



pass4press

Version 5
2007/2008

Web Offset Printing



Production & Technology committee

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| Jasper Scott (Co-Chairman) | IPC Media |
| Rose Benjamin | PPA Executive |
| Sharon Bird | IDG Communications |
| Michele Cohen | Profile Media Group |
| Sarah Davidson | The Condé Nast Publications |
| Meurig Evans | Haymarket Business Publications |
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Accreditation committee

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| Bob Marchant | Colour Therapy |
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| Jack Bisset | Polestar |
| Brent Martin | DuPont |
| Andy Psarianos | FE Burman Limited |
| Marcus Kirby | Vertis prs |
| Pamela Raftery | St Ives |



Pass4press committee

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| Robert Banbury | The Economist Group |
| Jack Bisset | Polestar |
| Chris Burn | Agfa |
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| Joanne Izatt | The Condé Nast Publications |
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| Frank Maeder | Southernprint |
| Bob Marchant | Colour Therapy |
| Brent Martin | DuPont |
| Richard Mason | Emap |
| Jonathan Moore | The Condé Nast Publications |
| Andy Psarianos | FE Burman Limited |
| Pamela Raftery | St Ives |
| Christopher Reed | William Reed Publishing |

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Pass4Press V5: Introduction

Dear Colleagues,

It has been five years since **pass4press** was originally launched, during which time we have seen an enormous amount of change in the industry in pursuit of a complete digital workflow. This brochure has been produced to incorporate revisions to the **pass4press** specification and to provide updates on developments with the preflighting and **proof4press** initiatives.

We cannot have a complete digital workflow if pictures are still submitted in an analogue form, therefore the committee has worked extremely hard this year to produce a set of best practice guidelines for the supply and processing of digital imagery. Details of these guidelines can be found within the separate **pic4press** brochure, which I hope you will find extremely useful.

The **pass4press** website (www.pass4press.com) will be updated throughout the year with any further developments and I am pleased to inform you that some videos have been produced giving step-by-step instructions of how to create **pass4press** files using the latest specifications. These have kindly been produced for us by **Darrin Stevens** at **Polestar** and they can be accessed via the **pass4press** website. If you would like to make any comments about **pass4press** or the website please contact **Rose Benjamin** at the **PPA** on **020 7404 4166**.

I would like to thank all the committee members who have given up their time, knowledge and expertise to help develop the **pass4press** specifications. Finally, I would like to offer a special thank you to **Jonathan Moore, The Condé Nast Publications**, for all his time and effort spent in producing this brochure.



**Debbie Read, IPC Media
pass4press committee chair**

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Preparation

Recommended digital image specifications

Resolution and size: Colour or greyscale continuous-tone images should be saved at **300dpi**, bitmaps at **2400dpi**. Where known, the image's dimensions should be set to the final printed size. Images too small or too low resolution for their final use will have to be resupplied to prevent quality loss.

Format Ideally files should be saved as **TIFFs**, but **JPEG** compression can be used as a transmission format to speed up delivery times – see note below.

Compression Compression is split between lossy and loss-less formats. Lossy formats, such as JPEG, throw pixel information away to reduce file sizes, and rely on algorithms to rebuild the discarded data when decompressing (ie, opening) the file (see **Glossary** entry, p15). Loss-less formats such as **Stuffit** or **Zip** archives look for repeating code in a file, remove it and then tag that area so it can replace that part when the file is decompressed. The file therefore contains all the information from the original and is decompressed in its original format.

Colour Spaces Files should be in **DeviceGrey**, **DeviceCMYK**, **DeviceN** or **Separation** colour spaces, but must only include cyan, magenta, yellow and black separations. Any objects in **Device RGB**, **CalibratedRGB** or **LAB** must be converted before being imported into a layout application. **DeviceCMYK** should be in an appropriate CMYK colour space such as the **ECI's ISOWebcoated.icc** profile (<http://www.eci.org>). For more information see the **pic4press** documentation on submission and handling of images (www.pass4press.com).

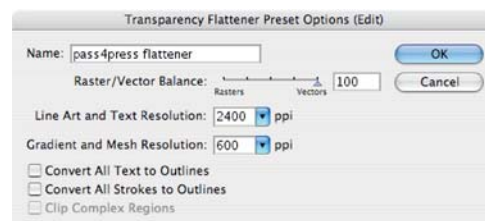
Total Area Coverage Combined colour values should not exceed **310 per cent**. Note that some publishers may require a lower maximum depending on the substrate used.

Proofs Where necessary a CMYK, ripped proof of a supplied digital image should be provided according to the **proof4press** and **RIP standardisation guidelines**.

Vector software: Adobe Illustrator CS and Macromedia Freehand MX

Files originated in Illustrator or Freehand should have all fonts embedded or outlined. Their colour space should be set to CMYK and all transparent elements should be flattened. In **Illustrator**: use **Edit>Transparency**

Flattener Presets set as per the example. **Freehand** 'fakes' its vector transparency effects by calculating overlapping colours, so does not need to have its files flattened. Any bitmaps contained within a vector file must be embedded. In Illustrator the rasterisation must be set in **Effects>Document Raster Effect Settings** set to CMYK and 300dpi. Freehand uses the native resolution of placed images and relies on their resolution being of sufficient quality, so does not need to be configured.



Page layout applications: Adobe InDesign CS and QuarkXPress 6

Colours: Delete any instance of non-CMYK colours. In **QuarkXPress**, select **Edit>Colours** to display all colours used: the icon to the left denotes whether it is RGB, CMYK or a Spot colour. Convert any non-CMYK colours using the **Model** tab. In **Adobe InDesign**, select **Window>Swatches**. Colour spaces are shown as a small icon on the right. You can also use the **Ink Manager** in the **Print** dialogue to convert Spots to CMYK. Note that if **colour management** is turned on in InDesign, all elements imported in the document which are of a different colour space than the output destination space will be transformed into the final document's working colour space when printed or exported directly to PDF.

Fonts: Delete any instances of fonts that are present in the document but not being used. In **QuarkXPress**, select **Utilities>Usage** and select the **Fonts** tab. Make sure no fonts are using pseudo bolds or italics. In **Adobe InDesign**, select **Type>Find Font**. This palette also displays a warning triangle next to any problem fonts.

Placed images: Go through your placed image files. Check resolutions and colour spaces, try to carry out any resizing in **Adobe Photoshop**, rather than in your page layout application, as this adds to potential problems. Ideally every image should be placed at 100 per cent of its original size. This does not apply to pure vector artwork. Verify your images in **QuarkXPress** in **Utilities>Usage** in the **Pictures** tab. Click the **More Information** for additional details. In **InDesign** choose **Window>Links**. Problems will be displayed by warning icons next to the relevant image.

Page size: Finally, double-check your page document size is correct. In your page setup, create a custom paper size which is **the size of your document plus 20mm** in both width and depth to allow for registration marks to be added at the PDF creation stage. In this brochure a standard A4 page size is used as an example: make sure you enter dimensions which are relevant to your publication.

PDF/X-1a Overview

An outline of the **PDF/X** format in comparison to any other PDF, **PDF/X**'s future development and why the **PPA pass4press** committee is recommending its usage

What is new in pass4press Version 5?

With the release of **Version 5** of the **pass4press** specification comes a mandate that PDF files conform to **PDF/X-1a** as per the **Ghent PDF Workgroup 2004 Magazine Ads** specification.

Why PDF/X-1a?

PDF/X-1a:2001, to give the specification its full name, is a global agreement on how files for the whole of the print industry should be constructed. It goes further towards strengthening the reliability of digital workflows by giving clear and concise instructions on how to properly interpret these files. The PDF/X standards give application developers tangible guidelines to adhere to, allowing them to create better products. It is now simple to create and process files that conform to **PDF/X-1a: Adobe InDesign CS** can natively export the format, **QuarkXpress 6** can create **PostScript** files that can be converted to PDF/X using **Adobe Distiller 6**. Last year's Version 4 recommendations were to use PDF/X-1a where possible, reflecting the fact that software was only just becoming available that made it possible to use the format. **Version 5** of **pass4press** now uses **PDF/X-1a** as the foundation on which further market specific restrictions have been applied. This method has been coined as **PDF/X+** and is the intended way of using PDF/X.

What can I do in PDF/X-1a that I can't do with any other PDF?

Nothing. PDF/X is not an alternative to PDF – it is a focused subset limiting settings which are either not relevant or which commonly cause problems in a high-resolution printing environment. It is designed specifically for reliable pre-press data interchange. It is also an application standard, as well as a file format standard. In other words, it defines how applications creating and reading PDF/X files should behave.

How do I create a pass4press Version 5 file?

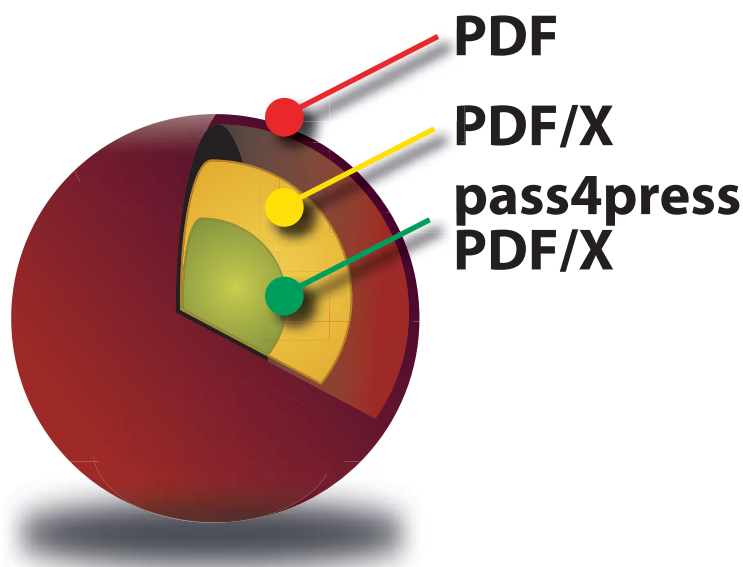
Follow the guidelines on the following pages to create a file that conforms to the **Version 5 pass4press** specification. You can also download a preset version of these settings for use in **Distiller 6** from the website, **www.pass4press.com**. It is very important that you flightcheck the file before transmission, either using standalone flightchecking software or a server solution such as the PPA's own **pass4press Online Flightchecking service, www.pass4press.com**.

What is the Ghent PDF Workgroup?

The **Ghent PDF Workgroup** is an international assembly of industry associations whose goal is to establish and disseminate process specifications for best practices in graphic arts workflows worldwide.

The following objectives are defined:

- 1:** Streamline and coordinate the decision process between industry associations (worldwide) interested in best practices for graphic arts workflows.
- 2:** Develop and maintain process specifications and associated documentation for best practices in graphic arts workflows.
- 3:** Develop and maintain reference implementations for those process specifications to ensure the practical applicability of such specifications.
- 4:** Actively promote adoption of the established specifications by the worldwide user and vendor community.



The **Ghent PDF Workgroup** consists of two membership classes: Association and Vendors.

Association members are graphic arts industry associations representing printers, publishers, design agencies, pre-press houses and/or similar companies.

Association members include:

| | | | | | |
|-----------------|---------|--------------------|-------------|------------------|---------|
| Cebuco | Holland | DAL TC | Holland | DDAP | USA |
| DDPFF | Denmark | DRRB | Denmark | ERA | Europe |
| Febelgra | Belgium | FICG | France | IDP Groep | Holland |
| IPA | USA | Medibel+ | Belgium | PPA | UK |
| Sicogif | France | Taga Italia | Italy | VFG | Austria |
| VIGC | Belgium | VSD | Switzerland | | |

Vendor members are software and/or hardware companies with an active interest in supporting the process specifications developed by the Workgroup.

Vendor Members include:

| | | | | |
|----------------------|------------------------|------------------------|------------------|-------------------------|
| Adobe | Agfa | Artwork Systems | Creo | Enfocus Software |
| Esko Graphics | Global Graphics | pub-specs | Quark Inc | Screen |

For more information visit: www.ghentpdfworkgroup.org

What are the specifications for a pass4press Version 5 file?

The following are **required** in order for a PDF file to be considered a valid **pass4press Version 5** file:

- A PDF file shall be compliant to the ISO PDF/X-1a:2001 standard as defined by ISO 15930-1.
- A PDF file shall not be created with the Adobe PDFWriter product.
- A PDF file must either have no crop box defined or have a crop box set to the same size as the Media Box.
- No object in a PDF file shall be transparent.
- A PDF file shall not use Multiple Master fonts or Multiple Master instances.
- Embedded composite fonts which are not sub-set shall not be used in a PDF file.
- A PDF file shall not contain white text set to overprint.
- Images using 16 bits per sample shall not be used in PDF files.
- PDF files shall not use layers.
- A PDF file shall not contain annotations that are set to print.
- The number of pages in a PDF file shall be exactly one.
- Total area of coverage (TAC) of elements on a page should not exceed 310 per cent.
- Resolution of colour and greyscale images shall not be below 150 dpi.
- Resolution of 1-bit images (either regular images or image masks) shall not be below 550 dpi.
- 1-bit images shall not use JBIG compression.
- Images shall not use JPEG2000 compression.

The following are **not recommended** in PDF files and should generate a warning in preflight:

- A PDF file should not contain objects that are completely off the page (as defined by the MediaBox).
- A PDF file should not contain custom UCR functions for objects in any colour space.
- A PDF file should not contain custom BG functions for objects in any colour space.
- A PDF file should not use black text smaller than 12 points that is set to knockout.
- A PDF file should not contain text that is smaller than 5 points or text that is smaller than 9 points and coloured with more than 2 colour separations.
- Resolution of colour and greyscale images should not be above 450 dpi.
- Resolution of 1-bit images (either regular images or image masks) should not be above 3600 dpi.

Settings for preflight applications will be available on the website, www.pass4press.com

proof4press proofing initiative update

The **proof4press** sub-committee is developing a ‘standard’ proofing method acceptable and relevant across the UK magazine industry

Introduction

proof4press is a standard for proofing to ensure that editorial and advertising material can be produced to a consistent and appropriate standard for the printing condition to be used, to give the printer the best chance of meeting the expectations created by the proof. **proof4press** will enable publishers, advertisers and printers to accept proofs from a variety of different accredited proofing devices and be confident that they will all fall within a tight tolerance. The **proof4press** standard is completely non-proprietary and is thus open for any vendor’s RIP, ink, paper or proof engine combination to gain accreditation. In 2003 the first **proof4press** standard was announced and major proofing vendors such as **DuPont**, **Agfa** and **Creo** now have accredited solutions, with many other companies currently going through the process to gain accreditation.

Proof4press accreditation

Any proofing manufacturing company can apply for **PPA proof4press accreditation**. The process of accreditation falls into four parts, detailed below:

1 Rip standardisation

The RIP for the proofing engine must pass the **pass4Press RIP Standardisation Test Form**. PDF files need to be interpreted in order to be displayed or printed. The results can vary from device to device. It is possible that the devices you are using have been configured incorrectly or were not intended to be used for the proofing of printing material. This test is designed to identify any discrepancies by means of a quick visual check. It is simple to understand and only takes minutes to run and analyse. Whilst this **Test Form** does not guarantee 100 per cent integrity it does conform to the RIP standards set by the PPA and adopted by suppliers to the UK magazine printing industry. More elaborate testing of complete workflows can be carried out with **ECI’s Altona Suite** or the **Kensington Suite**. The **proof4press** sub-committee will require evidence to demonstrate that the verification test has been passed for a device to achieve accreditation. You can get test files, as well as the white papers, from the website at www.pass4press.com.



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2 Visual assessments of proofs compared to target

A set of eight A4 images have been selected that are representative of typical magazine pages and are challenging to reproduce – the images cover a wide range of colours and gradations. The images, along with an **Objective Test Form** (see stage 3 below), are made available to the applicant, together with proofs of the images proofed to the **proof4press DP 10** target standard. If necessary, a proof can be output of the vendor’s own test forms to assist with their colour management. Vendors seeking accreditation can arrange to submit their proofs for visual assessment by the **proof4press** sub-committee. If approved at the visual assessment stage, step 3 can commence. If the proofs do not pass visual assessment the vendor will be given guidelines and the opportunity to re-supply their proofs at the next scheduled meeting. A copy of the visual assessment form used by the **proof4press** sub-committee can be found on the **pass4press** website for reference.



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3 Assessment of objective test form

The **Objective Test Form** (proofed using the same profile as the one used for the images passed in phase 2) will be measured with a spectrophotometer to check that the proof conforms to the expected standards and that all colours are within a **delta E tolerance of 2** compared to the **proof4press DP 10** original target.



4 Input of data into proof4press verifier software

Once a pass has been given at the third phase, the data from the PPA control strip is input into the **proof4press** verifier software. The applicant will be encouraged to supervise the inputting of the data.



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The verifier software will then enable any supplier or receiver of proofs to check that the proof conforms to the standard. A proof will fail if any patch has a tolerance of greater than a **delta E** of **2** compared to the data that has been input into the software.

Proof4press verification

The **proof4press** standard is maintained by a verification process. Once a pass has been given at the accreditation stage, data from the **pass4press** control strip is input into the **proof4press** verifier software. The verifier software will then enable any supplier or receiver of proofs to check that the proof conforms to the standard. A proof will fail if any patch has a tolerance of greater than a **delta E** of **2** compared to the data that has been input into the software. The verifier software is available for purchase from **Laurie Mullaney Associates Ltd** (www.lmal.co.uk) or for further information see www.pass4press.com.

Accredited proofing devices

To get an up to date list of accredited proofing solutions, visit www.pass4press.com.

Using proof4press

Everyone can benefit from using **proof4press**. Publishers and advertisers should be looking to specify **proof4press** verified proofs as part of their specifications; repro houses and other suppliers of reproduction for print should be using **pass4press**-certified proofing devices; printers should be supporting **proof4press** as a proof that they are confident of matching on press.

Producers of **pass4press** proofs should have purchased the **pass4press** verifier software and have the required spectrophotometer to enable them to check from the **proof4press control strip** that the output falls within tolerance. Proofs that match the required standards will have a 'Pass' label embedded – enabled from within the **pass4press** verifier software – and a copy of the **proof4press control strip** will be incorporated on all proofs. Receivers of **pass4press** proofs, whether advertisers, publishers or printers, should be looking for the **proof4press control strip** and the accreditation label, but should also consider using the verifier software themselves as a quality check on the incoming proofs and as a method of ensuring standards are maintained.



Proof4press developments

The initial **proof4press** standard created in 2003 reflected the widely-used **DP 10** target and is aimed at magazines produced on coated paper. Extensive work has been going on all year with a view to enlarging the range of proofing standards by covering a broader range of substrates. In common with other related initiatives, **pass4press** is seeking to align to internationally-recognised standards. To this end, the **ECI (European Colour Initiative)** profiles for **offset** are presently under consideration. The specific profiles under test are:

ISOcoated.icc Paper type 1 and 2, gloss and matte coated, 150 lpi (60/cm), FOGRA27L

ISOwebcoated.icc Paper type 3, gloss coated web (LWC), 150 lpi (60/cm), FOGRA28L

ISOuncoated.icc Paper type 4, uncoated white, 150 lpi (60/cm), FOGRA29L

ISOuncoatedyellowish.icc Paper type 5, uncoated slightly yellowish, 150 lpi (60/cm), FOGRA30L

Testing has already taken place using the internationally recognised **Altona Suite** and selected magazine images with a number of vendors and devices, but the committee feels that more extensive testing on a wider range of devices needs to be undertaken to establish the full gamut of the **ECI** tolerance range, before firm recommendations can be made. The intention is to be in a position to offer recommendations in advance of the 2005 PPA Conference.

FAQ Questions you need answered

What is a PDF?

Portable Document Format. A digital file format developed by Adobe to be compact, cross-platform and capable of containing graphics. This makes it ideal for the distribution of files within the print publishing market.

How do I create a pass4press file?

Either by following the guidelines in this brochure or by using an accredited workflow system that is capable of producing PDF files which conform to the **pass4press** standard.

Why can't I supply a native Quark XPress or Adobe InDesign file?

Fonts are not embedded in these files, which means that as well as there being font legality issues, unpredictable results may occur. However, using the methods described in this brochure, you can export a **PDF** directly from Adobe InDesign that will adhere to the **pass4press Version 5** standard.

Why can't I use multiple master fonts?

Multiple Master fonts are incompatible with the majority of RIP devices currently in use, so should be avoided.

Do I need to supply a proof with my PDF?

Yes. Proofs must be 100 per cent of the final output size and created from the actual PDF being submitted. Proofs must not be produced from the original application files as the result will not accurately reflect the final print file.

Can I supply any type of proof?

No, the proof should be an approved colour contract proof that builds in dot gain and represents the printing colour space. RIP Standardisation Guidelines (p12) should be adhered to.

Will the PDF print as it views on screen?

No, not always. This is why it is essential that a proof is produced from the PDF file and that the proof is ripped according to the RIP Standardisation Guidelines.

What is a PDF/X file?

PDF/X is a focused subset of PDF designed for reliable pre-press interchange. PDF/X is also an application standard that defines how applications creating and reading PDF/X files should behave. PDF/X is now the recommended format, providing that all the **pass4press** parameters such as resolution and maximum ink density have been conformed to. The Output Intent should be set to the colour space your document has been created.

Why do problems arise with overprints?

Problems sometimes occur with different RIPs interpreting PDF files in different ways. RIP settings need to be standardised, which is why the **pass4press** committee has carried out RIP

standardisation – see page 12. Further details are available on the website: www.pass4press.com.

Can I create a pass4press version 5 file using Microsoft Windows?

Yes, settings for applications on a PC are virtually identical and guidelines will be posted in PDF format on the website, www.pass4press.com, in the near future.

Why you need to set the trapping flag within your PDF

When creating a **pass4press Version 5 PDF** in **Acrobat Distiller** one of the options is to set the values for **Trapping**. The **pass4press Version 5** specification recommends that this must be set to **True** if you have either already applied trapping or if you do not wish to have any trapping applied. This flag must otherwise be set to **False**. Bear in mind that when creating a composite (rather than a separated) **PostScript** file from **QuarkXpress** it will not include any trapping information, but all overprint and knockout informations set with the the trapping dialogue box will be retained. We recommend in this case that the flag is set to **False**. However, some PDF workflow systems may generate files which incorporate trapping information and should therefore set the flag to **True**. Note that if the flag is set to **False** it does not necessarily mean that any other party, such as the pre-press house or printer, will apply trapping at a later stage.

How do I fix trim or page boxes?

PDF files contain invisible boxes which define the geometry of the page. Applications like QuarkXpress, Acrobat Distiller 5.05 and above, as well as Adobe InDesign CS all create and handle page boxes correctly as long as the guidelines outlined in this document are followed. These boxes need to be present and defined correctly in order for processes such as automatic page positioning and automatic size checking to work. If the files have been created incorrectly these pages may need to be handled manually which could incur additional costs.

Adobe InDesign CS see page 8, Step 5 for exporting PDFs. See page 9, Step 3 for printing a PostScript file.

QuarkXPress 6 See page 10, Step 2.

How do I avoid problems with transfer functions?

When saving to a Photoshop EPS or DCS file, you are presented with buttons that give options including halftone screens and transfer functions. All of these buttons should be left off unless they are specifically required for your job – check with your printer or pre-press supplier. When using the **pass4press** Acrobat Distiller 6.0 settings, any halftone, screening, orientation, or background information will be removed in the distilling process, but transfer curves will be applied. It is strongly recommended not to use transfer functions as a means of applying colour corrections or special effects within images as there are better methods available.

Glossary of terms: What it means

CMYK An abbreviation for cyan, magenta, yellow and black (or 'key').

Colour management A process used to ensure colour consistency across different input and output devices so that printed results match originals.

Compression The reduction in size of a digital file, which can be lossy or loss-less. Lossy formats (such as JPEG) permanently discard data – when the file is expanded the remaining data is used to rebuild the missing data, which can lead to a noticeable quality drop.

Downsampling The reduction in resolution of an image, whilst retaining sizing and positioning information.

DPI/PPI Dots per inch/pixels per inch. Measurements used to determine the resolution of printing images and text.

EPS Encapsulated PostScript. The EPS file format can contain both vector and bitmap graphics and is widely supported by most graphic applications. EPS files are often used as an intermediate way of transferring graphic elements from one application to another.

Halftone Screen A pattern of dots of different sizes used to simulate a continuous-tone image.

JPEG Joint Photographic Experts Group – the body that has defined compression standards. A JPEG trades image quality for file size. Compression can be set from 1 (lowest quality) to 12 (highest quality). Ideally the maximum setting should be used for print-quality images. Every time a JPEG is saved there is a potential quality drop, normally visible in the form of pixel 'blocks' appearing on the image. JPEGs are typically supplied at 72dpi in RGB. It is advisable to convert JPEGs to a loss-less format (ie, TIFF) if any work such as retouching is to be carried out. When images are embedded into **pass4press** PDFs they are compressed as maximum quality JPEGs.

LPI Lines per inch. A measurement for the number of lines per inch in the halftone grid.

OPI Open Pre-press Interface. A system in which low-resolution images are automatically replaced with high-resolution images on output. OPI comments are not acceptable within **pass4press** compliant PDF files.

Output Intent The PDF/X standard requires that all CYMK data be identified for a target printing condition using an Output Intent. For printing conditions included in the ICC registry, this may be conveyed by a pointer to the printing characterisation data (Output Condition Identifier). For other conditions a full output profile is required as the value of the DestOutputProfile key. If you are not sure which colour space you should use, talk to your printer or publisher, otherwise **pass4press** suggest the ECI's ISO web coated profile. See the ECI website for more information (<http://www.eci.org>).

Overprint The printing of one colour over another without knocking out the colour beneath, meaning colours merge.

Press dot gain The amount by which a halftone dot increases between the printing plate and printed sheets. This occurs when ink is absorbed by paper and is an inevitable part of the printing process – therefore it must be compensated for when scanning and be represented on the proof.

RGB The red, green and blue colour space used on scanning devices and computer displays. This colour space is not suitable for the printing process, so any element using it must be converted into CMYK before producing a PDF.

RIP Raster Image Processor. A software program or computer that interprets digital data (for instance, PostScript) and determines what value each individual pixel of a final output page bitmap should have. In short, the interpretation of vector data into rasterised information.

Spot Colour Colour printed with customised ink outside the four process colours of cyan, magenta, yellow and black, such as metallics or fluorescents. Spot colours are not currently acceptable within a **pass4press** PDF.

Total Area Coverage Total area coverage refers to the maximum amount of ink – expressed in the cumulative sum of dot percentages – of all the colours being printed in one area. For example, CMYK has a maximum of 400% ink – 100% of each colour. In Offset printing it is not desirable to print 400% of ink in one area as this can cause problems ranging from inconsistent results to ink drying problems. The recommended amount of TAC is dependant on many variables including paper type and printing process; **pass4press** recommends 310% maximum for the printing of magazines on heatset web offset printing on good quality coated paper, but stresses that in all cases one should verify with the printer or publisher for the recommended TAC.

TIFF Tagged Image File Format. The traditional rasterised bitmap file format for high-quality, print-usage image files, photographic in nature, which can theoretically be any resolution or colour space. TIFFs are typically used in print at 300dpi at 100% of their placed size. TIFFs can lose quality if enlarged.

Transfer Functions These are instructions to change the colour gradation of an image. They have traditionally been used to compensate for dot gain in output devices or for the creation of special effects. Transfer functions are rarely used today. The **pass4press** specification forbids the use of transfer functions within PDF files. It recommends that these effects are applied during the creation of a PDF file.

Trapping A pre-press operation that allows for variations in registration during printing. The effect is created mainly by allowing an overlap between adjacent areas of colour. The requirement for trapping is greatly reduced with digital workflows.

UCR/GCR Under-Colour Removal/ Grey Component Replacement. UCR replaces the grey component of neutral colours with black ink, whereas GCR replaces the grey component of all colours with black ink, to minimise the amount of ink used during printing.

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