

TRÜKITEHNOLOOGIA

**Neljavärvitrükis kasutatavate trükivärvikomplektide
värv ja läbipaistvus**

**Osa 1: Poognatrükk ja *heat-set* rulloffsetlitograafia
(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 2846-1:1997)

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

<p>Käesolev Eesti standard EVS-ISO 2846-1:2007 "Trükitehnoloogia. Neljavärvitrükkis kasutatavate trükivärvikomplektide värv ja läbipaistvus. Osa 1: poognatrükk ja <i>heat-set</i> rullofsetlitograafia" sisaldab rahvusvahelise standardi 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" identset ingliskeelset teksti.</p>	<p>This Estonian Standard EVS-ISO 2846-1:2007 consists of the identical English text of the International Standard 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".</p>
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<p>Standard EVS-ISO 2846-1:2007 on kinnitatud Eesti Standardikeskuse 30.05.2007. käskkirjaga ja jõustub sellekohase teate avaldamisel EVS Teataja 2007. aasta juuniku numbris.</p>	<p>This standard is ratified with the order of Estonian Centre for Standardisation dated 30.05.2007 and is endorsed with the notification published in the official bulletin of the Estonian national standardisation organisation.</p>
<p>Standard on kättesaadav Eesti Standardikeskusest.</p>	<p>The standard is available from Estonian Centre for Standardisation.</p>

Käsitlusala

ISO 2846 käesolev osa määrab kindlaks teatud värvid, mille tekitavad neljavärvitüki-ofsetlitograafias (nii proovitrükkide kui tootmistrükkide trükkimisel) kasutatavad trükivärviseeriad, kui neid prinditakse laboris printimisomaduste katseseadme abil kindlates tingimustes, kindlale alusmaterjalile. Vastavuse tagamiseks kirjeldab see osa ka katsemeetodit. Esitatud on kehtib poognatrükkis, *heat-set* rullofsettrükkis ja kiirgustahkestamisprotsessis kasutatavate trükivärvide kohta.

ISO 2846 käesolev osa ei kehti fluorestseerivatele trükivärvide kohta ning siin ei määrata kindlaks pigmente, et mitte takistada teistsuguste pigmendikombinatsioonide eelkat kasutamist tulevikus käesolevale standardile vastavate kolorimeetriliste nõuete täitmiseks.

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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.

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.

International Standard ISO 2846-1 was prepared by Technical Committee ISO/TC 130, *Graphic technology*.

It cancels and replaces ISO 2846:1975 and ISO 2845:1975, of which it constitutes a technical revision.

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

- *Part 1: Sheet-fed and heat-set web offset lithographic printing*
- *Part 2: Newspaper printing*

Annex A forms an integral part of this part of ISO 2846. Annexes B to E are for information only.

Introduction

The original version of this part of ISO 2846 (ISO 2846:1975) was produced to allow lithographic printers to obtain different sets of inks (both for proof and production printing) which would produce a similar colour when printed on the same substrate at the appropriate film thickness. By doing this, it enabled colour separations for offset-lithographic printing to be based on known colour standards. It was accepted that the colorimetric characteristics specified would only be obtained when the inks were printed on the reference substrate. However, it was noted that similarity of two inks on a reference substrate would ensure similarity on another substrate, as described above, and thereby enable industry specifications or standards for all substrates to be developed when based on these inks. As time has passed, such specifications have become increasingly important, so the significance of this part of ISO 2846 has increased since its development.

The original specification was based on extensive measurements of commercial ink sets made in Europe during the 1960s. However, by the end of the 1980s it was clear that some changes in the colour of commercial inks had occurred and therefore the need for a revision of ISO 2846:1975 was required. This revision is based on input from the European Confederation of Paint, Printing Ink and Artists' Colour Manufacturers' Associations (CEPE) who measured a number of European commercial ink sets in recommending that a new standard (CIE 30-89) be prepared; colorimetric data of commercial process inks of seven German manufacturers collected by FOGRA; the National Association of Printing Ink Manufacturers (NAPIM) in the USA who used inks for SWOP[®] (Specifications for Web Offset Publications) as the basis of their ink data set and the Japan Printing Ink Makers' Association who also defined a set of standard colours based on measurements of commercial ink sets, known as Japan Colour Ink SF-90. More details on this are given in annex C.

A joint working group consisting of TC 130 process control and material experts examined the three inputs and found that a single set of colour coordinates could adequately represent all three proposals within reasonable tolerances. It was also agreed that other changes and extensions to the original International Standard ISO 2846:1975 were appropriate, including the inclusion of black ink, a new measure of transparency (and therefore no definition of secondaries), changes to the colorimetric references and explicit inclusion of inks requiring drying methods other than oxidation drying. (Inks for cold-set newspaper printing are considered in ISO 2846-2.)

In comparison with ISO 2846:1975 the following major changes were made for this revision:

- reduction of chroma for cyan and magenta;
- slight red hue shift for the yellow;
- slight green hue shift for the cyan;
- specification of the black ink;

- change of the normative colorimetric conditions to D_{50} illuminant (rather than illuminant C), 2° observer, CIELAB for specification and tolerances (rather than xyY and $U^*V^*W^*$), and $0^\circ/45^\circ$ (or $45^\circ/0^\circ$) geometry;
- addition, for information only, of spectral data, D_{65} colorimetric data equivalent to those for D_{50} and specifications for $8^\circ/\text{diffuse}$ (or $\text{diffuse}/8^\circ$) measuring geometry equivalent to those for $0^\circ/45^\circ$ (or $45^\circ/0^\circ$);
- choice of the perfect reflecting diffuser as the white reference;
- explicit inclusion of inks for heat-set web offset and radiation curing;
- specification of minimum transparency;
- no specification of secondaries;
- more specific details on test print preparation together with exclusive specification of a laboratory printability tester for test print preparation;
- specification of the reference substrate;
- upward extension of the ink film thickness range;
- no provisions for lightfastness and solvent resistance.

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

Part 1:

Sheet-fed and heat-set web offset lithographic printing

1 Scope

This part of ISO 2846 specifies a set of colours which will be produced by a series of inks intended for four-colour offset-lithography (both proof and production printing) when printed under specified conditions, on a defined substrate, using a laboratory printability tester. It also describes the method for testing to ensure conformance. Information is provided on inks for sheet-fed, heat-set web and radiation-curing processes.

This part of ISO 2846 does not apply to fluorescent inks and it does not specify pigments 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.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 2846. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO 2846 are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

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

ISO 536:1976, *Paper and board - Determination of grammage.*

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

ISO 2834:—¹⁾, *Graphic technology - Test print preparation for offset and letterpress inks.*

1) To be published. (Revision of ISO 2834:1981)

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

ISO/DIS 8254-1, *Paper and board - Measurement of specular gloss - Part 1: 75° gloss.*

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.*

ISO/CIE 10526: 1991, *CIE standard colorimetric illuminants.*

ISO/CIE 10527: 1991, *CIE standard colorimetric observers.*

CIE Publication 15.2: 1986, *Colorimetry.*

3 Definitions

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

3.1 standard ink: Ink, intended for four-colour printing, which when printed on the reference substrate and within the applicable range of ink film thicknesses complies to the colorimetric and transparency specifications of this part of ISO 2846.

3.2 standard ink set: Complete set of standard inks comprising yellow, magenta, cyan and black.

3.3 primary colours: Colours of individual prints from yellow, magenta and cyan inks. If the prints are produced as specified in this part of ISO 2846 and conform to the colorimetric characteristics specified, they are standard primary colours.

3.4 secondary colours: Colours obtained by overprinting pairs of the three chromatic inks.

3.5 transparency: Ability of an ink film to transmit and absorb light without scattering. It is generally expressed as some measure of the unwanted scattering.

3.6 transparency measurement values: The reciprocal of the slope of the regression line between ink film thickness and colour difference for overprints of chromatic inks over black.

4 Test method

4.1 Principle

Each ink to be tested shall be printed on the reference substrate (as described in annex A) at a range of ink film thicknesses. The colours which result shall be measured colorimetrically. If one or more samples are found which conform to the values and tolerances specified in this part of ISO 2846, and the ink also meets the transparency criteria, that ink shall be deemed to be in compliance with this part of ISO 2846.