SLOVENSKI STANDARD
oSIST prEN ISO 8501-3:2024

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Priprava jeklenih podlag pred nanašanjem barv in sorodnih premazov - Vizualno ocenjevanje čistosti površine - 3. del: Stopnje priprave zvarov, robov in ostalih površin s površinskmi nepravilnosti (ISO/DIS 8501-3:2024)

Preparation of steel substrates before application of paints and related products - Visual assessment of surface cleanliness - Part 3: Preparation grades of welds, edges and other areas with surface imperfections (ISO/DIS 8501-3:2024)

Vorbereitung von Stahloberflächen vor dem Auftragen von Beschichtungsstoffen - Visuelle Beurteilung der Oberflächenreinheit - Teil 3: Vorbereitungsgrade von Schweißnähten, Kanten und anderen Flächen mit Oberflächenunregelmäßigkeiten (ISO/DIS 8501-3:2024)

Préparation des subjectiles d'acier avant application de peintures et de produits assimilés - Évaluation visuelle de la propreté de surface - Partie 3: Degrés de préparation des soudures, arêtes et autres zones présentant des imperfections de surface (ISO/DIS 8501-3:2024)

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ISO

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ISO/DIS 8501-3

Preparation of steel substrates before application of paints and related products — Visual assessment of surface cleanliness —

Part 3: Preparation grades of welds, edges and other areas with surface imperfections

Préparation des subjectiles d'acier avant application de peintures et de produits assimilés — Évaluation visuelle de la propreté d'un subjectile —

Partie 3: Degrés de préparation des soudures, arêtes et autres zones présentant des imperfections

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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).

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For an explanation of 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 www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 35, Paints and varnishes, Subcommittee SC 12, Preparation of steel substrates before application of paints and related products.

This third edition cancels and replaces the second edition (ISO 8501-3:2006), which has been technically revised. The main changes compared to the previous edition are as follows:

— Revised illustrations of types of imperfections, Table 1;

— New references to relevant ISO standards;

— Expanded introduction.

A list of all parts in the ISO 8501 series can be found on the ISO website. Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

The performance of protective coatings of paint and related products applied to steel is significantly affected by the state of the steel surface immediately prior to painting. Therefore, it is recommended that the entire steel building organization, including steel structures designers, is informed about the requirements of this document.

The principal factors that are known to influence this performance are:

a) the presence of rust and mill scale;

b) the presence of surface contaminants, including salts, dust, oils and greases;

c) the surface profile.

International Standards ISO 8501, ISO 8502 and ISO 8503 have been prepared to provide methods of assessing these factors, while ISO 8504 provide guidance on the preparation methods that are available for cleaning steel substrates, indicating the capabilities of each in attaining specified levels of cleanliness.

These International Standards do not contain recommendations for the protective coating system to be applied to the steel surface. Neither do they contain recommendations for the surface quality requirements for specific situations even though surface quality can have a direct influence on the choice of protective coating to be applied and on its performance. Such recommendations are given in other documents such as national standards and codes of practice. Users of these International Standards should ensure that the qualities specified are:

— compatible and appropriate both for the environmental conditions to which the steel will be exposed and for the protective coating system to be used;

— within the capability of the cleaning procedure specified.

The four International Standards referred to above deal with the following aspects of preparation of steel substrates:

— ISO 8501, *Visual assessment of surface cleanliness*;

— ISO 8502, *Tests for the assessment of surface cleanliness*;

— ISO 8503, *Surface roughness characteristics of blast-cleaned steel substrates*;

— ISO 8504, *Surface preparation methods*.

Each of these International Standards is in turn divided into separate parts.

Imperfections at welds, edges and other areas of steel substrates are generally starting points for corrosion. Such areas are also difficult to protect by application of paints and related products. To assist in achieving efficient corrosion protection, this part of ISO 8501 defines certain imperfections and preparation grades for such areas.

Steel imperfections may be generated in the manufacturing process or during handling, shipping, building and erection of a steel structure and could affect the durability of a protective coating system if they are not remedied.

The required preparation grade (P1-P3) for a specific steel structure should be based on the required longevity of the coating system and the corrosivity of the environment that the coated steel structure will be exposed to.

Ensure that the specified surface preparation grade is compatible with other steel structures requirements, e.g. those specified in:

— ISO 8501-1, *Preparation of steel substrates before application of paints and related products — Visual assessment of surface cleanliness — Part 1: Rust grades and preparation grades of uncoated steel substrates and of steel substrates after overall removal of previous coatings*;

— ISO 5817:2023, *Welding – Fusion-welded joints in steel, nickel, titanium and their alloys (beam welding excluded) — Quality levels for imperfections;*

— EN 10025, *Hot rolled products of structural steels;*

— EN 10225, *Weldable structural steels for fixed offshore structures - Technical delivery conditions*;

— EN 10163 series *Delivery requirements for surface condition of hot-rolled steel plates, wide flats and sections*.

Preparation of steel substrates before application of paints and related products — Visual assessment of surface cleanliness —

Part 3: Preparation grades of welds, edges and other areas with surface imperfections

1 Scope

This document identifies visible imperfections and defines three preparation grades for welds, edges and surfaces of steel to assist in achieving efficient corrosion protection. Such imperfections can become visible before and/or after an abrasive blast cleaning process.

The preparation grades given in this document have been selected to make steel with imperfections suitable for corrosion protection by paints and related products.

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 8501-1, *Preparation of steel substrates before application of paints and related products — Visual assessment of surface cleanliness — Part 1: Rust grades and preparation grades of uncoated steel substrates and of steel substrates after overall removal of previous coatings*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

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

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

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

3.1
as welded
condition of a weld, with or without imperfections, without any dressing

3.2
dressing a weld
grinding the surface of a weld to remove visible pores, lumps, welding spatter, excess metal and sharp edges, and/or correcting undercut or weld toe imperfections

3.3
visible
capable of being seen without tools in normal environmental conditions

4 General information

Protective coatings are applied to a substrate in liquid form. During the curing process, the liquid film forms a solid, continuous coating. This process is called film formation and is of crucial importance for the quality of the resulting coatings. Imperfections described in this document creates additional stresses in the coating during curing and cause weak points in the corrosion protection system after the coating is fully cured. The preparation grades given in this document have been selected to make steel with imperfections suitable for corrosion protection by paints and related products. The surface preparation levels P1 to P3 should be selected based on corrosivity and the desired durability of the coating system.

4.1 Recommended workflow

To avoid unnecessary production costs for steel structures that will be painted, it is recommended that the entire steel building organisation is informed about the requirements in this document. Involved parties include:

a) steel structures designer;

b) steel purchaser;

c) internal logistics;

d) quality manager;

e) welder and welding inspector.

Involved parties should be informed of the requirements in this document prior to starting any design, purchasing, shipping or welding work.

Ideally, all welds should be checked against the requirements in this document prior to welding approval. If additional grinding to meet the requirements of this document is needed after welding approval, the responsible welding quality manager shall be notified. Welds that are pre-treated after welding approval shall not be dressed in such a way that the resulting weld violate any form requirements and/or tolerances specified by the steel structures designer or welding quality manager.

The steel imperfections described in this document may be visible as built or as welded. Imperfections may in addition become visible after a cleaning process, e.g. those described in the ISO 8504-series.

An assessment of the pre-treatment grade should therefore include inspections both before cleaning pretreatment (as built or as welded) and inspections after each cleaning step described in ISO 8504-series.

5 Types of imperfections

The various types of imperfections are illustrated in Table 1. The required appearance after pretreatment is described by words and illustrative examples under the corresponding pretreatment grade P1, P2 and P3 in Clause 6, Table 1.

6 Preparation grades

The three preparation grades are as follows:

P1 **Minimal requirement:** Minimum preparation needs to be carried out.

P2 **Medium requirement:** Most imperfections are remedied.

P3 **High requirement:** All significant imperfections are remedied.

NOTE 1 It is possible that different imperfections on a structure require different preparation grades. For example, undercut (Table 1, 1.4) might require P3 preparation while all other imperfections might require P2 preparation.