

Specifications

For preparing materials for print
and basic production standards

In-Store Solutions

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I. OVERVIEW

This document defines technical requirements for materials supplied to Quad/Graphics Sp. z o.o. (the Company), general quality standards of products produced by the Company, quality controlled parameters, as well as definitions of acceptable product.

II. DEFINITIONS

Master Materials – materials used as a master for colours in the printing process. A master material can be a signature accepted by the Client or a certified contract proof. A master material can also be a non-certified proof or print from previous editions, however colour on such a master is treated only as a general reference.

Contract Proof – master material faithfully simulating the real effect of the printing process in a given technology. The basis to consider proof as a contract proof is its certification.

Proof Certification – process of checking of proof workmanship accuracy, consisting of determining the colour difference between values measured on test strip fields placed on the proof, and target values. Target values are determined on the basis of the ICC profile, with which the proof is executed. Proof certification may be carried out at the Client's facility or at the Company.

Certified Proof – proof with attached results of colour difference ΔE measurement, in which the colour difference may not exceed the tolerance limit defined in Basic Quality Standards.

ICC Profile – digital file containing colour characteristics of a given device. That profile meets requirements specified in ICC Specification.

Distribution List – document in the form of a table containing information concerning the method of preparation of dispatch of particular issue batches, including quantities (package standard, pallets, quantity of pallets), issue versions, dispatch addresses, method of sorting, packaging and marking of issues.

Assembly - placing pdf files on one sheet (single use of packaging or parts of stands, etc.) according to the layout of the die-cutter used for cutting of the sheet.

Bleed – area of an image extending to the crop marks defining net page size. Lack of bleed causes defect generation during bookbinding operations.

III. SPECIFICATIONS FOR PREPARING PRINT MATERIALS

1. Preparation and delivery of digital materials for sheet-fed offset printing

1.1. Digital materials should be delivered via an FTP (File Transfer Protocol) to the designated server: **ftp://quaddisk.quadgraphics.pl**. Data enabling access to the server - login (user name) and password are made available by the Customer Service Representative serving your company.

Digital materials may also be delivered via the Internet by means of InSite, using the tools included. Data enabling access to the server - login (user name) and password are made available by the Customer Service Representative or the Technologist serving your company.

Logging in to InSite is possible via a web browser at: <http://insite.quadgraphics.pl>

The name of a dispatch (folders) may not include any local (diacritic) language signs, spaces and special characters (* > ! ? < : / \ etc.). Only the following characters are permitted:

a b c d e f g h i j k l m n o p q r s t u v w x y z 1 2 3 4 5 6 7 8 9 0 and _.

Digital materials may also be delivered on most popular digital data carriers formatted for PC or Mac systems (CD-ROM or DVD).

Under no circumstances should the Printing House download files from the Client's server and no digital materials should be sent via e-mail.

1.2. The graphics should be prepared in the following file formats:

- Postscript level 1, 2 or 3 (separated or composite),
- PDF 1.4 – 1.6 (Acrobat 5-7)
- PDF/X-1a:2001
- AI (provided that fonts are changed to curves and all graphic elements used are included)
- EPS (as above)

The Printing House **recommends** composite files, prepared in scale 1:1.

Separated files should not be prepared due to complex imposition process and introduction of automatic trapping. ZIP compression is recommended, JPG Maximum Quality compression is acceptable if graphic elements allow for it.

1.3. The resolution of photographs included in digital files for packaging and commercial works:

Minimum	Optimal	Maximum
250 dpi	300 dpi	450 dpi

For stands and posters, the minimum resolution of photographs is 200 dpi.

For digital printing: 150 dpi.

The Printing House will reduce to 300 dpi the resolution of all colour and greyscale images exceeding 450 dpi.

By supplying an image with lower resolution than the minimum above means acceptance of an inferior quality reproduction of that image.

1.4. The resolution of 1-bit images shall not exceed 2400 dpi.

1.5. Graphic elements of the page must not include attached profiles (no tagged profiles).

- 1.6. Graphic elements of the page must not include OPI (Open Prepress Interface) comments.
- 1.7. Supplied files must not contain copy-dot elements without prior agreement with the Company.
- 1.8. Before sending the materials to the Printer it is recommended to preflight the files with the use of an appropriate software applications, such as Adobe InDesign (version CS4 or higher), | Adobe Acrobat (version 6.0 or higher) or Enfocus PitStop to detect the most frequently occurring errors.
- 1.9. The client must indicate to the Customer Service Representative the differences between versions/mutations and provide the naming scheme used for the files. The name of a file should contain a description of the version.
- 1.10. The date of delivery of digital materials shall be considered the date of delivery of completed materials not requiring correction.
- 1.11. Failure to keep these terms of delivery may cause delays in shipping the finished product, for which the Company shall not be responsible.

2. File Generation

- 2.1. The Company recommends composite files in PDF generated with Adobe or QuarkXpress applications. The Company allows also files created by PS file conversion using Adobe Acrobat Distiller in version 5.0 or later according to manual available for download on website: <https://www.quadgraphics.eu/materials-for-the-client>
- 2.2. In case of questions, please send us sample files and contact your Customer Service Representative. We also recommend visiting: <https://www.quadgraphics.eu/materials-for-the-client>
- 2.3. In case of starting cooperation it is obligatory to send us sample files.

3. Total Area of Ink Coverage

- 3.1. For certain paper type groups the Total Area Coverage (TAC) is determined and it can be used during the preparation of files. If TAC is exceeded, some defects may appear and the Printing House takes no responsibility for them. TAC value for coated materials is 330 and for other group of materials this value cannot exceed 280.

4. File Naming Standards

- 4.1. A separate file should be generated for each use (packaging, part of a stand). Also for two-sided print, separate files should be created for left and right side.
- 4.2. All files delivered to the Printing House should be in a way that allows for an unambiguous assignment of a file to the printing order. Subsequent versions of the same file should have a different name, for example, they should include a subsequent number.
- 4.3. If a filename is ambiguous and prevents assembly being made on time, the Printing House takes no responsibility for any resulting delays.
- 4.4. The name of a file may not include any local (diacritic) language signs, spaces or special characters (* > ! ? < : / \ etc.). Only the following characters are permitted: a b c d e f g h i j k l m n o p q r s t u v w x y z 1 2 3 4 5 6 7 8 9 0 and _.

5. Layout

5.1. Each page should have bleed of at least 3 mm from each side

5.2. Die-cutter layout (in vectors) should be overlaid on the graphics (in 1:1 scale) in the trim location. The colour of the die-cutter, contrasting to the graphics, should be defined as an additional colour (SPOT) with the name, e.g. DIE and have an attribute of the overprint (OVERPRINT). In addition, the die-cutter layout may contain selective varnish omission for gluing, marked with a frame filled with diagonal lines and a designation of the wave direction in the corrugated cardboard.

5.3. Finishing elements, such as selective UV coating or gilding, etc. should be overlaid on the graphics (in 1:1 scale) in their exposure location. Any finishing elements should be saved as a separate LAYER in an open graphic file. In a PDF file they should be created as an additional colour (SPOT) with the name, e.g. UV COAT and with an OVERPRINT attribute. If finishing elements are placed on the next page

of a PDF, it is also necessary to include the die-cutter layout. All texts and graphics in which the sharpness of edges is important should be submitted in vector format. Selective varnish coating should be saved in vector format (due to plotter cutting of the varnish coated form).

5.4. If UV coating is to be printed into metallic foil, a mask should be prepared for those graphic elements that will not have the metallic effect. A mask (white coating ink) will be overprinted on the foil in first place and then other colours will be added.

5.5. Important text or graphic elements should be positioned at least 3 mm from the trim edge.

5.6. Minimum type size for one colour printing is:

6 pt for one-element fonts

7 pt for two-element fonts

Minimum type size for more than one colour or reverse printed is:

8 pt for one element fonts

10 pt for two-element fonts

5.7. Minimum permissible line thickness is 0.2 pt. Reverse printed lines or in more than one colour should be at least 0.75 pt thick.

5.8. Minimum permissible line thickness is 0.2 pt. Reverse printed lines or in more than one colour should be at least 0.75 pt thick.

5.9. In order to obtain richer black depth and avoid picking effect in solid areas, black should be generated from 4 colours. The recommended formulas are C 70, M 60, Y 60, K 100 for coated papers and C 50, M 40, Y 40 K 100 for uncoated papers.

5.10. Inaccuracy may be avoided by trapping, that is minimal overlapping of colours on one another. When submitting composite files, which are of preference by the Printing House, the Client should not make any trapping. This process is conducted in the Printing House, provided the Client does not express any reservations. If the Client submits separated files, the Printing House is unable to include trapping, so it must be made by the Client. The recommended trapping value is 0.05mm (0.144 pt).

For reverse printed text on black background composed of 4 colours, negative trapping for CMY colours of 0.17mm (0.5 pt) is needed.

If spot ink is used for printing (Pantone, metallic colour), a CMYK spread must be made towards the spot colour (Pantone, metallic colour).

5.11. A black text smaller or equal to 24 pt set against a colour background must be overprinted. The exception are texts (K or CMYK) on spot colours (Pantone, metallic colours), where knockout should be applied, according to point 5.10 above with K or CMYK spread towards the spot colour. All graphic elements printed over spot colours (such as shades) must also be selected and spread in similar manner. This is the only way we can ensure proper representation of all the elements.

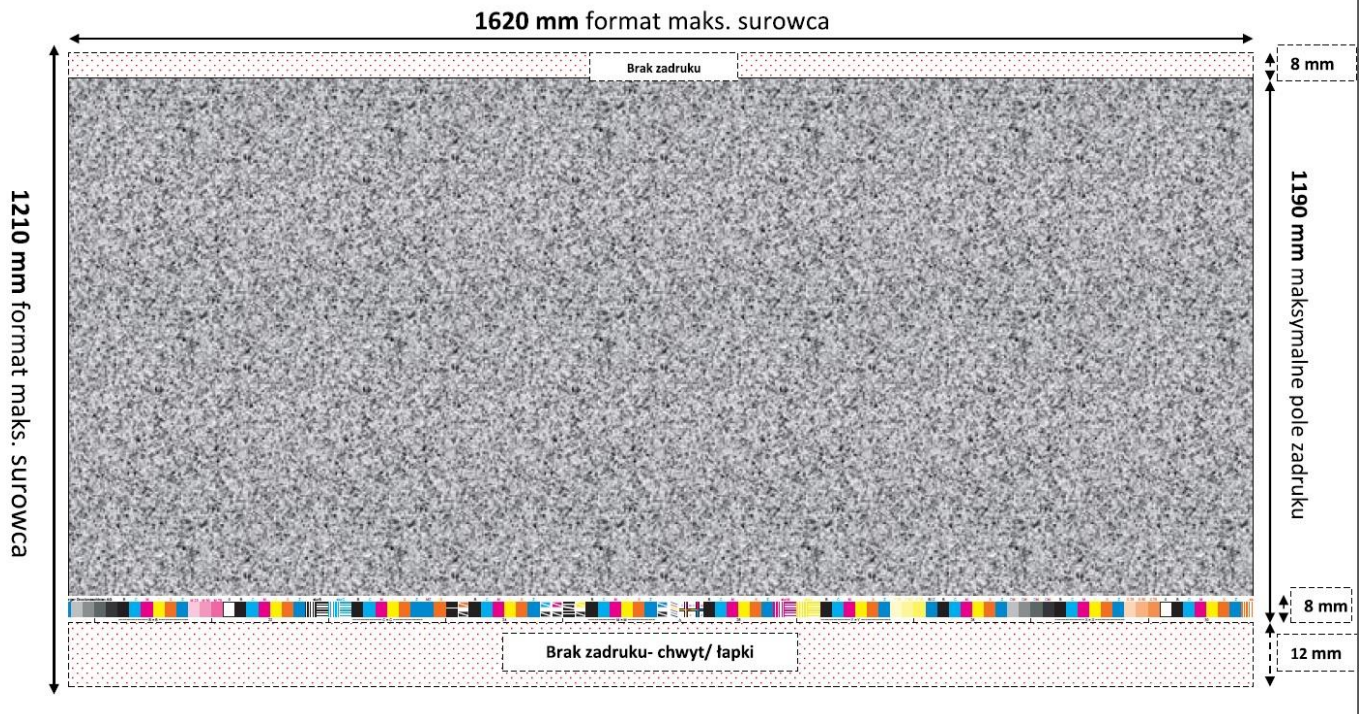
Black texts larger than 24 pt may be made of 4 colours according to the formula specified in point 5.9 above.

5.12. All graphic elements and photographs must be prepared in CMYK colour space. Graphic elements and photographs in other colour spaces, such as RGB or Lab, are automatically converted to CMYK colour space by using ICC ISO Coated V2_300_eci by means of perceptual rendering. All other spot colours, e.g. Pantone®, have to be converted to CMYK. Spot colours may be used only if agreed with the Printing House.

5.13. White graphic elements must have a KNOCKOUT attribute (selection), otherwise they will not be printed on the sheet (they will disappear).

5.14. IMPORTANT! When printing on large format sheet printers, the print control strip is positioned on the holder side. This has to be considered when preparing files for "plano" printing. There is a 20 mm space from the holder side (at the bottom of the sheet) (12 mm for holders + 8 mm of the print control strip field), and no graphic elements or printing registration can be positioned there.

Obszar maksymalnego zadruku arkusza na maszynach A14/A15 Speedmaster XL 162 VLF



Obszar maksymalnego zadruku arkusza na maszynach A14/A15 Speedmaster XL 162 VLF	The maximum printing area on the sheet in A14/A15 Speedmaster XL 162 VLF machines is the following:
1210 mm format maks. surowca	1,210 mm max. format of the material
1620 mm format maks. surowca	1,620 mm max. format of the material
Brak zadruku	No printing
1190 maksymalne pole zadruku	1,190 maximum field of print
Brak zadruku - chwyt/łapki	No printing - holder

6. Separation

6.1. ICC profiles used for generating separations should be adjusted to the paper grade on which the printing is done according to the ISO 12647-2 standard. ICC profiles are made available to clients by your Customer Service Representative. Profiles recommended by the Company should be used. Using other ICC profiles is permissible only in agreement with your Customer Service Representative.

The Company takes no responsibility for the final product, if files have not been prepared in accordance with the above guidelines or if they contain objects imported directly or indirectly from CorelDraw or AutoCad software. The Printing House also has the right to refuse the acceptance of any files not consistent with specifications.

All additional operations aimed at correcting the files in order to reach consistency with specifications and all changes made by the Company at the Client's request are considered additional paid service.

7. Master Materials

7.1. Attaching a contract proof to each project is recommended.

7.2. Contract proofs should be made after the last correction of files submitted for printing.

7.3. The ICC profile acquired by the Customer Service Representative should be used for making a contract proof.

7.4. File name, date of proof performance and name of the ICC profile used should be included on each contract proof. Also, a control strip must be placed on each contract proof. Use a Ugra/FOGRA Control Strip or the one provided by the Customer Service Representative. Lack of description or strip makes it impossible to use a contract proof as a master material in the Company.

7.5. If the customer accepts the print, a sheet accepted and signed by the customer becomes the master material for the offset operator.

7.6. Prints from previous editions are not contract proofs and may only serve as reference for the operator. Using this type of master material entails the probability of obtaining a different colour as a result of lack of information on the preparation of materials and the printing process or as a result of a different positioning of the graphics on the sheet.

7.7. If the Client does not deliver contract proofs, the print will be carried out according to Lab coordinates of primary colours corresponding to the ECI profile of the job and dot gain specified by ISO 12647-2 standard for a given paper grade.

7.8. Detailed requirements concerning methods of control proof preparation are included in Basic Quality Standards (chap. IV, item 1.1.2)

8. File preparation for digital printing

8.1. The graphics should be prepared in PDF or EPS file formats.

8.2. In order to use the high quality of the print offered by the machines, the files should be at least 150 dpi (300 dpi maximum) in 1:1 scale. Of course, files of lower resolutions will also be printed but the Printing House does not take any responsibility for the print quality at such low resolution.

8.3 The file should be prepared in 1:1 scale, in CMYK colour space. By prior arrangements, it is also possible to print from RGB files.

8.4 If the file should contain a cutting or punching outline, it should be made as:

- an outline (of any thickness) with spot colour and an overprinting option.
- overlaid on the graphics (in 1:1 scale) in the trim location
- the colour of the die-cutter defined as an additional colour (colour type: SPOT colour) with an attribute of the overprint (OVERPRINT) should be contrasting with graphics. In addition, the **die-cutter layout** may contain selective varnish omission for gluing, marked with a frame filled with diagonal lines and a designation of the wave direction in the corrugated cardboard.
- the creasing line - defined by the spot colour named BIGA or CREASE
- the cutting line - defined by the spot colour named CIECIE (without Polish characters in the name) or CUT
- the partial cutting line - defined by the spot colour named CZESCIOWE CIECIE (without Polish characters in the name) or PARTIAL CUT
- it is recommended to send the die-cutter layout in a separate PDF file with the layout only, without the graphics (in 1:1 scale)

The die-cutter layout or the cutting line should not be another element than the outline. In case of placing the above elements in CMYK colours or as an object other than the outline, the layout can be printed together with the graphics. If a file is provided without the die-cutter layout or cut, please provide an overview file with graphics and layout.

8.5 In the case of further processing, i.e. cutting on a plotter or die cutting, **the graphics have to include cut marks indicating the most extended knife/die-cutter elements**. They will serve as a fitting point for a plotter or a die-cutting machine. The marks should be made in the standard way - taking into account the 3mm or 5mm graphic bleed.

8.6 It is possible to print according to the Client's colour proof. There is a possibility to print a proof in the printing house. If there is no provided proof, the works are printed by default with ISO Coated V2 profile (the digital printing standard in QuadGraphics Europe). In the case of printing from RGB files, the works are printed with a profile embedded in the file (most often it is a device profile: camera, scanner, etc.).

8.7 It is possible to profile the substrate delivered for printing. However, this requires prior contact and discussion of the details.

8.8 The maximum size of a single sheet is **2,050x3,140mm**.

9. File preparation for cutting plotter

9.1 Works to be cut on the plotter should be delivered in **DXF**, **CF2** or **ARD** (ArtiosCAD native format) files. Due to limitations of DXF format, if a file is delivered in this format, visual graphics or a Project Card (PDF or JPG file) must be enclosed that will present types of lines in the file and a description of the type of lines (knife, crease, perforation, milling cut, etc.).

9.2 The supplied ARD files must include correct colour coding of cutting and creasing lines. It is recommended to supply a **PDF** or **JPG** file as **visual aid**.

9.3 The production file must be supplied in 1:1 scale. The graphics with the cutting outline should also be supplied as visual aid.

9.4 In the case of executing the entire order at QuadGraphics Europe (printing, die cutting, etc.) **the graphics have to include cut marks indicating the most extended knife/die-cutter elements**. They will serve as a fitting point for a plotter or a die-cutting machine. The marks should be made in the standard way - taking into account the 3mm or 5mm graphic bleed. In addition, the graphics should include control tags for ARS (Automatic Registration System). The positioning of the marks is described in point 9.9 below.

9.5 The maximum possible area for single die cutting should be inscribed in the 1,660x3,180mm dimension.

9.6 The minimum format possible to cut on an automatic plotter is 600x870mm.

9.7 The precision range of the manual plotter is ± 0.2 mm. The repeatability of cutting is ± 0.2 mm.

9.8 The precision of automatic cutting is ± 0.5 mm. The repeatability of automatic cutting is ± 0.5 mm.

9.9 The method of placing ARS control tags:

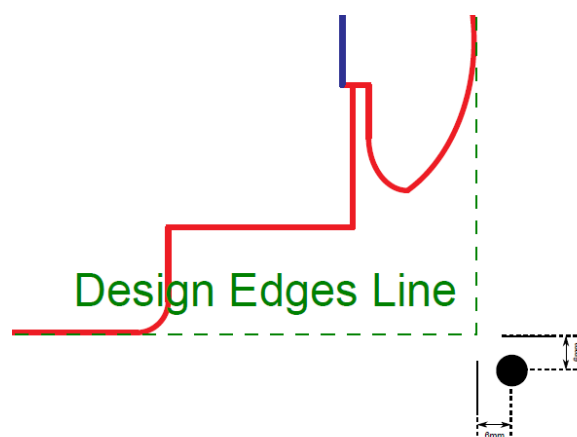
The control tag for ARS system is a **circle of 3 mm diameter, a 100K fill** or CMYK components closest to black.

The element cannot have a contour and should be filled with colour entirely.

The tags should be placed in each corner of the imposition at a **distance of 5mm** from the edge of the cutting line or the cutting markers defining the furthest elements of the knife/die as referred to in point 8.5 above.

The tags cannot overlap with graphics or touch the graphic bleed. If necessary, select (delete) at least 1 mm graphics from the edge of the tag.

A visual presentation of ARS tags positioning in one of the corners of the imposi



IV. PRODUCTION STANDARDS

1. Printing process

1.1. Colour:

1.1.1. The colour of the finished product should be as close as possible to the colour of the properly made contract proof supplied by the Client, taking into consideration the specificity of offset print, paper quality, proof characteristics and other factor affecting the colour of the copy.

1.1.2. Requirements concerning contract proofs

A control strip Ugra/FOGRA should be placed on every proof. Each proof delivered to the Printing House should have a certificate confirming its correctness. The current standard in force for contract proof certification is ISO 12647-7:2007.

Acceptable proof	Non acceptable proof
ΔE_{ab} CMYK patches <5	ΔE_{ab} CMYK patches >5
ΔE_{ab} average of the entire control strip <3	ΔE_{ab} average of the entire control strip >3
Maximum ΔE_{ab} <6	Maximum ΔE_{ab} >6
ΔE_{ab} substrate simulation <3	ΔE_{ab} substrate simulation >3
Maximum ΔH of CMYK patches <2.5	Maximum ΔH of CMYK patches >2.5
Average ΔH of greyscale balance <1.5	Average ΔH of greyscale balance >1.5

Measuring conditions: white backing, D50 illuminant, 2^o standard observer, absolute value, no UV filter and no polarizing filter.

The proof must be made with the ICC profile provided by the Printing House's Technologist. The proof must include simulation of a printing substrate.

1.1.3. If the proof is not made according to the specification, it will not be considered a contract proof. In such case, the Printing House will make a contract proof at the Client's cost. If the Client does not agree for the preparation of a proof, the Client's proof may serve as the master material for the operator but this may mean a different hue of the print.

1.1.4. Optical densities of the printing process are selected in such a way as to ensure that Lab values of solid CMYK patches, corresponding to primary Lab values obtained from standard ECI profiles, are obtained on paper of a given group and with given inks.

1.1.5. Printing control tolerance for particular sheet accepted by the Client or by an authorized Printing House employee.

	Acceptable	Non-acceptable
Optical density	$\leq \pm 0.1$	$> \pm 0.1$
Dot gain	$\leq \pm 4\%$	$> \pm 4\%$

Measuring conditions: black backing, E (DIN) status, relative value, no polarizing filter

1.1.6. Consistency of colours between the contract proof and the printed product is assessed visually at D50 standard lighting as per ISO 3664:2000 standard.

- 1.1.7. If it is necessary to obtain optimal consistency with the master material, Lab values of solid patches may exceed the tolerance limits specified in ISO 12647-2 standard.
- 1.1.8. In order to ensure the best quality of colour reproduction in relation to the correctly produced contract proof, the Printing House may apply additional optimisation of input data.

1.2. Colour registration

Permissible deviation of registration of colours printed consecutively

Acceptable	Non-acceptable
≤ 0.1 mm	> 0.1 mm

1.3. Additional Pantone® colours

Due to lack of possibility of densitometric control of colour intensity, a correct colour is considered to be a colour that visually fits between sample (-) and sample (+) supplied by the ink manufacturer. Additional colours should be individually accepted by the Client.

Pantone® colour system

Pantone colours are printed in accordance with the current Pantone® colour system updated **every year**. The Printing House does not bear any responsibility for unmatched colours compared to an old Pantone® colour system.

1.4. Perforating during printing tolerance from the theoretical perforation line for longitudinal and lateral perforation (rotary die cutter)

Acceptable	Non-acceptable
≤ 1 mm	> 1 mm

1.5 Picture and varnish layer registration in selective varnish coating

Acceptable	Non-acceptable
≤ 1 mm	> 1 mm

1.6. Varnish layer

The offset, dispersion or UV varnish layer is considered incorrect if it contains some uncoated areas on the surface intended for varnishing.

- 1.7. Due to offset printing specificity, the process is accompanied by ink rubbing off the printed area. The Printing House will do its best to minimize this occurrence but cannot guarantee its complete elimination.

2. Binding process

2.1. Sheet cutting (cardboard, solid cardboard)

Permissible deviation of sheet cutting to single items:

Acceptable	Non-acceptable
≤ ± 1mm	> ± 1mm

2.2. Off-line folding and perforations

- 2.2.1. Folding - permissible deviation of fold from the nominal line of its position (on each fold)

Acceptable	Non-acceptable
$\leq \pm 1\text{mm}$	$> \pm 1\text{mm}$

2.2.2. Perforation - deviation of the preformation from its nominal position

Acceptable	Non-acceptable
$\leq \pm 1\text{mm}$	$> \pm 1\text{mm}$

2.2.3. Final deviations of the performed folds and perforations also result from permissible deviations in earlier technological processes, i.e. printing and cutting of the sheet.

2.3. Lamination

Acceptable deviations:

Single sided	Double sided
Acceptable up to 1.5 mm	Acceptable up to 2 mm

2.4. Die cutting

Acceptable deviations:

Non-laminated	Laminated
Acceptable up to 1 mm	Acceptable up to 2 mm

Important!! On recycled cardboard from GD group that are not finished with thermofoil, some cracking effect may occur at the edges of creased places when folding and some shredding at the edges of the cardboard at the point of cutting with a cutting knife. This defect mainly results from the structure of the raw material.

2.5. Thermofoil lamination

Acceptable deviation: up to 5 mm at the longer side of the sheet
up to 10 mm at the shorter side of the sheet (overlap)

3. Acceptable Delivery Criteria

Delivery is considered consistent with the order when at least 98% of the product has quality parameters within the tolerance range permissible by this specification.

Any comments or reservations should be submitted within 14 days of shipment date.¹

4. Terms and conditions concerning storage of cardboard and paperboard products such as packages and stands

Detailed information is provided in a separate file at: <https://www.quadgraphics.eu/materials-for-the-client>