

Cathodic protection of complex structures

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EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

<p>Käesolev Eesti standard EVS-EN 14505:2005 sisaldab Euroopa standardi EN 14505:2005 ingliskeelset teksti.</p> <p>Käesolev dokument on jõustatud 22.06.2005 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes.</p> <p>Standard on kättesaadav Eesti standardiorganisatsioonist.</p>	<p>This Estonian standard EVS-EN 14505:2005 consists of the English text of the European standard EN 14505:2005.</p> <p>This document is endorsed on 22.06.2005 with the notification being published in the official publication of the Estonian national standardisation organisation.</p> <p>The standard is available from Estonian standardisation organisation.</p>
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<p>Käsitlusala: This European Standard applies to the cathodic protection of complex structures. It is applicable to structures, which are to be cathodically protected, but cannot be electrically isolated, whether for technical or safety reasons, from foreign metallic structures situated in the same electrolyte as the structure to be protected. Such a structure is referred to as a "complex structure".</p>	<p>Scope: This European Standard applies to the cathodic protection of complex structures. It is applicable to structures, which are to be cathodically protected, but cannot be electrically isolated, whether for technical or safety reasons, from foreign metallic structures situated in the same electrolyte as the structure to be protected. Such a structure is referred to as a "complex structure".</p>
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ICS 77.060

English version

Cathodic protection of complex structures

Protection cathodique des structures complexes

Kathodischer Korrosionsschutz komplexer Anlagen

This European Standard was approved by CEN on 15 March 2005.

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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

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Foreword

This European Standard (EN 14505:2005) 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 October 2005, and conflicting national standards shall be withdrawn at the latest by October 2005.

It may be difficult to obtain complete cathodic protection of certain structures when following the general guidelines in EN 12954. This may be due to an electrical connection to one or more metal structures (electrodes) situated in the same electrolyte as the structure, which is to be protected. In particular, the structure may be earthed in order to mitigate electrical hazards or the connection to the other structures may be dictated by construction or operational requirements.

An electrical connection to a foreign structure can result in a significantly increased cathodic protection current demand, since the current flows not only to the structure to be protected but also to the foreign structure. This unwanted increased current demand is enhanced when the foreign structure consists of a metal, which is more noble (having a more positive resting potential) than the metal in the structure to be protected. Connection to a copper earthing electrode or to the steel reinforcement in a concrete structure are examples of the latter.

These difficulties can mean that a significantly increased cathodic protection current is required because of structures electrically connected to the structure to be protected, resulting in inadequate cathodic protection, current distribution and shielding effects.

For this reason, the term "complex structure" has been used. It does not refer to the complexity of the structure or to the complexity of the cathodic protection system.

In such conditions the prerequisites, the criteria and the methods described in the present document expand those given in EN 12954.

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

1 Scope

This European Standard applies to the cathodic protection of complex structures. It is applicable to structures, which are to be cathodically protected, but cannot be electrically isolated, whether for technical or safety reasons, from foreign metallic structures situated in the same electrolyte as the structure to be protected. Such a structure is referred to as a “complex structure”.

This European Standard is not applicable to structures that can be protected in accordance with EN 12954. When contacts with foreign structures or defective isolation from foreign structures exist, but can be corrected, EN 12954 is applicable instead of this document. As an example pipeline network distribution systems are not considered to be complex structures

It is assumed in this document that the design, installation, commissioning, inspection and maintenance are entrusted to adequately trained, experienced, competent and reliable personnel in order to achieve effective and efficient cathodic protection.

Annexes A and B show the principle scheme of a complex structure with examples.

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.

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

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

3 Terms and definitions

For the purposes of this European Standard, the terms and definitions given in EN 12954:2001 and the following apply.

NOTE For other definitions related to corrosion, refer to EN ISO 8044:1999.

3.1

complex structure

structure composed of the structure to be protected and of one or more foreign electrodes, which, for safety or technical reasons, cannot be electrically separated from it

3.2

foreign electrode

electrode (anode or cathode), in contact with the structure under consideration

NOTE a foreign anode is a foreign electrode, which has a more negative potential than the structure, a foreign cathode is a foreign electrode, which has a more positive potential than the structure.

4 Criteria for the cathodic protection of complex structures

For complex structures, the cathodic protection criteria defined in EN 12954 should be used where possible. Indeed, the characteristics of complex structures and the special influential factors (see Clause 5) which can occur means that it is not always possible on every part of the complex structure to determine by measurement whether these criteria of cathodic protection are met. In this case alternative methods of verification may be selected to