Cathodic protection measurement techniques

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EESTI STANDARDI EESSÕNA **NATIONAL FOREWORD**

Käesolev Eesti standard EVS-EN 13509:2003 sisaldab Euroopa standardi EN 13509:2003 ingliskeelset teksti. Käesolev dokument on jõustatud 06.06.2003 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes. Standard on kättesaadav Eesti standardiorganisatsioonist.	This Estonian standard EVS-EN 13509:2003 consists of the English text of the European standard EN 13509:2003. This document is endorsed on 06.06.2003 with the notification being published in the official publication of the Estonian national standardisation organisation. The standard is available from Estonian standardisation organisation.

Käsitlusala: This European Standard deals with the cathodic protection against corrosion of buried or immersed metallic structures, detailing the measuring methods to be used for assessing the effectiveness of cathodic protection as well as the measurements and measures taken to monitor cathodic protection during operation	**Scope:** This European Standard deals with the cathodic protection against corrosion of buried or immersed metallic structures, detailing the measuring methods to be used for assessing the effectiveness of cathodic protection as well as the measurements and measures taken to monitor cathodic protection during operation

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Cathodic protection measurement techniques

Techniques de mesures applicables en protection cathodique

Messverfahren für den kathodischen Korrosionsschutz

This European Standard was approved by CEN on 27 December 2002.

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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 Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and United Kingdom.

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Foreword

This document (EN 13509:2003) has been prepared 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 November 2003, and conflicting national standards shall be withdrawn at the latest by November 2003.

This European Standard should be considered as a basic document developing general measurement techniques applicable for the protection of buried or immersed metallic structures.

Annexes A, B, C, D, E, F, G, I, J and K are informative.

Annex H is normative.

This document includes a Bibliography.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and the United Kingdom.

Introduction

This European Standard describes the principles of the different methods of measurement used to assist in the design of the cathodic protection system of a buried or immersed metallic structure, for the verification of its effectiveness and finally for its optimum operational conditions.

It deals in particular with the measurement of the structure to electrolyte potential, which indicates whether or not the cathodic protection criterion for the structure is met.

Apart from specifying the factors, which may influence the measurement of the potential, this European Standard describes the different techniques possible and their suitability in various situations.

Further, this European Standard provides parameters to be controlled and measurements to be carried out (potential, potential gradient, current and resistance measurements) to ensure the correct functioning of the cathodic protection system and its effectiveness for the entire structure.

Several measurement methods described in general terms in the body of the standard are explained in more detail in annexes. These methods differ from one another to account for differences in type or state of the structure, the local environment and the degree of accuracy selected.

Measurements on buried structures that are not easily accessible e.g. pipe networks in urban areas are difficult to implement and interpret. To take measurements without the full knowledge of the problems associated with the measurement technique renders the interpretation of the measurements difficult and leads to incorrect decisions.

One of the clauses of this European Standard therefore outlines the difficulties encountered when measuring structure to electrolyte potentials, and suggests several methods of measurement that take into account, or avoid, these difficulties.

Based on knowledge and experience, the most suitable measurement techniques can be selected as described in this European Standard.

In order to achieve effective and efficient cathodic protection, measurements should be performed by trained, experienced and responsible personnel.

Instrumentation used for measurement should be kept in good working order and should be subjected to periodical calibration and safety checks.

1 Scope

This European Standard deals with the cathodic protection against corrosion of buried or immersed metallic structures, detailing the measuring methods to be used for assessing the effectiveness of cathodic protection as well as the measurements and measures taken to monitor cathodic protection during operation.

Throughout the text, the measurement techniques are described primarily for pipelines.

However, they are sufficiently general to apply to other kinds of buried or immersed (except offshore) structures.

General principles with regard to cathodic protection are described in EN 12954. Other measurement methods specific to particular cases are described in other European Standards e.g. prEN 50162.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text, and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN 12954:2001, *Cathodic protection of buried or immersed metallic structures — General principles and application for pipelines*

EN ISO 8044:1999, *Corrosion of metals and alloys — Basic terms and definitions (ISO 8044:1999)*

3 Terms, definitions and symbols

3.1 Terms and definitions

For the purposes of this European Standard the following terms and definitions apply. For other terms and definitions related to corrosion refer to EN ISO 8044:1999 and to cathodic protection refer to EN 12954:2001.

3.1.1
anode backfill
material with a low resistivity, which may be moisture-retaining, immediately surrounding a buried anode for the purpose of decreasing the effective resistance of the anode to the electrolyte

3.1.2
backfill
see anode backfill

3.1.3
bond
metal conductor, usually of copper, connecting two points on the same or on different structures usually with the intention of making the points equipotential