carbon, And Cubic Boron Nitride Coatings -- SURFACE MODIFICATION -- APPLICATIONS OF LASERS TO MATERIALS FORMING -- Shaping And Removal -- Desktop Deposition -- Joining -- POWDER PREPARATION -- COMPOSITES FABRICATION -- Fiber And Whisker Preparation -- Metal-Matrix Composites Fabrication -- Ceramic-Matrix Composites Fabrication -- NANOPHASE MATERIALS -- OPTICAL SURFACES AND DEVICES -- POLYMERS -- MATERIALS FOR ENERGY PRODUCTION -- BIOIMPLANT DEVICES -- REFERENCES -- 6 INTEGRATED PROCESSING -- INTEGRATED PROCESSING IN MICROELECTRONICS -- Integrated Processing For Integrated Circuits. Traditional Integrated Circuit Processing Techniques -- Advances Toward Integrated Processing -- Integrated Processing Tools -- Applications For Integrated Processing Tools -- INTEGRATED PROCESSING FOR METALS AND CERAMICS -- Architectural Glass Coatings -- In-Line Dry Coating Process For Stainless Steel Sheet -- Mechanical Fabrication -- REFERENCES -- 7 REQUIREMENTS AND PROBLEMS FOR FURTHER INTEGRATION -- REFERENCE -- APPENDIX A ACRONYMS AND ABBREVIATIONS -- APPENDIX B BIOGRAPHICAL SKETCHES OF COMMITTEE MEMBERS.
Sommario/riassunto	Beam technologies play an important role in microelectronic component fabrication and offer opportunities for application in other manufacturing schemes. Emerging beam technologies that incorporate potential for sensors, control, and information processing have created new opportunities for integrated processing of materials and components. This volume identifies various beam technologies and their applications in electronics and other potential manufacturing processes. Recommendations for research and development to enhance the understanding, capabilities, and applications of beam technologies are presented.