



**Graphic production technology –
preparation and transfer of digital print data**

This manual specifies the technical conditions for preparing data for printing house Graspo CZ, a.s.

These conditions must be observed by the customer.

Date: 1/1/2023

Brief overview

1 Standards

As of 1 January 2017, printing house Grasp CZ, a.s. has adopted the new standard **ISO 12647-2:2013**. Compared to previous standards, this standard takes into account the presence of optical brighteners in papers. New ICC profiles **PSO Coated v3 (FOGRA51)** and **PSO Uncoated v3 (FOGRA52)** are now available with this standard, which need to be implemented in the system and applications.

[More information here](#)

2 Data preparation

Follow general guidelines for preparing print data in the preparation of data, including the correct format, number of pages, colour space, correct image resolution, appropriate font size, etc.

[More information here](#)

3 Page design

Watch the safety margin and bleed when designing a page. Also consider the layout in relation to the binding of the printed material.

[More information here](#)

4 Data format

We recommend using the standard **PDF/X-4:2010** published in ISO 15930.

We can also process older standards **PDF/X-1a:2001** and **PDF/X-1a:2003**, but these are now outdated and no longer meet current requirements.

[More information here](#)

5 Print data export

When exporting to PDF, all fonts must be active and none of the images used can be missing.

The settings for export are based on the settings of **[PDF/X-4:2008]** with minor adjustments. These adjustments consist in setting the bleed, turning on crop marks and page information, and turning on the colour space conversion (with numbers preserved).

We recommend checking the overprint settings before sending the files. In the Adobe Acrobat settings (and in the Adobe Reader browser) you need to set: Edit - Preferences - Page Display. Here is the Use Overprint Preview option – you must select, 'Always'. If the overprint preview is not turned on, some data may appear differently, giving the appearance that everything is fine when it is not.

Name the files in a way so that it is clear what pages they contain. E.g.: ,Block_001-032.pdf',

,Front_endpaper_1-4.pdf', ,Cover_1.pdf' (do not use names such as ,advertising.pdf' or ,colophon.pdf'). This will help you avoid searching for missing files or complications in determining the order of pages.

None of the exported files should be larger than 4 GB.

[More information here](#)

6 RIP settings

The RIP is set to turn on text overprints in 100% K text and convert colours from non-printable colour spaces.

[More information here](#)

7 Language versions

Orders in multiple language versions can be prepared in two ways: one way is to export them to PDF with layers turned on, and the other is to export complete CMYK data from each language version. Both methods have conditions that need to be adhered to.

[More information here](#)

1 Standards

In December 2013, a new version of the ISO 12647-2:2013 standard for offset printing was published. This version approximates the prescribed values to currently used materials, current properties of the printing process and the results of offset printing.

The revision of the standard takes into account papers with a higher content of optical brightening agents (OBA), the natural transfer curve in the preparation of printing plates exclusively with CtP technology, and advances in lighting standardisation and colour measurement. All this facilitates the implementation of a standardised printing process according to the standard, increases the predictability of printing, and improves the possibility of mutual comparison of proofs with production prints.

The new ICC profiles **PSO Coated v3 (FOGRA51)** and **PSO Uncoated v3 (FOGRA52)** are based on standard ISO 12647-2:2013 and cover the most commonly used printing papers in offset printing.

This is why it is necessary to have profiles established in the system and in all the applications in which you will prepare documents.

Identifier	Printing conditions	Name of new ICC profile	After the implementation of ISO 12647-2:2013, it will replace the old ICC profiles
FOGRA51	Offset printing on high-quality coated glossy or matte paper, WFC, HWC, MWC (printing conditions 1 pursuant to ISO 12647-2:2013)	PSO Coated v3	ISO Coated v2 according to FOGRA39 by ECI, Coated FOGRA39 by Adobe, or older ICC profiles based on FOGRA27
FOGRA52	Offset printing on wood-free uncoated white paper, WFU (printing conditions 5 pursuant to ISO 12647-2:2013)	PSO Uncoated v3 (FOGRA52)	PSO Uncoated ISO12647 according to FOGRA47 and ISO uncoated according to FOGRA29 by ECI, Uncoated FOGRA29 by Adobe

Both profiles can be downloaded at: www.eci.org/en/downloads#icc_profiles_from_eci

Offset profiles		
PSO Coated v3 📄 pso-coated_v3.zip	1784 KB	2015-09-30
PSO Uncoated v3 (FOGRA52) 📄 pso-uncoated_v3_fogra52.zip	1722 KB	2015-09-30

1.1 Profile installation

On computers with Windows

Profiles can be installed by right-clicking the ICC profile file and selecting **Install Profile** in the context menu.

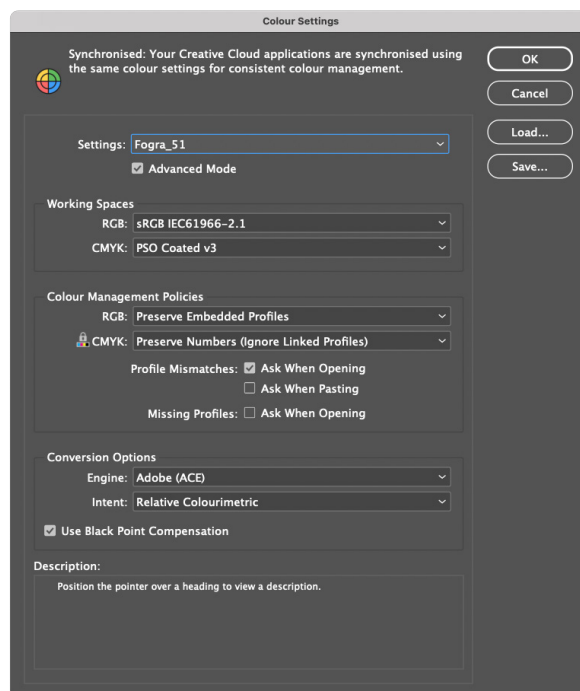
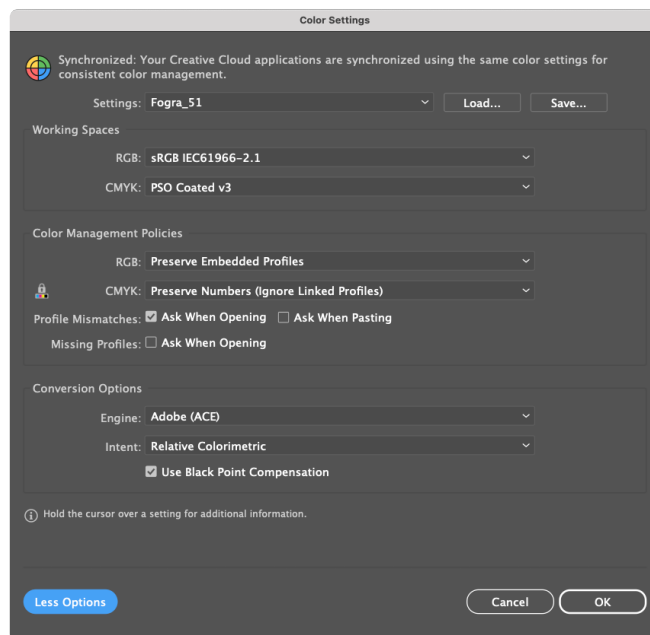
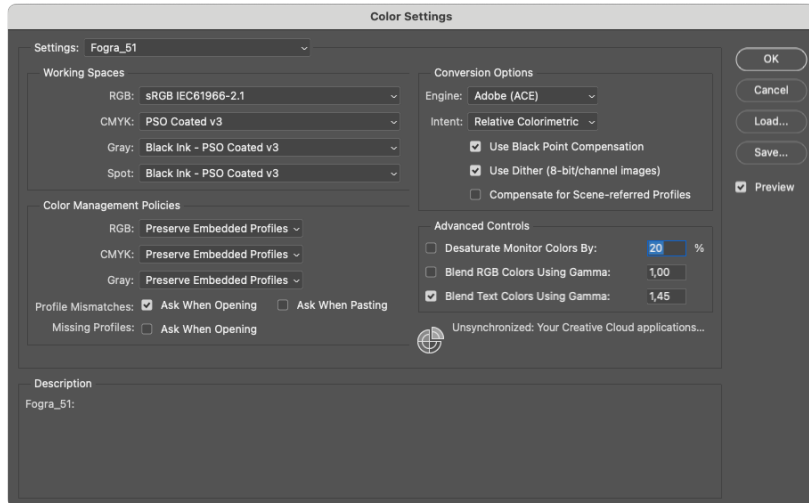
On computers with Mac OS

You can install profiles by copying them to the folder **[system drive]/Library/ColorSync/Profiles**.

If you don't see the **Library** folder on the system drive, you can access it via Menu **Finder/Open/Library**.

1.2 Introduction of profiles into applications (Photoshop, Illustrator, InDesign)

Menu **Edit / Colour Settings** and set the values according to the image below.



[Back to overview](#)

2 Data preparation

When preparing images, work with established profiles Fogra 51/Fogra 52, depending on the paper you will be printing on. If possible, prepare the documents (and the materials printed from them) on a scale of 1:1.

If the data are not in CMYK or spot colours, they will be converted to CMYK according to RIP specifications. See Chapter [RIP Settings – Colour Conversions](#).

The resolution of images should be according to the following table:

Screen	Optimal resolution (ppi)
AM screening	300
AM screening from Dainippon Screen with a frequency of 370 lpi	400
FM screening spekta 2 from Dainippon Screen with a frequency of 650 lpi	600
Line art	1,200

The TAC – Total Area Coverage should not exceed 300 %.

A moiré pattern may appear in images that contain a regular screen in combination with the printing screen.

It is forbidden to use registration colours for graphics. These colours are only used for crop and trim marks. The minimum font size is 5 points for fonts in one colour plate and 100% tone.

For two- and multi-coloured or negative fonts, the minimum size is 8 points.

The thickness of lines should follow the table below. It is also necessary to pay attention to the thickness of the printing screen, which significantly affects the quality of printed lines.

Line	minimum thickness	
Single-colour line	dark colour (K)	light colour (Y)
10 %	0.75 pt (0.2646 mm)	1.5 pt (0.5292 mm)
25 %	0.5 pt (0.1764 mm)	1 pt (0.3528 mm)
50 %	0.3 pt (0.1058 mm)	0.75 pt (0.2646 mm)
75 %	0.2 pt (0.0706 mm)	0.5 pt (0.1764 mm)
100 %	0.15 pt (0.0529 mm)	0.35 pt (0.1235 mm)
Multi-colour line	0.4 pt (0.1411 mm)	
Negative line	on single-colour surface	on multi-colour surface
	0.5 pt (0.1764 mm)	1 pt (0.3528 mm)

The presence of spot colours must match the order in which the numbers of spot colours must also be listed. The latest deadline for the provision of information about used direct colours and their numbers is the date on which the data are delivered. Spot colour names must not contain any diacritics. We recommend choosing colours from the application swatches in which the data are prepared. If the data contain spot colours that are not specified in the order, they will be converted to CMYK on the RIP.

If the printed material contains endpapers that are not part of the block, they need to be prepared in separate files. Each endpaper must have 4 pages, whereas the first page of the front endpapers and the 4th page of the back endpapers must be blank. If the endpapers are part of a block, the first and last pages must be blank.

Data for UV coating must be prepared in one colour plate, 100% tone and supplied in a separate file.

The data for making dies must be vector data, the texts must be converted to curves, and they should also be in one colour plate, 100% tone and in a separate file.

Print data must only contain data to be printed. No additional lines or other notes belong in print data.

Crop marks and page information should be placed after the bleed.

[Back to overview](#)

3 Page design

Keep a safety margin and bleed when designing pages.

The safety margin is a 3 mm section of the page from the crop of the trim size towards the page. This area should contain no text and graphics other than bleed objects.

The bleed is the overlap of objects on the page to its clear, trim size. It is added to documents due to tolerance of inaccuracies arising during the subsequent bookbinding of the printed material. When printed material is trimmed to trim size, a thin white strip may appear on the side of the document without a bleed, and this is undesirable. The bleed should be at least 3 mm thick.

The type of binding and graphic elements inside the printed matter should be considered. For example, V2 glued binding cannot be opened like other types of binding, so this needs to be taken into account in preparation of the graphic design. There should be no text on the spine, as it would not be legible.



[Back to overview](#)

4 Print data format

The customer must provide print data in PDF format. Other formats, e.g. JPG, TIFF, EPS etc., are open data and must be handled individually.

We recommend using the applicable standard published in ISO 15930.

PDF/X-4:2010

You can also use older standards

PDF/X-1a:2001 or **PDF/X-1a:2003**, but these standards do not support 'live' transparency. It is merged during export, and more complex data are often created than in the PDF/X-4 version.

The PDF/X-1a standard also does not support the layers needed in the processing of multilingual publications.

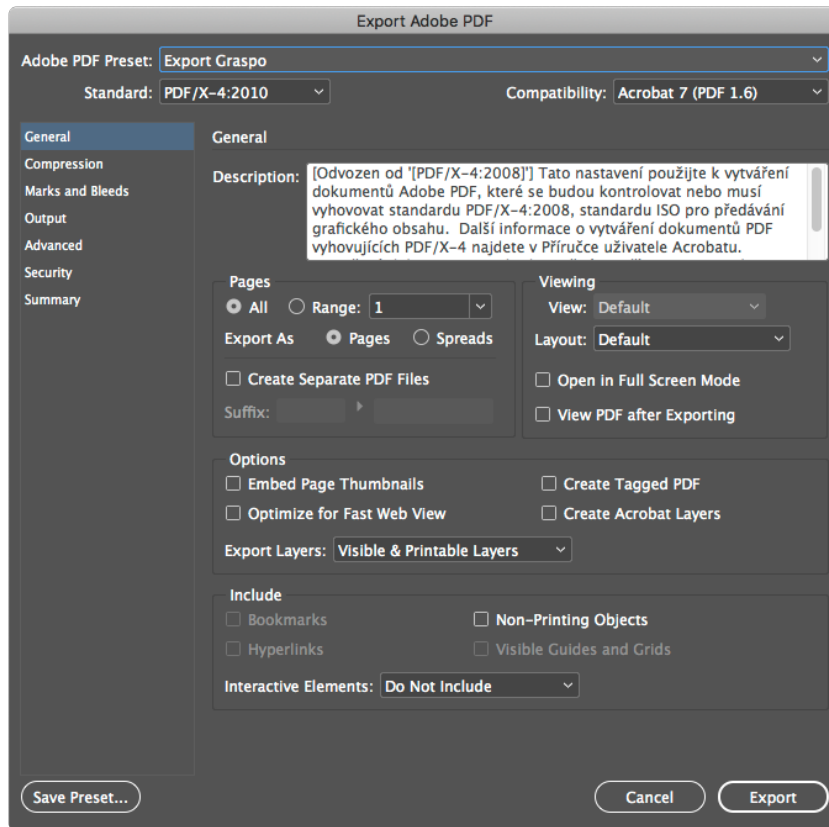
This is why we prefer PDF/X-4:2010.

source data in InDesign	wireframe data exported to the PDF/X-1a:2001 standard	wireframe data exported to the PDF/X-4:2010 standard
		

[Back to overview](#)

5 Print data export

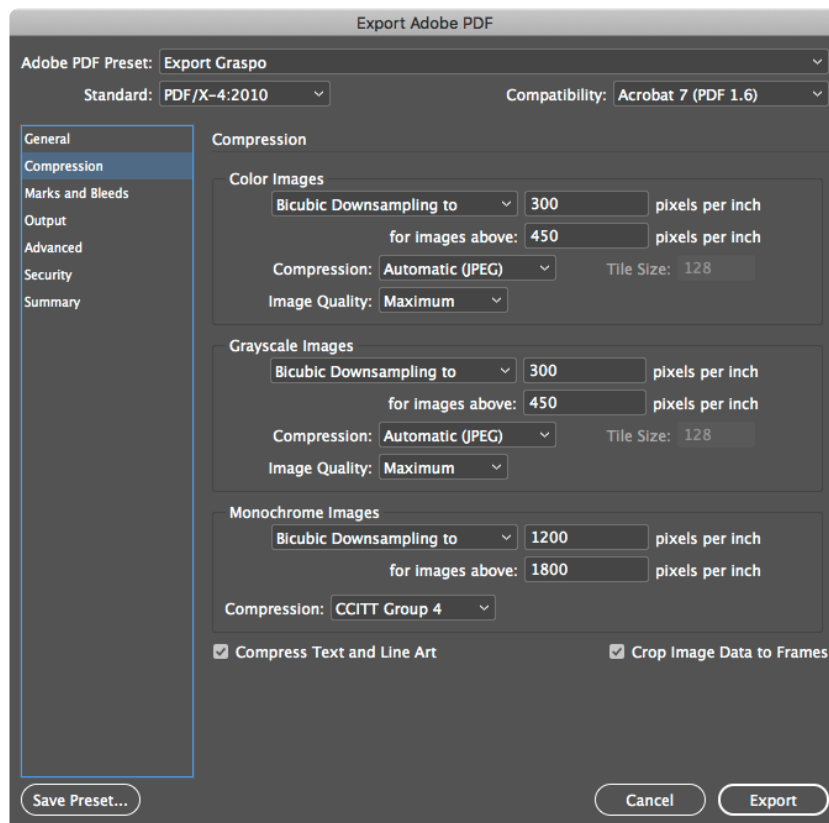
The page order must be the same as the final order in the printed material. It must contain all pages including blanks (flyleaves). Only export single pages, **do not turn on spreads**.



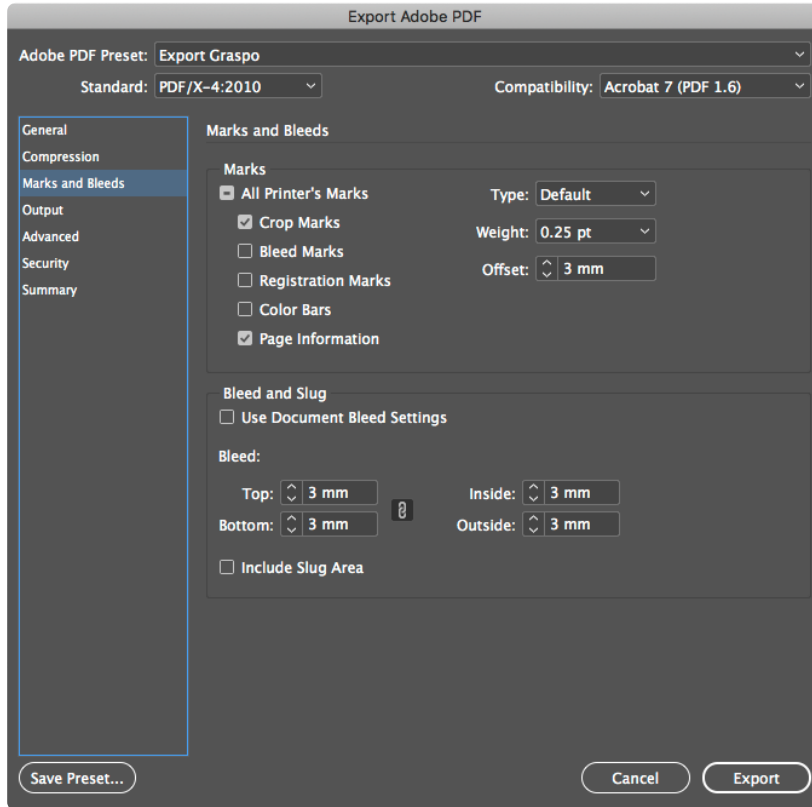
We recommend setting compression and resampling according to the image below.

When finer screening is used, we recommend changing the bicubic resampling from 300 ppi to 400 ppi, or to 600 ppi for the FM Spekta 2 screening.

If your images contain very subtle colour gradients created in bitmap graphics and you work with lossless compression all the time, we recommend changing the compression from Automatic (JPEG) to lossless ZIP.

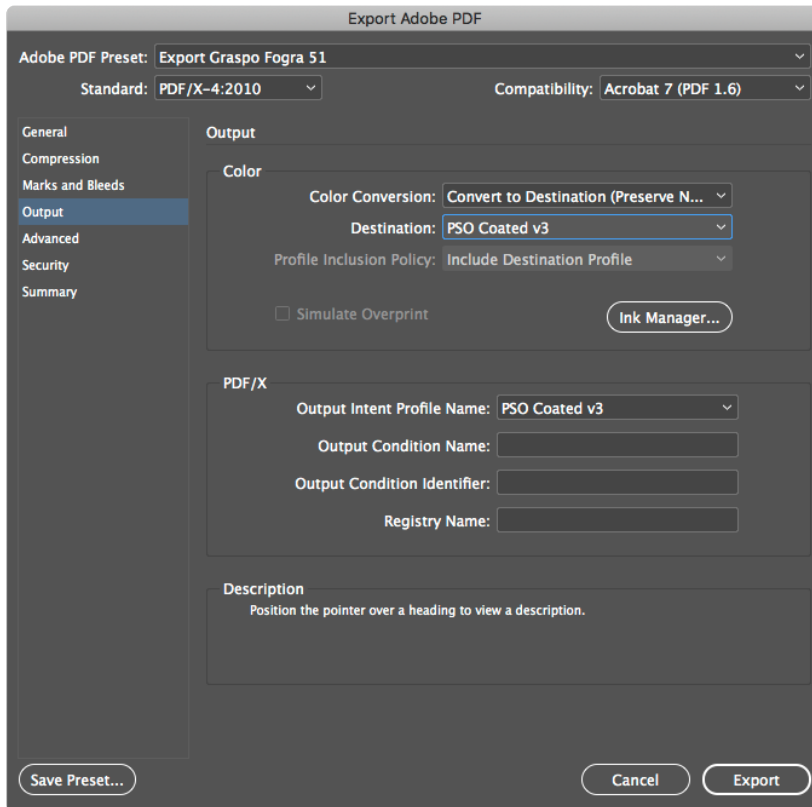


Only turn on the fit marks and page information during export. Set the bleed and crop mark offset to 3 mm. These marks must be placed behind the bleed. There is no need for bleed marks, registration marks or colour bars.



If you have objects in colour spaces other than CMYK in your data, we recommend selecting Convert to Profile (preserving the numbers).

The profile PSO Coated v3 must be chosen as the target profile for chalky paper; choose PSO Uncoated v3 (Fogra 52) for wood-free paper. The same profiles need to be set for the output intent as well. When you send the data to be printed, let us know which profiles you used for each part of the order.



If the delivered data contain other colour spaces, they will be converted to RIP according to the settings, as described on the next page in the chapter [RIP Settings – Colour Conversions](#).

[Back to overview](#)

6 RIP Settings – Colour Conversions

Overprinting

The RIP is set to turn on overprinting on text in the K colour plate that are 100%. Other overprinting set by the customer is preserved.

Colour conversions

RGB —> CMYK

— If the data contains output profiles, they are used for conversion to CMYK. In this case, the conversion is

ICC profile —> Fogra51L or Fogra52L

— If the ICC profile is not found in the RGB data, it is assumed that it is an sRGB space and the conversion will be

sRGB —> Fogra51L or Fogra52L

The conversion uses a perceptual method so that details are not lost and the result matches the source data to the maximum extent.

CIE LaB —> CMYK

— The CIE LaB colour space is converted to the CMYK space regardless of the embedded profile and the conversion will be

LaB —> Fogra51L or Fogra52L

The conversion uses a perceptual method so that details are not lost and the result matches the source data to the maximum extent.

ICC Based —> CMYK

— An ICCbased colour space with data in an RGB space is converted using an embedded ICC profile. The conversion to CMYk is therefore

ICC profile RGB —> Fogra51L or Fogra52L

— An ICCbased space with data in the CMYK space is not converted, the embedded ICC profile is only removed, leaving ,pure' CMYK colours.

The conversion uses a perceptual method so that details are not lost and the result matches the source data to the maximum extent.

CMYK —> CMYK

Here we assume that the data are prepared in valid Fogra 51L and/or Fogra 52L profiles and there are no conversions.

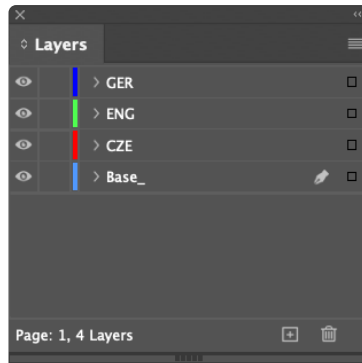
Data that were not prepared in valid profiles will be processed, but the customer must expect slight colour deviations to occur in the printing process.

[Back to overview](#)

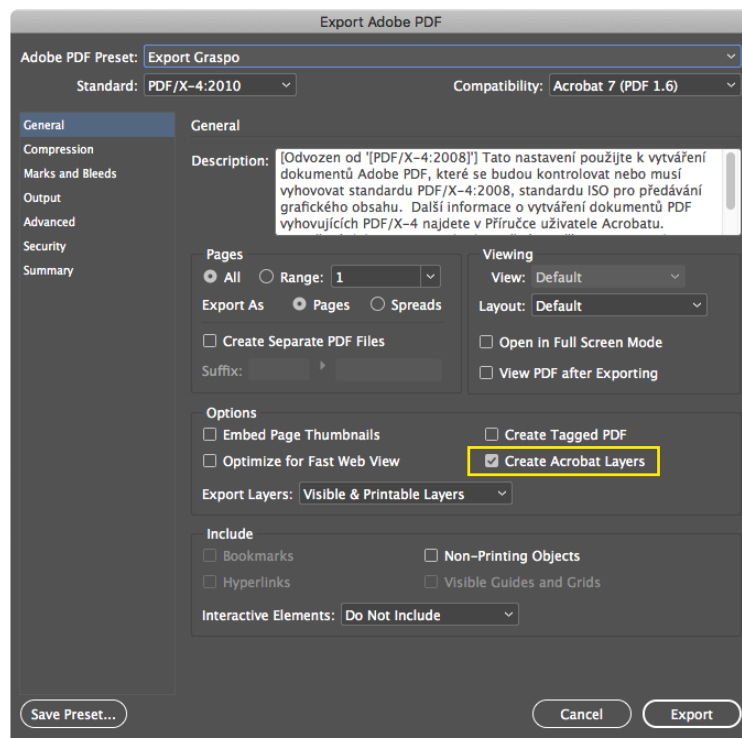
7 Language versions

Variant 1

To prepare documents with multiple versions, it is best to create a document with objects common to all versions in the ‚Base_‘ layer (without quotation marks) and the graphics of individual versions in separate layers.



To export a document in layers, you need to turn on ‚Create Acrobat layers‘. Everything else remains unchanged.



Variant 2

Another option is to supply complete CMYK data for each language version. Here it is absolutely necessary to observe the placement of images and other graphic elements in all versions.

[Back to overview](#)