DIN EN 13445-8:2012-12 (E)

Unfired pressure vessels - Part 8: Additional requirements for pressure vessels of aluminium and aluminium alloys

Contents

Page

1 Scope 5

2 Normative references 5

3 Terms, definitions, symbols and units 6

4 General requirements 6

5 Materials 6
5.1 General 6
5.2 Elongation after fracture 6
5.3 Prevention of brittle fracture 6
5.4 Lamellar tearing 7
5.5 Chemical composition 7
5.6 Material grouping system 7

6 Design 8
6.1 General 8
6.2 Design temperature and properties 8
6.3 Time-independent nominal design stress 8
6.4 Thick walled, small bore piping for shells 8
6.5 Fatigue design 9
6.6 Lapped joints, joggle joints, permanent backing strips 9
6.6.1 General 9
6.6.2 Lapped joints 9
6.6.3 Joggle joints 9
6.6.4 Joints with permanent backing strips 10

7 Manufacture 10
7.1 General 10
7.2 Materials 10
7.3 Welding procedure specification (WPS) 10
7.4 Qualification of welding procedure specifications (WPQR) 10
7.5 Qualification of welders and welding operators 11
7.6 Joint preparation 11
7.7 Preheat 11
7.8 Production test, reference criteria 11
7.9 Extent of testing 11
7.10 Performance of test and acceptance criteria 12
7.11 Forming procedures 12
7.12 Heat treatment after forming 12
7.13 Sampling of formed products 14
7.14 Tests 14
7.14.1 Base material 14
7.14.2 Butt welds 15
7.15 Post weld heat treatment (PWHT) 15

8 Inspection and testing 15
8.1 General 15
8.2 Non-destructive testing of welded joints 15
8.2.1 General 15

8.2.2 Demonstration of satisfactory experience for testing group 2 16
8.2.3 Symbols 17
8.3 Determination of extent of non destructive testing 17
8.4 Applicable non destructive testing techniques 20
8.4.1 NDT methods 20
8.4.2 Acceptance criteria for radiographic testing (RT) 21
8.4.3 Acceptance criteria for visual and surface penetrant testing 21

Issue 4 (2012-07) 8.4.4 Acceptance criteria for penetrant testing (PT) 22
8.5 Selection of non-destructive testing methods for internal imperfections 22
8.6 Standard hydrostatic test 23
8.7 Pneumatic testing 23

9 Inspection and testing of serially produced pressure vessels -- Model approval 23
9.1 General 23
9.2 Inspection and testing of pressure vessels subject to cyclic loads 23

Y.2 List of corrected pages of Issue 2 (2010-07) 24
Y.3 List of corrected pages of Issue 3 (2011-07) 24
Y.1 List of corrected pages of Issue 4 (2012-07) 24

Annex ZA (informative) Relationship between this European Standard and the Essential Requirements of the EU Pressure Equipment Directive 97/23/EC 25

Bibliography 26