Altona Test Suite 1.2 – Online Version

Explanation of the Test Elements

bvdm. Bundesverband Druck und Medien e.V.

European Color Initiative

FOGRA Forschungsgesellschaft Druck

ugra

www.bvdm-online.de

www.eci.org

www.fogra.org

www.ugra.ch

Welcome to the Altona Test Suite

The Altona Test Suite consists of a set of PDF files, specially designed for testing digital output devices – in particular, proofing solutions, conventional and digital printing systems. However its use is not limited to output devices. The purpose of the Altona Test Suite is to check PDF/X-3 compliance and color accuracy for all software and hardware modules used in a composite PDF workflow for print production.

PDF/X-3 is a file format defined by an International Standard (ISO 15930-3 and ISO 15930-6) for digital file exchange using the Adobe Portable Document Format. PDF/X-3 defines restrictions and requirements for the use of PDF in print production over and above the Adobe PDF file specification.

Using the detailed description of all the elements you can easily evaluate printed output, for PDF/X-3 applicability, visually. Sample images of correct output and typical errors will help to identify wrongly adjusted system settings or product limitations. Additionally the Altona Test Suite is well suited to test editorial publishing systems, e.g. whether the final output of a newspaper page retains all properties of a placed PDF/X-3 ad.

The first version of the Altona Test Suite was released at the end of the year 2002. In order to incorporate a new release of the ugra/FOGRA media wedge 2.0 version 1.1 of the Altona Test Suite has been made available as of September 2003. The Altona Test Suite Online Version 1.2 contains now one of the new ECI offset profiles published in March 2004 (ISOcoated).

In conjunction with reference prints of the Altona Test Suite application kit provided by the German Printing and Media Industries Federation (bvdm), the respective ‚Visual' pages allow the adjustment of final proof and print output according to standard printing conditions. For details of the set of reference prints see www.altonatestsuite.com.

The Altona Test Suite was developed by bvdm, ECI, FOGRA and ugra with substantial contributions from Olaf Drümmer, callas software gmbh, and Florian Süßl, MetaDesign AG.

Altona Test Suite at a Glance

The Altona Test Suite comprises three PDF files each designed for specific purposes.

Altona Measure (next page top)

Altona Measure contains test elements for setting up and checking output systems such as proofers or conventional or digital printing systems based on colorimetric and densitometric measurements. The file is a common PDF 1.3 file as it is not limited to be used for one single printing condition only.

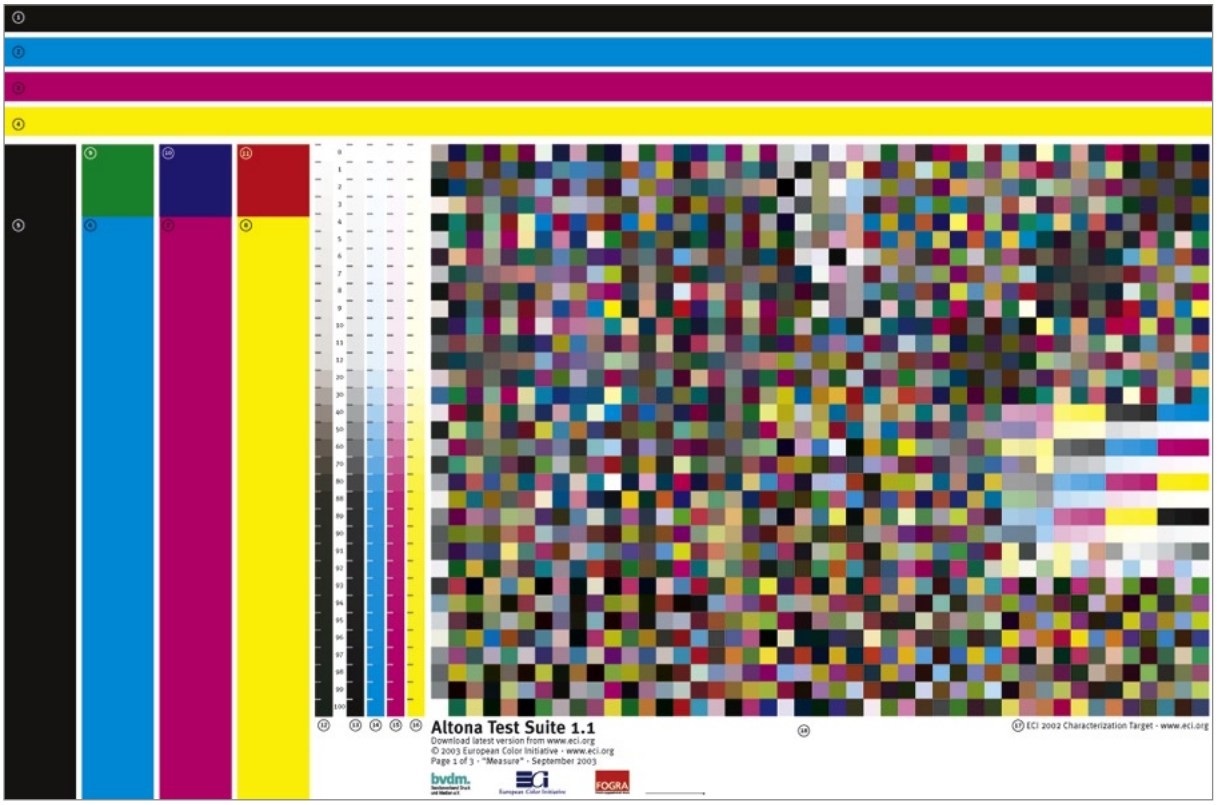
Altona Visual (next page bottom)

Altona Visual is a PDF/X-3 file focusing on visual testing of the PDF/X-3 applicability. As PDF/X-3 allows a color-managed workflow, this page comprises not only CMYK and spot color elements, but also several components containing device independent colors such as CIELAB and ICC based RGB. In conjunction with the reference prints*, Altona Visual allows visually checking and adjustment of color accuracy of press simulation on a proofing system.

Note: All natural CMYK motifs (㉑ to ㉕) have been created in Adobe Photoshop based on the same set of RGB images using “Convert to Profile” with ECI-RGB as source color space and the respective output intent profile of the PDF/X-3 file as destination color space and the rendering intent “Perceptual”. Hence the CMYK values are individually adjusted in accordance with the respective printing conditions, the total ink coverage e. g. in the newspaper version is lower than the ink coverage of the offset version for coated stock.

Altona Technical (figure on page 17)

Altona Technical addresses overprinting and font formats from a technical perspective. The elements of Altona Visual which test correct overprinting obviously cannot cover all possible combinations of elements set to overprint. Altona Technical therefore contains 864 carefully structured patches for a thorough evaluation of whether a PostScript RIP is able to correctly deal with overprinting. In addition, this page holds text, coded in all relevant font formats (Type 0 CID, Type 1, Type 2 CID, Type 3, TrueType).



Altona Measure

Altona Visual

1 Structure in Detail – The Test Elements of Altona Measure

Note: Control elements marked with **[PRINT]** are used for adaptation and checking of color appearance of printed output. They also serve as evaluation criteria for details in image reproduction of proofs and production prints.

① to ④ – Solid strips [PRINT]

Solid strips of the process inks Cyan, Magenta, Yellow and Black to help press operators equalize ink flow in all color zones.

⑤ to ⑧ – Color specimens [PRINT]

These printed process color specimens will help press operators to visually adjust the solids of the four process colors according to the printing conditions as defined in the normative part of International Standard ISO 12647. Separate color specimens prints for the printing processes offset and continuous printing are included in the Altona Test Suite Application Kit (www.altonatestsuite.com).

⑨ to ⑪ – Color patches Green, Blue, Red [PRINT]

The patches “Green” (Cyan/Yellow), “Blue” (Cyan/Magenta) and “Red” (Magenta/Yellow) are intended to be evaluated visually and based on colorimetric measurements with respect to the color values as defined in ISO 12647.

⑫ – Step wedge, CMY [PRINT]

The step wedge is for a visual reference for evaluation of proof and press run. The resulting color is not neutral gray since the patches are defined with equal tone values of the process colors Cyan, Magenta and Yellow.

⑬ to ⑯ – Step wedges process colors [PRINT]

The step wedges of the process colors Cyan, Magenta, Yellow and Black are intended for the adjustment of film exposure and conventional platemaking or CtP platemaking in order to archive tonal transfer according to the standard [2]. The numbers to the left of the wedges indicate the tone values as defined in the file. Fine graduation in steps of 1 percent in light (0 to 12 percent) and dark (88 to 100 percent) areas allow for precise tonal transfer adjustments. The respective ranges of tonal values are known to be critical for accurate gradation and color reproduction.

⑰ – ECI 2002 characterisation target [PRINT]

The characterisation target can be used to create ICC profiles for proofing devices and non-standard printing conditions. The target contains all patches of the ISO 12642 chart (IT8.7/3).

⑱ and ㊼ – Ugra/FOGRA media wedge CMYK [PRINT]

Color measurements of the control wedge allow an unbiased evaluation, of whether a given proof is in compliance with international standard printing conditions or not. The german FOGRA institute (Graphic Technology Research Association, www.fogra.org) provides reference color values for the patches of this control wedge matching standard offset printing conditions as defined in ISO 12647-2 (Offset printing). FOGRA provides characterisation tables for numerous common printing conditions, conforming to the ISO 12647 series of process standards, from which the aim values for the

patches may be taken. For visual evaluation, the visual match of the Ugra/FOGRA Media Wedge CMYK, especially of the gray scales, with the respective reference print* should be judged.

Note: A license of Ugra/Fogra Media Wedge is not included in this Altona Test Suite Online Version (freeware). Ugra/Fogra Media Wedge is generally recommended as standard control element for proofing. For information and order of ugra/Fogra Media Wedge CMYK please see www.fogra.org.

2 Structure in Detail – The Test Elements of Altona Visual

Visual test criteria

The Altona Test Suite addresses a set of six criteria well known for being critical in proofing and print production of PDF/X-3 files. For the evaluation of each criterion several elements are to be taken into account. For easy reference all elements have been marked by numbers. The criteria for visual evaluation are: “Process color”, “Duotone and spot color”, “Device independent color”, “Overprinting”, “Smooth shades” and “Resolution”.

For evaluating the criterion “Process color” check elements ⑲ to ㉕ and ㊴.

Elements ㉖ and ㉗ are intended to be used for evaluating the criterion “Duotone and spot color”.

All marked elements (㉒, ㉔ and ㉞ to ㊳) contain device independent color definitions such as ICC-based RGB and CIELAB.

The purpose of elements ㉗ and ㉘ is evaluation of the criterion “Overprinting”.

The quality of gradients and the support of PostScript 3 smooth shades can be evaluated visually in elements ㉙ to ㉝.

See elements ㊵ to ㊻ to evaluate the resolution of a printed output.

Note: Control elements marked with **[PDF/X-3]** are used for the evaluation of PDF/X-3 compliance of RIPs and workflow systems and as a tool for system configuration for an error-free output of PDF/X-3 files. For a complete observance of the PDF/X-3 standard not only the requirements explicitly given in the PDF/X-3 standard (ISO 15930-3) text must be granted, but also all normative references (specifications) of the standard. This applies especially to Adobe's specification of the Portable Document Format (PDF), and the ICC specification of the file format for color profiles.

Control elements marked with **[PRINT]** are used for adaptation and checking of color appearance of printed output. They also serve as evaluation criteria for details in image reproduction of proofs and production prints.

⑲ – Background [PRINT]

The background area consists of the primary colors (C25 M19 Y19 K20) and shows an approximate gray; lightness and color deviation are due to the printing process and printing condition. The evaluation requires visual comparison with the respective reference print of the Altona Test Suite Application Kit.

⑳ – Portrait grayscale image, gradient and step wedge [PDF/X-3] [PRINT]

All three elements are printed with process black ink only. These elements are well suited to evaluate press simulation of process black ink. Digital proofing systems usually print not only black but also colored ink in order to simulate the color appearance of the process ink Black. Digital color proofs therefore tend to show inconsistent color casts along the tonal range. Some RIPs are handling the image incorrect as spot color and print without print simulation only with the black ink of the proofing system. The error is especially visible in print simulation on uncoated paper. In this case the image reproduction shows too much contrast. This error produces also color stripes in the circles colored with process colors solids (28).

㉑ – Portrait skin tones [PRINT]

Images with skin tones tend to show visible color errors even in the case of subtle color changes. Therefore this motif is well suited to visually checking proofing quality.

㉒ – Neutral colors [PRINT]

Neutral colors are well known for being hard to match without color shifts. Like skin tones neutral colors tend to show unacceptable color casts even in the case of only slight errors in ink adjustment. In addition the quality of tonal reproduction is tested in the critical areas of high key (white carpet) and low key (belt).

㉓ – High key image, pastel colors [PRINT]

A slight adjustment error in ink ratio will cause a noticeable color shift when reproducing this kind of image. In addition the accuracy of high light tonal reproduction is checked through this motif.

㉔ – Saturated colors [PRINT]

The purpose of this image is to be able to visually check the quality of reproducing the definition and color accuracy of highly saturated colors.

㉒ and ㉔ – RGB and CMYK [PDF/X-3]

In order to test PDF/X-3 functionality both images are divided into two sections with different color modes. A cross shaped section in the centre of the motif contains an RGB image. The image was assigned an embedded source ICC profile (ECI-RGB) and the perceptual rendering intent. The rest of the image is in CMYK color mode.


In a fully PDF/X-3 compliant workflow both parts of the images will show identical colors (image on left hand side). Noticeable color differences in the centered cross shaped section indicate that the respective system does not support color transforms as defined in PDF/X-3. Subtle color differences are acceptable as they may be caused by different CMM's.

Note: Like all other CMYK images of the Altona Test Suite, the CMYK images have been created in Adobe Photoshop using "Convert to Profile" with ECI-RGB as source space and the output intent profile of the PDF as destination space. The conversion options were "Adobe (ACE)" as Engine with the rendering intent set to "perceptual". "Black Point Compensation" and "dithering" were switched off as these features are specific to Adobe software only.

㉕ – Low key image [PRINT]

This motif addresses the importance of the correct tonal reproduction of the image definition in dark areas. In addition the brown color shades are known to react very sensitively in the case of a slight adjustment error in process color ratio..

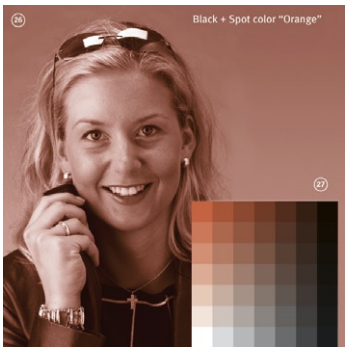
㉖ – Consistency of spot color reproduction [PRINT]

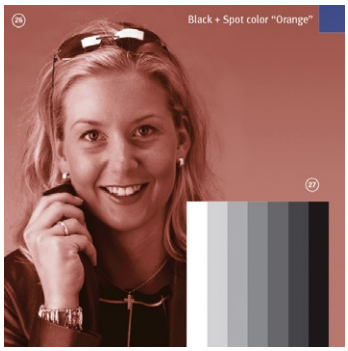
This duotone image was created in Adobe Photoshop in duotone mode selecting a spot color named Orange and process color Black. The image on the left hand side shows correct output like in the reference print*.

For the output on office color printers and display on monitors, spot colors are defined by additional default color definitions (alternate colors) – typically RGB or CMYK. Depending on which DTP-application is used for the creation of the document, a number of different default color definitions may occur for one spot color. Professional output systems offer the possibility, to unify these default color definitions and to optimize the color simulation for instance by an input of individual CIELAB-values of the printed spot color.

To check the processing of spot colors, the PDF/X-3 file Altona Visual contains **one** spot color Orange with **two** alternate color definitions: Blue and Orange.

Accordingly, there are two possible and useful output variations: a completely blue or a completely orange color reproduction of the duotone image.





A small blue square in the upper right corner of the orange spot color duotone image (image on the right hand side) indicates that the system is not able to correctly deal with spot colors or the system settings must be adapted for an error-free output.

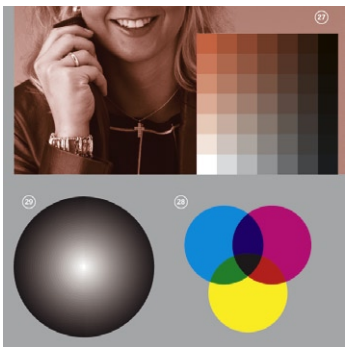
(27) – Overprinting – spot color and process color black [PDF/X-3] [PRINT]

The color table consists of two stacked grayscale images colored with spot color Orange and process color Black. The image on top was colored with process color Black set to "overprint". Vertical black bars instead of the color table indicate that the RIP ignores "overprint" settings.

(28) – Overprinting – process colors only [PDF/X-3] [PRINT]]

This element consists of three circles colored with solids of the process colors Yellow (top), Magenta (middle) and Cyan (bottom) all set to "overprint".

Visible vertical (Cyan and Magenta) and horizontal (Yellow) color bars indicate that the system misinterprets process colors as spot colors.



Correct overprint simulation

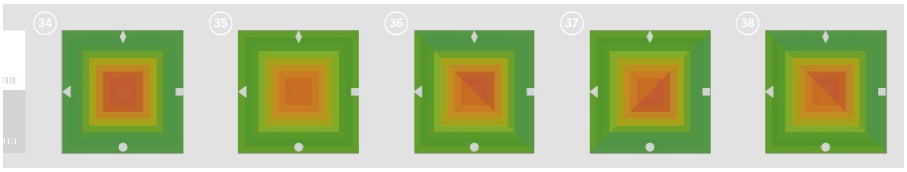
Missing overprint simulation

Wrong simulation of process colors set to overprint – Rectangles show correct process color simulation

(29) to (33) – Circle shaped gradients [PDF/X-3] [PRINT]

The five circle shaped gradients have been colored with identical tonal values of the three process inks Cyan, Magenta and Yellow (29) and all process inks printed separately (30) through (33) respectively. All circles consist of gradients coded in two PostScript types: conventional PostScript gradients on the left hand side (consisting of subsequent stripes colored with increasing tonal values), and PostScript 3 smooth shades on the right hand side.

㉞ to ㊳ – Color management patches [PDF/X-3]



The purpose of the five patches is to check whether or not rendering intents (RI) and source profiles of a PDF/X-3 file are processed correctly. Each square consists of four triangular sections marked by small elements (rhomb, square, circle and triangle). Light gray strokes from underneath leading into the patches 36, 37 and 38 indicate along which virtual line noticeable color differences shall be visible in correct output.

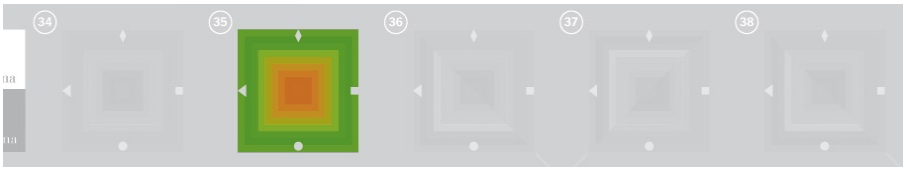
㉞ – ECI-RGB and CMYK [PDF/X-3]

Rhombus (top):	ECI-RGB	(perceptual RI)	Vector
Square (right):	ECI-RGB	(perceptual RI)	Pixel
Circle (bottom):	CMYK		Pixel
Triangle (left):	CMYK		Vector

Purpose of this element is to check whether or not the color transformation of device independent color into the CMYK color space of the output intent matches the result of the same conversion carried out in Adobe Photoshop. The respective color codings of the triangles are ECI-RGB and DeviceCMYK, each used for pixel and vector type elements, respectively.

Under no circumstances shall a distinct color difference be visible per color mode between vector and pixel elements. A subtle color difference between the elements of different color modes is acceptable. As a consequence, along the virtual line between ECI-RGB and DeviceCMYK (from upper left to lower right corner), a subtle color difference may be visible. Color differences between elements – vector versus pixel – within the same color mode indicate that vector and pixel elements are treated differently

㉟ – Different device independent color spaces [PDF/X-3]



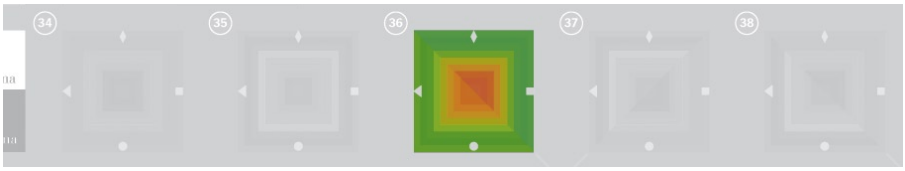
Rhombus (top):	ECI-RGB	(relative colorimetric RI)	Vector
Square (right):	ECI-RGB	(relative colorimetric RI)	Pixel
Circle (bottom):	CIELAB	(relative colorimetric RI)	Pixel
Triangle (left):	CIELAB	(relative colorimetric RI)	Vector

This element is intended to be used for checking whether the color transformations of different device independent color spaces produce identical color results. The segments are coded in the color spaces CIELAB and ECI-RGB in such a way as to match colorimetric identical colors. As all four segments

have been assigned the relative colorimetric rendering intent (RI) no distinct color differences should be visible.

A distinct color difference between ECI-RGB and CIELAB after conversion to the CMYK destination color space indicates an error, as both color spaces should be treated identically. Color differences between elements – vector versus pixel – within the same color mode indicate an unwanted difference during color conversions of vector and pixel elements.

(36) – CIELAB and different rendering intents [PDF/X-3]



Rhombus (top):	CIELAB	(perceptual RI)	Vector
Square (right):	CIELAB	(perceptual RI)	Pixel
Circle (bottom):	CIELAB	(relative colorimetric RI)	Pixel
Triangle (left):	CIELAB	(relative colorimetric RI)	Vector

This patch was designed to check whether the rendering intent is correctly taken into account during color conversions into the destination color space. All four segments have been created with identical color values in the CIELAB color space. In a correctly printed output segments with identical rendering intent show identical colors, whereas a distinct color difference occurs between elements with different rendering intents.

A distinct edge will be visible in this patch from upper left to lower right corner accordingly. This patch checks the usage of rendering intents only and not the accuracy of the resulting color. Color differences between elements – vector versus pixel – within the same color mode indicate that vector and pixel elements are treated differently.

(37) – Different source profiles, different rendering intents [PDF/X-3]

Rhombus (top):	ECI-RGB	(relative colorimetric RI)	Pixel	(„WideGamutRGB.icc" is an
Square (right):	ECI-RGB	(perceptual RI)	Pixel	ICC profile delivered with
Circle (bottom):	WideGamutRGB	(perceptual RI)	Pixel	Adobe software covering a
Triangle (left):	WideGamutRGB	(relative colorimetric RI)	Pixel	large color gamut.)

This patch is intended for the evaluation of the consistency of color transformations to the destination color space based on colors characterized by different ICC source profiles. The device independent color values of the segments, coded in ECI-RGB and Wide Gamut RGB, have been carefully adjusted to match identical colorimetric colors.

All four segments are coded as pixel images with two different rendering intents per color gamut. Hence correct output will show a distinct color difference between segments that are color characterized by identical ICC profiles. Between elements with different ICC profiles assigned, none or only a subtle color difference should be visible. Therefore a distinct color diffe-

rence from the lower left corner to the upper right corner indicates correct output. In the case of a distinct edge from the upper left corner to the lower right corner the output system is not able to correctly deal with ICC source profiles.

㊳ – ECI-RGB and different rendering intents [PDF/X-3]

Rhombus (top):	ECI-RGB	(perceptual RI)	Vector
Square (right):	ECI-RGB	(perceptual RI)	Pixel
Circle (bottom):	ECI-RGB	(relative colorimetric RI)	Pixel
Triangle (left):	ECI-RGB	(relative colorimetric RI)	Vector

Similarly to patch 36, this element is to be used for evaluating whether the rendering intent is correctly taken into account or not. The color space is device independent too, but instead of CIELAB, ECI-RGB is used. In a correctly printed output, segments with identical rendering intent show identical colors, whereas a distinct color difference occurs between elements with different rendering intents.

A distinct edge will be visible in this patch from the upper left to the lower right corner accordingly. Color differences between elements – vector versus pixel – within the same color mode indicate that vector and pixel elements are treated differently.

㊴ – Technical Black [PRINT]

The purpose of this element is to check whether or not a proofing system correctly simulates the color difference between solid Black and Black plus Cyan.

㊵ to ㊸ – Resolution – image scaling and rotation [PRINT]

As a prerequisite for evaluating these elements, the bvdm reference prints* are necessary. The four images are intended to be used for evaluating the quality of proofing a scaled and rotated motif with respect to the reference prints*.

㊹ to ㊻ – Resolution – output device resolution [PRINT]

For evaluating these elements on a given proof print we recommend having the bvdm reference prints* to hand. Comparing the elements one by one visually will indicate to which degree a proof printer is capable of simulating fine details, such as serifs of small characters, correctly. In addition, the accuracy of print head registration (proof printer) and plate registration (offset press) can be visually checked by evaluating element 44. The lines are defined as solids of all process colors Cyan, Magenta, Yellow and Black.

㊼ and ⑱ – Ugra/FOGRA media wedge CMYK [PRINT]

Color measurements of the control wedge allow an unbiased evaluation of whether a given proof is in compliance with international standard printing conditions. The German FOGRA institute (Graphic Technology Association, www.fogra.org) provides reference color values for the patches of this control wedge matching standard offset printing conditions as defined in

ISO 12647-2. FOGRA provides characterisation tables for numerous common printing conditions, conforming to the ISO 12647 series of process standards, from which the aim values for the patches may be taken. For visual evaluation, the visual match of the Ugra/FOGRA Media Wedge CMYK, especially of the gray scales, to the respective reference print* should be judged.

Note: A license of Ugra/Fogra Media Wedge is not included in this Altona Test Suite Online Version (freeware). Ugra/Fogra Media Wedge is generally recommended as standard control element for proofing. For information and order of ugra/Fogra Media Wedge CMYK please see www.fogra.org.

3 Structure in Detail – The Test Elements of Altona Technical

Page 3 of the Altona Test Suite focuses on two areas of rendering of PDF/X files: (1) fonts and (2) objects that are set to overprint or knock out other objects underneath. Both font and overprint patches are using as many of the features in PDF 1.3 – which is the basis for PDF/X – as feasible. Fonts are included in all relevant font types. The overprint patches use most of the relevant color spaces in a selection of combinations that is believed to cover most real world situations.

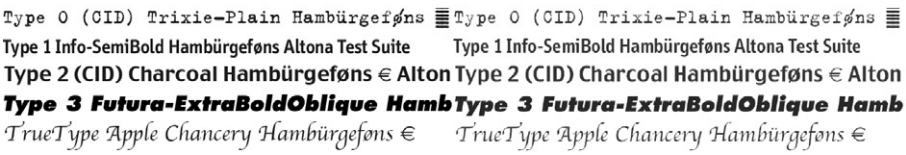
Test criteria

To find out whether a given device or process handles this test page correctly it will be easiest to have a reference print* at hand and compare patch by patch. This documentation gives some pointers to what might be causing a problem if the result of the device or process investigated does not match the reference print.

Without a reference print at hand it will be necessary to closely follow the discussion of patches in this documentation and thus find out, whether a given process or output device is having any problems with this test page.

1 – The font patches

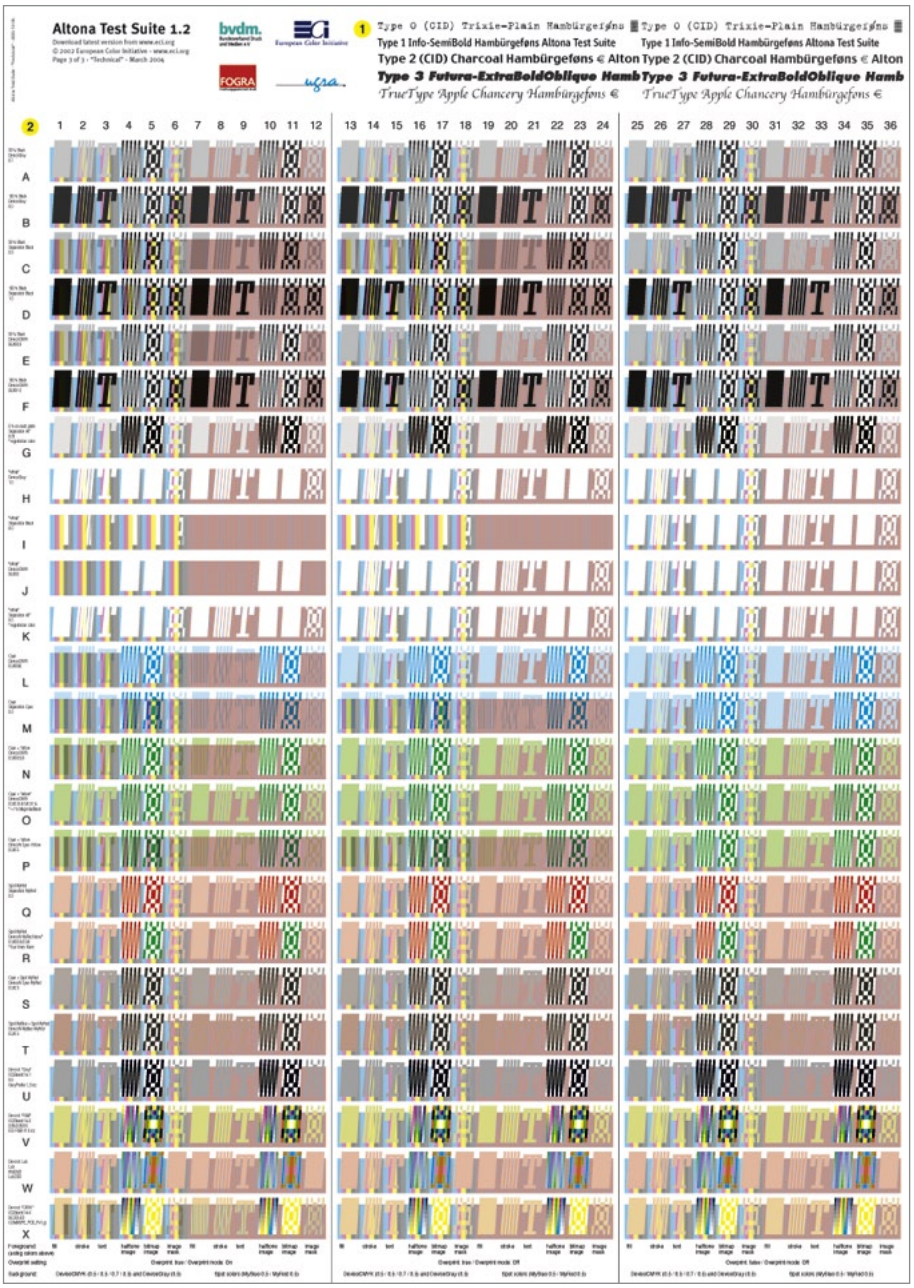
The font patches in the upper right corner of the test page are divided into two groups: the group of five lines of text on the left hand is actually using those fonts indicated in each line of text (all fonts are embedded in the PDF file). The group of five lines of text on the right hand side actually is a gray scale image, visualizing what the left group should look like of rendered properly. Thus it will be very easy to find out whether the actual text lines on the left hand side are imaged properly.



The font patch consists of two halves: the left part contains actual text, using various types of fonts and font formats (Type 0 CID, Type 1, Type 2 CID, Type 3, TrueType), whereas the right part contains an image that visualizes what the left part should look like when rendered correctly.

Possible problems

Under some circumstances the spacing of characters on a line is different from what it should be (horizontally “dancing” characters). This is typically happening if the output device is not using the font embedded in the PDF file but some other font (nearly always with the same name, but possibly a different version or vendor) that is locally resident or is still in the font cache of the output device. It is urgently recommended for a reliable PDF/X oriented workflow to always use the fonts embedded in the PDF file, and to turn font



Altona Technical

caching off in the RIP. It is actually a useful approach to not have any other fonts available to the RIP than Courier. Also, when using Acrobat, always turn off “Use local fonts”.

Note: Please also take into account the various pieces of text serving as explanations for the overprint patches. They all use Helvetica, and the Helvetica used is also embedded in the PDF file. Often printing processes or devices substitute a standard font like Helvetica with a similar font. This often leads to less than perfect character spacing and sometimes slightly different character shapes.

If any or all of the lines of text in the left hand group of the font patches is missing completely this can have two reasons. First, the process or device

may not be prepared to handle that type of font. In that case it has to be said that the process or device is not fully PDF 1.3 (or PostScript 3) compliant. Second, as the font patch is incorporated into the page as a Form XObject (a PDF mechanism that is somehow similar to importing an EPS into a layout page) it may drop out altogether, as some processes or devices are not able to handle Form XObjects properly. A workaround may be to not process the PDF directly, but to print/convert to PostScript 3 and then process the resulting PostScript file.

2 – The overprint patches

At first glance the section with the overprint patches may be a bit overwhelming with its 36 by 24 (that is 864) single patches. Nevertheless, the overprint section has been organized in a way that will help reduce complexity when verifying the output of a process or device.

Three main columns

The overprint patches are divided into three main columns. The left main column – comprising columns 1 through 12 – covers overprinting objects, with the Illustrator overprint mode enabled (OPM is set to 1). The middle main column – with columns 13 through 24 – also deals with overprinting objects, but with Illustrator overprint mode disabled (OPM set to 0). Finally, in the right main column – columns 25 through 36 – all objects are set to knock.

What is Illustrator overprint mode?

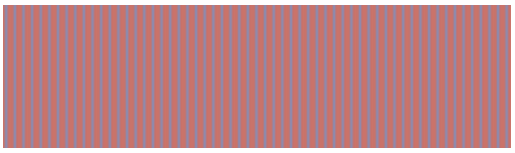
Illustrator overprint mode (OPM) influences, how DeviceCMYK objects that are set to overprint are handled when printed on top of elements using process colors. It never applies to images or smooth shades (only to vector objects, text and image masks), and it never affects overprinting objects using color spaces other than DeviceCMYK or objects that are not set to overprint, and it only affects the color channels in the DeviceCMYK object that are 0 %. If a color channel in a DeviceCMYK object that is set to overprint is zero, it will not erase the color that has already been painted in that same color channel before, if and only if Illustrator overprint mode is enabled (OPM = 1). Otherwise that color channel using 0 % will paint 0 %, thus erasing the color in the same color channel.

Example: Given a rectangle has been filled with 50 % Cyan and 100 % Yellow and 0 % each for Magenta and Black (resulting in a light green). Next, an overprinting circle that overlaps this rectangle is filled – using DeviceCMYK – with 0 % Cyan, 50 % Magenta, 100 % Yellow and 0 % Black. The result will depend on the currently active Illustrator overprint mode. If it is disabled (OPM = 0 or not defined at all), the 0 % Cyan in the circle will knock out the Cyan in the rectangle‘s area underneath it. Painting 50 % in the Magenta channel and 100 % Yellow in the Yellow channel (erasing the Magenta or Yellow that has been there before) will result in kind of orange. (Black does not play a role here as it is 0 % for both objects.) Opposed to this, if Illustrator overprint mode is enabled, the 0 % Cyan in the circle will be ignored, that is it will not erase the Cyan already imaged in that area. The behavior for all DeviceCMYK channels that are not 0 % remains the same as described before. Thus the result will be a brownish color.

Background layer

Within each main column there are rows consisting of two areas. The left portion of a row within a main column is a sequence of six rectangles with vertical stripes of 50 % Cyan, 50 % Magenta, 70 % Yellow, 50 % Black (using DeviceCMYK) and 50 % Black (using DeviceGray). Both Black stripes should look identical, so that the rectangles give the impression, that the 50 % Black stripe is twice as wide as each of the Cyan, Magenta and Yellow stripes. The right portion consists of thin vertical stripes alternating between the spot colors MyRed and MyBlue. Thus it can be said that the left portion is only using process colors, while the right portion is only using spot colors.

The process color background patches consist of stripes of 50 % Cyan, 50 % Magenta, 70 % Yellow and two variations of Black, one built as DeviceCMYK, the second one built as DeviceGray. Both have 50 % Black 50 % and should render identically. The sequence of five stripes is repeated six times, so that the six different types of overprinting elements can be placed on top of them.



The spot color background patches consist of stripes of the spot colors MyBlue and MyRed. The stripes are repeated to allow for the six different types of overprinting elements to be placed on top of them.

Foreground layer

The foreground layer consists of groups of six elements, imaged on top of each of the groups with process color or spot color patches in the background.

The first element – a slanted rectangle – is an area filled with the currently active foreground color.

The second element consists of five lines, stroked with the currently active foreground color.

The third element is a text element, using the letter T in Courier-Oblique, painted with the currently active foreground color.

The fourth element uses a continuous tone image, with its pixels painting in the currently active color space with varying amounts.

The fifth element uses a bitmap image, with its pixels painting in the currently active color space with either full amount of color or no color per color channel.

The sixth element uses an image mask (a special type of bitmap, where the bits that are “on” paint the current color, whereas the bits that are “off” do not paint anything).

Using these groups of six elements it is possible to verify that all essential types of graphic objects – fill, stroke, text, continuous tone, image, bitmap image and mask – are rendered correctly.

Each group of foreground elements consists of six elements, each of a different type (filled area, stroked lines, text, continuous tone image, bitmap image, image mask).

The foreground layer consists of 24 rows (letters A through X) each using a different color space and different color values. A description of the color space and color values used can be found to the left of every row.

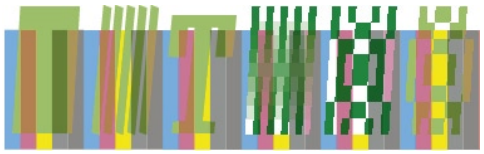
Analyzing the overprint patches – first step

In order to not have to evaluate each of the 864 patches one by one, it is recommended to begin with the following steps:

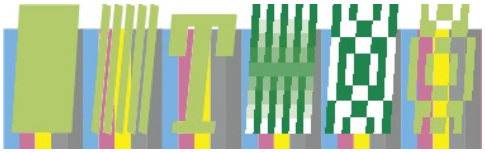
(a) first of all, check whether any of the patches in the left and middle main column show any overprinting effects. If all three main columns are identical, not displaying any overprint effect at all, the process or device simply is not able to honor any overprinting.

(b) next, investigate the right main column: none of its patches should display any overprint effect. If nevertheless there are patches where overprinting effects occur, it is probably due to some ‚intelligent‘ mechanism in the process or device that tries to optimize the output – which in the case of this test page – as well where correct processing of PDF/X is required – is not at all desirable. Typical instances would be settings in a RIP that always apply overprinting for Black.

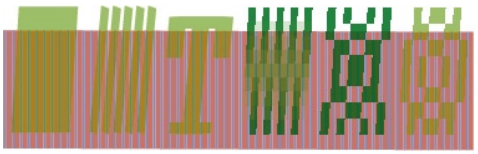
(c) the right spot color halves of the left and the middle column should be identical, as the only difference between both main columns – Illustrator overprint mode enabled or disabled – should only affect overprinting objects printed on top of process colors. If there are any differences, this is a pointer to the fact that the process or device does not handle Illustrator overprint mode correctly when overprinting elements are printed on top of spot color elements.



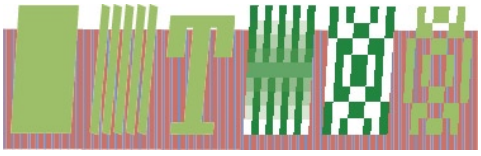
In this example, the foreground elements – using Cyan and Yellow only – printed on top of the process color background patches show the overprinting effect with all color stripes except the Cyan and Yellow ones, where the color from the overprinting elements alone con-trol the result. There is also one problematic aspect in the example: DeviceCMYK Black and DeviceGray Black in the background elements do not behave in the same way, instead the DeviceGray Black seems to be rendered using Cyan, Magenta and Yellow as well instead of just using Black.



In this example, the foreground elements – using Cyan and Yellow only – printed on top of the process color background patches are set to knock out, so that no overprinting effect occurs. There is also one problematic aspect in the example: DeviceCMYK Black and DeviceGray Black in the background elements do not behave in the same way, instead the DeviceGray Black seems to look darker than the DeviceCMYK Black, though it should look identical.



In this example, the foreground elements – using process colors Cyan and Yellow only – printed on top of the spot color background patches show the overprinting effect with all spot color stripes.



In this example, the foreground elements – using process colors Cyan and Yellow only – printed on top of the spot color background patches are set to knock out so that no overprinting effect occurs.

Analyzing the overprint patches – second step

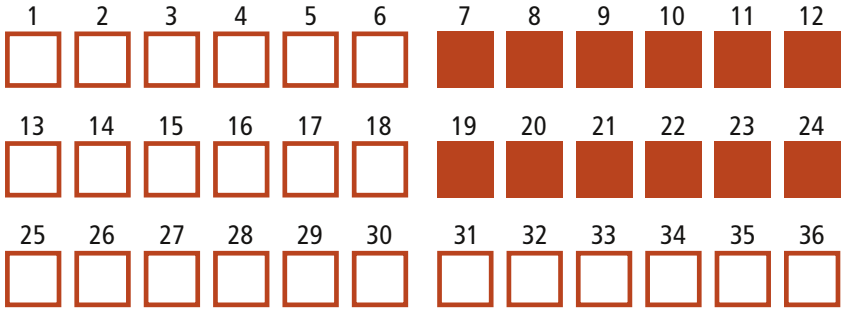
Note: The detailed analysis of this second step will only discuss the left main column and the left halve of the middle main column (see page 18). Discussion will proceed row by row, indicated by the drop cap letters A to X. Within each row entry, a chart visualizes which patches show overprinting, which should not, and which may have a mix of overprinting and knock out.

signals a patch where no overprinting should occur, that is each element should look as rendered completely opaque.

signals a patch where some overprinting should occur. This will happen for example, if a MyBlue foreground element is printed – with overprinting turned on – on top of the spot color background patches consisting of MyBlue and MyRed. The foreground MyBlue will knock out the background MyBlue and will instead paint its own color value, whereas the MyRed should shine through.

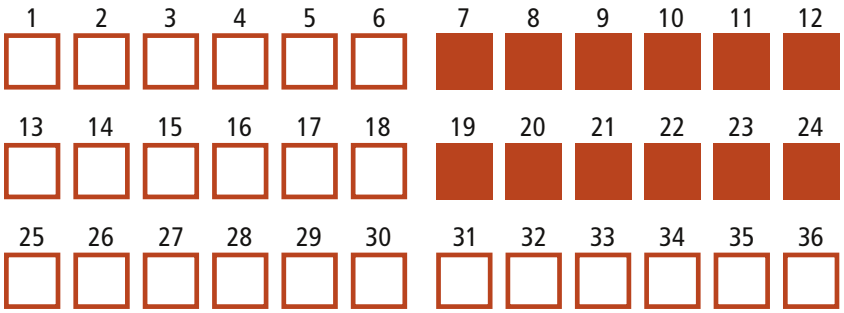
signals a patch where overprinting should occur everywhere, that is each foreground element should look different than it would look if printed on top of a white area.

A (DeviceGray, “30 % Black”): Overprinting effects should only appear with the spot color background patches. DeviceGray always knocks out process colors, regardless whether it is set to overprint or not.

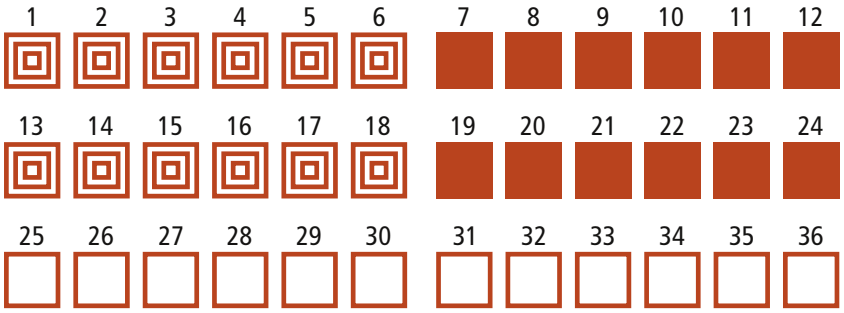


B (DeviceGray, “100 % Black”): Overprinting effects should only appear with the spot color background patches.

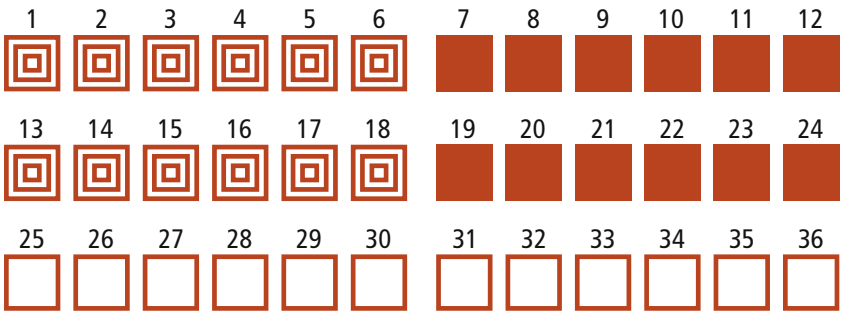
Note: With some output devices it may be difficult to tell, whether the 100 % Black printed on top of the various background patches actually overprints or knocks out. For devices that in principle are capable of rendering 100 % Back differently from a rich Black, where in addition to 100 % Black other color channels are contributing to the color to be imaged, it should be possible to see this effect also in this case.



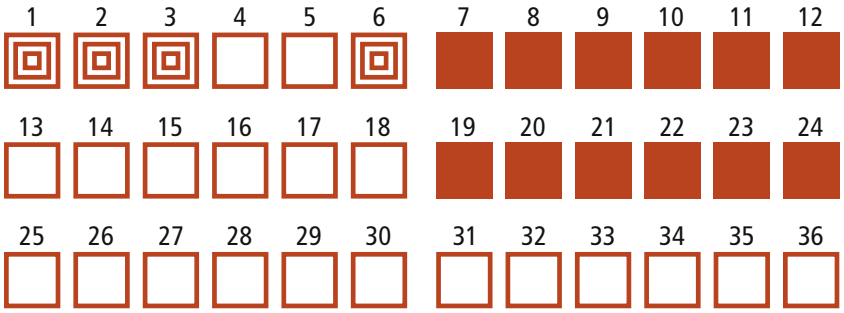
C (Separation Black, “30 % Black”): Overprinting effects should appear everywhere except for the 50 % Black (DeviceCMYK and DeviceGray) stripes in the process color background patches.



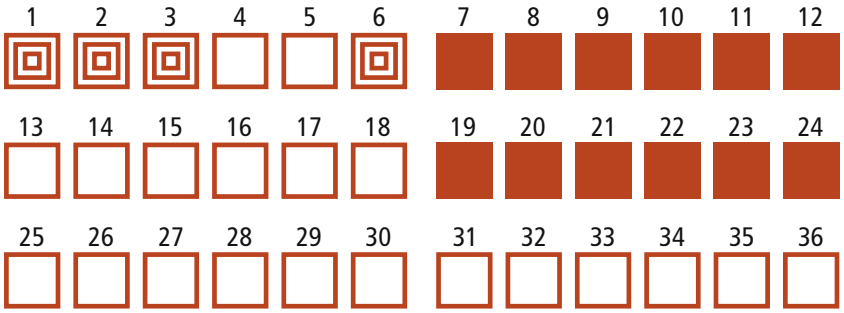
D (Separation Black, “100 % Black”): Overprinting effects should appear everywhere except for the 50 % Black (DeviceCMYK and DeviceGray) stripes in the process color background patches, where the result should be plain 100 % Black.



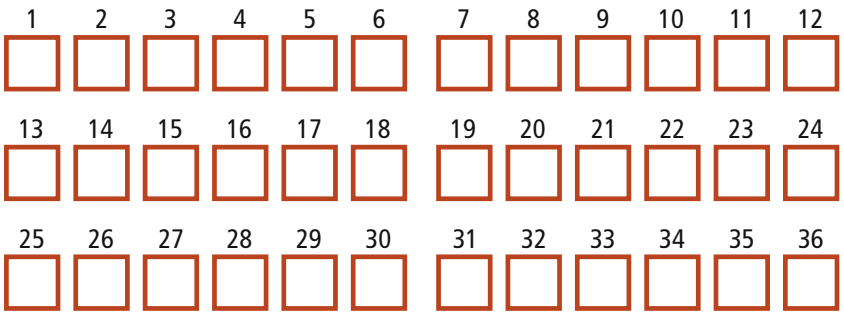
E (DeviceCMYK, "30 % Black"): In the left main column (columns 1 through 12) overprinting effects should appear everywhere except for the 50 % Black (DeviceCMYK and DeviceGray) stripes and the two images objects (continuous tone and bitmap image) in the process color background patches. In the middle main column (columns 13 through 24) overprinting effects should only occur for the spot color background patches. For the process color background patches the behavior should be the same as for knocking out.



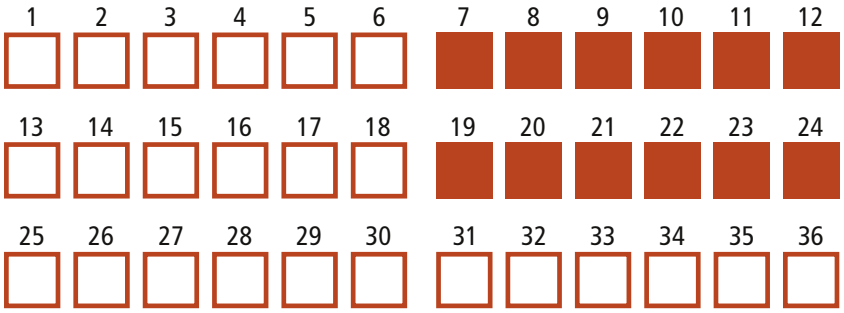
F (DeviceCMYK, "100 % Black"): In the left main column (columns 1 through 12) overprinting effects should appear everywhere except for the 50 % Black (DeviceCMYK and DeviceGray) stripes and the two images objects (continuous tone and bitmap) in the process color background patches. In the middle main column (columns 13 through 24) overprinting effects should only occur for the spot color background patches. For the process color background patches the behavior should be the same as if the elements were set to knock out.



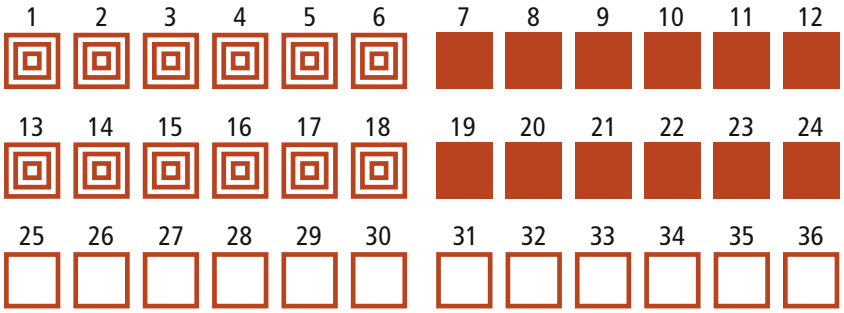
G (Separation All, 5 % on every plate): As the Separation color space "All" (registration color) images onto every plate, existing color on all plates will be knocked out. The visual effect is as if all elements were set to knock out.



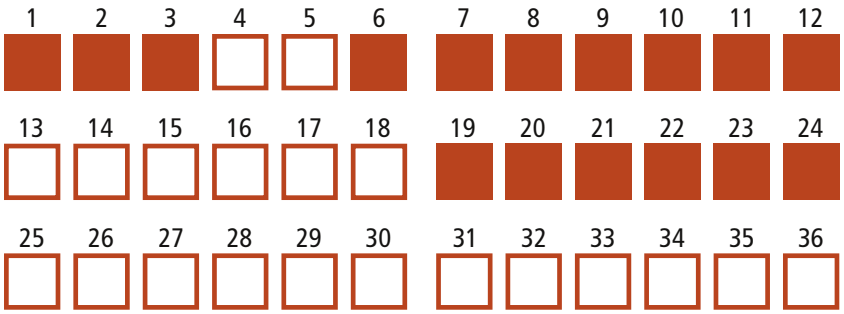
H (DeviceGray, "White"): Overprinting effects should only appear with the spot color background patches (where the "white" will thus "disappear"). DeviceGray always knocks out process colors, whether set to overprint or not.



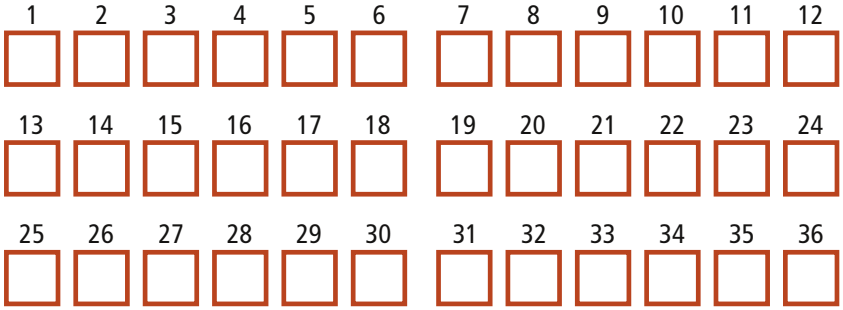
I (Separation Black, 0 %, "White"): Overprinting effects – for "white" this means that it seems to "disappear" – should appear everywhere except for the 50 % Black (DeviceCMYK and DeviceGray) stripes in the process color background patches, where the result should be plain 0 % Black ("white").



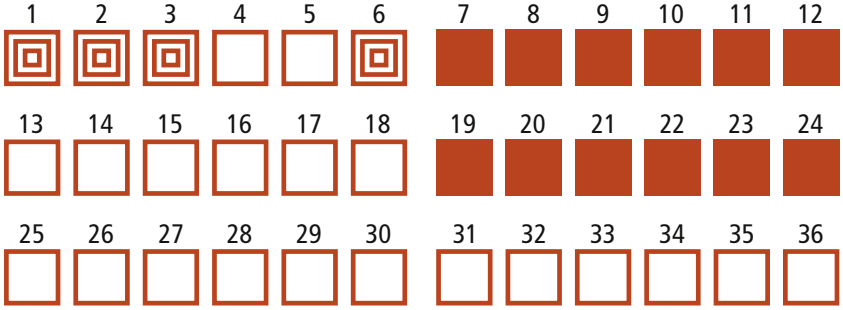
J (DeviceCMYK, 0/0/0/0 %, "White"): For the left main column (columns 1 through 12) overprinting effects – for "white" this means that it seems to "disappear" – should occur everywhere except for the image elements (continuous tone image and bitmap images) on top of the process color background patches. For the middle main column (columns 13 through 24) overprinting effects should only occur with the spot color background patches.



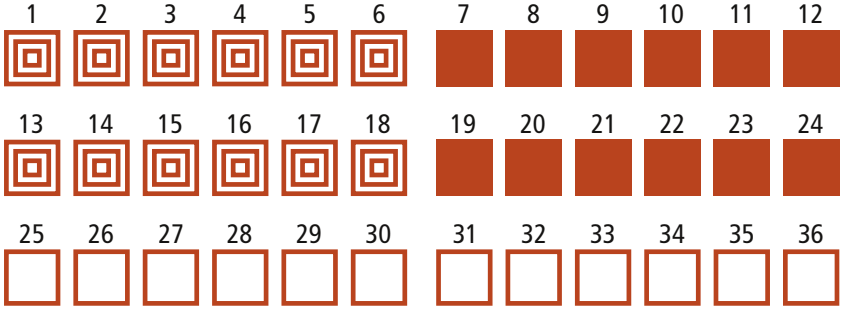
K (Separation “All”, 0 %, “White”): As the Separation color space “All” (registration color) images onto every plate, existing color on all plates will be knocked out. The visual effect is as if all elements are set to knock out everywhere. Using Separation “All” with 0 % is actually the safest approach to never see white elements drop out because overprint was not set or handled properly.



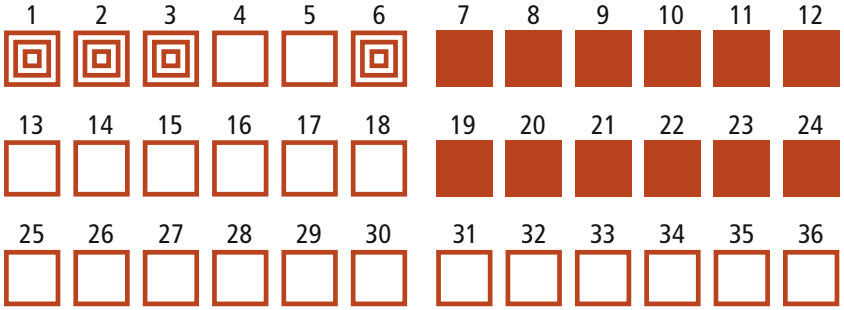
L (DeviceCMYK, 30/0/0/0, “30 % Cyan”): In the left main column (columns 1 through 12) overprinting effects should appear everywhere except for the 50 % Cyan stripe and the two images objects (continuous tone and bitmap image) in the process color background patches. In the middle main column (columns 13 through 24) overprinting effects should only occur for the spot color background patches.



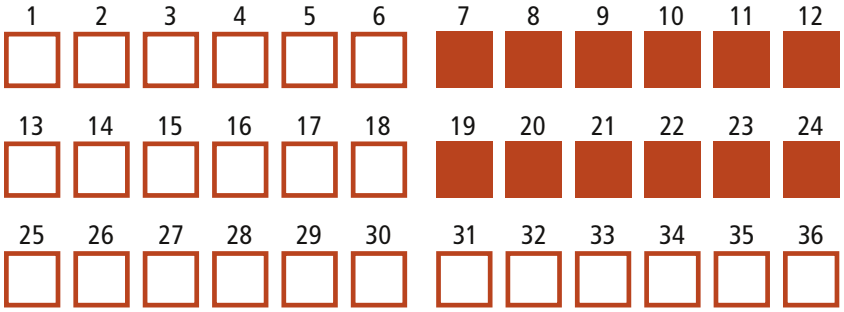
M (Separation Cyan, 30 %, “30 % Cyan”): Overprinting effects should appear everywhere except for the Cyan stripes in the process color background patches.



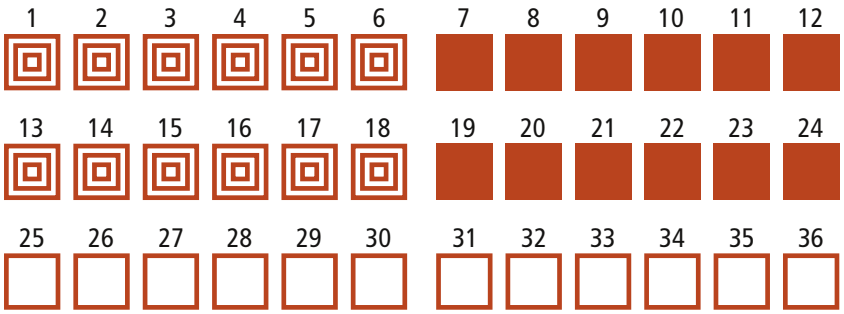
N (DeviceCMYK, 30/0/50/0 %, “light Green”): In the left main column (columns 1 through 12) overprinting effects should appear everywhere except for the 50 % Cyan and 70 % Yellow stripes and the two images objects (continuous tone and bitmap image) in the process color background patches. In the middle main column (columns 13 through 24) overprinting effects should only occur for the spot color background patches.



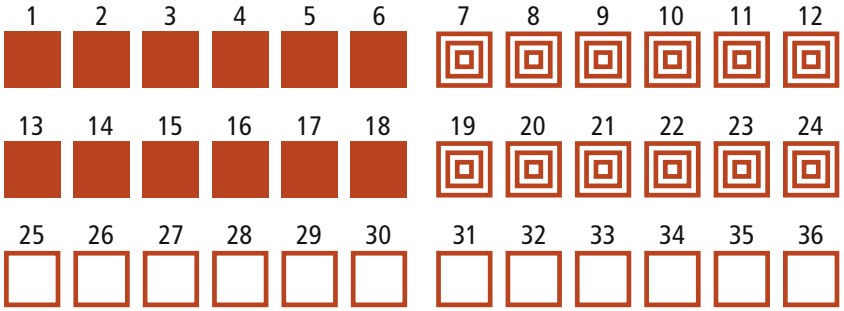
O (DeviceCMYK, 30/1/50/1 %, “light Green”): Due to the 1 % values in the Magenta and Black channels, overprint mode does not have any effect here; thus in the left as well as the middle main column (columns 1 through 12 and 13 through 24) overprinting effects should appear only for the spot color background patches.



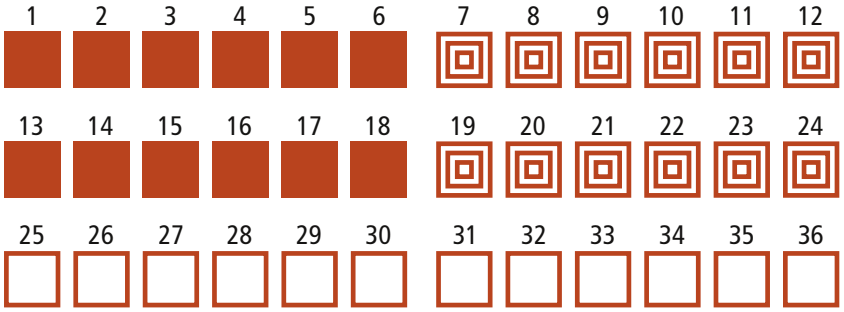
P (DeviceN Cyan + Yellow, 30/50 %, “light Green”): Overprinting effects should appear everywhere except for the Cyan and Yellow stripes in the process color background patches.



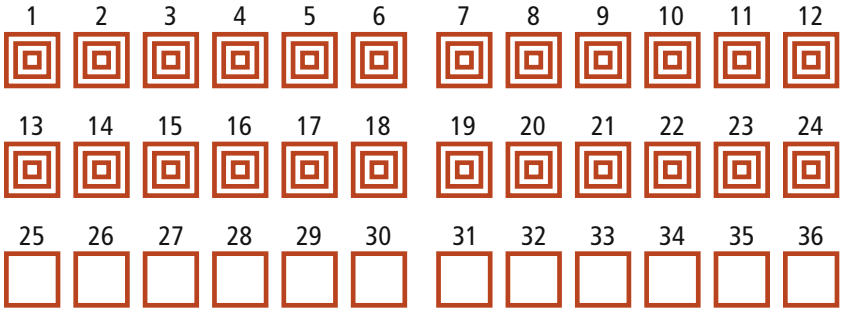
Q (Separation spot color MyRed, 30, "Pink"): Overprinting effects should occur everywhere except for the MyRed colored stripes in the spot color background patches.



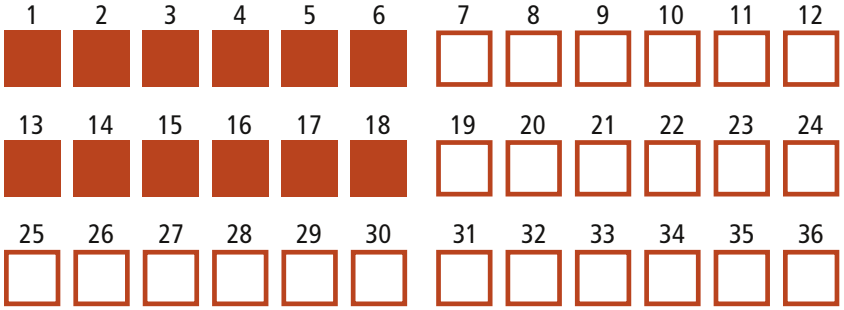
R (DeviceN with Separation spot color MyRed and four times "None", 30/0/30/30/0 %, "Pink"): Overprinting effects should occur everywhere except for the MyRed colored stripes in the spot color background patches.



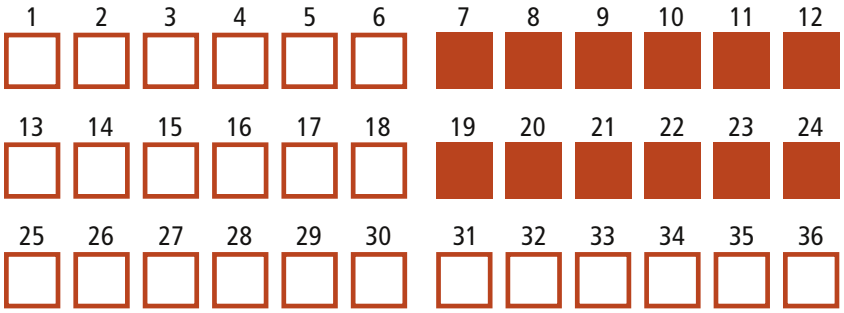
S (DeviceN Cyan + spot color MyRed, 30/30 %, "light Violet"): Overprinting effects should occur everywhere except for the Cyan stripes in the process background patches and for the MyRed colored stripes in the spot color background patches.



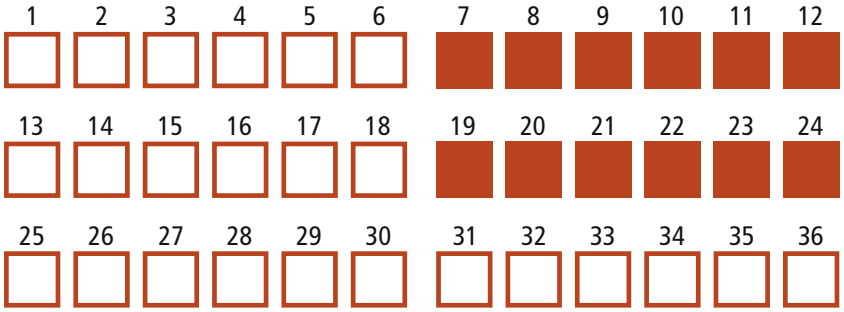
T (DeviceN MyBlue + spot color MyRed, 20/40 %, “dark Pink”): Overprinting effects should occur only for the process color background patches.



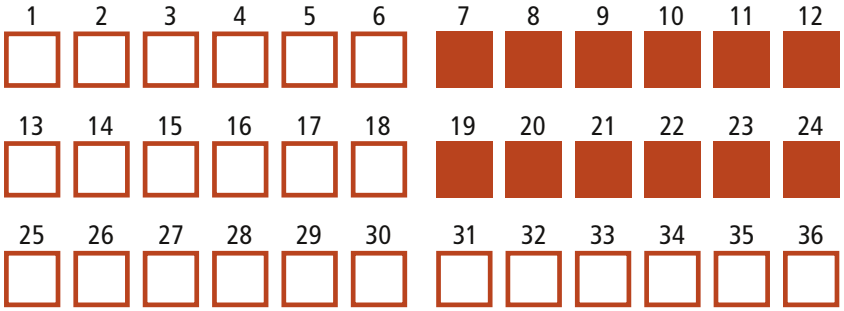
U (Device independent Gray, 0.7, “30 % Gray”): Overprinting effects should occur only for the spot color background patches.



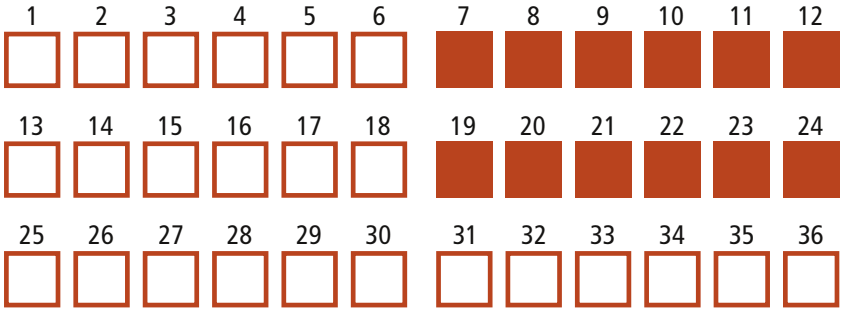
V (Device independent RGB using ECI-RGB.v1.0.icc, 0.85/0.85/0.5, “yellowish Green”): Overprinting effects should occur only for the spot color background patches.



W (Device independent Lab, using Lab D50, 85/22/22, "light peach color"): Overprinting effects should occur only for the spot color background patches.



X (Device independent CMYK using COMMSPE_POS_PA1_glossy_PO4, 0/20/40/0 %, "light Orange"): Overprinting effects should occur only for the spot color background patches.



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- PDF/X-dev mailing list (in English); this is a mailing list focusing on the development of systems and software for PDF/X – whether PDF/X-1a or PDF/X-3; please go to www.pdfx.info for details about how to subscribe to the PDF/X-dev mailing list.
- ECI mailing lists (both in English and German); these mailing lists are run by the European Color Initiative; please go to www.eci.org for details about how to subscribe to the ECI mailing lists.

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