

1. Record Nr.	UNINA9910450404203321
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Titolo	Electronic basis of the strength of materials // John J. Gilman [[electronic resource]]
Pubbl/distr/stampa	Cambridge : , : Cambridge University Press, , 2003
ISBN	1-107-12771-8 0-521-07894-6 1-280-41734-X 9786610417346 1-139-14548-7 0-511-17872-7 0-511-05966-3 0-511-33060-X 0-511-54124-4 0-511-06810-7
Descrizione fisica	1 online resource (x, 280 pages) : digital, PDF file(s)
Disciplina	620.1/12
Soggetti	Strength of materials Electronic structure
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Title from publisher's bibliographic system (viewed on 05 Oct 2015).
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	1. Nature of elastic stiffness -- 2. Generalized stress -- 3. Generalized strain -- 4. Elastic coefficients -- 5. Properties of electrons -- 6. Quantum states -- 7. Periodic patterns of electrons -- 8. Heisenberg's Principle -- 9. Cohesion of atoms -- 10. Intramolecular cohesion -- 11. Intermolecular cohesion -- 12. Bulk modulus -- 13. Shear moduli -- 14. Entropic elasticity (polymers) -- 15. Universality and unification -- 16. Macroscopic plastic deformation -- 17. Microscopic plastic deformation -- 18. Dislocation mobility -- 19. Mechanics of cracks -- 20. Surface and interfacial energies -- 21. Fracturing rates.
Sommario/riassunto	This 2003 book relates the complete set of strength characteristics of constituent atoms to their electronic structures. These relationships require knowledge of both the chemistry and physics of materials. The

book uses both classical and quantum mechanics, since both are needed to describe these properties, and begins with short reviews of each. Following these reviews, the three major branches of the strength of materials are given their own sections. They are: the elastic stiffnesses; the plastic responses; and the nature of fracture. This work will be of great value to academic and industrial research workers in the sciences of metallurgy, ceramics, microelectronics and polymers. It will also serve well as a supplementary text for the teaching of solid mechanics.
