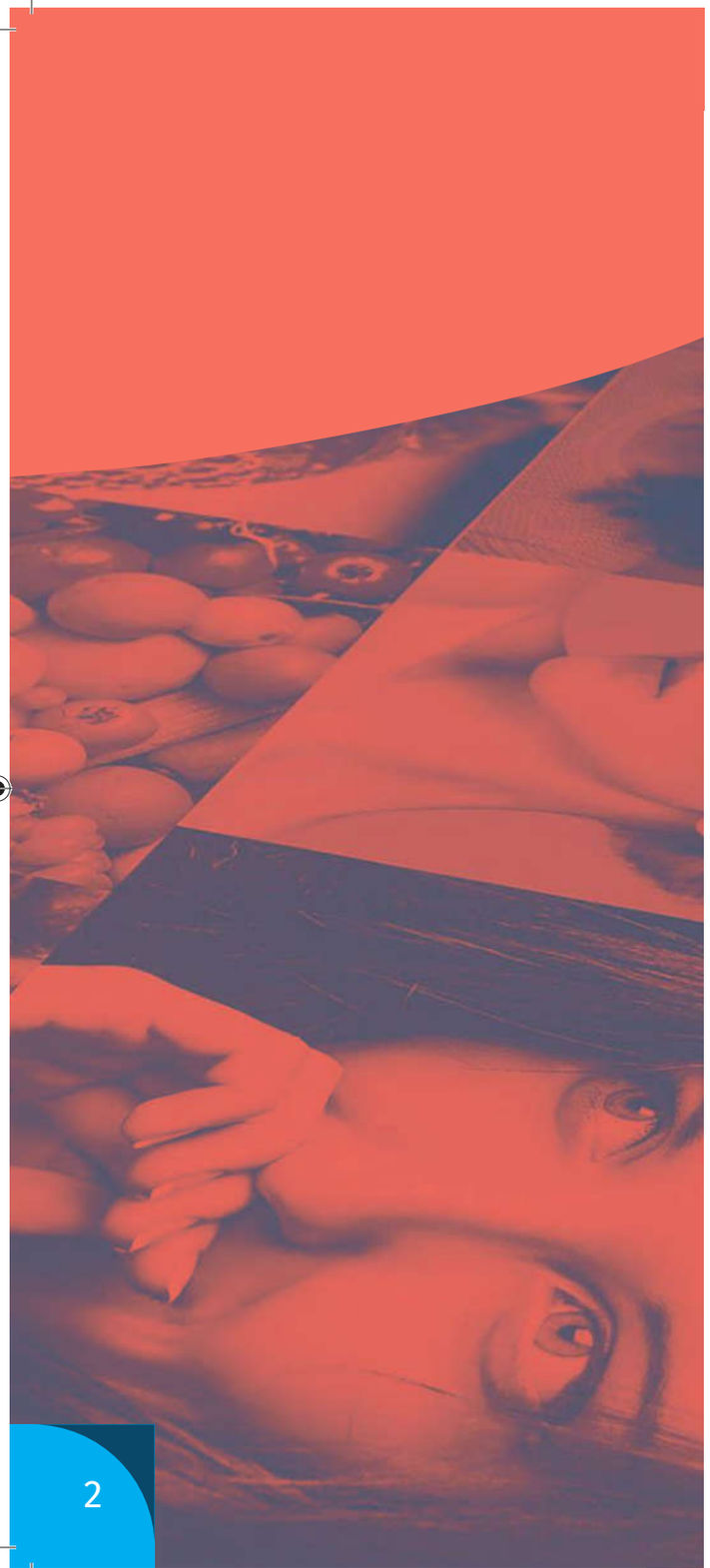
TECHNICAL GUIDE

COLOUR MANAGEMENT

ISO STANDARDS COMPLIANCE GUIDE

Second Edition

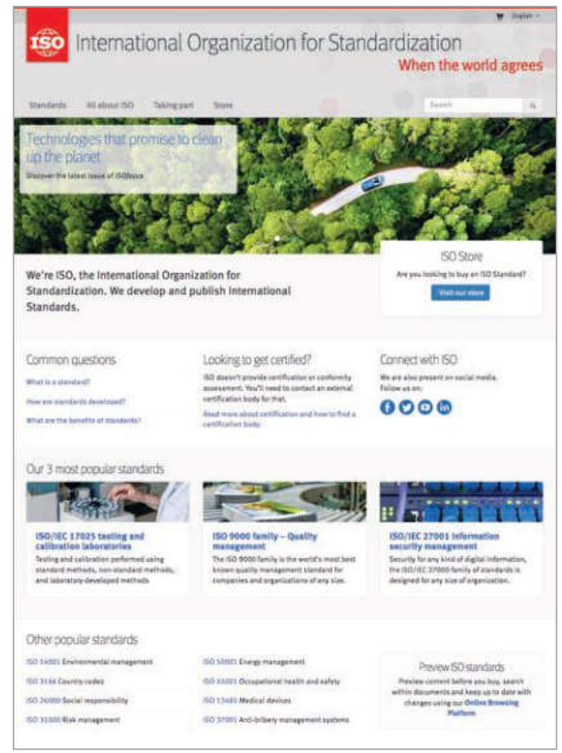
FESPA
profit for purpose



Technical Guidance for ISO Standards compliance

The International Organisation for Standardisation (ISO) has been around for decades, and thousands of companies around the world use its standards to improve business processes. ISO's active involvement in the graphic arts industry dates from 1989, when Technical Committee (TC) 130 for graphics technology was reactivated after years of dormancy. ISO TC130 is responsible for printing industry standards, and over the last twenty-five years has developed many standards to make life easier for printers and their customers.

There is a common misconception that the purpose of ISO standards is in some way to restrict business options, but this is far from the ISO spirit. ISO exists to ensure product safety, reliability and quality, and to provide businesses with tools for managing



Screen capture from ISO Website where printing standards can be ordered online.

resources, increasing productivity, and encouraging global trade. It is the world's largest standards body and has global participation in its work. ISO TC130 has over twenty participating member countries from developed and developing nations. Fifteen working groups dedicated to different subject areas develop tools for instance to improve prepress workflow efficiency and productivity, or calculate the carbon footprint of print and electronic media.

Volunteers working in local national committees develop ISO standards on a consensual basis. Experts from all over the world share local practice and experience and collectively consider how best to solve graphics industry problems. This can lead to lowest common denominator thinking, however in the case of ISO TC130, it leads to healthy and often heated debate because the interests of printers and their customers are always of paramount importance.

The delegates in the ISO technical committee for graphic arts standards work voluntarily and unpaid, and represent the member countries worldwide. Here some of the delegates in a meeting in Chicago, USA, a couple of years ago.

Tools Available

There are plenty of ISO tools for the printing industry, over ninety at the last count. Which ones are of most benefit to you depends on your business, how efficient your processes and colour management are, and how productive and profitable the company is. For offset printers ISO 12647-2 (Graphic technology – Process control for the production of half-tone colour separations, proof and production prints – Part 2: Offset lithographic processes) is usually the starting point and for screen printers it is ISO 12647-5 (Part 5: Screen printing processes). Both documents specify targets and procedures for producing half-tone colour separations, proof and production prints. They are available from either ISO for CH118 (€97) and CH58 (€48) respectively, or from national standards bodies at local rates. Perhaps more important than process control standards are the numerous prepress standards to aid colour management.

These prepress tools, range from ISO 12640 (Graphic technology – Prepress digital data exchange – Part 5: Scene-referred standard colour image data (RIMM/SCID)) for preparing standard colour image data to a common reference, to the eXtensible Metadata Platform (XMP) aka ISO 16684, for tagging files with information about such things as how and by whom they were created.

ISO 15930 (PDF/X) defines how digital data should be exchanged between players in the graphic arts supply chain and the wider industry, and is based on Adobe PDF (ISO 32000). Adobe handed PDF over to ISO several years ago, but continues to be actively involved in its development and ISO 15930. PDF/X has several parts customised for different workflow expectations and flexibility requirements. For instance if you want completely blind exchange, PDF/X-1a allows only those PDFs where all fonts are embedded and where colours are described as spot or CMYK data and are specified as trapped or not. Alternatively you may want to consider the more recent PDF/X-4 which is based on a later version of PDF and allows PDFs with layers and transparency.

Approaches to standards compliance vary worldwide. Some compliance and certification schemes are very loose and others extremely demanding. Over one thousand companies globally have received certifications for compliance to ISO 12647-2. Other parts of ISO 12647 are specific to other printing methods including newsprint, flexo, gravure, screen and proofing. ISO 12647-2 for offset printing is the most widely adapted and has become the *de facto* benchmark for digital printing. There are even some digital printing companies who have invested in certification to ISO 12647-2 for their digital presses.

ISO 12647-2 & Digital Printing

ISO TC130 has been working for several years on a possible standard for digital printing. But the big challenge is to standardise the characteristics of so many types on toners and inks, so we still don't have a dedicated standard for digital print production. Digital printers often want to prove to customers and prospective clients that they can match on a digital press the quality they achieve in offset.

A viewing booth needs to have standardised light conditions to show prints and proofs in an accurate and predictable way. This LED-based viewing booth from Marks-3zet, Germany, complies with ISO 3664, the standard for viewing conditions.

One of the most successful and popular standards is ISO 12647-7, the standard for contract proofs. Here a control strip measured using the spectrophotometer Spectropad from Barbieri.

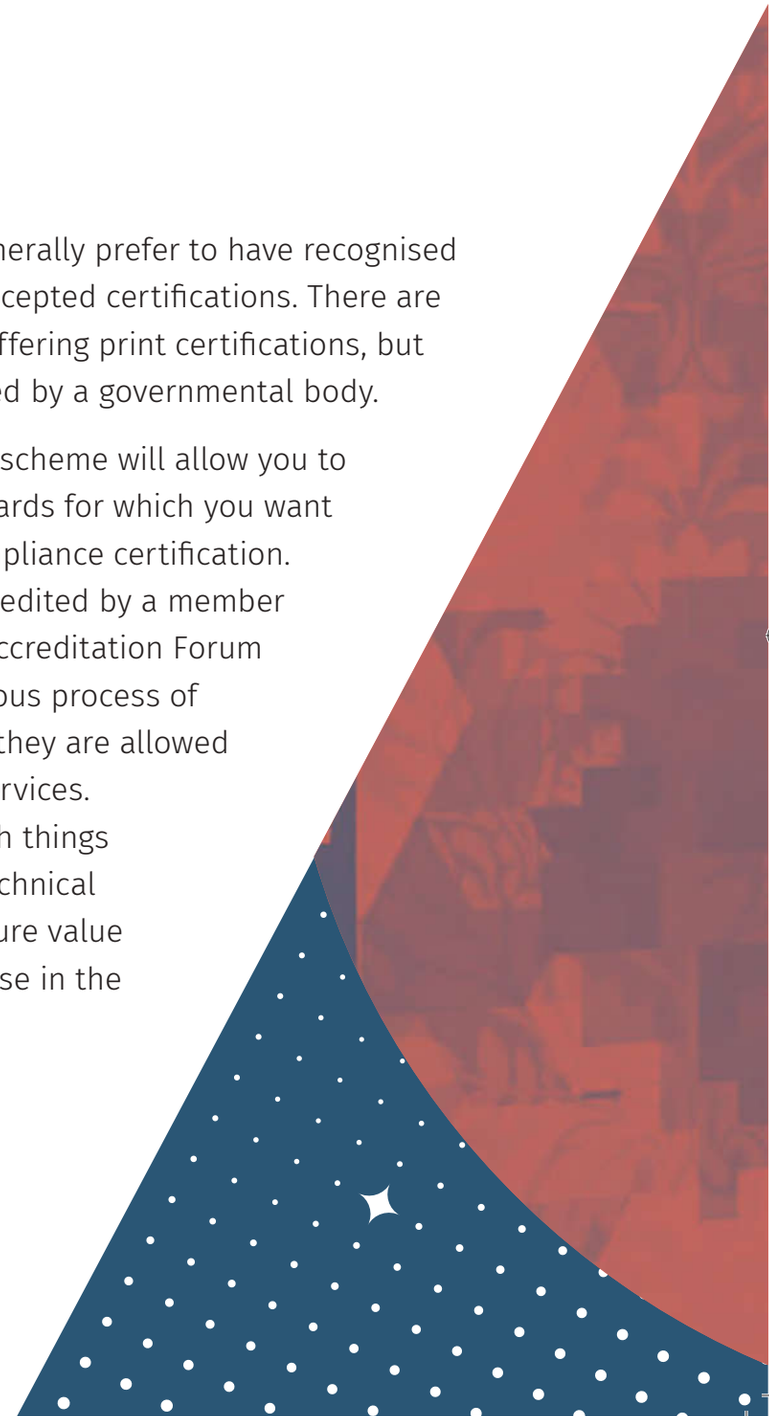
Customers want common colour appearance, regardless of the print process or media, something especially important for brand owners, such as car manufacturers or retailers. Having a formal confirmation that you can reliably and consistently produce the same print and colour appearance across workflows and print methods has considerable value for many printers and their clients. The market has turned to ISO 12647-2 as a reference for both analogue and digital print workflows.

Certification

Print buyers increasingly use certification to ISO 12647-2 as a short list criteria, so more companies are investing in colour management and quality control procedures. The most important consideration in deciding which certification scheme to use is the robustness of the process and the extent to which it imposes a discipline that will benefit your business over time. Rigorous certification requirements are tough to achieve, but they help you manage the business more effectively within a performance driven business model. This improves resource management, aids cost control and protects margins: what you can measure you can control. Certification by accredited certification bodies, rather than software resellers or consultants, gives print buyers assurance that you can achieve a specified output quality consistently over time, helping to build trust and confidence.

This is important if your customers operate worldwide. Many use certification to ISO standards to benchmark output quality in all geographies. They generally prefer to have recognised and internationally accepted certifications. There are many organisations offering print certifications, but very few are accredited by a governmental body.

Ideally a certification scheme will allow you to specify the ISO standards for which you want confirmation and compliance certification. Certifying bodies accredited by a member of the International Accreditation Forum must undergo a rigorous process of accreditation, before they are allowed to sell certification services. Evaluations cover such things as impartiality and technical competence, and ensure value for money and recourse in the case of disputes.



Implementation

ISO standards are tools for improving business performance. Management standards such as ISO 9001 for quality management and ISO 14001 for environmental management systems are commonly used worldwide to help companies improve business efficiency and resource management. Most of these enterprises start with some form of motivation: customer pressure, shareholder requirements or staff expectations for a better run business. Process and product standards used in the graphic arts are generally implemented for one of these reasons. Understanding the nature of the motivating factor for standards implementation is the first step to completing a successful project.

An ISO TC130 working group is looking at how to provide formal confirmation of conformance and to provide a reference that certification bodies can use to recognise and acknowledge excellence within the printing industry. The document is a single, internationally agreed framework for how to measure quality control and colour management in print. This document will confirm compliance to standard targets and provide print buyers with a means of differentiating service providers.

This document will make it possible for any graphics process defined in a published ISO TC130 standard to be certified for conformance, using the certification reference document. In the meantime printing companies can manage their own compliance simply by following what is laid out in a particular standard, documenting performance over time. Some ISO standards are tougher than others to implement, and the ISO TC130 standards cover diverse areas from prepress, process control and media, through to safety and environmental footprint. You have plenty to choose from.

Start with defining short and long term objectives, and what you would consider a successful implementation. Involve the people this project will impact early in the evaluation and planning stages, because it is the people affected who will most influence the success of the project.

Here is a list of the key standards available from ISO relating to printing and graphic communications.

DIGITAL TEST IMAGES

ISO 2640
Prepress digital data exchange. CMYK standard colour image data (CMYK/SCID

ISO 12640-2
Prepress digital data exchange. XYZ/ sRGB encoded standard colour image data (XYZ/SCID)

ISO 12640-3
Prepress digital data exchange. CIELAB standard colour image data (CIELAB/SCID)

ISO 12642-series
Input data (test forms) for characterization of 4-colour process printing

COLOUR MEASUREMENT PROCEDURES

ISO 13655
Spectral measurement and colorimetric computation for graphic arts images

PRINTING INK COLOURS

ISO 2846-1
Graphic technology. Colour and transparency of printing ink sets for four-colour printing.

Sheet-fed and heat-set web offset lithographic printing

ISO 2846 -2
Graphic technology. Colour and transparency of printing ink sets for four-colour printing. Coldset offset lithographic printing

ISO 2846-4
Graphic technology. Colour and transparency of printing ink sets for four-colour printing. Screen printing

ISO 2846-5
Graphic technology. Colour and transparency of printing ink sets for four-colour printing. Flexographic printing

PROCESS CONTROL

ISO 12647-1
Graphic technology. Process control for the production of half-tone colour separations, proof and production prints. Parameters and measurement

ISO 12647-2
Graphic technology. Process control for the production of half-tone colour separations, proof and production prints. Offset lithographic processes

ISO 12647-3
Graphic technology. Process control for the production of half-tone colour separations, proofs and production prints. Coldset offset lithography on newsprint

ISO 12647-4
Graphic technology. Process control for the production of half-tone colour separations, proofs and production prints. Publication gravure printing

ISO 12647-5
Graphic technology. Process control for the manufacture of half-tone colour separations, proof and production prints. Screen printing

ISO 12647-6
Graphic technology. Process control for the production of half-tone colour separations, proofs and production prints. Flexographic printing

ISO 12647-7
Graphic technology. Process control for the production of half-tone colour separations, proof and production prints. Proofing processes working directly from digital data

ISO 12647-8
Graphic technology. Process control for the production of half-tone colour separations, proof and production prints. Validation print processes working direcly from digital data

COLOUR MONITORS FOR SOFT PROOFING

ISO 12646
Graphic technology. Displays for colour proofing. Characteristics and viewing

ISO 14861
Requirements for colour soft proofing systems

CHARACTERISATION TARGETS

ISO 12640
Graphic technology. Prepress digital data exchange. CMYK standard colour image data (CMYK/SCID)

ISO 12640-2
Graphic technology. Prepress digital data exchange. XYZ/sRGB encoded standard colour image data (XYZ/SCID)

ISO 12640-3
Graphic technology. Prepress digital data exchange. CIELAB standard colour image data (CIELAB/SCID)

ISO 12641
Graphic technology. Prepress digital data exchange. Colour targets for input scanner calibration

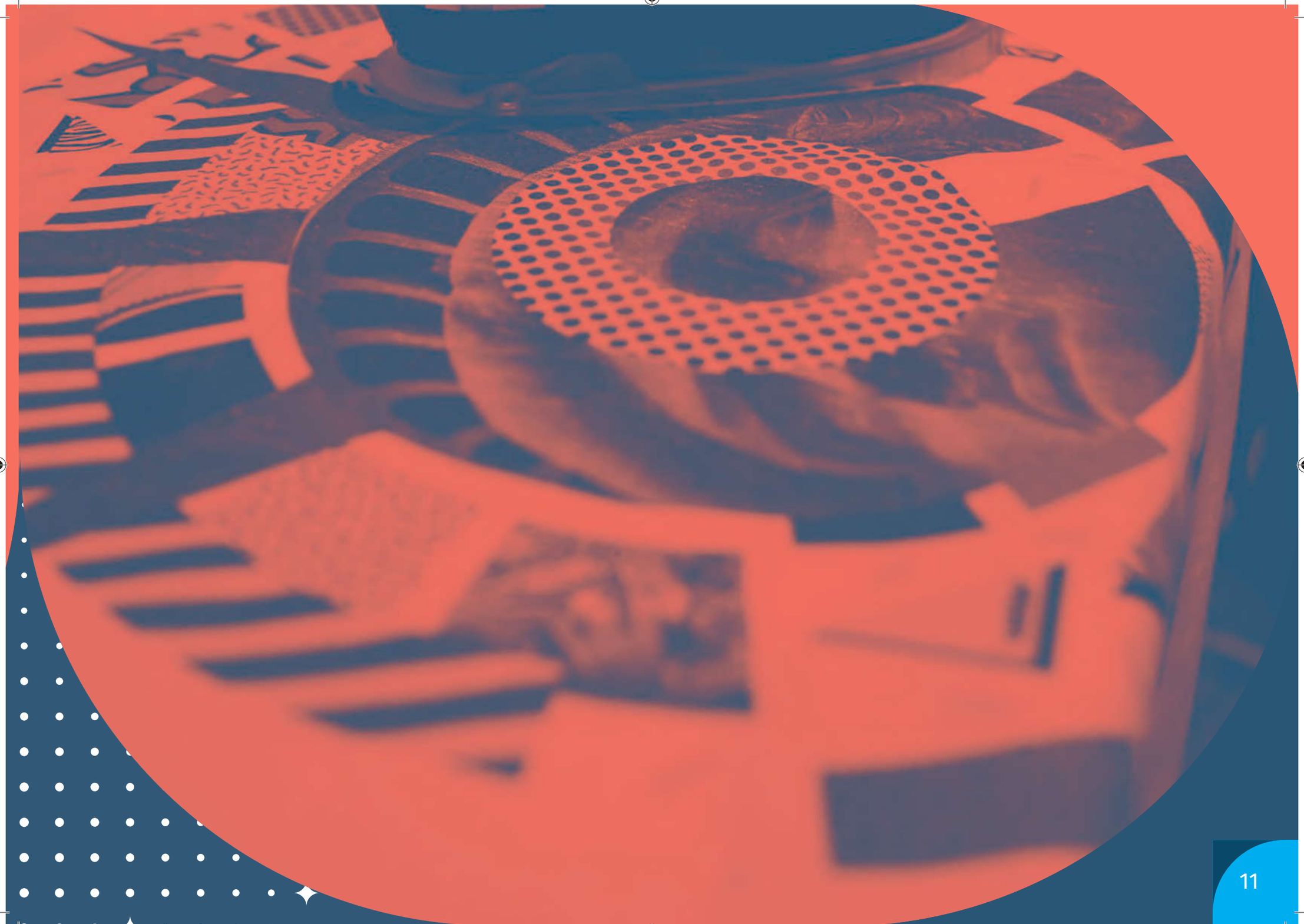
ISO 12642-1
Graphic technology. Prepress digital data exchange. Input data for characterization of 4-colour process printing

ISO 12642-2
Graphic technology. Input data for characterization of 4-colour process printing. Expanded data set

STANDARD ENCODINGS AND FILE FORMATS

ISO 15076
Image technology colour management. Architecture, profile format and data structure.

ISO 22028
Photography and graphic technology. Extended colour encodings for digital image storage, manipulation and interchange. Architecture and requirements



Published by FESPA Limited
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