INTERNATIONAL STANDARD

ISO 8502-4

Second edition
2017-01

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

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

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 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 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.