

# SVENSK STANDARD

## SS-ISO 19302:2018



Fastställt/Approved: 2018-12-11  
Utgåva/Edition: 1  
Språk/Language: engelska/English  
ICS: 37.100.01

---

**Grafisk teknik – Validering av färgöverensstämmelse för trycksaker (ISO 19302:2018, IDT)**

**Graphic technology – Colour conformity of printing workflows (ISO 19302:2018, IDT)**

This preview is downloaded from [www.sis.se](http://www.sis.se). Buy the entire standard via <https://www.sis.se/std-80008266>

# Standarder får världen att fungera

*SIS (Swedish Standards Institute) är en fristående ideell förening med medlemmar från både privat och offentlig sektor. Vi är en del av det europeiska och globala nätverk som utarbetar internationella standarder. Standarder är dokumenterad kunskap utvecklad av framstående aktörer inom industri, näringsliv och samhälle och befrämjar handel över gränser, bidrar till att processer och produkter blir säkrare samt effektiviserar din verksamhet.*

## Delta och påverka

Som medlem i SIS har du möjlighet att påverka framtida standarder inom ditt område på nationell, europeisk och global nivå. Du får samtidigt tillgång till tidig information om utvecklingen inom din bransch.

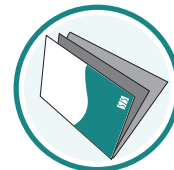
## Ta del av det färdiga arbetet

Vi erbjuder våra kunder allt som rör standarder och deras tillämpning. Hos oss kan du köpa alla publikationer du behöver – allt från enskilda standarder, tekniska rapporter och standardpaket till handböcker och onlinetjänster. Genom vår webbtjänst e-nav får du tillgång till ett lättnavigerat bibliotek där alla standarder som är aktuella för ditt företag finns tillgängliga. Standarder och handböcker är källor till kunskap. Vi säljer dem.

## Utveckla din kompetens och lyckas bättre i ditt arbete

Hos SIS kan du gå öppna eller företagsinterna utbildningar kring innehåll och tillämpning av standarder. Genom vår närhet till den internationella utvecklingen och ISO får du rätt kunskap i rätt tid, direkt från källan. Med vår kunskap om standarders möjligheter hjälper vi våra kunder att skapa verklig nytta och lönsamhet i sina verksamheter.

**Vill du veta mer om SIS eller hur standarder kan effektivisera din verksamhet är du välkommen in på [www.sis.se](http://www.sis.se) eller ta kontakt med oss på tel 08-555 523 00.**



# Standards make the world go round

*SIS (Swedish Standards Institute) is an independent non-profit organisation with members from both the private and public sectors. We are part of the European and global network that draws up international standards. Standards consist of documented knowledge developed by prominent actors within the industry, business world and society. They promote cross-border trade, they help to make processes and products safer and they streamline your organisation.*

## Take part and have influence

As a member of SIS you will have the possibility to participate in standardization activities on national, European and global level. The membership in SIS will give you the opportunity to influence future standards and gain access to early stage information about developments within your field.

## Get to know the finished work

We offer our customers everything in connection with standards and their application. You can purchase all the publications you need from us - everything from individual standards, technical reports and standard packages through to manuals and online services. Our web service e-nav gives you access to an easy-to-navigate library where all standards that are relevant to your company are available. Standards and manuals are sources of knowledge. We sell them.

## Increase understanding and improve perception

With SIS you can undergo either shared or in-house training in the content and application of standards. Thanks to our proximity to international development and ISO you receive the right knowledge at the right time, direct from the source. With our knowledge about the potential of standards, we assist our customers in creating tangible benefit and profitability in their organisations.

**If you want to know more about SIS, or how standards can streamline your organisation, please visit [www.sis.se](http://www.sis.se) or contact us on phone +46 (0)8-555 523 00**



Den internationella standarden ISO 19302:2018 gäller som svensk standard. Detta dokument innehåller den officiella engelska versionen av ISO 19302:2018.

The International Standard ISO 19302:2018 has the status of a Swedish Standard. This document contains the official English version of ISO 19302:2018.

© Copyright/Upphovsrätten till denna produkt tillhör SIS, Swedish Standards Institute, Stockholm, Sverige. Användningen av denna produkt regleras av slutanvändarlicensen som återfinns i denna produkt, se standardens sista sidor.

© Copyright SIS, Swedish Standards Institute, Stockholm, Sweden. All rights reserved. The use of this product is governed by the end-user licence for this product. You will find the licence in the end of this document.

*Upplysningar om sakinnehållet i standarden lämnas av SIS, Swedish Standards Institute, telefon 08-555 520 00. Standarder kan beställas hos SIS som även lämnar allmänna upplysningar om svensk och utländsk standard.*

*Information about the content of the standard is available from the Swedish Standards Institute (SIS), telephone +46 8 555 520 00. Standards may be ordered from SIS, who can also provide general information about Swedish and foreign standards.*

Denna standard är framtagen av kommittén för Grafisk teknik, SIS/TK 434.

Har du synpunkter på innehållet i den här standarden, vill du delta i ett kommande revideringsarbete eller vara med och ta fram andra standarder inom området? Gå in på [www.sis.se](https://www.sis.se) - där hittar du mer information.

# Contents

Page

<b>Foreword .....</b>	<b>v</b>
<b>Introduction .....</b>	<b>vi</b>
<b>1 Scope.....</b>	<b>7</b>
<b>2 Normative references .....</b>	<b>7</b>
<b>3 Terms and definitions.....</b>	<b>7</b>
<b>4 Printing workflow requirements.....</b>	<b>9</b>
4.1 Job colour definition.....	9
4.1.1 General.....	9
4.1.2 Digital file creation .....	10
4.1.3 Graphic content.....	10
4.1.4 Spot colour and device colour build .....	10
4.2 Process colour reproduction .....	11
4.2.1 Colour management.....	11
4.2.2 Prepress .....	12
4.2.3 Process control.....	12
4.3 Product colour conformity .....	13
4.3.1 General.....	13
4.3.2 Print control .....	13
4.3.3 Colour control.....	13
<b>5 Printing workflow standards requirements .....</b>	<b>14</b>
5.1 Job colour definition.....	14
5.1.1 Digital file creation .....	14
5.1.2 Validation print production .....	14
5.1.3 Proofing.....	14
5.2 Process colour reproduction .....	14
5.2.1 Colour management.....	14
5.2.2 Prepress .....	15
5.2.3 Prepress for commercial printing.....	15
5.2.4 Prepress for packaging printing .....	15
5.2.5 Process control.....	15
5.3 Product colour conformity .....	15
5.3.1 Print control .....	15
5.3.2 Colour control.....	16
5.4 Measurement conditions.....	16
5.4.1 General.....	16
5.4.2 Measurement conditions for commercial printing.....	17
5.4.3 Measurement conditions for packaging printing.....	17
5.5 Viewing and illumination.....	17
5.6 Sampling.....	17
<b>6 Scoring schema .....</b>	<b>18</b>
<b>7 Reporting .....</b>	<b>18</b>
<b>Annex A (informative) Colour control .....</b>	<b>19</b>
<b>Annex B (informative) Information exchange .....</b>	<b>20</b>
<b>Annex C (informative) Typical scoring schemas .....</b>	<b>21</b>
<b>Bibliography.....</b>	<b>23</b>

## 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](http://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](http://www.iso.org/patents)).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, 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 [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

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

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at [www.iso.org/members.html](http://www.iso.org/members.html).

## Introduction

The printing industry comprises a variety of workflows that produce a variety of printed products. For tone and colour reproduction, many ISO standards specify aims and tolerances and they are necessary for the implementation of a colour-managed and standardized workflow.

Even though relevant standards can specify aims and tolerances, the printer's ability to demonstrate conformity of their entire production workflow to these standards often becomes a technical issue as well as a business issue.

Printed colour reproduction quality depends on printing workflow operation. Printing workflow operation is made up of colour definition (what colour to specify), process colour reproduction requirements (what to control) and colour conformity (verify the outcome of the process).

There is a need to provide printers, suppliers, customers and independent bodies with guidelines that will allow them to implement and/or assess a printing workflow in order to achieve and demonstrate conformity of printed products.

This document recognizes and makes provisions for the following:

- a) conditions and test methods for file generation conformity;
- b) conditions and test methods for file colour separation conformity;
- c) conditions and test methods for spot colour and/or composite colour conformity;
- d) conditions and test methods for soft proofing conformity;
- e) conditions and test methods for hard proofing conformity;
- f) conditions and test methods for viewing conditions conformity;
- g) conditions and test methods for the evaluation of process, print and colour conformity with respect to specified reference printing conditions (RPCs).

This document is applicable to all printing applications including CMYK, CMYK + spot, spot only, non-CMYK-based processes and multicolour printing.

This document defines the three main production stages of a printed product as follows:

- 1) colour definition: the first stage where the customer and design services choose the desired brand and visual colours;
- 2) colour reproduction: the production process which starts upon reception of the job file and ends when the job is printed;
- 3) colour conformity: the stage which is necessary for the evaluation of the conformity of a printed job.

This document provides:

- a reference framework description for a typical standardized printing workflow (CMYK, CMYK with spot, non CMYK, spot only and multicolour);
- required International Standards applicable at each stage of a standardized printing workflow;
- a description of expected setup, calibration and process control operations required at each stage of printing workflow according to the appropriate International Standards;
- a definition of test conditions for colour conformity activities when these are not clearly mentioned in the relevant standard.

# Graphic technology — Colour conformity of printing workflows

## 1 Scope

This document defines the requirements of printing workflows and evaluation methods for their tone and colour reproduction.

It applies to any printing process using any colourant, such as CMYK, CMYK with spot, non-CMYK, spot only or multicolour.

This document refers and points to international or national standards and can be used to define, evaluate and audit any printing workflow in whole or in part.

## 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 3664, *Graphic technology and photography — Viewing conditions*

ISO 12646, *Graphic technology — Displays for colour proofing — Characteristics*

ISO 12647 (all parts), *Graphic technology — Process control for the production of halftone colour separations, proof and production prints*

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

ISO 14861, *Graphic technology — Requirements for colour soft proofing systems*

ISO 15930 (all parts), *Graphic technology — Prepress digital data exchange using PDF*

ISO 17972-4, *Graphic technology — Colour data exchange format (CxF/X) — Part 4: Spot colour characterisation data (CxF/X-4)*

CIE 15, *Colourimetry – Third edition*

## 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:

— ISO Online browsing platform: available at <https://www.iso.org/obp>

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

### 3.1

#### **actual printing condition**

#### **APC**

printing condition of the actual printing device or printing process

### 3.2

#### **colourant**

physical substance such as ink or toner which is used alone or as part of a set of colourants in order to produce a colour

## SS-ISO 19302:2018 (E)

### 3.3

#### **comp**

mock-up

proof formed to the shape of the final product indicating whether or not it is colour accurate

### 3.4

#### **device colour build**

colour destined to be printed using a process colourant combination

Note 1 to entry: It is typically used to define device-specific values that allow reproduction of a colour using only process colourants.

### 3.5

#### **preflight check**

file inspection to determine that the digital data contained therein will process such that all data can be accurately imaged to an image carrier or substrate

### 3.6

#### **print buyer**

person or organization that prepares job data and files in order to deliver them to a print service provider

### 3.7

#### **print service provider**

person or company that receives job data and files for the purpose of printing them

### 3.8

#### **printing condition**

set of primary process parameters which describe the conditions associated with a specific printed output and define spectrally or colourimetrically aim values

Note 1 to entry: Such parameters include printing process, substrate, colourant, colourant sequence and screening. Aim values typically comprise colourants and tone reproduction curves description.

Note 2 to entry: For the purposes of colour management, a printing condition should be fully characterized by giving the relationship between process input values (as stipulated in ISO 12642-2 for CMYK) and the corresponding measured colourimetric values.

### 3.9

#### **process colour**

colour that is the outcome of a colour separation operation and that typically requires one or more printing units and process colourants to be reproduced

### 3.10

#### **process colourant**

colourant that is used to print process colours

### 3.11

#### **reference printing condition**

#### **RPC**

aim printing condition for the job

### 3.12

#### **metameric index**

difference between spectral radiance distributions within the visible spectrum for two specimens with identical tristimulus values for a given reference illuminant and reference observer

Note 1 to entry: The procedures concerned with a special metamerism index for a change from a reference illuminant to a test illuminant of different spectral composition, or that for a change from a reference observer to a test observer of different colour-matching functions, are called the determination of special metamerism indices.

Note 2 to entry: Requirements for metameric index are specified in CIE 15.



Note 3 to entry: A measure of metamerism for the two specimens is the colour difference between the two metameric specimens caused by substituting an illuminant, “special metamerism index: change in illuminant”, and caused by substituting an observer, “special metamerism index: change in observer”. The colour difference is evaluated using a CIE colour difference formula and it shall be clearly stated which formula has been used.

Note 4 to entry: It is recommended that for two specimens whose corresponding tristimulus values ( $X_1 = X_2$ ,  $Y_1 = Y_2$ ,  $Z_1 = Z_2$ ) are identical with respect to a reference illuminant and observer, the metamerism index,  $M$ , be set equal to the colour difference  $\Delta E^*_{ab}$  between the two specimens computed for the test illuminant or for the test observer.

$$MI = \sqrt{(\Delta L^*_1 - \Delta L^*_2)^2 + (\Delta a^*_1 - \Delta a^*_2)^2 + (\Delta b^*_1 - \Delta b^*_2)^2}$$

### 3.13

#### spot colour

colour typically used for the definition of brand colours or special design effects that is usually chosen with the intent of being printed using one printing unit and one spot colourant and that is usually not blended with other colourants

### 3.14

#### spot colourant

colourant that is primarily used to print a spot colour even if it can replace or be blended with process colourants to obtain a specific colour gamut or colour reproduction

### 3.15

#### substrate-corrected colourimetric aim

##### SCCA

colour data that are corrected in order to compensate for the colourimetric difference between reference substrate and production substrate colours, assuming that the primary difference between them lies in the colour of the substrates

### 3.16

#### system qualification

assessment operation used to qualify the ability of a print device or a printing process to reproduce a defined colour data set

Note 1 to entry: This qualification, also named “extended scrutiny”, cannot usually be performed by print providers during production as it requires specific testing conditions and protocols.

## 4 Printing workflow requirements

### 4.1 Job colour definition

#### 4.1.1 General

As illustrated in [Figure 1](#), colour definition is the first step of a printing workflow. This is where a brand owner or a designer chooses the desired spot and visual colours for the printed product.

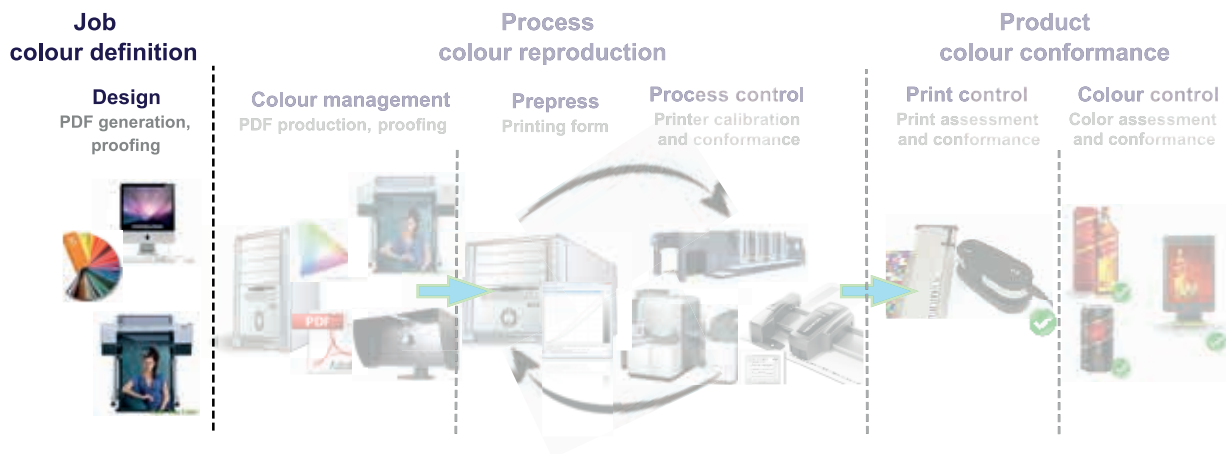


Figure 1 — Universal printing workflow — Job colour definition

#### 4.1.2 Digital file creation

File format shall be mutually agreed between provider and receiver. The print service provider should provide its customers with a detailed specification detailing the technical properties of the digital files to be received (e.g. format, resolution, metadata, colour definition). If no agreement is present then files shall be prepared in conformity with the ISO 15930 series.

#### 4.1.3 Graphic content

Print buyer specifications shall be clearly defined and mutually agreed on with the print service provider in terms of:

- reference printing condition (RPC);
- conformity (process, print, colour conformity, criteria, aims and tolerances).

#### 4.1.4 Spot colour and device colour build

##### 4.1.4.1 General

Spot colour definition is important because it is often associated with a brand or product identification. A specific colour can also be defined as a device colour build made of process colourant composite.

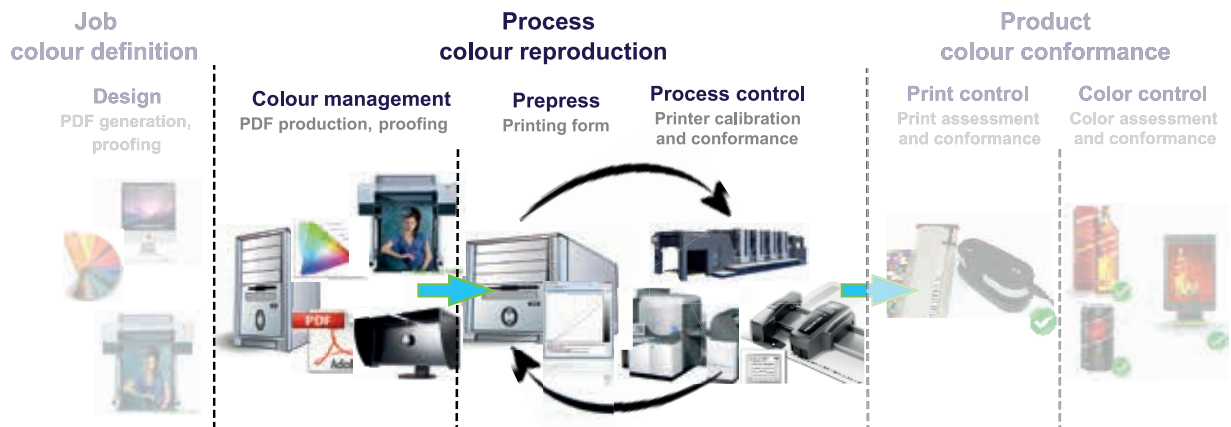
##### 4.1.4.2 Spot and device colour for commercial printing

In commercial applications, spot colours shall be defined by colourimetric values (CIELAB, CIELCh) and should be defined by spectral values.

##### 4.1.4.3 Spot and device colour for packaging printing

In packaging applications spot colours shall be defined by their spectral response curves.

## 4.2 Process colour reproduction



**Figure 2 — Universal printing workflow — Process colour reproduction**

As illustrated in [Figure 2](#), the colour reproduction stage of a printing workflow can be divided into three main areas:

- colour management [adapting PDF RPC to actual printing condition (APC)];
- prepress (printing form preparation);
- process control (print device calibration and conformity).

### 4.2.1 Colour management

#### 4.2.1.1 Digital file reception

The print service provider should perform a preflight check on files upon job file reception in order to identify print buyer expectations and intended printing conditions. Any concern shall be notified immediately to the print buyer.

To enable a reliable colour management, the following job file metadata should be available in PDF XMP fields or in another machine-readable file format:

- RGB or CMYK working colour space used;
- rendering intents;
- output intent.

#### 4.2.1.2 Proof and validation print

Digital job files should be delivered with digital proofs that conform with the requirements of [5.1.3.2](#).

If the print service provider has applied any colour conversion or substrate colour correction on the received file in order to match RPC with APC, a new hard proof should be produced with this modified file.

Hard proof margin information shall clearly mention production date, proofing system information, date of last calibration, simulation profile or characterization data [including substrate-corrected colourimetric aim (SCCA) parameters: RPC, reference white point and actual white point].