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Autore	Krautkramer Josef
Titolo	Ultrasonic Testing of Materials / / by Josef Krautkrämer, Herbert Krautkrämer
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ISBN	3-662-10680-9
Edizione	[4th ed. 1990.]
Descrizione fisica	1 online resource (xvi, 677 pages) : illustrations
Disciplina	620.11
Soggetti	Materials - Analysis Nuclear physics Nuclear fusion Engineering design Automotive engineering Characterization and Analytical Technique Nuclear Physics Nuclear Fusion Engineering Design Automotive Engineering
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Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	A / Physical Principles of Ultrasonic Testing of Materials -- 1 Ultrasonic Waves in Free Space -- 2 Plane Sound Waves at Boundaries -- 3 Geometrical Acoustics -- 4 Wave Physics of the Sound Field -- 5 Echo from and Shadow of an Obstacle in the Sound Field -- 6 Attenuation of Ultrasonic Waves in Solids -- 7 Piezo-electric Methods of Generation and Reception of Ultrasonic Waves -- 8* Other Methods for Transmitting and Receiving Ultrasound -- B / Methods and Instruments used for the Ultrasonic Testing of Materials -- 9 Historical Survey of Developments -- 10 The Pulse-Echo Method; Design and Performance of a Pulse-Echo Flaw Detector -- 11 Transit-Time Methods -- 12 The Shadow Method -- 13 Imaging, and Methods of Reconstruction -- 14 Sound Emission Analysis (SEA) -- C / General Testing Technique -- 15 Coupling -- 16 Interference Effects of Boundaries. Complex Sound Paths and Screen Patterns -- 17 Testing with Ultrasonic Waves Radiated Obliquely to the Surface -- 18 Interference from External High-Frequency and Ultrasonic Sources -- 19 Detection and Classification of Defects -- 20 Organization of Testing; Staff and Training Problems -- 21 Testing Installations and Evaluation of Test Results -- D / Special Test Problems -- 22 Workpieces for General Mechanical Construction -- 23 Railway Engineering Items -- 24 Plate and Strip -- 25 Semi-finished Products: Rod, Bar, Billet and Wire -- 26 Pipes, Tubes and Cylinders -- 27 Castings -- 28 Welded Joints -- 29 Testing of other Types of Joint and Compound Structures -- 30 Nuclear Power Plants -- 31 Metallic Materials and their Specific Problems for Ultrasonic Testing -- 32 Testing Problems on Non-metallic Specimens -- 33 Ultrasonic Testing by Determination of Material Properties -- 34 Standards -- Appendix. Tables, Formulae and Diagrams -- References -- Supplementary References.
Sommario/riassunto	Nondestructive testing of solid material using ultrasonic waves, for defects such as cavities, nonbonding, and strength variations, is treated in this book from the physical fundamentals of ultrasonics and materials up to the most sophisticated methods. The book is written at a level which should make it accessible to readers with some knowledge of technical mathematics. Physical laws are explained in elementary terms, and more sophisticated treatments are also indicated. After the fundamentals, instrumentation and its application is extensively reported. Tricks and observations from thirty years of experience in the field are included. The third part of the book presents test problems related to special materials or ranges of modern heavy industry, including recent applications such as those in nuclear power plants. This fourth edition features improved presentation of certain fundamental physical facts, updated reports on electronic instrumentation, and new applications in the nuclear and space industries.