Chapter 2 „Grading"

Contents

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In Grafis, first patterns are originally developed in the base size. All construction and modification steps are registered by imperceptibly creating a record. This construction record can be recalled with other sizes, thus creating the patterns in the respective size automatically. The creation and editing of measurement charts is subject of the first part of this chapter. The second part deals with calling basic blocks. Automatic construction of various sizes, also called grading in Grafis, is subject of the third part of the chapter. In the following chapters you will learn about the modification functions in Grafis.

Please use the detailed exercises at the end of this chapter to consolidate the acquired knowledge. If you follow the instructions in this chapter your screen will display the graded basic block shown in this picture.
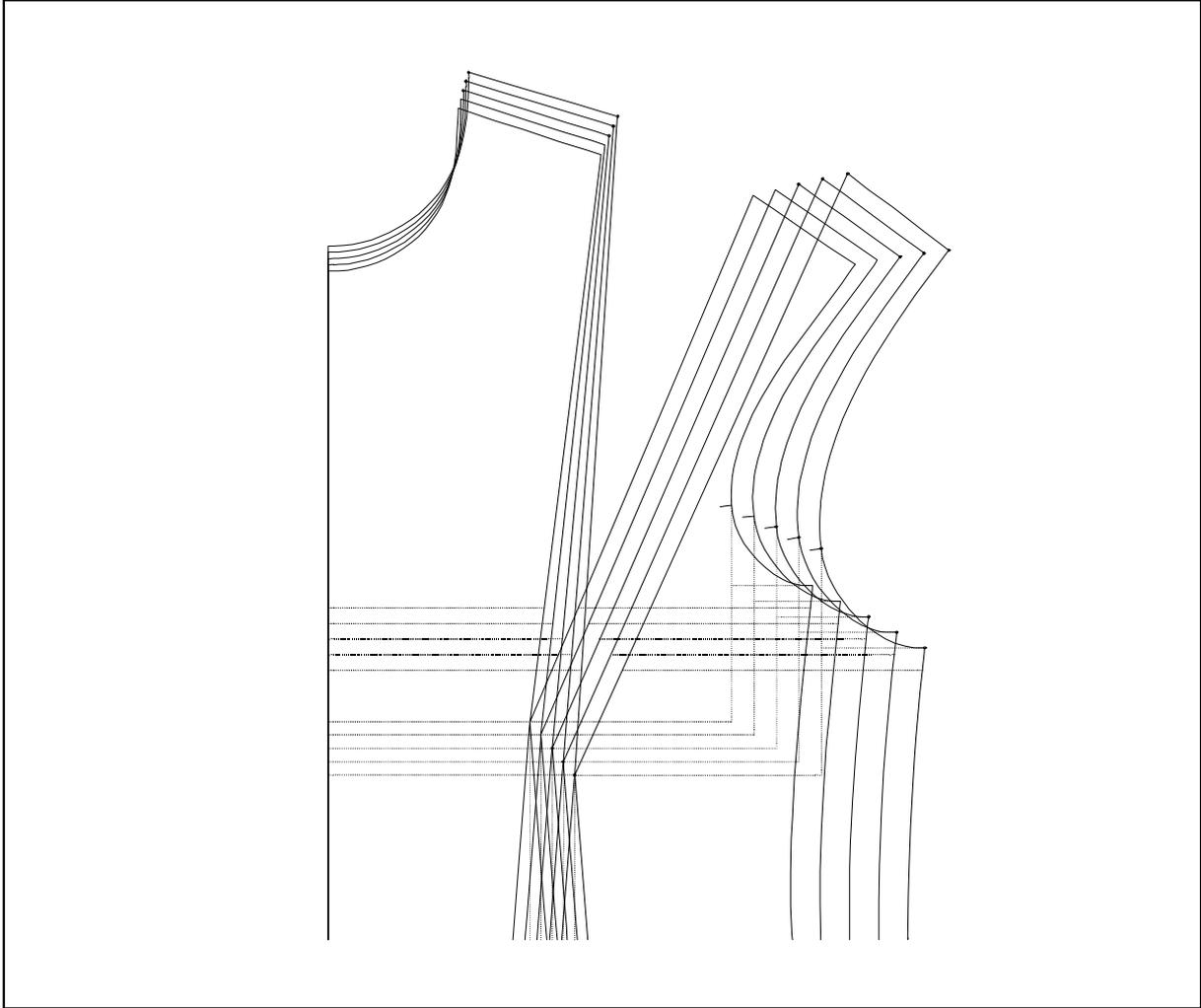
2.1 Work with measurement charts

The construction principle and the generation of measurements

Grafis works according to the same principle described in textbooks for pattern construction, using the computer. First patterns are created in three stages.

First stage: At the beginning of the pattern construction the measurements are drawn up. These measurements include the body measurements of the person to be dressed, either measured on the person according to given measuring rules or taken from a size table.

Second stage: A basic block is drafted on the basis of these measurements, applying set construction rules incorporating posture, ease, technological aspects etc.

Third stage: The production patterns are derived from the basic block.

Thus, the construction principle does not require grading increments. The basis for generating the first pattern in the different sizes are measurements, given in Grafis in form of *measurement charts.*

Measurement charts in Grafis

Measurement charts can be generated for standard sizes and individuals. They are accessible at all times. Measurement charts are valid for one specific construction/measurement system (e.g. measurement system for men, women or children). It is also possi-

ble to implement own measurement systems into Grafis. This feature is especially used by the industry. Selection of the construction system ensues when starting Grafis, already (see paragraph 1.2).

Grafis distinguishes between **standard measurement charts** and **individual measurement charts**. Standard measurement charts contain the measurements for standard sizes. The values in these charts cannot be altered, they are given by the standard sizes. Individual measurement charts contain taken body measurements or company specific measurements which can be altered at any time. This applies to the names of the measurement charts, also. For standard measurement charts the name is set, for individual measurement charts it can be selected.

Opening and processing measurement charts (picture 2-1) ensues via the pull-down menu *Extras | Edit Measurement Charts.*

Generate standard measurement charts

Step-by-step guide
⇒ *Extras | Edit Measurement Charts*
⇒ From the option Standard measurement chart / Individual measurement chart select 'Standard measurement chart'
⇒ Select the figure type required
⇒ Enter the required size in the dialogue box 'Size name'; half-sizes are also possible
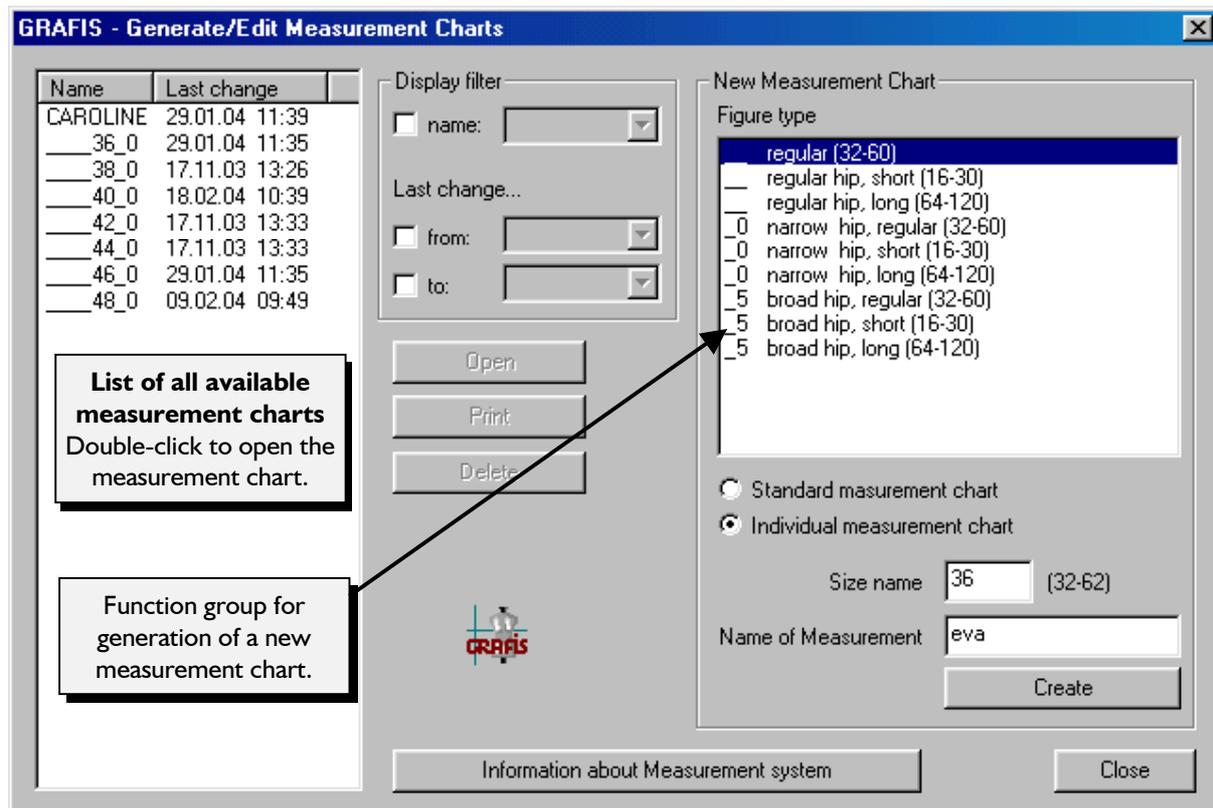
Picture 2-1

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Grafis is installed with one size, only (size 40 in the women's construction systems). Any other size has to be generated.

As well as standard sizes "half-sizes" can be generated, e.g. 39 or 38.7. Grafis calculates the half-sizes through interpolation. When entering half-sizes the point (.) is the decimal point, e.g. 38.5.

The measurement charts are listed alphabetically or according to the date of generation in ascending or descending order. To change the listing click on "Name" or "Date".

In the list of available measurement charts (picture 2-1), the name ____36_0 defines the measurement chart of size 36; ____38_5 stands for the half-size 38.5. In construction system „Hohenstein Women (Damen_5)" a „0" prefix indicates the slim hip figure type, a „5" prefix indicates broad hips, see also table 2-1.

View measurement charts

Step-by-step guide
⇒ *Extras | Edit Measurements*
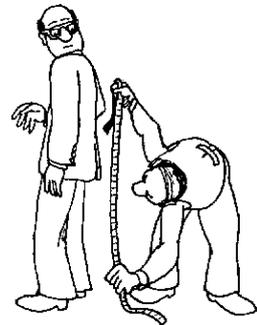⇒ Double-click on the required measurement chart or select the chart and click on "*Open*"

After having double-clicked on the required measurement chart in the list of available measurement charts (picture 2-1), e.g. ____36_0, the measurement chart of the standard size 36 is displayed. Check the entries and compare them with picture 2-2. Quit viewing measurement charts with "*Close*".

Generate individual measurement charts

Step-by-step guide
⇒ *Extras | Edit Measurement Charts*
⇒ Select "Individual measurement chart" from the option Standard measurement chart / Individual measurement chart
⇒ Select the figure type of the person and the best fitting standard size to select the measurement chart template
⇒ Enter the name for the individual measurement chart (e.g. name of the person) in the "Name" dialogue box.
⇒ Edit the individual measurement chart by entering the measurements taken on the person into the table

Select "*Individual measurement chart*" in the measurement chart window. Select the figure type and enter the best fitting standard size for the person for which you are generating the measurement chart. Grafis determines a measurement chart template to save you time and allow for control over the measuring results. Now enter the name of the measurement chart into the "Name" dialogue box, e.g. the person's name or a customer number (max. 8 characters). The provisional individual measurement chart is generated. Now, the person is to be measured.

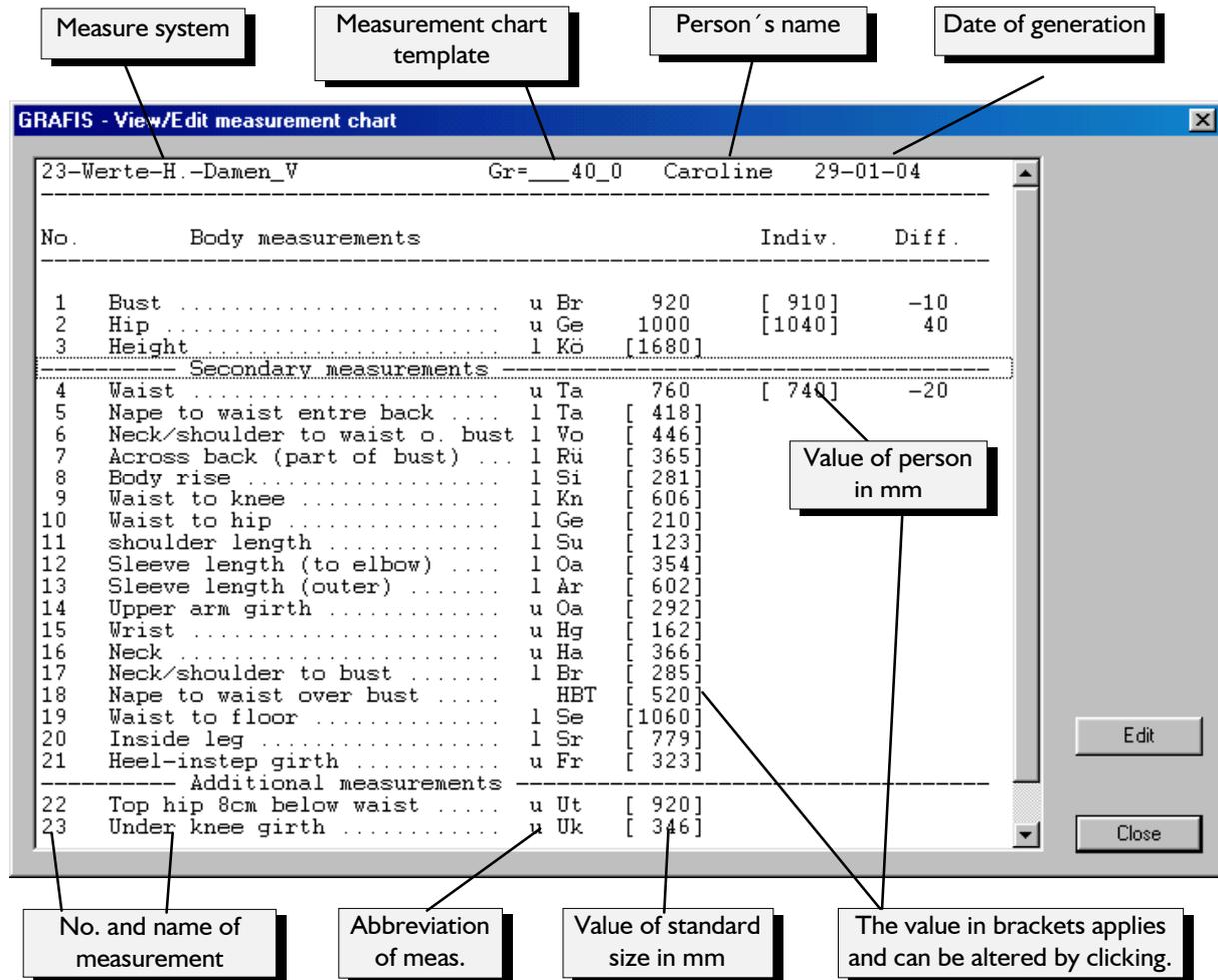### Alter individual measurement charts

Step-by-step guide
⇒ *"Extras | Edit Measurement Charts"*
⇒ Double-click on the measurement chart to be altered
⇒ Double-click on the value of the measurement to be altered or select it and click on "*Edit*"
⇒ Enter new value
⇒ Continue with steps 3 and 4; quit with "*Close*"
⇒ Decide whether or not to save the alterations to the measurement chart

Values can be entered or altered in an individual measurement chart at any time. Double-click on the measurement chart to be altered in the list of available measurement charts (picture 2-1) will display the chart as shown in picture 2-2. The heading shows the date of generation, the name of the measurement chart and the size of the template.

To alter a body measurement double-click on the respective line and enter the new value. Note: all values must be entered in mm! The values in brackets [ ] apply!

The column "Diff." displays the difference between the current value and the template value. Quit the function with "*Close*". You then have to decide whether or not you want to save the changes. ⊞ takes you back to the basic menu.

Alterations are applied to the pattern only after recalculation of the construction. This ensues with clicking on *test run* or *grading*.

Measure system	Measurement chart template	Person´s name	Date of generation

```
GRAFIS - View/Edit measurement chart                                    [x]

 23-Werte-H.-Damen_V            Gr=___40_0   Caroline   29-01-04
 ---------------------------------------------------------------------
 No.        Body measurements                        Indiv.    Diff.
 ---------------------------------------------------------------------

  1   Bust ...................... u Br    920      [ 910]     -10
  2   Hip ....................... u Ge   1000      [1040]      40
  3   Height .................... l Kö            [1680]
 ----------- Secondary measurements ----------------------------------
  4   Waist ..................... u Ta    760      [ 740]     -20
  5   Nape to waist entre back .. l Ta            [ 418]
  6   Neck/shoulder to waist o. bust l Vo         [ 446]
  7   Across back (part of bust) ... l Rü         [ 365]
  8   Body rise ................. l Si            [ 281]
  9   Waist to knee ............. l Kn            [ 606]
 10   Waist to hip .............. l Ge            [ 210]
 11   shoulder length ........... l Su            [ 123]
 12   Sleeve length (to elbow) .. l Oa            [ 354]
 13   Sleeve length (outer) ..... l Ar            [ 602]
 14   Upper arm girth ........... u Oa            [ 292]
 15   Wrist ..................... u Hg            [ 162]
 16   Neck ...................... u Ha            [ 366]
 17   Neck/shoulder to bust ..... l Br            [ 285]
 18   Nape to waist over bust ... HBT            [ 520]
 19   Waist to floor ............ l Se            [1060]
 20   Inside leg ................ l Sr            [ 779]
 21   Heel-instep girth ......... u Fr            [ 323]
 ---------- Additional measurements ----------------------------------
 22   Top hip 8cm below waist ... u Ut            [ 920]
 23   Under knee girth .......... u Uk            [ 346]

                                                            Edit

                                                            Close
```

Value of person in mm

No. and name of measurement	Abbreviation of meas.	Value of standard size in mm	The value in brackets applies and can be altered by clicking.

Picture 2-2

Print measurement charts

Step-by-step guide
⇒ Click the required measurement chart
⇒ Click *"Print"*

To print standard or individual measurement charts select the measurement chart to be printed and click on *"Print"* (picture 2-1).

Delete measurement charts

Step-by-step guide
⇒ Click the measurement chart to be deleted
⇒ Click on *"Delete"*

To delete a measurement chart select the measurement chart to be deleted and click on *"Delete"*. We recommend removing measurement charts no longer required from the list.

Export/ Import of measurement charts

Step-by-step guide
⇒ *Extras | Export/Import Measurement charts*
⇒ in the left window: select drive and collection **from where** (=source) the measurement charts are to be copied

⇒ in the right window: select drive and collection **to where** (=target) the measurement charts are to be copied
⇒ in the left window: mark the measurement charts to be copied
⇒ Click *copy*

Exercise

Generate the following measurement charts:
• normal 34, 36, 38, 42, 44 and 46,
• short and long 38 (in Grafis: ____19_0 and ____76_0),
• slim and broad hip 38 (in Grafis: ___038_0 and ___538_0),
• broad hip, long 38 (in Grafis: ____576_0),
• slim hip, short 38 (in Grafis: ____019_0).

Note: the preceding digits are not to be entered. Grafis enters the preceding number automatically. For the broad hip, long 38 click *broad hip (76-90)* and enter 76 as the size name.

Generate an individual measurement chart for Mrs. BERBER. Mrs. BERBER has a "normal" figure and standard size 40 to 42. Alter the following measurements as measured on Mrs. BERBER:

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- Bust: 925mm
- Hip: 960mm
- Waist: 710mm.

Generate individual measurement charts for Mrs. MEIER and Mrs. SCHULZE and alter various values such as bust, hip, shoulder.

Delete the measurement charts of Mrs. MEIER and Mrs. SCHULZE.

Generate your own measurement chart and save it on a disk via *Extras | Export/Import Measurement Charts*

2.2 Basic blocks and size table

Calling the size table

Calling this menu ensues via *Extras | Size Table.* Open the size table and read the explanations in picture 2-3.

The contents of the size table

With each style a size table is saved. Position 01 in the table shows the measurement chart for the pattern development (base size). In the womenswear systems size 40 is entered automatically. The user can enter a different measurement chart as base size (also individual measurement chart) at any time. The other positions can contain all generated measurement charts, e.g. standard sizes (38.0), "half-sizes" (41.4), short/long or slim/broad hip defined standard or "half-sizes" as well as individual measurement charts of persons (EVA).

Pattern development ensues on the base size. Grading means automatic application of the registered construction record to the activated measurement charts contained in the size table. Automatic reconstruction is possible because Grafis has registered all construction steps and repeats those with other measurement charts.

Entry and alteration in the size table

To **enter a measurement chart** click the required position in the measurement chart column. To the right of the size table a list with all available measurement charts appears. Then, click the measurement chart to be entered in the size table. The measurement chart is entered in the size table. A coloured bar indicates the active row in the size table.. After having entered a chart it moves down by one line so that entry can ensue with the next position without interruption. Click the right mouse button to terminate entry.

Picture 2-3

If the required measurement chart is not displayed in the list quit this menu with ⬜ and *"Close"*. Generate the measurement chart as described in section 2.1.

To **delete a measurement chart** from the size table move the cursor to the respective measurement chart, click ⬜ and then immediately ⬜. The measurement chart is deleted from the size table but not from the list of available measurement charts. With new entry in the size table the measurement chart is again available for grading.
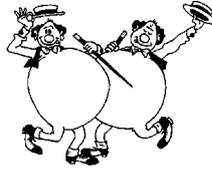
As not all measurement charts in the size table are to be graded each time, a simple **selection option** is integrated in Grafis. The measurement charts to be graded are marked with ">" (activated). To switch between activated and deactivated move the cursor to the respective position number and click ⬜.

A **simple operation** is offered by dragging the mouse with pressed left mouse button. Thus, entries in the size table can be copied quickly to the next position. This applies to the symbol ´<´ and the measurement charts. Consecutive measurement charts from the temporarily displayed lists can be copied to the size table in the same way. Explore these option by trial and experimenting.

Exercise

In this exercise the size table displayed on the previous page is to be generated.

After having opened a new style the size table contains size 40 as base size. Enter size 38 onto the second position. Click the second position in the measurement chart column. The window with all available measurement charts opens to the right. Move the cursor to "___38_0" and click ⬜. The measurement chart appears in the second position of the size table. Click ⬜ to terminate the process.

Click ⬜ on the second position in the position number column or the ´>´ (activation) column and size 38 is active for grading. The activation is confirmed with ">".

Switch between active and inactive by clicking position number 02 repetitively. Deactivate the measurement chart.

Now enter the other displayed measurement charts into the size table in the manner just learned. In position 05 enter your own measurement chart you created in chapter 2.1.

Delete the measurement chart on position 03 by moving the cursor onto the measurement chart in the 3rd line, click ⬜ and then ⬜.

2.3 Grading

Grading in Grafis

In Grafis grading is an **automatic similar construction**. All construction steps of the base size are repeated with the measurement charts to be graded. During construction the succeeding similar construction is to be considered, already. Construction with Grafis thus does not become more difficult but more elegant and more interesting.
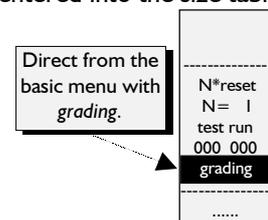
Start grading

Grading is started with:
Basic menu --> grading

Only measurement charts entered into the size table and activated will be graded.

Create a size table according to Picture 2-3 and call the ‚Grafis Bodice 10'. Start *grading*. The bodice construction appears on your screen in the sizes 38 to 46 and your individual measurement chart/ size.

The base size is always displayed in yellow!

Enter another measurement chart in the size table and deactivate the measurement charts already graded. Start *grading* and your screen displays all previously graded measurement charts plus the newly activated measurement chart. Alteration in the size table lead to grading of further measurement charts but not to deleting already graded measurement charts. To refresh the screen *test run* or a different record function from the basic menu must be started. Then you can grade anew.

Exercise

Activate all measurement charts in the size table and grade.

Activate the base size and your individual size only in the size table and grade. Start *test run* from the basic menu and then *grading* again. On the screen you can see the basic block in the base size and your individual measurement chart.

Start other basic blocks and grade them. Reject the graded basic blocks by clicking *N*reset* in the basic menu. Change the size table also.

Note

It is to be recommended to use grading from time to time during construction as a test. A number of extreme measurement charts should be activated in the size table, e.g. 36, 46 and 54.

This allows you to check the construction steps as you go and avoids having to reset at a later date.

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2.4 Adjust interactive construction

Step-by-step guide

⇒ Call construction (see section 1.3)
⇒ Activate construction with double-click or from the overview with <F12>
⇒ Set options for the construction
⇒ Activate drag areas and adjust the construction; use *raster* and also *compare*.

Activate construction

All constructions loaded into the style can be activated with either

- double-click on the respective construction or
- <F12> in the list of interactive constructions (Picture 2-4).
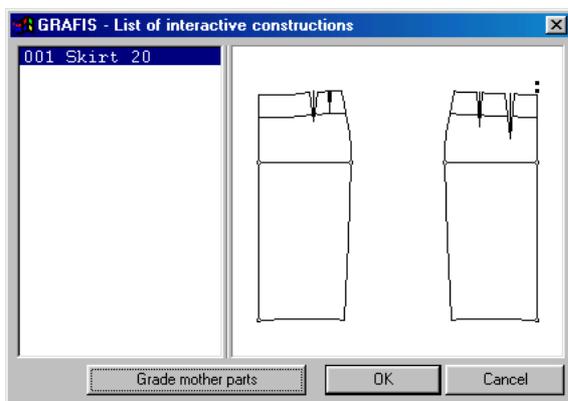
Picture 2-4

The list of interactive constructions (Picture 2-4) contains all constructions called into the style and the number of the part into which they were called. They are listed according to part numbers. The window on the right contains a preview of the selected construction. A construction is activated with double-click or selection and *OK*.

Set options

After having activated a construction the menu displayed on the right of this page appears.
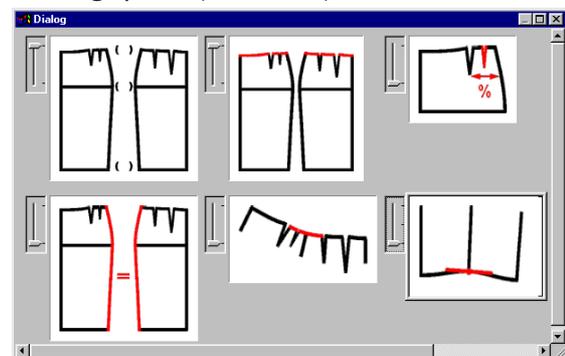
There are a greater or smaller number of options available for each construction. The list of options (Picture 2-5) opens by switching to *+options* in the right menu. The options window can be resized as required. A scroll bar appears at the edge of the window if not all options are visible. The active option is highlighted (Picture 2-5 bottom right). Using the arrow keys, the mouse wheel or altering the slider to the left of the image alters the active option. A different option is selected by clicking.

The alteration of an option is immediately applied to the construction behind. We recommend working with a reduced option window so that you can follow the alterations to the construction.

Exercise

Open a new style and call the basic block „Grafis Skirt 20"into part 001. Activate the construction. Set the following options (Picture 2-5):

Picture 2-5

- contour identical side seams
- adjust waist at side seam: yes
- link hem direction at side seam.

```
shape:
 load
 save
break size
raster:
*00  01  05
 10  25  50
- magnet

- ruler
display:
+values

- comments
- options

- measmnt
  set

- compare
  set

- stack
  set

00  ←  0  →
abort

end
```
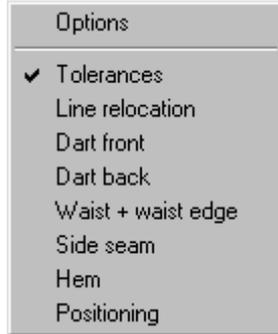
Drag areas

Each construction has one or more drag areas. The drag areas are selected via the context menu which opens with right mouse click. The drag areas were introduced to give greater control so that not too many points can be altered at the same time.

Picture 2-6

After having activated an interactive construction the first drag area is active. It is indicated by a tick mark in the context menu (Picture 2-6).
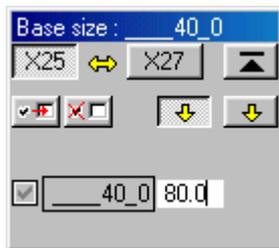
Drag points

In the drag area small red points appear at the construction. With these so-called drag points the construction can be altered interactively. Close to a drag point a symbol at the cursor indicates how this drag point can alter the construction. The following symbols may appear:

	The drag point is moved ...
⊕	free
↔	in x direction only
↕	in y direction only
⊕|⊕	free, symmetrical
↔|↔	in x direction only, symmetrical
↕|↕	in y direction only, symmetrical
|⊕	free, asymmetrical
|↔	in x direction only, asymmetrical
|↕	in y direction only, asymmetrical
	The curve is altered ...
∿	free
∿|∿	symmetrical
|∿	asymmetrical
	The angle is altered ...
◿	free
◿|◿	symmetrical
|◿	asymmetrical
╱	**The point slides along a line.**

A drag point is activated by clicking. The point additionally marked with a green rectangle ⊡ is the **active drag point**.

The **value window** (Picture 2-7) contains the values for the active drag

Picture 2-7

point. Only one or two size-dependent values can exist per drag point. Two values exist only if the point with cursor ⊕ can be moved free in x and y direction.

Dragging a point

Each drag point can be altered
- interactively by dragging the point or
- by entering a value directly into the value window.

When dragging a point interactively the **raster** can be switched on. Click on one of the numbers 00 01 05 10 25 25 in the menu on the right. The active raster is indicated with a * in front of the number. The value attached to the drag point behaves according to the selected raster. To deactivate the raster set it to *00.

With +**values** (after clicking this line in the menu on the right) the value is displayed at the cursor during dragging.

Switch to +**compare** to show a comparison with the state of alteration at the last click of **set** (below +/-compare) or the original state.

By clicking ← or → at the end of the display: section you can **undo alteration steps** or **redo** them. „0" corresponds with the original state.

Save/ load shape

Clicking shape: **save** saves the current adjustments of the construction as a shape. Clicking shape: **load** opens the list of available shapes for the construction. Shapes are saved with date, time, computer name and user name. Double-click opens a different shape from the list.
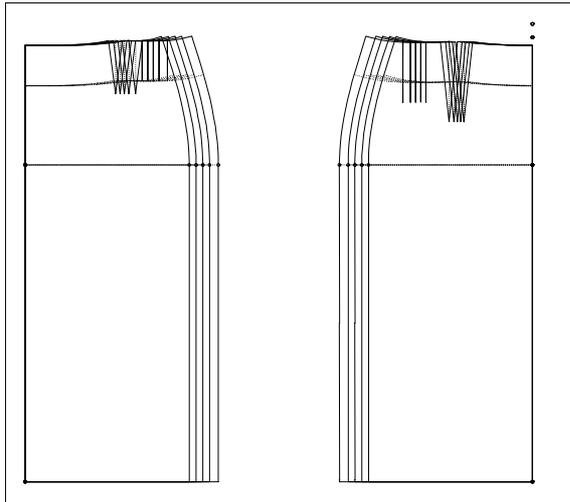
Exercise

Adjust the following on the prepared „Grafis Skirt 20":
- the skirt length to 650mm in the „relocation" area
- close the 2nd dart in the „front dart" area
- close the 2nd dart in the „back dart" area
- the side seam adjustment to 0mm in the „hem" area

Save the adjusted shape and the style as „straight skirt". It will be the basis for exercises in the following chapters.

Grade the construction in the sizes 38 to 46. The result is shown in Picture 2-8.
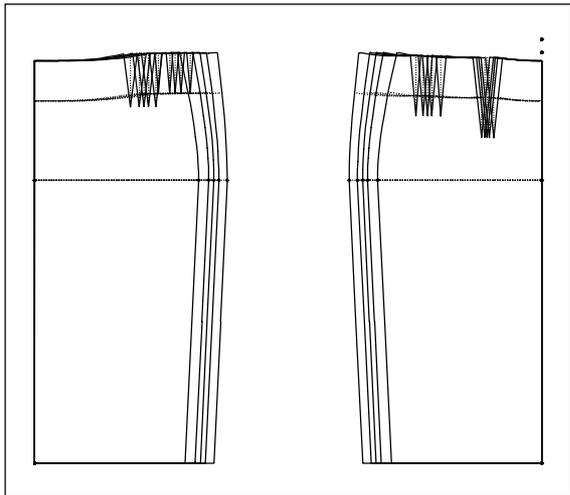
_____

Picture 2-8

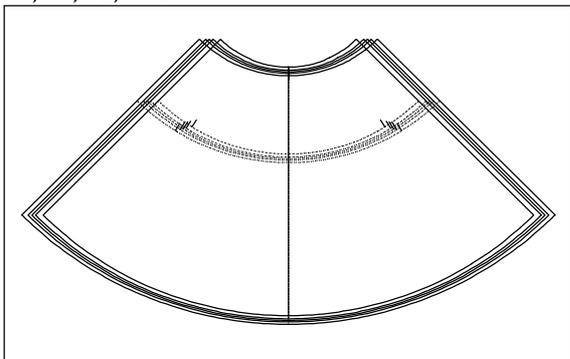## 2.5 Exercises

<u>1st Exercise</u>
Grade the basic block „Grafis Skirt 20" in the sizes 38, 40, 42, 44 and 46.
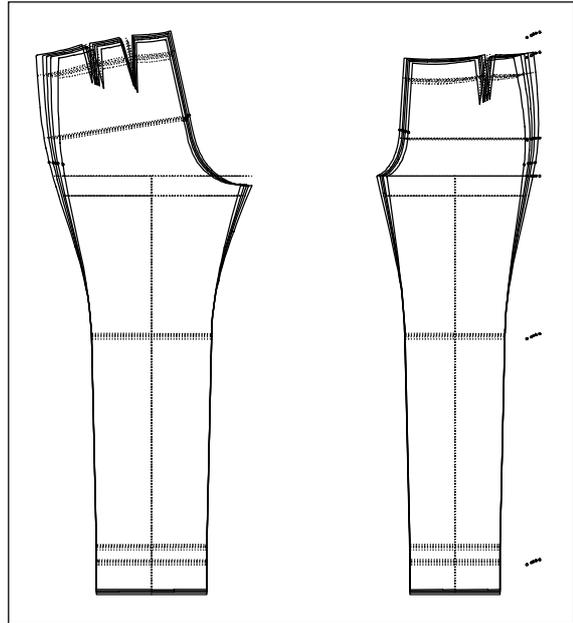

<u>2nd Exercise</u>
Grade the basic block „Grafis Skirt 10" in the sizes 38, 40, 42, 44 and 46.
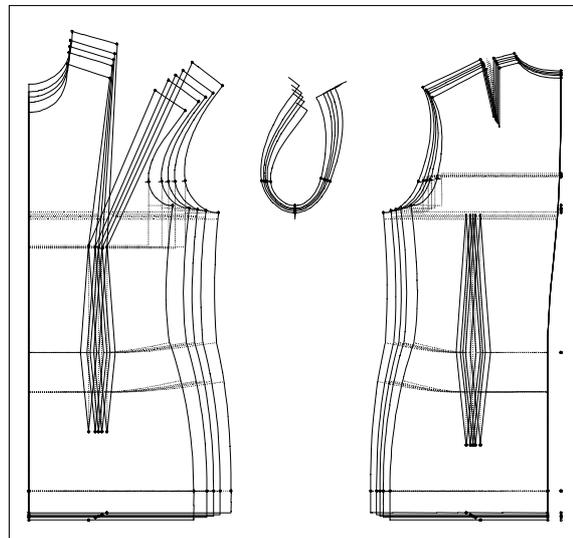

<u>3rd Exercise</u>
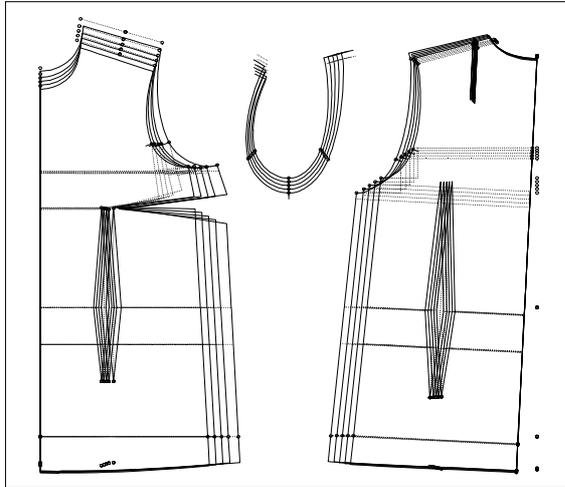Grade the basic block „Grafis Trouser 10" in the sizes 38, 40, 42, 44 and 46.

<u>4th Exercise</u>
Call the basic block „Grafis Bodice 10" and grade in the sizes 38, 40, 42, 44 and 46.

5th Exercise *„Shirt blouse"*

Open a new style, call the basic block „Grafis Bodice 10"into part 001 and activate it. Set the following options:

- Centre Back fold
- Straight side seam
- Bust dart in side seam
- Link hem direction at side seam
- 4 Segments

Adjust the following in the „Tolerance horizontal and vertical"area:

- Tolerance at bust: 100mm
- Tolerance at hip: 100mm
- Tolerance at across bust: 15mm
- Tolerance at across back: 15mm
- Tolerance at shoulder width: 10mm

Adjust the following in the „Bust dart" area:

- Loosen armhole by 25mm

Adjust the following in the „Shoulder dart" area:

- Close shoulder dart

Adjust the following in the „Neckline" area:

- Increase neckline by 5mm at shoulder, centre front and centre back

Adjust the follwing in the „Shoulder" area:

- Relocate shoulder by 10mm to the front

Save the adjusted shape and the style as „Shirt blouse". It will be the basis for exercises in the following chapters.

6th Exercise *„Bodice with vertical panel seams"*

Open a new style, call the basic block „Grafis Bodice 10"into part 001 and activate it. Set the following options:
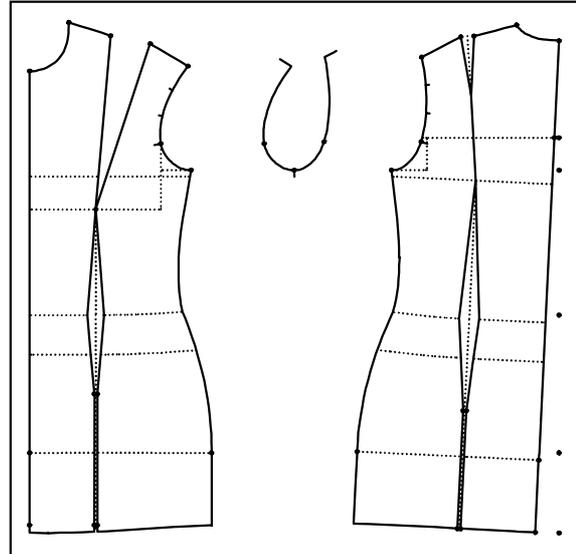
- Centre back fold
- Position shoulder dart as bust dart
- Position waist dart back relative to waist
- Length waist dart to hem
- Link hem direction at side seam
- Panel seam in the back: yes
- 8 Segments

Adjust the following in the „Tolerance horizontal and vertical" area:

- Tolerance at bust: 60mm
- Tolerance at waist: 55mm
- Tolerance at hip: 60mm
- Tolerance at across bust: 10mm
- Tolerance at across back: 10mm
- Tolerance at shoulder width front/back: 10mm

Adjust the following in the „Line relocation" area:

- Length to 750mm

Adjust the following in the „Bust dart" area:

- Position dart at 50% of shoulder seam
- Loosen armhole: 5mm

Save the adjusted shape and the style as „Bodice with vertical panel seams". It will be the basis for exercises in the following chapters.