

# SVENSK STANDARD

## SS-EN 16222:2012



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### **Katodiskt skydd av fartygsskrov**

### **Cathodic protection of ship hulls**

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EUROPEAN STANDARD

**EN 16222**

NORME EUROPÉENNE

EUROPÄISCHE NORM

October 2012

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ICS 47.020.01; 77.060

English Version

## Cathodic protection of ship hulls

Protection cathodique des coques de bateaux

Kathodischer Korrosionsschutz von Schiffen

This European Standard was approved by CEN on 25 August 2012.

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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 CEN-CENELEC Management Centre has the same status as the official versions.

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## SS-EN 16222:2012 (E)

### Foreword

This document (EN 16222:2012) 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of an identical text or by endorsement, at the latest by April 2013, and conflicting national standards shall be withdrawn at the latest by April 2013.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.

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.



## **Introduction**

Cathodic protection is usually applied, mostly as a complement to protective coatings, to protect the external surfaces of ship hulls and immersed appurtenances from corrosion due to seawater.

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

The general principles of cathodic protection are detailed in EN 12473.

## SS-EN 16222:2012 (E)

### 1 Scope

#### 1.1 General

This European Standard defines the general criteria and recommendations for cathodic protection of immersed external ship hulls and appurtenances.

This European Standard does not cover safety and environmental protection aspects associated with cathodic protection. Relevant national or international regulations and classification society requirements apply.

#### 1.2 Structures

This European Standard covers the cathodic protection of the underwater hulls of ships, boats and other self propelled floating vessels generally used in seawater together with their appurtenances such as rudders, propellers, shafts and stabilisers.

It also covers the cathodic protection of thrusters, sea chests and water intakes (up to the first valve).

It does not cover the protection of internal surfaces such as ballast tanks.

It does not cover steel offshore floating structures which are covered in EN 13173.

#### 1.3 Materials

This European Standard covers the cathodic protection of ship hulls fabricated principally from carbon manganese steels including appurtenances of other ferrous or non-ferrous alloys such as stainless steels and copper alloys, etc.

This European Standard applies to both coated and bare hulls; most hulls are coated.

The cathodic protection system should be designed to ensure that there is a complete control over any galvanic coupling.

This European Standard does not cover the cathodic protection of hulls principally made of other materials such as aluminium alloys, stainless steels or concrete.

#### 1.4 Environment

This European Standard is applicable to the hull and appurtenances in seawater and all waters which could be found during a ship's world-wide deployment.

### 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 12473, *General principles of cathodic protection in sea water*

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

EN 13509, *Cathodic protection measurement techniques*

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

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

### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN ISO 8044, EN 12473 and the following apply.

#### 3.1

##### **immersed zone**

zone located below the water line at draught corresponding to normal working conditions

#### 3.2

##### **underwater hull**

part of the hull vital for its stability and buoyancy of a ship

Note 1 to entry: Part of the underwater hull might include that below the light water line.

#### 3.3

##### **boot topping**

section of the hull between light and fully loaded conditions which may be intermittently immersed

#### 3.4

##### **cathodic protection zone**

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

Note 1 to entry: A single zone may comprise a variety of components with differing design parameters.

#### 3.5

##### **submerged zone**

zone including the immersed zone and the boot topping

#### 3.6

##### **driving voltage**

difference between the structure/electrolyte potential and the anode/electrolyte potential when the cathodic protection is operating

#### 3.7

##### **closed circuit potential**

potential measured at a galvanic anode when a current is flowing in between the anode and the surface being protected

### 4 Competence of personnel

Personnel who undertake the design, supervision of installation, commissioning, supervision of operation, measurements, monitoring and supervision of maintenance of cathodic protection systems shall have the appropriate level of competence for the tasks undertaken. This competence should be independently assessed and documented.

EN 15257 constitutes a suitable method of assessing and certifying competence of cathodic protection personnel which may be utilised.

Competence of cathodic protection personnel to the appropriate level for tasks undertaken should be demonstrated by certification in accordance with EN 15257 or by another equivalent prequalification procedure.