

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 | Terms and definitions | 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 |