INTERNATIONAL STANDARD

ISO 20654

First edition
2017-08

Corrected version
2018-01

Graphic technology — Measurement and calculation of spot colour tone value

Technologie graphique — Mesurage et calcul de la valeur de tons des couleurs d'accompagnement

Reference number
ISO 20654:2017(E)

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Foreword

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This document was prepared by Technical Committee ISO/TC 130, *Graphic technology*.

This corrected version of ISO 20654:2017 incorporates the following corrections:

— Introduction: final paragraph removed;

— Formula (6) revised.

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Introduction

This document defines a new metric Spot Colour Tone Value (SCTV) for the determination of the tone value of a spot colour ink. Spot colours in this document are defined as non-process colours (process colours being the CMYK 4-colour primary inks). This method produces approximately uniform visual spacing of the tones between the unprinted substrate and the 100% coverage, known as the solid ink. This metric is calculated from either the measured spectral reflectance factors or from colorimetric values computed from the same spectral data.

Historically, spot colours have been managed by measuring the solid ink value only, with no clear guidelines or methodology for measuring intermediate halftones. For artwork that only incorporates the spot ink at full coverage, this can be a reasonable practice; however, for artwork that includes gradations of the spot colour, which can print alone or in combination with the other inks, a formal strategy for managing the spot colour tone is required. This solution has been to print linear scales and use those values as a reference tone for alignment. This practice renders different results from each print supplier.

In the past, spot colour tones have been measured using the standard process colour tones methodology based on ISO status density measurement using a set of spectral products optimised for cyan, magenta and yellow inks. This method does not work well with intermediate tones of spot colours and in many cases produced a tone scale far from being perceptually uniform. Hence, there is a need for a new metric that will quantify the intermediate tones of spot colours in a more perceptually uniform way.

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Graphic technology — Measurement and calculation of spot colour tone value

1 Scope

This document defines a metric for assessing intermediate tones of a spot ink. This method for the calculation of Spot Colour Tone Value (SCTV) produces approximately uniform visual spacing of tones between substrate and solid. It can be calculated from spectral reflectance or colorimetric measurements of the solid ink, substrate and one or more patches of intermediate tones to be measured.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at http://www.electropedia.org/

— ISO Online browsing platform: available at http://www.iso.org/obp

3.1
colour exchange format
CxF/X
standard defining a format for the communication of spot ink characterisation data (CxF/X-4)

3.2
spot colour ink
ink which is not part of the set of process inks

Note 1 to entry: Spot colour inks are often used when printing brand colours.

[SOURCE: ISO 12647-7, 3.9]

3.3
Spot Colour Tone Value
SCTV
value which describes the apparent halftone area for a non-process ink

Note 1 to entry: The series of all possible tone values between the unprinted substrate and the fully covered, solid tone will produce an approximately uniform visual spacing of the colours of the printed tones. The range of this metric is 0 % to 100 %, where 0 represents substrate and 100 represents solid spot colour.

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