Irish Standard
I.S. EN ISO 13174:2012

Cathodic protection of harbour installations (ISO 13174:2012)

I.S. EN ISO 13174:2012

Incorporating amendments/corrigenda/National Annexes issued since publication:

The National Standards Authority of Ireland (NSAI) produces the following categories of formal documents:

I.S. xxx: Irish Standard – national specification based on the consensus of an expert panel and subject to public consultation.

S.R. xxx: Standard Recommendation - recommendation based on the consensus of an expert panel and subject to public consultation.

SWiFT xxx: A rapidly developed recommendatory document based on the consensus of the participants of an NSAI workshop.

This document replaces:
EN 13174:2001

This document is based on:
EN ISO 13174:2012

Published:
11 January, 2013

This document was published under the authority of the NSAI and comes into effect on:
11 January, 2013

ICS number:
47.020.99
77.060

NSAI
1 Swift Square,
Northwood, Santry
Dublin 9

T +353 1 807 3800
F +353 1 807 3838
E standards@nsai.ie

W NSAI.ie

Sales:
T +353 1 857 6730
F +353 1 857 6729
W standards.ie

Údarás um Chaighdeáin Náisiúnta na hÉireann

I.S. EN ISO 13174:2012

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN ISO 13174

December 2012

ICS 77.060; 47.020.99

Supersedes EN 13174:2001

English Version

Cathodic protection of harbour installations (ISO 13174:2012)

Protection cathodique des installations portuaires (ISO 13174:2012)

Kathodischer Korrosionsschutz für Hafenbauten (ISO 13174:2012)

This European Standard was approved by CEN on 18 December 2012.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: Avenue Marnix 17, B-1000 Brussels

Ref. No. EN ISO 13174:2012: E

Contents

Page

Foreword

This document (EN ISO 13174:2012) has been prepared by Technical Committee CEN/TC 219 “Cathodic protection", the secretariat of which is held by BSI, in collaboration with Technical Committee ISO/TC 156 "Corrosion of metals and alloys".

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 2013, and conflicting national standards shall be withdrawn at the latest by June 2013.

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

This document supersedes EN 13174:2001.

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

This page is intentionally left BLANK.

I.S. EN ISO 13174:2012

INTERNATIONAL STANDARD

ISO 13174

First edition
2012-12-15

Cathodic protection of harbour installations

Protection cathodique des installations portuaires

Reference number
ISO 13174:2012(E)

COPYRIGHT PROTECTED DOCUMENT

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

Contents

Page

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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 13174 was prepared by the European Committee for Standardization (CEN) Technical Committee CEN/TC 219, *Cathodic protection*, in collaboration with Technical Committee ISO/TC 156, *Corrosion of metals and alloys*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

ISO 13174 cancels and replaces EN 13174:2001, which has been technically revised.

Introduction

Cathodic protection is applied, sometimes in conjunction with protective coatings, to protect the external surfaces of steel harbour installations and appurtenances from corrosion due to seawater, brackish water, saline mud or soil fill.

Cathodic protection works by supplying sufficient direct current to the immersed external surface of the structure to change the steel to electrolyte potential to values where corrosion is insignificant.

The general principles of cathodic protection in seawater are detailed in ISO 12473. The general principles of cathodic protection in soils are detailed in EN 12954.

Cathodic protection of harbour installations

1 Scope

1.1 General

This International Standard defines the means to be used to ensure that cathodic protection is efficiently applied to the immersed and driven/buried metallic external surfaces of steel port, harbour, coastal and flood defence installations and appurtenances in seawater and saline mud to provide protection from corrosion.

1.2 Structures

This International Standard specifies cathodic protection of fixed and floating port and harbour structures. This includes piers, jetties, dolphins (mooring and berthing), sheet or tubular piling, pontoons, buoys, floating docks, lock and sluice gates. It also specifies cathodic protection of the submerged areas of appurtenances, such as chains attached to the structure, when these are not electrically isolated from the structure.

This International Standard is to be used in respect of cathodic protection systems where the anodes are exposed to water or saline mud. For buried areas, typically in soil or sand filled areas behind piled walls or within filled caissons, which may be significantly affected by corrosion, specific cathodic protection design and operation requirements are defined in EN 12954, the anodes being exposed to soils.

This International Standard does not cover the cathodic protection of fixed or floating offshore structures (including offshore loading buoys), submarine pipelines or ships.

This International Standard does not include the internal protection of surfaces of any components such as ballast tanks, internals of floating structures flooded compartments of lock and sluice gates or the internals of tubular steel piles.

1.3 Materials

This International Standard covers the cathodic protection of structures fabricated principally from bare or coated carbon and carbon manganese steels.

As some parts of the structure may be made of metallic materials other than carbon steels, the cathodic protection system should be designed to ensure that there is a complete control over any galvanic coupling and minimize risks due to hydrogen embrittlement or hydrogen-induced cracking (see ISO 12473).

This International Standard does not address steel reinforced concrete structures (see ISO 12696).

1.4 Environment

This International Standard is applicable to the whole submerged zone in seawater, brackish waters and saline mud and related buried areas which can normally be found in port, harbour, coastal and flood defence installations wherever these structures are fixed or floating.

For surfaces which are alternately immersed and exposed to the atmosphere, the cathodic protection is only effective when the immersion time is long enough for the steel to become polarized. Typically, effective cathodic protection is achieved for all surfaces below mid tide.

For structures such as sheet steel and tubular steel piles that are driven into the sea bed or those that are partially buried or covered in mud, this International Standard is also applicable to the surfaces buried, driven and exposed to mud which are intended to receive cathodic protection along with surfaces immersed in water.

Cathodic protection may also be applied to the rear faces of sheet steel piled walls and the internal surfaces of filled caissons. Cathodic protection of such surfaces is specified by EN 12954.

This International Standard is applicable to those structures which are, or may be in the future, affected by "Accelerated Low Water Corrosion" (ALWC) and other more general forms of microbial corrosion (MIC) or other forms of so-called "concentrated corrosion" associated with galvanic couples, differential aeration and other local corrosion influencing parameters

NOTE Information is available in BS 6349-1:2000, Clause 59 and CIRIA C634 (see Bibliography)

1.5 Safety and environment protection

This International Standard does not address safety and environmental protection aspects associated with cathodic protection to which national or international regulations apply.

2 Normative references

The following referenced documents are indispensable for the application 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 12473, *General principles of cathodic protection in sea water*

EN 12496, *Galvanic anodes for cathodic protection in seawater and saline mud*

ISO 12696, *Cathodic protection of steel in concrete*

EN 12954, *Cathodic protection of buried or immersed metallic structures – General principles and application for pipelines*

EN 13509, *Cathodic protection measurement techniques*

EN 50162, *Protection against corrosion by stray current from direct current systems*

3 Terms and definitions

For the purposes of this document, the terms and definitions in ISO 12473 and the following apply.

3.1
accelerated low water corrosion
ALWC
localised corrosion generally found on the sea side at or just below the LAT level of structures, but can be present at all immersed levels

Note 1 to entry: This phenomenon is associated with microbiologically influenced corrosion (MIC) and generally quiescent conditions. (See CIRIA C634.) Corrosion rates, without cathodic protection, can be as high as 2 mm/side/year and the corrosion is typically localized as large, open pitting

3.2
atmospheric zone
zone located above the splash zone, i.e. above the level reached by the normal swell, whether the structure is moving or not

3.3
buried zone
zone located under the mud line or in soil or fill

3.4
cathodic protection zone
that part of the structure which can be considered independently with respect to cathodic protection design