Gravure

Artwork Manual for Rotogravure Printing

Introduction

Working with the Keylines

The Opening Devices

Designing

SIG Documents

Delivering Data

Doc.-No.: I-G-0146-en
Edition: V7 Appendix A (English)

We reserve the right to
make technical changes

Artwork Manual
Contents

01

Packaging by **SIG**

111111 222222
333333 444444

555555 666666
Drawing 02 / 0...

Typo
Juice

Typo
Juice

The System for Success.

SIG is the company leading the way in the global packaging industry. We manufacture aseptic carton packaging for food such as milk, juice, soups and sauces while developing and producing the required filling machines.

We are driven by the motivation of achieving joint success with our customers. We use our high-grade, high-performance and flexible system to guide the entire packaging process. One portion of this process is preparing packaging design for production in rotogravure printing.

We would like to use this manual to support you in laying out the design of your carton packaging. Applying the criteria described in this manual will provide a reliable foundation for optimum implementation of your design ideas in the SIG standard.

Carton Structure - The Carton Combination of SIG

Raw board

Middle polyethylene coating

Aluminium

Inner polyethylene coating

Printing on outer polyethylene coating

Creasing and punching

Folding and sealing

Sleeve dispatch

SIG Bloc

SIG Fit

The strong edges ensure that the carton is always on good shape.

The longtidudinal seam offers aseptic safety.
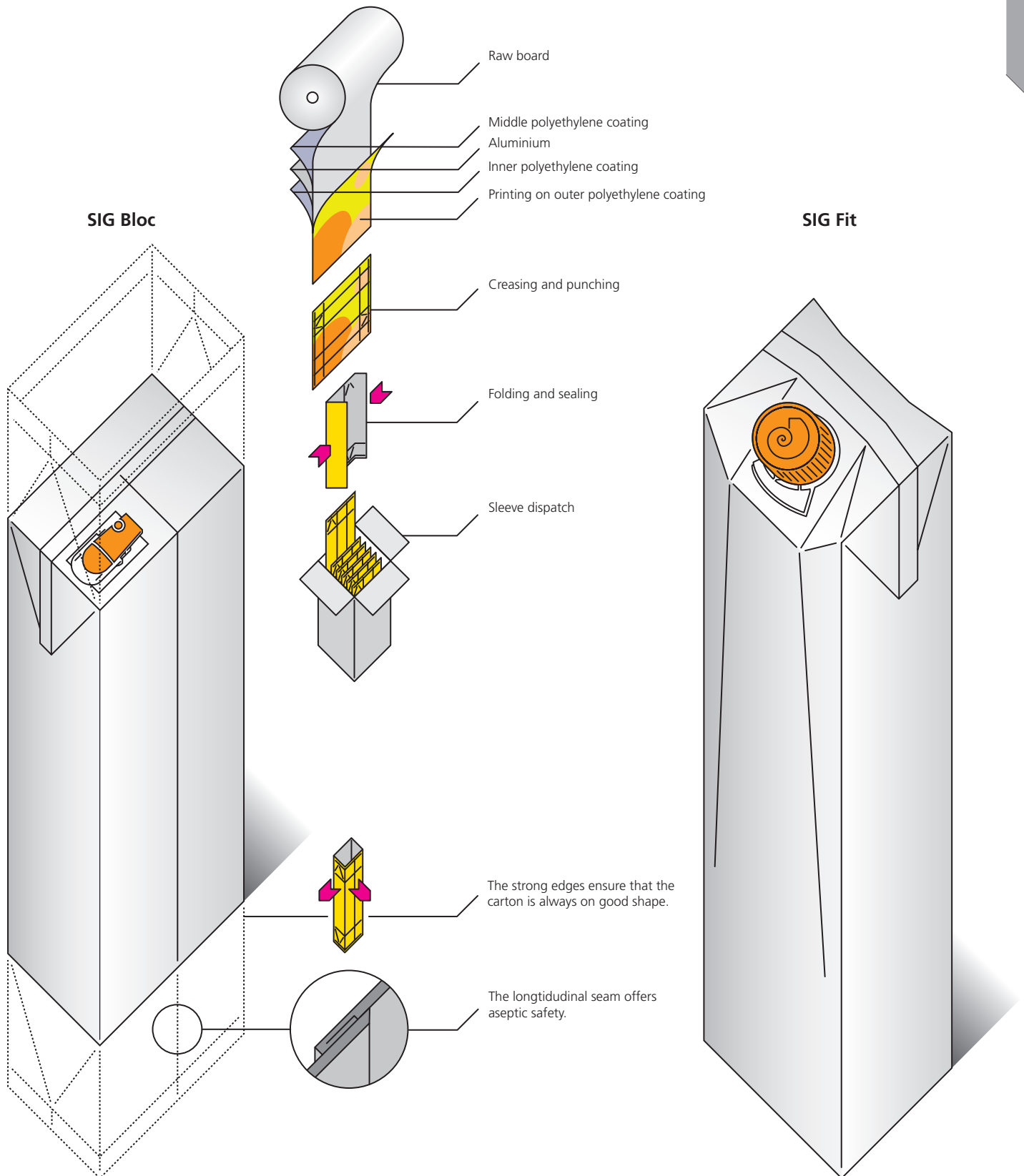
The preformed carton sleeves are produced in the packaging material facilities at SIG and they are later aseptically filled on the filling machines on the customer's premises. The carton is given an inside and outside layer of high-grade polyethylene (PE) including an extremely thin layer of aluminium and another inner layer of polyethylene.
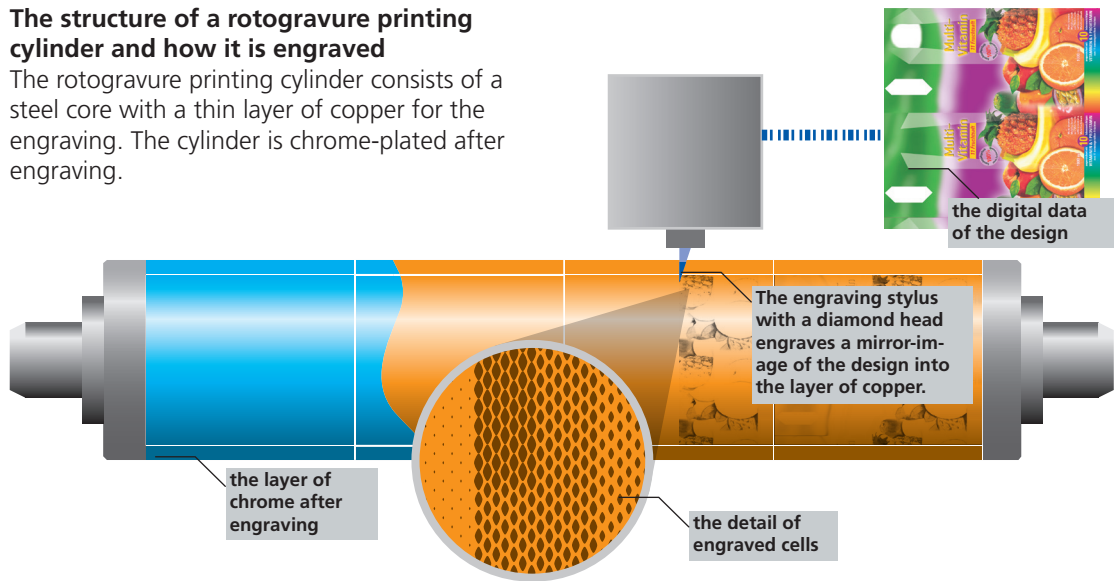
Rotogravure printing for stunning colours
After coating, a high-grade rotogravure printing technique that is especially suited to high runs of sophisticated products with intensive colours is used to print on the carton.
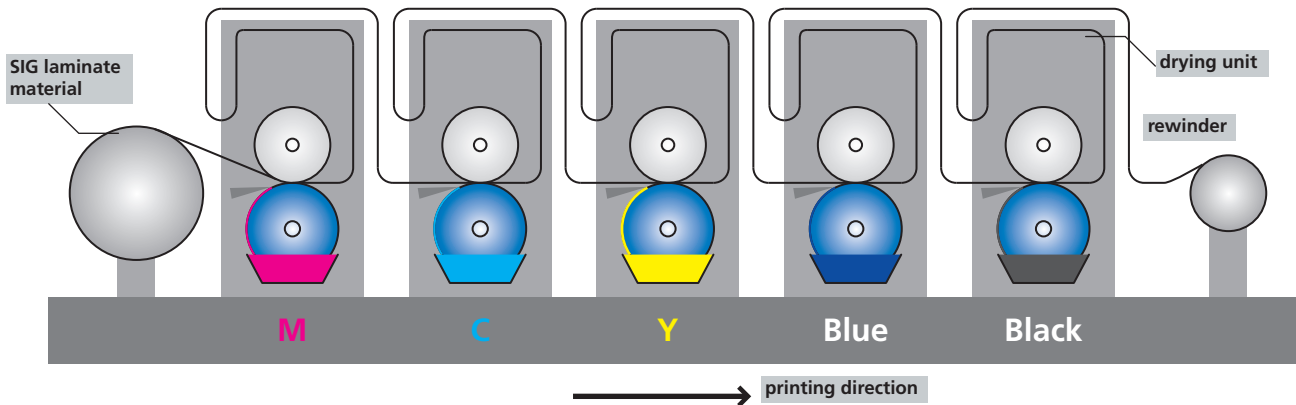
Introduction
The Printing Technique - The SIG Process

The structure of a rotogravure printing cylinder and how it is engraved
The rotogravure printing cylinder consists of a steel core with a thin layer of copper for the engraving. The cylinder is chrome-plated after engraving.

the digital data of the design

The engraving stylus with a diamond head engraves a mirror-image of the design into the layer of copper.

the layer of chrome after engraving

the detail of engraved cells

A schematic diagram of the printing machine

SIG laminate material

drying unit

rewinder

M   **C**   **Y**   **Blue**   **Black**

printing direction

A schematic diagram of the printing unit

impression cylinder

SIG laminate material

direction of printing

blade

printing cylinder

ink tray
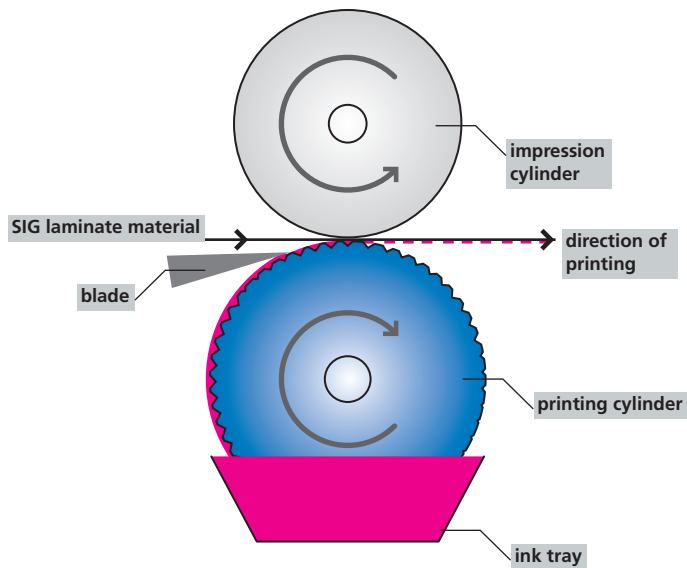
The rotogravure printing technique
Rotogravure printing is a direct printing technique where all of the printing elements are engraved to the cylinder surface as little cells. The cylinder rotates in a trough filled with low-viscosity ink. The ink flows into the cell, while the surplus ink is scraped off from the print free zones with a doctor blade. The ink is then transferred to the laminate.

Introduction
The Filling Process in the SIG Filling Machine

product

sterile air
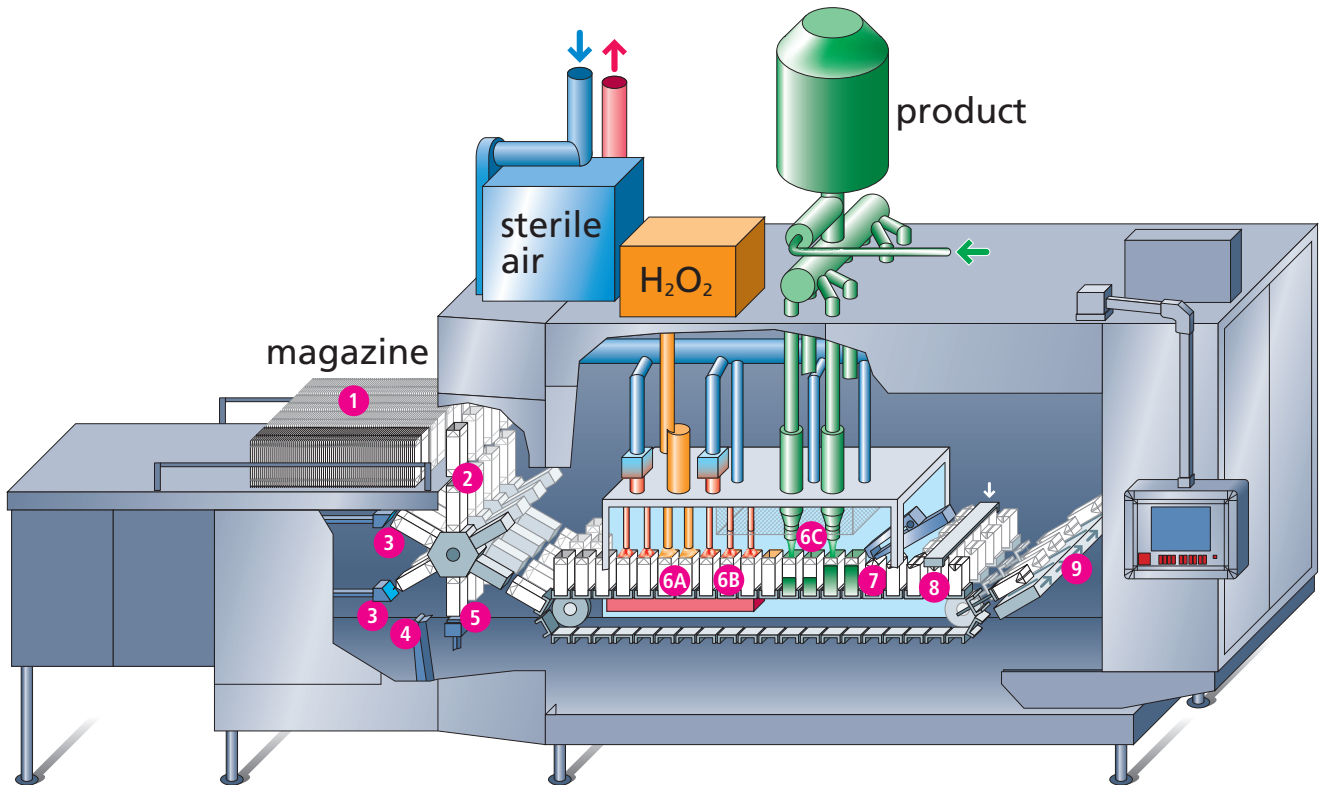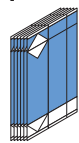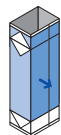
H₂O₂

magazine

1 **Magazine**

The magazine holds the sleeves, and is refilled by the operator or the optional CAM module.

2 **Sleeve extraction + opening-up of sleeves**

The individual sleeves are extracted through suction units, they are opened up rectangulary and are pushed onto a mandrel. This ensures a reliable guidance for the production of the bottom section.
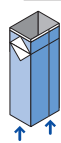
3 **Bottom activation**
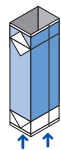
Hot air is used at two stations to activate the areas of the bottom section of the sleeve.

4 **Bottom folding**
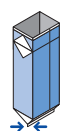
During the time the mandrel wheel transports the sleeve to the bottom pressing station, rotating lateral folders and a longtidudinal folder are used to prefold the bottom section.
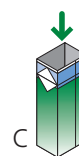
5 **Bottom pressing station**

Bottom press dies and the face side of the mandrel are used to fully press and seal the bottom section of the carton. The specific design of the pressing elements ensures the typical, patented concave-shaped bottom section guaranteeing the particularly good standing features.
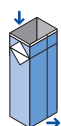
6 **Aseptic area**

The aseptic area consists of the areas: sterilisation (A), drying (B) and filling (C) of the carton. First, hydrogen peroxide (H_2O_2) is used to sterilise the inside of the carton. Afterwards, the heated sterile air is blown in at several stations and thus dries out, the H_2O_2 still inside. The process is used to kill the micro-organisms inside the package in a reliable way. The product is filled into the carton in the filling station at two stages. The aseptic area is under a slight overpressure of sterile air, thus avoiding the ingression of non-sterile air from the outside and thus preventing the aseptic area from being contaminated.

7 **Top sealing through ultrasonic sealing**
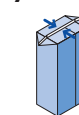
The top section of the carton is folded by the ultrasonic sealing tools and is sealed on top of the fill level. Before sealing the carton with ultrasonic energy, steam is injected into the carton to reduce the head space to a minimum after the cooling-down process. A nitrogene injection is available as an option.

8 **Top forming station**
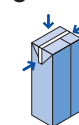
The polyethylene is heated up with hot air at the top triangles and at the narrow side of the carton, the top triangles are folded downwards and are sealed to the carton.

9 **Ejector and discharge station**
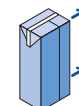
The carton is ejected out of the pocket, and is put up and then placed onto the off-conveyor.

**preliminary phase /
graphic artists / customers**

design order placed with SIG
(data, artwork,
Design Order Form Doc-Nr.: 10.F-SC 701)

**place reproduction order
and request proof**

internal correction loop

**proof supplied
to SIG for checking
and sending to
customer**

no

customer reviews proofs

customer correction loop

**customer gives
approval for cylinder
engraving**

no

**packaging
order placed**

packaging is scheduled after
the packaging order is placed
and at the same time as
design implementation

**Packaging Order
is placed**

no → inquire Packaging Order

**cylinder produced and
test proof supplied to SIG**

internal correction loop

**SIG approves
production cylinder**

no

packaging production

The Structure of the SIG Bloc and SIG Fit Layouts (Back Panel Divided)

print free sealing area

no text

Packaging by SIG

FSC

top panel
back left

top panel
back right

111111 222222
333333 444444

top front side

cylinder numbers

555555 666666

Drawing 04 / 05

version no. of keyline

print free ear area

crease line

crease line

lay-out area (background/picture)

back panel left

left hand side panel

front panel

right hand side panel

back panel right

type area marking

type area marking

FSC
MIX
Board | Supporting
responsible forestry
FSC® C020428

Sample

connection

connection

spreading/bleed

spreading/bleed

register marks

000 000
printing number

SIG

register marks

FSC® C020428
MIX
Board | Supporting
responsible forestry

print check

carton base

Interleaved Code
000000

Rapport 158,25 mm
cb 5   750 ml

⚠ Please note that front and back panel as shown in shelves may differ from this illustration, for example depending on the chosen secondary packaging solution. We invite you to clarify this point prior to submitting the design files to SIG. The description Front / Back also refers to the pack design / 3D model below.

Format series cb4 · cb5 · cb6 · cb7 · cf7
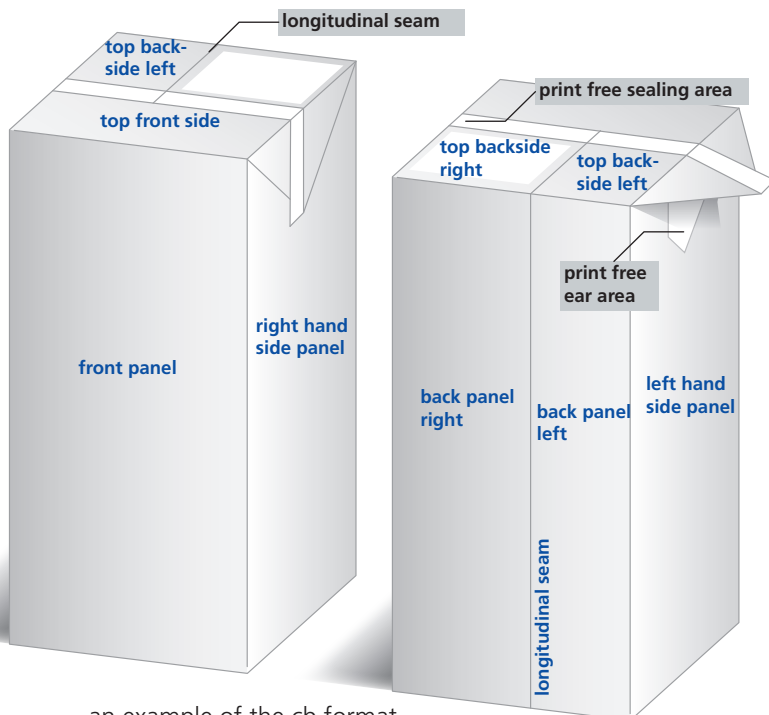
longitudinal seam

top back-
side left

top front side

top backside
right

top back-
side left

print free sealing area

print free
ear area

front panel

right hand
side panel

back panel
right

back panel
left

left hand
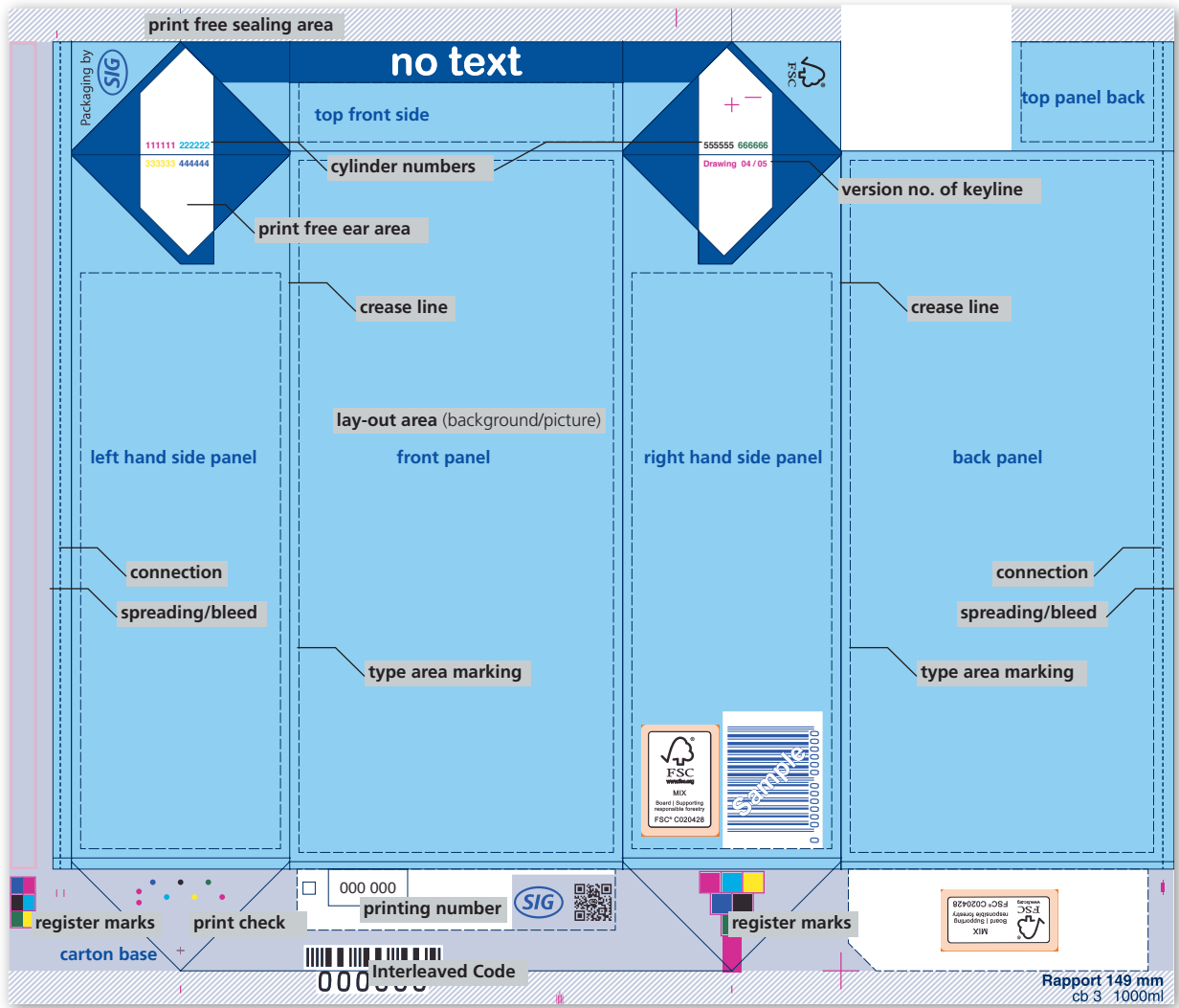side panel

longitudinal seam

an example of the cb format

Area definition:

Lay-out area

Covered lay-out area,
with formed packaging

Print free areas
for ear area and opening device
(white)

Print free sealing areas
on top and bottom

Type area marking
(dashed)

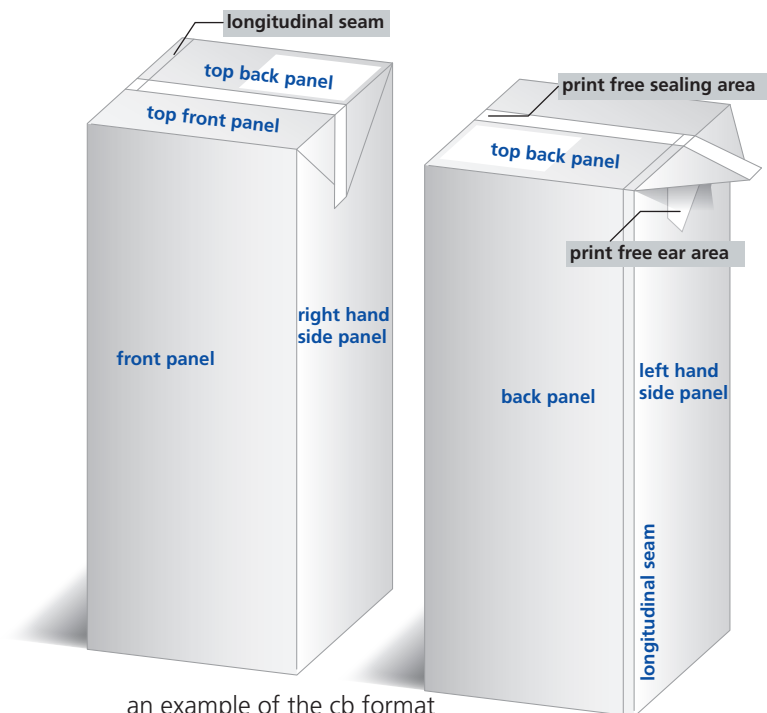**Printable areas on the
carton base** (white)

The Structure of the SIG Bloc and SIG Fit Layouts

The Structure of the SIG bloc Layouts (Back Panel Not Divided)

Labels on the layout diagram:
- print free sealing area
- Packaging by SIG
- no text
- top front side
- top panel back
- 111111 222222
- 333333 444444
- 555555 666666
- Drawing 04 / 05
- cylinder numbers
- version no. of keyline
- print free ear area
- crease line
- crease line
- lay-out area (background/picture)
- left hand side panel
- front panel
- right hand side panel
- back panel
- connection
- spreading/bleed
- connection
- spreading/bleed
- type area marking
- type area marking
- FSC MIX Board | Supporting responsible forestry FSC® C020428
- Sample
- register marks
- print check
- printing number
- SIG
- register marks
- FSC® C020428 MIX Board | Supporting responsible forestry
- carton base
- 000 000
- Interleaved Code
- Rapport 149 mm
- cb 3 1000ml

⚠ Please note that front and back panel as shown in shelves may differ from this illustration, for example depending on the chosen secondary packaging solution. We invite you to clarify this point prior to submitting the design files to SIG. The description Front / Back also refers to the pack design / 3D model below.

Format series cb1 · cb2 · cb3 · cb8 · cb9

Labels on 3D models:
- longitudinal seam
- top back panel
- top front panel
- print free sealing area
- top back panel
- print free ear area
- front panel
- right hand side panel
- back panel
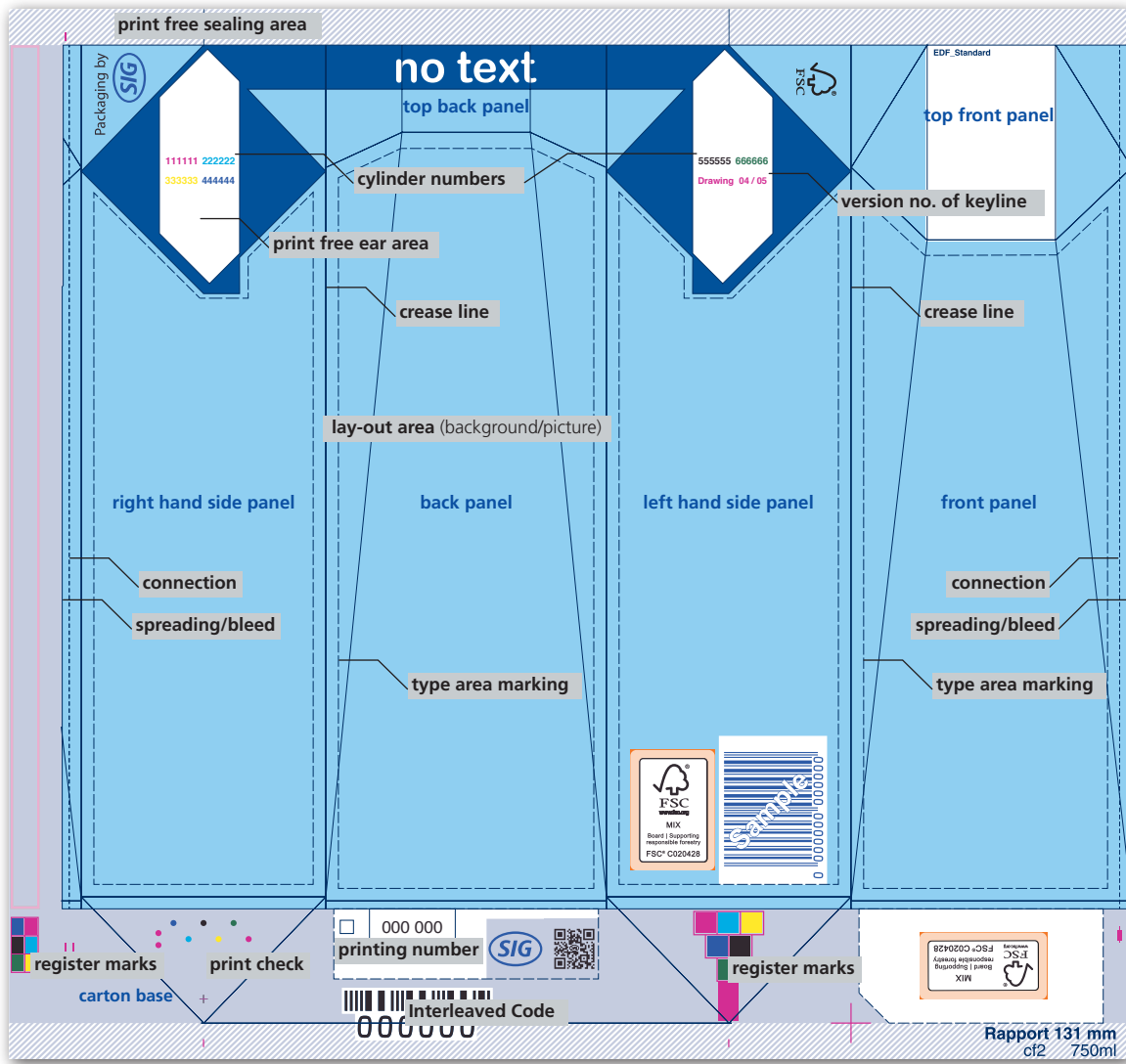- left hand side panel
- longitudinal seam

an example of the cb format

Area definition:

- **Lay-out area**
- **Covered lay-out area,** with formed packaging
- **Print free areas** for ear area and opening device (white)
- **Print free sealing areas** on top and bottom
- **Type area marking** (dashed)
- **Printable areas on the carton base** (white)

The Structure of the SIG Fit Layouts (Back Panel Not Divided)

print free sealing area
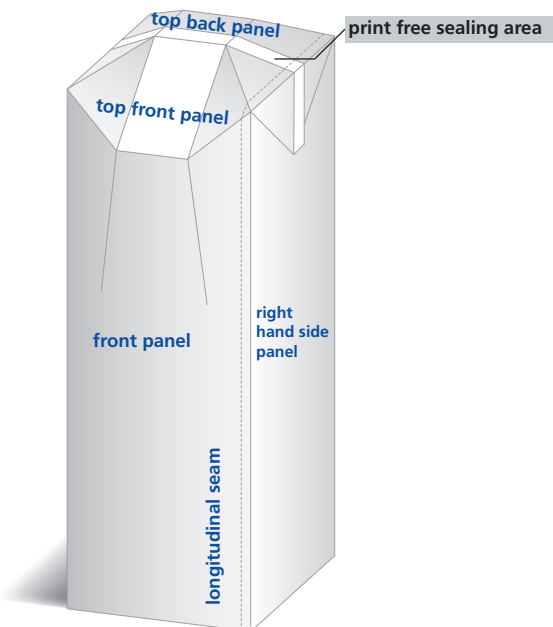
Packaging by SIG

no text

top back panel

EDF_Standard

top front panel

111111 222222
333333 444444

555555 666666
Drawing 04 / 05

cylinder numbers

version no. of keyline

print free ear area

crease line

crease line

lay-out area (background/picture)

right hand side panel

back panel

left hand side panel

front panel

connection

connection

spreading/bleed

spreading/bleed

type area marking

type area marking

FSC MIX Board | Supporting responsible forestry FSC® C020428

Sample

register marks

print check

000 000
printing number SIG

register marks

FSC® C020428 MIX Board | Supporting responsible forestry

carton base

Interleaved Code

Rapport 131 mm
cf2   750ml

⚠️ Please note that front and back panel as shown in shelves may differ from this illustration, for example depending on the chosen secondary packaging solution. We invite you to clarify this point prior to submitting the design files to SIG. The description Front / Back also refers to the pack design / 3D model below.

Format series cf2 · cf8 · cf9

top back panel   **print free sealing area**

top front panel

front panel

right hand side panel

longitudinal seam

an example of the cf format

Area definition:

Lay-out area

Covered lay-out area, with formed packaging

Print free areas for ear area and opening device (white)

Print free sealing areas on top and bottom

Type area marking (dashed)

Printable areas on the carton base (white)

The Bottom Section of the Carton
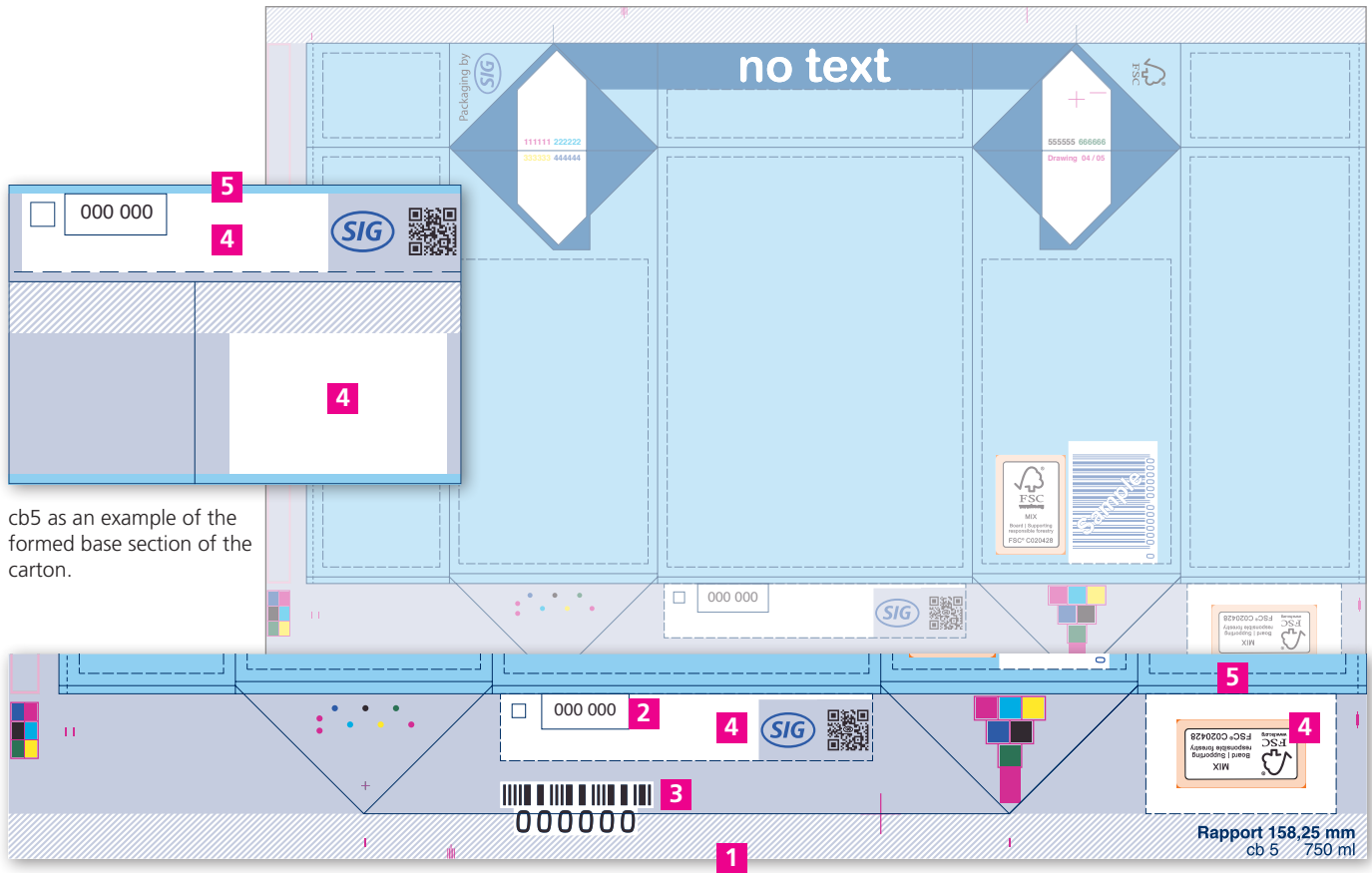
cb5 as an example of the formed base section of the carton.

1 The base area contains printing control, printing assistance and colour control marks. None of the bottom elements can be changed from the standard. The areas marked in grey are either covered or have to remain uncovered for technical control elements.

2 The print number is the most important and most reliable feature for identifying a design. It should always be given as a reference number when asking questions or getting information. You can see this number when the carton is formed. The impression number is shown to the left of the printing number reproduced in the register colour (first colour).

3 The interleaved code contains the print number and is used for SIG storage purposes.

4 Free zones for additional text and linework elements are shown in white. These areas are not allowed to be printed with screen printing or as full tone area.

5 The background, pictures and graphic elements going down to the bottom section must continue bleeding 2mm beyond the base crease

6 The SIG QR code which leads to the following SIG website: https://www.sig.biz/smartchoice/en.

The priorities for assigning colours:

|	
1	dark blue tones
2	cyan
3	blue tones (high contrast / easily legible)
4	high contrast colour tone, closest to blue
5	darkest colour (wherever possible avoid yellow, red and orange tones)
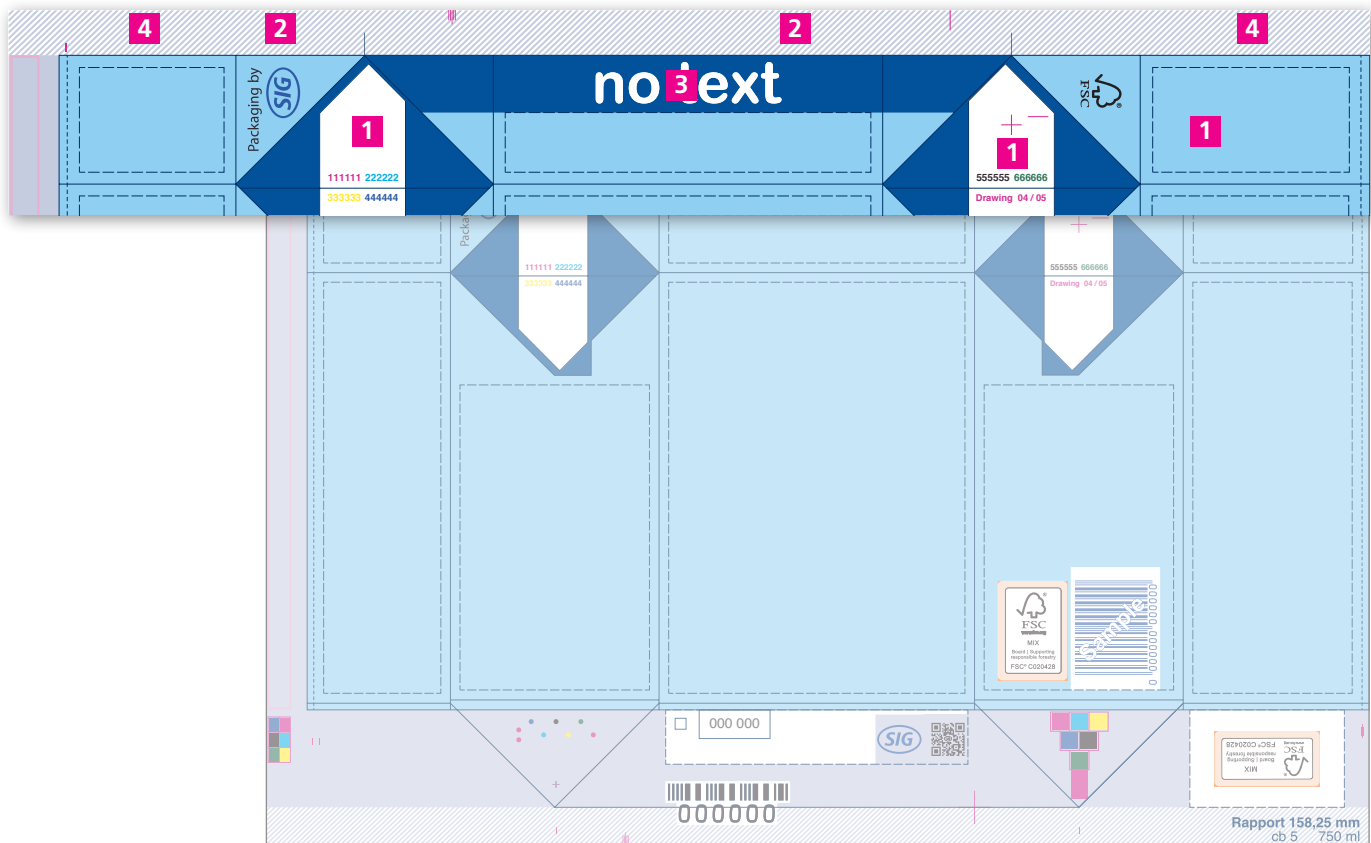
1 There are print free areas for the glueing surfaces of the ears and for opening devices in the carton top panel area. The register cannot change them. The cylinder numbers are in the print free ear area. They are internal numbers for SIG printing preparation and are covered after the carton is formed.

2 The seal is generated by pressure and ultrasound that are applied by two sealing faces.

3 These zones are covered after the forming of the top panel.

4 **Printing the best before date**
The best before date or other information can be printed in the seal area of the carton top panel of the filled carton using inkjet printing.

ultrasound sealing faces

The Carton Top Panel / Manufacturer Identification (MI)
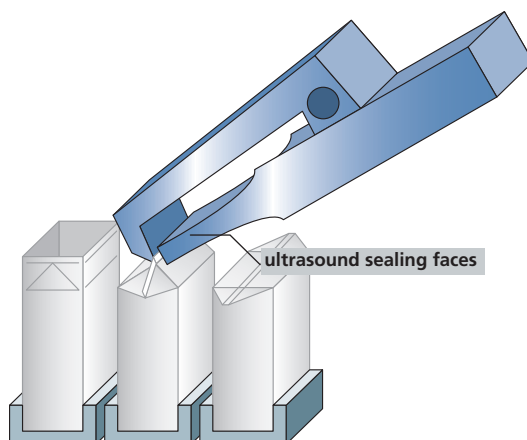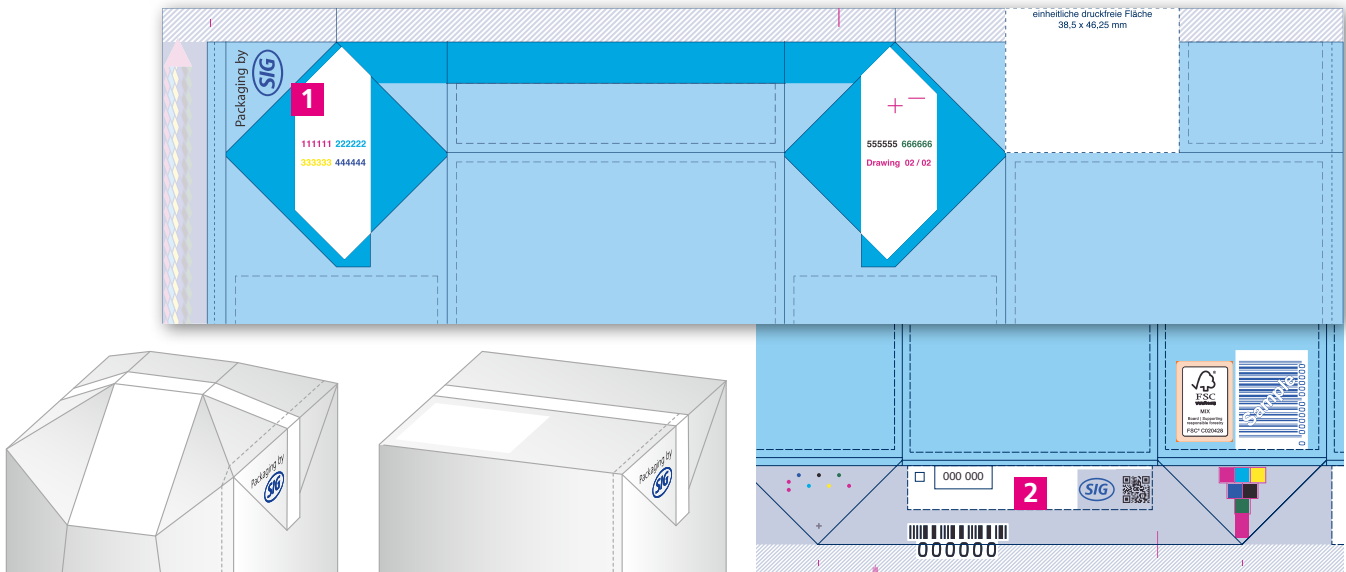
The Manufacturer Identification "Packaging by SIG" is printed on the package following the information on the purchase order printing cylinder or consultation with the person responsible for the customer at the Preprint department.

The identification is placed on the left ear-flap **1**.

The identification is to be coloured:

- In the colour of the printing-number **2**.
- If a darkblue, similar to SIG's darkblue (PMS 072), is used in the design the complete logo needs to be coloured in this colour **3**.
- If black is used additionally, the text "Packaging by" is to be coloured in black (see favorite version).
- The colours overprint the background

- If the background is too dark or the modulation is too strong to read positive text, the identification is to print negative white with a 0,3mm contour **4** in the colour of the printing-number.

The change is to be carried out for all new and revised designs. For revised designs the sign needs to be placed only if the relevant cylinders are affected by the design change, to avoid additional cylinder costs.

The priorities for assigning colours:

1 dark blue tones

2 cyan

3 blue tones (high contrast / easily legible)

4 high contrast colour tone, closest to blue

5 darkest colour (wherever possible avoid yellow, red and orange tones)

favorite version

version with black as text colour

version with dark-blue as text colour

version with dark-green as text colour
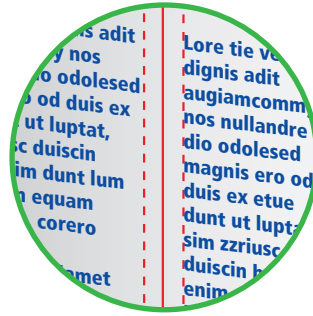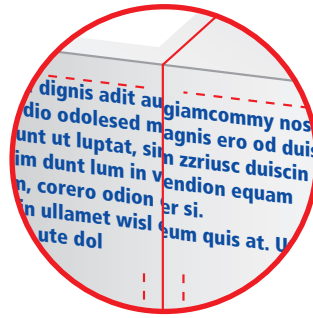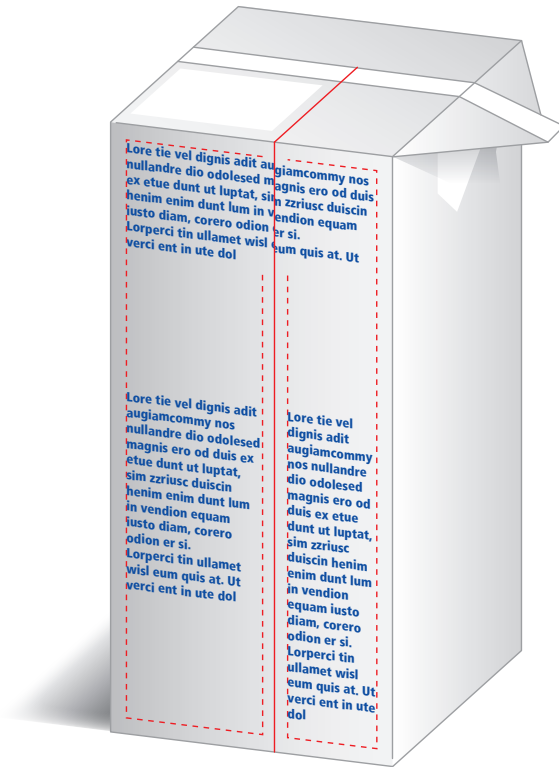

version with inverted logo + contour

The Back Panel and Longitudinal Seam

Types of cartons with a divided back panel

The back panel is not divided in the middle and the left-hand side is wider than the right-hand side. Please see the type area marking to prevent elements from being cut.

Types of cartons without a divided back panel

The back panel is 3 mm narrower than the front panel and the missing area is added from the left-hand panel area. Please see the type area marking to prevent elements from being cut.
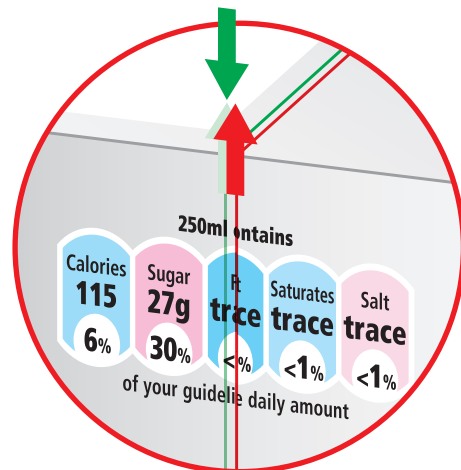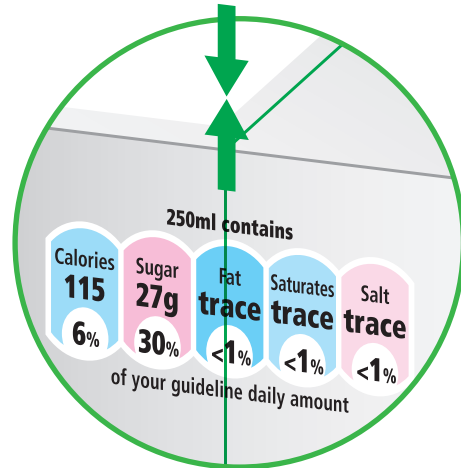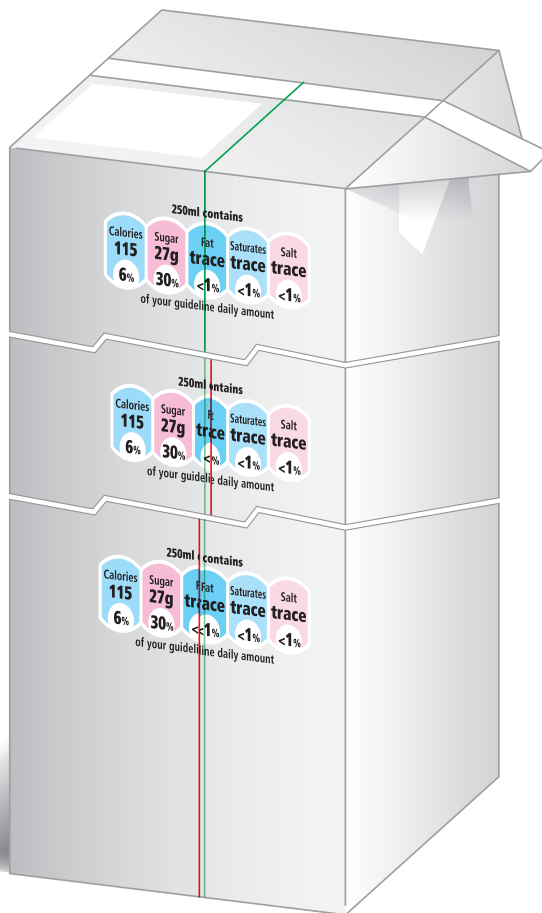
Misalignment along the Longitudinal Seam

Misalignment along the longitudinal seam
Production tolerances in the dye-cutting and glueing machines cause deviation along the longitudinal seam. To ensure that text will neither be cut nor appear double the type area marking needs to be maintained.
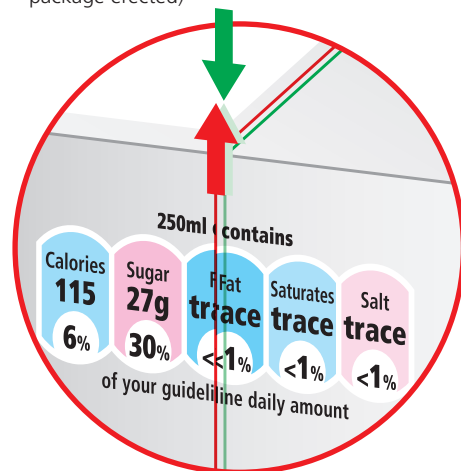
If it is not possible to maintain the type area marking by reason of the design, deviations compared to the approved artwork will occur in the bulk production. The clearness of the deviation depends on the size and width of the text and the typefont used.

The illustrations on this page show possible production tolerances.
Please consider the tolerances specified in the table on page "Standard Values: Print - Reproduction - Carton blank".
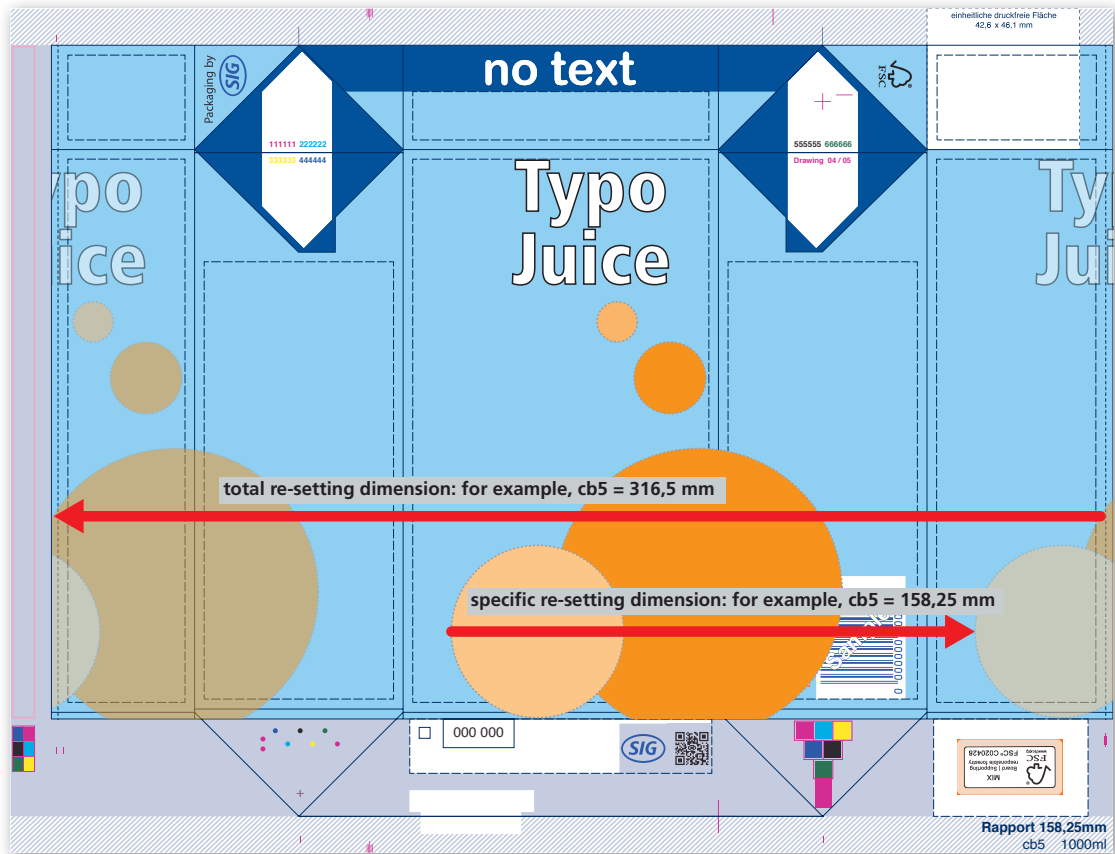
Misalignment: ± 2.0 mm
(**longitudinal seam horizontal match point** – package erected)

Re-Setting Dimensions and Connection

no text

Typo Juice

total re-setting dimension: for example, cb5 = 316,5 mm

specific re-setting dimension: for example, cb5 = 158,25 mm

einheitliche druckfreie Fläche
42,6 x 46,1 mm

111111 222222
333333 444444

555555 666666
Drawing 04 / 05

000 000

Rapport 158,25mm
cb5   1000ml

Re-Setting Dimensions/Report

The re-setting dimension can be found on the keylines. It has the purpose of re-setting a design for the front and back panel while providing a seamless connection between the dimensions and longitudinal seam.
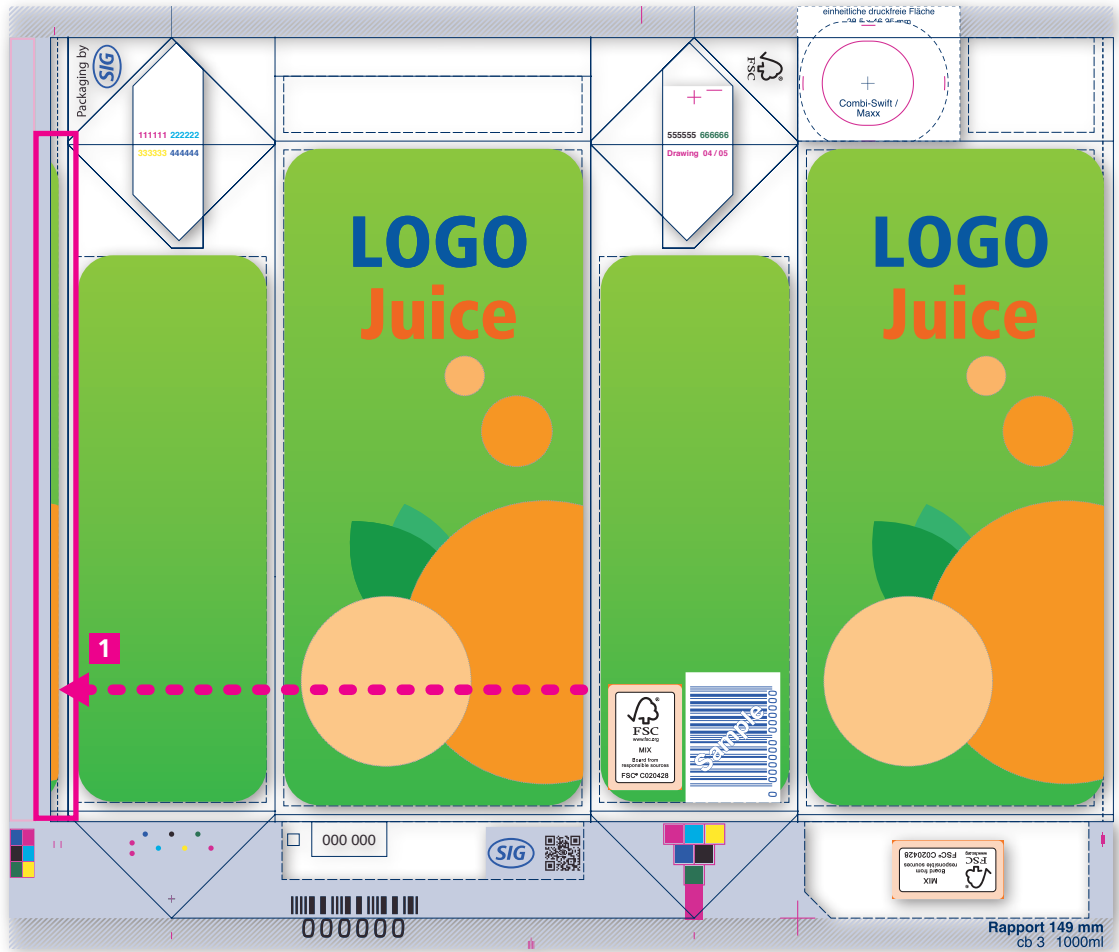

connection

spreading/bleed

connection

spreading/bleed

at least 2.5 mm to the connection

Packaging by SIG
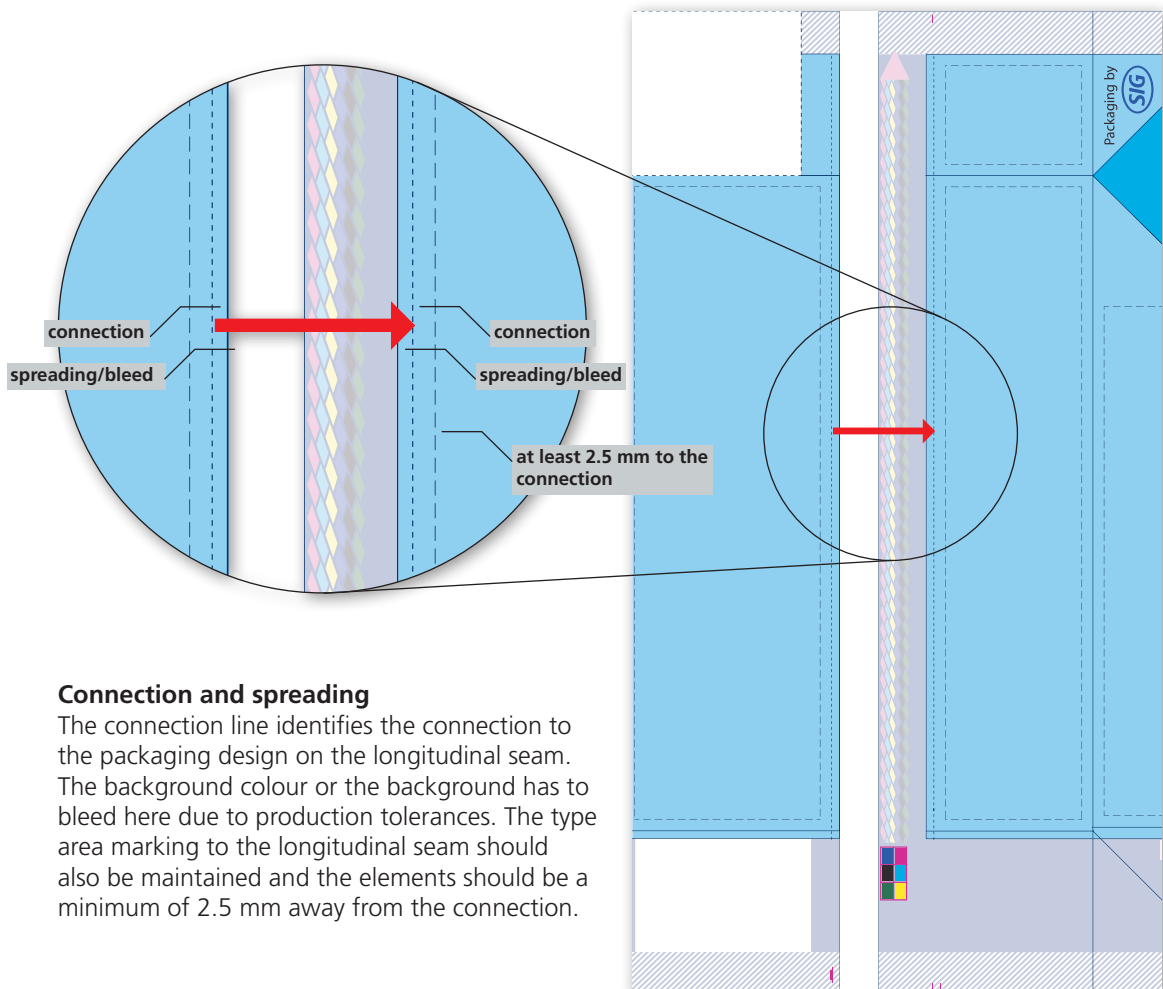
Connection and spreading

The connection line identifies the connection to the packaging design on the longitudinal seam. The background colour or the background has to bleed here due to production tolerances. The type area marking to the longitudinal seam should also be maintained and the elements should be a minimum of 2.5 mm away from the connection.
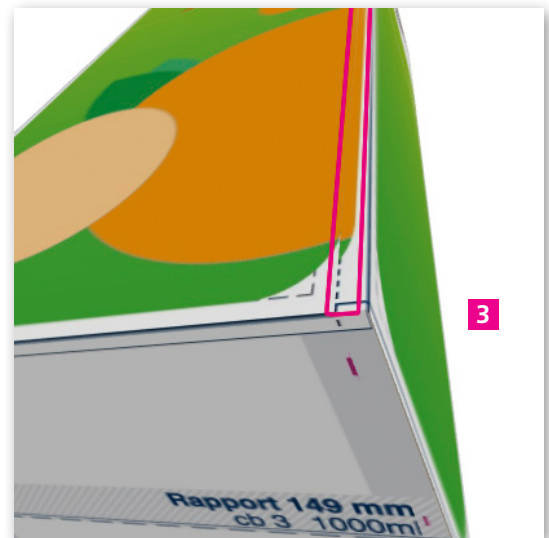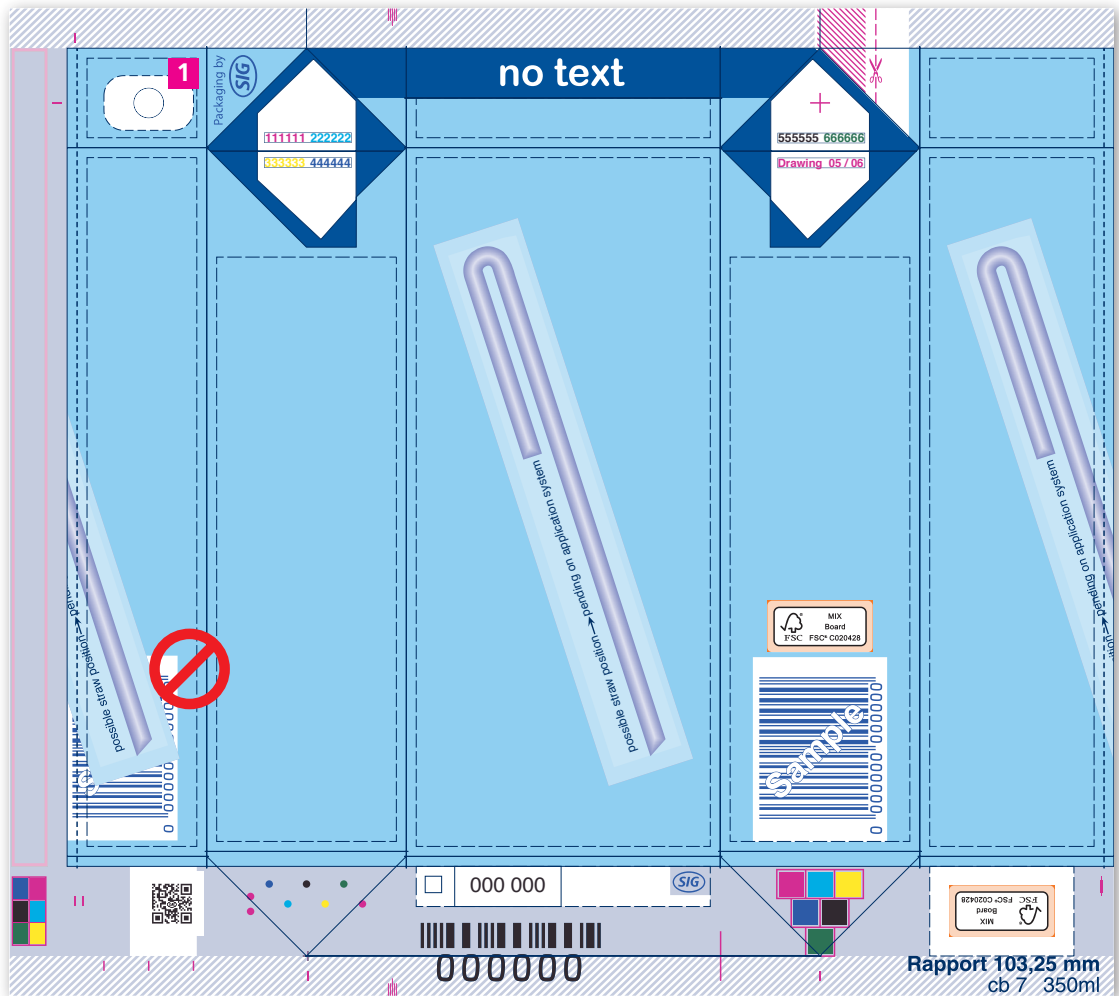
Re-Setting Dimensions and Connection

In designs without a divided back panel the design must **not be copied** to the left side when it only meets the connection line **1**.

If the design is not copied **2** edges after longitudinal seam glueing will be avoided **3**.

Applying the straw
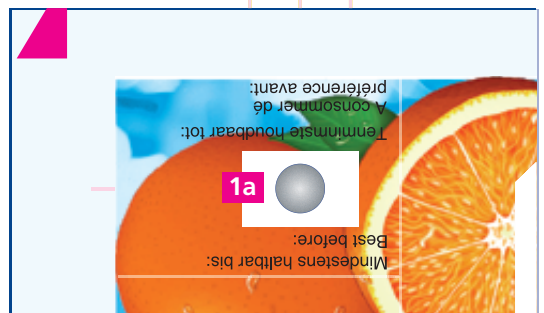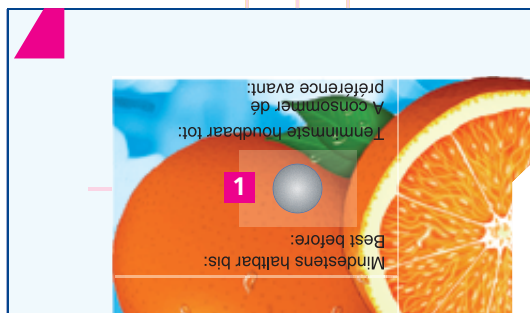There may not be a barcode in this space if a straw is applied to the back panel.

1 The straw hole
The straw hole has a diameter of 6 mm normally and is on the left-hand side of the carton top panel. A 9 mm vertical and 14 mm horizontal rectangle around the centre point has to be kept unprinted and free of graphic elements to prevent punching.
The area free of text and graphic is 11 mm x 18 mm large here.

1a Ink may be applied to the layer of aluminium if a background or picture runs over the prepunched hole for the straw. Customers often complain about this even though the printing inks used are physiologically safe (i.e., suitable for foodstuffs). **However SIG recommends to avoid ink in this area.**
The 9.0 mm x 16.0 mm (6 mm strawhole) respectively 11.0 x 18.0 mm (8 mm strawhole) area around the hole for the straw has to be unprinted (i.e., white) to prevent inking.

Cross-Section of the Opening Devices per Format

1 **Straw hole** (see page 17)
For details of the straw application please see page 17.

5 **Complete Perforation** is a perforation for ce6 only, that goes along the complete width of the package. The opening pictograms in the key-lines can be used on customer demand.

2 **W Perforation,** **3** **V Perforation,** **4** **optimised V Perforation,** **5** **Complete Perforation** and **6** **C Perforation**

They are on the ear of the right-hand side of the carton and do not require any unprinted areas. Opening instruction pictograms should be placed on the narrow right-hand side and individual opening instruction pictograms can also be located here. The bend & tear text can be in any language.
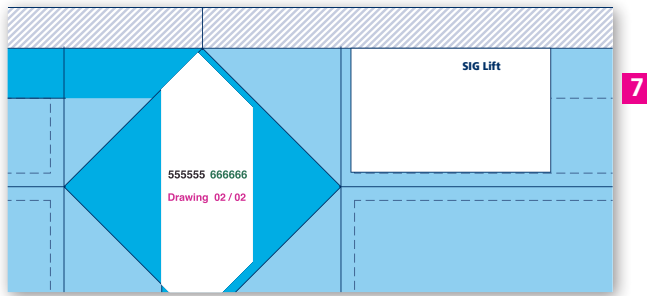
The register cannot be changed with any element.

	Straw	W Perforation	V Perforation ●/ optimised V Perforation ○		Complete Perforation	C Perforation
	1	**2**	**3** / **4**		**5**	**6**
cb1	● 8 mm		●			
cb2						
cf2						
cb3	500 ml/8 mm	●	●**			
cb4			●			
cb5	500 ml	●	●	○		
cb6	●	●		○		
cb7*	● 6 mm / 8 mm		●			AFP (food)
cf7*	● 6 mm / 8 mm					
cb8	500 ml/8 mm		●			
cf8						
cb9						
cf9						
ce6					●	
cb12	● 6 mm / 8 mm					

* only available for standard structure
** optimised V Perforation not available for CB3

Cross-Section of the Opening Devices per Format

types of cartons with the divided back panel

7 SIG Lift

They are on the right-hand carton top panel. The area within the white area (SIG Lift) is to be unprinted at least.

*

	SIG Lift
	7
cb1	
cb2	●
cf2	
cb3	●
cb4	●
cb5	●
cb6	
cb7	
cf7	
cb8	●
cf8	
cb9	●
cf9	
ce6	
cb12	

*Not available for future projects

Cross-Section of the Opening Devices

The Opening Devices
Cross-Section of the Opening Devices per Format

9 SIG SwiftCap/ SIG MaxxCap
This is on the right-hand carton top panel with cb formats and the slanted top with cf formats. The area within the broken line (SIG Swift Cap/ SIG Maxx Cap) is to be left unprinted.
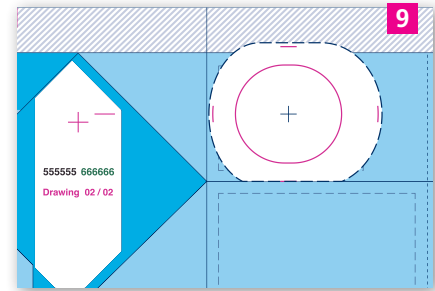
9 SIG SwiftCap/MaxxCap Central
This is centered on the right-hand carton top panel with cb 8 format.
The area within the broken line (SIG Swift Central) is to be left unprinted.
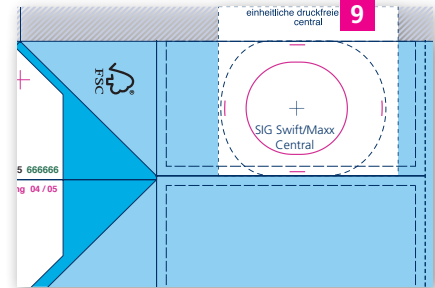
10 SIG SmartCap
This is on the right-hand carton top panel with cb formats and the slanted top with cf formats. The area within the blue line (SIG Smart) is to be left unprinted.
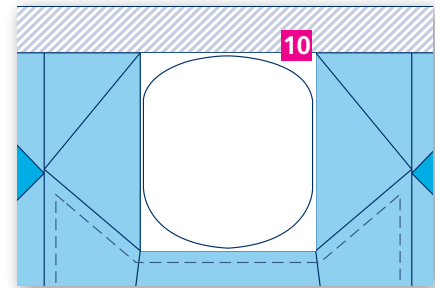
	SIG SwiftCap/ SIG SwiftCap Linked	SIG MaxxCap/ SIG MaxxCap Linked	SIG SmartCap/ SIG SmartCap Linked
	9	**9**	**10**
cb2	●		
cf2	●		
cb3	●	●	
cb4			
cb5	●		
cb6			●
cf7			●
cb8	●	●	
cf8	●	●	
cv8	●		
cb9	●		
cf9	●		

Cross-Section of the Opening Devices

Standard Print-Free Area (EDF)
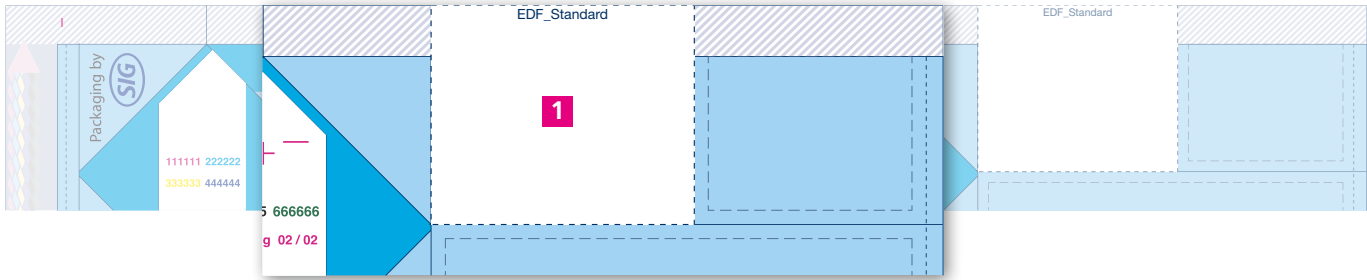
1 The **EDF** is a general standard for the print-free area of all fitments. The EDF is as large in each direction as all print-free areas developed until today super imposed.

The area needs to be placed in all new designs starting 01.04.2006, unless SIG gives different information. In that case the existing print-free areas for the opening devices remain valid.

The EDF is different for each cb-line. The cb-lines affected are cb2, cb3, cb4, cb5, cb8, cb9.
The standard area is defined as:
- the area goes to the dye-line of the ear-flap on the left
- the area goes to the dye-line of the back side
- the area goes to the top edge of the blank
- the area goes to the right as far as the largest print-free area in each cb-line.
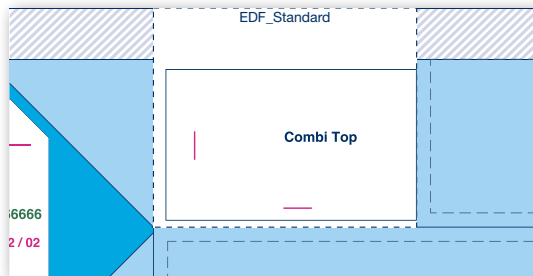
The printing marks for SIG Top and SIG Swift need to be inserted inside of the EDF.
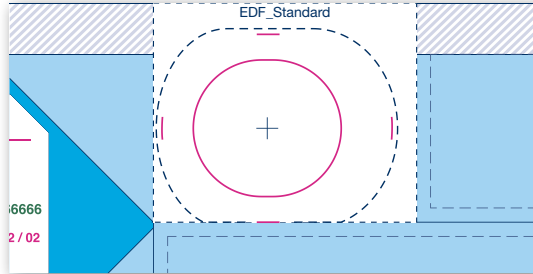
SIG Top needs to be coloured in the register colour.

SIG Swift needs to be coloured in register colour.

Overview of the EDF dimensions in mm:

cb-line	width	heigth
cb2	46,25	39,5
cb3	46,25	38,5
cb4	46,35	48
cb5	46,1	42,6
cb5/250 ml	46,1	41,6
cb8	46,1	44
cb9	46,3	44,1
cf2	32,5	49
cf8	35	56
cf9	36	52,5

For cf2 the existing standard area of SIG Twist now has become the EDF for all fitments including SIG Cut. The dimension is 32,5mm wide and 49mm high. For cf2 the existing shaped print-free areas remain valid for special customer demands.

Examples of Opening Instruction Pictograms and How They are Positioned
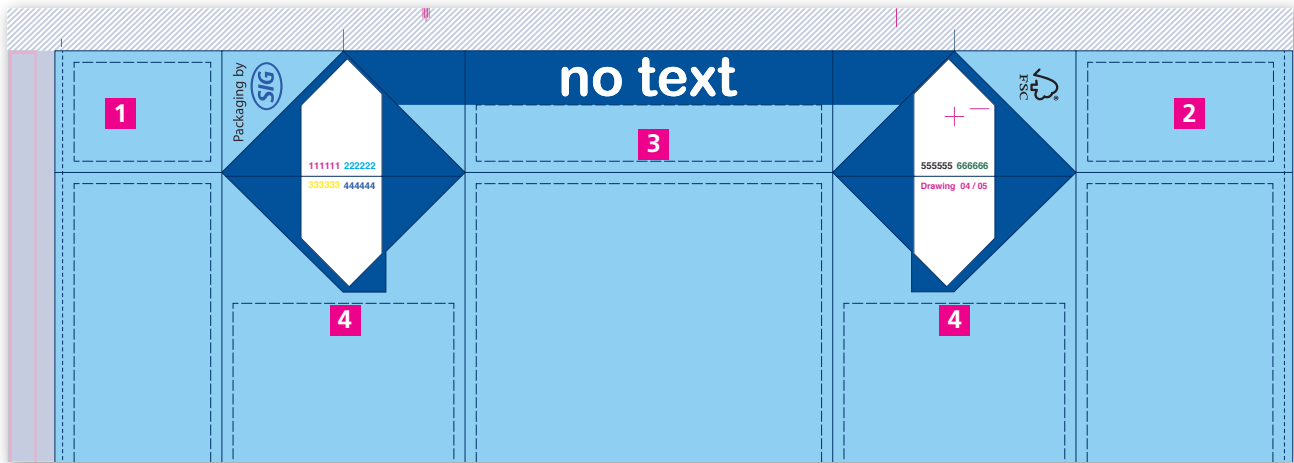
The illustration above shows the possible positioning of the opening instruction.

1 **2** It can be positioned on the left- or right-hand top panel, however only if the opening device is not provided here. There is only one top rear panel area throughout cartons with an undivided back panel.

3 Positioning on the front top panel.

4 Positioning below or next to the ear areas.

SIG will give you various opening instruction pictograms for each of the opening devices as a computer file on request.

W Perforation
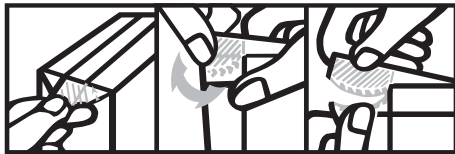
V Perforation

SIG LiftCap

Öffnen mit zwei Fingern.

Zum besseren Ausgießen Hebel
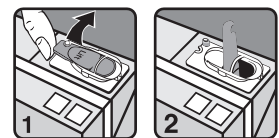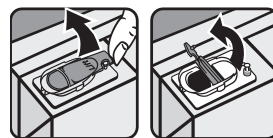
SIG SmartCap

SIG SwiftCap/MaxxCap

Opening Instruction Pictograms
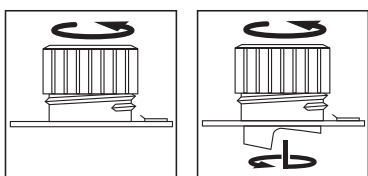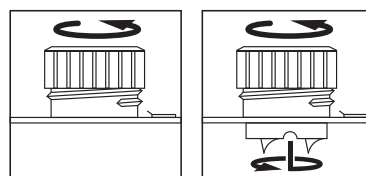
Colour Sequence/Printing Sequence

The printing sequence has the purpose of achieving the best results for both the customer/agency while also taking production needs into consideration. All artwork, with confirmed colours that the supplier gets ready for customer approval, has to be aligned with SIG's colours.

Please bear the following in mind for determining colour sequence:
The existing reproduction

If you already have the same or similar design, the same printing sequence may still not be used. Instead, please check to see whether it corresponds to the current colour sequence following the last finger print. If not, please adapt it to the valid color sequence.

Colour sequence

Use the lowest number of inks/cylinders and check to see whether common cylinders can be used.

Printing sequence

The process colours for a picture are in first place while the black prints at fifth place. The special colours are in-between.

The lightest colour prints in first place and the darkest colour prints in last place.

The colours in-between are arranged from light to dark.

If a printed image contains magenta or red, this colour runs in first place (register colour). If a printed image does not contain any red, please use a high contrast colour as the register colour.

Using special/spot colours

Please avoid building up a printed image with several special colours or only use them with particularly complex designs and only if it solves register problems. The image sequence is restricted to 3 colours.

Graphic elements, areas and gradations should be built up from a maximum of 2 colours that should not be used in the picture.

Dominant colours that determine the design series and are repeated in various designs (such as background colours or corporate colours) should be set up as special colours. This also provides improved colour precision.

Check whether you can replace a process colour with a spot colour when reducing colours, stabilising the printed image or in order to avoid register variations (for instance, red instead of magenta

– the spot colour of green instead of cyan – with tone-in-tone designs).

Using grey and brown

If a printed image has predominantly grey tones (such as milk, cream or porcelain), please check whether grey can be used as a special colour for printing enhancement. Use a maximum of two basic colours to approach the play of colours of the original. Grey and brown have to be above the basic colours used in the tonal value.

 If a printed image has brown as a predominant colour (such as cocoa), a basic tone of brown should be used as a special colour to prevent colour drift.

100% black areas

Put 50% cyan or 50% of an alternative color underneath 100% black areas.

M	C	Y	K

standard colour sequence
without spot colour

M	C	Y	PMS

standard colour sequence
with spot colour

M	C	Y	PMS	K

standard colour sequence
with spot colour and black, if necessary

M	C	Y	PMS	PMS

standard colour sequence
with 2 spot colours, if black is not necessary

M	C	Y	K
M	C	Y	PMS

colour sequence with red
instead of magenta to avoid register variations or to achieve a separate tone out of two colours in combination printing. With black if necessary, with spot colour if black is not necessary.

M	C	Y	PMS	K
M	C	Y	PMS	PMS

colour sequence with red
instead of magenta to avoid register variations or to achieve a separate tone out of two colours in combination printing. With spot colour and black if necessary, with a second spot colour, if black is not necessary.

light	dark

When creating a design with special colours, make sure you set up the first 3 colours in the sequence red, blue and yellow if available.
Black/grey or the darkest colour are set up in the fifth printing unit, even with six-colour designs.

Gold and Silver can only be printed as fulltone colours. It is impossible to screen these colours. The pigments are too large, to be taken by the engraved cells in the screen area. This will cause stripes from the doctor-blade.
Metallic is not not availible in the 1. printing unit. If the designs requires over printed metallic ink, the position of the process colors can be changed.

Colour Sequence Priorities
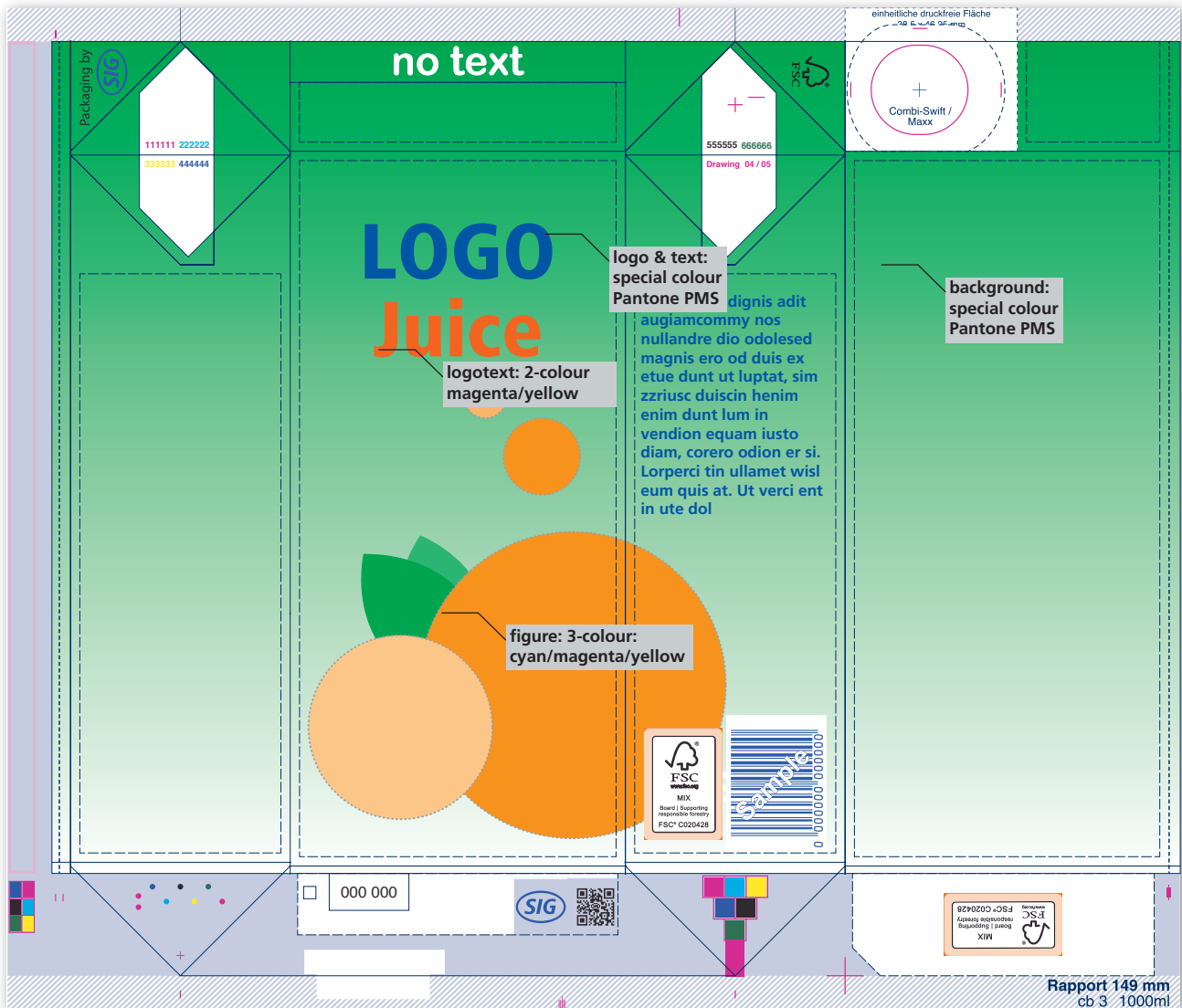
- Figures are created with magenta, cyan and yellow in the SIG standard and black is generally not necessary
- We target re-setting with five decorative colours with the colour sequence.
- Three printing colours are required for illustrating images.
- One more printing colour is required for the running text if a basic colour cannot be used for it.
- The last unprinted colour can be used for the background.

Stating Colours

Please define spot colors by using the C-Colours from the SIG colour giude. Alternativly communicate Pantone colors to SIG as reference. SIG will use the best matching C-Colour to substitute the Pantone colour.

Gold and silver

We have gold and silver for metallic effects. These colours have to be set up as special colours.
If necessary, please request an ink sample from SIG.

The black sequence in the SIG standard

The SIG standard only creates images in magenta, cyan and yellow **1** and black is generally not necessary. **2** An image sequence with black is required with graphic figures with high contrast black contours (such as comics).

5-colour image sequence with black

3-colour image sequence without black

SIG standard printing with 3-colour build-up of the picture design

printing 5-colour build-up of the picture design

Black Sequence

Colour Drift with Grey and Brown Elements

With the three-colour build-up, there may be colour drift (i.e., a shift in colour) with process colours in different batches (see below) using grey or brown elements such as glasses of milk, porcelain, cocoa or brown backgrounds.

This means that the colour characteristic of the blanks may vary in relation to one another. This is the reason why it is essential to use special colours for these tones to ensure the impression of one colour throughout.

colour drift to blue

colour drift to yellow

colour drift to red

build-up with a special colour
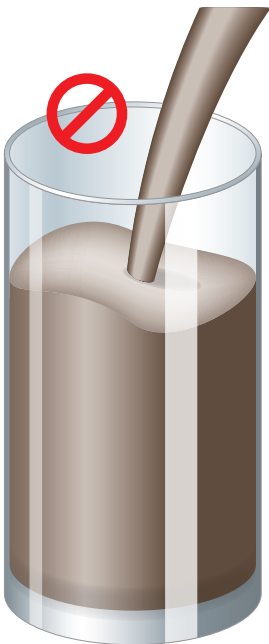
colour drift to blue
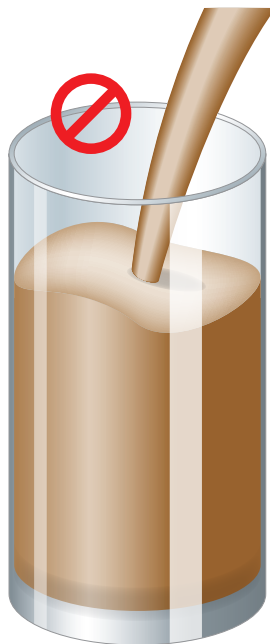
colour drift to yellow
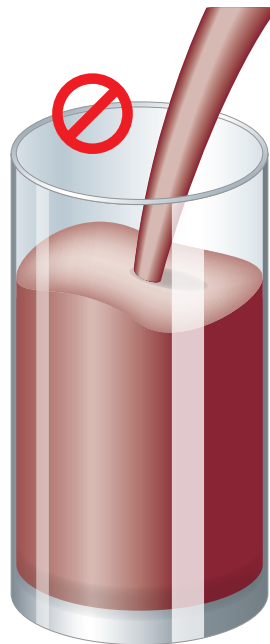
colour drift to red
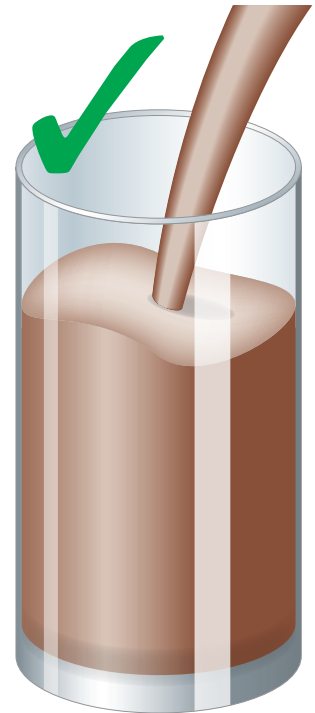
build-up with a special colour

Colour Drift

Colour Drift

With the three-colour build-up, there may be colour drift in different batches with background areas, logos and product colours **1** or by packing the flooding limit **2**. The colour overflows the cup at the flooding limit which leads to a tonal value shift. **3** The flooding limit is in the range of 55% - 65% and there may be colour drift with all copies within one unwinding. This is the reason why we recommend using a special colour.

deviation	target	deviation

1

Typo
Juice

colour drift from the colour:
37% cyan
100% magenta
26% black

deviation	target	deviation

2

Typo
Juice

colour drift from the colour:
60% magenta
60% yellow

deviation	target	deviation

3

Colour Drift
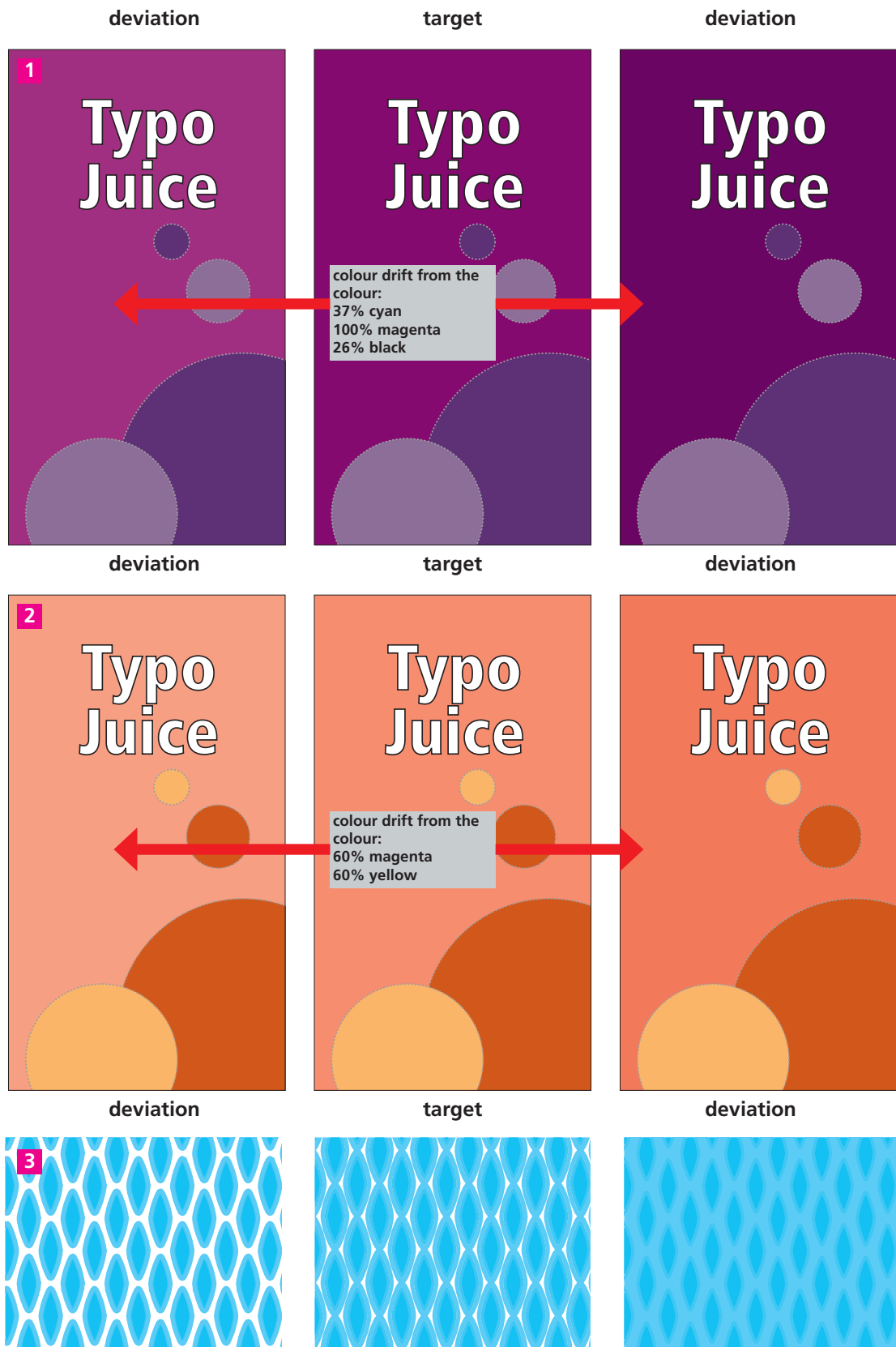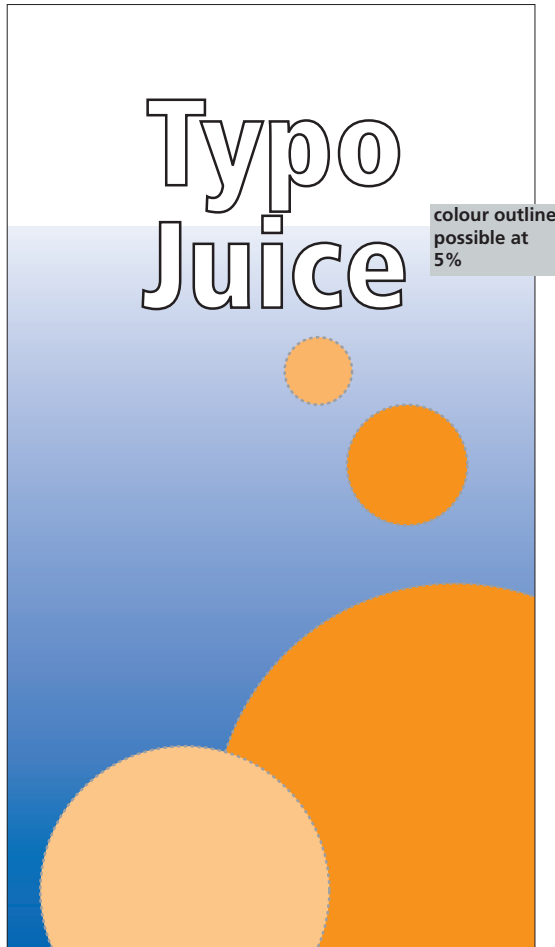
The first technical tone printed (5%)
This is the first tone that the engraved cylinder can transfer to the carton. The lighter tonal values do not print. The density of the first transferred tone printed is not stable and it is set up as a minimum tone gradation in pictures and gradations. High-precision highlight dots can be set up in figures below the 5% limit.

colour outline possible at 5%
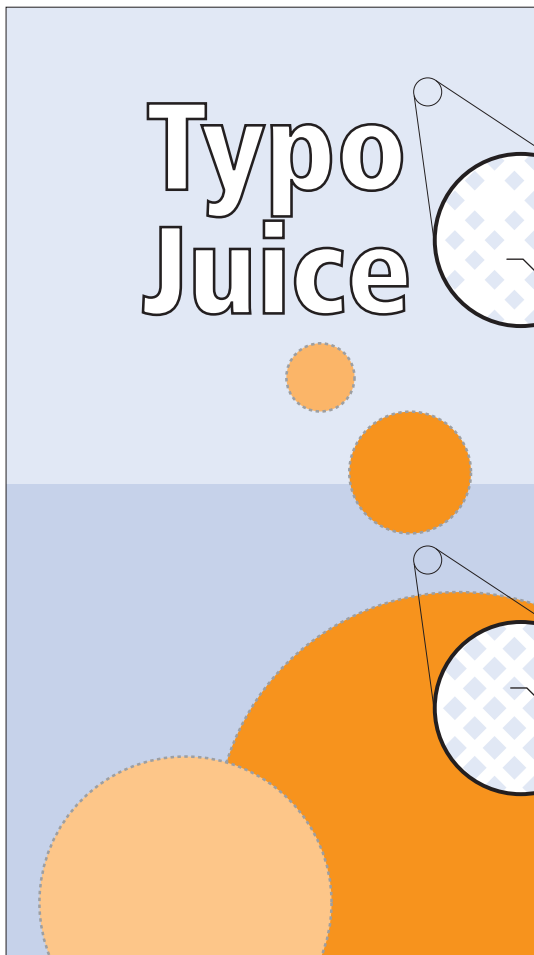
Minimum tone for even ink transfer (18%)
Since the first technical tone printed cannot be printed stable, the minimum tone has to be 18% in broken graphic elements and areas. The first tone printed is higher in areas of technical tones or larger areas. This is also valid for large picutures composed by several colors like sky, wooden structures or other pattern, etc.

less than 18% area coverage

A colour can only be printed on an area stable in the SIG process from 18% area coverage. Please bear this in mind since the print may be uneven.

more than 18% area coverage

First Tone Printed

Designing
Gradations

The SIG printing process can generally reproduce gradations well. However, please bear the following in mind when setting up gradations.

Two-colour reverse gradations
With gradations from bright blue to dark blue, the brighter tone should be the area under the entire gradation to achieve even print-out and good saturation. The mixture of gradations laid opposite one another has a very flat effect.

Gradations of complementary colours
Gradations of complementary colours mix in the middle and become a neutral grey, which cannot be seen as clearly on the monitor as in the print-out. You can only counter this effect by adjusting the gradation curve.
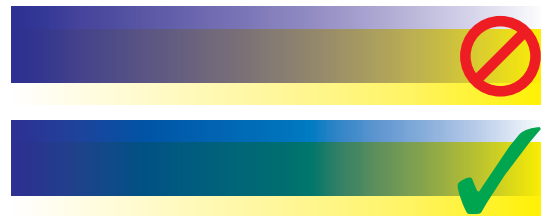
Two-colour parallel gradations
There may be colour outlines with gradations built up of two printing colours. Ideally, these gradations are printed from one special colour.
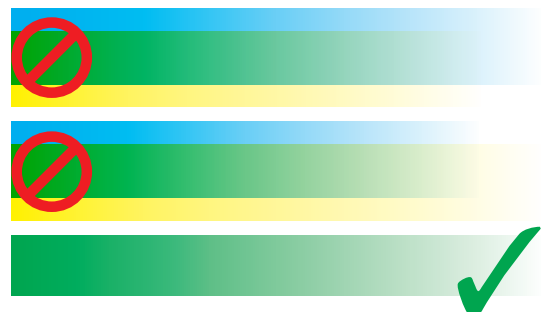
Diagonal gradations
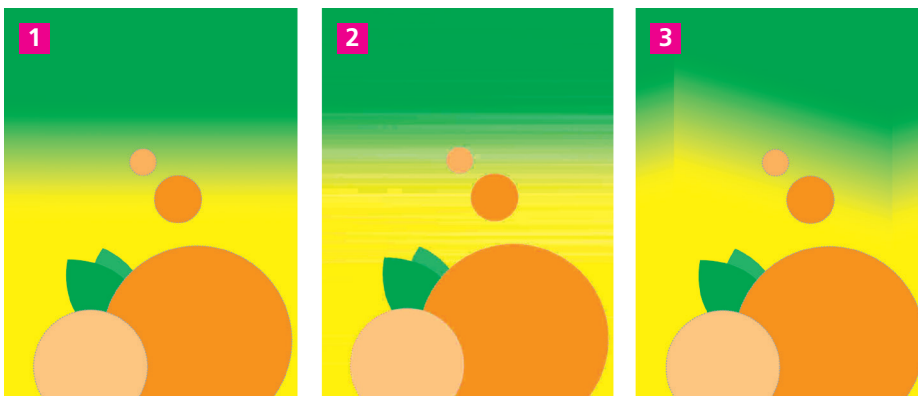
Streaking:
In the mass production streaks in vignetts that run in printing dirction, cannot be avoided unfortunately **1**.

2 Simulation of streaks.

Vignetts that are designed a little diagonally, have less tendency to print streaky **3**.

Overprinting

Overprinting spotcolours must follow in the colour sequence from dark to light colours **1**.

This order is valid for printing units 4 and 6. Black or the darkest design-colour must run in printing unit 5 conform to the specification.

The order of Process colours **2** or their substitute colours **3** must not be changed.

An exception is Black overprinting a light spot colour. In this case it is allowed to bring Black forward **4** .

Trapping / Spreading

Registers

There may be register variations in the printing process from the roll between the individual printing units.

1 Without trapping no white flashes are visible in the Epsonproof.

2 Due to register movement within the permitted production tolerance of +/- 0,25mm for each colour white flashes are visible. This will be preceived as uncomfortable often.

3 White flashes will be avoided by trapping contacting elements.

SIG will adapt the necessary trappings to the design during the repro process.

Trapping / Spreading

Trapping / Spreading

Examples

Trappings will be implemented in different ways to avoid problems with miss register in the print production.

1 If two colours overlap, you can prevent annoying white flash edges by setting up trapping. The worst-case scenario would be a dark contour.

2 If elements are left open in two colours, the brighter colour is pulled back. The darker colour remains as a sharp contour.

3 Register fluctuations may impair the readability of negative text in a multicoloured environment. This is the reason why a supporting contour has to be laid around the text in a dark contrast colour. We recommend avoiding negative text because of its poor readability.

SIG will adapt the necessary trappings to the design during the repro process.

1

spreading from green to the colour of the picture

spreading from green to the colour of the picture

2

refilling yellow while magenta remains as a sharp contour (100% M, 100% Y)

3

dark supporting contour with a small negative text

Loreet, consent non exerit dolorer si. Duis augue tem nos niscilit vulpute er auguer sit lor iureros alit illandr veliquat utat vulla faccum dolo er aliquis nit, sequis num exero
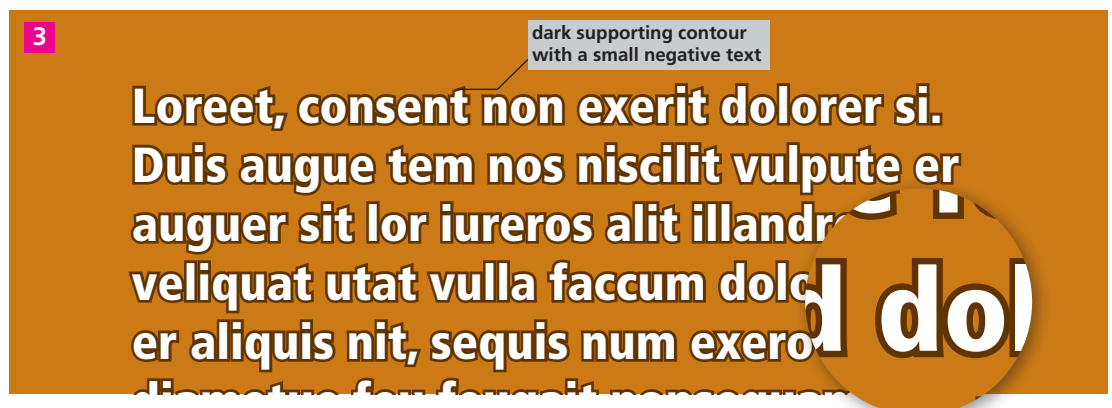
EAN-Code Standard/UPC-Ccode

1 The code's standard position is parallel to the printing direction. SIG can only guarantee the readability of the code in the standard position and when the minimum code size is chosen.
The minimum code size for all formats except for cb12 and SIG Safe is about 91% - SC 01.
The minimum code size for cb12 is about 85%.
The line reduction is about standard 30 µ.
The minimum code size for SIG Safe is about 100% - SC 02.

2 In this position SIG cannot guarantee the readability of the barcodes.

3 In this position SIG cannot guarantee the readability of the barcodes. The biggest possible code will be inserted in the limited free space in the right hand side of the bottom (see format series).

4 The interleaved code is identical with the print number and is used for storage purposes. Binding for the position is the rectangle in the valid keylines.

Interleaved-Code		
code size	line reduction	code height
63%	0.00 mm	5.00 mm

General Instructions
The height of the codes can be shortened (bar length) by 33%. If the code number is not known yet, insert zeros instead. Do not use number sequences such as 1234...6789. Only by using zeros do you make sure that an invalid code is definitely recognized.

Barcodes have to be set up in a high contrast colour. Therefore, please set up the code in black, cyan, dark blue or dark green and avoid codes in yellow, orange, red, violet, bright brown tones and pastel colours since the red-light laser perceives these colours as white. Codes in metallised colours and negative set-up codes cannot be decoded.

The background of barcodes should be completely white.

Electro-mechanical engraving is used as standard engraving technology.

If requested by SIG Preprint department, other engraving technologies like HQH, XT can be used as well.

UPC Code
The information for the EAN code also applies to the UPC code. Please also note that the white space of the UPC code differs.

EAN-Code Standard/UPC-Code

EAN-Code Free Zones

EAN 13
91% - SC 01
25.9 x 35.93

expansion

minimum free area

EAN 8
91% - SC 01
20.69 x 25.32

expansion

minimum free area
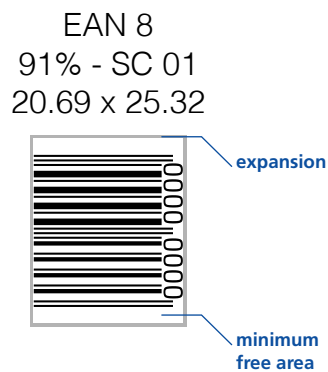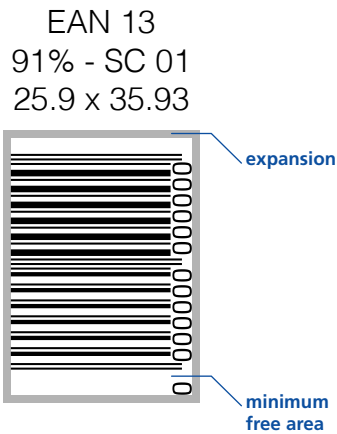
Please do not use codes from customer data files. New codes should be created together with the print free area. It is also necessary to increase the frame by at least 0.5 mm (EAN8) and at least 1.0 mm (EAN13) on all sides in order to keep the bars from touching the side lines due to register fluctuations.

Special requirements are in force for ALDI Süd as far as size and free zones for codes are concerned, because they demand quality class B (see special code design ALDI Süd). The same conditions apply to customers demanding the same level of quality, i.e. based on the table minimum code sizes per material class in order to achieve quality class B.

All measurements in mm

- **The minimum code size for all formats is about 100% - SC 02.**
  The line reduction is about standard 30µ.
  Electro-mechanical engraving is used as standard engraving technology. If XT is used for other elements in the relevant colour, the barcode must be engraved using the special engraving technology also.

- The background of barcodes should be completely white.

- Before the first and behind the last bar a print free area of 4 mm is indispensable.

The readability is worked out according to DIN EN ISO/IEC 15416.
To re-check the REA Scan-Check is used. Quality class B has to be achieved.

EAN 13
100 % - SC2
27,9 x 40,63

4.0 mm   expansion

<< printing direction <<

4.0 mm   minimum
                                          free area

EAN 8
100 % - SC2
22,2 x 30,07

4.0 mm   expansion

4.0 mm   minimum
                                          free area

Special EAN-Code for ALDI
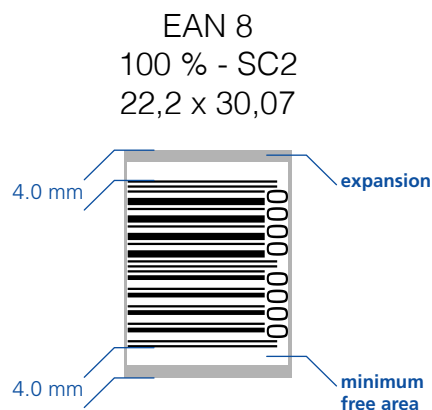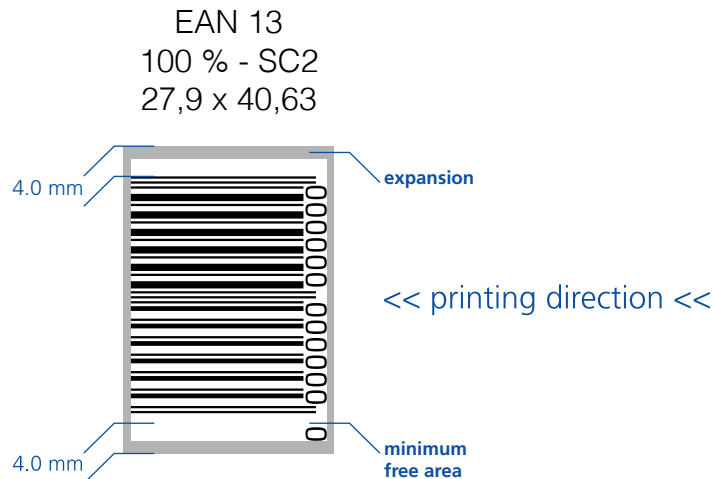
QR-Code		
Module-Size	Quality-Grade	White Area
0.47	Q	5 Modules

The QR-Code cannot be generated by SIG and must be created and delivered by the design agency following the specification.

Example for minimum
QR-Code size

Module ☐
White Area ☐

Standard Values: Print - Reproduction - Carton Blank

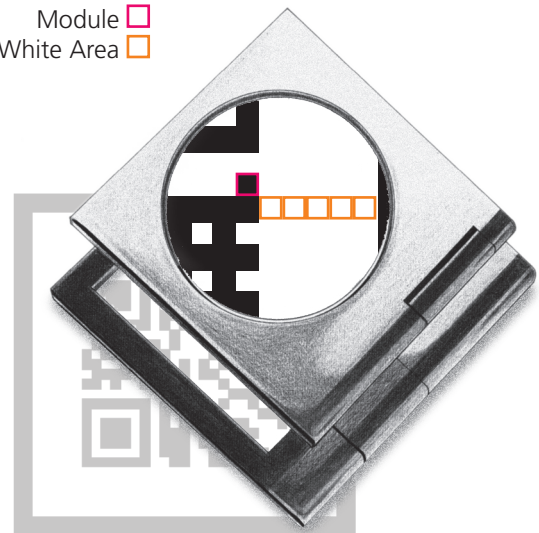The following standard values result from SIG's production process.

register tolerance	**± 0.25 mm**
first printing tone	**5%**
minimum tonal value	**18%** (graphic elements)
Maximum ink-coverage	**300%,** in trapping keylines also
register colour	**1st colour**
Lines and text always print in one colour	
line weight positive 1-colour	**min. 0.2 mm**
line weight negative 1-colour	**min. 0.2 mm**
White keyline	**min. 0.5 mm**
positive text in one colour	**1.6 mm min. cap height and 0.2 mm line weight** 6.5 points Helvetica Regular (Adobe Illustrator for MAC OS)
negative text in one colour	**1.6 mm min. cap height and 0.2 mm line weight** 6.5 points Helvetica Regular (Adobe Illustrator for MAC OS)
positive text in one colour with special engraving	**1.2 mm min. cap height and 0.12 mm line weight** 4.8 points Helvetica Regular (Adobe Illustrator for MAC OS)
text contoured and 1-colour	**min. 0.5 mm** + underfilling $^1/_2$ contour = 0.25 mm
Gold and Silver	**These colours can only be printed as fulltone colours, not as screened halftones. Electromechanical engraving using 54 screen is required**
text / lines in gold and silver	**3.0 mm min. cap height and 0.35 mm line weight** 12 points Helvetica Regular (Adobe Illustrator for MAC OS)
serif typefaces	**special engraving if serifs are below 0.2 mm**
height difference of the seam	**± 0.75 mm** (**longitudinal seam vertical match point** – package erected)
seam deviation	**± 2.0 mm** (**longitudinal seam horizontal match point**, package erected)

Restrictions for the use of font styles

The font styles "condensed", "compressed" and fonts using kerning are not allowed to be used for tables and main text as the legibility is constricted.

Helvetica condensed	Helvetica compressed	Helvetica regular using kerning
Ich bin nur ein kleiner Blindtext. Wenn ich gross bin, will ich Ulysses von James Joyce werden. Aber jetzt lohnt es sich noch nicht, mich weiterzulesen. Denn vorerst bin ich nur ein kleiner Blindtext.	Ich bin nur ein kleiner Blindtext. Wenn ich gross bin, will ich Ulysses von James Joyce werden. Aber jetzt lohnt es sich noch nicht, mich weiterzulesen. Denn vorerst bin ich nur ein kleiner Blindtext.	Ich bin nur ein kleiner Blindtext. Wenn ich gross bin, will ich Ulysses von James Joyce werden. Aber jetzt lohnt es sich noch nicht, mich weiterzulesen. Denn vorerst bin ich nur ein kleiner Blindtext.

Standard Values
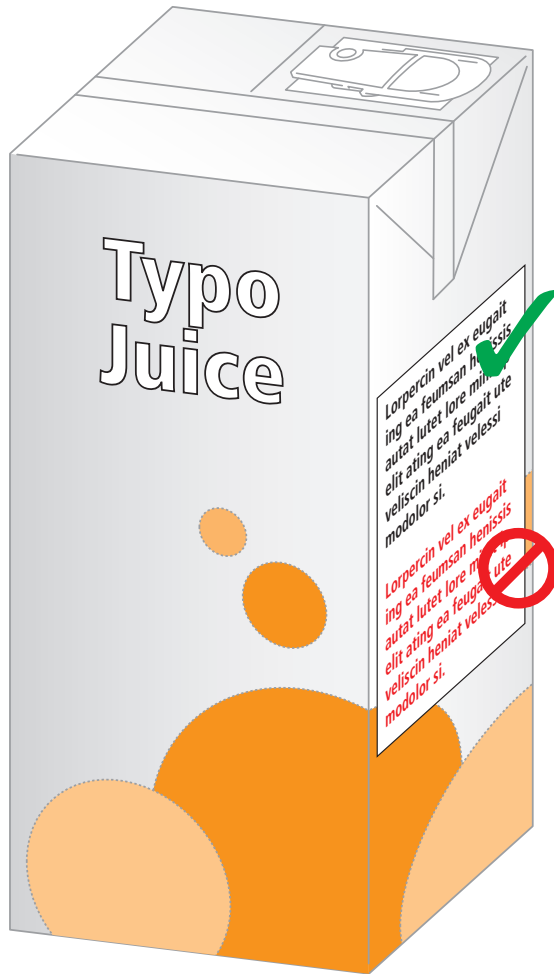
Lay out your design so that only one cylinder will have to be engraved again if there are later changes in the text (for instance, if there are ingredients or nutritional value changes). Avoid negative white texts that run through parts of the image because this always makes more colours (and therefore cylinders) necessary.

Monocolour text (black) =
Here you save money because you only have to engrave one printing cylinder again.

Two or multicolour text = higher costs because you have to engrave two or more printing cylinders again.
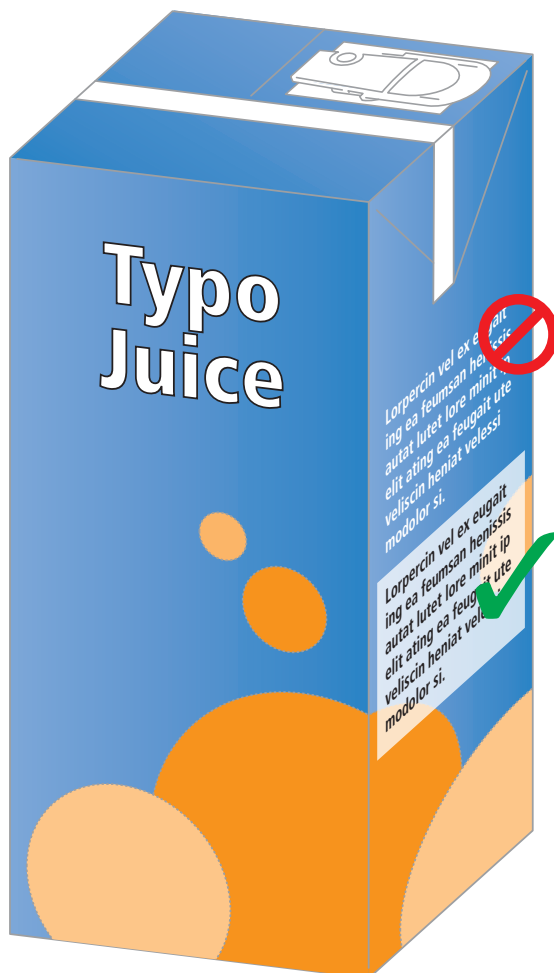
Negative text = higher costs,
because you have to engrave two or more printing cylinders again.

Monocolour text on lightened background = Here you save money because you only have to engrave one printing cylinder again.

Flooding – Test Proof

✓   target state ✓   ✓   🚫

60 / 2 - 130°

60 / 0 - 140°

60 / 3 - 140°

60 / 0 - 130°
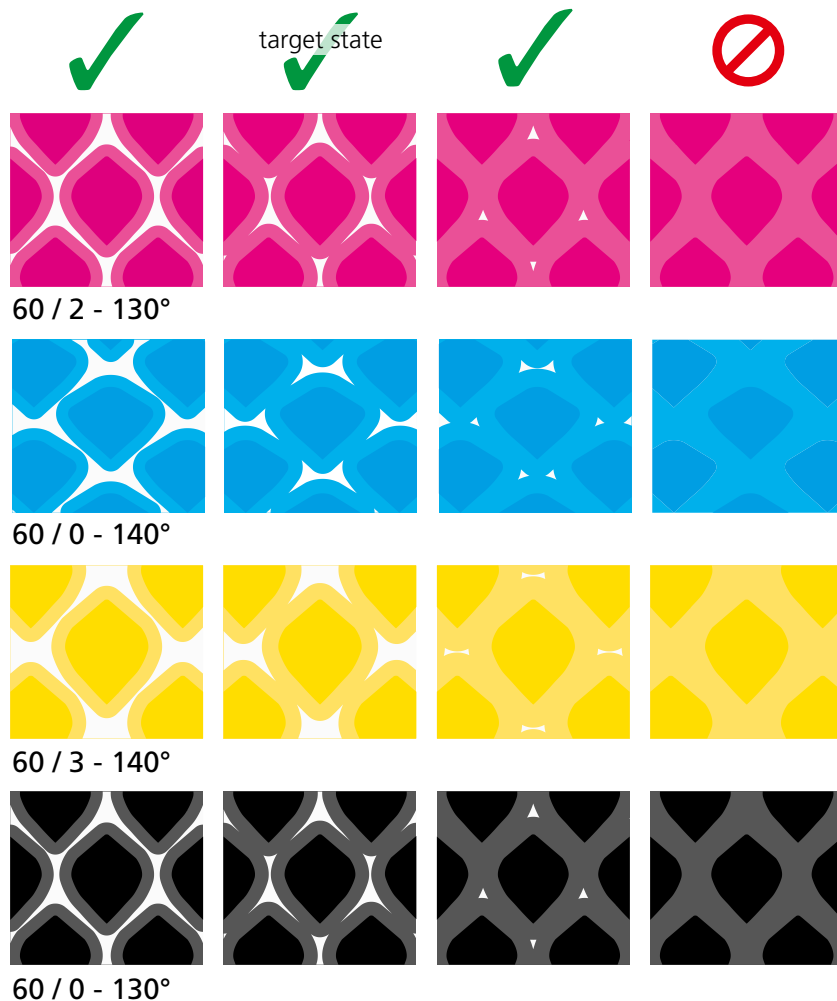
Potential screen angles for mixed colours:

Flooding 60%-tone

Print-Check

7% 60% 100%

under 60%
sharp point
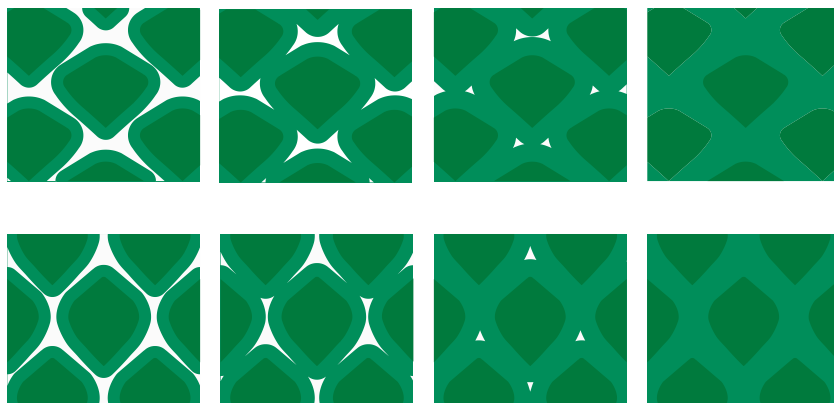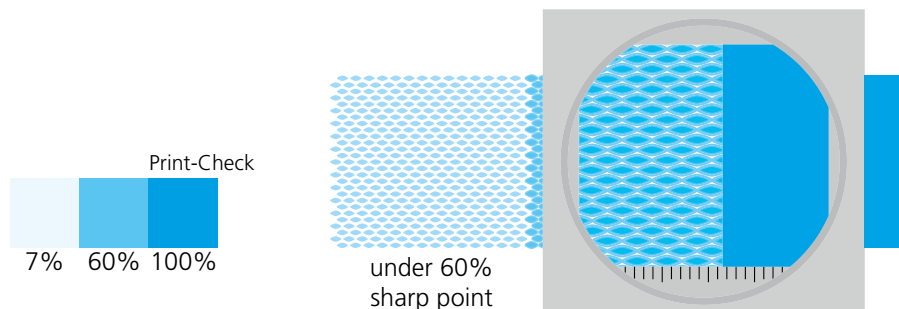
The ink is flooding the edges of the cells and is forming an almost
closed surface whereby individual white dots remain visible.
Checking is done with a linen tester.

Flooding – Test Proof

Control Marks

1st colour/ register colour

5,5 x 5,5 mm

white border 0.25 mm

line weight 0.3 mm
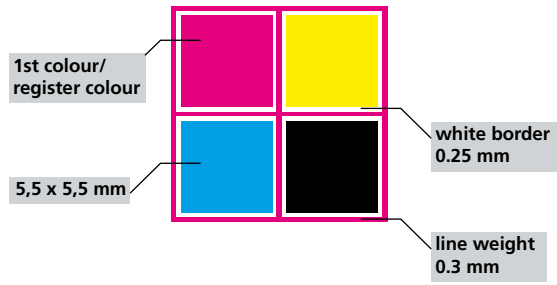
The **register marks** are printed on the left hand side of the base of all packs. The correct position is indicated in the current format overlays. The 1st colour is always the register colour, if the design contains red this should be used in this position. If there are two shades of red, the red of any design is the register colour. If the design is made up of spot colours, use a colour that is rich in contrast, if possible a tone which is close to red.

Arrangement
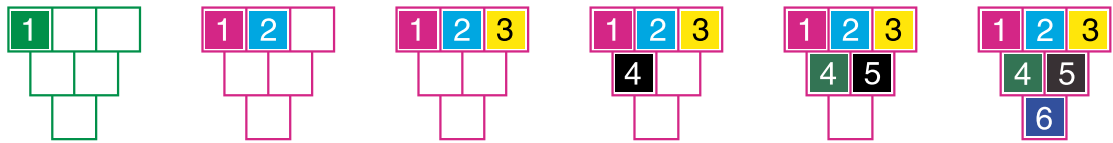
All format series

The **register strip** is set in the longitudinal sealing area (left hand side of the blank).

The **halftone wedge** is located in the longitudinal sealing area.

Special Engravings

HQH

- For line width of < 0.2 mm - 0.15 mm the engraving technology HQH must be used.
- "HQ" (type size 8 points semi-bold) should be set next to the register mark in all colours that are lasered to identify the technology.

Xtrem

Using XT

Please bear the following in mind when making XT cylinders:

- Designs should be XT engraved if they have lines less than 0.15 mm thick for positive texts and graphic elements.
- Special engravings are only allowed to be used for elements with a line width of 3 mm at a maximum.
- The supplier should check designs where the major portion of elements have a line weight necessary for engraving as to whether the elements that are too small can be enlarged. Please contact SIG if this is not possible.
- The supplier should decide whether it is used.
- "XT" (type size 8 points semi-bold) should be set next to the register mark in all colours that are lasered to identify the technology.

Combined engraving

If on a cylinder electro-mechanical engraving is combined with special engraving for separate elements, a mark must be inserted to indicate combined engraving. "KG, XT or HQ" (type size 8 points semi-bold) in all colours that are using combined engraving to identify the technology.

Special Engravings

Information on SIG pdf files and Epsonproofs

Please consider comments that have been marked in the blue framed SIG Quality Box placed next to the design in the pdf file and Epsonproof. These comments describe deviations from the SIG design guideline. The design is printable with these deviations, but printing / quality issues may occur.

SIG cannot be held responsible for any printing / quality problems and therefore will not accept any complains relating to these comments.

Anmerkungen / Remarks SIG:

Eine gute Druckqualität kann nur erreicht werden, wenn die Vorgaben und Hinweise aus dem Druckleitfaden SIG eingehalten werden. Bitte stellen Sie sicher, dass der Druckleitfaden in ihrem Hause und bei Ihren Agenturen bekannt ist und die Basis für die Designgestaltung darstellt.
Folgende, kommentierte Punkte stellen eine Abweichung vom Leitfaden dar bzw. bilden ein Risiko für ein stabiles, reproduzierbares Druckergebnis. Sofern keine Änderung möglich oder gewünscht ist, können wir keine Reklamationen aus daraus folgenden Qualitätsbeeinträchtigungen akzeptieren.

A good print quality can only be achieved if the requirements and instructions of the SIG artwork guideline are observed. Please make sure that the SIG artwork guideline is well-known for you and your agency. The SIG artwork guideline should be the basis for the design layout.
The following comments describe a deviation from the guideline. They could be a risk for stable and repeatable print results. If a required adaptation will be considered impossible or finally not desired by the customer, SIG Combibloc cannot be held responsible for printing problems and will consequently not accept any complaints accordingly.

☐ 1. Mehrfarbig aufgebaute Texte
    Multicoloured / composed text

☐ 2. Unter- / Überfüllungen nicht gemäß Leitfaden
    Trapping not according to guideline

☐ 3. Aufbau Fläche / Bild nicht gemäß Leitfaden
    Composition of flat area / Image not according to guideline

☐ 4. Druckfreie Fläche nicht gemäß Keyline
    Printed free areas not according to keyline

☐ 5. Texte verlaufen über die Rückennaht
    Text is placed on the sealing area

☐ 6. Erstdruckender Ton für Fläche
    First printing tone for area

☐ 7. EAN Code nicht gemäß Leitfaden
    Barcode not according to guideline

☐ 8. Linienstärke und / oder Schriftart nicht gemäß SIG Leitfaden
    Line width and / or font style not according to guideline
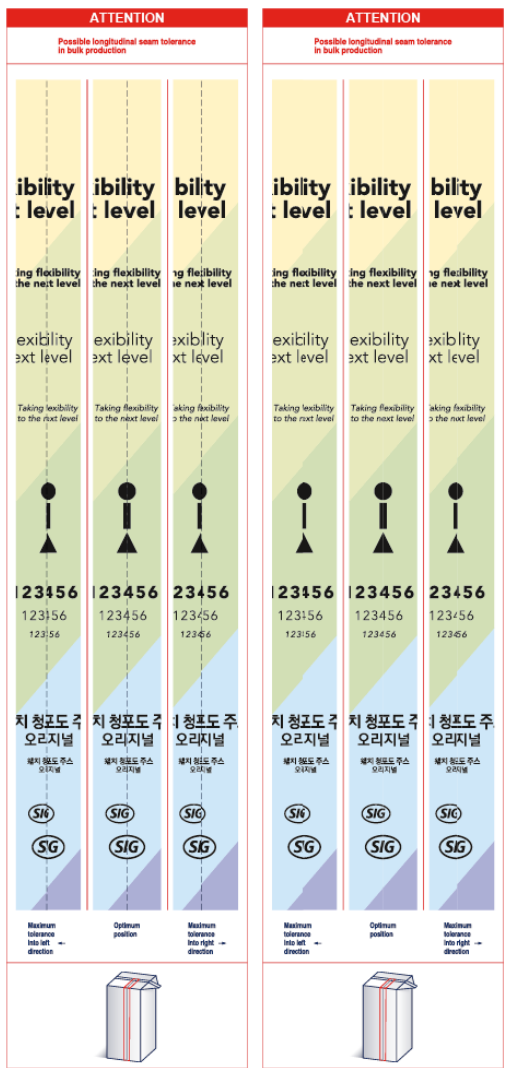
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Misalignment along the longitudinal seam

Production tolerances in the dye-cutting and glueing machines cause deviation along the longitudinal seam as described on page 20. The simulation of the production tolerances are shown in the box right of the design in the pdf file and Epsonproof.

Information for Delivering Data

We have compiled some information for optimum and least expensive working conditions.

Please bear the fact in mind that your designs have to be transformed into files for the SIG digital printing process. This might involve modifying the data to comply with all specifications and adapting them to SIG's colour space.

Design files
Certain rules have to be followed for creating and delivering design files. For example, no layers must be flattened in Photoshop or Illustrator. In other words, pictures, texts and backgrounds, etc. all have to have a separate layer to be able to work efficiently.

The programs and operating systems used
We can process all open computer files from the standard graphic programs in the Mac and Windows operating systems. Please do not use any office software (such as Word, Excel or PowerPoint) for layouts. We also process all common storage media available today.

The completeness of data components
Please always make sure that all data components linked to the document such as fonts, pictures or graphics, etc. are on the data carrier.

Design Separation
Please make sure that the deliverd files are separated in CMYK.

Fonts
To work out all necessary technical adaptions and to do corrections belated please send the graphic file with open, editable texts and also saved with vectorised texts. Please remember that the typefonts used in the design need to be delivered. All font information has to be converted to path in files from a Windows environment and with non-latin characters.

Print-outs and colour target
It is important to attach print-outs in colour along with your data. This is the only way we can compare the design file you supply with the expected results.

High resolution image files
We process the picture data formats TIFF, EPS, PSD and DCS. Digital picture resolution also has to be at least 300 dpi on a scale of 100% for optimum reproduction quality. Graphic elements such as logos and symbols should be set up for optimum reproduction in printing as vector graphics.

Check-list
We have prepared a check list to ensure the completness of the files and to avoid any delays afterwards.

Order for the production / modification of a design
To start the repro work and to produce the printing forms after approval of the design SIG requires the filled "Order for the production / modification of a design" form. Please ask your contact person at SIG to provide you the document if you don't have it on hand.

Please remember that we can only start the design origination process as soon as we have received all above mentioned information and files.

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Delivering Data

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Information for
Delivering Data

Check-List for Delivering Data

☐ **Print-outs and colour information**
We have attached colour print-outs with remarks on colours. We have also attached and labelled the existing colour specifications such as labels. We have given internal and logo colours or they are attached as patterns.

☐ **The programs and operating systems used**
The computer file was created in Photoshop or ArtPro in the MAC or Windows operating systems. Please consult with SIG if other programs than the ones mentioned above have been used to create the files. All computer files have been
supplied as open data.

☐ **Completeness of open design files**
All linked data components of the document such as fonts (also used in EPS computer files), pictures and graphics, etc. are on the data carrier. All font information is already converted to path in graphic EPS computer files from a Windows environment.

☐ **Typefonts**
The fonts of all characters used in the design will be delivered. The file has been saved with open, editable texts to ensure text amendments. Please remember that the typefonts used in the design need to be delivered. Non-latin characters are delivered converted to path only.

☐ **Document structure**
The design was created on an SIG supplied keyline.

☐ **Colours**
It only contains CMYK colours. Colours and layers not used in the design file are deleted.
3
☐ **High resolution image files**
The picture data correspond to the TIFF, EPS, PSD or DCS formats in the colour modes of bitmap, grey levels, CMYK or Duplex.

☐ **Order for the production / modification of a design**
By forwarding the document the order to process repro and printing forms is intended.