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

Part 1: General introduction

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

Partie 1: Introduction générale

Reference number
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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 12944-1:1998), which has been technically revised.

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

— some parts of the scope have been moved to Clause 4;

— the terms and definitions which were not used in the main part of the standard have been deleted;

— the normative references have been updated;

— the requirements regarding sample areas have been included;

— 7.8 with reference to ISO 12944-9 has been added.

— a bibliography has been added.

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.

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

Part 1: General introduction

1 Scope

This document defines the overall scope of ISO 12944 (all parts). 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 (all parts) for a given project.

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 4628-1, *Paints and varnishes — Evaluation of degradation of coatings — Designation of quantity and size of defects, and of intensity of uniform changes in appearance — Part 1: General introduction and designation system*

ISO 4628-2, *Paints and varnishes — Evaluation of degradation of coatings — Designation of quantity and size of defects, and of intensity of uniform changes in appearance — Part 2: Assessment of degree of blistering*

ISO 4628-3, *Paints and varnishes — Evaluation of degradation of coatings — Designation of quantity and size of defects, and of intensity of uniform changes in appearance — Part 3: Assessment of degree of rusting*

ISO 4628-4, *Paints and varnishes — Evaluation of degradation of coatings — Designation of quantity and size of defects, and of intensity of uniform changes in appearance — Part 4: Assessment of degree of cracking*

ISO 4628-5, *Paints and varnishes — Evaluation of degradation of coatings — Designation of quantity and size of defects, and of intensity of uniform changes in appearance — Part 5: Assessment of degree of flaking*

ISO 12944-2, *Paints and varnishes — Corrosion protection of steel structures by protective paint systems — Part 2: Classification of environments*

ISO 12944-3, *Paints and varnishes — Corrosion protection of steel structures by protective paint systems — Part 3: Design considerations*

ISO 12944-4, *Paints and varnishes — Corrosion protection of steel structures by protective paint systems — Part 4: Types of surface and surface preparation*

ISO 12944-5, *Paints and varnishes — Corrosion protection of steel structures by protective paint systems — Part 5: Protective paint systems*

ISO 12944-6, *Paints and varnishes — Corrosion protection of steel structures by protective paint systems — Part 6: Laboratory performance test methods*

ISO 12944-7, *Paints and varnishes — Corrosion protection of steel structures by protective paint systems — Part 7: Execution and supervision of paint work*

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ISO 12944-8, *Paints and varnishes — Corrosion protection of steel structures by protective paint systems — Part 8: Development of specifications for new work and maintenance*

ISO 12944-9, *Paints and varnishes — Corrosion protection of steel structures by protective paint systems — Part 9: Protective paint systems and laboratory performance test methods for offshore and related structures*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 12944-2, ISO 12944-3, ISO 12944-4, ISO 12944-5, ISO 12944-6, ISO 12944-7, ISO 12944-8, ISO 12944-9 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 https://www.iso.org/obp

3.1
coat
continuous layer of metal material or a continuous film of *paint* (3.6), resulting from a single application

3.2
corrosion
physicochemical interaction between a metal and its environment that results in changes in the properties of the metal, and which can often lead to impairment of the function of the metal, the environment or the technical system of which these form a part

[SOURCE: ISO 8044:2015, 2.1, modified — in the definition “may” has been replaced by “can often” and Note 1 to entry has been deleted.]

3.3
corrosion damage
corrosion (3.2) effect which is considered detrimental to the function of the metal, the environment or the technical system of which these form a part

3.4
corrosion stress
environmental factor which promotes *corrosion* (3.2)

3.5
durability
expected life of a *protective paint system* (3.8) to the first major maintenance painting

Note 1 to entry: Durability is a technical consideration/planning parameter that can help the owner set up a maintenance programme (see 5.5).

3.6
paint
pigmented coating material which, when applied to a *substrate* (3.9), forms an opaque dried film having protective, decorative or specific technical properties

[SOURCE: ISO 4618:2014, 2.184]

3.7
protective coating system
sum total of the *coats* (3.1) of metal materials and/or *paints* (3.6) or related products which are to be applied or which have been applied to a *substrate* (3.9) to provide *corrosion* (3.2) protection

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3.8
protective paint system
sum total of the *coats* (3.1) of *paints* (3.6) or related products which are to be applied or which have been applied to a *substrate* (3.9) to provide *corrosion* (3.2) protection

3.9
substrate
surface to which the coating material is applied or is to be applied

Note 1 to entry: The substrate is considered to be carbon steel.

3.10
spot repair
localized repair (including surface preparation) of deteriorated *corrosion* (3.2) protection system

3.11
partial refurbishment
spot repair (3.10) of coating defects followed by surface preparation and application of a minimum of one top *coat* (3.1) over the whole area

3.12
total refurbishment
total removal of protective *paint* (3.6) system and application of a new one

3.13
sample area
area on which the properties of a newly applied coating are tested

4 General introduction to the ISO 12944 series

4.1 Summary

ISO 12944 (all parts) deals with the corrosion protection of steel structures by protective paint systems.

4.2 Protective functions covered

ISO 12944 (all parts) covers only the corrosion-protective function of paint systems. Other protective functions, like protection against

— microorganisms (marine fouling, bacteria, fungi, etc.),

— chemicals (acids, alkalis, organic solvents, gases, etc.),

— mechanical action (abrasion, etc.), and

— fire

are not covered by ISO 12944 (all parts).

4.3 Field of application

4.3.1 Overview

The field of application is characterized by

— the type of structure,

— the type of surface and surface preparation,

— the type of environment,

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