# ISO 21809-5:2010-04 (E)

## Petroleum and natural gas industries - External coatings for buried or submerged pipelines used in pipeline transportation systems - Part 5 : External concrete coatings

## Contents

Page


Foreword ..... v

Introduction ..... vi

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 General requirements ..... 7
5.1 Rounding ..... 7

6 Information supplied by the purchaser ..... 7
6.1 General information ..... 7
6.2 Additional information ..... 8

7 Materials ..... 8
7.1 Pipe ..... 8
7.2 Cement ..... 9
7.3 Supplementary cementitious materials ..... 9
7.4 Aggregate -- Fine and coarse ..... 10
7.5 Heavyweight aggregate ..... 10
7.6 Lightweight aggregate ..... 11
7.7 Recycled concrete as aggregate ..... 11
7.8 Water ..... 11
7.9 Steel reinforcement ..... 12
7.10 Concrete admixtures ..... 12
7.11 Reclaimed concrete ..... 12

8 Concrete mix ..... 12

9 Coating application ..... 13
9.1 Qualification ..... 13
9.2 Application of concrete coating ..... 15
9.3 Environmental conditions ..... 15
9.4 Pipe ..... 15
9.5 Steel reinforcement ..... 15
9.6 Concrete cutback ..... 17
9.7 Anode installation ..... 17

10 Curing methods ..... 17

11 Inspection and testing ..... 17
11.1 General ..... 17

11.2 Test procedures ..... 19
11.3 Retesting ..... 21
11.4 Test results ..... 22

12 Repair of concrete coated pipe ..... 22
12.1 General ..... 22
12.2 Damaged areas ..... 23
12.3 Cracks ..... 23
12.4 Gaps ..... 23
12.5 Stripping ..... 23

13 Markings ..... 23

14 Handling and storage ..... 23

15 Test reports and certificate of compliance ..... 24

Annex A (normative) Water absorption test ..... 25

Annex B (normative) Shear resistance test ..... 28

Bibliography ..... 29