



SLOVENSKI STANDARD
oSIST prEN ISO 12944-8:2016
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Barve in laki - Korozijska zaščita jeklenih konstrukcij z zaščitnimi premaznimi sistemi - 8. del: Razvoj specifikacij za novogradnje in vzdrževanje (ISO/DIS 12944-8:2016)

Paints and varnishes - Corrosion protection of steel structures by protective paint systems - Part 8: Development of specifications for new work and maintenance (ISO/DIS 12944-8:2016)

Beschichtungsstoffe - Korrosionsschutz von Stahlbauten durch Beschichtungssysteme - Teil 8: Erarbeiten von Spezifikationen für Erstschutz und Instandsetzung (ISO/DIS 12944-8:2016)

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Peintures et vernis - Anticorrosion des structures en acier par systèmes de revêtement - Partie 8: Développement de spécifications pour les travaux neufs et l'entretien (ISO/DIS 12944-8:2016)

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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 revêtement —
Partie 8: Développement de spécifications pour les travaux neufs et l'entretien*

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ISO/CEN PARALLEL PROCESSING

This draft has been developed within the International Organization for Standardization (ISO), and processed under the **ISO lead** mode of collaboration as defined in the Vienna Agreement.

This draft is hereby submitted to the ISO member bodies and to the CEN member bodies for a parallel five month enquiry.

To expedite distribution, this document is circulated as received from the committee secretariat. ISO Central Secretariat work of editing and text composition will be undertaken at publication stage.



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Contents

Page

Foreword.....	iv
1 Scope.....	1
2 Normative references.....	1
3 Terms and definitions.....	2
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.....	18
Annex E (informative) Classification of environments – Checklist (derived from ISO 12944-2).....	19
Annex F (informative) Recommended form for a protective paint system specification - New work (To be filled in for each constituent element of the structure).....	20
Annex G (informative) Recommended form for a protective paint system specification – Maintenance (To be filled in for each constituent element of the structure).....	21
Annex H (informative) Recommended form for a report on paint work progress and application conditions	23
Annex I (informative) Recommended form for final report on corrosion protection work.....	24
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	27
Bibliography	32

ISO/DIS 12944-8:2016(E)

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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 12944-8 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.

ISO 12944 consists of the following parts, under the general title *Paints and varnishes — Corrosion protection of steel structures by protective coating systems*:

- *Part 1: General introduction*
- *Part 2: Classification of environments*
- *Part 3: Design considerations*
- *Part 4: Types of surface and surface preparation*
- *Part 5: Protective paint systems*
- *Part 6: Laboratory performance test methods*
- *Part 7: Execution and supervision of paint work*
- *Part 8: Development of specifications for new work and maintenance*
- *Part 9: Protective paint systems and laboratory performance test methods for offshore and related structures*

Annexes A to K of this part of ISO 12944 are for information only.

Introduction

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

There are different ways of protecting steel structures from corrosion. ISO 12944 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, it is necessary for owners of such structures, planners, consultants, companies carrying out corrosion protection work, inspectors of protective coatings and manufacturers of coating materials to have at their disposal state-of-the-art information in concise form on corrosion protection by paint systems. Such information has to be as complete as possible, unambiguous and easily understandable to avoid difficulties and misunderstandings between the parties concerned with the practical implementation of protection work.

This International Standard – ISO 12944 – 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 is familiar with other relevant International Standards, in particular those dealing with surface preparation, as well as relevant national regulations.

Although ISO 12944 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 this standard may 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 part of ISO 12944 is intended as an aid when a corrosion protection specification is to be drawn up.

Paints and varnishes — Corrosion protection of steel structures by protective coating systems — Part 8: Development of specifications for new work and maintenance

1 Scope

This part of ISO 12944 deals with 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 part of ISO 12944 concerns 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, for example due 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 part of ISO 12944.

In annex B, reference areas for assessing the quality of the corrosion protection work and the performance of the protective paint systems used are dealt with. Annexes C and D provide detailed flow charts for planning new work and maintenance, which should be taken into account when writing a specification.

If extreme corrosion stresses or high temperatures occur, or the protective paint systems are to be used on other substrates such as non-ferrous metals or concrete, the specifications will have to take this into account. This part of ISO 12944 may also be used as a guide in such cases.

2 Normative references

The following documents, in whole or in part, are 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.

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

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

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

ISO 8501-4, *Preparation of steel substrates before application of paints and related products — Visual assessment of surface cleanliness — Part 4: Initial surface conditions, preparation grades and flash rust grades in connection with high-pressure water jetting*

ISO/DIS 12944-8:2016(E)

3 Terms and definitions

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

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

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 12944-5:1998, 5.4.

3.3 durability
expected life of a protective paint system to the first major maintenance 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

3.5 maintenance
sum of all measures, as covered by ISO 12944, which ensure that the function of the protection of the steel structure against corrosion is maintained

Note 1 to entry: Maintenance includes but is not limited to paint work. Such paint work can be patch painting (repair of degraded 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 specified for each coat or for the whole paint system to achieve the required durability

Note 1 to entry: For details see ISO 12944-5:1998, 5.4.

3.7 project
whole of the work for which the specification is being developed and which can include one or more structures.

3.8 specification
technical document describing all the requirements that are 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, protective coating system specification, coating work specification, inspection and assessment specification are defined in 3.8.1 to 3.8.4.

3.8.1**project specification**

specification that describes the project and the requirements relating specifically to it

3.8.2**protective paint system specification:**

specification 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

3.8.3**paint work specification:**

specification that describes the way the coating work is to be carried out, in conformity with the project specification and the protective coating system specification, as well as with the inspection and assessment specification

3.8.4**inspection and assessment specification**

specification that describes how inspection and assessment are to be carried out

3.9**specifier**

anyone responsible for the development of a specification

3.10**sample area**

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

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 the annexes.

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);

ISO/DIS 12944-8:2016(E)

- health and safety requirements;
- environmental protection requirements.

These parameters are described in detail in ISO 12944-1 to ISO 12944-7 and ISO 12944-9. In this part of ISO 12944, only such information is given which is considered to be particularly important to the specifier.

In the drafting of a specification for maintenance work on a structure or constituent element, a decision has to be taken between

- repair,
- partial renewal, and
- complete renewal.

When complete renewal has been decided, the specification should preferably be developed in accordance with a specification for new work, e.g. using the form given in annex G.

In Annex D is shown how to define the work for different types of maintenance work. The exact definition which kind of work is necessary shall be decided in dependence of the structure. Test areas can be useful to find a sufficient solution.

At an early stage in the drafting of a project specification, a final decision will have to be taken by the specifier on essential planning parameters, such as protection of slip-resistant connections using high-tensile bolts, the inside surfaces of hollow sections and other hidden steel surfaces (see ISO 12944-3 for details of design).

Exclusions, i.e. items not to be painted, shall be indicated in the specification(s).

The choice of protective paint systems shall be based on practical experience and/or the results of laboratory performance tests, particularly when new coating technology is involved. The protective paint systems shall be tested for compatibility with existing coatings on previously coated surfaces.

The specifier shall further take into account regulations and/or requirements relating to environmental protection, health and safety, and working conditions in the shop or on site.

Because national requirements concerning health and safety at work, pollution control etc. vary significantly, it may not be possible to include detailed information covering such requirements in a specification. However, the specification shall draw attention to the need to comply with current local, regional, national and international legislation and regulations.

5 Contents of a specification**5.1 Supply**

The items which are preferably to be covered by a specification are listed in tables 1 to 4, under the following headings:

- contents of a project specification (Table 1);
- contents of a protective paint system specification (Table 2);
- contents of a paint work specification (Table 3);
- contents of an inspection and assessment specification (Table 4).

NOTE 1 For small structures, or those whose protection is not subject to any particular requirements, only certain items need to be taken into account.

An example of a specification based on Table 1 is given as Annex F.

NOTE 2 Each table contains sufficient information to enable the specifier to write a specification for any one of the subjects listed above without having to make frequent references to the other tables. This has led to some expressions being repeated in each of the tables, for example under 1.1, 2.1, 3.1 and 4.1 the items "name of project", "name of owner" and "name of specifier" are repeated. In practice, such information should only be given once in the complete specification.

Table 1 — Contents of a project specification

No.	MAIN ITEM/Sub-item ^a	Remarks
1.1	GENERAL INFORMATION	
1.1.1	Name of project	
1.1.2	Name of customer	
1.1.3	Location(s) of structure(s)	
1.1.4	Name of specifier	State organization and person.
1.1.5	Environmental conditions at location(s) of structure(s)	See annex E and ISO 12944-2.
1.1.6	References to standards and regulations	
1.2	TYPE OF PROJECT	For definitions of project, structure and constituent element, see clause 3.
1.2.1	New construction without protection	
1.2.2	New construction blast-cleaned and coated	
1.2.3	Touch-up and final paint work	
1.2.4	Maintenance	See annexes H, I, J and K.
1.2.5	New construction and maintenance combined	
1.2.6	Items not to be coated	
1.3	DESCRIPTION OF EACH CONSTITUENT ELEMENT	Each structure should preferably be divided into constituent elements on the basis of the protective paint system(s) to be used and the corrosion stresses associated with each constituent element.
1.3.1	Substrate(s)	Metallic coatings, e.g. zinc, are part of the coating system.
1.3.2	Existing paint system and its condition	See annex K and ISO 12944-5.
1.3.3	Areas (m ²)	
1.4	DESCRIPTION OF ENVIRONMENT OF EACH CONSTITUENT ELEMENT	Descriptions are given in ISO 12944-2. See also annex E.
1.4.1	Atmospheric environmental conditions	See annex E, E.1.1.
1.4.2	Special situations	See annex E, E. 4.1.
1.4.3	Special stresses	See annex E, E.4.2 (including the effects of exposure to strong UV radiation).
1.5	DURABILITY	
1.5.1	Durability range	See ISO 12944-1.
1.6	PROTECTIVE PAINT SYSTEMS - PARTICULAR CONSTRAINTS WITH RESPECT TO SURFACES AND SURFACE PREPARATION	Details of types of surface, surface preparation grades, surface profiles and surface preparation methods can be found in ISO 12944-4. In the specification, the required surface preparation grade shall be given for each individual protective paint system to be used.