SLOVENSKI STANDARD
SIST ISO 2846-3:2005

01-januar-2005

Grafična tehnologija - Barvni učinki in prozornost sklanih (procesnih) tiskarskih barv - 3. del: Revijalni globoki tisk

Graphic technology -- Colour and transparency of printing ink sets for four-colour-printing -- Part 3: Publication gravure printing

Technologie graphique -- Couleur et transparence des gammes d'encre d'impression en quadrichromie -- Partie 3: Impression hélio

Ta slovenski standard je istoveten z: ISO 2846-3:2002

ICS:

17.180.20	Barve in merjenje svetlobe	Colours and measurement of light
87.080	Barvila. Tiskarske barve	Inks. Printing inks

SIST ISO 2846-3:2005 **en**

INTERNATIONAL STANDARD

ISO 2846-3

First edition
2002-10-01

Graphic technology — Colour and transparency of printing ink sets for four-colour-printing —

Part 3: Publication gravure printing

Technologie graphique — Couleur et transparence des gammes d'encre d'impression en quadrichromie —

Partie 3: Impression hélio

Reference number
ISO 2846-3:2002(E)

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.ch
Web www.iso.ch

Printed in Switzerland

Contents

Page

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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this part of ISO 2846 may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 2846-3 was prepared by Technical Committee ISO/TC 130, *Graphic technology.*

ISO 2846 consists of the following parts, under the general title *Graphic technology — Colour and transparency of printing ink sets for four-colour-printing:*

— *Part 1: Sheet-fed and heat-set web offset lithographic printing*

— *Part 2: Coldset offset lithographic printing*

— *Part 3: Publication gravure printing*

— *Part 4: Screen printing*

— *Part 5: Flexographic printing*

Annex A forms a normative part of this part of ISO 2846. Annexes B to D are for information only.

Introduction

The demand for the publication gravure printing process to become more consistent and predictable has required a means of standardizing the product to ensure the easy flow of business between the various parties involved in its production. An essential component in this process is the colorimetric characteristics of the ink set.

To produce a set of standard four-colour process inks suitable for gravure printing it is necessary to specify a number of parameters. It is the purpose of this part of ISO 2846 to describe those parameters which affect the colorimetric characteristics in such a manner that a standard set of inks can be supplied by any ink manufacturer to any printer who can then supply prints to a print buyer with confidence in the colour of the work produced.

This part of ISO 2846 will allow publication gravure printers to obtain different sets of inks that will produce a similar colour when printed on the same substrate. In addition, it will allow colour separations for gravure printing to be based on known colour standards. The colorimetric characteristics specified may only be obtained when the inks are printed on the reference substrate. However, two inks of the same type that are similar in colorimetric characteristics and transparency according to this part of ISO 2846 will normally ensure similarity on another substrate.

Graphic technology — Colour and transparency of printing ink sets for four-colour-printing —

Part 3:
Publication gravure printing

1 Scope

This part of ISO 2846 specifies the colour and transparency to be produced by a process colour ink set including extender intended for four-colour publication gravure printing when printed under specified gravure printing conditions. It also specifies the test method to ensure conformance.

This part of ISO 2846 does not specify pigments (or spectral reflectance) in order not to preclude developments which may enable different pigment combinations to be used advantageously while still achieving the colorimetric requirements specified in this part of ISO 2846.

NOTE This part of ISO 2846 may also apply to certain non-publication gravure applications.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of ISO 2846. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of ISO 2846 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 535:1991, *Paper and board — Determination of water absorptiveness — Cobb method*

ISO 536:1995, *Paper and board — Determination of grammage*

ISO 2144:1997, *Paper, board and pulps — Determination of residue (ash) on ignition at 900 °C*

ISO 2846-1:1997, *Graphic technology — Colour and transparency of ink sets for four-colour-printing — Part 1: Sheet-fed and heat-set web offset lithographic printing*

ISO 6588:1981, *Paper, board and pulps — Determination of pH of aqueous extracts*

ISO 8254-1:1999, *Paper and board — Measurement of specular gloss — Part 1: 75° gloss with a converging beam, TAPPI method*

ISO 8791-4:1992, *Paper and board — Determination of roughness/smoothness (air leak methods) — Part 4: Print-surf method*

ISO 13655:1996, *Graphic technology — Spectral measurement and colorimetric computation for graphic arts images*

3 Terms and definitions

For the purposes of this part of ISO 2846, the following terms and definitions apply.

3.1
extension
addition of a transparent material (colorant-free ink) to the ink to reduce the pigment concentration without significantly influencing the rheological properties of the ink

3.2
press-ready ink
ink that has all necessary components and is at press viscosity

3.3
transparency
ability of an ink film to transmit and absorb light without scattering

NOTE It is generally expressed as some measure of the unwanted scattering.

[ISO 2846-1:1997, 3.5]

4 Test method

4.1 Principle

Each ink shall be printed on the reference substrate described in annex A at a range of colorations obtained by varying the extension of the press-ready ink. The colours which result shall be measured colorimetrically and the colour difference between the sample and the pertinent value in Table 1 shall be plotted versus the percentage of press-ready ink. If one or more samples conform to the values and tolerances specified, and the ink also meets the transparency criteria, that ink complies to this part of ISO 2846.

Transparency, T, shall be evaluated by printing or applying each of the chromatic process inks on a black substrate at a range of ink extensions. The CIELAB colour difference, ΔE_{ab}^*, shall be determined for each sample, between the overprinted and unprinted black. The linear regression coefficient (slope of the regression line) between the percentage by mass of press-ready ink in each of the extended ink samples being tested and colour difference shall be calculated from a plot of ΔE_{ab}^* vs. percentage press-ready ink over a range of extensions. An ink conforms to this requirement if the transparency, T, which is the reciprocal of the regression coefficient, is negative or greater than the value specified. For further details, see annex D.

4.2 Test print preparation

4.2.1 Prints for colorimetric evaluation

For each ink to be evaluated, prepare an extension series with 50 %, 60 %, 70 %, 80 %, 90 % and 100 % of press-ready ink using extender diluted to press viscosity. Apply the series of extended inks to the reference substrate specified in annex A with a method that produces an even ink film thickness. Examples are printing with a printability tester for gravure inks or coating applicator. The wet ink film thickness used for the extension series shall be approximately equal.

The method chosen shall produce a curve that shows a pronounced minimum or a data point which is in conformance with Table 1 when ΔE_{ab}^* is plotted versus percentage of press-ready ink. If the extension series does not produce such a curve, produce another series of specimens with a different ink film thickness. Produce a higher ink film thickness if the colour difference decreases with an increasing percentage of press-ready ink. Produce a lower ink film thickness if the colour difference decreases with a decreasing percentage of press-ready ink.

See annex D for further information.

4.2.2 Prints for transparency evaluation

Test prints for transparency evaluation shall be produced by printing the inks to be tested over black. The black shall have a lightness (L^*) less than 6 when determined according to ISO 13655.

One appropriate substrate is the contrast card[1)].

Since the CIELAB values of the black need to be established, both when unprinted and overprinted by the chromatic ink, the measurements of the black alone shall be made prior to overprinting.

The ink to be tested shall then be printed on the substrate such that a range of samples is achieved, each with a different percentage of press-ready ink.

4.2.3 Drying of test prints

Prior to colour measurement, all samples shall be thoroughly dried.

4.3 Colour measurement procedure

Test prints shall be measured in accordance with ISO 13655, except that a substrate backing consisting of at least 3 sheets of the unprinted reference substrate shall be used.

NOTE The samples are measured spectrally, with a 0°/45° or 45°/0° geometry instrument. For calculation of CIELAB values and colour differences, CIE 1931 (2°) standard colorimetric observer data are used together with CIE illuminant D_{50}.

5 Colour and transparency

5.1 General

For an ink to conform to this part of ISO 2846 it shall meet the specification for colour defined in 5.2 and the specification for transparency defined in 5.3.

5.2 Colorimetric values

To meet the specification for colour, an ink shall produce a colour that falls within the colour difference tolerances from the specified colorimetric values given in Table 1, when printed as defined in 4.2.1 at some percentage of press-ready ink.

NOTE 1 Unlike some other parts of ISO 2846, this part of ISO 2846 does not specify limits for concentration or ink film thickness within which to meet the specified colour difference, as such requirements are not applicable to the gravure process.

NOTE 2 Typical spectral data for inks conforming to this part of ISO 2846 are provided in annex B. Reference spectral data for 8°/diffuse (specular included) are also included in annex B.

NOTE 3 CIELAB data calculated from the CIE 1931 (2°) standard colorimetric observer, together with CIE standard illuminant D_{65}, are included in annex C for both geometries. CIELAB data for 8°/diffuse or diffuse/8° (specular included) geometry and illuminant D_{50} are also included in that annex.

---

1) Leneta paper or card (No. 105C) which can be purchased from Leneta Corp. Mahwah, N.J., USA. Leneta paper or card is a tradename of a product supplied by Leneta Corp. This information is given for the convenience of the users of this part of ISO 2846 and does not constitute an endorsement by ISO of the product named. Equivalent products may be used if they can be shown to lead to the same results.