

ISO 21809-1:2018 (E)

Petroleum and natural gas industries — External coatings for buried or submerged pipelines used in pipeline transportation systems — Part 1: Polyolefin coatings (3-layer PE and 3-layer PP)

Contents

	Foreword
	Introduction
1	Scope
2	Normative references
3	Terms and definitions
4	Conformance
4.1	Rounding
4.2	Compliance with this document
5	Symbols and abbreviated terms
5.1	Symbols
5.2	Abbreviations
6	Information supplied by the purchaser
6.1	General information
6.2	Additional information
7	Coating classification
7.1	General
7.2	Coating classes
7.3	Coating thickness classes
8	Qualification processes
8.1	General — Qualification scheme
8.2	Application procedure specification
8.3	Pre-production trial (PPT)
8.4	Inspection and testing plan (ITP)
8.5	Procedure qualification trial (PQT)
9	Coating material qualification
9.1	Composition of the coating system
9.2	Qualification of the coating materials
9.2.1	General requirements
9.2.2	Epoxy material
9.2.3	Adhesive material
9.2.4	PE/PP top layer material
9.3	Batch certificate
9.4	Storage and handling of coating materials
10	Coating system qualification
11	Application of the coating system
11.1	General
11.2	Surface preparation
11.2.1	Initial preparation
11.2.2	Abrasive blast cleaning — Cleanliness and surface roughness
11.2.3	Surface dust contamination

- 11.2.4 Surface pre-treatment and salt contamination
- 11.3 Coating application
 - 11.3.1 General
 - 11.3.2 Epoxy application
 - 11.3.3 Adhesive application
 - 11.3.4 PE/PP application
 - 11.3.5 Rough coat application
- 11.4 Cutback
- 12 Inspection and testing
 - 12.1 General
 - 12.2 Re-testing
- 13 Coating repairs
- 14 Marking
 - 14.1 General
 - 14.2 Required markings
- 15 Handling and storage in the applicator's facilities
 - 15.1 Handling
 - 15.2 Storage
- 16 Test reports and certificate of compliance
- Annex A (normative) Inspection of thickness
 - A.1 General
 - A.2 Equipment
 - A.3 Procedure
 - A.4 Results and test reports
- Annex B (normative) Holiday detection test
 - B.1 General
 - B.2 Equipment
 - B.3 Procedure
 - B.4 Results and test reports
- Annex C (normative) Peel strength test
 - C.1 General
 - C.2 Equipment
 - C.3 Procedure
 - C.3.1 General
 - C.3.2 Small-diameter pipes
 - C.3.3 Large-diameter pipes
 - C.4 Results and test reports
- Annex D (normative) Thermal analysis of epoxy and cured epoxy coating film with $T_g \leq 115^\circ\text{C}$
 - D.1 General
 - D.2 Equipment
 - D.3 Procedure and measurement for epoxy
 - D.3.1 Procedure
 - D.3.2 Measurement
 - D.4 Evaluation of results
 - D.4.1 Glass transition temperature
 - D.4.2 Heat of reaction of the epoxy
 - D.5 Procedures and measurement for coating sample
 - D.5.1 Sample preparation
 - D.5.1.1 Two-component epoxy liquid
 - D.5.1.2 One-component epoxy liquid
 - D.5.1.3 Epoxy powder
 - D.5.2 Measurement
 - D.5.3 Evaluation of results
 - D.5.3.1 Glass transition temperature
 - D.5.3.2 Residual heat of reaction of cured coating

D.6	Results and test report
Annex E	(normative) Impact test
E.1	General
E.2	Equipment
E.3	Procedure
E.4	Results and test reports
Annex F	(normative) Indentation test
F.1	General
F.2	Equipment
F.3	Procedure
F.4	Results and test reports
Annex G	(normative) UV ageing test and thermal ageing test
G.1	UV ageing
G.1.1	General
G.1.2	Equipment
G.1.3	Sampling
G.1.4	Procedure
G.1.5	Results and test report
G.2	Thermal ageing
G.2.1	General
G.2.2	Equipment
G.2.3	Sampling
G.2.4	Procedure
G.2.5	Results and test report
Annex H	(normative) Cathodic disbondment test
H.1	General
H.2	Equipment
H.3	Test specimens
H.4	Procedure
H.5	Results and test report
Annex I	(normative) Flexibility test
I.1	General
I.2	Equipment
I.3	Test specimen
I.4	Procedure
I.5	Result and test report
Annex J	(normative) Gel time of the epoxy powder
J.1	General
J.2	Equipment
J.3	Procedure
J.4	Results and test reports
Annex K	(normative) Total volatile/moisture content of the epoxy powder — Mass loss
K.1	General
K.2	Procedure A — Manual method
K.2.1	Equipment
K.2.2	Procedure
K.3	Procedure B — Automatic procedure
K.4	Results and test reports
Annex L	(normative) Hot water immersion test
L.1	General
L.2	Equipment
L.3	Sample preparation
L.4	Test procedure
L.5	Results and test reports
Annex M	(normative) Density of epoxy powder

M.1	General
M.2	Procedure A — Manual procedure
M.2.1	Equipment
M.2.2	Procedure
M.3	Procedure B — Automatic procedure
M.4	Results and test reports

Page count: 62