



SLOVENSKI STANDARD
SIST EN 13523-3:2002
01-september-2002

Coil coated metals - Test methods - Part 3: Colour difference - Instrumental comparison

Bandbeschichtete Metalle - Prüfverfahren - Teil 3: Farbabstand - Farbmetrischer Vergleich

Tôles prélaquées - Méthodes d'essai - Partie 3: Différence de couleur - Comparaison au moyen d'instruments

ITeH STANDARD PREVIEW

(standards.iteh.ai)

SIST EN 13523-3:2002

Ta slovenski standard je istoveten z: **EN 13523-3:2001**

<https://standards.iteh.ai/catalog/standards/sist/2f0046c-8969-4709-aed9-c292c7dcdb9/sist-en-13523-3-2002>

ICS:

17.180.20	Barve in merjenje svetlobe	Colours and measurement of light
25.220.60	Organske prevleke	Organic coatings

SIST EN 13523-3:2002

en

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 13523-3:2002

<https://standards.iteh.ai/catalog/standards/sist/2fc0046c-8969-4709-aed9-e292e7dcbdb9/sist-en-13523-3-2002>

EUROPEAN STANDARD

EN 13523-3

NORME EUROPÉENNE

EUROPÄISCHE NORM

January 2001

ICS 17.180.20; 25.220.60

English version

Coil coated metals - Test methods - Part 3: Colour difference - Instrumental comparison

Tôles prélaquées - Méthodes d'essai - Partie 3: Différence de couleur - Comparaison au moyen d'instruments

Bandbeschichtete Metalle - Prüfverfahren - Teil 3: Farbabstand - Farbmetrischer Vergleich

This European Standard was approved by CEN on 30 December 2000.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Management Centre or to any CEN member.

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 Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

[SIST EN 13523-3:2002](https://standards.iteh.ai/catalog/standards/sist/2fc0046c-8969-4709-aed9-e292e7dcbdb9/sist-en-13523-3-2002)

<https://standards.iteh.ai/catalog/standards/sist/2fc0046c-8969-4709-aed9-e292e7dcbdb9/sist-en-13523-3-2002>



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

Management Centre: rue de Stassart, 36 B-1050 Brussels

Foreword

This European Standard has been prepared by 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 July 2001, and conflicting national standards shall be withdrawn at the latest by July 2001.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

1 Scope

This Part of EN 13523 specifies procedures for determining the instrumental colour difference (CIELAB) of an organic coating on a coil coated metal.

Establishing a standard as well as the magnitude of an acceptable colour difference are not covered by this method.

Two appropriate methods are given in this part of EN 13523:

- a) instrumental colour difference measurement using a tristimulus colorimeter;
- b) instrumental colour difference measurement using a spectrophotometer or equivalent.

Excluded from this method are specimens producing fluorescence, showing significant metamerism, and which are multi-coloured, pearlescent or metallic.

In order to determine whether metamerism is present, the metamerism index is determined (see EN 13523-15) and/or a visual examination (see the document in preparation, WI 00139156, Part 22 of this Standard) is performed with different artificial light sources.

2 Normative references

This European Standard incorporates, by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN 13523-0:2001

Coil coated metals – Test methods – Part 0: General introduction and list of test methods

EN 23270:1991

Paints and varnishes and their raw materials – Temperatures and humidities for conditioning and testing (ISO 3270:1984)

ISO 7724-3:1984

Paints and varnishes – Colorimetry – Part 3: Calculation of colour differences

3 Terms and definitions

For the purposes of EN 13523-3:2001 the terms and definitions given in EN 13523-0:2001 as well as the following terms and definitions apply:

3.1

colour

sensation resulting from the visual perception of radiation of a given spectral composition. [EN 971-1 : 1996]

3.2

embossed coating

coating which, when dried, has been mechanically impressed with a pattern.

3.3

metamerism

phenomenon characterized by the difference in colour observed when two specimens visually matching under a given light source are viewed under another light source with different spectral characteristics.

3.4 textured coating

coating which, after drying, is characterized by a relief surface.

4 Principle

The tristimulus values X , Y and Z (see ISO 7724-1:1984) of both standard colour reference panel (called "standard" through the text) and specimen are measured. Colour differences between the two measurements are calculated from these tristimulus values (see ISO 7724-3:1984).

5 Apparatus

Ordinary laboratory apparatus, together with the following:

5.1 Tristimulus colorimeter

5.2 Recording spectrophotometer or equivalent. The instrument shall provide the possibility of obtaining the tristimulus values either for the 2°-standard colorimetric observer and source C or for the 10°-supplementary standard colorimetric observer and source D65. The latter conditions of 10° observer and D65 source are preferred.

The measured area shall have a minimum diameter of 10 mm.

6 Sampling

See EN 13523-0:2001.

7 Specimens

See EN 13523-0:2001.

The surfaces to be measured shall be at least as large as the area of the measuring aperture and shall be flat against the measuring aperture.

8 Procedure

8.1 Calibration

Use the apparatus in accordance with the manufacturer's instructions, particularly with regard to warm-up time and calibration.

8.2 Measurement

Measure the colour at ambient temperature. In cases of dispute, the test temperature shall be defined as (23 ± 2) °C and the relative humidity as (50 ± 5) %, in accordance with EN 23270:1991.

Measure in the wavelength range of at least 400 nm to 700 nm in intervals not greater than 20 nm with a half-intensity width of the monochromator less than 20 nm. In special cases, such as highly chromatic paint films with steep spectral reflectance curves measurements in 10 nm or 5 nm intervals using a monochromator with 10 nm or 5 nm half-intensity width are more accurate.

The illumination/viewing geometry shall be one of the following:

- a) 45°/0° or 0°/45°;
- b) integrating sphere ($d/8^\circ$ or $8^\circ/d$) excluding specular reflection.

Determine first the tristimulus values of the standard. Immediately thereafter determine the tristimulus values of the specimen.

Using these tristimulus values, calculate the colour difference and its components, using the CIELAB formula given in ISO 7724-3:1984.

Colour differences shall not be compared when they are obtained by different colour scale system equations.

Textured and embossed coatings shall be measured with an integrating sphere or with 45°-circumference illumination. An approximate result may be obtained by turning the specimens three times through 90° to obtain four measurements.

9 Expression of results

Express the value of the instrumental colour difference in terms of the relevant colour coordinates ΔL^* , Δa^* , Δb^* or ΔL^* , ΔC_{ab}^* , ΔH_{ab}^* in addition to the total colour difference ΔE_{ab}^* .

ΔL^*	positive	=	lighter than standard
ΔL^*	negative	=	darker than standard
Δa^*	positive	=	redder than standard
Δa^*	negative	=	greener than standard
Δb^*	positive	=	yellower than standard
Δb^*	negative	=	bluer than standard
ΔC_{ab}^*	positive	=	specimen has more chroma (colour saturation) relative to the standard
ΔC_{ab}^*	negative	=	specimen has less chroma (colour saturation) relative to the standard
ΔH_{ab}^*	positive	=	In the CIELAB system ΔH_{ab}^* positive indicates that the hue angle ($\arctan b^*/a^*$) deviates from the standard in an anticlock-wise direction, i.e. in the sequence red to yellow to green to blue.
ΔH_{ab}^*	negative	=	The hue angle deviates from the standard in a clockwise direction, i.e. in the sequence blue to green to yellow to red.

The total colour difference ΔE_{ab}^* is a mathematical combination of the above colour difference components. Calculate the total colour difference ΔE_{ab}^* of textured coatings as the mean of the individual ΔE_{ab}^* measurements.

10 Precision

For dark colours (e.g. blues, browns, blacks) or for bright colours of high chroma (e.g. reds, yellows), the error in reflectance measurement at certain wavelengths may be sufficient to give misleading results. In these cases visual comparison is essential (see the document in preparation, WI 00139156, Part 22 of this Standard).

11 Test report

The test report shall contain at least the following information:

- all details necessary to identify the product tested;
- a reference to this Part of EN 13523 (EN 13523-3);
- the instrument used;
- the source and observer used;
- the geometry used;
- the colour difference equation;
- the colour difference value (see clause 9);
- components of the colour difference, if required;
- any deviation from the test method specified;
- the date of the test.

Bibliography

EN 971-1:1996

Paints and varnishes – Terms and definitions for coating materials – Part 1: General terms

EN 1396:1996

Aluminium and aluminium alloys – Coil coated sheet and strip for general applications – Specifications

EN 10169-1:1996

Continuously organic coated (coil coated) steel flat products – Part 1: General information (definitions, materials, tolerances, test methods)

ENV 10169-2:1999

Continuously organic coated (coil coated) steel flat products – Part 2: Products for building exterior applications

prEN 13523-15:2000

Coil coated metals – Test methods – Part 15: Metamerism

ISO 7724-1:1984

Paints and varnishes – Colorimetry – Part 1: Principles

DIN 6172:1993

Metamerie-Index von Probenpaaren bei Lichtartwechsel

WI 00139156

Coil coated metals – Test methods – Part 22: Colour difference – Visual comparison

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN 13523-3:2002](https://standards.iteh.ai/catalog/standards/sist/2fc0046c-8969-4709-aed9-e292e7dcbdb9/sist-en-13523-3-2002)

<https://standards.iteh.ai/catalog/standards/sist/2fc0046c-8969-4709-aed9-e292e7dcbdb9/sist-en-13523-3-2002>