

Corrosion of metals and alloys - Determination of AC corrosion - Protection criteria (ISO 18086:2019)

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

See Eesti standard EVS-EN ISO 18086:2020 sisaldab Euroopa standardi EN ISO 18086:2020 ingliskeelset teksti.	This Estonian standard EVS-EN ISO 18086:2020 consists of the English text of the European standard EN ISO 18086:2020.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
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English Version

Corrosion of metals and alloys - Determination of AC  
corrosion - Protection criteria (ISO 18086:2019)

Corrosion des métaux et alliages - Détermination de la  
corrosion occasionnée par les courants alternatifs -  
Critères de protection (ISO 18086:2019)

Korrosion von Metallen und Legierungen -  
Bestimmung der Wechselstromkorrosion -  
Schutzkriterien (ISO 18086:2019)

This European Standard was approved by CEN on 13 December 2020.

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CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

## European foreword

The text of ISO 18086:2019 has been prepared by Technical Committee ISO/TC 156 "Corrosion of metals and alloys" of the International Organization for Standardization (ISO) and has been taken over as EN ISO 18086:2020 by Technical Committee CEN/TC 219 "Cathodic protection" the secretariat of which is held by BSI.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by June 2021, and conflicting national standards shall be withdrawn at the latest by June 2021.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN ISO 18086:2017.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

## Endorsement notice

The text of ISO 18086:2019 has been approved by CEN as EN ISO 18086:2020 without any modification.

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## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see [www.iso.org/directives](http://www.iso.org/directives)).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see [www.iso.org/patents](http://www.iso.org/patents)).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC 156, *Corrosion of metal and alloys*.

This second edition cancels and replaces the first edition (ISO 18086:2015), of which it constitutes a minor revision. The changes compared to the previous edition are as follows:

- references cited informatively (EN 13509 and EN 15257) have been moved from [Clause 2](#) to the Bibliography;
- in [Clause 7](#), the two instances of the phrase “AC current density” have been changed to “AC average current density”.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at [www.iso.org/members.html](http://www.iso.org/members.html).

## Introduction

This document has incorporated criteria and thresholds together with experience gained from the most recent data. Various countries have a very different approach to the prevention of AC corrosion depending primarily on the DC interference situation. These different approaches are taken into account in two different ways:

- in the presence of “low” on-potentials, which allows a certain level of AC voltage (up to 15 V);
- in the presence of “high” on-potentials (with DC stray current interference on the pipeline for instance), which requires the reduction of the AC voltage towards the lowest possible levels.

This document also gives some parameters to consider when evaluating the AC corrosion likelihood, as well as detailed measurement techniques, mitigation measures, and measurements to carry out for the commissioning of any AC corrosion mitigation system. [Annex E](#) proposes other parameters and thresholds that require further validation based on practical experiences.



# Corrosion of metals and alloys — Determination of AC corrosion — Protection criteria

## 1 Scope

This document specifies protection criteria for determining the AC corrosion risk of cathodically protected pipelines.

It is applicable to buried cathodically protected pipelines that are influenced by AC traction systems and/or AC power lines.

In the presence of AC interference, the protection criteria given in ISO 15589-1 are not sufficient to demonstrate that the steel is being protected against corrosion.

This document provides limits, measurement procedures, mitigation measures, and information to deal with long-term AC interference for AC voltages at frequencies between 16,7 Hz and 60 Hz and the evaluation of AC corrosion likelihood.

This document deals with the possibility of AC corrosion of metallic pipelines due to AC interferences caused by conductive, inductive or capacitive coupling with AC power systems and the maximum tolerable limits of these interference effects. It takes into account the fact that this is a long-term effect, which occurs during normal operating conditions of the AC power system.

This document does not cover the safety issues associated with AC voltages on pipelines. These are covered in national standards and regulations (see, e.g., EN 50443).

## 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 8044, *Corrosion of metals and alloys — Basic terms and definitions*

ISO 15589-1, *Petroleum, petrochemical and natural gas industries — Cathodic protection of pipeline systems — Part 1: On-land pipelines*

IEC 61010-1, *Safety requirements for electrical equipment for measurement, control, and laboratory use — Part 1: General requirements*

EN 50443, *Effects of electromagnetic interference on pipelines caused by high voltage AC electric traction systems and/or high voltage AC power supply systems*

## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 8044 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>