Chapter 15   Export and Import

**Content**

_____

All Grafis users who deal with production abroad or provide pattern services for companies will have to deal with export and import. As a rule, during data exchange between CAD systems a loss of information occurs as the patterns are reduced to an agreed data format.

During export, the interactively adjustable patterns in Grafis are converted to a contour with grade rules plus additional information on grain line, notches, text and symbols. The exported patterns contain no information on x values, body measurements and piece interdependency.

Patterns from foreign systems can be imported into Grafis only as grade rule patterns. Grade rule patterns consist of a pattern perimeter with grade points. Each grade point is assigned a grade rule table with size dependant point movement in x and y direction.

_____
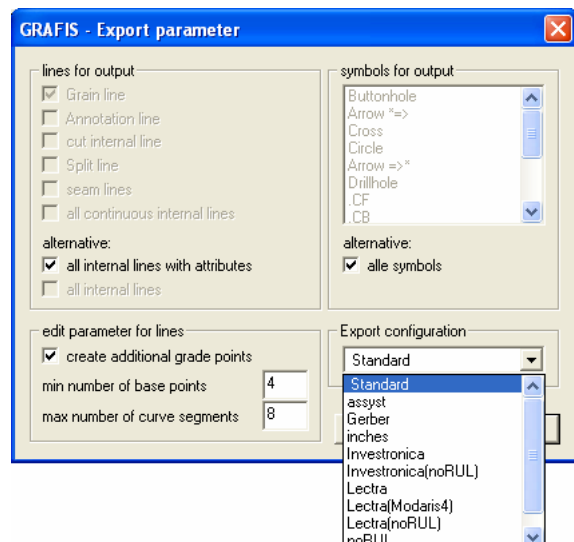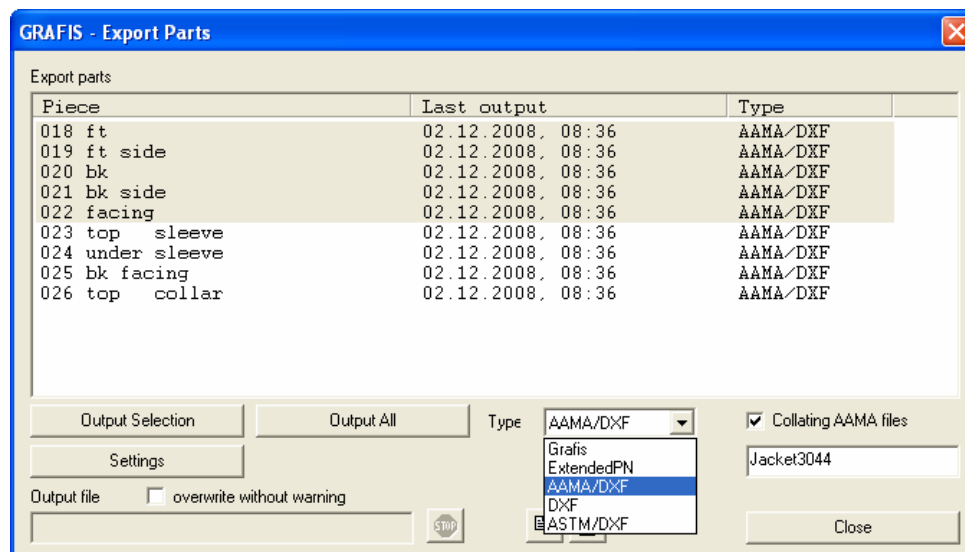
15.1 Preparation for export in the Grafis construction program

Step-by-step-guide

⇒ generate production patterns with closed perimeter
⇒ set grain line as symbol or as attribute line
⇒ set piece parameter *production piece* for all production pieces
⇒ enter all sizes to be exported in the size table and grade all pieces.

Construct production pieces with closed perimeter

During pattern development draft patterns are created from which the actual production patterns are derived, see   chapter 14 Part organisation. Only pieces with closed perimeter can be exported.
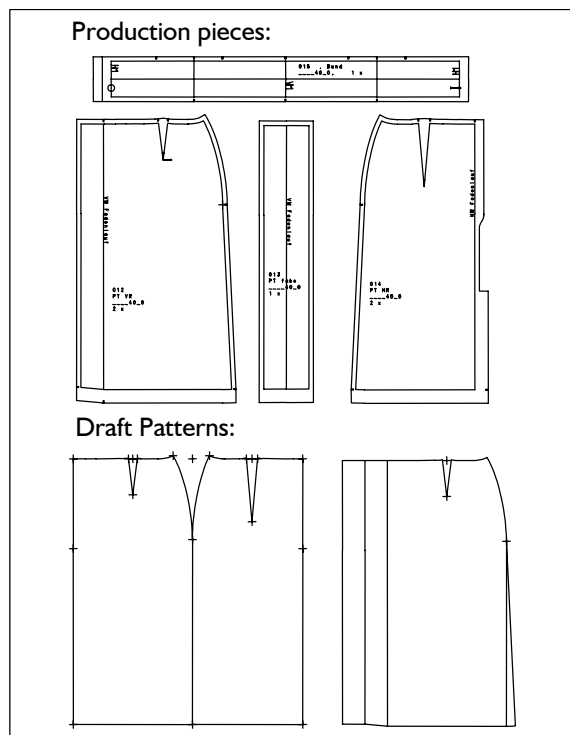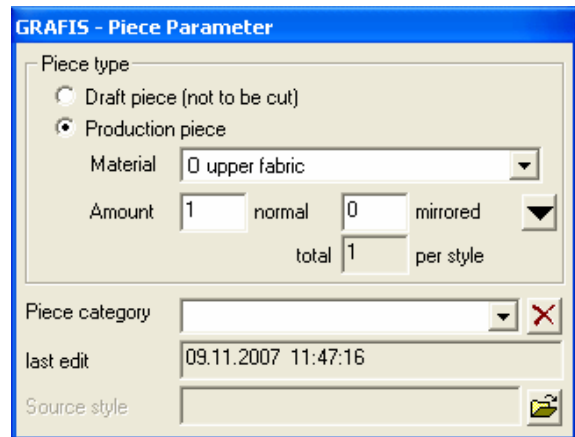

Picture 15-1

Set grain line

The Grafis symbol *grain line* should be set in the pattern pieces. Alternatively, an internal line can be declared as grain line in the *attributes* menu. If no grain line has been set, the negative y direction (direction downwards) is assumed as the grain direction as standard.

Assign piece parameter

In the *part organisation* menu the *Piece parameter* window opens if *+piece param* is selected (Picture 15-2). For export, all production pattern pieces
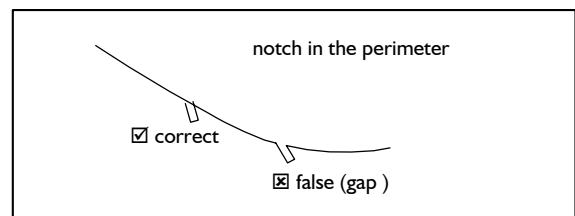

Picture 15-2

must be declared as *Production piece*. Only these pieces can be exported.

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.

Grafis checks for closed perimeter of the pieces when setting the piece parameter *production piece* and again during export. If Grafis finds gaps (>0.5mm) in the perimeter or protruding lines, an error message appears. Gaps can usually be found at corners, joints of lines or at symbols.

Picture 15-3

Line symbols such as notches are ignored during checking of the perimeter (Picture 15-3).

To avoid problems, the straight notch should be used.

To learn about the export function, prepare a simple style with pattern pieces, for example a skirt as shown in Picture 15-1.
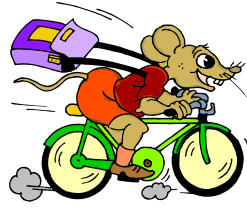
Grade production pieces

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

_____

15.2 Export formats and their particularities

Grafis can export in the following formats:
1. AAMA/DXF
2. ASTM/DXF
3. DXF
4. ExtendedPN
5. Grafis export format

With the exception of the Grafis and DXF export formats, during export, all pattern stacks are reduced to a base size with grade rules. As all sizes are constructed individually in Grafis, this leads to a loss of information. The target system calculates the contours of the different sizes from these reduced data with its own mathematical algorithms. Therefore, the shape can differ from the original shape in Grafis, particularly in extreme sizes.

1. AAMA-DXF

The AAMA format is the currently most widely used format. It is based on the DXF data format used by the AutoCAD software for transfer of vector graphics. The AAMA standardisation determines which content is to be deposited in which DXF data structure (contour, internal lines, notches, drillholes etc.). The contour of the base size is normally written into the .DXF file and the graded sizes are written into a separate .RUL file.

Unfortunately, the AAMA format is not clearly defined in all points so that significant differences may occur during interpretation by different CAD systems.

Grafis has addressed this issue: during export in AAMA/DXF format you can currently chose between ten different *Export configurations*. Which is the correct *Export configuration* in a particular case has to be tested. Information on the formats can be found in the Grafis <F1> help on Chart 41 'Export pattern pieces'.

2. ASTM

The ASTM format is the further development of AAMA format. It is more standardised but not available in all CAD systems. Furthermore, ASTM contains a number of new notch types and supports descriptive text.

3. Extended PN (EPN)

EPN is an interim format determined by Gerber Garment Technologies (GGT). Exactly one pattern piece with all grade rules is captured per file.

An additional conversion is necessary to take these data over to the data base of Gerber Accumark system. More detailed information on export via Extended PN format can be found in the Grafis <F1> help on Chart 41.

4. DXF

The DXF format is used for export of data to engineering CAD e.g. AutoCAD or drawing programs e.g. Corel Draw. The DXF format exported by Grafis uses a small amount of the standardized data types only. Thus, the exported data will be readable in many systems. The single sizes are exported to consecutive layers.

5. Grafis format

The Grafis format is a format for transfer of pattern pieces determined and published by Grafis. All pattern pieces are exported in all sizes with the complete perimeter and all internal objects. The advantage is the accuracy with which the graded sizes can be transferred. No subsequent grading, which could alter the shape of the graded sizes is required. This data format is currently supported by only one foreign system. Further information on the format can be found on Chart 40 of the <F1> Grafis help.

NB: Data exchange with other Grafis users should ensue via: Grafis styles, Grafis styles with reduced pieces, Grafis production styles, Grafis grade rule patterns or Grafis layplans!

6. Other data formats

There is no alternative to the above formats for transfer of pattern pieces in a number of graded sizes.
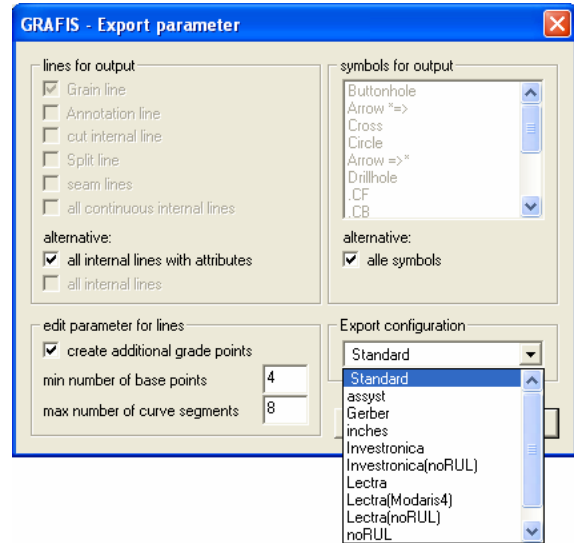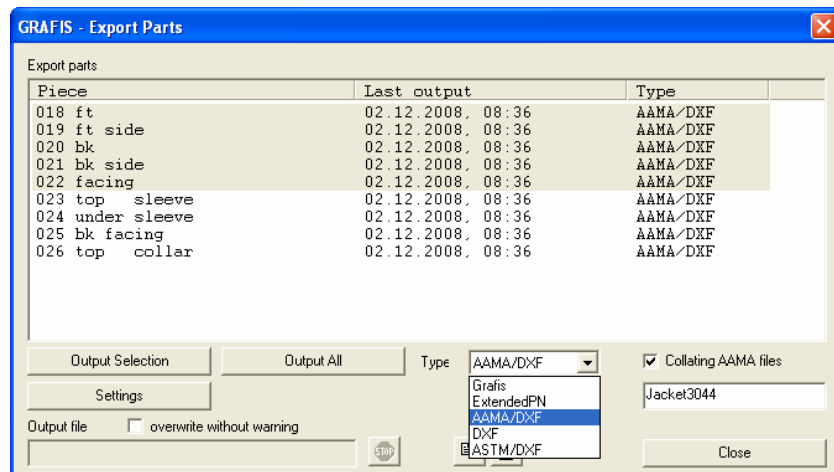
Individual pieces can be output in HP/GL vector graphic format, see Grafis <F1> help Chart 62 "Change Printer/ Plotter | Plot to file".

With the Grafis layplan, data can be output in ISO format to drive cutters. This interface is released for particular cutters as part of a maintenance contract.

15.3 Step-by-step guide for export in AAMA/ASTM/DXF format

This step sequence applies to export in AA-MA/ASTM/DXF format and in Grafis export format. The analogous step-by-step guide for export in Gerber EPN format can be found on Chart 47 of the Grafis <F1> help.

1. Every part of the style to be exported need to be marked as *Production piece* in sub-window *Part parameter*. It is possible that a number of parts are marked as production pieces as the parts will be chosen for export, later.

2. The parts must be available and graded in all sizes to be exported. Select all sizes to be exported in the *Size table* and then start *Grade All Parts* or *Grade Production Pieces*.

3. Open the export dialogue via *File | Export Pattern Pieces*. All productions pieces will be automatically prepared and displayed in all available sizes, see Picture 15-4.

Picture 15-4

4. Choose export type *AAMA/DXF, ASTM/DXF* or in exceptional cases *DXF* or *Grafis*. Please take note of the information about Export pattern pieces on Chart 41.

5. The following dialogue *Export parameter* opens after having clicked the button *Settings*, see Picture 15-5. Depending on the selected format AAMA/ ASTM/ DXF/ Grafis this dialogue differs only in the available export configurations. The information which export configuration is appropriate for which CAD system can be found in Chart 41. Choose the required export configuration and close dialogue *Export parameter*.

6. In the cases *AAMA/DXF* and *ASTM/DXF*: In dialogue *Grafis Export Parts* check if *Collating AAMA files* is active and enter an appropriate name. Only if C*ollating AAMA files* is checked

Picture 15-5

then all selected parts will be combined into one *.DXF file and one *.RUL file. It is important that the name has no more than 8 characters and does not contain any spaces or special characters. Otherwise the file name of the exported files might be changed during transfer by email.

7. Now choose the parts to be exported in the list of parts. Mark an area of parts by clicking the part at the end of the required area with pressed <Shift> key. Pressing the <Ctrl> key marks or unmarks single parts.

8. Then all selected parts will be exported with *Output Selection*. According to the settings under *Export Parameter* the grain line, the symbols and the inner lines are included, also. Alternatively all parts can be exported with *Output All*.

9. The export files are stored in the directory \Grafis\Basis_d\Interfac\Alpha\. The following applies: "Basis_d" is the current measurement system and "Alpha" the current collection. During output this path is displayed at *Output file* lower left of the window.

10. The *.DXF file as well as the *.RUL file of the same name have to be passed on together ideally packed into a *.ZIP file. Both files are complementary. The *.DXF file contains the contour data and the *.RUL file the grade rules of the sizes.

_____

15.4 Special settings and errors during export

Grade points

Grafis interprets each start and end point of a line as a grade point. It is to be expected that these points will appear correctly in the target systems throughout the graded size range. Therefore, it is important that the perimeter of the Grafis pattern is separated at all significant corner points and base points. Internal objects which contain corners or kinks should also be separated at these points. The only exceptions are points with attached notches. All base points of notches are automatically translated into grade points so that their position can be described accurately.

Perimeter

In addition to the separated points mentioned above, the perimeter of the piece must be properly closed. The export function tolerates gaps or overlaps of a max of 0.5mm in the base size. Therefore, it is recommended to close all corners properly with the corners function before export. But the perimeter should not be linked completely! More difficult to find are areas with blunt overlaps. Such sources of error should be avoided during pattern development if possible. They are difficult to rectify using construction methods at a later date. Especially in the graded sizes, blunt overlaps can arise after *link: single* and *parallel* or after *transformation* and *parallel*.

Curves

At *Export pattern pieces* Grafis automatically inserts additional grade points onto the curves so that the curve shapes in all sizes appear largely unchanged in the other systems. It is not necessary to separate the curve manually like in earlier Grafis versions. Only when using *Manual export...* this fact needs to be considered.

Notches and drillholes

During export there is a differentiation between two types of symbols, line symbols and point symbols. Line symbols as for instance the notch are considered in connection with the perimeter or with another base line. Point symbols, however, can be placed in any position inside a pattern piece. The drillhole is an example for a point symbol. Point symbols are divided into directional symbols (grain line, centre back, arrows etc.) and non-directional symbols (drillholes).

Of the different notch types the T notch is most suitable for export. It can be located accurately on the perimeter as the base point is part of the notch line. It can also be used as cutting line for separating curves. When using point symbols it should be considered that not all symbols are supported in the individual data formats. For example, AAMA recognises only one drillhole.

Text

Free text is directly supported by ASTM format, only. In general, only the transfer of part name and style name can be controlled. In addition, the size designation is usually transferred. However, the size does not have to be identical with the original Grafis size designation. Grafis uses the Grafis style name and the part text to determine these designations. Therefore, these designations should have a connection to the designation to be used later in the target system.

Possible sources for errors

For export of individual sizes there are no further sources for errors other than the points mentioned above.

For exporting graded nests the fact that most target systems expect a clear succession of grade points and notches within the perimeter is to be considered in addition to the points mentioned above. It is not acceptable for a notch to be placed exactly on a grade point in one size and slightly off to the side of the grade point in another size. Also, the succession of the points in the perimeter must always be identical. A notch must not move across a grade point throughout the size range! Such errors are reported in Grafis during export (Error 404) and the process is aborted.

Another possible source for errors are points positioned too closely. Gerber cutters often encounter problems if notches are placed closer together than the minimum distance allows. In other cases the import only succeeds if the base points of the perimeter have a minimum distance. If the distance falls below the minimum required relevant messages will appear during export. The limits should be tested before going into production.

_____

15.5 Manual export…

The **manual export** is started from the *File | Manual export…* pull-down menu. Grain line, perimeter, symbols are not automatically recognised but must be assigned individually. The interface file is output immediately. ***Use this variation only if the pattern piece cannot be exported or cannot be exported completely via 'Export pattern pieces'.***

Step-by-step *Manual export*

⇒ *File | Manual export*
⇒ Determine *grain line*
⇒ Determine *perimeter* of the pattern piece
⇒ Select internal lines or all lines for output
⇒ Select point symbols for output
⇒ Check interface file name (Grafis screen upper left) and edit if necessary with *file name*
⇒ Start *output* to interface file

Functions of the export menu

The individual functions and options have the following significance:

grain line

First, the grain line of the pattern piece is to be determined. Click the grain line outside, following the right principle. With this function the grain line can be corrected, also.

text line

This function is active for data export in AAMA format, only. With *text line* the annotation line can be determined. When clicking the right principle is to be considered.

perimeter

Most CAD systems, especially layplanning systems, have a clear distinction between the perimeter and internal lines. Internal lines and symbols must not lie outside the perimeter. In this case the perimeter <u>must</u> be determined. Clicking on *perimeter* opens the respective sub-menu with activated *determine* function. Now, the perimeter of the piece is to be clicked from the outside. It appears as red lines. The *mirror at* function is active for data export in the GerberEPN format, only. With *mirror at* a fold can be determined along which the piece will be unfolded in the layplan.
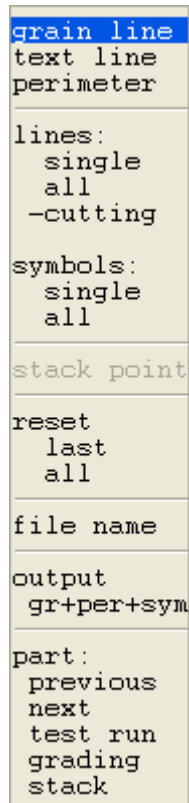
lines

In the next step the internal lines to be output are to be determined. Activating

single	enables output of individual lines to be clicked,
all	outputs all internal lines of the piece.

The +/-*cutting* switch is significant for GerberEPN and AAMA interface formats, only.

symbols

Selection of symbols such as arrows, drillholes, repeat symbols or buttonholes ensues by activating

single	for output of individual symbols to be clicked, separately and
all	selects all symbols of the size.

Notches are output together with the line to which they are attached.

stack point

determines the stack point of the graded nest. The stack point is marked as a round point. The function is active for export with protocol, only. In the other case *stack* is to be used.

reset

last or *all* resets the last selection or all output selection.

file name

Grafis automatically offers a file name for the export file. In a dialogue window the data format and the file name are indicated, constantly. The file name is pre-set with [style name].[part no.], e.g. INES_001.005 for the export file of the fifth part from style INES_001.

The set directory is always [Grafis drive:] \Grafis \[measurement system]\ INTERFAC\ [collection].

If a file with the same name exists already the new data is added (for Grafis data format, only) or overwritten.

A different file name or path can be given with the *file name* function.

output

Clicking **output** starts export of the file.

part:

In the lower part of the function strip frequently used functions can be found:

previous	activate previous part
next	activate next part
test run, grading, stack	

_____

15.6 Import of grade rule patterns

All patterns prepared in one of the export formats listed in section 15.2 can be imported into Grafis. They are imported as grade rule patterns into Grafis. Working with grade rule patterns forms the content of Chapter 16.

Overview of the import data formats:

Data formats with grading information	
AAMA	DXF and RUL or DXF without RUL with all sizes in the DXF file
ASTM	as AAMA
ExtendedPN	EPN
Grafis	001, 002, 003 etc
Data formats without grading information	
DXF (AutoCAD-DXF)	DXF without RUL
HPGL	PLO, PLT, HGL and others
ISO	CUT, ISO and others

Data can be imported into Grafis Construction and into Grafis Layplan. As opposed to Grafis construction, in Grafis layplan the size range cannot not be rebuilt. Only contours contained complete in the file are displayed in Grafis layplan. ***Therefore, import from data formats with grading information must always ensue into the Grafis construction program first. Import into the Grafis layplan program can only serve as a control measure. One exception is 'DXF without RUL with all sizes in the DXF file'.***

Unfortunately, a completely automatic import is not possible. The main reason is that the definition of the AAMA format is not clear and is interpreted differently by different CAD suppliers, see more detailed explanation in section 15.2. In addition, in Grafis the size range must be checked during import.

Step-by-step guide

⇒ Create a new style as the size table is usually altered during import

⇒ Pull-down menu *File | Import grade rule pattern*

⇒ Select file to be imported

⇒ Grafis import now tries to match the sizes in the file to the standard sizes common in Grafis. If this is not possible, a dialogue similar to the size table appears, see further information in the text.

⇒ During import of DXF files, a further dialogue appears with the option to select *AAMA-DXF* or *AutoCAD DXF* as well as other options. If the file comes from a clothing CAD system, select *AAMA DXF*. Otherwise select *AutoCAD DXF*. For your first import attempt leave the options in the dialogue unchanged.

⇒ Grade and check the imported patterns.

⇒ If one of the following discrepancies occurs, repeat import with changed options. Import again into an empty style.

Possible discrepancies in the case of *AAMA DXF*:

• Curves are kinked, not smooth/ soft.

• The piece description in *Grafis- Part organisation* is missing or too short.

• Import of an ASTM file has not worked.

• The perimeter seems to have been imported twice. The lines of the contour are not visible.

• All notches point in the same direction, e.g. all to the right or all upward.

• Patterns appear in the wrong scale.

Possible discrepancies in the case of *AutoCAD DXF*:

• Not all parts are visible

⇒ If error messages appear during import or nothing is imported, import with *File | Import (reduced)*. *Import (reduced)* does not transform the data into a gradeable pattern but shows exactly the content of the file.

Import of HPGL, ISO and DXF data without RUL ensues always into the first size. The size table remains unaltered.
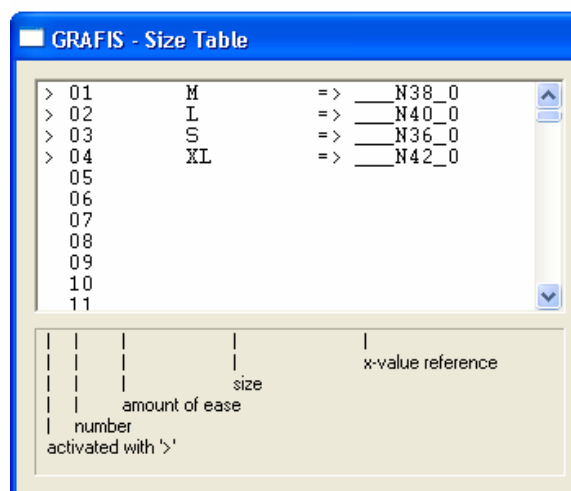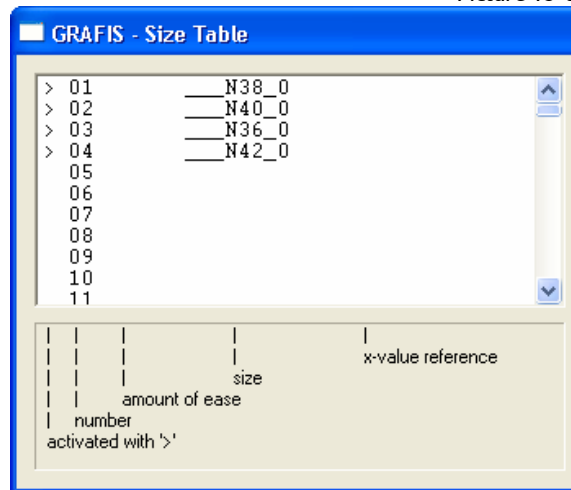
_____

Check size range

To ensure that the imported pattern can be graded in Grafis as a grade rule pattern, the sizes in the file must be assigned to the Grafis standard sizes of a figure type. Normally, an automatic assignment ensues:

- ‚38' is assigned to ‚____38_0' etc,
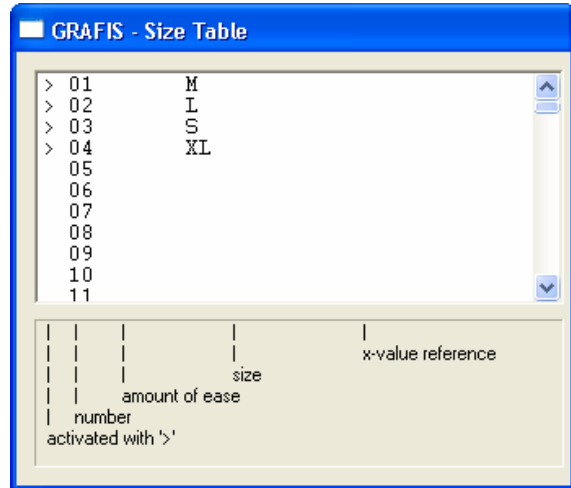
Picture 15-6

Picture 15-7

- In the case of ‚L', it is checked whether an individual measurement chart with and identical name exists. If yes, this individual measurement chart with the corresponding reference size is entered into the size table.

The dialogue in Picture 15-6 appears only if no automatic assignment is possible. In this dialogue it is possible to:

- replace sizes with the corresponding standard measurement charts, see Picture 15-7 top or
- create the missing individual measurement charts via *Edit measurement charts* and enter them into the dialogue, see Picture 15-7 bottom.

NB: During import, grade rule assignment ensues according to the position in the temporary size table. If you alter the order of the sizes at this point, the imported grading is also changed!

The *Grafis Import* dialogue for importing DXF files

The *Grafis- Import* dialogue (Picture 15-8) appears only for import of DXF files. It is required as data could be presented in AAMA or ASTM or AutoCAD DXF format. If the *AAMA format* button is greyed out, no data in AAMA or ASTM format is present. In this case only the *AutoCAD DXF format* option can be selected. Simultaneous with the *Grafis-Import* dialogue, the *Grafis DXF/AAMA/ASTM import* information window appears, containing information from the file.

If the data comes from a clothing CAD system, select AAMA DXF. Otherwise, select AutoCAD DXF.
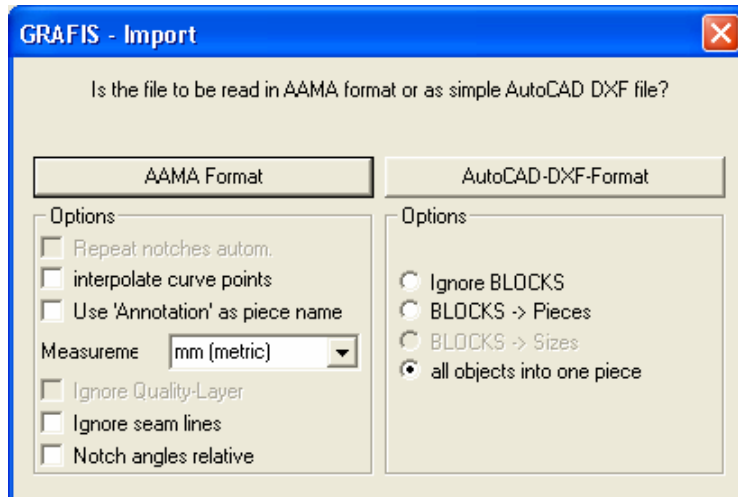
Before starting the import process, you can select different options. For a first import attempt, leave the options unchanged as Grafis has already preset them based on information from the file.

Measurement unit [AAMA/ASTM and AutoCAD DXF]

In the AAMA/ASTM format, normally only *metric* or *inch* is permitted as measuring units. Depending on the CAD system, *metric* could be interpreted in millimetres, centimetres or metres. Therefore, the *Measurement unit* is preset based on information in the file. The user can alter these settings. Entry of a user-defined unit in millimetres is possible. For metres, the value 1000. should be entered.

Interpolate curve points [only AAMA/ASTM]

Depending on the CAD system, sufficient or relatively few curve points are delivered for a curve. Set this option if the curves appear to have been imported slightly kinked during the first import attempt. Additional curve points will be interpolated so that the curve appears softer/ smoother.

_____

Picture 15-8

Ignore seam lines [only AAMA/ASTM]

Some CAD systems export the seam line as well as the contour. If the seam allowance has been set to 0mm, the contour and the seam allowance are doubled up and leave each other invisible. In this case or if too many auxiliary lines have been imported, activate *Ignore seam lines*.

Notch angles relative [only AAMA/ASTM])

Normally, the notch direction is calculated absolute in relation to the co-ordinate system. Some versions of CAD systems interpret this setting as relative to the base line of the notch. Therefore, the following applies: If all notches point in the same direction at the first import attempt, e.g. all to the right or all upward, activate *Notch angles relative*.

Ignore BLOCKS etc. [only AutoCAD DXF]

Only AutoCAD DXF files contain BLOCKS in which lines and points are grouped together. The options for AutoCAD DXF format determine where the BLOCK information is imported. The sizes or pieces could be saved in different BLOCKS or in different layers. If you are unsure how the different BLOCKS are interpreted, first select *all objects into one piece*. This shows everything contained in the file. Then, test the AutoCAD DXF import with all other options one after the other and check with which option all information appears in the desired order.

Additional options in the Grafis.ini [only AAMA/ASTM]

The Dialog.ini file offers a few additional options such as IMP_SIZE_MODE to control the dialogue for checking size runs or MIN_SLITNOTCH and MIN_VNOTCH for the minimum length of notches.

Use 'Annotation' as piece name [only AAMA/ASTM]

In the AAMA format, two text entries are available: `piecename` for the identification of the piece and `annotation` for a description. This switch determines whether the text in `piecename` or in `annotation` is used for the part description in part organisation. Normally, this switch is not set. However, some CAD systems assign `piecename` with very short and not very informative text. In this case, it is advisable to activate the switch.

Ignore Quality-Layer [only AAMA/ASTM]

Only ASTM files contain an additional quality layer. This layer contains the contour with individual auxiliary points and had been introduced as an aid for comparison in the target systems. If a quality layer is available, Grafis uses this more accurate data. If the import with ASTM does not work, activate the option *Ignore Quality-Layer*.