

Chapter 16 „Layplanning“

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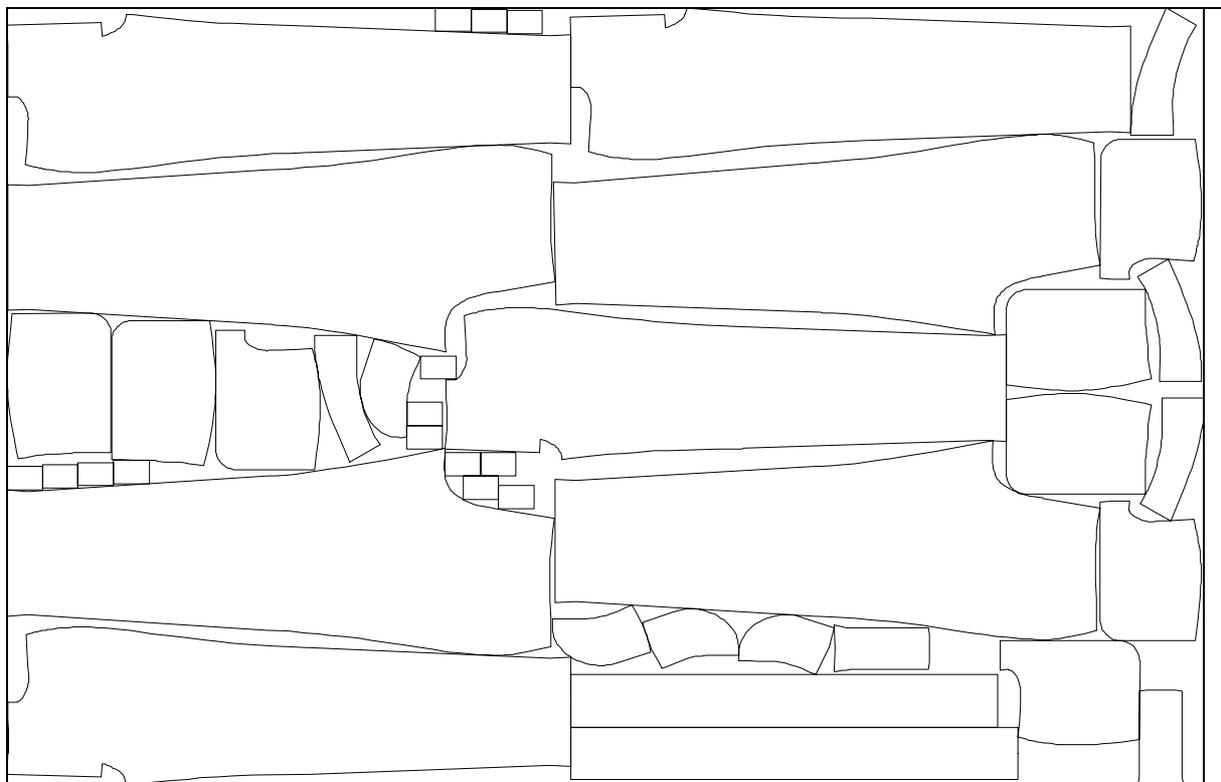
From Version 8 onwards, Grafis also contains the Grafis Layplan which fulfils industrial requirements. It is started as a separate application and can be open at the same time as Grafis Construction provided enough memory is available.

The Grafis Layplan can be used at different levels in industry, trade and education. It allows amongst other:

- Layplanning of all production patterns of the current style,
- Combining patterns from different styles within one layplan, also across different construction systems,
- Grouping of pieces,
- Open and folded layplans,
- Transfer of optimised layplans onto new layplans to be generated,
- Creation of fusing group and much more.

Technical parameters such as material type, grain, number of pieces per style and repeats are considered as well as planning parameters for buffer (global, piece-specific, direction-specific), shrinkage and material faults. Pieces can be rotated and flipped during layplanning.

Content of this chapter are the basic functions for creating a layplan from one or more styles. All other application options follow in Chapter 17.



16.1 The fastest way to a layplan

For industrial application, the layplanning software offers an abundance of planning and organisational options which have to be entered before the actual layplanning process. Not every user, however, requires all options. Therefore, the steps for minimum requirement are to be explained, first.

Note:

If you have no suitable style with production patterns available you can prepare the following: Open a new style in the construction system Optimass (BASIS_D). Call the „Unisex Basic Block“ into parts 001 and 002, respectively. In part 001 delete and points and lines of the back and call the part front. Part 002 becomes the back by deleting all points and lines of the front. Now, two parts with closed outline are available. Continue with the step „set part parameter“.

Steps in Grafis Construction

- ⇒ Create the production pieces with closed outline, if necessary set the grain line
- ⇒ Set part parameter; minimum: Attribute „production piece“, material type (e.g. „S Self“), number of pieces per style (e.g. 1x normal, 1x mirrored)
- ⇒ Enter all sizes to be layplanned into the size table and grade all parts.
- ⇒ Save the style
- ⇒ Start layplan via *File | Start Layplanning* or via the „Layplan“ icon on the desktop.

Steps in Grafis Layplan

- ⇒ Open the prepared style (of Version 8 or higher) via *Production Style | Open*
- ⇒ If necessary, check or edit the part parameter via *Production Style | Part Organisation*
- ⇒ Open the *Material index card* via *Layplan Information | Material*
- ⇒ Enter the material width, e.g. 1500 (entry in mm)
- ⇒ Select material type, e.g. „S Self“
- ⇒ Button „Continue“ to index card *Parts*
- ⇒ Optional: Select one or more pieces and enter buffer („buffer“ column) and allow rotate / flip („allowance“ column).
- ⇒ Button „Continue“ to index card *Sizes*
- ⇒ Click a size and set the amount of this size for the layplan via „Edit Amount“. Dragging with pressed left mouse button allows for selection of a number of sizes and changing the amount to be layplanned in one operation.
- ⇒ Button „Layplan“ opens the user interface for layplanning the pattern pieces.
- ⇒ Layplan the pieces according to section 16.5

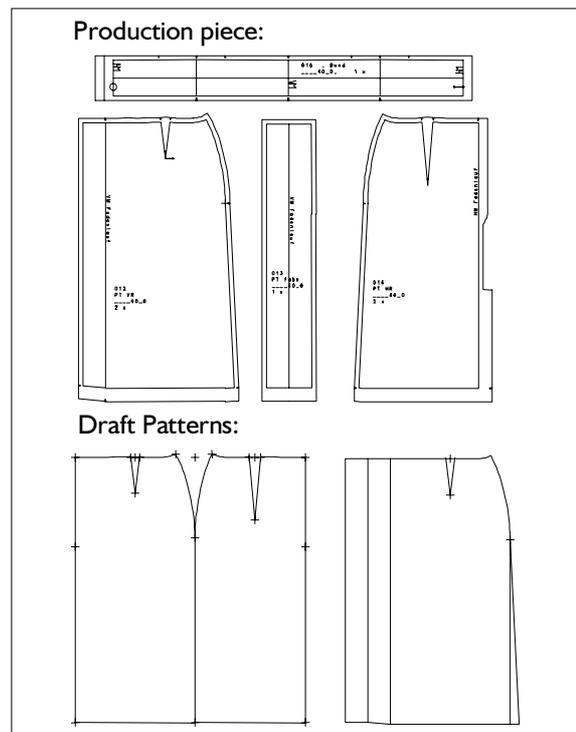
16.2 Preparations in Grafis Construction

Step-by-step guide

- ⇒ Create production pieces with closed outline
- ⇒ Set grain line
- ⇒ Enter part parameter (material type, amount of pieces per style)
- ⇒ Enter all sizes to be layed in the size table and grade all pieces.

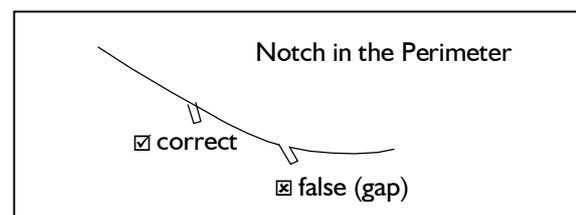
Construct production pieces with closed outline

During pattern development draft patterns are created from which the actual production patterns are derived (see Chapters 13 and 14). Pieces can only be layplanned if they have a closed outline. The outline corresponds with the cutting line on the fabric. It can be adjusted to the fabric by entering shrinkage values and buffer within the layplan.



Picture 16-1

Grafis checks whether the outline is closed when setting the part parameter „Production Piece“ (in the part organisation menu) and again when transferring all sizes into the layplan. If Grafis finds gaps (>0.5mm) in the outline or protruding lines, an



Picture 16-2

error message appears. Gaps can usually be found at corners, joints of lines or at symbols.

Line symbols such as notches are ignored during checking of the outline (Picture 16-2). For the first steps in the layplan, please prepare a simple style with production pieces, e.g. a skirt as shown in Picture 16-1.

Set grain line

In the production pieces the Grafis symbol „grain“ should be set at least.

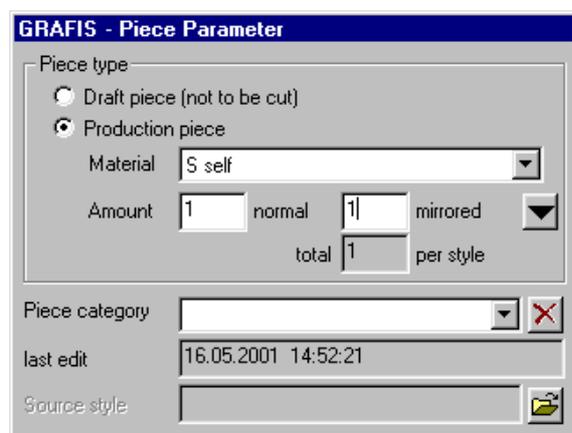
If no grain line is set, the negative y axis (direction downwards) is utilised as the direction of the grain, however, this can be changed subsequently (see 17.9). Also, an internal line can be declared as the grain line (see 17.10).

The following symbols and attributes must already be set in the style if they are required in the layplan:

- repeat symbols (see 17.2)
- annotation line (see 17.10)
- split line (see 17.10)
- internal line to be cut (see 17.10)

Assign piece parameter

In the part organisation menu the „piece parameter“ window opens if *+piece param* is selected (Picture



Picture 16-3

16-3). After having finished the production patterns the piece parameter for the production pieces should be assigned, already. These are:

- ⇒ Set piece type to „production piece“,
- ⇒ Determine the „material type“ for the production pieces;

If the required material type is not listed, it has to be entered in the file \Grafis\MATERIAL.DAT. This file contains the code for the material type in the first column. Each code can be assigned only once. For the code one capital letter or one number can be used. Use of special characters or umlaut is not permitted. The material name follows from the third column onwards.

- ⇒ enter the amount of this piece per style;
For right/left-symmetrical pieces (pairs) the piece is required „1x normal“ and „1x mirrored“. Please note that here, not the total number of pieces to be placed is to be entered but the amount for normal and mirrored position per style.

With the button  the piece parameters of the selected piece are transferred to the next piece. This relates to the attribute „production piece“, the material type and the amount per style in normal / mirrored position.

Optionally, each piece can be assigned a category for which the buffer at top / bottom / left / right and the settings for rotate and flip during layplanning are prepared. Details on work with categories can be found in section 17.6.

Grade production patterns

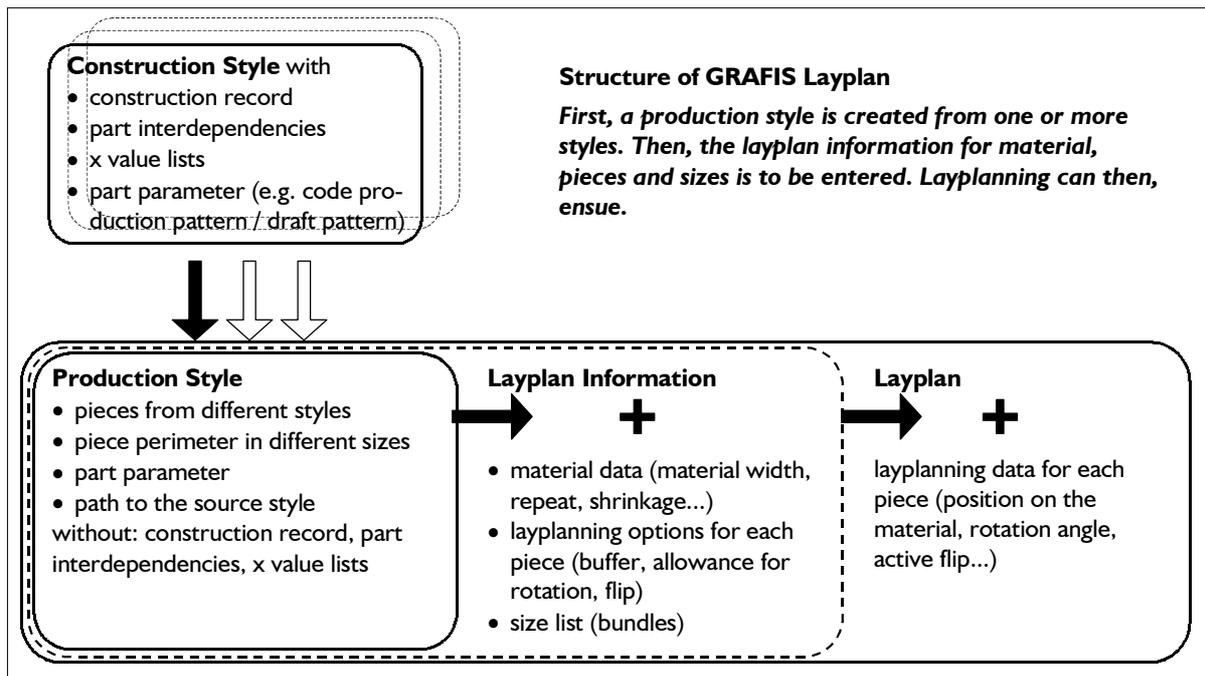
All sizes to be layplanned must be entered in the size table. One entry per size is sufficient. Grade all production patterns with *Grade all Parts*.

16.3 Structure of the Grafis Layplan

The Grafis Layplan is started via the icon „Layplan“ or from Grafis Construction via *File | Start Layplan*. Grafis Construction and Grafis Layplan can be open at the same time.

Data structure of the Grafis Layplan

The data of a layplan is divided into production style, layplan information and layplan. In this order, the information for the layplan is assembled. The overview in Picture 16-4 indicates the structure. The intermittent steps (production style, layplan information and „empty layplan“) can be saved, separately.



Picture 16-4

Production Style

... is the assembly of pattern pieces from different styles and different construction systems to be layed in a layplan. It contains

- all required pieces as outline in all required sizes,
- the part parameter for the pattern pieces and
- a connection to the source of the respective pieces.

As opposed to the styles in the Grafis Construction, the construction record with x value lists and the interdependence of the parts no longer exists.

Layplan information

... are the data of the production style and additionally

- all information about the material (width, repeat, shrinkage, ...)
- laying options for each piece (buffer, allowance for rotation / flip),
- sizes to be placed (bundle) and the name of the layplan.

Layplan

... contains the data of the layplan information with the data of the production style and additionally

- the laying data for each piece (current position in the layplan, rotated, flipped,...)

The data of every placed layplan are saved as layplan files with the extension *.scb.

Prepare layplan

Step-by-step guide

- ⇒ Prepare the style according to section 16.1 and start *Grafis Layplan*
- ⇒ Load or assemble the **production style**
- ⇒ Assign **layplan information**
- ⇒ Lay the **layplan**

For each of the highlighted steps, there is a pull-down menu with all relevant functions.

Load or assemble production style:

- ⇒ pull-down menu *Production Style*

Assign layplan information:

- ⇒ pull-down menu *Layplan information*

Lay layplan:

- ⇒ pull-down menu *Layplan*

To create a layplan these steps are to be processed one after another. The individual steps are explained in sections 16.4 to 16.7.

16.4 Create production style

Load production style

If only pieces of one style are to be placed, the following steps are sufficient:

Step-by-step guide

- ⇒ pull down menu *Production Style | Open Style*; open the prepared style.
- ⇒ if necessary, check or edit part parameter via *Production Style | Part Organisation*, set switch to *+part param.* and check the material type and the required amount for each part.

The production style is now prepared. You can continue immediately with the layplan information.

Assemble production style

Step-by-step guide

- ⇒ Open part organisation via *Production Style | New Style*.
- ⇒ Click *Create Connection*.
- ⇒ Select a style from any construction system.
- ⇒ The dialogue „Grafis Part connection“ appears.
- ⇒ Select the sizes required for the production style. The order of the sizes remains intact in the layplan when creating the bundles.
- ⇒ Click the button „Create Connection“ for all pieces required in the production style.
- ⇒ Select the next style with the button „Back“ or close the „Grafis Part Connection“ dialogue with the button „Close“.
- ⇒ Set the switch to *+part param.* and check the material type and the required amount per style for each piece.
- ⇒ End with right mouse button.

When assembling production styles from styles of different construction systems, ensure identical size names. If the size names are not identical, individual measurement charts with identical names may have to be created. Ensure correct settings for the alias in the size table.

The production style is assembled with the function or the *part organisation* menu which are largely identical with the ones in the Grafis Construction. All changes apply to the new production style, only. The source style remains unchanged.

Start the Grafis Layplan and select *Production Style | New Style*. Assemble the new production style by clicking on *Insert Connection* and selecting the required style.

Select style

In the user interface „Open Style for Insert“ select the drive on which the required style is saved under „Look in:“. In the window below, all construction systems appear, indicated as folders with the icon . Double-click changes to the required construction system. All available collections of the selected construction system appear, indicated by the icon . Double-click on the required collection opens the list of all available styles of the

collection. Styles are indicated by the icon . If a padlock appears at the icon , the style is currently being processed and is therefore, write-protected. Parts from a write-protected style are transferred in the state of the last save. Move up one level (folder / collection) with the button  Table 16-1 contains an overview of the icons used in Grafis and their significance.

Icon	Significance
	Folder (Construction System)
	Collection
	Style (Grafis Construction)
	Write-protected style
	Production Style
	Layplan
	Layplan information

Table 16-1

The content of the window can be arranged with the buttons according to Table 16-2.

Button	Significance
	List without details
	List with details
	Show / hide text preview
	Show / hide preview of the first piece

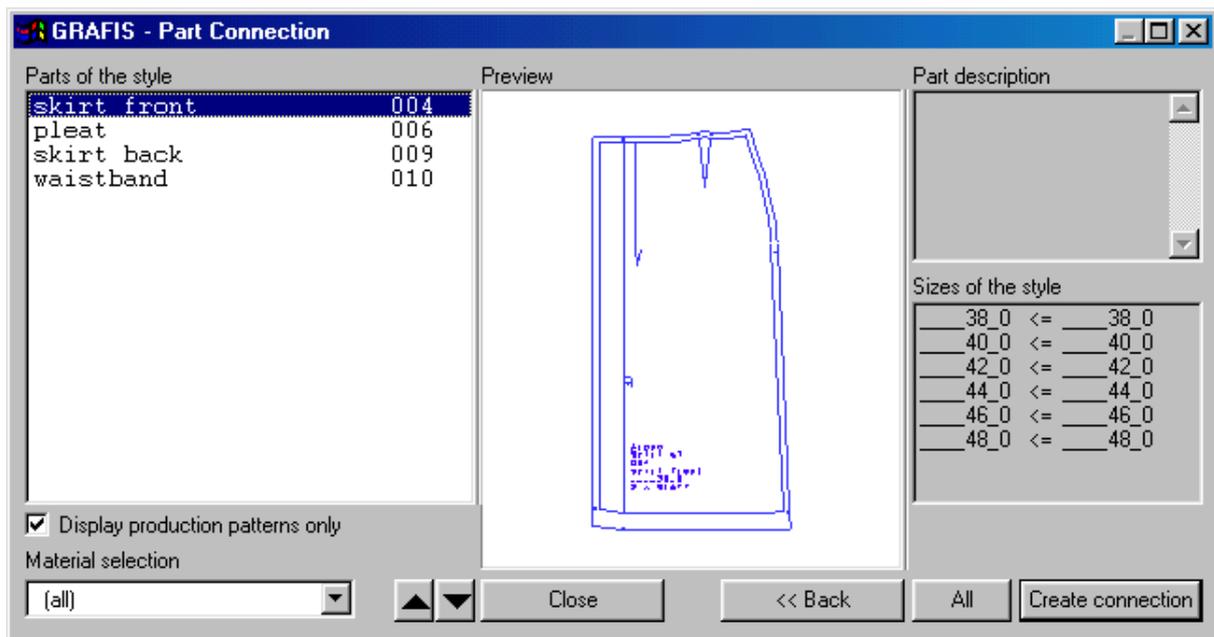
Table 16-2

Create connection

After having selected the required style, the window „Part Connection“ appears (Picture 16-5).

Step-by-step guide

- ⇒ Select all sizes to be transferred to the production style
- ⇒ Transfer pieces with: select piece and click button „create connection“ or double-click on the piece
- ⇒ Button „Back“ to select another style
- ⇒ End with button „Close“



Picture 16-5

Select sizes

All sizes positioned to the left of the arrow „<=“ in the section „sizes of the style“ will be available in the layplan. Double-click on the respective line transfers the size to the left or excludes it again. Selecting a number of sizes in one operation is also possible with pressed left mouse button. **The bundles will be created in the order of the sizes to the left of the „<=“**

Transfer pieces

The check mark „Display production patterns only“ can be set if all pieces to be layed have been assigned with the „production pattern“ attribute. If the check mark is set, all draft patterns are hidden. After having clicked a piece its outline appears in the „preview“ area and the content of the text box - if applicable - appears under „part description“. Clicking the button „create connection“ or double-click on the piece transfers the piece. The following piece is selected, automatically. A different insert position in the production style can be selected with

the buttons .

After having transferred all required pieces, another style can be selected with the „Back“ button or the assembly of the production style can be ended with „Close“.

Edit production style

The current list of parts can be opened via *Production style | Part Organisation*. In the part parameter window which appears with *+part param.* the date of the last edit of the piece, the name and the path of the source style are now shown for each piece. This information is used to ensure that any alteration of the source style will automatically be updated in the layplan. Further information on updating pieces can be found in section 17.1.

If necessary, check that

- no pieces have been transferred, twice by accident,
- the material type of the piece is correct,
- the required amount per style is correct and
- if applicable, the part category is correct.

Corrections can be made, immediately with the known function from the part organisation. Adding further pieces is started by clicking *insert connection*. The part organisation is closed with the right mouse button.

In the style view, the function keys <F2>, <F3>, <F4> and <F6> are assigned as in the Grafis Construction. Pressing <F5> arranges all transferred pieces in all transferred sizes. The functions *Copy*, *Measure*, *Stack* and *Move/Zoom* are also active (pull-down menu *Edit* or toolbox).

Save production style

The production style can be saved at this stage via *Production Style | Save Style As...* Finished styles should be sent to the customer or the production unit in the form of production styles. Alteration through application of other body measurements or x values are no longer possible.

For saving of production styles no fixed directory structure is given as the production styles are no longer attached to a construction system. With the

button  „New Folder“ a new folder / new directory can be created.

16.5 Edit layplan information

Step-by-step guide

- ⇒ Create a production style
- ⇒ Pull down menu *Layplan Information | New Now*, three file cards are to be filled in.
- ⇒ Fill in file card **Material** (enter material width and material type minimum)
- ⇒ Fill in file card **Pieces**
- ⇒ Fill in file card **Sizes**
- ⇒ Save „empty layplan“ lay the pieces in the layplan After preparation of the production style and before laying the pieces in the layplan, all information about the layplan must be entered into the file cards *Material, Pieces* and *Sizes*. As a rule, each of these file cards are indicated by one icon in the toolbox.

File card **Material**

On this file card, enter at least the **material width** and the **material type**. All other fields should be edited, only if necessary. Some of the other options are explained in the following. Further information about pre-selection of material, repeat, shrinkage values (global), fault areas and spreading types follow in Chapter 17.

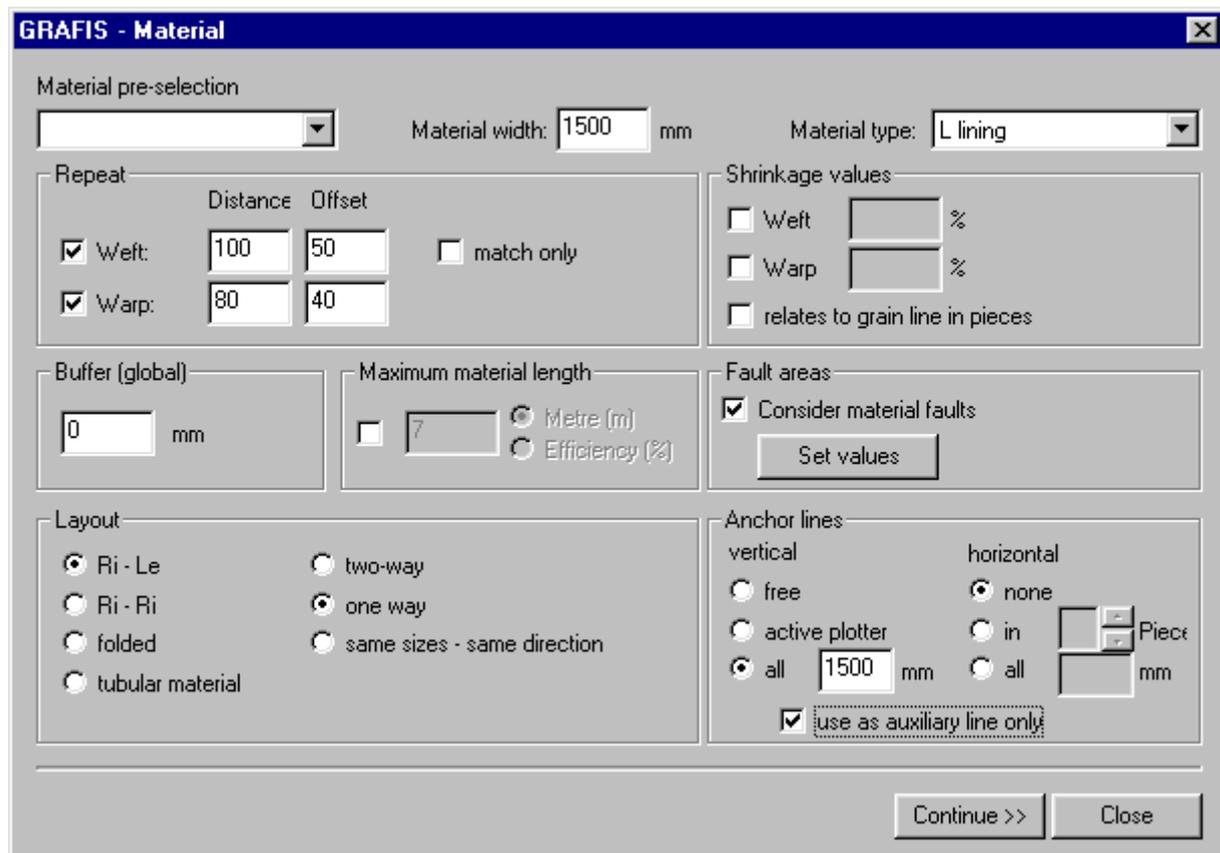
Buffer (global)

The global buffer applies to all pieces in the layplan. Grafis calculates a new outline for each piece with half of the buffer distance. Thus, the set safety margin between two pieces is ensured. If pieces are to be touching in the layplan, the global buffer must be 0. A piece-specific buffer can then be entered on the next file card.

Maximum material length

In this field, the maximum length for the layplan in metres or a minimum efficiency in % is entered. A default setting for the maximum length is entered in the Grafis.INI file and can be altered at any time. Material length of over 50 m require sufficient main memory.

When entering a minimum efficiency in %, the maximum material length is calculated, automatically from the area of all pieces and the width of the material.



GRAFIS - Material

Material pre-selection

Material width: 1500 mm Material type: L lining

Repeat

Distance Offset

Weft: 100 50 match only

Warp: 80 40

Shrinkage values

Weft %

Warp %

relates to grain line in pieces

Buffer (global)

0 mm

Maximum material length

7 Metre (m) Efficiency (%)

Fault areas

Consider material faults

Set values

Layout

Ri - Le two-way

Ri - Ri one way

folded same sizes - same direction

tubular material

Anchor lines

vertical horizontal

free none

active plotter in Piece

all 1500 mm all mm

use as auxiliary line only

Continue >> Close

Picture 16-6

Anchor lines

Anchor lines are laying aids which function like a border. Pattern pieces can be attached from left/right or up/ down. Placing a piece on top of an anchor line is only permitted if the check mark „**use as auxiliary line only**“ is set. Anchor lines can also be plotted.

With „**every... mm**“ the distance between vertical or horizontal anchor lines can be randomly selected. For **vertical** anchor lines, the distance between the lines can correspond with the page size of the „**active plotter**“. This setting is useful for single sheet plotter where the pattern pieces are not to protrude over the edge of the page.

Button Continue

Clicking the „Continue“ button opens the *Pieces* file card.

File card Pieces

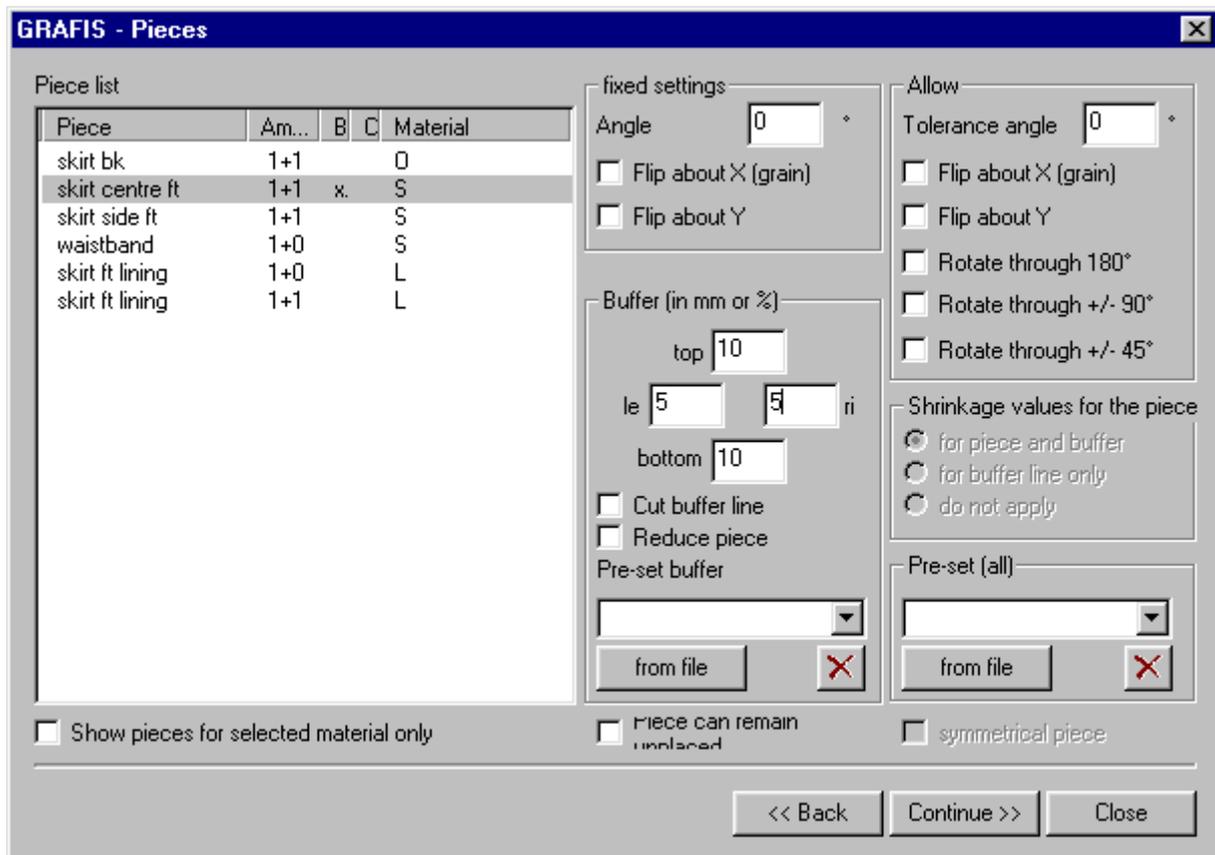
On the *Pieces* file card, settings regarding additional direction-specific buffer, flip and rotate allowance and special settings for shrinkage value can be entered for each piece.

In the part list (left on the file card) the following is stated next to the piece name:

Column	Content
Piece	Piece name
Amount	Amount of the piece per style; first number indicates normal and second number flipped position
Buffer	The character „x“ indicates that a piece and direction-specific buffer has been entered for this piece. Small „x“ original outline is cutting line; capital „X“ buffer line becomes cutting line; character „-“ the piece will be reduced.
Category	Display of category number and name assigned to this piece.
Material	Code for the material type

If only pieces of the selected material type are to be displayed, check „**display pieces for selected material only**“ Thus, only pieces which will be layed out can be seen. The material type is selected on the previous file card *Material*.

The values in the entry fields „Fixed settings“ „Allowance“, „Buffer“ and „Shrinkage value for the piece“ apply to the selected piece(s), respectively. To select a number of pieces at the same time, press the <Ctrl> or the <Shift> key when clicking on the pieces.



Picture 16-7

Fixed settings

For each piece the following can be set:

- fixed rotation angle
The piece is rotated through this angle before entering in the layplan.
- flip about x or y
The piece is flipped before layplanning.

Allowance

Additionally, the following rotate / flip allowances can be set:

- tolerance angle
The piece may be rotated freehand about a maximum of this angle in the layplan.
- flip about x (grain line)
- flip about y
- rotate through 180°
- rotate through +/-90°
- rotate through +/-45°

The piece may be rotated / flipped according to these settings.

Buffer

The piece and direction-specific buffers are added to the global buffer from the previous file card *Material*. The settings apply to the selected piece(s). A buffer can be entered into the fields „top“, „bottom“, „left“ and „right“ in mm or in %. When using percentage, only the character „%“ is to be entered. Move between entry fields with the Tab key. All settings relate to the first piece in the first bundle in unflipped position.

The check mark at „**cut buffer line**“ results in the piece being increased by the global and piece-specific buffer and cut at the buffer line. Complex pieces or pieces which the cutter may not be able to cut, accurately can be cut roughly and can then be cut, accurately by hand.

If the check mark at „**cut buffer line**“ is not set, the buffer is an invisible distance between the pieces.

A check mark at „**reduce piece**“ results in the piece being reduced by the global and piece-specific buffer and cut reduced. Interlining is sometimes reduced by

2 mm all around in this way to prevent the fusing press from being soiled with glue.

In the part list (left on the file card) the current settings are indicated as follows:

Character	Significance
x	<input type="checkbox"/> cut buffer line (original outline is cut line)
X	<input checked="" type="checkbox"/> cut buffer line (buffer line is cut line)
-	<input checked="" type="checkbox"/> reduce piece (piece is cut reduced)

All further options are explored in Chapter 17. These are

- shrinkage values for the piece
- pre-set buffer
- pre-set (all)
- replace style / add style

File card Sizes

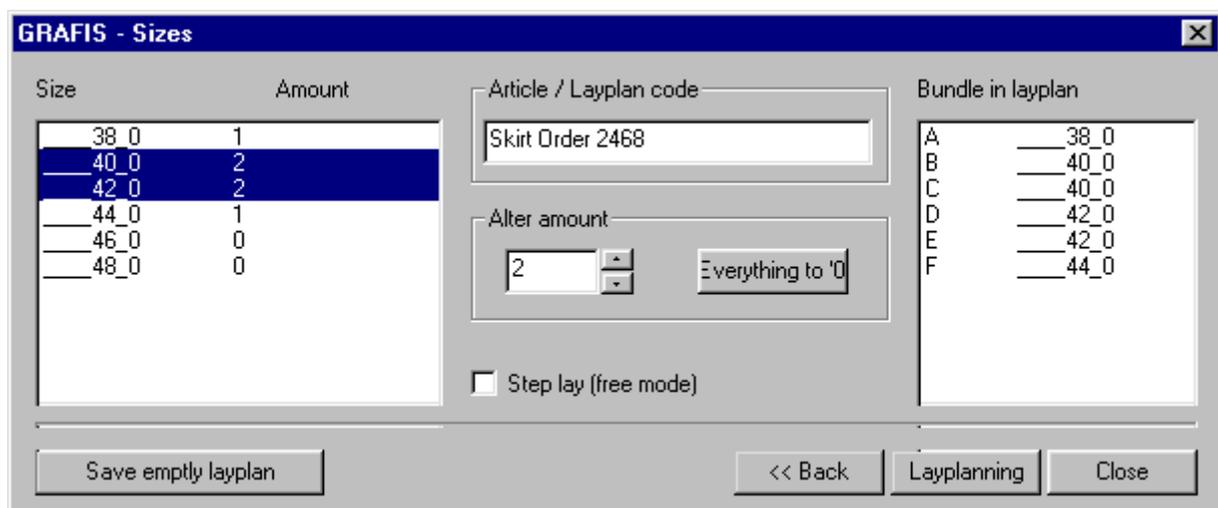
The file card *Sizes* determines **which sizes are placed and how often**. This information is displayed in the size list (Picture 16-8, left window). From this data, the bundles are created, automatically in the right window. Only the sizes set up in the production style can be placed. Adding unlisted sizes is only possible through reprocessing the production style. To edit the amount of the size, select one or more sizes in the window on the left. Pressing a number on the keyboard or the arrow keys next to the dialogue „**edit amount**“ changes the amount of the selected size(s). A number of sizes can be selected with the <Shift> and <Ctrl> keys, analogous to the handling in the part list.

In the field „**article/ layplan description**“ a short description of the layplan can be entered which can be plotted at the material edge.

Further information about the „**article/ layplan description**“ field and information about „**step lays**“ follow in Chapter 17.

Save empty layplan

As soon as all settings for the „Layplan Information“ are dealt with, this intermediate stage can be saved



Picture 16-8

as an „empty layplan“. Often, a number of layplans are required for the same style due to layplan optimisation. The first layplan contains sizes 36 and 42, the second layplan sizes 38 and 40 and so on. After having saved the „empty layplan“ for the sizes 36 and 42, the sizes 38 and 40 have to be entered, only in the required amount on the *Sizes* file card. Then, the layplan for sizes 38 and 40 is prepared, also.

Later, the first layplan is opened with *Layplan | Open Layplan*. If consecutive names have been given when saving the layplans, the next layplan can be loaded, immediately with *Layplan | Open Next Layplan*.

Layplanning opens the layplan interface, immediately.

Edit / correct the layplan information

Via the pull-down-menu *Layplan Information* the file cards *Material*, *Pieces* and *Sizes* can be opened, directly. Alterations to the file cards are possible at any time. They are automatically applied to the layplan. If overlapping or gaps occur, the layplan must be reprocessed.

16.6 Layplanning

Step-by-step guide

- ⇒ Create the production style
- ⇒ Enter the layplan information
- ⇒ *Layplan | Layplanning*

First, prepare the production style and enter the layplan information. From the last file card *Sizes* the button „layplanning“ leads to the layplan. If this file card is already closed, the layplan is opened via *Layplan | Layplanning*.

Layplan user interface

The layplan user interface (Picture 16-9) is divided into four areas:

- the rack,
- the pre-lay area,
- the material and
- the status line.

The rack is situated at the top of the screen. It contains all pieces to be placed in all sizes or bundles. The order of the pieces corresponds with the order in the part list of the production style. The number of pieces in normal and flipped position and the bundle name result from the settings on the file cards in the layplan information. If necessary, a scroll bar appears for scrolling to the left / right.

Below the boxes of the rack, the sizes to be placed and a capital letter for the bundle appear in the first column. The numbers in the following columns represent the amount of pieces in normal position

(left) and in flipped position (right). A clicked number is highlighted in white and the respective piece of the relevant bundle in the respective position hangs on the cursor.

The material is situated at the base of the screen. The width of the material was determined on the *Material* file card. At the end of the material (right) a marking for the efficiency in percent can be found.

The pre-lay area is the area between the rack and the material. It serves as a temporary store and can be increased in size by folding the rack. Click the button  at the upper right end of the rack.

Clicking  unfolds the rack.

The status line with information about the layplan is situated at the lower edge of the screen. The individual fields show (from left to right):

- part number and name of the piece on or below the cursor
- size and a capital letter for the bundle
- current length of the layplan in m
- current efficiency in %
- usage per bundle (average) in m
- material width in m
- placed pieces / total number of pieces to be placed
- placed production style

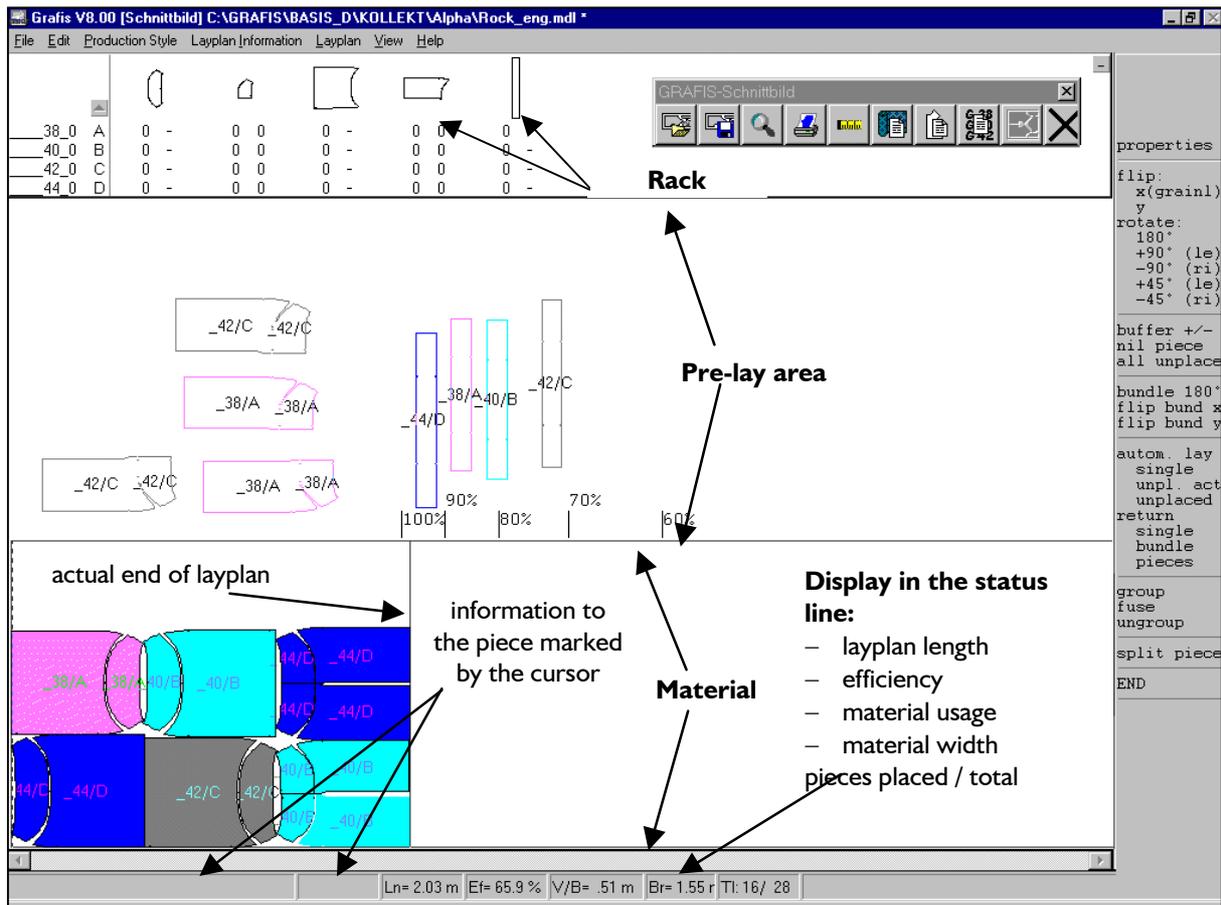
Call and place pieces from the rack

A piece is called from the rack by clicking the respective number below the box with the left mouse button. The piece hangs on the cursor and can be dropped in the pre-lay area or on the material with another short click of the left mouse button.

Only pattern pieces on the material placed without overlapping are displayed with colour fill.

A piece hanging on the cursor will cease to follow the cursor as soon as it touches another piece on the material, the selvedge or an anchor line. At the same time, a red thread appears between the piece and the cursor. If the thread exceeds a certain length, the piece will follow the cursor, even across the edge of the material or already placed pieces. The length of this so-called search area can be altered via *Layplan | Options*.

To reposition already placed pattern pieces move the free cursor (without pieces attached) over the pattern pieces. In the status line at the lower edge of the screen, the piece number and name, the size and the bundle appear. The size and the bundle name are also stated directly at the piece if this option is activated under *Layplan | Options*. Clicking on a piece with the left mouse button picks up the piece.

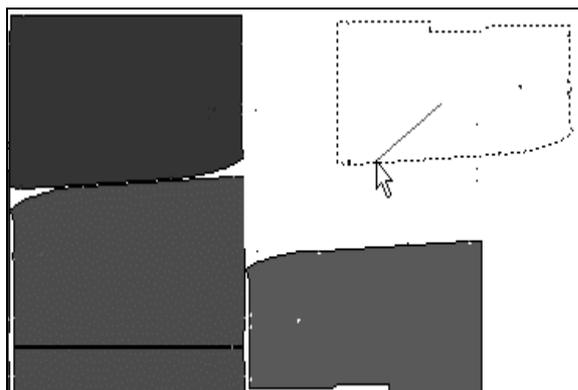


Picture 16-9

All pieces of one size appear in one of seven colours. Three different shades of a colour differentiate between the bundles of one size.

A number of pieces can be called from the rack at the same time by moving the cursor over the numbers of the required pieces with the right mouse button pressed. The right mouse button must be released when still in the area of the rack. Thus, all selected pieces hang on the cursor. With the left mouse button the pieces are dropped in the pre-lay area or on the material, slightly removed. Sliding the stack is also possible.

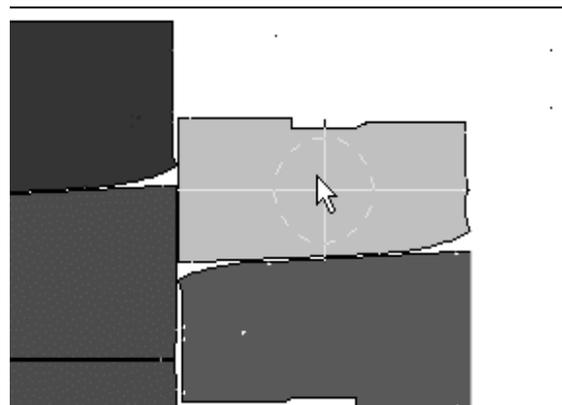
Sliding pieces



Picture 16-10

Click the piece for sliding so that it hangs on the cursor. Drag the piece with the left mouse button pressed. A red thread appears, indicating the direction of the slide (Picture 16-10).

As soon as the mouse button is released, the piece slides against already placed pieces or into the nearest gap (Picture 16-11).



Picture 16-11

The piece does not have to be picked up, first. The mouse button may remain pressed, immediately. Moving the mouse pulls the red thread. Releasing the mouse slides the piece onto already placed pieces.

Zoom / refresh

<F6> toggles between

- zoom to optimum layplan length and
- zoom to optimum layplan width.

At the same time, the pieces in the pre-lay area are rearranged according to bundles and the screen is refreshed. <F6> only changes the view if you have zoomed into a detail or if the layplan is not completely visible at full layplan width.

With <F4> or moving the layplan to the left / right, the screen is refreshed.

To reduce / increase the size of the layplan, the already known function **Move/Zoom** is available. It can be called from the toolbox or from the pull-down menu *Edit*. Maximum scale is 1:1.

Undo or redo laying operations

While the layplan user interface has not been closed, any number of laying operations can be reset via *Edit | Undo* (keyboard Ctrl + Z). Reset laying operations can be reprocessed with *Edit | Redo* (keyboard Ctrl + Y) as long as no new operation has been performed.

16.7 Layplanning: functions of the right menu

For almost all functions in the menu on the right the following rule applies:

An active function is applied as soon as a piece is clicked with the right mouse button. An icon at the cursor indicates the active function. If the selected function may not be applied to the piece (e.g. rotation not permitted), the icon  appears at the piece.

Exception to this rule is the function *End* and all functions which are carried out, immediately (without special icon).

Example: in the section *flip*: the function „x (grain)“ is active. The icon  appears at the cursor. After having clicked a piece with the right mouse button, it is flipped about the x axis (if permitted for this piece).

The following functions are offered in the menu on the right:

Function	Icon	Description
properties		Edit the piece properties on the <i>Pieces</i> file card
flip:		
x (grain)		Flip about x axis (grain line)
y		Flip about y axis
rotate:		
180°		1/2 turn
+90° (le)		1/4 turn to the left

-90° (ri)		1/4 turn to the right
+45° (le)		1/8 turn to the left
-45° (ri)		1/8 turn to the right
buffer +/-		Switch buffer (global + piece-specific) on / off
nil piece		Reset flip and rotation; piece appears unplaced (no colour fill)
all unplace	none	All pieces are <u>immediately</u> marked as unplace.
Bundle 180°		Rotate all pieces of the bundle through 180°
flip bund x		Flip all pieces of the bundle about the x axis
flip bund y		Flip all pieces of the bundle about the y axis
autom. lay:		
single		The clicked piece is placed, automatically.
unpl. Act.	none	All unplaced active pieces are <u>immediately</u> placed, automatically.
unplaced	none	All unplaced pieces, also from the rack, are <u>immediately</u> placed, automatically.
return		
single		Return single piece to the rack
bundle		Return all pieces of the bundle to the rack
pieces		Return all pieces with the same part number to the rack
group		Group the hatched pieces.
fuse		Fuse the hatched pieces.
ungroup		Ungroup
split piece		Split piece with seam allowance.

Flip / Rotate

If the icon  for „function not permitted“ appears at the cursor for one of the flip / rotate functions, it indicates that flip / rotate is not permitted for this piece. To permit flip / rotate

- select *properties* from the right menu,
- click the piece with the right mouse button,
- check allowance for flip / rotate on the open *Pieces* file card,
- return to the layplan with the button *Close*,
- reactivate the function for flip / rotate and
- click the piece to be flipped / rotated with the right mouse button.

The following functions can also be activated via the keyboard:

Function	Keyboard
flip about x	key <s>
flip about y	key <d>
rotate through 180°	key <q>
rotate through +90° (le)	key <w>
rotate through +45° (le)	key <e>

Nil piece

All flip and rotate operations are reset. The piece appears in the original orientation and is unplaced (no colour fill). The fixed settings remain intact.

Rotate / flip bundle

If one of the *rotate through 180°* or *flip x / y* functions is active for a bundle, all pieces of the bundle are flipped / rotated when clicking one piece of the bundle with the right mouse button. This applies to grouped or fused pieces of the bundle, also.

Automatic layplanning

The automatic layplanning function is not layplan optimisation. The piece or the group is placed in the first permitted position in the layplan (from the left). An optimisation considering outline or efficiency does not ensue!

Automatic layplanning with the function *single* is useful for placing lots of small pieces into gaps. The piece clicked with the right mouse button is placed as far to the left as possible.

This also applies to the functions *unpl. act* (for unplaced pieces in the pre-lay area and on the material) and *unplaced* (all unplaced pieces). Further options for automatic layplanning can be found in the pull-down menu *Layplan*.

Group / fuse pieces

Only pieces placed on the material without overlapping (with colour fill) can be grouped. To create a group, click the pieces once with the left mouse button while keeping the Ctrl key pressed. The pieces will be hatched. Then, activate the function **group** and click one of the hatched pieces with the right mouse button. The group can then be moved as one piece. The functions from the menu can also be applied to the group.

Only the allowances given to all pieces in the group re. rotate / flip apply. If one piece may be rotated through up to 15° and another up to 10°, the group consisting of these two pieces may be rotated through a maximum of 10°. The buffer apply to each piece of a group, individually even after grouping.

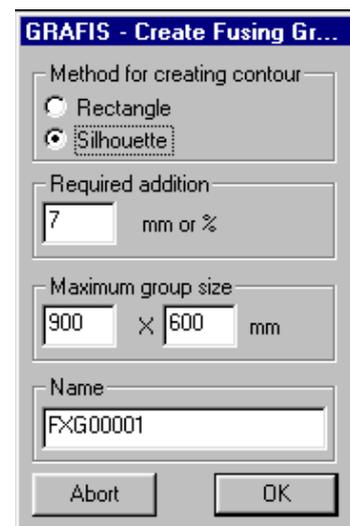
To ungroup pieces, activate the function **ungroup**. Clicking the group with the right mouse button dissolves the group. To release individual pieces

from a group, the group must first be dissolved and then grouped again.

To create a fusing group, all relevant pieces are to be clicked with pressed Ctrl key, also. Then, activate the function **fuse** and click one of the pieces of the group with the right mouse button. A window with the following options for the fusing group appears (Picture 16-12):

- method for outline creation (rectangle or silhouette),
- addition in mm or % around the fusing group in addition to the buffer of the fused pieces,
- maximum size of the fusing group, depending on the size of the fusing press and
- a name for the fusing group.

The fusing group is saved under the entered name as a new piece in the production style. When laying the interlining layplan, the shape of the fusing group can be transferred from the main fabric layplan with this piece.



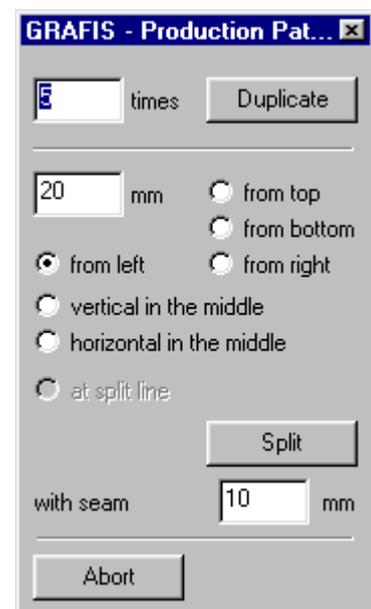
Picture 16-12

Split piece

Pieces can still be split or duplicated in any number in the „layplanning“ mode.

To split or duplicate a piece, the function **split piece** from the right menu must be activated first. Then, the piece is to be clicked with the right mouse button. A window with the following entry options appears (Picture 16-13):

To **duplicate**, enter the required amount in the field „times“ and click on the button „duplicate“.



Picture 16-13

To **split** a piece first, you have to select where the piece is to be split. A piece can be split

- at a distance of xx millimetres from the top/ bottom/ left/ right,
- vertical/ horizontal in the middle or
- at the split line.

Then, the seam allowance to be added to both edges is to be entered. Clicking the button „split“ splits the piece.

End

With *End* or with the right mouse button in the menu area, the layplanning function is quit after a security question. The layplan user interface can be reopened at the last stage of work via *Layplan* | *Layplanning*.

16.8 Additional functions in the *Layplan* pull-down menu

Some of the functions from the pull-down menu *Layplan* are only available when the layplan is open or closed.

Open Layplan to open a previously saved layplan.

Open Next Layplan to open the next layplan. Layplans are alphabetically ordered and the layplan following the active layplan will be opened.

Save Layplan saves the layplan, immediately under the name given.

Save Layplan As... save the layplan in a directory to be selected and under a name to be entered.

Remove superfluous data should be used when a layplan has been layed and „always remove superfluous data during save“ has been switched off. The outlines of the unplaced pieces and unplaced sizes are removed from the layplan. The layplan file becomes smaller. „always remove superfluous data during save“ can be switched on via *Edit* | *Settings*. The two remaining options „save layplan with preview“ and „more columns in detail view“ should be set only if not working within a network. Otherwise, the window for the „Open Layplan“ dialogue would build very slowly. The option „save layplan with preview“ also requires sufficient memory.

Layplanning opens the layplan user interface.

Transfer layout transfers the layout of a previously saved layplan to be selected with identical amount of pieces and bundles. A preview and/or a detail information about the layplan appears via the buttons (List, Details, preview).

Delete layout data resets all layout data. Only the layplan information settings on the file cards remain existent.

Automatic layplanning (as described on the previous page)

- all pieces
- all active pieces from the pre-lay area or the material
- all pieces on the material
- all unplaced pieces *
- all unplaced, active pieces *

*These functions can also be found in the right menu in the layplan user interface.

Return (as described on the previous page)

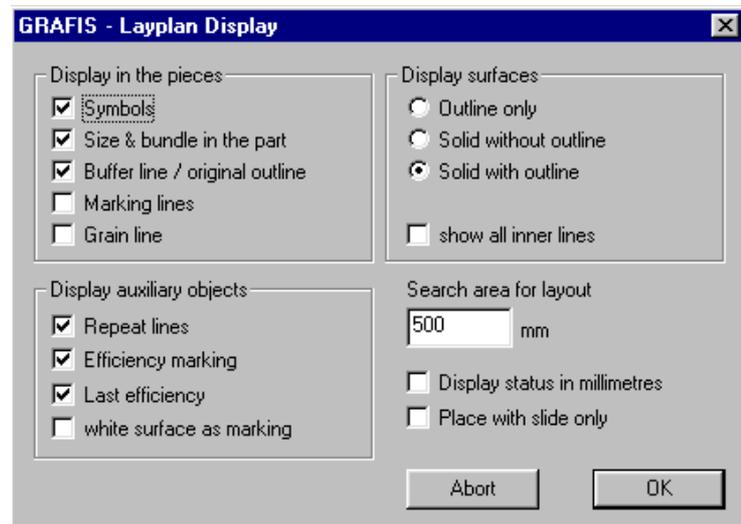
- all pieces
- all unplaced pieces.

Flip layplan about x

Flip layplan about y

Rotate layplan through 180°

All pieces in the layplan are flipped / rotated. This applies to unplaced pieces and pieces in the rack, also.



Picture 16-14

Options offers a window (Picture 16-14) with various display options in the layplan and settings for handling during layplanning. The „search area for layout“ relates to the length of the red thread during layplanning.

16.9 Plot layplan

Output of a layplan is started via *File* | *Plot / Print...* The plot dialogue according to Picture 16-15 opens.

In the section „output to,, select the plotter / printer for output. With the button „Settings“ further settings are offered.

If **plot with frame** is selected, the frame of the plot image is plotted. The frame is required, only when plotting onto a number of pages which are to be joined, subsequently frame by frame; or for output in full scale to small scale printers / plotters.

If **stop before output** is selected, the prepared plot image is displayed. Output can still be aborted at this stage.

A **margin** can be added to the left edge. This is useful if a safety margin is required between the end of one plot and the beginning of the next for output to a number of pages, e.g. for output on a roll if the plot is not cut off at the end.

In the section „Plot information“ the following can be set:

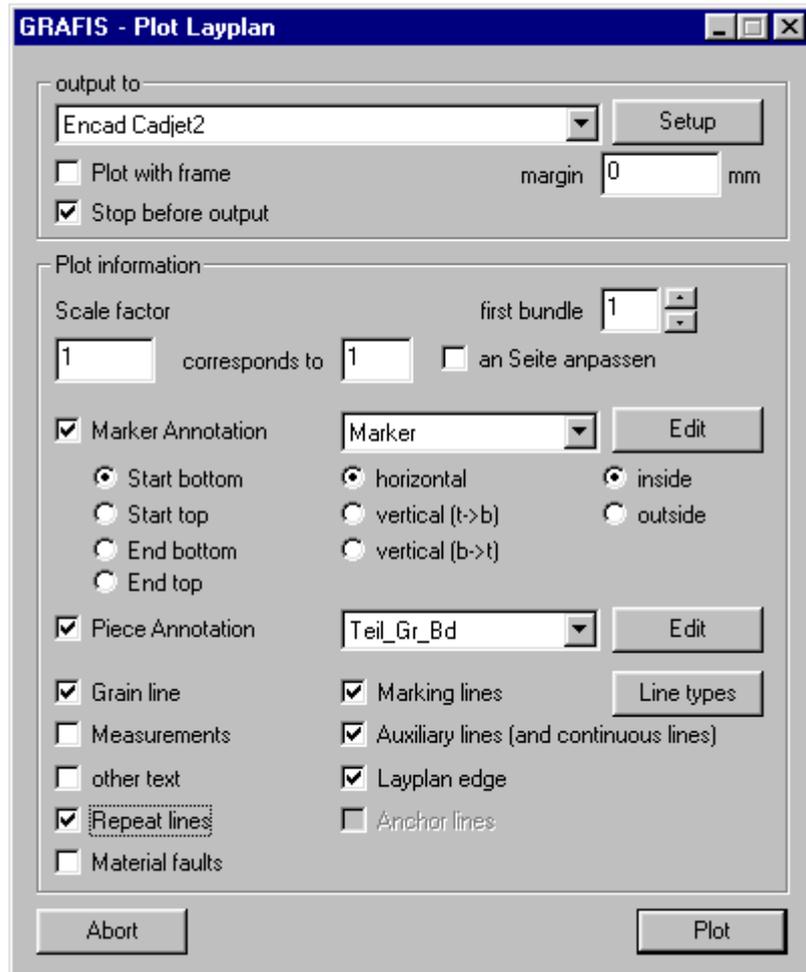
The entry fields **Scale factor** and **corresponds to 1:** are aligned. If the layplan is to be plotted in original size, the **Scale factor** must be set to 1 or **corresponds to 1:** must be set to 1. For reduced output in scale 1:2 the **Scale factor** must be set to 0.5 or **corresponds to 1:** must be set to 2.

If **fit page** is set the scale and page orientation are optimised by Grafis, automatically.

The digit for **first bundle** determines the number for the first bundle in this layplan.

Marker annotation determines if the layplan is annotated and how. The position of the marker annotation, start or end, orientation and whether the annotation is to be plotted inside or outside the layplan can be selected. With the button „Edit“ the content of the marker annotation can be edited. The marker annotation „Layplan all“ contains all codes which are replaced with the respective text, automatically during plot:

Date:	{Sdt}
Time:	{Szt}
Efficiency:	{Sef}%
Usage per bundle:	{Svb}m
Length:	{Sln}m {Slc}cm {Slm}mm



Picture 16-15

Layplan width:	{Sbc}cm {Sbm}mm {Sbr}m
No. of bundles:	{Sbz}
Size list:	{Sgl}.....}
Production style:	{Smd}
Layplan (File name):	{Ssb}
Article /layplan code:	{Sar}
Material code:	{Smk}
Material:	{Smt}
Outline lengths:	{Sum} m

The marker annotation is saved as a *.stx file in the directory \Grafis\TEXTE.

Piece annotation determines whether and how each piece is annotated with a standard text. The content of the piece annotation can be edited via the button „Edit“. The piece annotation „Pieces all“ contains all codes which are replaced with the relevant content, automatically:

Date:	{Sdt}
Time:	{Szt}
Piece text:	{Stl}
Piece text area:	{Stb0106}
Size:	{Sgr}
Bundle as letter:	{Sbd}
Bundle as number:	{Sbn}
Source style:	{Sqm}

Source collection: {Sqk}
Material code: {Smk}
Material: {Smt}
Amount in plan (normal+ flipped):{Snz}
Outline lengths: {Sum} m

The piece annotation is saved as a *.ttx file in the directory \Grafis\TEXTE.

Additionally, the following can be set for output:

- the grain line,
- measurements,
- other text,

- repeat lines,
- marking lines,
- auxiliary lines,
- the layplan edge and
- anchor lines

Plot starts the actual output.

The output of cutter data is started via **File | Generate cutter data**. The output must be set up and released by the Grafis-Team.