

KESKENY PRINTING HOUSE

2016

# Creating Metal Color Surfaces

Prepress Guide



# INTRODUCTION

Metallized colors can make your publications look more spectacular and exclusive. In addition to increasing the range of colors, the product will have a special added value that makes a difference from other similar products.

The costs of these new processes are not very high, they can be used in a cost-effective way even in case of small numbers of copies. In fact, due to increased marketability even these extra costs can be easily returned.

Print files can be prepared with any of the common graphic softwares, it does not require any special knowledge, and can be proofed. You only need to be familiar with the technology and to be able to adapt your way of thinking to its logic.

**This guide is intended to help you to achieve this.**

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# TRADITIONAL AND NEW TECHNOLOGIES

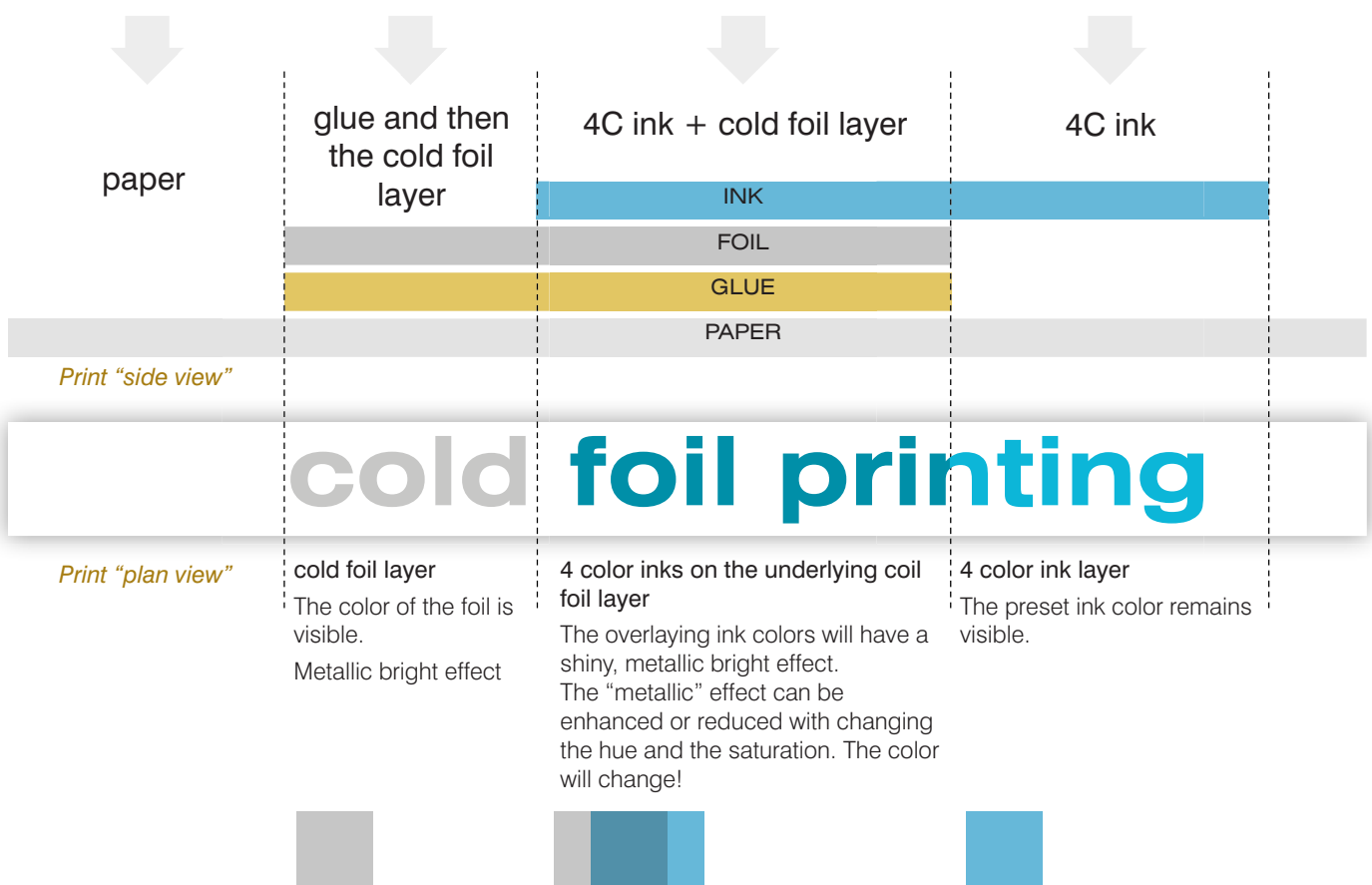
The traditional way of creating metallized surfaces is **hot foil stamping**. In this process metallic foil layer is pressed onto the already printed sheets by means of hot stamps. Costs may be somewhat high due to the creation of stamps while the need of the additional operational step considerably increases process time. Although it has numerous advantages, the applicability of this process is somewhat limited and is usually applied only to make small surfaces (text lines, logos) gold on book covers or business cards. Another disadvantage is that the metal foil is applied on printed layers, so overprinting it with colors requires a third run.

The modern technologies presented below are common in that they can be used to create metallic color surfaces more easily. They save the cost of the stamp for you and provide higher registration accuracy and faster process time. The most revolutionary innovation is that they allow the metal surface to be easily overprinted with ink. In addition to getting a real metallic effect, these new tools provide a cost-effective and easy way to considerably increase the range of colors with metallic colors.



# COLD FOIL

The following illustration explains the cold foil process.



The print file should contain a 5th color for the objects to be coil foiled. This will be applied on the paper before the inks. Thus, the sheet coming out of the printing machine may have the following surfaces:

- unprinted white (the color of the paper)
- parts overprinted with inks only (normal colors)
- unprinted silver metallic foil
- silver metallic foil overprinted with inks (metallic colors)

# DESIGNING THE ARTWORK

## What publications can it be applied to?

Typical applications of the coil foil technique include gift boxes, greeting cards, special occasion products requiring enhanced aesthetic (invitations, business cards) but can also be seen on book covers, exclusive brochures, magazine covers, or on the packaging of some everyday goods (medicine, chocolate).

It is a tool that provides more design options. It can be used to decorate, enhance publications, to make them flashy or – on the contrary – more elegant.

## What objects in the publication should have metallic color?

Coil foil makes the print more spectacular. Often the themes of graphical elements and photos themselves gives you the immediate idea for using cold foil. Coloring the main title in gold, or giving real metallic appearance to metal objects (cars, jewellery) could seem evident for the first time, but it might be revised if you would like to have a special result instead of a common.

## What should the metallic color be like?

### Characteristics of the metallic colors

As for the graphical design of a publication, the most important thing is to be familiar with the characteristics of the metallic colors and their appropriate application. Many of these characteristics are not widely known, but their negligence may likely will fall below our expectations. On the other hand their appropriate application may lead to a more spectacular result on the same picture or graphic.

The most important thing to be aware of during design is that every color that is printed in cold foil will **become darker and the hue may also change**. For this reason, midtones are advised to modify first, and taking care not to reduce the contrasts.

It is a particularly general mistake to put cold foil surfaces under every shiny object (sun, lamp, lighted buildings and windows). Metallic shine does not compensate for the darkening of the color, the range of shades is reduced. As in a dark environment – according to the higher contrast – the white is often brighter, so the metallic light can be more spectacular if used to make minor details (window frames, arches, water ripples, some of the halms of grass and sand grains) shiny. You can find several examples of these in our free sample collection booklet.

You can find color palettes in our varnish catalogue and sample collection to see how much and what way the color will darken on silver. The actual color can be approved in the form of a test print or metallized proof (more information at the end of the publication).

If the overprint color is not fixed, we recommend choosing bright saturated light colors for highlighting, such as 100% C + 10% M or 50% C + 100% Y. **The metallic effect is less spectacular in case of darker colors.** Also, it is important to keep the contrast between the metallic object and its environment in spite of the darkening effect.

Low saturated composite colors – such as 100% C + 100% Y dark green in 20% – may look quite gray when printed on cold foil losing much of the original hue. **Keep that in mind when printing cold foil under colors of less than 40% saturation!**

If the goal is to have the same color at the end with a metallic luster, reduce the black and/or cyan component with 30-40%.

If the aim is not highlighting, a smart effect can be achieved by overprinting cold foil patterns with darker or just slightly different color tones. You can also try to increase the elegance with matte varnish.

**Cold foil is less spectacular when using as halftones.** Although it applied on offset plate in low (40 lpi) screen resolution (The cold foil plate only, not the colors!), the size of cold foil screen dots become quite critical below 20% and above 60%. **In such cases, the lack of one or two points in a regular raster tone may blur the print. Therefore, we recommend using irregular patterns for shading (grain dots), which could still look pretty even if losing some of them.**

The same applies for all kinds of pattern when small objects (lines, small circles etc.) are repeated regularly.

## Useful creative ideas

Consider using not just gold and silver; **try the metallized versions of other colors as well.**

When used for **highlighting**, **try reversing the first idea.** (Applying metallic luster to the background instead of the headline or make the sky shiny instead of the building in the foreground may do the trick.)

Try using **matte varnish** instead of glossy varnish as finishing, creating unique metallic surfaces which may turn the print into a surprisingly elegant publication. For this purpose you can also use hybrid varnish, but that is a bit more expensive as it requires two runs of printing.

Try applying cold foil under **only certain parts** of an illuminated building or a gold-plated statue, such as arches, contours or edges.

You can create **smart backgrounds** by overprinting tiny cold foil patterns or ornaments with solid color.

Plasticity of the homogeneous background of a photo (eg. single-colored blue sky) can be increased if a **cold foil structure** (patches, waves) is applied under it.

Metallization can be used to highlight not only the headlines but other parts of text as well. Readability can be enhanced if cold foil is used only under the text, and not under the background, or on the contrary, leaving out the text of the metallized background.

## Gold cold foil

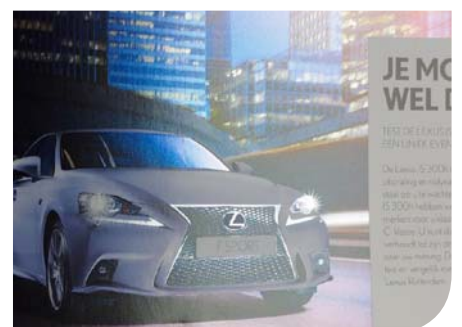
Cold foil technology can be applied not only with silver but with gold-colored metallic foil as well. In this latter way specially beautiful and smooth golden surfaces can be obtained on a large area of the print, in the quality of hot coil stamping, but without the extra cost of the stamp itself. On the other hand overprinting the gold cold foil is not suggested since it is extremely hard to predict the resulting hue of that color.

If, besides gold, you want to create other metallic colors as well, or if you would like to determine the shade of the gold, you should overprint silver with yellow. In this way unlimited number of gold shades can be created. Our sample collection intends to help your the selection.

## CREATING THE PRINT FILES FOR COLD FOIL

The basic concept of the preparation of print files is to create a 5th color channel for the cold foil base layer. In the following pages we will describe the necessary steps.

In our example the cold foil color channel is first created in Photoshop, then imported in Illustrator or InDesign to create the print pdf file.





## Photoshop

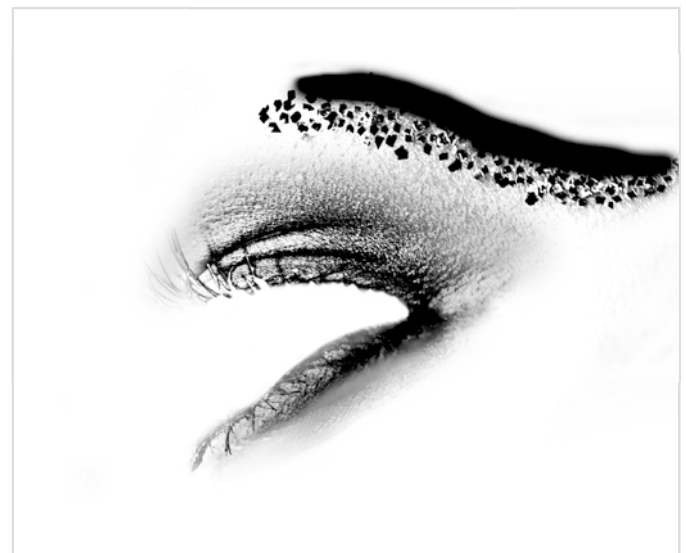
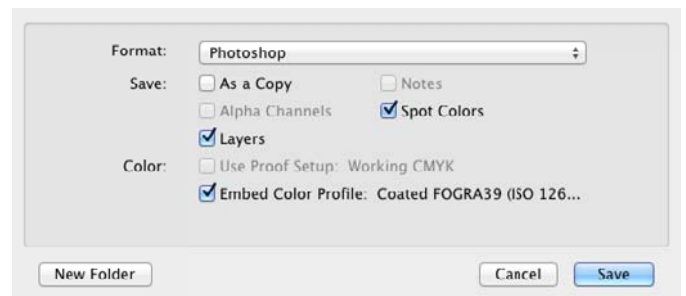
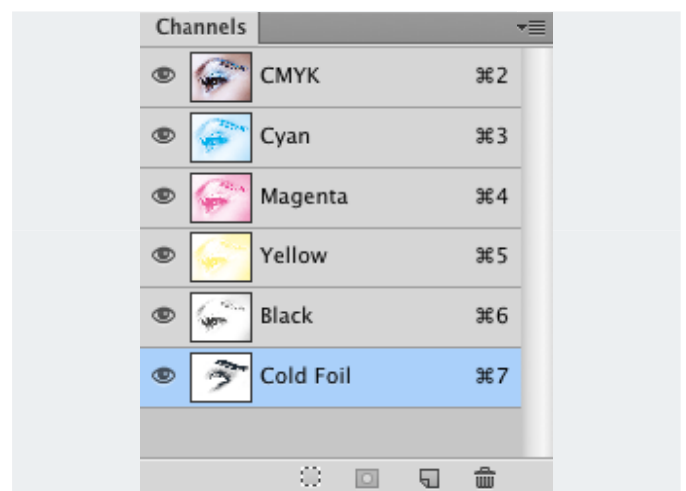
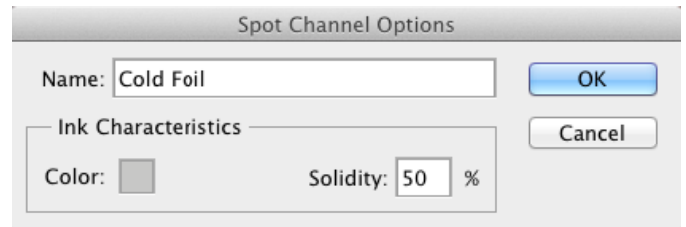
The best way is to create a fifth (spot) color channel for the cold foil layer of the desired area.

The 5 colored (4+1 layered) image shall be saved as a psd file so that it can be easily used both in InDesign or Illustrator for further purpose.

*Photo of the final print*



*4C image*



*Cold foil is the 5th layer*

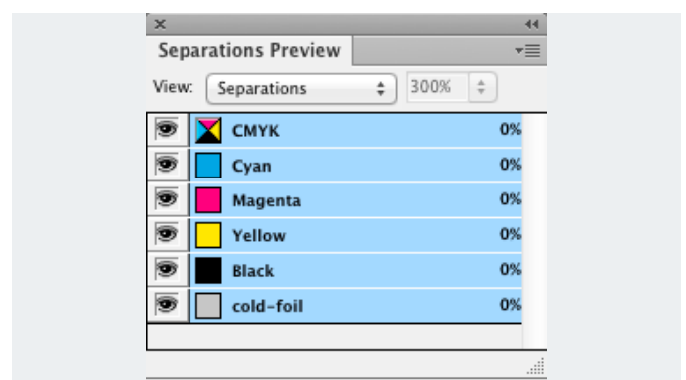
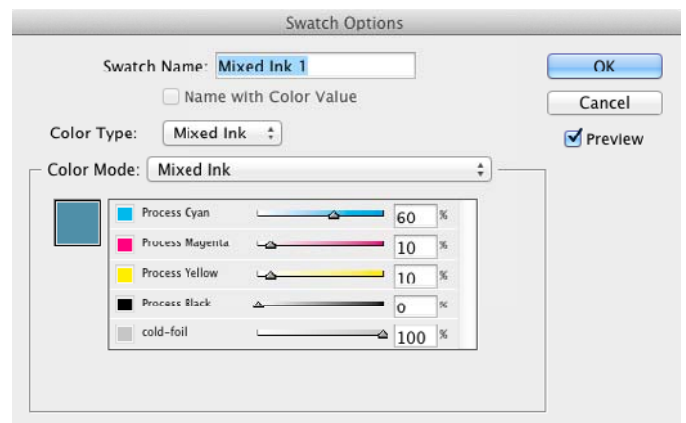
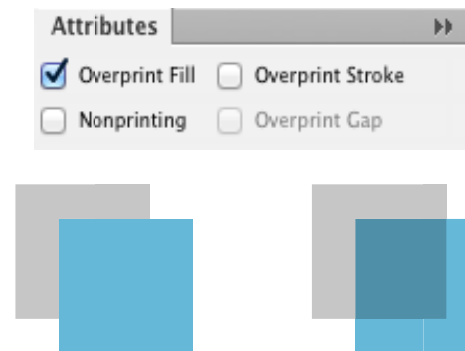
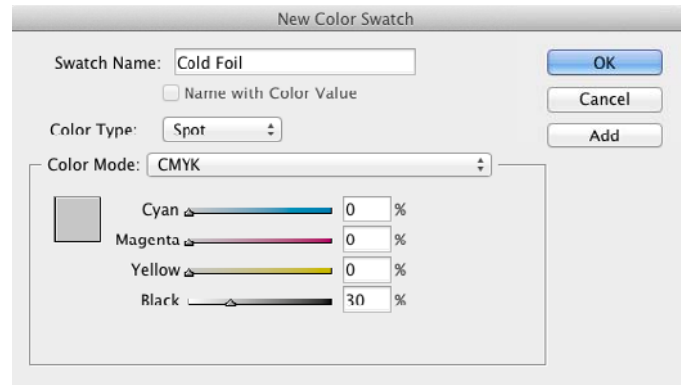
## InDesign

First of all a spot color shall be created. If you use the same spot color (with the same value and name), it can be easily overviewed in any software, or if the image is created in PhotoShop according to the instructions above, it will bring the color values with it.

By using overprint or multiply settings creatively, you can print the CMYK colors onto the foil in InDesign. (Be careful! The hue of the colors will change!) Changing the shape of the foil objects or printing special shapes on foil unique design can be created.

InDesign allows you to “mix” the foil with CMYK, creating “mixed ink”. In this way you can set fix foil raster value to the CMYK value throughout the whole publication.

The “separation preview” window allows you to review each color separation.

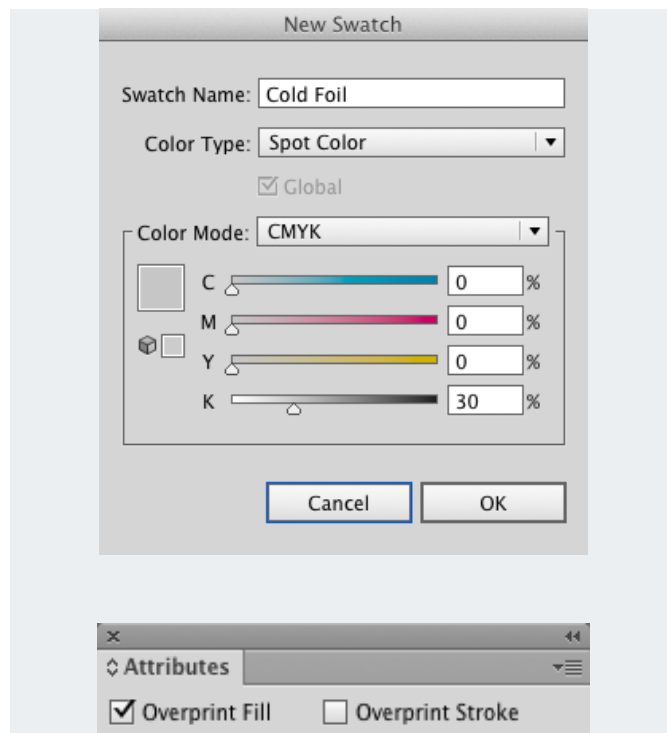


## Illustrator

First you have to create a spot color. If you use the same spot color (with the same value and name), it can be easily overviewed in any software, or if the image is created in PhotoShop according to the instructions above, it will bring the color values with it.

Set all the cold foil objects to overprint.

You can save the final graphic as .ai, so that it can be directly used in InDesign.



## Checks during work

In preparing the print file the most difficult thing is to predict the final result while keeping the ink order and overprints in mind. During preparation do not forget to set the 5th color of cold foil to **overprint**. This is actually opposed to the practice, as it is not the cold foil that overprints the color layers, but the look of the file however this way is the same as the print results: **metallic surfaces will be created where the graphic and the color indicating the cold foil are seen mixed**. It is important to check whether overprint preview setting is switched on on the screen [Overprint Preview → Always].

In any of the used softwares (including Acrobat Professional) the color part of the graphic and the cold foil color channel can be separately displayed by switching them on and off. This practice can detect many hidden faults in time.

The spot color of the cold foil color channel **should be displayed in 30-40% black** on the screen. This approximately shows the impact of the darkening effect, and so all the visible contrast reductions can be revealed during editing. (Do not forget to set overprint preview on to see the actual printing result it on the screen!)

There are several **proofing options** to choose from in order to preview and approve the final result. These are detailed at the end of this document.

## Technical requirements for the print files

**Any spot color** may be used for indicating cold foil, and it must be on the same page of the PDF file as the graphics.

Applying on a separate layer is not necessary, but practical in the design phase. In case of layered PDF files, deactivated layers should be deleted in order to avoid accidental activation of invisible objects.

Cold foil must be **set to overprint** everywhere.

Black ink printed on cold foil does not fade. Overprint should be applied for tiny black patterns, small black types or thin strokes as well. In such cases, cold foil should not be knocked out to avoid color registration problems. However, when cold foil is overprinted by large and solid black surfaces, the hue can get a not significant but visible visible metallic shine. In CMYK printing, 4-color black changes hue on cold foil, turning brownish. In such exceptional cases, it may be reasonable to turn cold foil overprint off.

Using **line width** or gaps below 0.15 mm is not recommended.

Metallic foil and ink have different physical properties. Applicable line thickness values, screen dot sizes and color registration accuracy are somewhat limited, making the expected results inaccurate in certain ranges.

**Below 0.15 mm**, line thickness may be **critical** and the line may break up. This may be a problem especially when thin parts of a typeface or elements of a regular pattern are not overprinted with colors, such as a small silver logo. The same applies for gaps between strokes. In such cases, graphic design should be altered and/or lines must be thickened in order to avoid the risk of getting a broken line at the end.

The **smallest type size** which can be printed in cold foil cannot be determined exactly as it largely depends on the typeface. The threshold is around 6 points, especially in light or calligraphic fonts. In case of this latter, a large difference between thin and thick lines is a typical phenomenon. Certain problems may occur, such as having the top or the bottom of the letter O disappear.

**The missing of a thin silver line is less disturbing if it is overprinted with ink.** In our example, if letter O remains silver, the damage is more visible. However, if overprinted with color, e.g. yellow, it remains readable. The fact that the color of thin lines is yellow at places instead of golden can be noticed only from close look.

**Application of halftone cold foil shades** is not recommended below 20% and above 60%.

Halftone cold foil is applied to the printing plate with a screen resolution of 40 (100 lpi) in order to create as large raster dots as possible. Nevertheless, **dot losses may already occur under 20% and closures above 60%**, making it difficult to have evenly filled surfaces and color blends. If you try to work with irregular screen dots instead of regular patterns, the minor point losses will not be noticeable and allows you to go beyond these thresholds.

Fine rastered fading of sharp cold foil edges is especially useful and can be used without problem.

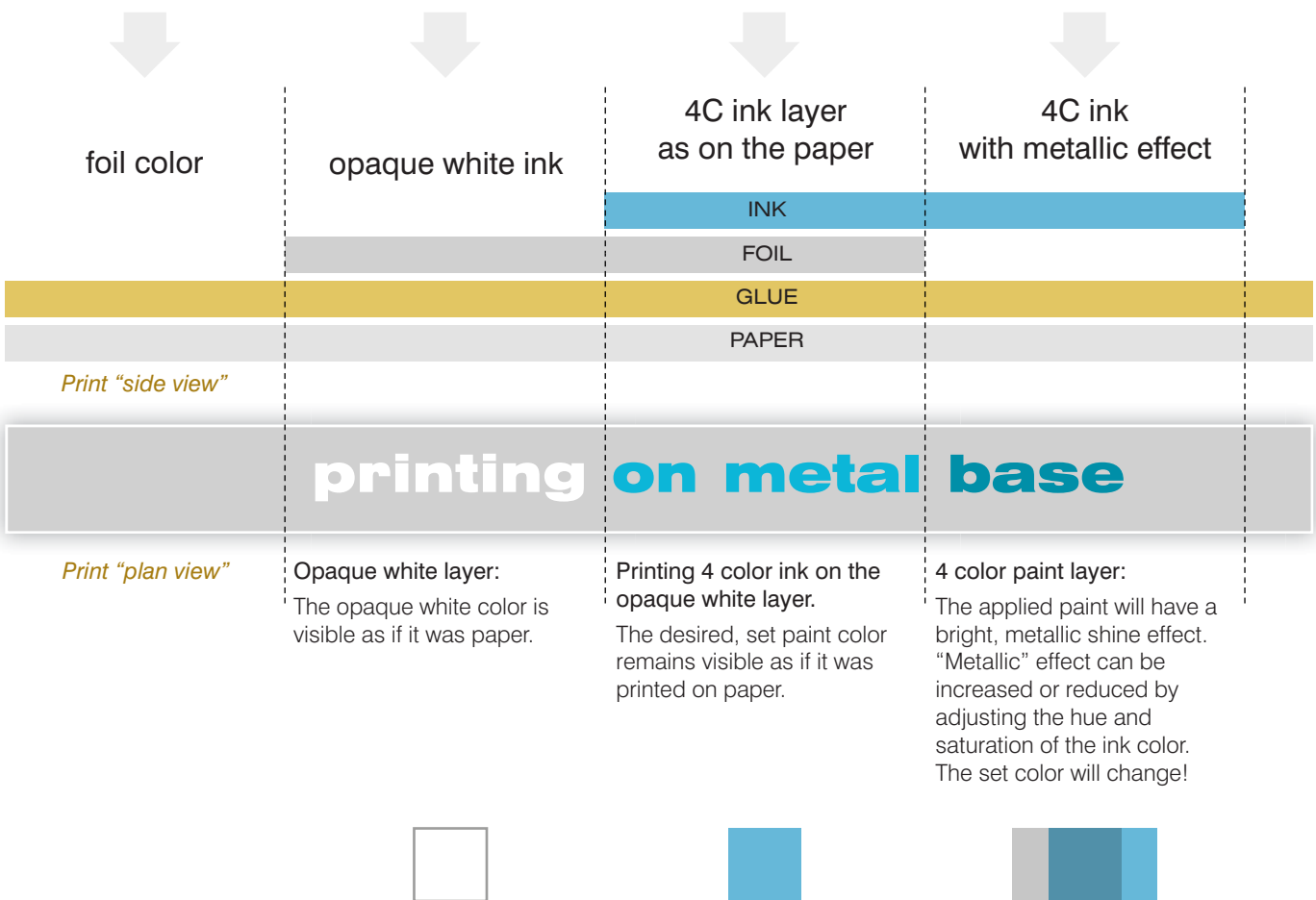
## Trapping

You should be prepared during the prepress phase that inaccurate misregistration of colors may occur during printing. Although this value is only around a hundredth of a mm, just as in case of printing inks, but due to the nature of the technology it is more frequent and more noticeable. To avoid such inaccuracies the so-called trapping plays an important role which is a well known tool in any of the DTP softwares. It is a simple operation, which creates very smooth overlaps at the contacting edges of colors. In cold foil not only the boundaries of surfaces but their overprint has to be taken into account as well, which means that in addition to avoiding gaps, you should prevent eventually protruding the silver from below the color.

This operation forms the part of the general prepress routine, **files with cold foil are usually not requested to be pre-trapped by the client.** It is possible, however, that the creation of the necessary overlaps cannot be done in the pdf at all due to the complexity of the pdf structure or you have to make decisions due to the nature of the graphic (eg. a fine text line should noticeably be made thicker or dangerously thin). **In such cases we might ask the client to do the trapping in the open file.** We explain them what decisions they have to make (risks and compromises) and give them detailed instructions on where and what extent they have to thin and thicken, if they agree.

# PRINTING ON METAL BASE

Metallic colors can also be created by printing inks on solid metallized foil substrate, achieving a similar result as with cold foil. The principle of the process is shown below.



You can see that the elements printed directly onto the substrate will be (remain) metallic colored. Apply opaque white under the objects that you do not want to be metallic. Therefore, the 5th color of the file to be created will not be that of the metallized object, but of its inverse, the opaque white. The sheet coming out of the printing machine now will have the following surfaces:

- unprinted silver metal foil (the silver base color of the print substrate)
- metal foil overprinted with opaque white paint (this will be white on the print)
- surface overprinted only with ink, without opaque white (metallic colors)
- opaque white layer overprinted with ink (normal colors)

## DESIGNING THE ARTWORK

When preparing a publication with metallized colors, you need to decide first whether the print files will be used for cold foil or for printing on metallized silver base.

### Differences from cold foil

When using this technology, metallized surfaces are created with the help of opaque white ink (by blocking them out from full silver). Thus there is no difference in terms of line widths and tint percentages compared to general color printing. **You can freely reduce the line width below 0.15 mm to 0.03, and you may create silver rasters even with the finest screen resolution below 20% and above 60% as well.**

As a less favorable feature, **the intensity of the colors printed on the opaque white layer is less bright** comparing to the ones printed directly on paper when using cold foil.

**The colors overprinting the silver will darken just like in the case of cold foil technology.** You can find the details of the chromatic properties of metallized colors according to the graphic design in the cold foil chapter.

### What types of publications can it be used for?

We recommend it especially for publications that **contain metallized colors for the most part.** Some typical examples for their application are drink gift boxes, special book covers and promotional products (wobblers, displays, etc.).

## CREATING THE PRINT FILES

When it comes to preparing print files, the most important thing is to create a spot color for the opaque white. The steps of this process will be presented on the next pages.

In our example we will only present the individual phases of preparing the files. The menu windows are identical to the methods described on pages 9-11 for cold foil.

Our aim is to create a print in which a part of the image is metallized on a metallized silver substrate and other parts not. There will be similarly (metallic and not metallic) text lines on the photo and additional pure white and pure silver as well.

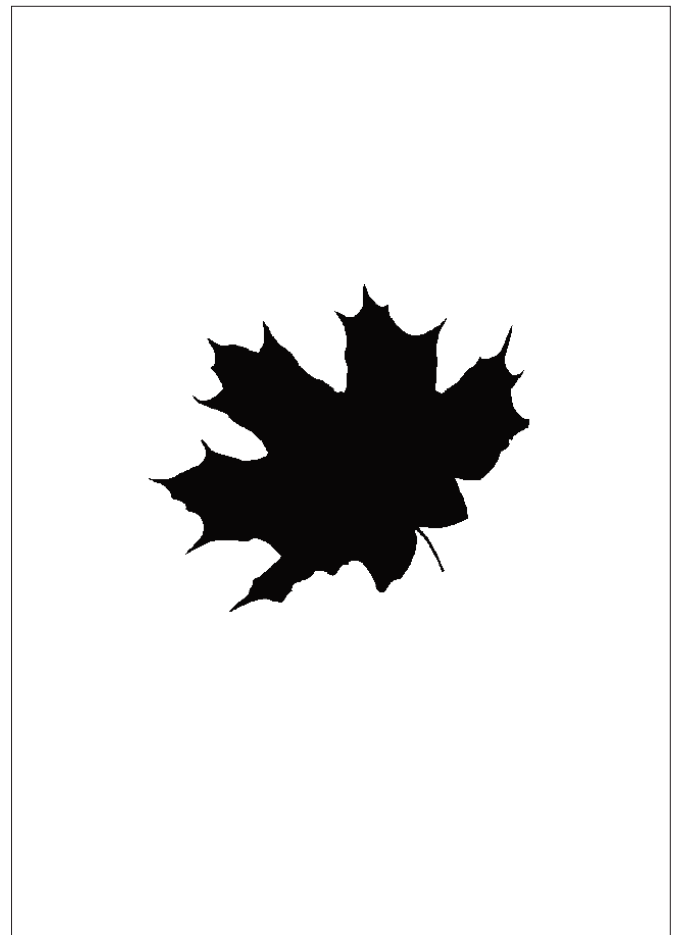




## PhotoShop

For the non-metallized detail of the picture, we need to create an opaque white spot color as a 5th spot channel (Channels / New spot channel). Saving the image containing 5 colors as a pdf file, we import and add the text lines in InDesign.

In our example we don't want the leaf in the middle of the picture to have a metallized color, so we draw its outline and save the path in a 5th color channel.



## InDesign

We place four types of text lines on the picture in InDesign. Their color will depend on whether you apply opaque white under them and the kind of overprint you set for them.



We block out the word SILVER from the color part of the picture, but don't include it in the white color channel. This way the silver base will be fully displayed under it, the word will have a pure silver color. The white blockout shouldn't be set to overprint, otherwise it won't be displayed.



We block out the word AUTHUM from the color part of the picture as well, and include in the opaque white color channel too. This will make the word AUTHUM white on the print. The white blockout may be left out, but then the overprint of opaque white needs to be set to knockout.



Color the word COLORS to green, but don't include in the opaque white color channel, so the silver substrate remains visible, changing the color to metal green. The word COLORS shouldn't be set to overprint, otherwise it will blend into the background (the green color of the text will be added to the background), and it will be barely noticeable.



Color the word 2016 green as well and include in the opaque white color channel as well, so that the silver base doesn't appear under it. 2016 will have a regular green color.

As it has been described at step 2 above, we can use opaque white to create a pure white color without blocking it out specifically from the color. In this case you can't set all the white objects to overprint. Thus the blocking out of the word AUTHUM may be left out from the color, but the opaque white needs to be set to knock out instead of overprint in turn. It is up to you which method you consider simpler and safer.

## Prepress controls

When it comes to preparing print files, the most difficult part is to keep in mind the order of layers and the overprints, and foresee the end result. As mentioned before, the opaque white 5th color should be set to overprint everywhere. In theory, this goes completely against reality, because it is not the opaque white that overprints the inks, but vice versa. However, this works in practice: you don't have to keep in mind the print order and you can easily predict the print results from what you see on the screen: **wherever the graphics and the color indicating the opaque white can be seen together, NON METALLIZED COLORED surfaces will be created.** (Make sure the overprint view is activated on the screen when checking.)

In each of the softwares used (including Acrobat Professional), **you can display the color and the white parts of the graphics respectively by activating and deactivating the channels.** You need to have a vivid imagination and strong logical skills to do the proofing in this way, but it can't be skipped.

In order to check for the overall effect and customer approval, you may choose from several proofing options. You will find a detailed description of these at the end of this publication.

## Technical requirements of print files

**The color indicating the opaque white** should not be white, and it should go on the same page of the pdf as the graphics.

In the design phase, it is advisable to apply the opaque white with a white spot color against a grey background, but before sending to the printing house, you should reset the white background, and the opaque white **should be colored to any color that is visible on the white background.** It is not obligatory to apply it on a special layer, but it can be practical. Make sure that there are no deactivated layers in order to avoid inadvertent activation during processing and display of elements intended to remain invisible.

### Pay attention to the overprint settings of the opaque white.

Depending on the method used to create white surfaces (see page 18), overprints should be checked differently. Either all the opaque whites should uniformly be set to overprint, or an exception could be made with those intended to be pure white.

### Black has to knock out opaque white.

Printed on an opaque white layer, black will look paler than on silver foil. Opaque white should be left out under black objects and even for delicate black pattern, small-print text in black or thin lines otherwise you will end up with a fader and uneven black on bigger surfaces.

### Do not use rich black.

On the other hand, if black printed directly on a silver substrate it will be rich enough, so there is no need to add further colors. In fact, it is to be avoided because it might easily change the hue of the black.

### No limitations on line width and raster tint.

This technology is not sensitive to printable sizes, so you can keep the same limitations on size and line thread (0.03 mm) as in case of normal ink printing.

The same applies to raster tones. While with cold foil you encounter physical limitations when creating lighter and darker silver tones, in case of a metallized substrate you can use any tints for opaque white (i.e. the inverse of cold foil) freely without reducing the screen resolution. For instance, you can create 10% silver by printing a 90% opaque white tone on the metallized silver substrate. The same would cause a problem with cold foil.

### Trapping

Inaccurate fitting is not more likely than with normal ink printing. Only opaque white needs special attention. While with cold foil you need to make sure that silver does not show under the color in case of a slightly inaccurate registration, when printing on a metallized substrate, it is **preventing white hangouts** that means a special task. Just like in the case of cold foil, fine overlaps are **set in the printing house** for this purpose with a routine software. However, in case of a more complex graphic design, **we may ask for the customer's help** giving all the necessary instructions about what and where to bold or thin in the source file.

# PROOFING OPTIONS FOR BOTH TECHNOLOGIES

When designing the graphics of metallized publications, you can see most of the technical features only indirectly on the screen, while the overall effect of the final output can be imagined at best.

In the following we will summarize the possible solutions for proofing before and during manufacturing, and the kind and the reliability of information each solution provides about the above.

## Checking files before sending to the printing house

Before submitting a finished print pdf, cold foil surfaces need to be checked for accuracy and compatibility with respect to the graphic design. The easiest way to proof that is to open the file in Acrobat Professional or rasterize it in Photoshop, and view it by turning the color channels on and off. You may get approximative information about the extent of darkening of the colors overprinting the metallized surfaces by adding 30-40% black to the given color (during viewing only).

## Test print

The entire publication or its main parts assembled on a sheet can be test printed in a pres machine in a few copies, testing the whole manufacturing process.

*Properties:* colors and the aesthetic appearance of metallized parts can be proofed with great accuracy on the actual paper or on a similar one. Boxes may even be cut out.

*Drawback:* expensive

## Extract print

By extracting some miniature details (of 1-2 cm) from the graphic files, they can be printed on the waste bits of the sheet of another publication manufactured with the same technology.

*Properties:* due to its dimensions, it can only be used for proofing metallized colors locally, but not for assessing the aesthetic layout of the entire publication. No additional costs are involved.

*Drawback:* lead time may be relatively long depending on how soon the next sheet is produced with the same technology, next to which it can be fitted.

## Cold foil proof

It is a recently introduced technology.

*Properties:* allows for proofing the aesthetic layout of the publication and the technical accuracy of the print files. It shouldn't be considered as a contract-value color sample; it is only indicative.

*Print size:* 450 x 305 mm. It costs four times as much as a normal A3 color proof. Lead time is minimum 1 and a 1/2 days. For bigger quantities a special quote can be requested.

The files to be proofed have to be submitted in the same way as for printing: the color indicating the cold foil should be a separate color channel.

## Print proof on metal base

It is a recently introduced technology.

*Properties:* allows for proofing the aesthetic layout of the publication and the technical accuracy of the print files. It shouldn't be considered as a contract-value color sample; it is only indicative.

*Print size:* A3. It costs four times as much as a normal A3 color proof. Lead time is about 1 day.

The files to be proofed have to be submitted in the same way as for printing: opaque white should be a separate color channel.

## Final print approval at the launch of the press

It can be considered as an end product in color fidelity and aesthetic layout. Colors can even be further adjusted to some extent on the press.

*Drawback:* any modification that affects the graphic files entails removal and plate repetition expenses, and is a potential hazard for delivery time. If the customer approves the print at the launch of the press, there are no additional costs involved.