ISO/TS 16829:2017-10 (E)

Non-destructive testing - Automated ultrasonic testing - Selection and application of systems

Contents

Page

Foreword v

1 Scope 1

2 Normative references 1

3 Termsanddefinitions 1

4 Basic system description 2
4.1 Systems 2
4.2 System schematic 3
4.3 Levels of automation 5

5 Examination of technical objectives and conditions of the testing 6
5.1 Test task 6
5.2 Other important conditions 6
5.2.1 General 6
5.2.2 Scanning density, test speed, extent and coverage of testing 6
5.2.3 Environment 7
5.2.4 Material properties 7
5.2.5 Complex component geometry 8
5.3 Test data 8
5.4 Reference blocks 8

6 Components and features of an automated test system 8
6.1 General 8
6.2 Test mechanics and positioning systems 9
6.2.1 General 9
6.2.2 Grade of mechanisation/automation required 9
6.2.3 Test object 9
6.2.4 Scale of testing 9
6.2.5 Test speed/speed along the scanning path 10
6.2.6 Precision of positioning 10
6.2.7 Coupling 10
6.2.8 Additional system requirements 10
6.2.9 Health and safety requirements 10
6.3 Coupling techniques 11
6.3.1 General 11
6.3.2 Selection of couplant with regard to the testing environment 11
6.3.3 Selection of couplant with regard to the ultrasonic requirements 11
6.3.4 Liquid couplants 12
6.3.5 Gaseous couplants 12
6.3.6 Solid couplants 12
6.4 Probes 12
6.4.1 General 12
6.4.2 Piezo-electric probes 13
6.4.3 Electro-magnetic ultrasonic probes (EMAT) 17
6.4.4 Laser ultrasonics 18
6.4.5 Special requirements for probes and cable connections 18
6.5 Testing of electronics and signal digitization 20
6.5.1 Transmission and reception system 20

6.5.2 Digitization 20
6.6 Data acquisition, processing and storage 23
6.6.1 General 23
6.6.2 Hardware 23
6.6.3 Software 23
6.6.4 Probe position and orientation 23
6.6.5 Data acquisition and data reduction 23

6.6.6 Data storage 25
6.7 Presentation and evaluation of data 25
6.7.1 Presentation of data 25
6.7.2 Evaluation of data 25
6.8 System check 26

7 Execution of test 26
7.1 System set-up 26
7.2 Performing the test 27
7.3 Management of NDT data 27

Bibliography 28