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Classificazione	ST 00
Disciplina	621/.07/11
Soggetti	Mechanical engineering - Study and teaching Mechanical engineering Génie mécanique Génie mécanique - Étude et enseignement mechanical engineering Periodicals.
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Periodico
Note generali	Refereed/Peer-reviewed

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Descrizione fisica	1 online resource (175 p.)
Disciplina	687.162
Soggetti	Materials science
Lingua di pubblicazione	Inglese
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Livello bibliografico	Monografia
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Nota di bibliografia	Includes bibliographical references.
Nota di contenuto	""Front Matter""; ""Preface""; ""Acknowledgment of Reviewers""; ""Contents""; ""Tables, Figures, and Boxes""; ""Acronyms and Abbreviations""; ""Summary""; ""1 Overview""; ""2 Fundamentals of Lightweight Armor Systems""; ""3 Mechanisms of Penetration in Protective Materials""; ""4 Integrated Computational and Experimental Methods for the Design of Protection Materials and Protection Systems: Current Status and Future Opportunities""; ""5 Lightweight Protective Materials: Ceramics, Polymers, and Metals""; ""6 The Path Forward""; ""Appendixes""; ""Appendix A: Background and Statement of Task"" ""Appendix B: Biographical Sketches of Committee Members""""" Appendix C: Committee Meetings""; ""Appendix D: Improving Powder Production""; ""Appendix E: Processing Techniques and Available

Classes of Armor Ceramics""; ""Appendix F: High-Performance Fibers""; ""Appendix G: Failure Mechanisms of Ballistic Fabrics and Concepts for Improvement""; ""Appendix H: Metals as Lightweight Protection Materials""; ""Appendix I: Nondestructive Evaluation for Armor""; ""Appendix J: Fiber-Reinforced Polymer Matrix Composites""

Sommario/riassunto

"Armor plays a significant role in the protection of warriors. During the course of history, the introduction of new materials and improvements in the materials already used to construct armor has led to better protection and a reduction in the weight of the armor. But even with such advances in materials, the weight of the armor required to manage threats of ever-increasing destructive capability presents a huge challenge. Opportunities in Protection Materials Science and Technology for Future Army Applications explores the current theoretical and experimental understanding of the key issues surrounding protection materials, identifies the major challenges and technical gaps for developing the future generation of lightweight protection materials, and recommends a path forward for their development. It examines multiscale shockwave energy transfer mechanisms and experimental approaches for their characterization over short timescales, as well as multiscale modeling techniques to predict mechanisms for dissipating energy. The report also considers exemplary threats and design philosophy for the three key applications of armor systems: (1) personnel protection, including body armor and helmets, (2) vehicle armor, and (3 transparent armor. Opportunities in Protection Materials Science and Technology for Future Army Applications recommends that the Department of Defense (DoD) establish a defense initiative for protection materials by design (PMD), with associated funding lines for basic and applied research. The PMD initiative should include a combination of computational, experimental, and materials testing, characterization, and processing research conducted by government, industry, and academia."--Publisher's description.