

Preparation of steel substrates before application of paints and related products - Tests for the assessment of surface cleanliness - Part 4: Guidance on the estimation of the probability of condensation prior to paint application (ISO 8502-4:2017)

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

See Eesti standard EVS-EN ISO 8502-4:2017 sisaldab Euroopa standardi EN ISO 8502-4:2017 ingliskeelset teksti.	This Estonian standard EVS-EN ISO 8502-4:2017 consists of the English text of the European standard EN ISO 8502-4:2017.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
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Standard on kättesaadav Eesti Standardikeskusest.	The standard is available from the Estonian Centre for Standardisation.

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ICS 25.220.10

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English Version

Preparation of steel substrates before application of paints  
and related products - Tests for the assessment of surface  
cleanliness - Part 4: Guidance on the estimation of the  
probability of condensation prior to paint application (ISO  
8502-4:2017)

Préparation des subjectiles d'acier avant application de  
peintures et de produits assimilés - Essais pour  
apprécier la propreté d'une surface - Partie 4:  
Principes directeurs pour l'estimation de la probabilité  
de condensation avant application de peinture (ISO  
8502-4:2017)

Vorbereitung von Stahloberflächen vor dem Auftragen  
von Beschichtungsstoffen - Prüfungen zum Beurteilen  
der Oberflächenreinheit - Teil 4: Anleitung zum  
Abschätzen der Wahrscheinlichkeit von Taubildung  
vor dem Beschichten (ISO 8502-4:2017)

This European Standard was approved by CEN on 19 September 2016.

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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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EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

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## European foreword

This document (EN ISO 8502-4:2017) has been prepared by Technical Committee ISO/TC 35 "Paints and varnishes" in collaboration with Technical Committee CEN/TC 139 "Paints and varnishes" the secretariat of which is held by DIN.

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 August 2017, and conflicting national standards shall be withdrawn at the latest by August 2017.

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.

This document supersedes EN ISO 8502-4:1999.

According to the CEN-CENELEC Internal Regulations, the national standards organizations 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, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

## Endorsement notice

The text of ISO 8502-4:2017 has been approved by CEN as EN ISO 8502-4:2017 without any modification.

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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](http://www.iso.org/directives)).

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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 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](http://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 second edition cancels and replaces the first edition (ISO 8502-4:1993), which has been technically revised with the following changes:

- a) normative references have been updated;
- b) mercury thermometer has been replaced by thermometer in [Clause 4 a](#));
- c) additional information is given in the note to [Clause 4 b](#));
- d) combined instrument described in [Clause 4 d](#));
- e) notes on instrument properties have been added in [Clause 4](#);
- f) in [5.2](#), “at a given atmospheric pressure” has been added to read “Their parameters are air temperature and relative humidity at a given atmospheric pressure”;
- g) in [5.3](#), it has been added that non-contact thermometers should not be used;
- h) [5.4](#) has been changed to account for the definition of high and low risk of condensation given in [Clause 3](#);
- i) description of the procedure with combined instruments has been added in [5.5](#).
- j) a reference to the formula used in [Annex A](#) has been added.

ISO 8502 consists of the following parts, under the general title *Preparation of steel substrates before application of paints and related products — Tests for the assessment of surface cleanliness*:

- *Part 2: Laboratory determination of chloride on cleaned surfaces*
- *Part 3: Assessment of dust on steel surfaces prepared for painting (pressure-sensitive tape method)*

- *Part 4: Guidance on the estimation of the probability of condensation prior to paint application*
- *Part 5: Measurement of chloride on steel surfaces prepared for painting (ion detection tube method)*
- *Part 6: Extraction of soluble contaminants for analysis — The Bresle method*
- *Part 9: Field method for the conductometric determination of water-soluble salts*
- *Part 11: Field method for the turbidimetric determination of water-soluble sulfate*
- *Part 12: Field method for the titrimetric determination of water-soluble ferrous ions*

## 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. The principal factors that are known to influence this performance are as follows:

- a) presence of rust and mill scale;
- b) presence of surface contaminants, including salts, dust, oils and greases;
- c) surface profile.

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

These series of International Standards do not contain recommendations for the protective coating systems 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 found in other documents such as national standards and codes of practice. It will be necessary for the users of these International Standards to 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, and
- within the capability of the cleaning procedure specified.

The four series of International Standards referred to above deal with the following aspects of preparation of steel substrates before application of paints and related products:

- ISO 8501 on visual assessment of surface cleanliness;
- ISO 8502 on tests for the assessment of surface cleanliness;
- ISO 8503 on surface roughness characteristics of blast-cleaned steel substrates;
- ISO 8504 on surface preparation methods.

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

Some paints (but not all) require dry surfaces when being applied to steel structures. Thin films of condensed water on steel surfaces are mostly invisible. It is therefore important to have a method by which the probability of condensation can be estimated prior to the application of paint.



# Preparation of steel substrates before application of paints and related products — Tests for the assessment of surface cleanliness —

## Part 4: Guidance on the estimation of the probability of condensation prior to paint application

### 1 Scope

This part of ISO 8502 gives guidance on the estimation of the probability of condensation on a surface to be painted. It may be used to establish whether conditions at the job site are suitable for painting or not.

### 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.

ISO 8601, *Data elements and interchange formats — Information interchange — Representation of dates and times*

### 3 Probability of condensation

The relative humidity of the air and the steel surface temperature are the basis for the estimation of the probability of condensation, but there is no simple rule to employ. The situation is complex because there are a multitude of factors which have an influence on the condensation and evaporation of moisture, such as

- heat conductance of the structure,
- solar radiation on the surface,
- flow of ambient air around the structure, and
- contamination by hygroscopic substances on the surface.

These factors sometimes provoke wetting or prevent drying locally on the surface, e.g. where the surface temperature remains low or tends to fall due to heat losses or where the air becomes quickly saturated due to reduced ventilation. Naturally, the same factors sometimes have the opposite effect. Therefore, any test results should be interpreted with the greatest care.

Unless otherwise agreed, the steel surface temperature should generally be at least 3 °C above the dew-point when paints are used.

NOTE 1 For paints that are tolerant to moisture on the surface, a temperature difference less than 3 °C might be acceptable.

Other temperature differences may be specified by the paint manufacturer or agreed by the interested parties.