

1. Record Nr.	UNINA9910480452903321
Autore	Maldague Xavier P.V
Titolo	Nondestructive Evaluation of Materials by Infrared Thermography [[electronic resource] /] / by Xavier P.V. Maldague
Pubbl/distr/stampa	London : , : Springer London : , : Imprint : Springer, , 1993
ISBN	1-4471-1995-9
Edizione	[1st ed. 1993.]
Descrizione fisica	1 online resource (XXXII, 207 p. 21 illus.)
Disciplina	620.1
Soggetti	Mechanics Mechanics, Applied Electronics Microelectronics Materials science Condensed matter Theoretical and Applied Mechanics Electronics and Microelectronics, Instrumentation Characterization and Evaluation of Materials Condensed Matter Physics
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Bibliographic Level Mode of Issuance: Monograph
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	1 Overview of Nondestructive Evaluation (NDE) Using Infrared Thermography -- 1.1 General Considerations -- 1.2 Active and Passive Approaches in TNDE -- 1.3 New Materials -- 1.4 Detectors for Infrared Imaging -- 1.5 TNDE: Pros and Cons -- 2 Theoretical Aspects -- 2.1 Radiometry -- 2.2 Heat Transfer Modelling -- 3 Experimental Apparatus -- 3.1 Description of the System and Intended Use -- 3.2 Acquisition Process: Signal Restoration -- 3.3 System Calibration -- 4 External Thermal Stimulation: Methods and Image Processing -- 4.1 General Considerations -- 4.2 Study of Graphite Epoxy Composites: Procedures, Investigation, Processing -- 4.3 Study of Aluminium Laminates: Procedures, Investigation, Processing -- 4.4 Automatic Defect Detection -- 5 Internal Thermal Stimulation: Methods and Image Processing -- 5.1 General Considerations -- 5.2 Case Study I:

Evaluation of Corrosion Damage to Pipes -- 5.3 Case Study II: Inspection of Jet Turbine Blades -- 6 Quantitative Analysis of Delaminations -- 6.1 General Considerations -- 6.2 The Inverse Problem -- 6.3 Experimental Procedure: Thermogram Processing -- 6.4 Discussion on the Quantitative Characterization Procedure -- 7 Inspection of Materials With Low Emissivity by Thermal Transfer Imaging -- 7.1 General Considerations -- 7.2 Thermal Transfer Imaging -- 7.3 Physical Behaviour of Thermal Transfer Imaging Technique -- 7.4 Experimental Results -- 8 Thermal Diffusivity Measurements of Materials -- 8.1 General Considerations -- 8.2 Classical Thermal Diffusivity Measurement Method -- 8.3 Diffusivity Measurement Method Based on the Laplace Transform -- 8.4 Diffusivity Measurement Method Based on Phase Measurement -- 9 Thermal Tomography -- 9.1 General Considerations -- 9.2 Method -- 9.3 Some Results -- 10 Thermal NDE of Nonplanar Surfaces -- 10.1 General Considerations -- 10.2 Principle of Surface Curvature Correction -- 11 Applications of Infrared Thermography to High Temperatures -- 11.1 Detection of Rolled-in Scale on Steel Sheets -- 11.2 Thermal Inspection of High Temperature Industrial Structures -- Appendix A Computer Model -- Appendix B Smoothing Routine -- Appendix C Parabola Computation -- Appendix D Higher Order Gradient Computation Based on the Roberts Gradient -- References.

Sommario/riassunto

With national trade barriers falling, causing the expansion of the competitive global market, the question of quality control has become an essential issue for the 1990s. The time where the promise was to replace a product if it does not work seems to have passed; what is more important now is not so much a reduction in what is going wrong but an increase of what is going right the first time (Feigenbaum 1990). This new trend is sometimes referred to as total quality. Among the many advantages of this zero-defect manufacturing policy, we can enumerate (Laurin 1990): superior marketability of wholly dependable products, enormous gain in productivity, elimination of wasteful cost in replacing poor quality work and retrofitting rejected products from the field. Although total quality is a relatively new and attractive concept for mass products such as cars, consumer electronics and personal computers, in many fields, mainly aerospace and military, it has been the rule for years because of security reasons.
