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Nota di contenuto	Preface -- Acknowledgments -- Chapter 1. Introduction -- 1.1. Background -- 1.2. When are plastic optics appropriate? -- Chapter 2. Optical plastics -- 2.1. Plastic versus glass maps -- 2.2. Material properties -- 2.3. Material selection -- 2.4. Material specification -- Chapter 3. Manufacturing methods -- 3.1. Casting -- 3.2. Embossing and compression molding -- 3.3. Machining -- 3.4. Injection molding -- Chapter 4. Design guidelines -- 4.1. Design basics -- 4.2. Tolerances -- 4.3. Plastic versus glass -- 4.4. Shape and thickness -- 4.5. Aspheric surfaces -- 4.6. Diffractive surfaces -- 4.7. Athermalization -- 4.8. Coatings -- 4.9. Optomechanical design -- 4.10. Stray light -- 4.11. Special considerations for small and large parts -- 4.12. Drawings -- 4.13. Vendors and vendor interaction Chapter 5. Design examples -- 5.1. Singlet lens -- 5.2. Webcams -- 5.3. Cell phone camera -- 5.4. Infrared multiorder or harmonic diffractive lens -- Chapter 6. Testing -- 6.1. Parameters, equipment, and techniques -- 6.2. Making testing easier -- Chapter 7. Prototyping -- 7.1. Optics -- 7.2. Mechanical parts -- 7.3. Assembly and test -- Chapter 8. Production -- 8.1. Transition to production -- 8.2. Steady-state production -- References -- Index.
Sommario/riassunto	Many items we use in our daily lives-the traffic signals, motion sensors, fingerprint readers, cell phone cameras, bar code scanners, and DVD players-rely upon plastic optical systems to perform. Consequently, there is a growing need for individuals who are knowledgeable in the design, development, and production of such systems. This book provides an overview of the design of plastic optical systems and is structured along the lines of a typical development project. Following a brief background discussion, the advantages and disadvantages of plastic optics are considered. Next, the available materials and their properties are described, as well as the issues of material selection and specification. Various manufacturing methods are reviewed, followed by a chapter on design guidelines, leading into several design examples. Following the examples, the prototyping and testing of a design is covered. Finally, bringing the design to production is discussed. Several groups will benefit from the material presented, including optical engineers, technical managers, and engineers of other disciplines who need to design and develop plastic optical systems but lack the knowledge or training to do so. With the help of this book, readers should understand the benefits and limitations of plastic optical systems and be able to determine if this technology is appropriate for their applications. They will have the basic knowledge to undertake the design of these systems, should they choose to do so themselves, or they will be able to have the appropriate conversations with the individuals or companies they ask to perform the work.