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Paints and varnishes — Corrosion protection of steel structures by protective paint systems —

Part 8: Development of specifications for new work and maintenance

Peintures et vernis — Anticorrosion des structures en acier par systèmes de peinture —

Partie 8: Développement de spécifications pour les travaux neufs et de maintenance

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ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

Contents

Page

Foreword ... **iv**

Introduction ... **v**

1 Scope ... **1**

2 Normative references ... **1**

3 Terms and definitions ... **1**

4 How to develop a specification for new work or maintenance ... **3**

5 Contents of a specification ... **4**

5.1 Supply ... 4

Annex A (informative) **Basic information for inclusion in a protective paint system specification for new work and maintenance** ... **12**

Annex B (informative) **Reference areas** ... **14**

Annex C (informative) **Flow chart for planning new work** ... **17**

Annex D (informative) **Flow chart for planning maintenance work** ... **19**

Annex E (informative) **Classification of environments — Checklist (derived from ISO 12944-2)** ... **20**

Annex F (informative) **Recommended form for a protective paint system specification — New work** ... **22**

Annex G (informative) **Recommended form for a protective paint system specification — Maintenance** ... **23**

Annex H (informative) **Recommended form for a report on paint work progress and application conditions** ... **25**

Annex I (informative) **Recommended form for final report on corrosion protection work** ... **27**

Annex J (informative) **Recommended form for a detailed inspection report on the condition of an existing protective paint system, including the assessment of the need for maintenance** ... **30**

Bibliography ... **34**

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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).

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).

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

For an explanation on 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 the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 35, *Paints and varnishes*, Subcommittee SC 14, *Protective paint systems for steel structures*.

This second edition cancels and replaces the first edition (ISO 12944-8:1998), which has been technically revised.

The main changes compared to the previous edition are as follows:

— the normative references have been updated;

— the terms and definitions have been updated;

— water soluble contaminants and dust have been added in Table 1 as particular constraints with respect to surfaces and surface preparation;

— Annex E has been updated with regard to corrosivity classes;

— Annex I has been updated with regard to surface preparations;

— the bibliography has been updated;

— the text has been editorially revised.

A list of all parts in the ISO 12944 series can be found on the ISO website.

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Introduction

Unprotected steel in the atmosphere, in water and in soil is subjected to corrosion that can lead to damage. Therefore, to avoid corrosion damage, steel structures are normally protected to withstand the corrosion stresses to which they will be subjected during the service life required of the structure.

There are different ways of protecting steel structures from corrosion. ISO 12944 (all parts) deals with protection by paint systems and covers, in the various parts, all features that are important in achieving adequate corrosion protection. Additional or other measures are possible but require particular agreement between the interested parties.

In order to ensure effective corrosion protection of steel structures, owners of such structures, planners, consultants, companies carrying out corrosion protection work, inspectors of protective coatings and manufacturers of coating materials need to have at their disposal state-of-the-art information in concise form on corrosion protection by paint systems. It is vital that such information is as complete as possible, unambiguous and easily understandable to avoid difficulties and misunderstandings between the parties concerned with the practical implementation of protection work.

ISO 12944 (all parts) is intended to give this information in the form of a series of instructions. It is written for those who have some technical knowledge. It is also assumed that the user of ISO 12944 (all parts) is familiar with other relevant International Standards, in particular those dealing with surface preparation.

Although ISO 12944 (all parts) does not deal with financial and contractual questions, attention is drawn to the fact that, because of the considerable implications of inadequate corrosion protection, non-compliance with requirements and recommendations given in ISO 12944 (all parts) can result in serious financial consequences.

ISO 12944-1 defines the overall scope of all parts of ISO 12944. It gives some basic terms and definitions and a general introduction to the other parts of ISO 12944. Furthermore, it includes a general statement on health, safety and environmental protection, and guidelines for using ISO 12944 for a given project.

This document is intended as an aid when a corrosion protection specification is to be drawn up.

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Paints and varnishes — Corrosion protection of steel structures by protective paint systems —

Part 8: Development of specifications for new work and maintenance

1 Scope

This document covers the development of specifications for corrosion protection of steel structures using protective paint systems. It relates to new work and maintenance in the workshop or on site and is also applicable to the corrosion protection of individual components. This document covers the corrosion protection of steel structures exposed to different corrosion stresses by environments such as indoors, open-air and immersion in water or burial in soil, as well as special stresses, due for example, to medium or high temperatures. The need for different durability ranges is considered.

Steel surfaces that have been hot-dip-galvanized, metal-sprayed, zinc-electroplated or sherardized, and previously painted steel surfaces, are also covered by this document.

In this document, reference areas for assessing the quality of the corrosion protection work and the performance of the protective paint systems used are dealt with. This document provides detailed flow charts for planning new work and maintenance, which are taken into account when writing a specification.

This document can also be used as a guide if extreme corrosion stresses or high temperatures occur, or if the protective paint systems are to be used on other substrates, such as non-ferrous metals or concrete, to define suitable specifications.

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 12944-1, *Paints and varnishes — Corrosion protection of steel structures by protective paint systems — Part 1: General introduction*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 12944-1 and the following apply.

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

— IEC Electropedia: available at http://www.electropedia.org/

— ISO Online browsing platform: available at http://www.iso.org/obp

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3.1
constituent element
part of a structure that is exposed to a particular environment and which will therefore require a specific *protective paint system specification* (3.8.2)

Note 1 to entry: For example, a storage tank will have more than one constituent element as it comprises internal and external surfaces and possibly also support steelwork.

3.2
dry film thickness
DFT
thickness of a coating remaining on the surface when the coating has hardened

Note 1 to entry: For details, see ISO 12944-5:—[1)], 5.4.

3.3
durability
expected life of a protective paint system to the first major *maintenance* (3.5) painting

Note 1 to entry: For further important information on durability and durability ranges, see ISO 12944-1.

3.4
inspector
anyone responsible for ensuring conformity with one or more of the individual *specifications* (3.8)

3.5
maintenance
sum of all measures, as covered by ISO 12944 (all parts), which ensure that the steel structure is protected from corrosion

Note 1 to entry: Maintenance includes, but is not limited to, paint work. Such paint work can be patch painting (repair of degradated spots/areas of the coating system), patch painting followed by overpainting of the structure, or total repainting.

3.6
nominal dry film thickness
NDFT
dry film thickness (3.2) specified for each coat or for the whole paint system to achieve the required *durability* (3.3)

Note 1 to entry: For details, see ISO 12944-5: —[1)], 5.4.

3.7
project
whole of the work for which a *specification* (3.8) is being developed and which can include one or more structures

3.8
specification
technical document describing all the requirements to be observed when a steel structure is to be protected against corrosion by using protective coating systems and which consists of several individual specifications

Note 1 to entry: Individual specifications, i.e. *project specification* (3.8.1), *protective paint system specification* (3.8.2), *paint work specification* (3.8.3), *inspection and assessment specification* (3.8.4), are defined.

3.8.1
project specification
specification (3.8) that describes the *project* (3.7) and the requirements relating specifically to it

1) Under preparation.

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3.8.2
protective paint system specification
specification (3.8) that describes the preparation of the surface of the structure and the protective coating system(s) for the structure, in conformity with the *project specification* (3.8.1)

3.8.3
paint work specification
specification (3.8) that describes the way the coating work is to be carried out, in conformity with the *project specification* (3.8.1) and the *protective paint system specification* (3.8.2), as well as with the *inspection and assessment specification* (3.8.4)

3.8.4
inspection and assessment specification
specification (3.8) that describes how inspection and assessment are to be carried out

3.9
specifier
anyone responsible for the development of a *specification* (3.8)

3.10
sample area
area on which the properties of a newly applied coating are tested

3.11
touch-up
application of coating material on a small area

4 How to develop a specification for new work or maintenance

It is recommended that the specifier considers the information given in Clause 5 and establishes which specification(s) apply/applies to the project or constituent element to be protected. Then, the specifier should check in the respective table, item by item, which of the items listed are to be taken into account in the specification. The various items are supported by detailed information given in the "Remarks" column in Tables 1 to 4 and in Annexes A to J.

When writing a specification for new work or maintenance, it is important to choose the most suitable protective paint system. Prior to refurbishment, it can be helpful to create sample areas, e.g. to assess the coating suitability and appearance. To achieve this, all relevant parameters shall be taken into consideration, for example:

— required durability;

— environmental conditions and special stresses;

— surface preparation;

— different generic types of paint;

— number and types of coats [priming coat(s), intermediate coat(s) and top coat(s)];

— methods of application and application requirements;

— place of application (shop or site);

— scaffolding requirements;

— requirements regarding (future) maintenance (if any);

— health and safety requirements;

— environmental protection requirements.

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