Richard W. Hertzberg, Richard P. Vinci, Jason L. Hertzberg

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DESCRIPTION

Deformation and Fracture Mechanics of Engineering Materials provides a combined fracture mechanics-materials approach to the fracture of engineering solids with comprehensive treatment and detailed explanations and references, making it the perfect resource for senior and graduate engineering students, and practicing engineers alike.

The 5th edition includes new end-of-chapter homework problems, examples, illustrations, and a new chapter on products liability and recall addressing the associated social consequences of product failure. The new edition continues to discuss actual failure case histories, and includes new discussion of the fracture behavior and fractography of ceramics, glasses, and composite materials, and a section on natural materials including bone and sea shells.

New co-authors Richard P. Vinci and Jason L. Hertzberg add their talent and expertise to broaden the book's perspective, while maintaining a balance between the continuum mechanics understanding of the failure of solids and the roles of the material's nano- and microstructure as they influence the mechanical properties of materials.
ABOUT THE AUTHOR

Richard W. Hertzberg received his B.S. cum laude in Mechanical Engineering from the City College New York, his M.S. in Metallurgy from M.I.T. and his Ph.D. in Metallurgical Engineering from Lehigh University. A recipient of two Alcoa Foundation Awards of Outstanding Research Achievement, co-recipient of Lehigh University's Award of Outstanding Research, recipient of Lehigh University’s College of Engineering Teaching Excellence Award, and co-recipient of Lehigh University’s award in Recognition of outstanding contributions to the University, Dr. Hertzberg has served as Research Scientist for the United Aircraft Corporation Research Labs, and Visiting Professor at the Federal Institute of Technology, Lausanne, Switzerland. As an active member of several engineering societies, he has been elected as a Fellow of the American Society for Metals and was recipient of the TMS 2000 Educator Award as the most outstanding educator in the nation. He has authored approximately 230 scholarly articles, co-authored Fatigue of Engineering Plastics (Academic Press, 1980), and co-authored the fifth edition of *Deformation and Fracture Mechanics of Engineering Materials*. Dr. Hertzberg has also been an invited lecturer in the United States, Asia, Israel, and Europe, and has served as a consultant to government and industry. He was previously Chair, Materials Science and Engineering Dept. and Director of the Mechanical Behavior Laboratory of the Materials Research Center at Lehigh University. Currently, he is New Jersey Zinc Professor Emeritus of Materials Science and Engineering.

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• Substantially reorganized to improve flow and to more clearly delineate topics related to elasticity, yielding, plastic flow, time dependent deformation, fracture, and fatigue.

• Greater balance and integration among material classes, with increased coverage of glass, ceramics, polymers, composites, nanomaterials, and natural materials including bone and mollusk shells.

• New examples and case histories of actual failures, including shot guns, manatee bones, and the Titanic ship's deficient wrought iron rivets.
• New sections on elastic buckling, adhesion, and ultra high cycle fatigue.

• Expanded discussions of yield criteria, fractography, environmental degradation mechanisms, and environmentally enhanced fatigue crack propagation processes.

• A new chapter discussing product liability and product recall.

• Revised and supplemented appendices containing new specimen configurations and Y calibrations.

• Revised and expanded indices, and a new guide to data tables inside the back cover.

• Over 1500 references cited throughout the text, including more than 300 new sources.

• More than 550 figures, with over 80 new illustrations, hundreds of redrawn plots, and photographs recreated from the original images.

• More than 300 new end-chapter problems now organized by learning goal.

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**FEATURES**

• Combined fracture mechanics-materials approach to the fracture of engineering solids

• Comprehensive treatment, and detailed explanations and references

• Case Studies and Case Histories of real engineering failures

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