1. Record Nr. UNINA9911001467303321

Autore	Li Zhen
Titolo	Microwave Non-Destructive Testing and Evaluation of Fibre-Reinforced Polymer Composites : Principles and Applications / / by Zhen Li
Pubbl/distr/stampa	Singapore : , : Springer Nature Singapore : , : Imprint : Springer, , 2025
ISBN	981-9642-61-2
Edizione	[1st ed. 2025.]
Descrizione fisica	1 online resource (XII, 158 p. 105 illus., 100 illus. in color.)
Disciplina	621.3
Soggetti	Telecommunication Measurement Measuring instruments Materials - Analysis Composite materials Microwaves, RF Engineering and Optical Communications Measurement Science and Instrumentation Materials Characterization Technique Composites Characterization and Analytical Technique
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Fibre-reinforced polymer composites -- Theory and components associated with microwave testing -- Electromagnetic properties of composites -- Reflection methods -- Transmission methods -- Resonant perturbation methods -- Planar-circuit methods -- Focusing methods -- Emerging methods -- Appendix A: MATLAB code for the extraction of S parameters from Keysight FieldFox analyser -- Appendix B: Two-port calibration using the Thru-Reflect-Line (TRL) standard -- Appendix C: MATLAB code for permittivity calculation -- Appendix D: MATLAB code for the interaction with CST software.
Sommario/riassunto	This book provides a detailed exploration of microwave testing, a Non-Destructive Testing (NDT) method fully recognized by the American Society for Non-Destructive Testing (ASNT) within the past decade. Designed with a special focus on carbon fibre- and glass fibre-

reinforced polymer composites, it addresses the needs of industries where these advanced materials are increasingly used, including aerospace, wind energy, electronics, marine, automotive, construction, sports and piping. For NDT practitioners, understanding this new technique is essential. The book offers an in-depth analysis of the electromagnetic properties of composites. In addition, a thorough discussion of the detection principles, advantages and applications of various methods is presented. The methods are not limited to composites and can be readily adapted to other dielectric materials. This handbook is tailored for engineers and researchers specialising in NDT of composites. It also doubles as a reference for graduate students and senior undergraduates studying microwave engineering or composite materials. Elevate your expertise in microwave testing with this essential guide—crafted for professionals, researchers, and educators driving innovation in advanced non-destructive testing and evaluation. Elevate your expertise in microwave testing with this essential guide—crafted for professionals, researchers, and educators driving innovation in advanced non-destructive testing and evaluation.