

ISO 21809-3:2008-12 (E)

Petroleum and natural gas industries - External coatings for buried or submerged pipelines used in pipeline transportation systems - Part 3: Field joint coatings

| Contents | | Page |
|--------------------|--|-------------|
| Foreword | | vi |
| Introduction | | vii |
| 1 | Scope | 1 |
| 2 | Normative references | 1 |
| 3 | Terms and definitions | 4 |
| 4 | Symbols and abbreviated terms | 6 |
| 4.1 | Symbols | 6 |
| 4.2 | Abbreviated terms | 7 |
| 5 | General requirements | 7 |
| 5.1 | Rounding | 7 |
| 5.2 | Compliance to standard | 7 |
| 6 | Information to be supplied by the purchaser | 8 |
| 6.1 | General information | 8 |
| 6.2 | Additional information | 8 |
| 7 | Application procedures and qualification | 9 |
| 7.1 | Application procedure specification (APS) | 9 |
| 7.2 | Coating materials | 9 |
| 7.3 | Procedure qualification trial (PQT) | 10 |
| 7.4 | Pre-production trial (PPT) | 11 |
| 7.5 | Qualification of coating and inspection personnel | 11 |
| 7.6 | Production testing and inspection | 11 |
| 7.7 | Certificates of compliance and traceability | 12 |
| 8 | Classification of field joint coatings | 12 |
| 9 | General requirements for surface preparation, coating application, testing and repair | 13 |
| 9.1 | Surface preparation | 13 |
| 9.2 | Application of the coating | 14 |
| 9.3 | Visual inspection of the applied coating | 14 |
| 9.4 | Testing of the field joint coating | 14 |
| 9.5 | Repairs | 15 |
| 9.6 | Verification and storage of coating materials | 15 |
| 10 | Bituminous, petrolatum, wax and polymeric tape coatings | 15 |
| 10.1 | Coating identification | 15 |
| 10.2 | Description of the coatings | 15 |
| 10.3 | Surface preparation | 15 |
| 10.4 | Coating application | 16 |
| 10.5 | Testing of the applied coatings | 17 |
| 11 | Heat-shrinkable coatings | 25 |
| 11.1 | Coating identification | 25 |
| 11.2 | Description of the coatings | 25 |
| 11.3 | Surface preparation | 26 |

| | | |
|---|---|----|
| 11.4 | Application of the coatings | 26 |
| 11.5 | Testing of the applied coatings | 27 |
| 12 | Fusion-bonded epoxy (FBE) powder coatings | 31 |
| 12.1 | Coating identification | 31 |
| 12.2 | Description of the coatings | 32 |
| 12.3 | Surface preparation | 32 |
| 12.4 | Application of the coatings | 32 |
| 12.5 | Testing of the applied coatings | 33 |
| 13 | Liquid coatings | 35 |
| 13.1 | Coating identification | 35 |
| 13.2 | Description of the coatings | 35 |
| 13.3 | Surface preparation | 35 |
| 13.4 | Application of the coatings | 36 |
| 13.5 | Testing of the applied coatings | 36 |
| 14 | Polyolefin-based coatings | 41 |
| 14.1 | Coating identification | 41 |
| 14.2 | Description of the coatings | 41 |
| 14.3 | Surface preparation | 42 |
| 14.4 | Application of the coating | 43 |
| 14.5 | Testing of the applied coatings | 44 |
| 15 | Thermal spray aluminium (TSA) coatings | 49 |
| 15.1 | Coating identification | 49 |
| 15.2 | Description of the coating | 49 |
| 15.3 | Qualification | 49 |
| 15.4 | Surface preparation | 49 |
| 15.5 | Application of the coating | 49 |
| 15.6 | Testing of the applied coating | 50 |
| 16 | Hot-applied microcrystalline wax coatings | 51 |
| 16.1 | Coating identification | 51 |
| 16.2 | Description of the coating | 52 |
| 16.3 | Surface preparation | 52 |
| 16.4 | Application of the coating | 52 |
| 16.5 | Testing of the applied coatings | 53 |
| 17 | Elastomeric coatings | 54 |
| 17.1 | Coating identification | 54 |
| 17.2 | Description of the coatings | 55 |
| 17.3 | Surface preparation | 55 |
| 17.4 | Application of the coatings | 55 |
| 17.5 | Testing of the applied coatings | 56 |
| Annex A (normative) Inspection of thickness | | 60 |
| Annex B (normative) Holiday detection test | | 61 |
| Annex C (normative) Adhesion test -- Resistance to removal | | 62 |
| Annex D (normative) Peel-strength test | | 64 |
| Annex E (normative) Thermal analysis of epoxy powder and cured coating film (FBE) | | 68 |
| Annex F (normative) Cathodic disbondment test | | 72 |
| Annex G (normative) Impact test | | 78 |
| Annex H (normative) Indentation test | | 80 |
| Annex I (normative) Hot-water immersion test | | 82 |
| Annex J (normative) Drip resistance of petrolatum and wax tapes | | 84 |
| Annex K (normative) Specific electrical insulation resistance | | 85 |

| | |
|--|-----------|
| Annex L (normative) Lap shear strength | 87 |
| Annex M (normative) Peel strength between layers | 89 |
| Annex N (normative) Thermal ageing resistance | 92 |
| Annex O (normative) Test programmes for procedure for qualification trials, pre-production trials or production testing | 96 |
| Bibliography | 99 |