

E DIN EN ISO 21809-3:2025-09 (E)

Erscheinungsdatum: 2025-08-22

Oil and gas industries including lower carbon energy - External coatings for buried or submerged pipelines used in pipeline transportation systems - Part 3: Field joint coatings (ISO/DIS 21809-3:2025); English version prEN ISO 21809-3:2025

Contents

Page

Foreword.....	vii
Introduction.....	viii
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.....	8
5 General requirements.....	9
5.1 Responsibility of the end user.....	9
5.2 Rounding.....	9
5.3 Compliance, testing and quality.....	9
6 Information to be supplied.....	9
6.1 General.....	9
6.2 Information to be supplied by the purchaser to the applicator.....	9
6.3 Information to be supplied by the applicator to the purchaser.....	10
7 Classification of field joint coatings.....	11
8 Qualification processes.....	12
8.1 Qualification of a coating system.....	12
8.1.1 Coating Qualification (CQ), originated by the manufacturer.....	13
8.1.2 Procedure Qualification Trial (PQT), originated by the applicator.....	14
8.1.3 Coating System Qualification (CSQ), originated by the applicator.....	15
8.1.4 Pre-Production Trial (PPT), originated by the applicator.....	15
8.1.5 Inspection and testing during production.....	16
8.2 Coating application documents.....	16
8.2.1 Application procedure specification (APS).....	16
8.2.2 Inspection and Test Plan (ITP).....	19
8.2.3 Inspection and Test Plan (ITP).....	20
8.2.4 Inspection documents, traceability and verification.....	20
8.3 Qualification of coating operatives and inspection personnel.....	21
8.3.1 General.....	21
8.3.2 Qualification of coating operatives.....	21
8.3.3 Documentary evidence of applicator's coating operatives' qualification.....	22
8.3.4 Requalification.....	23
9 Surface preparation.....	23
9.1 General.....	23
9.2 Preparation of the steel substrate.....	23
9.2.1 General.....	23
9.2.2 Abrasive blast-cleaning.....	24
9.2.3 Wire-brush cleaning.....	24
9.2.4 Other cleaning methods.....	25
9.3 Preparation of the adjacent plant-applied coating.....	25

10	Hot-applied bituminous tape coatings	27
	10.1 Coating identification.....	27
	10.2 Description of the coatings.....	27
	10.3 Surface preparation.....	27
	10.4 Coating application.....	28
	10.5 Testing of the applied coatings.....	28
	10.5.1 General.....	28
11	Petrolatum and wax-based tape coatings	30
	11.1 Coating identification.....	30
	11.2 Description of the coatings.....	30
	11.2.1 Petrolatum tapes (Type 11A).....	30
	11.2.2 Wax-based tapes (Type 11B).....	30
	11.3 Surface preparation.....	30
	11.4 Coating application.....	31
	11.4.1 Application of the primer.....	31
	11.4.2 Application of petrolatum or wax-based tapes.....	31
	11.5 Testing of the applied coatings.....	31
	11.5.1 General.....	31
12	Cold-applied polymeric tape coatings	35
	12.1 Coating identification.....	35
	12.2 Description of the coatings.....	35
	12.2.1 Cold-applied tape coatings with a polymeric continuous backing (Type 12A).....	35
	12.2.2 Cold-applied tape coatings with a polymeric mesh backing (Type 12B).....	35
	12.3 Surface preparation.....	35
	12.4 Coating application.....	35
	12.5 Testing of the applied coatings.....	36
	12.5.1 General.....	36
13	Non-crystalline low-viscosity polyolefin-based coatings	40
	13.1 Coating identification.....	40
	13.2 Description of the coatings.....	40
	13.3 Surface preparation.....	40
	13.4 Coating application.....	40
	13.5 Testing of the applied coatings.....	41
	13.5.1 General.....	41
	13.5.2 Pre-application check of compound containing reinforcement.....	41
14	Coatings based on heat-shrinkable materials	47
	14.1 Coating identification.....	47
	14.2 Description of the coatings.....	47
	14.2.1 General.....	47
	14.2.2 Type 14A.....	47
	14.3 Surface preparation.....	48
	14.4 Coating application.....	48
	14.5 Testing of the applied coatings.....	48
	14.5.1 General.....	48
15	Hot-applied microcrystalline wax coatings	56
	15.1 Coating identification.....	56
	15.2 Description of the coatings.....	56
	15.3 Surface preparation.....	56
	15.4 Coating application.....	56
	15.5 Testing of the applied coatings.....	56
	15.5.1 General.....	56
16	Elastomeric coatings	58
	16.1 Coating identification.....	58
	16.2 Description of the coatings.....	58

16.3	Surface preparation.....	58
16.4	Coating application.....	58
	16.4.1 General.....	58
	16.4.2 In situ vulcanization method.....	58
16.5	Testing of the applied coatings.....	59
	16.5.1 General.....	59
	16.5.2 Rheometer curve — Oscillating disc.....	63
	16.5.3 Electrical volume resistivity.....	63
17	Fusion-bonded epoxy (FBE) powder coatings.....	63
17.1	Coating identification.....	63
17.2	Description of the coatings.....	63
17.3	Surface preparation.....	63
17.4	Coating application.....	63
	17.4.1 General.....	63
	17.4.2 Transport and storage of epoxy powder.....	64
	17.4.3 Heating.....	64
	17.4.4 Application of epoxy powder.....	64
17.5	Testing of the applied coatings.....	64
	17.5.1 General.....	64
	17.5.2 Thickness.....	67
18	Liquid-applied coatings.....	67
18.1	Coating identification.....	67
18.2	Description of the coatings.....	67
	18.2.1 Liquid epoxy — 18A.....	67
	18.2.2 Liquid polyurethane — 18B.....	67
	18.2.3 Fibre reinforced epoxy — 18C.....	67
	18.2.4 Fibre reinforced vinylester — 18D.....	67
	18.2.5 Fibre reinforced polyurethane — 18E.....	67
	18.2.6 Polyolefin enclosure with polyurethane filling — 18F.....	68
18.3	Surface preparation.....	68
18.4	Coating application.....	68
	18.4.1 General.....	68
	18.4.2 Heating.....	68
	18.4.3 Liquide coating application.....	68
	18.4.4 General guideline.....	68
18.5	Testing of the applied coatings.....	69
	18.5.1 General.....	69
19	Hot-applied polyolefin-based and polyurethane coatings.....	73
19.1	Coating identification.....	73
19.2	Description of the coatings.....	73
	19.2.1 Coatings based on flame-sprayed polypropylene powder applied over an epoxy layer— Type 19A.....	73
	19.2.2 Coatings based on polypropylene tapes/sheets / extruded hot-applied over an epoxy layer— Type 19B.....	73
	19.2.3 Coatings based on injection-moulded polypropylene over an epoxy layer— Type 19C.....	73
	19.2.4 Coatings based on flame-sprayed polyethylene powder applied over an epoxy layer — Type 19D.....	73
	19.2.5 Coatings based on polyethylene tapes/sheets / extruded hot-applied over an epoxy layer — Type 19E.....	74
	19.2.6 Coatings based on injection-moulded polyethylene over an epoxy layer — Type 19F.....	74
	19.2.7 Coatings based on injection-moulded polyurethane over an epoxy or a polyurethane primer layer — Type 19G.....	74
19.3	Surface preparation.....	74
19.4	Coating application.....	74
	19.4.1 General.....	74

19.4.2	Preparation of the plant applied coating	74
19.4.3	Heating	75
19.4.4	Application of the primer	75
19.4.5	Application of the chemically modified PP or PE	75
19.4.6	Application of the top coat	75
19.5	Testing of the applied coatings	76
19.5.1	General	76
20	Thermal spray aluminium (TSA) coatings	83
20.1	Coating identification	83
20.2	Description of the coatings	83
20.3	Surface preparation	83
20.4	Coating application	83
20.4.1	General	83
20.4.2	Aluminium	83
20.4.3	Sealer	83
20.5	Testing of the applied coatings	84
20.5.1	General	84
Annex A	(informative) Reporting of results	86
Annex B	(informative) Inspection of thickness	90
Annex C	(informative) Holiday detection test	92
Annex D	(informative) Impact test	94
Annex E	(informative) Indentation test	101
Annex F	(informative) Specific electrical insulation resistance test	104
Annex G	(informative) Cathodic disbondment test	114
Annex H	(informative) Adhesion test (peel, lift and pull off)	128
Annex I	(informative) Hot water immersion (exposure) test	139
Annex J	(informative) Lap shear test	142
Annex K	(informative) Drip resistance test	145
Annex L	(informative) Peel strength between layers	146
Annex M	(informative) Thermal ageing resistance	149
Annex N	(informative) Coating porosity test	154
Annex O	(informative) Bursting strength of reinforced backing	157
Annex P	(informative) Thermal analysis of epoxy powder and cured coating film (FBE)	158
Annex Q	(informative) Adhesion test (X cut) — Resistance to removal	165
Annex R	(informative) Coating flexibility test	167