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

**Part 9:
Metal decoration printing processes
using offset lithography**

*Technologie graphique — Maîtrise des procédés pour la fabrication
des séparations couleur, des épreuves et des tirages en ton tramé —*

*Partie 9: Impression décorative sur métal avec un procédé offset
lithographique*



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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.

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).

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).

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.

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

A list of all parts in the ISO 12647 series can be found on the ISO website.

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.

Introduction

ISO 12647-1 serves to provide definitions, general principles, the general order and materials to be covered in ISO 12647-2 to ISO 12647-9, the definition of the data, the measurement conditions, and the reporting style.

This document relates to the subject of offset printing on coated metallic substrates and establishes the printing requirements for the metal decoration market. This market includes metal boxes and cans in which the printing is performed directly onto the white coated surface of the metal prior to the formation of a container.

This document specifies aim values (or sets of aim values) and tolerances, for the primary parameters specified in ISO 12647-1 for digital proof printing. Primary parameters that define a printing condition include screening parameters (where applicable), the colours of the solids, the colour of the print substrate, colours of intermediate tint values and the tone curve. Adherence to these values essentially ensures that a grey which at the colour separation stage was composed for a specified printing condition also prints as a grey colour when both proofing and printing. Remaining deviations from grey due to differences in trapping can then be removed by adjusting the colouration within the tolerances provided. This document also specifies test methods for those properties of prints and their substrates that are considered relevant for stable and reliable metal deco reproduction.

Typically, the specified printing condition is defined through an International Color Consortium (ICC) profile or the associated characterisation data set, both of which relate the source data and the colorimetrically defined printed colour. Such data can be derived from printing conditions conforming to the pertinent process standard of ISO 12647 (all parts) by industry trade groups or individuals.

Printing on metallic substrates poses unique challenges. Sometimes, the metal surface is pre-coated with an opaque white and then the coloured inks are printed on top of the white coating. Other times, the coloured inks are printed directly onto the metallic surface and the nature of the bare metal, shininess, texture or polishing marks can be observed and measured through the ink layer. Most metallic substrates are electrolytic tinplate (ETP), tin free steel (TFS) and aluminium, all coated with a white coating or pre-printed with a printing white ink before being printed with coloured inks. This document considers only the substrates, which are pre-coated with a white coating.

Historically, there has been no consistency in the way that either the characterisation data or the criteria and limits for a satisfactory match have been provided. This has led to significant redundancy and inconsistencies in the evaluation of proofing systems for different, but similar, applications, and a cost and time burden on the industry. This document therefore attempts to provide guidance in this area by providing specifications and associated testing procedures.

This document defines requirements for printing offset on metallic substrates that have been pre-coated with a white coating. Bare metallic substrates have not been included because of the complexity of the specular and surface reflection requirements. Also, the grey nature of the substrate means that it will always be restricted in gamut and difficult to manage. The industry does not print much process imagery on bare metal.

This document does not specifically consider the production of spot colours from a process printing approach. However, such colours can be generated from such an approach and the tolerances should be agreed between the buyer and the seller. Spot colour management is defined in this document to utilize spectral data in an .xml schema defined by ISO 17972-1^[1] and ISO 17972-4^[2]. ISO 17972-4 includes exchange specifications for spot colour characterization data to facilitate the communication of spot colour data.

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Part 9: Metal decoration printing processes using offset lithography

1 Scope

This document specifies requirements for systems that are used to produce offset prints for process colour reproduction on metallic substrates, which have been printed with a white coating. It is intended for flat printed sheet metal applications. It does not cover shaped or pre-formed metal such as pre-formed cans. Recommendations are provided with regard to appropriate test methods associated with these requirements.

This document differs from the method used to produce an offset print on paper or board in ISO 12647-2 in that it considers the colour values of a typical white coated metal substrate intended for metal decoration, using offset lithography and substrates that are independent of backing colour.

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/TS 10128, *Graphic technology — Methods of adjustment of the colour reproduction of a printing system to match a set of characterization data*

ISO 12642-1, *Graphic technology — Input data for characterization of four-colour process printing — Part 1: Initial data set*

ISO 12642-2, *Graphic technology — Input data for characterization of 4-colour process printing — Part 2: Expanded data set*

ISO 12647-1:2013, *Graphic technology — Process control for the production of half-tone colour separations, proof and production prints — Part 1: Parameters and measurement methods*

ISO 12647-7, *Graphic technology — Process control for the production of halftone colour separations, proof and production prints — Part 7: Proofing processes working directly from digital data*

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

ISO 15076-1, *Image technology colour management — Architecture, profile format and data structure — Part 1: Based on ICC.1:2010*

3 Terms and definitions

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