Standardised Print Production (SPP)

Accredited certification according to ISO 12647-2

Part 3:
Quality Management

A Digital Dots Publication

Standardised Print Production (SPP)

Achieving accredited certification according to ISO 12647-2

Technical Reference Part 3:

Quality Management

Digital Dots

Published June 2013

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Printed in the UK

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Introduction

Over the last few years we have been heavily involved in standards work, working internationally with ISO and print federations in both Sweden and the UK. The Digital Dots Standardised Print Production (SPP) series explains what printing companies and print media buyers need to know about using the ISO 12647-2 standard for offset lithography process control. This standard can also provide a useful framework for digital press quality control.

The complete SPP series includes standalone documents describing what you need to do in prepress, on press, and for overall quality assurance. An executive summary covers the key points in a separate document. Altogether the series provides all the information required to understand, implement and use ISO 12647-2 for high quality production control and colour prints, adding value, business performance improvement and competitive edge for print producers and media buyers. This part of SPP covers *requirements for quality management* for printing companies enabling them to ensure superior and consistent print production quality, with continuous process improvement. Part 1 of SPP covers requirements for document preparation and prepress, the foundation work that must be done if a printer wants to fully implement the ISO 12647-2 standard. Part 2 explains what must be done on press including press calibration and validation of prints.

SPP: Quality Management is organised in sections, and following each section there are short summaries of what the requirements mean specifically for a print media buyer and a print media producer. Parts 1 and 2 of SPP provide what you need to know for prepress and press control. An executive summary is included in the series for the people not directly involved in production or print buying, but who have a commercial interest in the successful implementation of ISO 12647-2. See digitaldots.org.

For the Print Buyer

These synoptic boxes provide print buyers with a quick section summary. Use them if you don't want to bother with the background and explanations. What's listed in these paragraphs can serve as a checklist.

For the Printer

These synoptic boxes are for printers. They provide a quick section summary, if you don't want to bother with the background and explanations. What's listed in these paragraphs can serve as a checklist.

Standardised Print Production (SPP)

SPP provides printers with a defined procedure for print production to guarantee both high print quality and cost effective production processes. The SPP guides follow international standards for graphic arts production and are consistent with established certification schemes based on ISO 12647-2. They integrate the core elements of ISO 9001 (requirements for quality management systems) with ISO 12647-2.

The SPP guides provide everything prepress professionals, publishers and printers need to know in order to produce high print quality and cost effective production processes. They provide all of the details required in order to prepare for (and hopefully pass) an accredited ISO 12647-2 audit. The guides support all international certification schemes including those of the BPIF, The Swedish Printers Federation, Fogra, UGRA and IDEAlliance.

SPP does not require a full ISO 9001 implementation, however it does include some critical components relating to customer satisfaction, planning, measurements, analysis, improvements and control of non-conforming products. All of these are vital for successful and systematic quality control and colour management. Properly implemented they should improve overall efficiency and lead to enhanced business performance.

What This Means for the Print Buyer

You can use the SPP guide to improve your understanding of ISO 12647-2 and what is required of a printing company in order to achieve it. Work with your printer to make sure you have a complete understanding of their file delivery, preflight, proofing, viewing conditions and colour control requirements. All of these should be based on the requirements in ISO 12647-2.

What This Means for the Printer

The SPP guide gives you everything you need for a successful implementation of ISO 12647-2. Use it to prepare for audits and certification and/or to demonstrate to customers your ability to reach the standard. Make sure you communicate fully the value of this to your customers.

The Importance of Independent Certification

There are many ways in which a printing company can shout about its quality control using ISO 12647-2. Compliance is a simple claim that states that the printing company follows the

primary process parameters and technical requirements of the standard. But it is no guarantee of a quality result. Some developers and industry associations have their own procedures, and issue certificates for compliance.

A certificate's value depends on who has done the audit prior to the certification, and the scope of their authority. Only accredited and qualified external auditors can provide independent and unquestionably credible certification to ISO 12647-2. An external audit is also invaluable for printers who want independent recognition of their production quality control standards.

Such certification is robust and credible, which is why it is so valuable for printers who want formal recognition for their production quality. It can also be an incidental aid to cost control and business performance improvement because compliance with a rigorous management and production scheme can help a business to get production and related factors under complete control. Certification is also of value to print buyers because it provides assurance that service providers can achieve a specified output quality, measured and judged to a robust compliance scheme. This in turn helps print buyers ensure value for money and to help them to select print service providers on the basis of proven and qualified competence.

Certification provides print buyers with assurance that service providers can achieve a specified output quality and helps them to ensure value for money. However print buyers should be wary of certifications provided by organisations that are also consultants to the company or which have related products to sell.

What This Means for the Print Buyer

If you want high quality colour prints you really should be working with a printer who understands ISO 12647-2. Ask your print provider about their level of conformance to international standards and how it is demonstrated. Make sure that you specify on all print orders that you want output quality that is compliant with ISO 12647-2 and be clear that this means the printer should be prepared to provide you with copies of certificates of compliance. Make sure the certificates are current.

What This Means for the Printer

If you are selling work on the basis of ISO 12647-2, make sure that you are able to fully demonstrate that you can meet the standard. Make sure your company is formally certified, either through an independent organisation or an industry association, and that your staff know how to communicate the information.

ISO 12647-2 in Context

ISO 12647-2 is one of several standards in the ISO 12647 series that standardise the control parameters for various printing processes. Each part in the series is specific to a different print method. 12647-2, the part for offset lithography, is the most widely implemented. Various bodies, such as the British Printing Industries Federation, the Swedish Printers' Federation, FOGRA in Germany, UGRA in Switzerland and IDEAlliance in the US, have developed certification procedures for ISO 12647-2, with more or less rigour. They provide certificates to companies who pass their series of tests for compliance.

Rather than develop our own certification procedures, Digital Dots has worked with certifying bodies and certification scheme developers. With SPP, we have developed comprehensive guidelines for implementing ISO12647-2 that are easy to follow and inexpensive to apply. These guidelines are based on work that we have done with the Swedish Printers Federation and the British Printing Industries Federation, to assist with the development of their certification schemes.

Useful ISO Standards

SPP refers to several ISO standards listed here. You should be familiar with all of them to some extent in order to fully and successfully implement ISO 12647-2. All of these standards are very useful, but we particularly recommend that you invest in ISO 12647-2 and ISO 9001.

ISO 12647-1	Parameters and measurement methods
ISO 12647-2	Offset lithographic processes
ISO 12647-7	Proofing processes working directly from digital data
ISO 2846-1	Colour and transparency of ink sets for four-colour printing
ISO 3664	Viewing conditions – Graphic technology and photography
ISO 9001	Quality management systems – Requirements
ISO 12642	Input data for characterisation of four colour process printing
ISO 12646	Displays for colour proofing
ISO 13655	Spectral measurements and colorimetric computation for graphic arts images
ISO 15076	Image technology colour management (ICC profiles)
ISO 15930	PDF and prepress digital data exchange (PDF/X)

Standardised Print Production: Quality Management

Quality Management in general

There are many ways to define quality. One is when a product meets a customer's expectations, so SPP focuses on a print buyer's expectations for print quality and colour reproduction accuracy. The SPP guide does not assume a full ISO 9001 implementation, however it does include some critical components relating to customer satisfaction, planning, measurements, analysis,

While printing according to standards may seem to be a technical issue, it's actually more about ensuring business efficiency and customer satisfaction.

improvements and control of non-conforming products, i.e. those that miss some aspect of the ISO 12647-2 standard. If a printing company wants to include all aspects of quality management for all departments at the site, we recommend a full implementation of ISO 9001.

Quality management of colour reproduction and printed output involves, to a greater or lesser extent, most of a printing plant's departments: marketing, sales, customer service and administration. Obviously the prepress department and press room are the departments most involved in colour accuracy and print quality, but just like the general principles in ISO 9001, it's important that all personnel in the company are at least aware of the quality policy, and know

the central points of what it means to print according to the ISO 12647-2 standard. It's also crucial that the management is engaged in this work.

Setting up ISO 9001 is sometimes said to generate a lot of administrative work, with many forms to fill in. This was probably true when ISO 9000 was first introduced in the late eighties, and even during the nineties. But since the 2000 version of the standard was introduced the focus has been on customer satisfaction, and on reducing paperwork to a minimum, to what is really useful and necessary for the actual processes in hand.

There are of course some areas in the ISO 9001 standard for which written documentation must exist to support the quality management system. First of all there has to be a formal Quality Manual, which should describe a company's Quality Policy, including a list of stated Quality Objectives. ISO 9001 also requires six specific areas to be documented, and these topics may or may not be included in the Quality Manual itself.

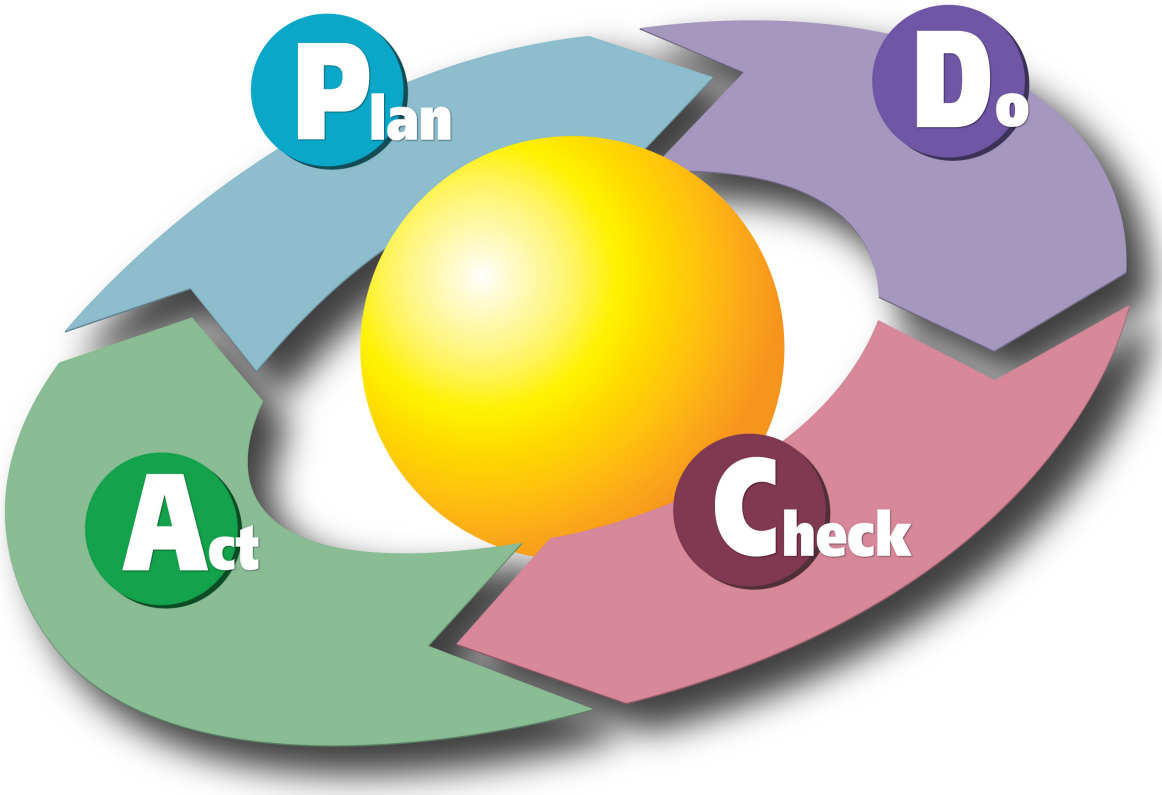
The first area that needs to be documented relates to how documents are structured and numbered. The next is how documents and records are stored, backed up and managed, and where back-ups are kept. The third area is when and how internal audits are planned and executed, and the fourth area is a description of quality control metrics that are judged as being crucial to ensure consistently maintained quality. The fifth requirement is to document any non-conformity with ISO 12647-2, or other standards referred to in the Quality Manual. Their root cause must be identified, along with the actions taken to eliminate the non-conformities.

Finally, the company should report preventative actions taken in order to eliminate a future repetition of a problem or non-conformity. A company that is truly serious about quality control cannot ignore any of these six areas in a quality system.

ISO 9001 provides the framework for a company's Colour Quality Management System. For print media production the ISO 12647-2 standard provides details on tolerances in print production and on press. ISO 12647-7 specifies tolerances for hardcopy proofs and is a useful addition to a company's standards armory.

ISO 9001 in a nutshell

ISO 9000 was introduced in 1987, but applies at least 20 years worth of prior experience with quality management. One principle that dominates the spirit and thinking in ISO 9000 is the Plan, Do, Check (measure) and Act (analyse and take action) or PDCA cycle, advocated by the American statistician Dr W. Edwards Deming, and clearly credited to him in the standard.



ISO 9001 has adopted the PDCA-cycle, advocated by W. Edwards Deming. This stands for Plan, Do, Check (measure) and Act (analyse and take action). *Diagram by Karn G. Bulsuk (http://www.bulsuk.com)*

Properly applied, PDCA will inevitably lead to continuous improvements in processes and business management. But for PDCA to work management needs to invest in training and education in best practice quality management techniques in general, and the ISO 9001 requirements in particular.

The purpose of a Quality Policy is to communicate the intent of the quality work to all staff and to customers, both existing and potential. Complementing the Quality Policy with clear and understandable Quality Objectives will help make things happen within the stipulated timeframe. When choosing and describing the Quality Objectives the Specific, Measurable, Achievable and Relevant (SMART) criteria can be applied. It's also very important that they are time limited. Sometimes it could be useful to add one more "A" to the list – it doesn't hurt if the objectives are a bit Ambitious!

Once the Quality Objectives have been defined, along with the types of measurements that must be conducted in regular production, this information is included in the analysis of non-conformities that may occur. Non-conformities should ideally be caught and reported internally, to prevent faulty products from reaching the customer. Since customer complaints are the most

serious form of non-conformity to be reported, failure to address the errors that lead to those complaints means they are likely to be repeated and this may damage a company's goodwill. Properly and swiftly managed, customer complaints might even help to strengthen the image of a company: print buyers can see and recognise that a company is committed to continuous quality improvement and that it practises what it preaches.

In all cases of customer complaint it is crucial to identify the root cause of a problem, and not only to fix it promptly, but also to identify preventative actions that might permanently resolve the source of the complaint. Sometimes the source of complaints can be traced to the need for further staff training, other times software or hardware needs to be replaced, or investments made into new technologies. Sometimes the problem is that a customer's expectations haven't been properly identified and addressed. The key here is to identify how the printing company can specify these considerations working with staff and customers together. One way, for instance, is to agree the file format that should be used for delivering files in readiness for the print production workflow.

When developing the Quality Policy and the Quality Objectives it's good to think SMART. The objectives should be Specific, Measurable, Achievable, Relevant and Time limited.

SPP recommends the use of PDF/X, since this means that the ICC profile will be embedded in the PDF, and other aspects related to quality can be checked when incoming PDFs are preflighted. Specifying what types of PDF/X files a printer expects to receive from the customer is important because it helps both print buyer and printer to understand their respective roles in process automation. It should also be made very clear which ICC profile should be used for the actual paper, as part of the process of specifying the print job. The ICC profile determines the characteristics of the substrate or printing device both of which have a profound impact on colour appearance. When multiple files that are not according to specifications enter the prepress department, preventative actions need to be taken to address the problem. Error correction takes time and is often one of the unseen and so unbillable costs of print media production. Clear information

relating to file formats and ICC profiles must be communicated to the customer. Ideally this information should be easily accessible on a printing company's website, but it should also be repeated elsewhere. File delivery requirements should also be stated on the order confirmation. Such a policy provides a useful step in quality management for the business.

When analysing non-conformities and trying to get to their root cause, asking the question "Why?" as often as it takes is as important as providing a superficial fix. We are quick to fix an obvious problem or error, especially under time pressure and when sorting out the underlying cause is more complicated and time consuming. But too often we stop the process of fixing nonconformities and errors when we have found an obvious symptom: we mistake the symptom for the problem and asking "Why?" is the means to identifying the source of the error. Make sure to take the time and actions required to ensure that you understand the source and cause of the problem so that you can take steps to fix it and ensure that it doesn't re-occur. This approach will yield the long term benefits a Quality Management system is designed to deliver.

What This Means for the Print Buyer

Do you know the Quality Policies of the printers you use? If not, ask where you can find your service provider's Quality Policy, and if it's not clear, ask to have it explained to you. Be sure to understand how it benefits you, the customer.

What This Means for the Printer

Make sure your Quality Policy is clear and fully explains how your Quality System supports your Quality Policy intentions. Communicate the policy to both staff and customers and complement the policy with a limited set of Quality Objectives. Test to ensure that those objectives follow the SMART criteria: Specific, Measurable, Attainable, Relevant and Timely.

Audits – what's the point?

One of the required documents in a Quality Management System is a description of how audits are planned. This doesn't refer to external audits conducted by a third party (normally the accredited certifying organisation), but to a company's internal audits. Internal audits are the tool that ensures that a Quality System can actually work and that continuous improvements are achieved. It is for this reason that a company's management team is involved and directs most of the internal audits. At least once per year management needs to communicate the results of these audits to the entire staff. Conducting regular management reviews is mandatory in an ISO 9001 compliant Quality Management System.

But between the internal and external audits daily production has to continue and the quality management metrics will be regularly analysed and fed into the handling of any non-conformities or errors that occur in regular production. A quality management system doesn't necessary prevent problems from occurring, but rather it helps in detecting and resolving them. Identifying problems that compromise business performance even if it is only in a small way should be welcomed and encouraged.

The key point is to take proper actions and to prevent errors from reoccurring so that the business can continue to grow healthily. Hence internal audits should focus on identifying the root cause of a problem, and check that the proper preventative actions have been identified and implemented in an effective manner. In mature Quality Management Systems preventative actions should be thoroughly considered and introduced swiftly. They should be carefully followed up by the management. It might take a company several years of systematic and devoted work to reach this level of experience, however the net result over the years will have been a continuously improving business structure, which influences a company's effectiveness and profitability.

External audits normally take place annually and should be looked upon as possibilities for additional training for applied quality management. The risk of being blind to its own failings is ever present for any business. Management may have taken into account all identifiable aspects of quality assurance for the organisation, but an external auditor can often see things that may have been overlooked. Again, the identification of problems should be welcomed, because then the business has something new to improve. The result should be the elimination of wasted processes and inefficiencies, either in materials or time. The positive outcome is evident in the company's cost savings and process efficiencies.

What This Means for the Print Buyer

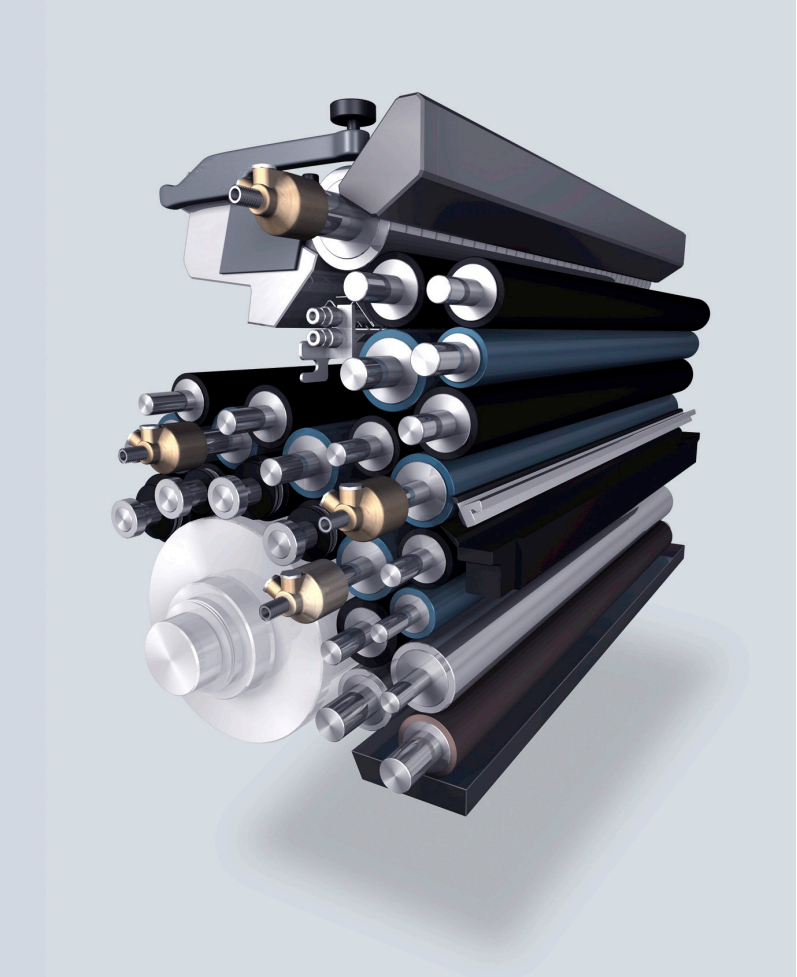
Have you had any reason to complain about any aspect of your printer's service, such as the print quality or colour accuracy of the prints you ordered? Or perhaps you didn't get the customer service you were expecting? If so, did you make a formal complaint? How did the printer address and resolve your complaint? What criteria will you use for your next print media investment?

What This Means for the Printer

Is there a pattern, obvious or otherwise to the customer complaints your business receives? How do you correct repeated errors? Do you clearly specify the requirements for incoming digital files and proofs? Are your customers aware of how files should be specified when they request print compliant with ISO 12647-2?

Certification versus Accreditation

ISO 12647-2 is one of several parts in the ISO 12647 series. It provides the control parameters for various printing processes, with each part in the series specific to a different printing method. ISO 12647-2 is the part for high quality offset lithography, the most widely implemented in the market. Various entities, such as the BPIF, the Swedish Printers' Federation, FOGRA in Germany, UGRA in Switzerland and IDEAlliance in the US and elsewhere have developed certification procedures, which confirm a printing company's ability to produce work that complies with the standard.



While press maintenance isn't mentioned *per se* in ISO 12647-2, it will be difficult to stay within tolerances of TVI, colour deviation and variation if the press isn't serviced according to the manufacturers instructions.

SPP supports all of these schemes which are the basis of various accreditation procedures, some of which are audited by independent auditors and some of which are not. A printing company successfully fulfilling the requirements of an accredited ISO 12647-2 scheme receives a certificate confirming its achievements. The certificate's value depends, of course, on who has done the certifying and the scope of the certification body's authority. For example, the BPIF certification scheme is accredited by the United Kingdom Accreditation Service (UKAS), an internationally recognised government body. which gives the BPIF scheme international validity. UKAS also audits those certification companies who want to conduct audits based on the BPIF scheme. While anyone can create and sign a certificate and perform audits according to a particular scheme, a UKAS accredited organisation will perform the task with a high level of competence that has been independently verified. A certificate from such an organisation is of the very highest value.

As with certifications according to ISO 9001, one should beware certifications provided by organisations that also provide consulting services to the company, or sell software or equipment to that company. In a true third party auditing scenario, the auditing party should have no vested interest in whether the company being audited passes or fails.

Print certifications worldwide

The international technical committee for ISO standards within the graphic arts has started work on a generic certification methodology. This is not a certification scheme, but it outlines what a scheme ought to address. It will be possible to use this standard worldwide to certify a printer's compliance to ISO standards, including the ISO 12647 series. This will hopefully improve the confidence of print buyers and print's competitiveness in the media market.

Certification can ideally be an incidental aid to cost control because compliance with a rigorous management and production scheme helps get production and related factors under complete control: what one can measure one can control. Certification also gives print buyers assurance that service providers can consistently achieve a specified output quality measured and judged to a robust compliance scheme. This in turn helps print buyers to ensure value for money and to select print service providers on the basis of qualified and proven competence.

What This Means for the Print Buyer

Does your company operate worldwide? If so you need your printers to have certifications that are recognised and accepted internationally. While there are many print certifications available worldwide, very few are accredited by a governmental body. If this is important to you, make sure to ask for proof of the accreditation and its source.

What This Means for the Printer

You are most likely able to obtain ISO 12647-2 compliance certification from several sources and companies. If this is important to you, make sure to ask for proof of the accreditation and its source. Your customers will most likely value such a certificate more highly than non-accredited certifications.

About the authors

Laurel Brunner

Laurel started her career in 1978 as an accountant for a printing company. Since then she has worked exclusively in the prepress and publishing industries, with a particular specialisation in digital prepress, digital production and digital printing. She is managing director of Digital Dots, an international consulting group, and publisher of Spindrift. This is the industry's only independent, subscriber supported newsletter for the graphic arts, printing and publishing industries.

Laurel is active in standards development through her work with several ISO committees and is the convenor of ISO's Working Group 11 which is developing standards related to the environmental impact of print.

Paul Lindström

Paul Lindström entered the graphic arts industry in 1980 as a typographer and graphic designer. He has worked in computer assisted graphic design and print production ever since. Paul was the production manager and owner of a commercial printer where he became involved with digital printing, before moving to Elanders' Electronic Printing division. During his three years with Elanders Paul played a key role in developing the company's variable data management and print on demand strengths.

Between 1993 and 2003 Paul worked as technical editor for AGI, Scandinavia's leading graphics arts trade magazine. In addition he lectured part time for the Graphic Arts Department at Malmoe University, running degree courses on digital imaging, colour and quality management, the optimisation of workflow systems and production processes. Since 1998 Paul has been an UKAS accredited auditor for ISO 9001 and ISO 12647 certification, and is the co-editor of the certifications schemes in both Sweden and the UK. He is an appointed expert to ISO TC130, the technical committee responsible for authoring ISO standards for graphic arts and print media production.

Digital Dots is an independent graphic arts research group established in 1999. The company specialises in technology evaluations for digital prepress, printing and publishing applications and has conducted technology tests since its inception. Digital Dots also provides exclusive market research, testing and evaluation services for developers and buyers and is the publisher of Spindrift, a subscriber supported journal for the graphic arts.

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