ISO 16828:2025-07 (E)

Non-destructive testing - Ultrasonic testing - Time-of-flight diffraction technique for detection and sizing of discontinuities

Contents

Page

Foreword v

Introduction vi

1 Scope 1

2 Normative references 1

3 Terms and definitions 1

4 Symbols and units 2

5 General 3
5.1 Principle of the technique 3
5.2 Requirements for surface condition and couplant 5
5.3 Materials and process type 5

6 Qualification of test personnel 5

7 Requirements for test equipment 6
7.1 General 6
7.2 Instrument and display 6
7.3 Probes 8
7.4 Scanning 8

8 TOFD setup procedures 9
8.1 General 9
8.2 Probe selection and probe separation 9
8.2.1 Probe selection 9
8.2.2 Probe separation 10
8.3 Time window setting 10
8.4 Sensitivity setting 10
8.5 Scan increment setting 10
8.6 Setting of scanning speed 11
8.7 Checking of system performance 11

9 Interpretation and analysis of data 11
9.1 Basic analysis of discontinuities 11
9.1.1 General 11
9.1.2 Characterization of discontinuities 12
9.1.3 Estimation of discontinuity position 12
9.1.4 Estimation of discontinuity length 13
9.1.5 Estimation of discontinuity depth and height 13
9.2 Detailed analysis of discontinuities 14
9.2.1 General 14
9.2.2 Additional scans 14
9.2.3 Additional algorithms 15

10 Detection and sizing in complex geometries 16

11 Limitations of the TOFD technique 16

11.1 General 16
11.2 Accuracy and resolution 17
11.2.1 General 17
11.2.2 Inaccuracy in the lateral position 17
11.2.3 Timing inaccuracy 17
11.2.4 Inaccuracy in sound velocity 17
11.2.5 Inaccuracy in probe centre separation 17
11.2.6 Spatial resolution 18
11.3 Obscured zones 18

12 TOFD testing without data recording 19

13 Test procedure 19

14 Test report 19

Annex A (informative) Reference blocks 20

Bibliography 21