ARTWORK
ERRORS AND EXPLANATIONS

for GZ Media

How to supply an artwork for printing in GZ Media.
Explanation of the most common errors and some general advice..

What is bleed?

When any image or element on a page touches the edge of the page (product), extending beyond the trim edge, leaving no margin it is said to **bleed**. It may bleed or extend off one or more sides.

Bleed allowance

To allow for any deviations in cutting the paper to the finished page size an element that bleeds off the page is typically extended about 1/8" (3 mm) beyond the trim lines (corner or crop marks). The image shows an example of the bleed allowance according to the crop marks.

crop marks   *bleed*

trim edge
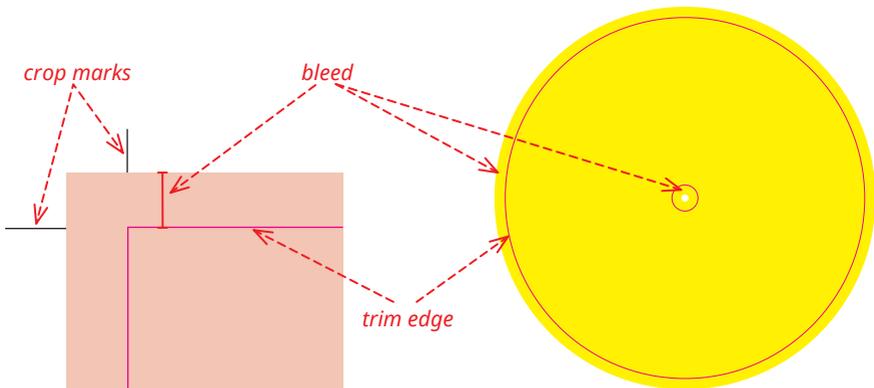
Note that the bleed allowance has to be also around all possible cut-outs from the actual artwork. The image shows an example of the bleed allowance for LP label.

Text near the trim lines

No text, logos, or similar graphics should be placed closer than 3 mm to the trim lines. This safety distance is the same as for bleed. Deviations in cutting usually are 1-2 mm.

3 mm

Text
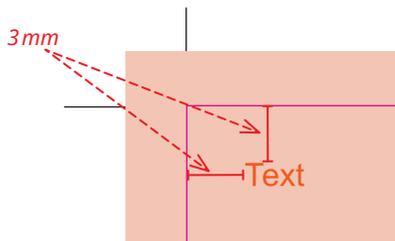
Crop marks

The artwork should always contain either correctly created crop marks or inserted template (registration marks are not necessary).

What are the crop marks?

markings (usually thin lines) that show where a page or image has to be trimmed. Don't forget to use the color ‚registration' (most applications have such a color) if you create your own crop marks. **Please make sure any crop marks you place in your layout are clear of the live printing area.**

What are the registration marks?

A cross-hair target outside the page or image area that is used to help align film separations or to align the printed images on the press sheet. The mark should appear on all separations. Apparently in some countries, registration marks without a cross in them are used because of religious reasons.

Inserted template

Our templates on FTP are created as vector graphic, with a special spot color (called "cutter") and set to overprint. They are in 100% scale. You can import these templates to most graphic programs (QuarkXPress, InDesign, Illustrator, etc.) Do not change the pre-set attributes (overprint and color settings).Please note the inserted template must remain in vectors – **do not rasterize/flatten it with the actual artwork!!!** Such a template cannot be removed from the artwork and would get printed.

registration marks

inserted template

crop marks

RESOLUTION

What is a bitmap?

Bitmaps images are exactly what their name says they are: a collection of bits that form an image. The image consists of a matrix of individual dots (or pixels) that all have their own colour (described using bits, the smallest possible units of information for a computer). The unit of measurement used to describe the resolution of images is DPI (dots per inch).

Types of bitmap images

Bitmap images can contain any number of colours but we distinguish between three main categories (see the list below with their description and recommended resolution for each of them).

Line-art images

These images only contain two colours, usually black and white. Sometimes these images are referred to as bitmaps because a computer has to use only 1 bit (on=black, off=white) to define each pixel.

Recommended resolution: min. 800 dpi.

Grayscale images

These images contain various shades of grey as well as pure black and white.

Recommended resolution: min. 300 dpi.

Full colour images

The colour information can be described using a number of colour spaces: RGB, CMYK or Lab for instance. Only CMYK colour space is used for print.

Recommended resolution: min. 300 dpi.

FONT RASTERIZATION

What is font rasterization?

Font rasterization is the process of converting text from a vector description (as found in scalable fonts such as TrueType fonts) to a raster or bitmap description. This often involves some anti-aliasing on screen text to make it smoother and easier to read. It may also involve „hinting", that is, the use of information precomputed for a particular font size.

Simple rasterization without antialiasing

The simplest form of rasterization is simple line-drawing with no antialiasing of any sort. This is the fastest method (that is, it requires the least computation to place on screen). This approach has the disadvantage that glyphs may lose their definition when rendered at small sizes. Therefore, many fonts contain „hints" which aid the system's rasterizer in deciding where to render pixels for particularly troublesome areas in the glyphs, or sets of hand-tweaked bitmaps to be used at specific pixel sizes.

sample

Rasterization with antialiasing

A more complicated approach is to use standard anti-aliasing techniques from computer graphics. This can be thought of as determining, for each pixel, how much of that pixel is occupied by the letter, and drawing that pixel with that degree of opacity. For example, when drawing a black letter on a white background, if a pixel ideally should be half filled (perhaps by a diagonal line from corner to corner) it would be drawn in 50% gray. Simple application of this procedure can lead to somewhat blurry glyphs: for example, if the letter includes a vertical line which should be one pixel wide but falls exactly between two pixels, it will appear on screen a two-pixel-wide gray line. This blurriness is a tradeoff of clarity for accuracy. Some systems demonstrate the opposite sacrifice by using hinting to force lines to fall within integral pixel coordinates.

sample

Vectors

One key aspect of vector art is key for printing. Since the art is made from a series of mathematical points it will print very crisp no matter how you resize the art. For instance you can take the same vector logo and print it on a business card or blow it up to billboard size and keep the same crisp quality. In contrast a raster graphic would blur incredibly if it were blown up from a business card size to billboard size.

sample

COLOR SPACE

What is CMYK?

To reproduce full-color photographic and other images, typical printing presses use 4 colors of ink. The four inks are placed on the paper in layers of dots that combine to create the illusion of many more colors. CMYK refers to the 4 ink colors used by the printing press:

C is **cyan** (blue), **M** is **magenta** (red), **Y** is **yellow**, and **K** is **black**.

A mistake often made when submitting artwork for 4-color printing is not converting the images to the CMYK color space. This is needed so that the file can be separated into the four colors, so that a separate printing plate can be made for each of the colors.

What is RGB?

A common color mode, **RGB** stands for the colors of **Red**, **Green**, **Blue**. Add red, green, and blue light to create white light. Because you ADD the colors together to get White, we call these RGB colors the **additive primaries**. Colors on screen are displayed by mixing varying amounts of red, green, and blue light.

RGB is the most common color mode used when creating graphics, even though graphics to be commercially printed are eventually converted to CMYK mode, the colors used in printing inks.

Spot color

A spot color is specially mixed ink using in printing. Spot color inks come in a rainbow of colors, including some specialty inks such as metallic and fluorescent. Unlike CMYK or process color, which creates colors by laying down layers of just 4 specific inks, spot colors are pre-mixed and you use one ink for each color in the publication.

There are different brands of spot color inks. The dominant spot color printing system is PANTONE. The Pantone Matching System or PMS consists of over 1,000 colors of ink. The Pantone system allows users to mix percentages of base inks (such as CMYK) to create new colors, either physically (these are called spot colors) or on the printed page using screens to allow certain amounts of ink through and then overlaying the base colors.

COLOR SPACE

The Pantone system also allows for many 'special' colors to be specified such as metallics and fluorescents.

Označení barev v podkladech by mělo odpovídat vzorníkům Pantone.

ICC profiles

It is a set of data that characterizes a color space of input or output device according to ICC (International Color Consortium) standards. The profile determines how to display actual color values. Every device that captures or displays colors can be profiled. The profile is mapping from device source to the PCS (profile connection space) and the PCS and target color space. This PCS is either CIELAB (L*a*b*) or CIEXYZ. In practice, an RGB image with sRGB IEC61966-2.1 profile will be converted to the CMYK color space described by FOGRA 39 via CIELAB

In GZ we use **PDF/X-1a** standard. It means it is necessary to export PDF with destination CMYK values (converted via appropriate ICC profile) and Output Intent embedded. See *PDF export settings*.
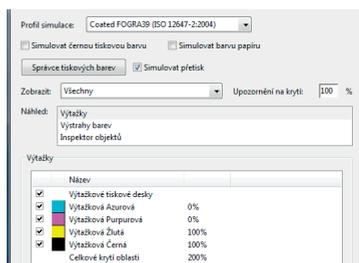
Total ink coverage

Depending on the paper stock, the type of printing process and the press itself, your printer can specify a certain 'total ink coverage' (TIC). This is the maximum amount of ink that any object on a page should contain. For example: if the TIC is 320 (as in our case), you can have objects on the page that contain 80 percent of cyan, magenta, yellow or black but a mixture of 100 percent cyan, 100 percent magenta, 70 percent yellow and 70 percent black has a TOC of 340 which is too much and will lead to smudging on the press.

In reality, the correct ink coverage is achieved when PDF is exported from InDesign (or other program) using **PDF/X-1a** standard. Selecting relevant color profile during PDF export ensures correct ink coverage (with some caveats) for given type of paper. For example correct ink coverage for coated papers is 330% according to FOGRA 39. See *PDF export settings*.
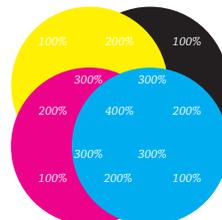
Silkscreen

In comparison with offset printing, the silk-screen prints have a more visible relief. This is due to the greater quantity of ink applied on the screen in comparison with an offset press, where a thin application of ink and the flat printing technique allow for colour densities below 5% and over 90%. The results of silk-screen printing are influenced by the screen used, by the capillary film and by the quantity of ink applied.

When a plate is prepared, the print-on screening dots are detailed onto the screen of the stencil. To print a light hue, the ink must be pressured through very small holes in the stencil. Some of those points are covered by the fibres of the, and no ink is applied. This is why at very light values a screening dot deficit can occur; there is a lower limit of about 15% to the achievable saturation values.

Conversely, when printing at a high density, the points in the stencil are so close one to another that they tend to combine into large surfaces or stains. This limits the maximum density to around 85%.

As a result, it is necessary to plan half-tone prints with levels of opacity not falling below 15% or above 85% !! Moreover, abrupt density changes must be avoided (e.g. artist on stage under spotlight, etc.). If this is unavoidable in the selected artwork, corrections will have to be made during the preparation of the film at the DTP studio.

Furthermore, this is not enough sometimes. There are some cases, where artwork is in CMYK (in printable values), but will deffinitely look far more better printed by spot colour (see an exeample below). The brownish colour used there is C-20%, M-30%, Y-50%, K-0%, which are printable values, but their combination causes printing problems, so we recommend to print such as areas in spot colour, that will ensure the final colour will have solid and consistent look.

Epoq Design, version 2.0
Installera programmet i din PC.
Skivan innehåller en användarmanual i pdf-format.
Börja med att titta på vår demo,
så ser du hur ritverktyget fungerar.

Offset

Offset technology allows printing halftone from 0 to 100%. Nonetheless very low (0-5%) and very high tones (90-100%) are difficult to print without issues.

Very low CMYK values mean very small printing dots and small printing dots do not emerge on the plate. Then no color is transferred to the paper. Low halftone value even in one color can affect the printed result.

High CMYK values usually print as 100% i.e. as a flat area of given color. It is due to the **dot gain**. Dark artworks, clearly displayed on monitor, can get darker, flatter (details missing) or even disappear in plain black area. Minimal difference should be 15% in one color channel (for example background flat area K 100%, foreground artwork K 85%).

Insufficient contrast

The dot gain affects even middle tones images i.e. something between very light and very dark artworks (30-70%). In particular cases there may rise the same issue as with high CMYK values. We call it insufficient contrast. It means there isn't a suffcient difference between foreground artwork and background area.

It is difficult to say what the sufficient difference should be. We recommend at least 30% (adding up all CMYK channels). However, it isn't carved in stone. We have had cases where even bigger color difference wasn't sufficient and colors looked the same after printing.

TRANSPARENCY

What is transparency?

Transparency is an effect applied to an object causing it to appear transparent and letting objects underneath show through. A common example of transparency is drop shadow. Transparency may be applied to an object in a number of different ways.

Transparency is possible in a number of graphics file formats. The term transparency is used in various ways by different people, but at its simplest there is „full transparency" i.e. something that is completely invisible. Of course, only part of a graphic would by fully transparent, or there would be nothing to see. More complex is „partial transparency" or „translucency" where the effect is achieved that a graphic is partially transparent in the same way as colored glass. Since ultimately a printed page or computer or television screen can only be one color at a point, partial transparency is always simulated at some level by mixing colors. There are many different ways to mix colors, so in some cases transparency is ambiguous.

Transparency flattening

The challenge with transparency is reproducing transparent effects in printed output or in exported file formats that do not support live transparency. To reproduce these effects, transparent objects and that interact with them must be flattened.

At its simplest, the process of flattening converts all the overlapping and interacting elements in a group of transparent objects into a collection of opaque elements that result in the same appearance as the original.

IMPOSITION

Imposition is a term used in the printing industry. Print operators will print books using large sheets of paper, which will be folded later. This allows for faster printing, simplified binding and lower production costs.

What is imposition?

Imposition is the process of arranging pages correctly prior to printing so that they fold in the correct order (see below).

Front				Back			
5	12	6	8	7	10	11	9
4	13	16	1	2	15	14	3
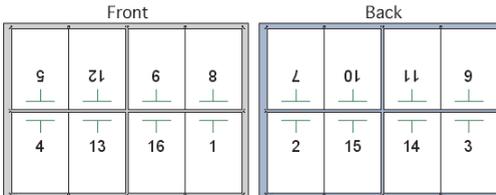
To someone unfamiliar with the imposition process, the pages may seem to be arranged randomly; but after printing, the paper is folded, bound and trimmed. If correctly imposed, the pages should all appear in the correct orientation and readable sequence.

In the example above, a 16-page book is prepared for printing. There are eight pages on the front of the sheet, and the corresponding eight pages on the back. After printing, the paper will be folded in half vertically (page two falls on page three). Then it will be folded again horizontally (page four meets page five). A third fold completes this process. The example below shows the final result prior to binding and trimming.

How to supply the data?

The good news is the customer does not need to care about imposition. **For overhelming majority of products a one-page (signle-page) layout PDF is sufficient for all kinds of binding (including saddle stitch).** It means that page 1 of the PDF document is also page 1 of the booklet (brochure, book etc.). The pages in artwork should be **marked with correct page numbers**.

There is an option to supply spreads in correct order (see examples below) for **saddle stitch only**. Nevertheless, it is not necessary and we do not recommend it. The one-page layout is simpler and suffcient for our sake.

4	1
2	3

8	1
2	7
6	3
4	5

12	1
2	11
10	3
4	9
8	5
6	7

ANTI-PIRACY PROGRAM

At GZ Digital Media, a.s. we work hard to fight piracy and to protect the Intellectual Property Rights (IPR) of our customers. That's why we recently joint the International Recording Media Association (IRMA) Anti-Piracy Compliance Program. We installed procedures to ensure that we will not produce products that violate anyone's IPR while at the same time produce for true owners of IPR without delays and burdensome paperwork.

The requirements of IRMA?

We will ask all customers for certain information depending on the format:

• In case of CD-Audio or DVD-Audio we need a tracklist with information on the track title, the artist, the author, and the timing.

• In case of CD-ROM or DVD-ROM we need the customer to fill the new section in our Order Form specifying the nature of the content (it is freeware/shareware without need for licensing, customer has a license, or customer owns the IPR). Furthermore we need a complete listing of the trade names of all executable software programs and related files in compressed or uncompressed form.

• In case of DVD-Video we need the customer to describe the content of the disc in the new section on our Order Form.

Joining the IRMA program also means that we may consult applicable governing bodies (i.e., IFPI, BSA, OSA) concerning intellectual property rights ownership. In such consultation we shall disclose only that information necessary to determine the ownership of the intellectual property at issue.

Black in overprint

In most cases, black text, lines and fills that overlap colorized backgrounds should be set to overprint. If this is forgotten, it may cause white spaces when the job is printed out of register.

White set to knock-out

QuarkXPress has the annoying habit of forgetting to switch off ‚overprint' settings when black text is changed to another color. This can cause the text to disappear. Make sure white text is set to ‚knock-out'.

Rich black

For small black objects that are partly positioned on a light background and partly on a darker background, it is better to use a „rich black". This is 100 percent black with 40 percent cyan and/or magenta added to it. This way the background does not shine through the black object. The top bar in the example below shows the problem.


Hairlines

Some applications have a line thickness that is called „hairline". Never use this, always stick to a specific width, e.g. 0.25 points. The problem with hairlines is that they are imaged as the finest possible line on any given device. This may be fine on a 300 dpi laser printer but a 1 pixel wide line on a 2400 dpi image setter is hardly visible. Some RIPs allow the operator to set a minimum line width to avoid this trap. Just don't count on this workaround and avoid hairlines entirely. The smallest line width you can use

depends on the press, paper, speed... Consult your printer. As a general rule, never make a line smaller than 0.2 points.

Trapping

Trapping is a technique that is used to minimize the effects of misregistration on the press. It relies on making light objects overlap darker objects slightly to avoid ugly bad lines showing up on the printed result. The example below illustrates the principle. Either you take care of trapping and communicate this with the service bureau or printer or you let them handle it. Trapping is both a skill and an art. Do not underestimate the time it takes to properly trap a file.
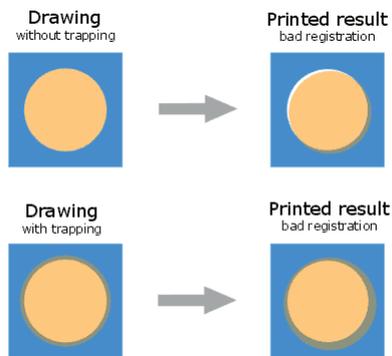
Barcode

It is a machine-readable representation of information in a visual format on a surface. Originally barcodes stored data in the widths and spacing of printed parallel lines, but today they also come in patterns of dots, concentric circles, and hidden within images. Barcodes can be read by optical scanners called barcode readers or scanned from an image by special software. Barcodes are widely used to implement Auto ID Data Capture (AIDC) systems that improve the speed and accuracy of computer data entry.

Barcode inserted into the supplied artwork should be in 100% Black (or other contrasting color to the background) and in curves (or high resolution line-art image). This will ensure the readability of barcode. Barcode should never be supplied as CMYK image. It should not be a negative.

vector   *CMYK image*

Colorized text

Don't colorize small text (e.g. < 8 points) in 2 or more process colors. The slightest registration problem on the press makes such text illegible.

Colorized thin lines

Don't colorize thin lines (e.g. < 1/2 point) in 2 or more process colors.

Digital proof

You should always provide your service bureau with a to-size printout of your document according to the standard for required paper type i.e. FOGRA 39 for coated papers etc. That way the prepress operator knows what he can expect from your file. Mark last-minute changes clearly on this proof if there is no time for updated printouts.

Supplying native file

If you are not able to output high resolution PDF, you can supply your source/native file (XPress, InDD, FH, PageMaker etc.), but don't forget to include all used images and fonts. Fonts should be in a compressed folder. Compression should be done on the same OS where the fonts are i.e. Mac fonts on MacOS.

Embossing, hot foil stamping

The artwork should be always created in curves/ vector graphic, and either in special spot color (called e.g. foil) as a part of the actual artwork, or in 100% black, but this should be in a separate file. We can also accept high-resolution line-art images, but the resolution should not be less than 1200 dpi. These specifications also apply for **spot-varnish** artwork.

Page orientation

Supplied artwork should always match the artwork template. E.g. the artwork for LP sleeve should be always created accordingly to the template below (not to scale) and never in separated files for front and back (or even spine).

HEAD

BACK

HEAD

FRONT