ISO 10863:2020-05 (E)

Non-destructive testing of welds - Ultrasonic testing - Use of time-of-flight diffraction technique (TOFD)

Contents

Page

Foreword v

1 Scope 1

2 Normative references 1

3 Terms and definitions 2

4 General remarks on the capabilities of the technique 2

5 Testing levels 3

6 Information required prior to testing 4
6.1 Items to be defined by specification 4
6.2 Specific information required by the operator before testing 4
6.3 Written test instruction or procedure 4

7 Requirements for test personnel and test equipment 5
7.1 Personnel qualifications 5
7.2 Test equipment 5
7.2.1 Ultrasonic instrument 5
7.2.2 Ultrasonic probes 5
7.2.3 Scanning mechanisms 5

8 Preparation for testing 5
8.1 Volume to be tested 5
8.2 Setup of probes 6
8.3 Scan increment setting 7
8.4 Geometry considerations 7
8.5 Preparation of scanning surfaces 7
8.6 Temperature 8
8.7 Couplant 8
8.8 Provision of datum points 8

9 Testing of base material 8

10 Range and sensitivity settings 8
10.1 Settings 8
10.1.1 General 8
10.1.2 Time window 8
10.1.3 Time-to-depth conversion 8
10.1.4 Sensitivity settings 9
10.2 Checking of the settings 9
10.3 Reference blocks 9
10.3.1 General 9
10.3.2 Material 9
10.3.3 Dimensions and shape 10
10.3.4 Reference reflectors 10

11 Weld testing 10

12 Interpretation and analysis of TOFD images 11
12.1 General 11
12.2 Assessing the quality of the TOFD image 11
12.3 Identification of relevant TOFD indications 11
12.4 Classification of relevant TOFD indications 11
12.4.1 General 11
12.4.2 TOFD indications from surface-breaking discontinuities 12
12.4.3 TOFD indications from embedded discontinuities 12
12.4.4 Unclassified TOFD indications 13
12.5 Determination of location 13
12.6 Definition and determination of length and height 13

12.6.1 General 13
12.6.2 Determination of length 14
12.6.3 Determination of height 16
12.7 Evaluation against acceptance criteria 17

13 Test report 17

Annex A (informative) Reference blocks 19

Annex B (informative) Examples of TOFD scans 24

Bibliography 37