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Paints and varnishes — Standard panels for testing

Peintures et vernis — Panneaux normalisés pour essai

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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).

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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.

The committee responsible for this document is ISO/TC 35, *Paints and varnishes*, Subcommittee SC 9, *General test methods for paints and varnishes*.

This fifth edition cancels and replaces the fourth edition (ISO 1514:2004), which has been technically revised with the following changes:

a) the preparation by zinc-phosphate and chromate treatment, chromate conversion coating and acid chromating, was deleted;

b) the following materials have been amended: coil-coated panels, plastics panels, glass-fibre reinforced plastics composite panels (GRP), carbon-fibre reinforced plastics composite panels (CFP);

c) the former Annex B on characterization of zinc and zinc alloy coatings has been deleted;

d) a new Annex B on common substrate panel has been added;

e) the normative references have been updated.

Introduction

For many of the test methods most widely used for paints and varnishes, the type of panel used and the particular way in which it is prepared for use can affect the test results to a significant degree. Consequently, it is important to standardize as carefully as possible both the panels and the procedures used to prepare the panels prior to painting.

It is not possible to include in an International Standard all the types of panels and preparation needed for paint testing

This International Standard describes preparation procedures that are known to be reproducible and gives additional guidance in instances where there might still be doubt due to lack of international uniformity of the procedure.

Paints and varnishes — Standard panels for testing

1 Scope

This International Standard specifies several types of standard panels and describes procedures for their preparation prior to painting. These standard panels are for use in general methods of test for paints, varnishes and related products (see Annex B).

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 1268 (all parts), *Fibre-reinforced plastics — Methods of producing test plates*

ISO 2409, *Paints and varnishes — Cross-cut test*

ISO 2808, *Paints and varnishes — Determination of film thickness*

ISO 4287, *Geometrical Product Specifications (GPS) — Surface texture: Profile method — Terms, definitions and surface texture parameters*

ISO 8336, *Fibre-cement flat sheets — Product specification and test methods*

ISO 11949, *Cold-reduced electrolytic tinplate*

EN 520, *Gypsum plasterboards — Definitions, requirements and test methods*

EN 622 (all parts), *Fibreboards — Specifications*

EN 1396, *Aluminium and aluminium alloys — Coil coated sheet and strip for general applications — Specifications*

EN 10205, *Cold reduced blackplate in coil form for the production of tinplate or electrolytic chromium/chromium oxide coated steel*

EN 13523-1, *Coil coated metals — Test methods — Part 1: Film thickness*

EN 13523-22, *Coil coated metals — Test methods — Part 22: Colour difference — Visual comparison*

EN 15283-2, *Gypsum boards with fibrous reinforcement — Definitions, requirements and test methods — Part 2: Gypsum fibre boards*

EN 16245-1, *Fibre-reinforced plastic composites — Declaration of raw material characteristics — Part 1: General requirements*

3 Steel panels

3.1 Material

Steel panels intended for general testing (as opposed to panels intended for testing for particular applications and uses) shall be free from rust, scratches, staining, discoloration and other surface defects. The physical dimensions of the panel shall be as specified in the description of the test method, or as otherwise agreed.

3.2 Storage prior to preparation

Prior to preparation, panels shall be stored in a manner that protects them from corrosion.

3.3 Preparation by solvent cleaning

Wipe the panel to remove any excess oil, and then wash it thoroughly with a suitable solvent to remove all excess of oil.

Ensure that any small fibres deposited by cleaning cloths are removed in the cleaning process, and that cloths are changed at predetermined intervals to avoid redeposition of oily residues. Do not contaminate the cleaned panels. Allowing the solvent to evaporate, lightly wiping the panels with a clean linen cloth and subjecting the panels to a stream of warm dry air are suitable methods of drying. If necessary, lightly warm the panels to remove any traces of condensed moisture.

If it is not feasible to apply the paint coating immediately after cleaning, the cleaned panels shall be stored in a dry and clean atmosphere, such as a desiccator containing an active desiccant, until required for use. It is also acceptable practice to wrap the panels in suitable paper.

Contaminated surfaces may be cleaned using a solvent which evaporates rapidly and residue-free which does not alter the material chemically.

3.4 Preparation by aqueous cleaning (spray or immersion process)

Clean the panels with a commercially available aqueous alkaline cleaner. A spray cleaning process is recommended, but an immersion cleaning process is also acceptable. Maintain the cleaner concentration and temperature in accordance with the recommendations of the cleaner manufacturer.

Cleaning by a spraying method is performed in four steps.

a) Clean each side of the plates at least 10 s. Set the temperature and the spray pressure as recommended by the manufacturer of the cleaning agent.

b) Rinse each side of the plates with tap water. Ensure that the wash water is not significantly contaminated during the cleaning process. This can be achieved by flooding the reservoir for the wash water continuously or from time to time with fresh tap water.

c) Rinse each side of the plates with deionized water, which has a conductivity of max. 20 µS/cm.

d) Dry the plates immediately after rinsing in an oven or with a hot air stream.

Steps b) to d) shall also be applied after the cleaning in an immersion process.

If it is not feasible to apply the paint coating immediately after cleaning, the cleaned panels shall be stored in a dry and clean atmosphere, such as a desiccator containing an active desiccant, until required for use. It is also acceptable practice to wrap the panels in suitable paper.

Contaminated surfaces may be cleaned using a solvent which evaporates rapidly and residue-free which does not alter the material chemically.

3.5 Preparation by abrasion

3.5.1 General

Some testing applications require a more uniform and reproducible surface than is available on steel, as rolled by the mill. In such cases, it is necessary to remove surface variability and contamination through mechanical abrasion. To ensure complete removal of contamination and variability, it is necessary to completely remove the original mill surface.

Prior to abrading, panels should be cleaned as described in 3.3 or 3.4. Unless otherwise agreed, the surface removal shall be accomplished as described in 3.5.2 and 3.5.3.

3.5.2 Hand abrasion

This involves abrading the panel by hand using preferably P220 silicon carbide paper. The following is a suitable sequence of operations for use in hand abrasion.

a) Abrade the panel uniformly straight across its face in a direction parallel to any one side.

b) Abrade the panel at a right angle to the initial direction until all signs of the original abrasion have been removed.

c) Abrade the panel using a circular motion, until a pattern is produced consisting solely of circular abrasion marks, superimposed one upon another.

3.5.3 Circular mechanical abrasion

This involves burnishing the panel by mechanical means using preferably P220 silicon carbide paper. When this method is employed, the panel shall be burnished using a circular motion. The operation shall be considered complete when no sign is visible of the original surface or any undulations.

3.5.4 Linear grinding

This involves a conveyor system using an abrasive belt mounted on a vertical grinding head to remove the original mill surface and produce a linear scratch finish on the panel. Grinding the surface with abrasive belts removes contamination and provides a surface that is more uniform and reproducible than a typical mill finish. A P100 aluminium oxide abrasive belt is suitable for use in this operation.

3.6 Inspection and cleaning

Inspect the abraded panels to ensure that the original surface has been completely removed. Clean the panels thoroughly as described in 3.3 or 3.4 to remove any loose grit, steel particles or other contaminants.

If it is not feasible to apply the subsequent coating immediately, store the clean panels in a clean and dry atmosphere, such as a desiccator containing an active desiccant, or wrap the panels in suitable paper.

3.7 Preparation by phosphate treatment

3.7.1 General

Phosphate conversion coatings are available from a number of sources, as proprietary compounds or processes, for application by spray or immersion. Follow the manufacturer's directions as to the application of the conversion coating. Preparation of test panels may consist of one or more steps of cleaning, rinsing and conditioning prior to the application of the conversion coating. Additional rinsing will usually be required after the conversion coating has been applied. If phosphate-treated panels are required, use the following method of preparation.

3.7.2 Amorphous iron phosphate treatment

This conversion coating method consists of reacting the steel surface in an acid phosphate solution containing oxidizing agents and accelerating salts. The steel surface is converted to an amorphous iron phosphate coating that improves the adhesion of subsequently applied coatings and inhibits corrosion to a lesser degree than the crystalline zinc phosphate coating. This treatment can be applied by spraying or immersion. Solution temperatures, concentrations and contact times will vary with the method of application and should be maintained in accordance with the chemical manufacturer's recommendations. Iron phosphate coatings typically range in colour from yellow-blue to purple.