

ISO 16828:2012-04 (E)

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

Contents		Page
Introduction		vi
1	Scope	1
2	Normative references	1
3	Terms, definitions, symbols and abbreviations	2
3.1	Terms and definitions	2
3.2	Abbreviations	2
3.3	Symbols	2
4	General	3
4.1	Principle of the technique	3
4.2	Requirements for surface condition and couplant	5
4.3	Materials and process type	5
5	Qualification of personnel	5
6	Equipment requirements	5
6.1	Ultrasonic equipment and display	5
6.2	Ultrasonic probes	6
6.3	Scanning mechanisms	7
7	Equipment set-up procedures	7
7.1	General	7
7.2	Probe choice and probe separation	8
7.2.1	Probe selection	8
7.2.2	Probe separation	9
7.3	Time window setting	9
7.4	Sensitivity setting	9
7.5	Scan resolution setting	10
7.6	Setting of scanning speed	10
7.7	Checking system performance	10
8	Interpretation and analysis of data	10
8.1	Basic analysis of discontinuities	10
8.1.1	General	10
8.1.2	Characterisation of discontinuities	10
8.1.3	Estimation of discontinuity position	11
8.1.4	Estimation of discontinuity length	11
8.1.5	Estimation of discontinuity depth and height	12
8.2	Detailed analysis of discontinuities	12
8.2.1	General	12
8.2.2	Additional scans	13
8.2.3	Additional algorithms	14
9	Detection and sizing in complex geometries	14
10	Limitations of the technique	14
10.1	General	14
10.2	Accuracy and resolution	15

10.2.1	General	15
10.2.2	Errors in the lateral position	15
10.2.3	Timing errors	15
10.2.4	Errors in sound velocity	15
10.2.5	Errors in probe centre separation	15
10.2.6	Spatial resolution	16
10.3	Dead zones	16
Foreword		v
11	TOFD examination without data recording	16
12	Test procedure	17
13	Test report	17
Annex A (normative) Reference blocks		18
Bibliography		19