ISO 18797-2:2021-09 (E)

Petroleum, petrochemical and natural gas industries - External corrosion protection of risers by coatings and linings - Part 2: Maintenance and field repair coatings for riser pipes

Contents

Page

Foreword vi

Introduction vii

1 Scope 1

2 Normative references 1

3 Terms and definitions 4

4 Symbols and abbreviated terms 7
4.1 Symbols 7
4.2 Abbreviated terms 7

5 Coating types 7

6 General requirements 8
6.1 Client's requirements 8
6.1.1 Approval of repair coating and repair method 8
6.1.2 Specification of purchase order mandatory information 8
6.1.3 Specification of purchase order additional information 9
6.2 Contractor's requirements 9
6.2.1 Documented information 9
6.2.2 Marking of coating materials 10
6.3 Rounding 10
6.4 Conformity to requirements 10
6.5 Criteria for the condition assessment of an existing coating 10
6.5.1 General - Evaluation of coating condition 10
6.5.2 Applicable inspection techniques 11

7 Qualification processes and application procedures 11
7.1 General 11
7.2 APS and ITP 12
7.2.1 General 12
7.2.2 APS 12
7.2.3 ITP 13
7.3 Technical assessment of coating conformity 13
7.4 Procedure qualification trial 13
7.5 Pre-production trial 14
7.6 Production, testing and inspection 15
7.6.1 General 15
7.6.2 Inspection documents and traceability 15

8 Selection criteria for repair coatings 15
8.1 General 15
8.2 Application constraints 16
8.2.1 Wet substrates 16
8.2.2 Contamination by soluble salts 17
8.2.3 Dust contamination 17

8.2.4 Contamination by oil, grease and other petroleum-like products 17
8.2.5 Compatibility with existing coating 17
8.2.6 Feasibility of surface cleaning 18
8.2.7 Space and riser access constraints 18
8.2.8 Time constraints 18
8.2.9 Temperatures and relative humidity 18
8.2.10 Coating continuity 18
8.3 Operational conditions 19
8.3.1 Resistance to ageing, weathering and water 19
8.3.2 Resistance to mechanical loads 19
8.3.3 Interaction with cathodic protection 19

9 Test programs 19

9.1 Substrate conditions used for tests 19
9.2 Inspections, tests and frequencies 19
9.3 Thickness testing 20
9.4 Retest 20

10 Non-crystalline low-viscosity polyolefin-based coatings 21
10.1 Coating identification 21
10.2 Description of the coatings 21
10.3 Surface preparation 22
10.4 Application of coatings 22
10.4.1 General 22
10.4.2 Overlap 22
10.5 Testing of coatings 22
10.5.1 General 22
10.5.2 Thickness 22
10.5.3 Glass transition temperature and crystallization temperature 23
10.5.4 Holiday detection 23
10.5.5 Drip resistance 23
10.5.6 Adhesion to pipe surface and existing coating 23
10.5.7 Lap shear resistance 24
10.5.8 Specific electrical insulation resistance 24
10.5.9 Impact resistance 24
10.5.10 Indentation resistance 24
10.5.11 Cathodic disbondment resistance 25
10.5.12 Resistance to ageing and weathering 25
10.5.13 Peel strength between layers of outer wrap 25
10.5.14 Thermal ageing resistance 26
10.5.15 Hot-water immersion test 26

11 Petrolatum and wax-based tape wrap systems 31
11.1 Coating identification 31
11.2 Description of the tape wrap systems 32
11.2.1 Petrolatum tape wrap systems (type 11A) 32
11.2.2 Wax-based tape wrap systems (type 11B) 32
11.3 Surface preparation 32
11.4 Application of coating systems 32
11.4.1 General 32
11.4.2 Overlap 32
11.5 Testing of the coating systems 33
11.5.1 General 33
11.5.2 Density 33
11.5.3 Dielectric strength 33
11.5.4 Thickness 33
11.5.5 Holiday detection 34
11.5.6 Impact resistance 34
11.5.7 Specific electrical insulation resistance 34
11.5.8 Cathodic disbondment resistance 34
11.5.9 Adhesion to pipe surface and existing coating 34

11.5.10 Drip resistance 35
11.5.11 Hot water immersion test 35
11.5.12 Resistance to ageing and weathering 35

12 Polychloroprene-based elastomeric coatings 41
12.1 Coating identification 41
12.2 Description of the coatings 41
12.3 Surface preparation 41
12.4 Application of the coating 41
12.4.1 General 41
12.4.2 Overlap 42
12.5 Testing of the coatings 42
12.5.1 General 42
12.5.2 Visual appearance 42
12.5.3 Thickness 42
12.5.4 Holiday detection 42
12.5.5 Hardness 42
12.5.6 Adhesion to pipe surface and existing coating 42
12.5.7 Cathodic disbondment resistance 43
12.5.8 Density 43
12.5.9 Rheometer curve 43
12.5.10 Tensile strength 43
12.5.11 Elongation at break 43
12.5.12 Tear strength 43
12.5.13 Electrical volume resistivity 43
12.5.14 Ozone resistance 43
12.5.15 Resistance to seawater 44
12.5.16 Hot-water immersion test 44
12.5.17 Thermal ageing resistance 44
12.5.18 Resistance to ageing and weathering 44

13 Liquid-applied epoxy coatings 46
13.1 Coating identification 46
13.2 Description of the liquid-applied epoxy coating 47
13.3 Surface preparation 47
13.4 Application of the coatings 47
13.4.1 General 47
13.4.2 Overlap 47
13.5 Testing of the coatings 47
13.5.1 General 47
13.5.2 Dry-film thickness 48
13.5.3 Holiday detection 48
13.5.4 Hardness 48
13.5.5 Impact resistance 48
13.5.6 Indentation resistance 48
13.5.7 Specific electrical insulation resistance 48
13.5.8 Cathodic disbondment resistance 49
13.5.9 Adhesion to pipe surface and existing coating 49
13.5.10 Thermal ageing resistance 49
13.5.11 Hot-water immersion test 49
13.5.12 Resistance to ageing and weathering 49

Annex A (informative) Likelihood of exposure in splash zone area 54

Annex B (informative) Tests for coatings applied on wet substrates 56

Bibliography 65