
**Graphic technology — Process control for
the manufacture of half-tone colour
separations, proof and production prints —**

**Part 5:
Screen printing**

iTeh STANDARD PREVIEW

*Technologie graphique — Contrôle du processus de confection de
sélections couleurs tramées, d'épreuves et de tirages —*

Partie 5: Sérigraphie

ISO 12647-5:2001

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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.

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 12647 may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 12647-5 was prepared by Technical Committee ISO/TC 130, *Graphic technology*.

ISO 12647 consists of the following parts, under the general title *Graphic technology — Process control for the manufacture of half-tone colour separations, proof and production prints*:

- *Part 1: Parameters and measurement methods*
- *Part 2: Offset lithographic processes* [ISO 12647-5:2001](https://standards.iteh.ai/catalog/standards/sist/dcb6874d-5839-404d-b379-27c597a8a13b/iso-12647-5-2001)
- *Part 3: Coldset offset lithography and letterpress on newsprint*
- *Part 4: Publication gravure process*
- *Part 5: Screen printing*
- *Part 6: Flexographic printing*
- *Part 7: Processes using digital printing or reproductions made on various traditional printing processes from digital files*

Annex A of this part of ISO 12647 is for information only.

Introduction

When producing a half-tone colour reproduction it is important that the colour separator, proofer and printer have previously specified a minimum set of parameters that uniquely define the visual characteristics and other technical properties of the planned print product. Such an agreement enables the correct production of suitable separations (without recourse to “trial and error”) and subsequent production of off-press or on press proof prints from these separations whose purpose is to simulate the visual characteristics of the finished print product as closely as possible.

It is necessary to distinguish between primary and secondary parameters. Whereas primary parameters, which are described in this part of ISO 12647, are defined here as having a direct bearing on the visual characteristics of the image, secondary parameters only influence the image indirectly by changing the values of primary parameters. Secondary parameters include:

- colour separation film thickness;
- film polarity (negative or positive);
- roughness of the emulsion surface;
- presence of colour marking or register marks.

It is the purpose of ISO 12647-1 to list and explain the minimum set of process parameters required to uniquely define the visual characteristics and related technical properties of a half-tone proof or production print produced from a set of half-tone separation films.

[ISO 12647-5:2001](https://standards.iteh.ai/catalog/standards/sist/dcb6874d-5839-404d-b919-21c397888201/iso-12647-5:2001)

It is the purpose of this part of ISO 12647 to list suggested values or sets of values of the primary parameters specified in ISO 12647-1 and related technical properties of a half-tone screen print produced from a set of half-tone colour separation films. Secondary parameters are also recommended for specification where deemed useful.

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Graphic technology — Process control for the manufacture of half-tone colour separations, proof and production prints —

Part 5: Screen printing

1 Scope

This part of ISO 12647 specifies a number of process parameters and their values to be applied when preparing colour separations for four-colour screen process printing when producing four-colour proof and production prints by flat bed or cylinder screen printing.

The parameters and values are chosen in view of the complete process covering the following process stages:

- colour separation,
- making of the printing forme,
- proof production,
- production printing,
- surface finishing.

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2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of ISO 12647. 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 12647 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 5-3, *Photography — Density measurements — Part 3: Spectral conditions*

ISO 2846-4, *Graphic technology — Colour and transparency of printing ink sets for four-colour printing — Part 4: Screen printing*

ISO 12637-5, *Graphic technology — Multilingual terminology of printing arts — Part 5: Screen printing terms*

ISO 12647-1:1996, *Graphic technology — Process control for the manufacture of half-tone colour separations, proof and production prints — Part 1: Parameters and measurement methods*

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

3 Terms and definitions

For the purposes of this part of ISO 12647, the terms and definitions given in ISO 12647-1 and ISO 12647-5 apply.

4 Requirements

4.1 General

The following subclauses are arranged according to the order set out in ISO 12647-1; they also depend on it for the definition of parameters and test methods.

4.2 Colour separation films

4.2.1 Quality

Unless otherwise specified, the core density shall be at least 3,5 above the transmission density of the clear film (film base plus fog). The transmission density in the centre of a clear half-tone dot shall not be more than 0,1 above the corresponding value of a large clear area. The transmission density of the clear film shall not be higher than 0,15. Both measurements shall be made with a (UV) transmission densitometer whose spectral products conform to ISO type 1 printing density as defined in ISO 5-3. The fringe width shall not be greater than one fortieth of the screen width; the half-tone dot shall not be split up in distinct parts. The colour separation film quality shall be evaluated according to ISO 12647-1:1996, annex B.

NOTE 1 The clear film density requirement is based on the understanding

- that the density range of the clear areas of all films that are to be exposed onto a screen printing forme, for consistent work, needs to be less than 0,10;
- that 0,05 represents the lowest commonly found value for ISO type 1 printing density.

In order to minimize the impact of the use of half-tone films with clear film densities above this range, agreements between the supplier of colour separations and the recipient are required. Contacting or duplicating can also be used to bring half-tone films with dissimilar clear film densities into agreement.

NOTE 2 As a practical guide, a core density of 3,5 above the clear film density will normally be achieved if the density of large solid areas is more than 4,5 above the clear film density.

NOTE 3 If a user wishes to use a blue filter for transmission density measurements it is necessary to determine, for the particular film type and processing conditions, the correlation between densities obtained with the blue filter and those obtained with an ISO type 1 printing density instrument. For the measurement of core density an ISO type 2 printing instrument may be used.

4.2.2 Screen ruling

The screen ruling (screen frequency) shall be within the range 20 cm^{-1} to 40 cm^{-1} .

NOTE 1 Outside of the 20 cm^{-1} to 40 cm^{-1} range the general principles of this part of ISO 12647 remain valid but specific values may differ.

NOTE 2 With computer generated screening, the parameters "screen ruling" and "screen angle" may be varied slightly in conjunction, from one process colour to another, in order to minimize moiré patterns.

4.2.3 Screen angle

The angles of the screen mesh shall be 0° and 90° with respect to the frame.

For half-tone dots without a principal axis, the nominal difference between the screen angles for cyan, magenta and black shall be 30° , with the screen angle for yellow separated by 15° from another colour. A typical example is shown in Figure 1. No colour should align with mesh warp or weft, or diagonal. In order to achieve this, one colour should be rotated by $7,5^\circ$ with respect to the mesh. These values refer to the films; right reading, emulsion up.

For half-tone dots with a preferential axis, the nominal difference between the screen angles for cyan, magenta and black shall be 60° , with the screen angle for yellow separated by 15° from another colour. A typical example is shown in Figure 2.

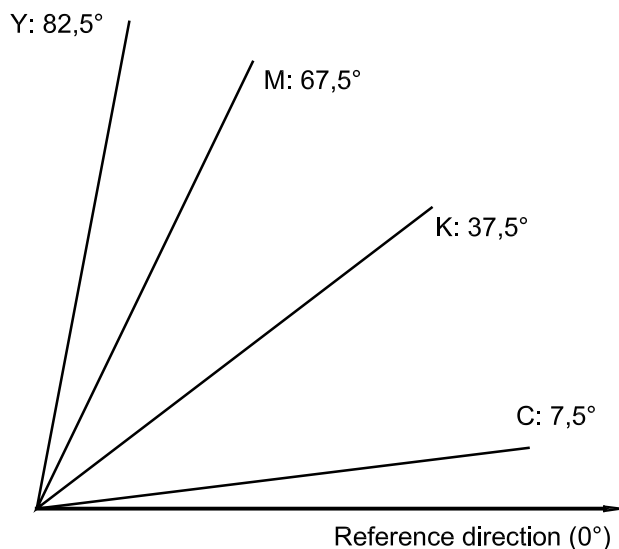


Figure 1 — Typical screen angles for half-tone dots without a principal axis

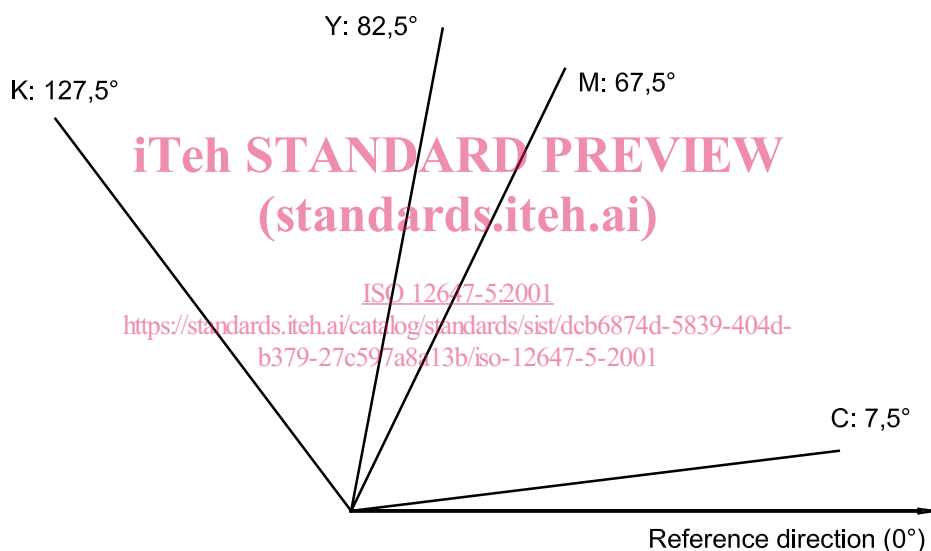


Figure 2 — Typical screen angles for half-tone dots with a principal axis

4.2.4 Dot shape and its relationship to tone value

Where elliptical half-tone dots are used, the first link up shall occur no lower than at 35 % tone value and the second linkup no higher than at 65 % tone value.

4.2.5 Image size tolerance

For a set of colour separation films in common environmental equilibrium, the lengths of the diagonals shall not differ by more than 0,02 %.

NOTE This tolerance includes image-setter repeatability and film stability.

4.2.6 Tone value sum

There is no restriction on the tone value sum.

NOTE Tone value sums between 300 % and 400 % may be used. However, in order to match products from other processes, a lower tone value sum may be appropriate.