# DIN EN ISO 18086:2021-02 (E)

## Corrosion of metals and alloys - Determination of AC corrosion - Protection criteria (ISO 18 086:2019)

## Contents

Page


European foreword ..... 4

Foreword ..... 5

Introduction ..... 6

1 Scope ..... 7

2 Normative references ..... 7

3 Termsanddefinitions ..... 7

4 Cathodic protection persons competence ..... 11

5 AssessmentoftheACinfluence ..... 11
5.1 General ..... 11
5.2 Assessment of the level of interference ..... 12

6 Evaluation of the AC corrosion likelihood ..... 12
6.1 Prerequisite ..... 12
6.1.1 General ..... 12
6.1.2 AC voltage on the structure ..... 13
6.2 AC and DC current density ..... 13
6.2.1 General ..... 13
6.2.2 AC current density ..... 13
6.2.3 High cathodic DC current density ..... 13
6.2.4 Low cathodic DC current density ..... 14
6.2.5 Current ratio "Ia.c./Id.c." ..... 14
6.2.6 Soil resistivity ..... 14
6.3 Corrosion rate ..... 14
6.4 Pipeline coatings ..... 14
6.5 Evaluation of the metal loss ..... 15

7 Acceptable interference levels ..... 15

8 Measurement techniques ..... 15
8.1 Measurements ..... 15
8.1.1 General ..... 15
8.1.2 Selection of test sites ..... 15
8.1.3 Selection of measurement parameter ..... 16
8.1.4 Sampling rate for the recording of interference levels ..... 16
8.1.5 Accuracy of measuring equipment ..... 16
8.1.6 Installation of coupons or probes to calculate current densities ..... 16
8.2 DC potential measurements ..... 16
8.3 AC voltage measurements ..... 17
8.4 Measurements on coupons and probes ..... 17
8.4.1 Installation of coupons or probes ..... 17
8.4.2 Current measurements ..... 18
8.4.3 Corrosion rate measurements ..... 18
8.5 Pipeline metal loss techniques ..... 19

9 Mitigation measures ..... 19
9.1 General ..... 19
9.2 Construction measures ..... 19
9.2.1 Modification of bedding material ..... 19
9.2.2 Installation of isolating joints ..... 19
9.2.3 Installation of mitigation wires ..... 20
9.2.4 Optimization of pipeline and/or powerline route ..... 20
9.2.5 Power line or pipeline construction ..... 20
9.3 Operation measures ..... 20
9.3.1 Earthing ..... 20
9.3.2 Adjustment of cathodic protection level ..... 21
9.3.3 Repair of coating defects ..... 21

10 Commissioning ..... 22
10.1 Commissioning ..... 22
10.2 Preliminary checking ..... 22
10.2.1 General ..... 22
10.2.2 Coupon AC voltage and current startup ..... 23
10.2.3 Verification of effectiveness ..... 23
10.2.4 Installation and commissioning documents ..... 23

11 Monitoring and maintenance ..... 24

Annex A (informative)SimplifieddescriptionoftheACcorrosionphenomenon ..... 25

Annex B (informative) Coupons and probes ..... 27

Annex C (informative) Coulometric oxidation ..... 32

Annex D (informative)InfluenceofsoilcharacteristicsontheACcorrosionprocess ..... 33

Annex E (informative)OthercriteriathathavebeenusedinthepresenceofACinfluence ..... 34

Annex F (informative) Parameters to take into account to choose a DC decoupling device ..... 38

Annex G (informative) Method to determine the reference electrode location to remote earth ..... 40

Annex H (informative) Simultaneous measurement on coupon current densities with high rate ..... 42

Bibliography ..... 44