

International standardization ISO 12647 secures worldwide high quality print production

The standardization of printing processes according to ISO 12647 is established worldwide today. Ten years after first publication of the ISO 12647-2 standard for offset printing, methods, applications and tools are well introduced and used with great success by customers, service providers and printers. For all printing processes, characterization data and profiles adapted to the standard are available as well as comprehensive tools for application at all process stages from data generation to the print run. In addition to the standardization of offset processes (sheet fed, web fed, continuous) the standardization of newspaper printing (ISO 12647-3), of gravure publication printing (ISO 12647-4) and of further printing processes was successfully implemented.

Why standardization of printing process?

Communication of colour and production security

The standardization of printing processes according to ISO 12647, the concepts and application tools are generally focused on one purpose: the correct, process-optimized colour communication from creation to final product. To achieve that, many process modules to be conducted and carried out correctly by customers, service providers and printers, are necessary. Examples are the evaluation and selection of materials (papers, printing ink) correct colour management and data file generation in applications (ICC profiles, PDF/X), the production of contract proofs, the measuring control and visual appraisal under standard viewing conditions of these proofs, the production of printing forms and the print run in accordance with acknowledged guidelines.

The international standard series ISO 12647 and the tools and applications developed on that basis enable secure, practice-proven solutions for all process steps. The consistent application of these means provides the maximum benefit for all parties involved – print buyers, prepress service providers, printers: predictable and repeatable colour results.

International cooperation to the benefit of users in globalized markets

The development of international standards in ISO Technical Committee 130 “Graphic Technology” and the implementation of such standards in application concepts, guidelines, control tools etc., has been supported for many years by national and international industry user associations and by manufacturers (systems, materials) from Europe, Asia, North and South America. Regional solutions, limited to a certain area, are no longer accepted by print buyers and service providers in the age of globalization.

In Europe a number of associations, such as German Printing and Media industries Federation (bvdm), fogra Graphic Technology Research Association, international newspaper association (Ifra), European Color Initiative (ECI), European Rotogravure Association (ERA) and the Swiss Center of Competence for Media and Printing Technology (ugra) have

constantly supported the ISO standardization work for many years to the benefit of users. The associations are providing essential publications and important application tools for practical use – many of these free of charge. For example ICC profiles and characterization data, reference prints and test data files, process- and media standards as well as print control tools (wedges, strips), e.g. for the control of grey balance. There are also projects for implementation of printing standards in a number of European countries, supported by the associations.

Adaptation to the state of the art

International standards for printing and prepress technology are regularly adapted to the current technical state of the art. Changes of the standard are implemented quickly in practical concepts, user guidelines, control tools, characterization data and ICC profiles.

Changes of material properties (printing paper and printing ink) or of systems (measuring devices, monitors, standard viewing light, output devices, software etc.) are clearly influencing the specifications of process control. The increasing amount of optical brighteners (OBA) in many papers, colorimetric properties and tolerances of printing inks, technical differences and tolerances of colour measuring tools, device-independent exchange of colour measuring data and metamerism are examples for topics to be addressed properly in standards for process control and measuring technology. To achieve this aim, all parties involved are requested to co-operate. Comprehensive research work on special topics is necessary and was started already in some cases. Thus, the norm is always matching the current state of applications and is able even to set standards for future developments. However, any short-term changing of standards (e.g. due to changes of material properties) is not recommended. The users need a reliable timeframe for standard application.

Other concepts: no proof of practical usability

Since recently a concept for process control from IDEAlliance (GRACoL) is hitting the international markets with major marketing efforts. According to earlier statements of its originators, GRACoL is superior to the standardization according to ISO 12647-2 and therefore should replace it. In the meantime, GRACoL has been described as an “application of ISO 12647-2”. This is wrong since GRACoL is built around different basic requirements. Until today there is no final definition of the GRACoL methodology and no final set of characterization data and profile available.

ISO 12647 defines tone value increase (TVI) and colours of solid inks (primary colours) as the most important process criteria. Further important criteria are the properties of papers and printing inks. The grey condition results from all these individual criteria. As visual control device for grey balance in print run production the use of a CMY grey wedge for process control according to ISO 12647 has worked satisfactorily.

GRACoL makes almost exclusive use of grey balance (NPDC neutral print density curve) and advocates a uniform tone value increase for all printing conditions. Despite numerous attempts, up to now there is no official GRACoL reference print, because all test print results to date failed to satisfy the specifications of the GRACoL representatives. The provisional GRACoL set of characterisation data originates from fogra test data, modified in relation to tone value increase and grey balance.

Grey balance is not the sole process control criterion

Although useful for production run control, the exclusive use of the grey balance and simultaneous neglect of tone value increase is a questionable method.

The process proposed by GRACoL, i.e. to set out from the colour tone of the paper white, migrate to a defined colour tone in the mid-tone area and then to keep this tone constant into the shadow area, is very complex, not adequately tested and can also lead to a grey perceived as a colour cast.

There are frequent calls for a fixed grey condition of, for example, 50/40/40 of the colours cyan, magenta and yellow (in that sequence). While theoretically possible, this causes variable solid coloration in print (and therefore other ink layer thicknesses or densities respectively). In that case, different tone value increase curves for the colour inks are also necessary resp. must be allowed. Although if combined with a correspondingly carried out separation this will lead to a good grey reproduction, it will cause problems in the colours because the coloration changes necessary to obtain the grey balance can lead to a poorer colour reproduction. Either the ink layer thicknesses are insufficient for a stable print or the layer thicknesses become too great with resulting excessive tone value increases. Or the tolerances for the coloration values are exceeded. Naturally, the individual results depend on the inks and paper used. A safe, measurable process control cannot be achieved in this way.

How to proceed: apply ISO 12647 and integrate new aspects

The proven and efficient process control in accordance with ISO 12647 should continue to be used. It is not recommended to replace ISO 12647 by a different concept whose effectiveness and reliability have not been evidenced and that is clearly more complicated to implement in practice. Instead, all available resources should be concentrated on resolving important aspects that are still unsettled (e.g. how to deal with optical brighteners in papers).

July 2006

German Printing and Media Industries Federation (bvdm)

European Color Initiative (ECI)

Graphic Technology Research Association (fogra)

Ifra - where publishing lives. (ifra)

Swiss Center of Competence for Media and Printing Technology (ugra)