ISO 3845:2024-05 (E)

Oil and gas industries including lower carbon energy - Full ring ovalization test method for the evaluation of the cracking resistance of steel line pipe in sour service

Contents

Page

Foreword v

Introduction vi

1 Scope 1

2 Normative references 1

3 Termsanddefinitions 2

4 Symbols and abbreviated terms 6

5 Principle 6

6 Reagents 7

7 Apparatus 8
7.1 Containment materials 8
7.1.1 General 8
7.1.2 Lid and base 8
7.1.3 Seal rings 8
7.2 Internal loading components 8
7.3 External loading components 10
7.4 Loading component treatment 11
7.5 Ancillary components 11

8 Sampling 12
8.1 General 12
8.2 Ultrasonic testing 12
8.3 Magnetic particle testing/penetrant testing 12

9 Procedure 12
9.1 General 12
9.2 Test specimen 12
9.2.1 Machining/Preparation 12
9.2.2 Surface preparation 13
9.2.3 Specimen loading 13
9.3 Preparation of the test cell 17
9.4 Test duration and solution parameters 17
9.5 Test commencement 18
9.6 Monitoring 18
9.6.1 Test solution 18
9.6.2 Ultrasonic testing 19
9.6.3 Hydrogen permeation 19
9.6.4 Galvanic coupling 19
9.7 Test completion 19
9.8 Secondary testing 19
9.9 Evaluation of test specimen 19
9.9.1 General 19
9.9.2 Post-test non-destructive testing 20
9.9.3 Metallographic examination 20

10 Test report 22

Annex A (normative) Ultrasonic testing (UT) 24

Annex B (normative) Strain gauge installation 29

Annex C (normative) Analysis of test solution - Iodometric titration procedure 37

Annex D (informative) Summary of the full ring test procedure 40

Annex E (informative) Examples of types of cracking 46

Annex F (informative) Example of full ring test report and loading report 48

Annex G (informative) Guidance on acceptance criteria 51

Bibliography 52