



# *cncCUT*



## Online help

Automatic NC-Program Generation



# Welcome to cncCUT's help files

## General Tips for Navigation of the Program



The screen is split into four frames: The menu to the left [1] with the navigation arrows for navigating the whole help document, and a box for entering a page number.

The top shows the Contents List [2] divided into chapters. The Glossary [4] of the most important technical terms is shown at the bottom. You can switch between the glossary and an gndex in this frame. Whichever you choose, clicking the catchwords will link you directly to the most relevant part of the corresponding help page.

Choosing the Control Method:

There are two ways to navigate the help pages for *cncCUT*.

### 1. Interactive Navigation

This allows you to decide for yourself which texts you need to read. Place the mouse cursor over the rectangles drawn onto the screenshots to get a more detailed description.

**interactive**

or

**contiguous**

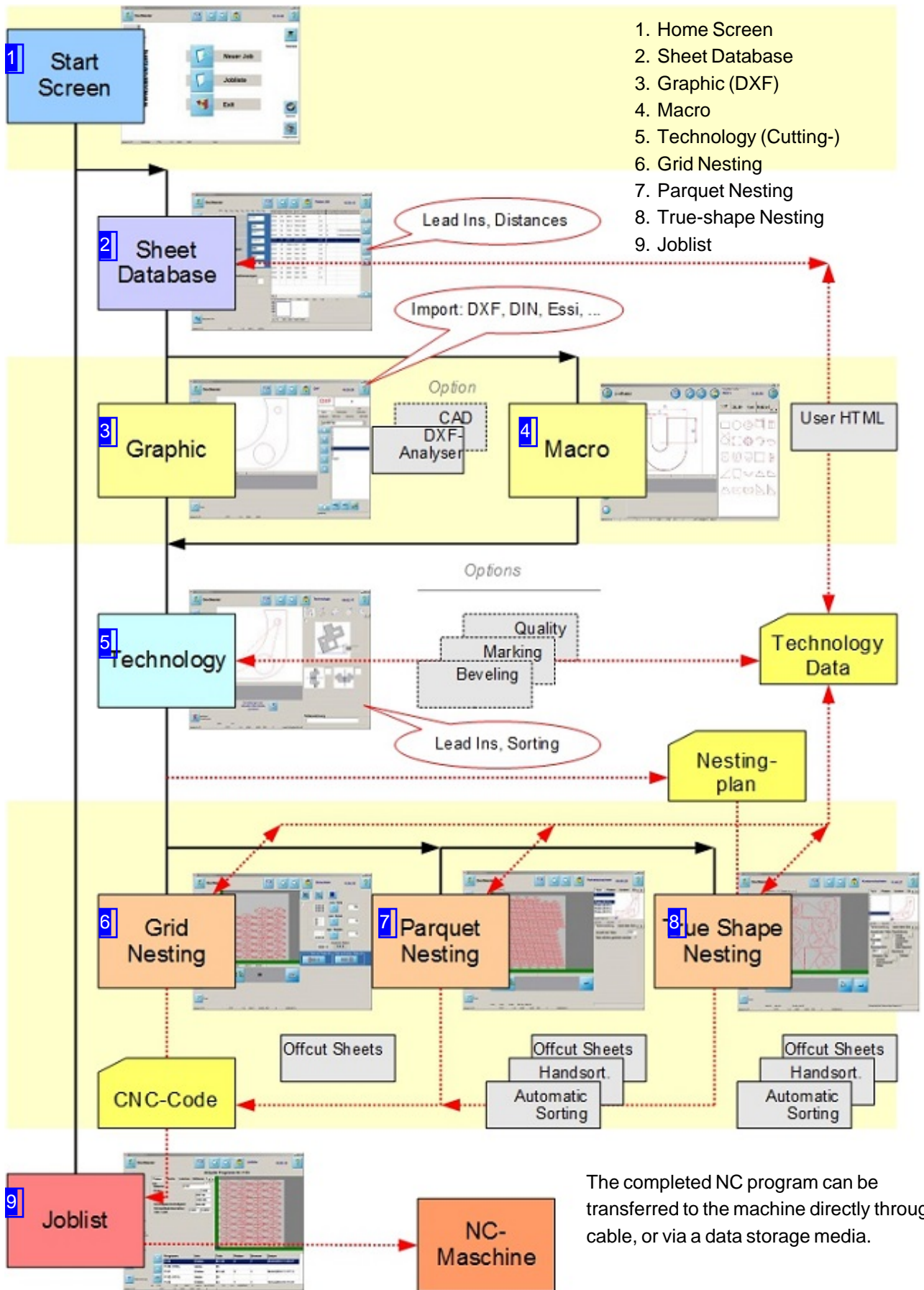
### 2. Continuous Navigation

This mode leads through the document sequentially. All details will be shown one after the other, simply press the 'Next' button (right arrow in the Navigation Panel [1]) to move through the document one step at a time.

### Important Note

The *cncCUT* program is not machine dependant. It offers an abundance of features, some of which will not be supported by your machine. This online help document describes the general functions based upon GUIs which, dependant on your machine, the modules you have installed and your post-processor(s) may appear differently on your copy. The post-processors have their own independent help files.

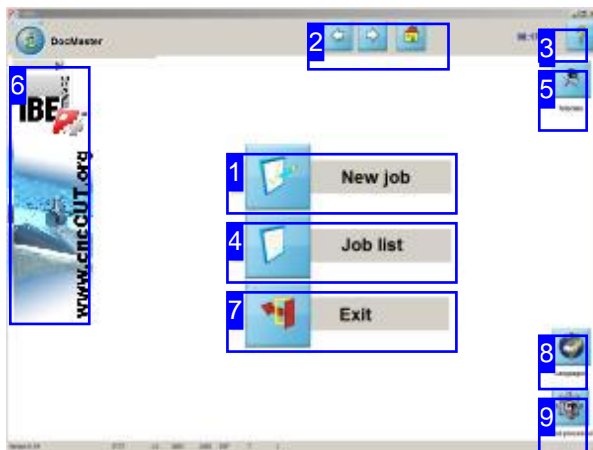
The continuous development of *cncCUT* can also lead to differences between the program's actual GUI and the GUI shown in the online help documents. If this occurs, please check the version and date of the help file against that of the program. If necessary, check our [homepage](#) for a newer version, or contact us.





## The Home Screen

Launch and close the program; navigate the program.



If you currently only own a trial version of *cncCUT* then you will only be able to use a restricted version of *cncCUT*. This means you may use the program for one year with one part and create NC code for parts one at a time. In terms of functionality, the trial version is the same as a full version - it offers everything the full version does, but for just one part at a time.

You can purchase a permanent License for *cncCUT* at any time. Call us or send an email, we are glad to call you back. We are also happy for you to visit our internet site.

The Home Screen is the gateway to *cncCUT*.

- o Get started by clicking either the 'New File' button [1] or "Forwards" [2].
- o The 'Job list' button [4] recalls all jobs that you have done and saved up to now.
- o The 'Help' button [3] opens the help page for the current window.
- o Clicking the 'Home' button [2] brings you back to this page from any screen in the program.
- o The tutorial pages for *cncCUT* can be opened by clicking on the 'Tutorials' button [5].
- o Clicking the IBE logo [6] opens a browser window containing the IBE Software GmbH homepage. You must be online for this to work.
- o Click 'post-processor' [8] to select a new post-processor
- o Click 'Languages' [9] to select a different language
- o Close the program by clicking 'Exit' [7].

1

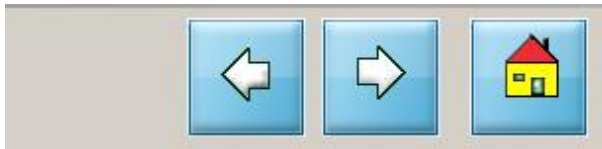


**New job**

Create a new file using this button.



2



These buttons are for navigating the program. 'Back' always takes you back one step in the program, as far as the Home Page. 'Forwards' always takes you to the next step in the work process, 'Home' brings you back to this page, the Home Page, from any other screen.

An additional left button allows you a quick switch to a program predefined by the administrator.

3



The 'Help' button shows the help page for the screen you are currently working in.

4



This button opens the 'Job list', in which all NC-programs you have created are saved.

5



**Tutorials**

You can open the tutorial program for *cncCUT* here. The tutorials teach you through example jobs.



6



If you are online, then you can click the IBE logo to open IBE Software GmbH's web page, where you can find out about our other software solutions for CNC engineering. We also offer nesting software for water, laser, plasma and gas cutting machines, with many options for individual processing and control.



7



In order to close *cncCUT* please press here. The button might be hidden, predefined by the administrator.



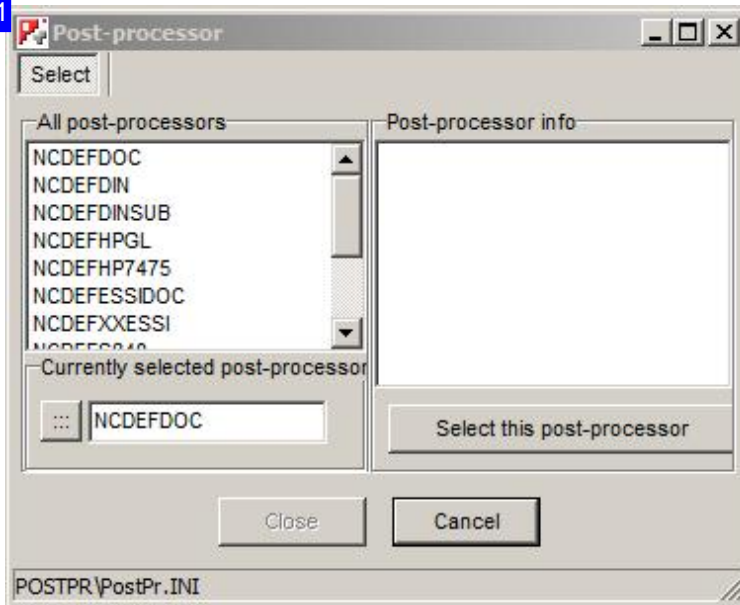
8



**Post-processor**

Clicking this button opens a dialog box for selecting a different post-processor to generate your NC code.

81



The left frame shows you all installed post-processors. Select an item from the list to show its details in the right frame. To switch to the selected post-processor, simply click 'Select this post-processor'. The lower left frame shows the current post-processor. The button to the left of this display opens a dialog which allows you to load a post-processor.ini file. You must restart *cncCUT* when changing post-processors.

9

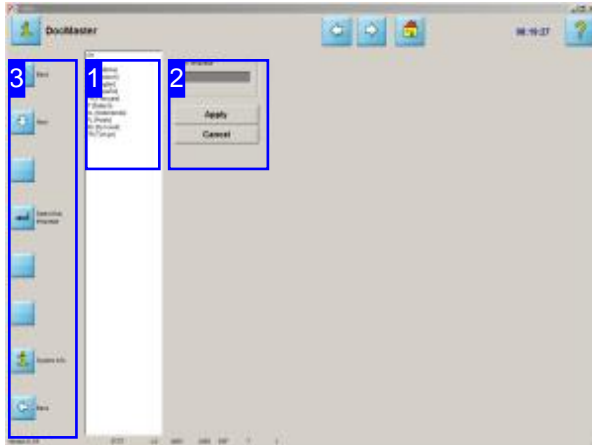


**Languages**

To use the program in another language, click here to open a window with a list of available languages.



## Select a Different Language.



To select a new language, select the required language from the list of available languages and click 'apply' [2]. The program will then restart!

You can use *cncCUT* in many languages. This screen allows you to choose your favorite.



Select the language you prefer to operate *cncCUT* in from the list. The country code for the language will be shown in the 'new language' field [2].





2



The country code for the selected language will be shown in the 'new language' field. To select a language, click 'apply', or the fourth button in the navigation panel [3]. The program will then restart. Click 'Abort' to return to the start screen without making any changes.

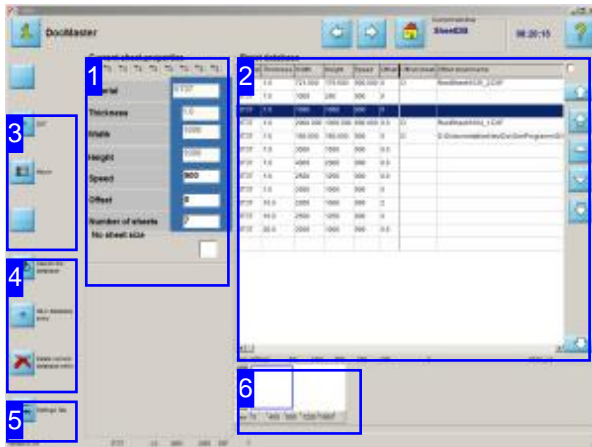
3



The top buttons are for navigating the list of languages [1]. The fourth button has the same function as the 'Apply' button [2]. Click the bottom button to abort and return to the home screen.

# The Sheet Database

## Current Sheet Properties



In this screen you choose the sheet from your database on which to nest. You can also add or delete sheets to your database. Other tabs also allow you to modify sheet properties and post-processor options. You also decide at this point whether to use a part created from a DXF file or a macro.

The sheet database can be managed from this screen.

- o Finding a sheet in the database:  
You can search the database in two ways. Either use the arrows to the right of the database [2], or the 'Search the DB' button in the left navigation bar [4]; this opens a Search window that you can enter properties into.
- o Deleting an entry from the database:  
Mark a database entry and click the 'Delete' button in the navigation panel [4].
- o Adding an entry to the database:  
Press the 'New Entry' button in the navigation panel [4] and use the Input window to add the sheet to the database.
- o Once you have selected a sheet for your work, you should decide on the source of your components. Choose between a DXF file and a macro based part using the navigation panel [3].
- o Use the 'Forwards' button in the top panel to proceed using a DXF file.



**1** **Current sheet properties**

Material:

Thickness:

Width:

Height:

Speed:

Offset:

Number of sheets:

No sheet size

This frame shows you the values for the sheet selected from your database [2].

In the top panel are (post-processor dependant) small buttons through which:

- o The current sheet paramaters can be shown.
- o You can set the lead-in values for a particular sheet, or select default values.
- o The post-processor's variables can be displayed.

This frame's content changes dependant on whether it is being used as the Input frame , Search frame , display frame or the (post-processor dependant) Options frame .

If you would like to use a sheet without limits then check the 'No sheet size' box.

**2** **Sheet database**

Material	Thickness	Width	Height	Speed	Offset	Offcut sheet	Offcut sheet name
ST37	1.0	721.000	176.600	900.000	0	<input type="checkbox"/>	RestSheet1035_2.DXF
ST37	1.0	1000	250	900	0	<input type="checkbox"/>	
ST37	1.0	1000	1000	900	0	<input type="checkbox"/>	
ST37	1.0	2000.000	1000.000	900.000	0.0	<input type="checkbox"/>	RestSheet1004_1.DXF
ST37	1.0	160.000	160.000	900	0	<input type="checkbox"/>	D:\Dokumentation\Neu\Doc\Gen\Programmi\Co
ST37	1.0	3000	1500	900	0.0	<input type="checkbox"/>	
ST37	1.0	4000	2000	900	0.0	<input type="checkbox"/>	
ST37	1.0	2500	1250	900	0.0	<input type="checkbox"/>	
ST37	1.0	2000	1000	900	0	<input type="checkbox"/>	
ST37	10.0	2000	1000	900	2	<input type="checkbox"/>	
ST37	10.0	2500	1250	900	0	<input type="checkbox"/>	
ST37	20.0	2000	1000	900	0.0	<input type="checkbox"/>	

This frame shows the sheet database with available sheets.

Navigate the sheet database with the arrows to the right.

The selection box at the top right allows you to set whether the user's clearance settings should be saved permanently in the registry. Mark the checkbox for yes.



3



Once you have selected a sheet you must decide whether you would like to import a DXF file, or proceed using a macro.

Click the 'DXF' button to import a DXF file. Click 'Macro' to proceed using a macro.

Click the last button ('PPz') to access your post-processor settings. There is more detailed information in the online help page for your post-processor .

4

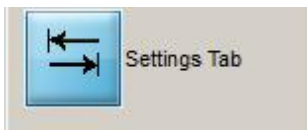


Use the 'Search the DB' button to search for a specific sheet. You may enter your search terms in the Search window

If you want to enter a new sheet, open the Input frame for entering its properties using the second button.

The last button allows you to delete a sheet from the database.

5



Clicking this button scrolls through the tabs in the 'Current sheet properties' frame [1].



**11** **Current sheet properties**

Material

Thickness

Width

Height

Speed

Offset

Number of sheets

If there is not currently a sheet with the correct properties entered in your database, a new sheet can be entered into the database. Click the 'New Entry' button in the navigation panel [4] to do this. The Material, Width, Thickness, Depth, Height, Speed and Cutting-path offset are made available to edit. Enter the required values.

To confirm the new values you must press the 'Enter' button underneath the editable fields. The new set of values will be entered as a sheet in your database, to the right.

The left button 'X' aborts the process.

**12** **Current sheet properties**

Material

Thickness

Width

Height

You can search by material, thickness, width and height. You can select material and thickness from a list; click the arrow next to the parameter to open a corresponding dialog box.

You can search using as many or as few of these variable as you need to. Once you have entered the criteria and clicked the 'Search the DB' button, the sheet database will be sorted by suitability. The search results are displayed in the database frame [2].



**13 Current sheet properties**

Ramp  
 Angle   
 Radius <= corner

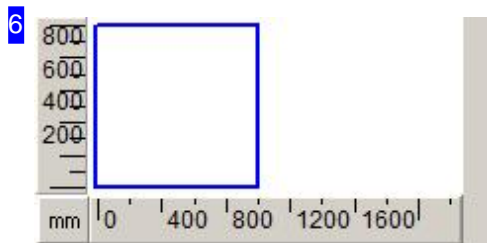
**Ramp element at start**  
 Length of ramp   
 Number of segments   
 Speed %   
 <Lead-in speed> = slow

**Ramp element at end**  
 Length of ramp   
 Number of segments   
 Speed %   
 <Lead-out speed> = slow

**Save ramp**  
 Assign the ramp parameters to the current sheet

These option frames are post-processor dependant. They show the settings for your various post-processors. If this frame is missing then there are no values for your chosen post-processor.

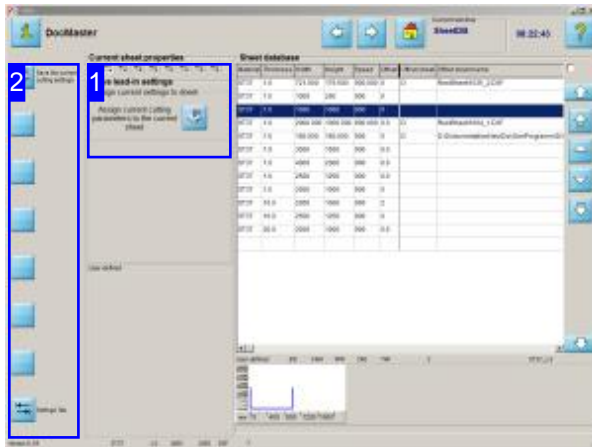
You will find a more detailed description in the online help for each Post-processor .



This is a preview of the sheet selected in the list [2]. This is particularly useful for selecting an offcut sheet. Display of the preview frame is dependent on a setting in your 'POSTPR.INI' file.



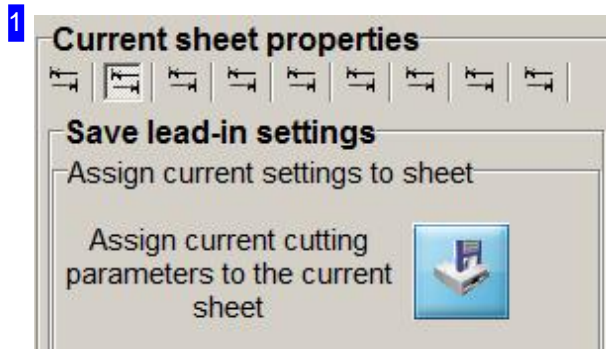
## Save lead-in settings



The settings for your sheet's lead-ins are managed from this screen. You can:

- o save the current lead-in settings to the database.
- o apply the application's pre-set defaults.
- o use your current settings for this sheet.

Each sheet is assigned lead-in settings by the application. These settings can be modified in the program and then reassigned here.



Save the current lead-in settings to the database. The settings will be assigned to the sheet.



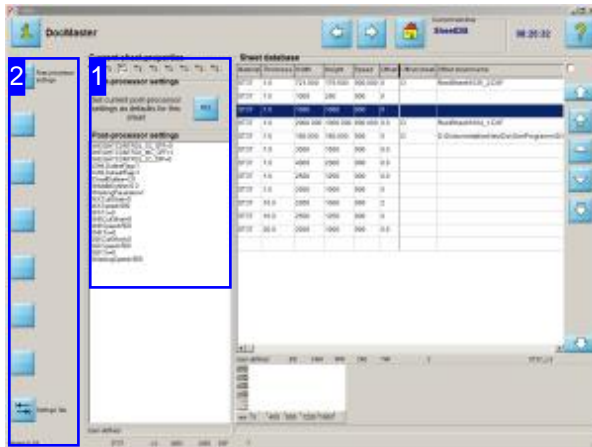
2



These buttons allow direct access to the settings in frame [1]. The bottom button toggles between the tabs in frame [1].



## Setting Post-processor Variables.

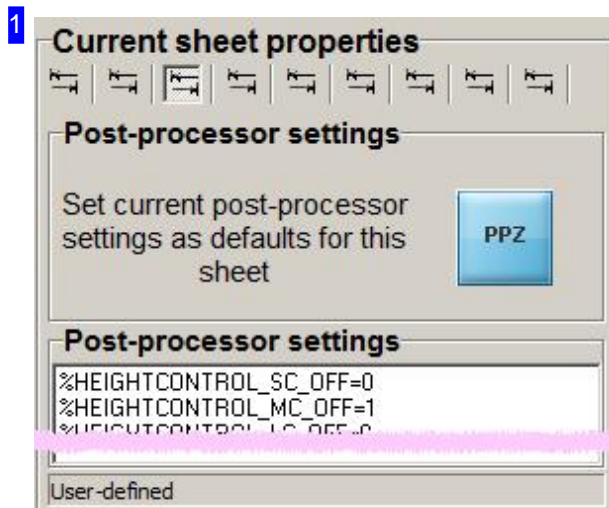


The frames you see here are dependant upon the currently loaded post-processor.

You can use *cncCUT* to operate the post-processors you have ordered from IBE Software GmbH. The post-processors directly influence the work area in *cncCUT*, whereby in some areas the online help pages are dependant upon the currently loaded post-processor.

In order to offer you the correct and most relevant help, you must first select the post-processor you would like to know about.

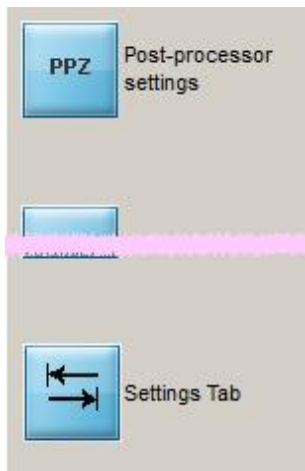
Go to the Selection screen; when you find yourself in the help screen for a post-processor you will see a menu with an orange/yellow background.



This frame is post-processor dependant and will not always be shown. To get to the frames for the currently selected post-processor please select one of the post-processors listed in the Selection screen.



2

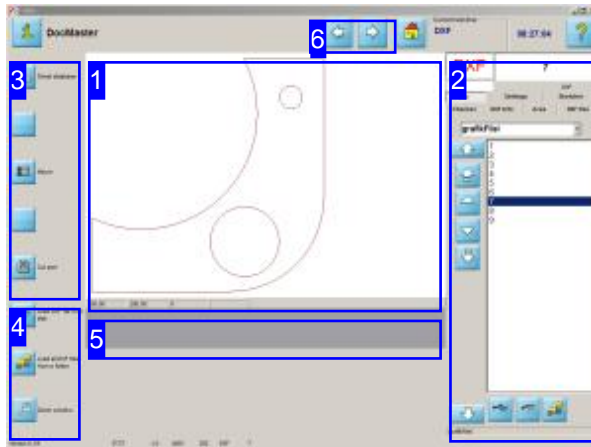


Clicking the top button takes you back to the 'Lead-in settings' window.

Clicking the bottom button takes you to the next tab in the sheet settings frame [1].

## DXF Selection - Choosing a DXF File

Select a DXF file from your stock.



This screen shows you all DXF and DIN files available from your stock. The buttons in the left navigation panel will adapt to the content displayed in the right window. This adaptation takes place when you change tabs by clicking the second button in the navigation panel, allowing full control of the window elements on the control panel version.

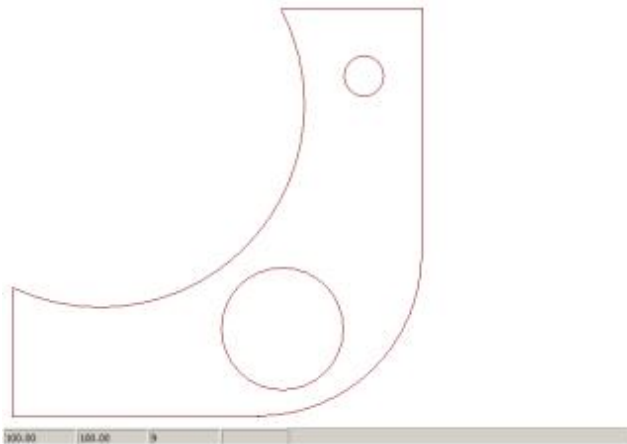
The options available in coming steps is dependant on the version you have. Although the 'Basic version' of the program does not allow true-shape nesting, you can still place multiple different parts in a nest on a sheet. As described under true-shape nesting, these parts can be positioned manually. To transfer parts, mark them in the selection list to the right and go to the next step.

The 'DXF Selection' screen allows you to choose a component from your stock of DXF files.

- o The middle window [1] previews the selected component.
- o The right window [2] shows you all available DXF files in your stock (stored in the 'GrafikFile' folder).
- o You can use the buttons in the left navigation panel [4] to import DXF and DIN files from other sources and import them into your stocklist, and to switch the folder.
- o If you would like a closer view of the part then press the 'Zoom' button in the navigation panel [4]. Take this chance to spot and repair flaws in the drawing file with the DXF checker.
- o The grey field [5] is usually empty. If your component is flawed though, there will be two buttons offered with options for proceeding. Open contours are generally recognised and flagged as errors. If you wish to cut an open contour, then you can use the checker to allocate a specific line type to this contour and use the 'cut open contours' menu to cut these specific types of contour.
- o The buttons in the navigation panel [3] take you to the sheet database or the macro selection screen. The lower button goes to the next work phase: the machine settings window.

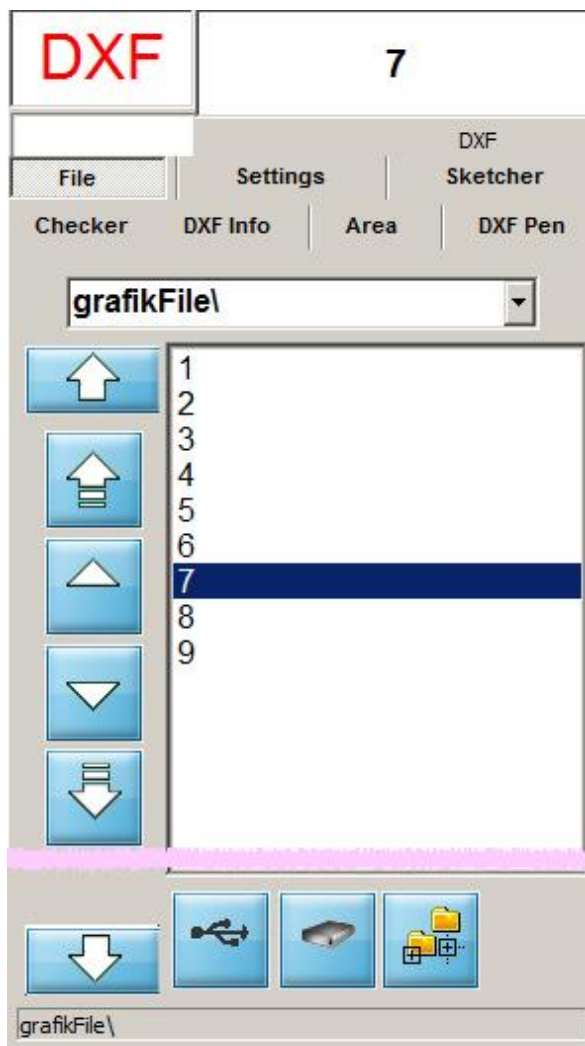


1



This frame shows a preview of your component. If you left-click on the preview this will open the 'Zoom window', allowing you to check the part over in detail.

2



All DXF files in your stock will be shown in this list. Click on your selected component to view a preview of it. The name will be displayed in the field above. If you click a file while holding CTRL, it will be imported through the DWG converter.

The footer panel shows you the path and save destination for your DXF files.

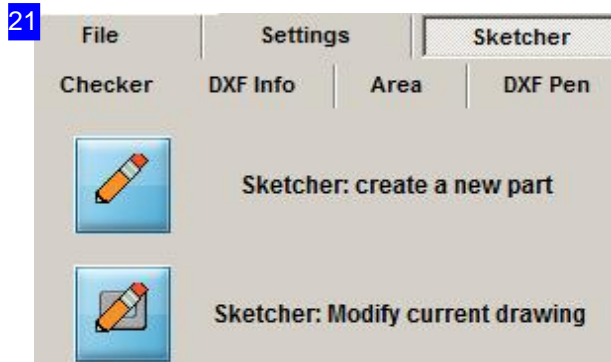
The 'Settings' tab allows you to influence how your components are displayed.

You can allocate technologies to a drawing's layers and line types in the 'DXF Info' tab. Select 'DXF Pens' for colours.

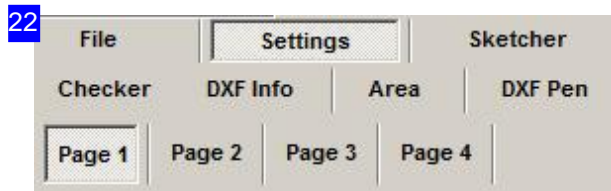
You can use a stretch-box to mark groups which can be deleted or separated under the 'Area' tab.

If you wish to make modifications to the part shown, or create a new part, the 'Sketcher' module offers the functionality you require. To select it, open the 'Sketcher' tab.

Switch to the 'Analyser' tab for a quick analysis of the individual elements.



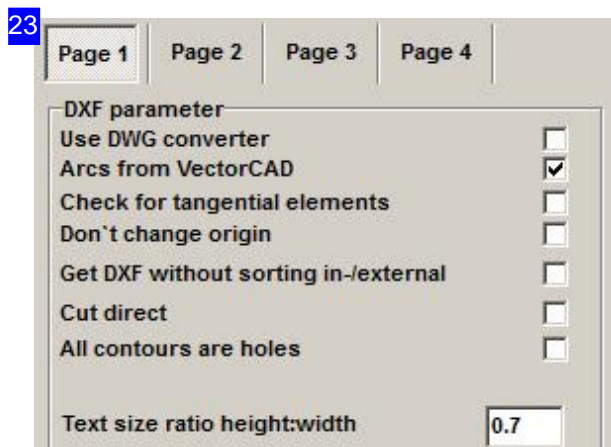
This frame allows you to open the 'Sketcher' module. Click the top button to create a new part, or click the bottom button to transfer the previewed part to the sketcher for editing. The 'Sketcher' module has its own Online help files in which all functions are described in detail.



The first tab allows you to influence the display of your components.

The second tab allows you to set the limits for joining points and vectors; the third tab allows you to scale DXF-drawings. To make single point visible use Tab 4.

If you used the navigation panel to reach this window you will also be able to modify the values using the buttons in the navigation panel.



This frame allows you to influence the display of your components.

- o Using the DWG converter.  
You can convert drawings saved as DWG files automatically. Mark the check box to use the DWG converter, and all files will be imported through it (including DXF files!) You must have the DWG converter installed on your system for this.
- o Get DXF without sorting internal/external contours.  
If a DXF-File's elements are sorted by internal- and external contours, you can suppress sorting. Mark the corresponding checkbox.
- o Apply sorting - cut directly.  
If this box is checked, the program will not sort for you. The parts will be cut directly, usually in the order

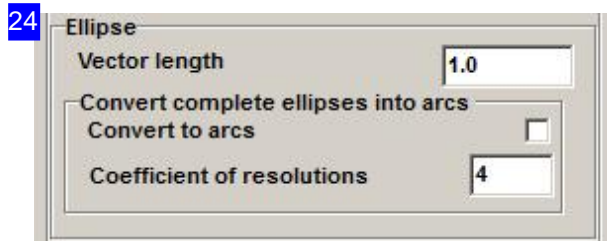


they were drawn.

- o Text line factor height/width.

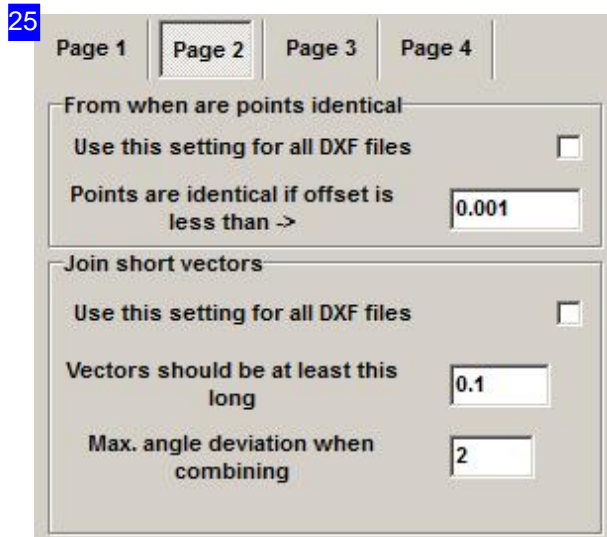
If text strings in markings are too long, you can compress them by entering a scaling factor in this text box. Enter a value less than 1 to compress, more than one to zoom.

Use the next frame for editing ellipses.



Use this frame for editing ellipses and separating ellipses into vectors

The splitting value can be adjusted manually in the 'Vector length' cell. The smaller this value, the finer the ellipse's resolution remains. Smaller values increase processing time for ellipses in your drawing correspondingly. For this reason you should not set too small a value if your ellipse is physically large. Small ellipses will require a small resolution, else they will not appear round when cut.



This frame allows you to set the limits for joining points and vectors.

- o Point limits.

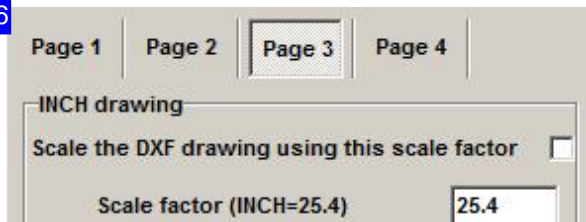
Enter the limit up to which points are to be considered identical. Mark the check box if this limit should be applied to all DXF drawings.

- o Limits for vectors.

Enter the limits of angles and lengths from which vectors should be joined. Mark the check-box if the limits should be applied to all DXF files.

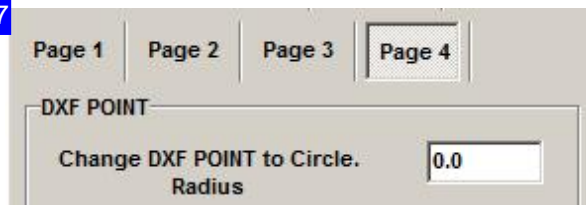


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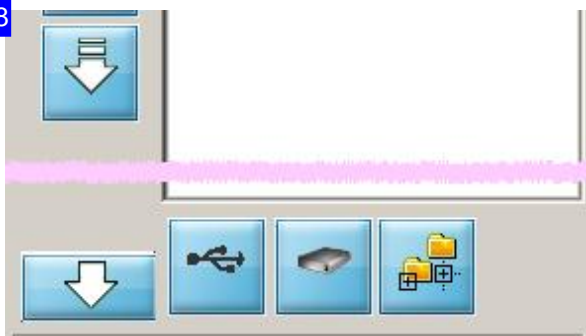
You can set the scaling for DXF files individually. Enter the value in the cell, and mark the check-box to confirm. The setting applies for all further DXF drawings, and so should be reset after use. See the next chapter for more about splines.

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You can make single DXF-Points visible. Enter a radius used for drawing single points.

28



You can use the menu under the list to change the list content in a targeted manner.

- o The left button loads parts directly from a disc drive.
- o Press the middle button if you would like to return to the default folder.
- o Press the right button to add a new component to the list through a file manager window.



3



These buttons are for controlling the program:

- o Press the top button to return to the sheet database.
- o The second button scrolls the tabs in the right window.
- o The middle button take you to the macro selection screen.
- o The bottom button takes you to the program's next step - the cutting technology window.

4



The top button allows you to import DXF files from a different disc drive or folder. A file selector with various file type filters opens for selecting your file. You can order extra file converters as optional extras to cncCUT. Some of these are dongle-protected - eg. DSTV, EPS, and must be enabled through your dongle. You can also open a workpiece which has beveling and was saved as a '\*.LBW' file.

Should you select a '\*.DWG' file, this will be converted into a DXF file if you have the relevant converter installed.

The second button allows you to change folder. Search using a file manager window.

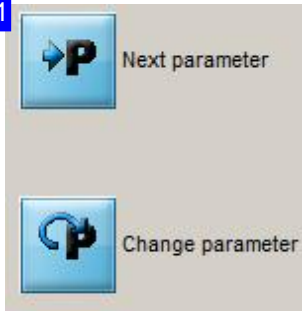
Click the 'Zoom' button to take a closer look at the component. This takes you to the 'Zoom window', which offers many display options and the DXF file fault checker.

Holding the <ctrl> button allows you to save your part.





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The top button allows you to scroll through the current window's elements. Click the bottom button to change a value (eg mark a checkbox).

5



If your component is flawed then these two buttons will be offered to correct it. If you want to target open contours specifically then allocate the contour specific line types using the Checker. These can then be worked directly in the 'Cut pen contours' screen.

Click 'Close contour' to make the program attempt to repair all flaws in the contour automatically. This is however not always possible. If it is not, then you can use the 'Check contour' button to switch to the DXF checker and fix the part.

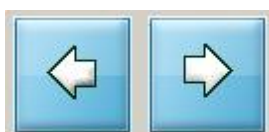
If you have imported a DIN file, there is a possibility that it will be displayed incorrectly. In this case the display is dependant on the relationship between I/J in the file. This frame will then offer two Check-boxes for correcting the relationships between I/J, either relative or absolute.

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These two check-boxes will be displayed when selecting a DIN file, so that you can change the I/J referencing. If the part is not displayed correctly, you may choose an absolute or relative referencing system for I and J.

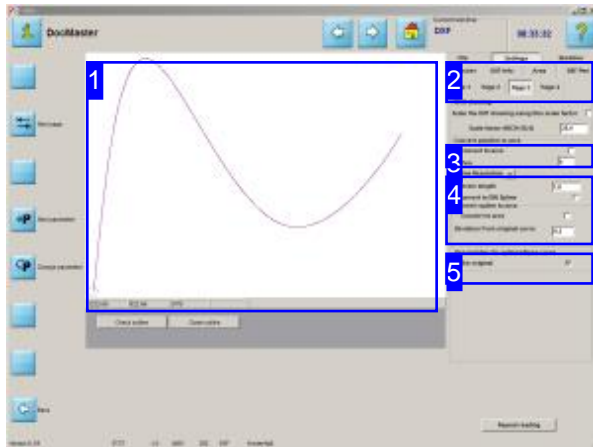
6



These buttons take you back to the Sheet Database, or onwards to the next step - the machine settings window.



## Dissolving Splines

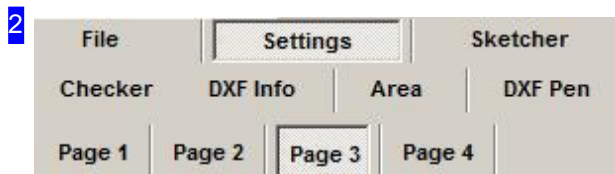


You can dissolve splines by entering new vector lengths and transforming into arcs. You can display the original curve with the new curve to check your settings are giving the right result. In this checking display, the new curve is shown in blue and the original curve in red. Control points can be displayed selectively; mark the corresponding checkbox.

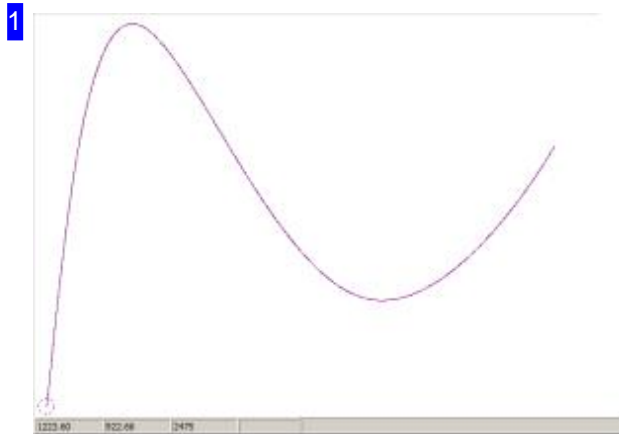
There must be a spline present which needs converting!

This screen allows you to replace an existing spline with an approximated spline.

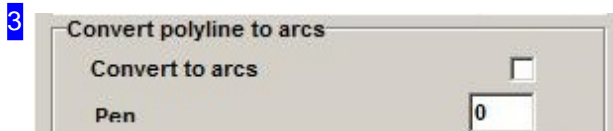
Spline curves are often made up of large collections of tiny vectors, giving them the exact required form. The total number of elements can be drastically reduced using limiting values to create a simplified spline, thus enabling *cncCUT* to process your drawing quicker and easier.



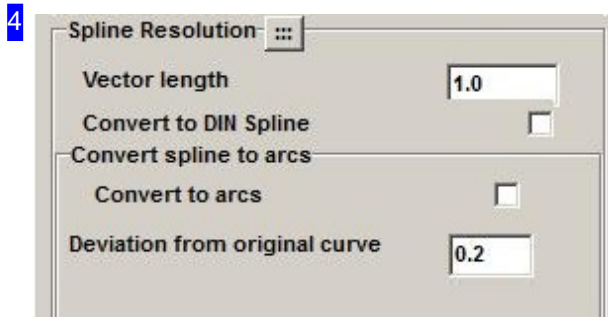
Once you have selected your drawing in the 'DXF selection' screen, switch to the 'Settings' tab and select the 'Page 3' sub-tab.



The preview shows you the new spline (blue) and when the corresponding checkbox is marked, also the original spline (red). You can use the cursor to stretch a box to zoom in on and check in more detail.



If the drawing has polylines, you can reduce the number of elements by converting them to arcs here. Mark the checkbox and refresh the display.



Splines can be dissolved into vectors and arcs. To dissolve into vectors, enter the maximum length. The default value is 1.

The dissolution of splines into arcs requires entry of the maximum deviation of the new curve from the original curve. The default value is 0.2. Mark the corresponding checkbox to convert the spline to arcs.

The textboxes below show the number of elements after dissolution.

- o V: Vectors
- o A: Arcs
- o C: Circles
- o T: Texts

Click the top button to refresh the display.



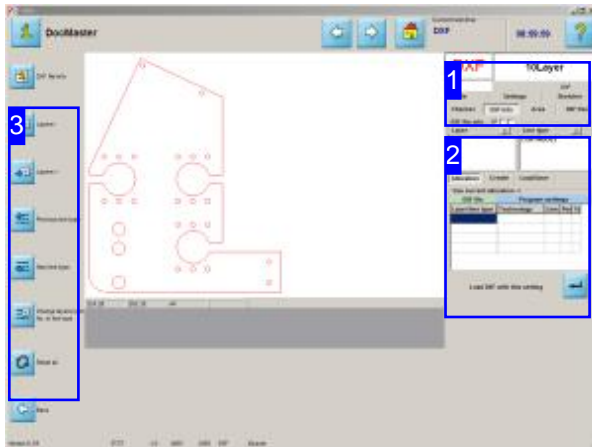
5

Pen number for spline/ellipse curve  
like original

You can use the pen number for a spline from original drawing. Mark the checkbox.

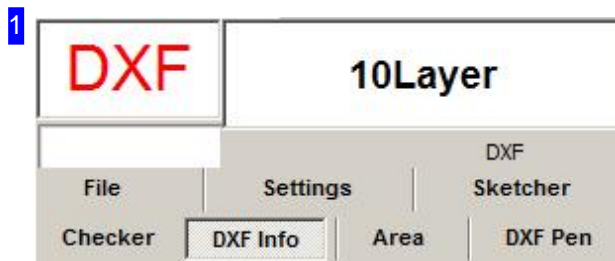


Adjust drawing content to fit the program.



You can select individual components of your workpiece and allocate them technology types here. To activate this feature click on the 'DXF Info' selection box to allocation technology types to certain DXF layers or line types. To manage the drawing's colors click 'DXF Pens'.

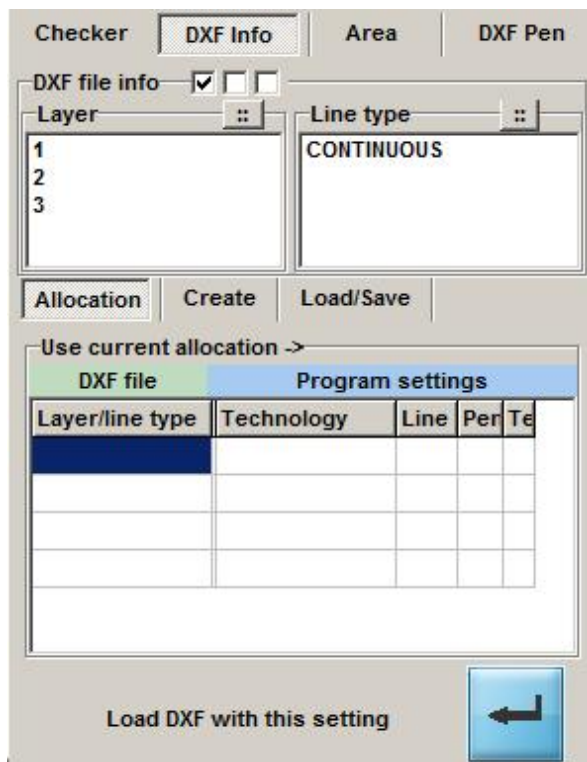
DXF drawings from various sources can contain multiple layers which *cncCUT* as a cutting program cannot separate. Despit this, this screen allows you to use the layers to set pen colors and line types which can be allocated different processing types. The available processes are set in the post-processor's technology table when 'TechCutTypes' is set. The standard processes 'cut' and 'mark' are allowed by default.



The 'DXF Info' tab allows you to allocate technology types to the layers and line types of your drawing. The 'DXF Stifte', tab allows the same for DXF pens.



2

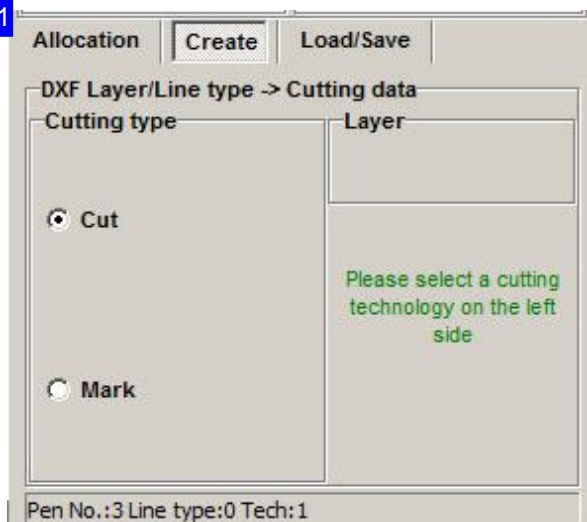


The 'DXF Info' tab allows you to allocate technology types to the layers and line types of your drawing. The 'Layer' frame lists all layers present in the drawing, the 'Line Type' frame lists all line types. The 'Allocation' tab lists all existing allocations in tabular form. The 'DXF File' column to the left shows the drawing's elements, and the columns under 'Program Settings' show how the elements will be processed according to the post-processor info or the default values.

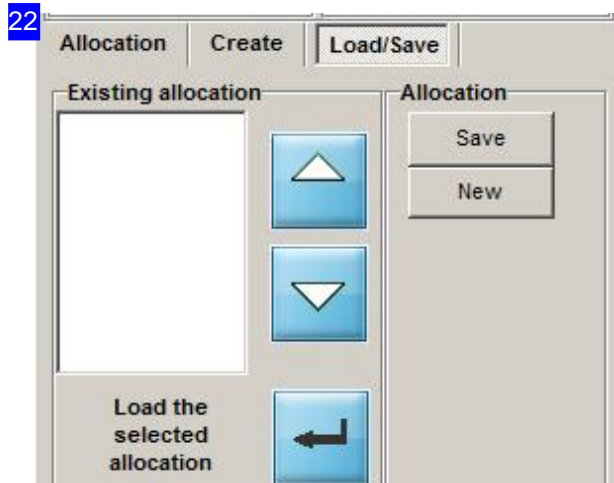
Select one or more layers or line types to work with from the lists at the top. You will then see the 'Create' tab to make your allocations.

Allocations can be 'Load/Saved' ed for future use.

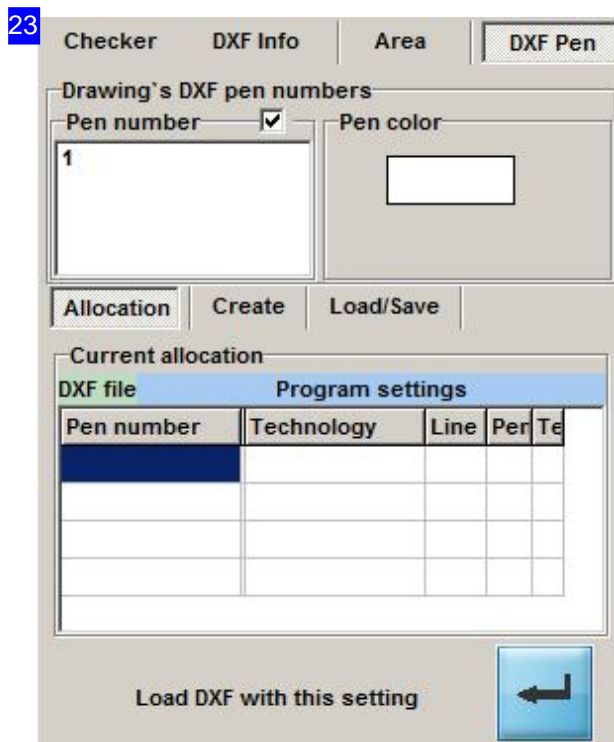
21



The 'Create' tab allows you to allocate a cutting type to the positions marked in the selection lists [2]. The cutting types available for selection are post-processor dependent and displayed only where relevant. The default settings are 'Cut' and 'Mark'. Select the cutting type using the radio button and click 'Apply'.



Technology allocations can be 'Load/Saved' ed to a file for future use. This allows you to use the settings you make for this drawing on another drawing.



To allocate a pen and associated technology data to a drawing color, begin as with line types and layers. The 'DXF Pen' tab contains the relevant selections, with the 'Pen Number' frame showing all pen numbers currently in use.



3

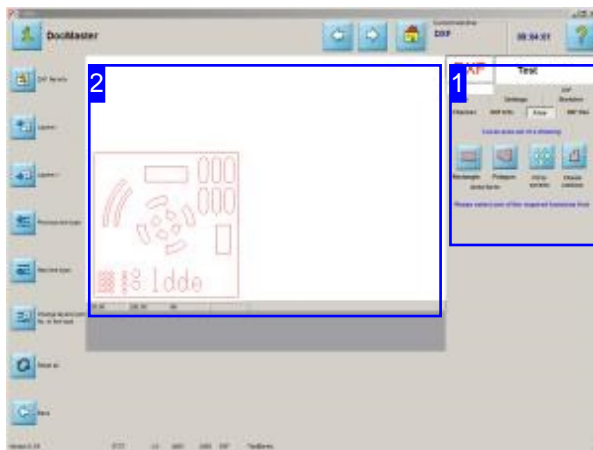


There are context-sensitive buttons in the navigation panel for navigating the selection lists. In the 'DXF Info' tab these are split with the top two for navigating layers and the bottom two for navigating line types. You change the navigation-pad for setting cutting-type or layer with a simple click on the bottom buttons.





## Separate an area of your drawing.

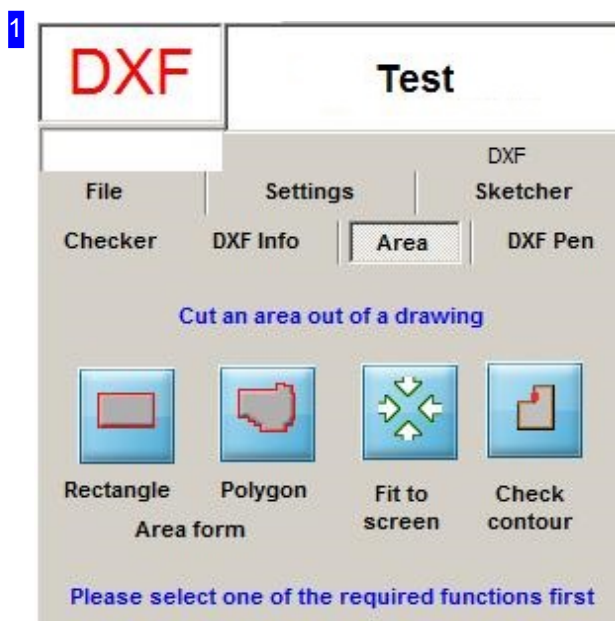


The 'Area' tab [1] contains all functions for separating or deleting areas of your drawings.

First set the method of area marking. You can choose between a rectangle or a polygon.

The preview window [2] shows your drawing with all its individual contours. Use the mouse to mark an area of the drawing.

Drawings may contain many individual elements which are not required for the current job. This screen allows you to delete or disembed an area from a drawing so that you can continue working with the remaining elements.



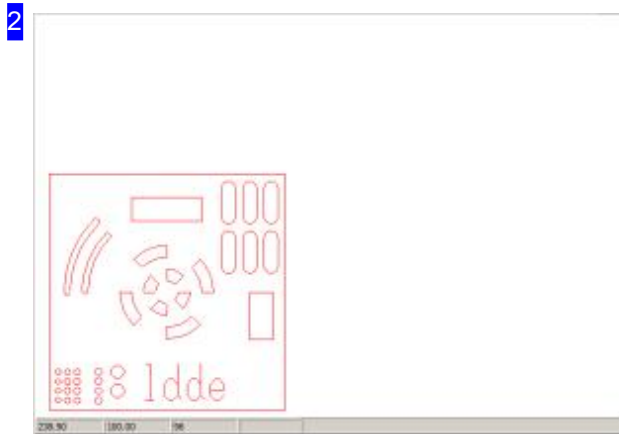
The 'Area' tab allows you to define an area of your drawing whose elements should be disembedded or deleted. The area is defined by stretching a selection box over the preview, or by drawing a demarcating polygon around the area.

The marked area will be scaled to fit the preview window.

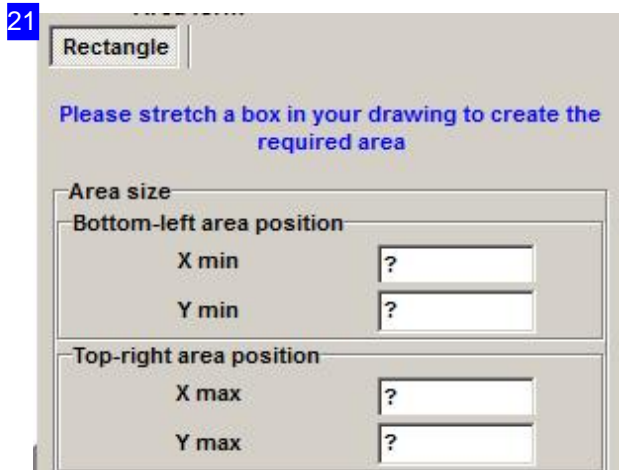
Click the 3rd button to 'see all' again.

Click the right-hand button to determine whether the separated contour is closed.

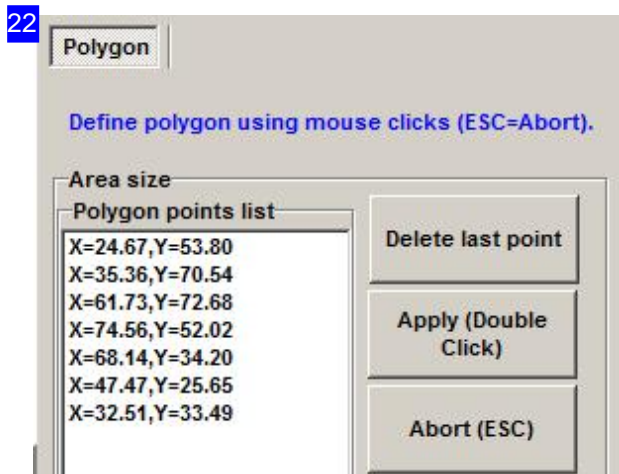
Select the relevant marking function first.



This frame (the preview) shows you the drawing with all its individual contours. Use the mouse to define the required drawing area by dragging a selection box, or by drawing a limiting polygon. Click each point on the polygon, and double-click to finalize the polygon.



The values of a selection box will be shown here. Two selection buttons are offered so that you can either adopt, or delete the elements in the marked area.

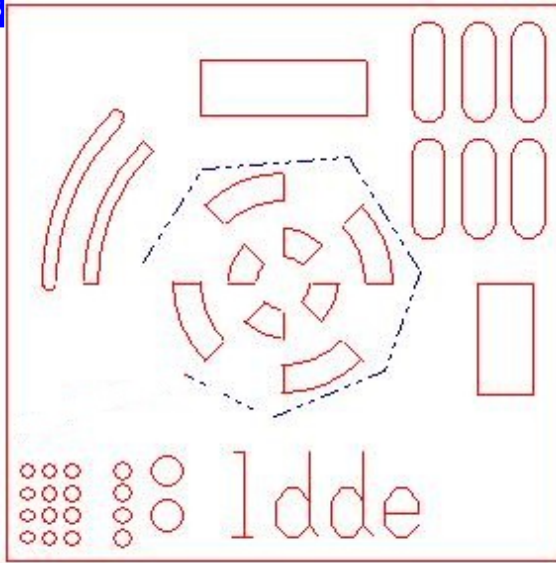


The details of a polygon's points are listed here. Two selection buttons are offered so that you can either adopt, or delete the elements in the marked area.

Press <esc> to abort the function.

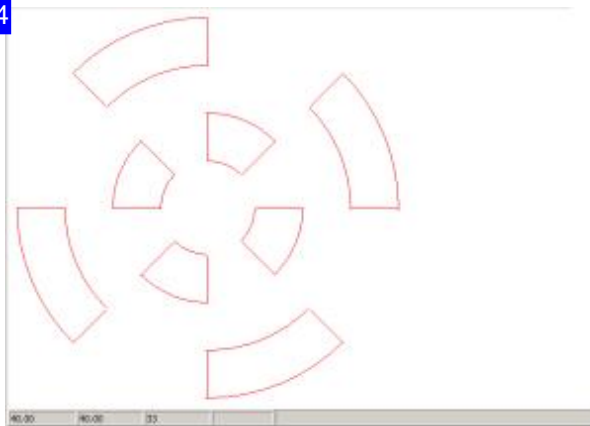


23



A selection polygon is shown on the drawing as a dash-dotted line. The polygon need not be closed in order to define an area. Double-click or select another function to stop adding points, and the polygon will be accepted as-is. Press <esc> to abort the function.

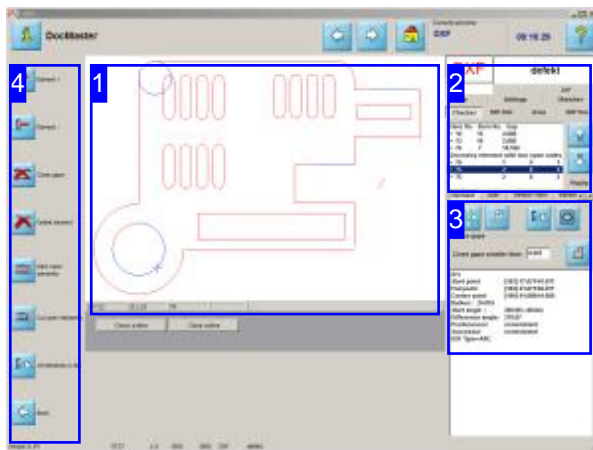
24



'Adopting' the elements in the selection area means separating and those and proceeding with only them for further editing. Insure that all external contours are still closed contours.



## Quick Vector Processing.



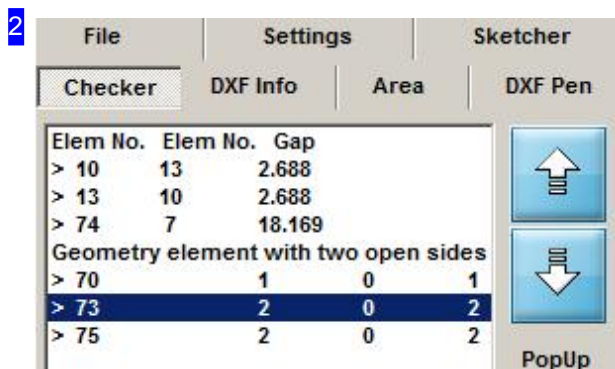
The first time you call this, conspicuous and potentially erroneous items will be shown in the list [2]. The most important steps in this field are:

- o Closing gaps in a contour.
- o Changing multiple smaller vectors into single joined vectors.
- o Changing open contours into markings.
- o Changing open contours into cutting lines.

The 'Analysis' screen allows you to quickly check over your workpiece's elements, and individually fix faulty vectors. The functions are the same as the 'Analyser' but with reduced complexity to give optimum usability without a mouse.

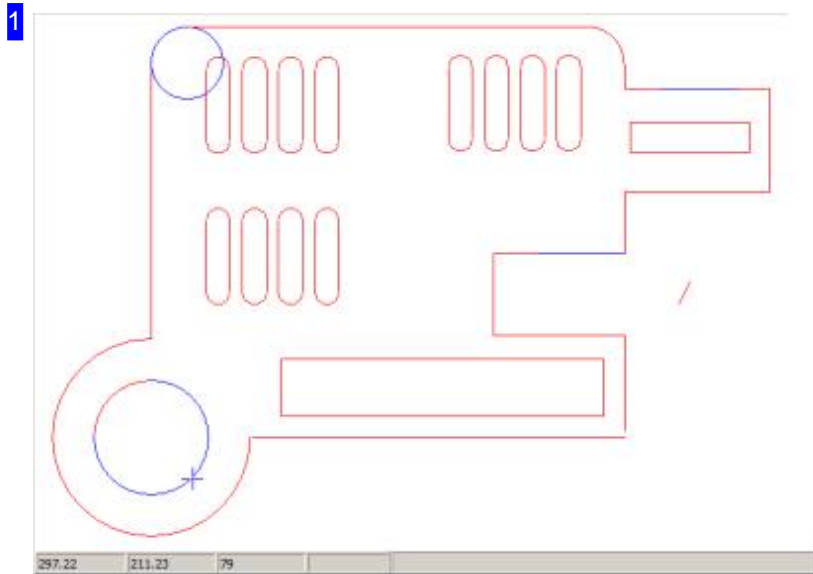
For a wider-reaching functionality, switch to the Zoom window, from which you can access the full Analyser.

When changing lines, line type and colour will be adapted to suit, you can also change them explicitly.

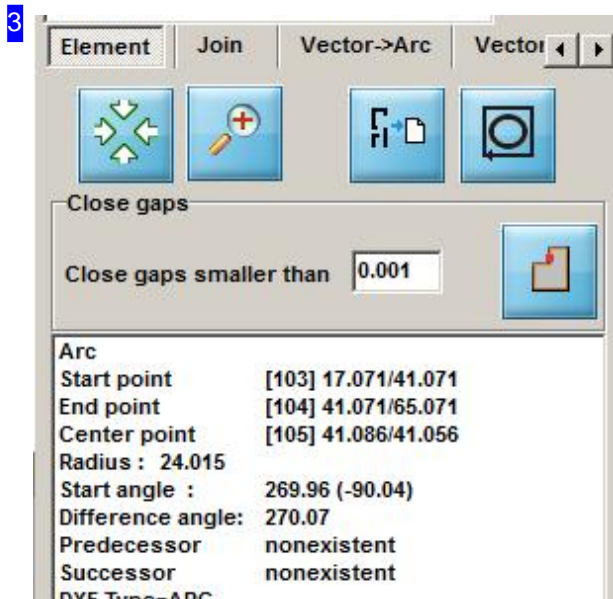


This list shows the contour's elements. You will be given tips about the elements' statuses to help you find and fix any faulty vectors.

The buttons to the right allow easy navigation of the list. These buttons are identical to the top two in the navigation panel [4].



The preview shows you the part in its entirety or, by highlighting in the list, individual detail views of each element. Use the buttons to the left of frame [3] to switch between these views.



This frame gives detailed information about the element marked in the top list [2]. Use the two left buttons in the top row to switch between a Preview of the whole drawing or a detailed view of the highlighted element.

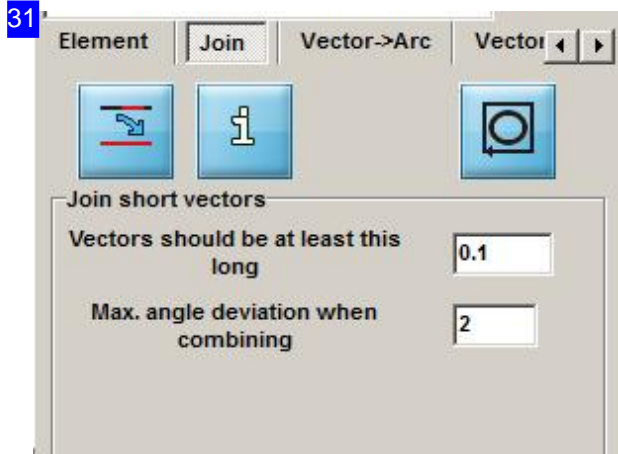
Click the third button to transfer all elements to the top list. Use the right button to check if your contour is closed-ended. A dialog box appears to report the result of your check.

You can enter a limiting value for gaps which should be automatically closed in the 'Close gaps' frame. Click the right button to automatically close all gaps up to the value you entered.

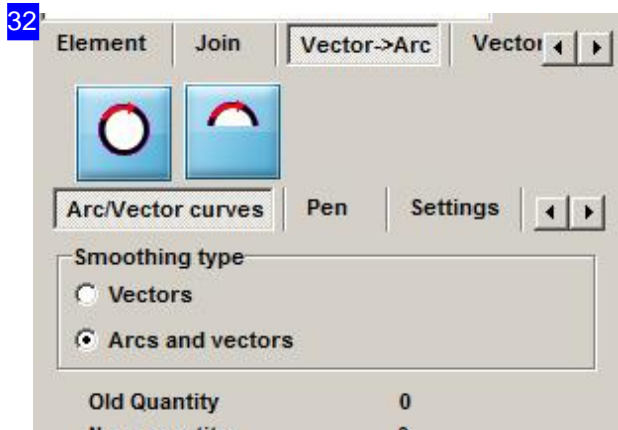


The 'Join' tab allows you to combine multiple small elements into a single larger one.

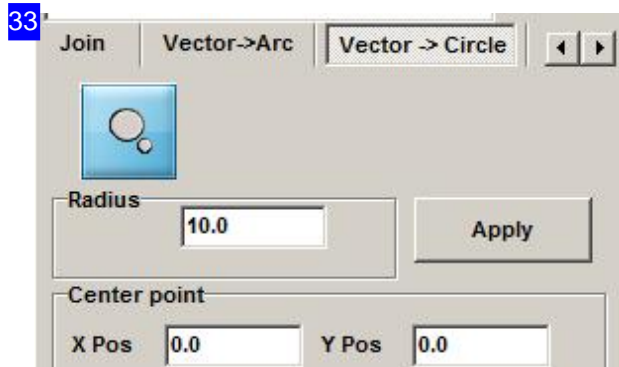
- o 'Join' - Combine multiple vectors into a single longer vector.
- o 'Vector-Arc' - Transfer areas into arc curves.
- o 'Vector-Circle' - Transfer areas into a circle.
- o 'Vector-Arc' - Calculate arc curves and mark or delete areas.



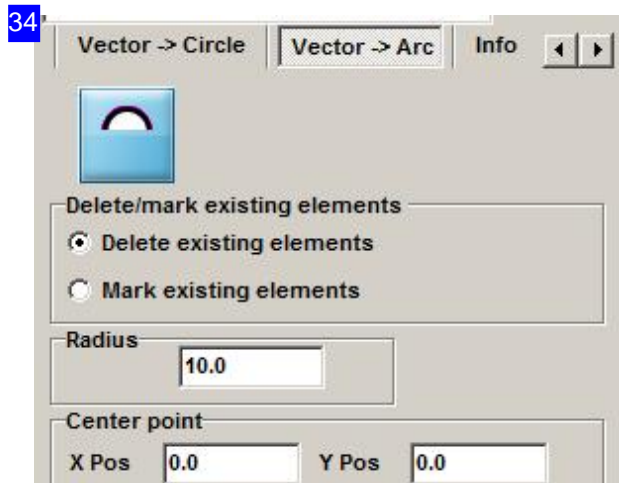
Contours which are made up of multiple small vectors can be joined into one larger vector in this tab. Enter the maximum permissible length and angle deviation here. Mark an element in the list or drawing and click the left button. This function allows ironing out of any irregularities in your contour.



From this tab you can join selected or all contours together to form an arc. Enter the criteria for joining in the settings tabs and click to convert.



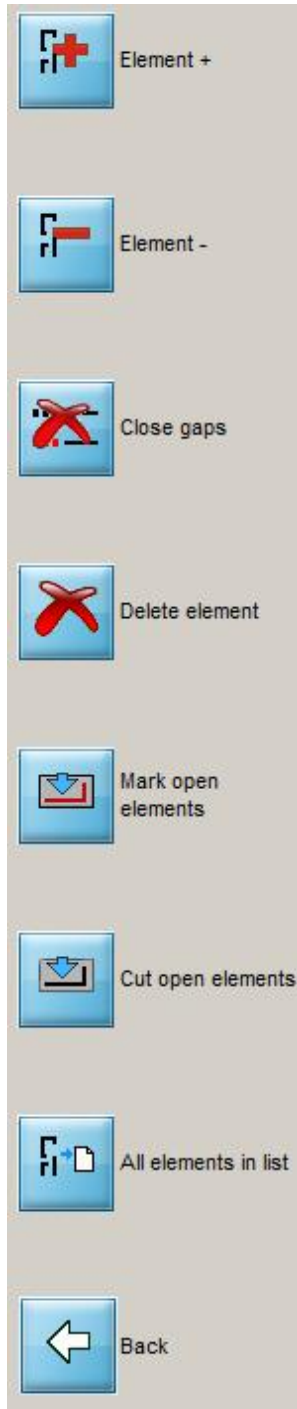
This tab allows you to convert a single element into a circle.



You can convert existing elements into arcs here, and either delete the existing element, or mark it.



4



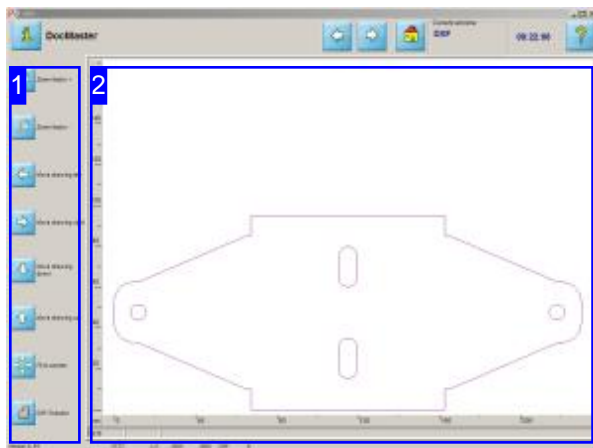
The most important functions in this screen can be accessed with one click using the navigation panel:

- o Use the top buttons to navigate the Element list.
- o Click the third button to close gaps in a contour according to your settings made in frame [4].
- o To delete a specific element, mark it in the preview [1] or element list [2] and click the fourth button.
- o The 'Mark open element' and 'Cut open element' buttons allow you to allocate an open contour the correct line type. This way you can easily allocate the right line types for eg. welding markings, or bend lines.
- o Click the penultimate button to show all contour elements in the list.
- o The last button exits the 'Analyser' and goes back to the screen for selecting a drawing.





## Check the component.



Zoom in on your component to the required magnification level in order to check it accurately.

All zoom windows have a function for measuring contours and gaps.

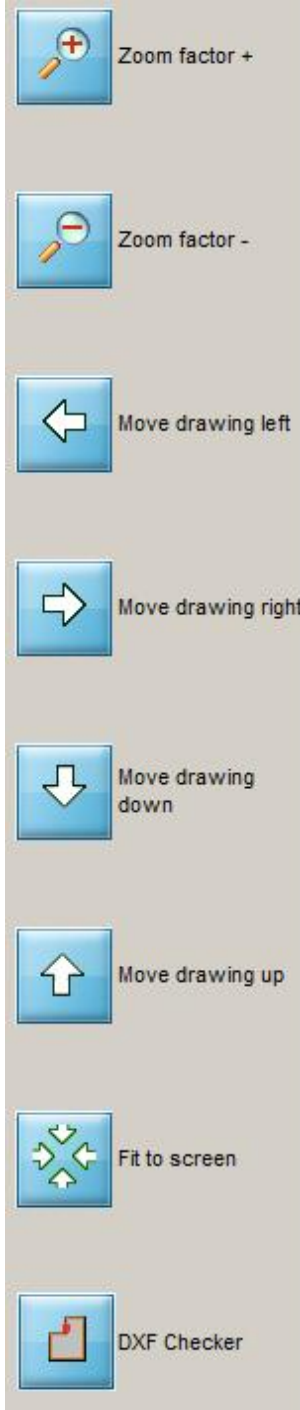
Access this window by clicking the bottom button in the navigation panel of the drawing selection screen or by clicking on the preview window.

The 'Zoom DXF' screen allows you to zoom in and out as you wish in order to inspect your component.

- o The left frame [1] offers various options for changing the display.
- o A preview of the component is shown to the right [2].
- o The lower button in the navigation panel [1] allows you to call the DXF Checker to examine the drawing for flaws. The DXF-Checker is opened as a dialog box, but can also be contained in an integrated frame, allowing you to assign the mouse particular functions in the checker's zoom window.



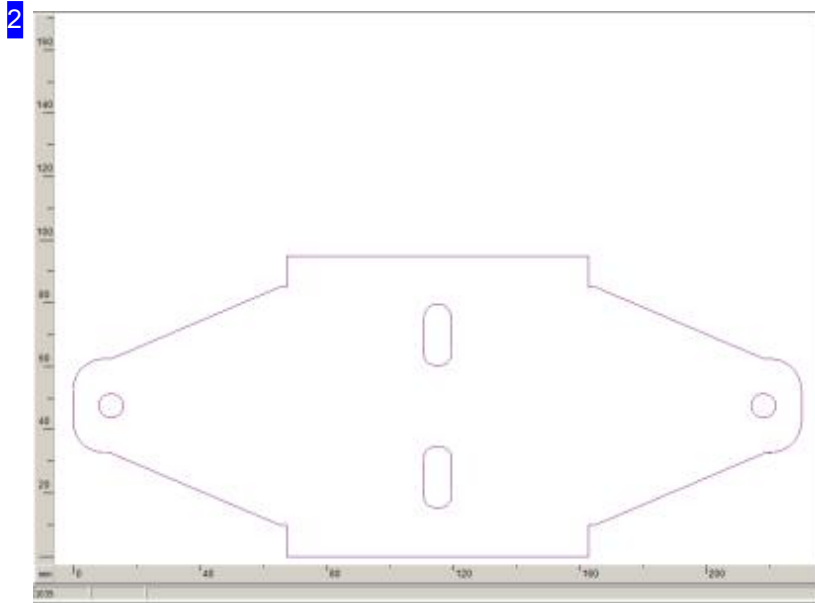
1



Use these buttons to examine your component. To zoom in or out you must first click the corresponding zoom button (+ or -) to select the zoom tool to use, then click in the drawing to apply that tool and zoom in or out.

The penultimate button fits the component to the screen.

Click the last button to open the DXF Checker. This allows checking the vectors directly from the zoom window. The Checker has priority in the programming sequence, and must be closed before you can continue. There is more detailed help available for this is the 'Checker's own help page'.



This frame shows a larger display of the component. This allows a more easy going. Move the Cursor in the drawing and zoom the component with the mouse wheel to the desired size.

They can also zoom with a mouse click; nevertheless, condition is that this function has been released by your administrator.

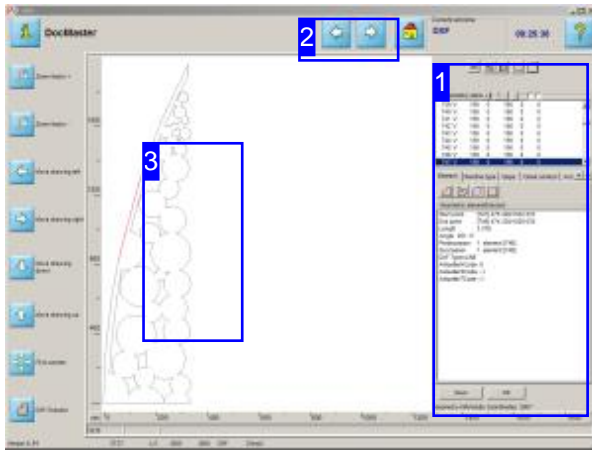
To measure a contour of gap, press <CTRL> resp. <Shift> and drag the cursor between the points to be measured.



Move the cursor to the start point of the line to be measured, and <CTRL>-click. Drag the cursor to the end point of the line, then release to see how long the line is, and at what angle it lies. Pressing <Shift>, the differences in x and y are shown between start- and end-point.



## Repairing flaws in a drawing

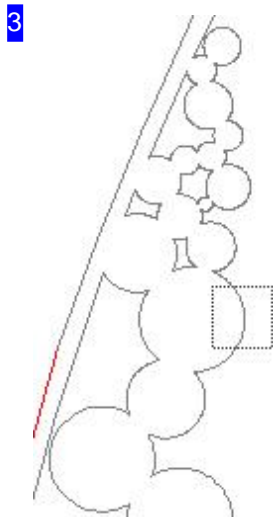


The screenshot shows the DXF selection screen's zoom window with a frame open for finding and repairing errors in your DXF drawing file.

The Checker in *cncCUT* offers the opportunity to examine a drawing for flaws, and correct any that are found.

The workshop may exhibit gaps, duplicate elements or superfluous elements. These errors should all be corrected; the Checker [1] can help you to do this. The Checker can close gaps, eliminate flawed elements and join separated vectors.

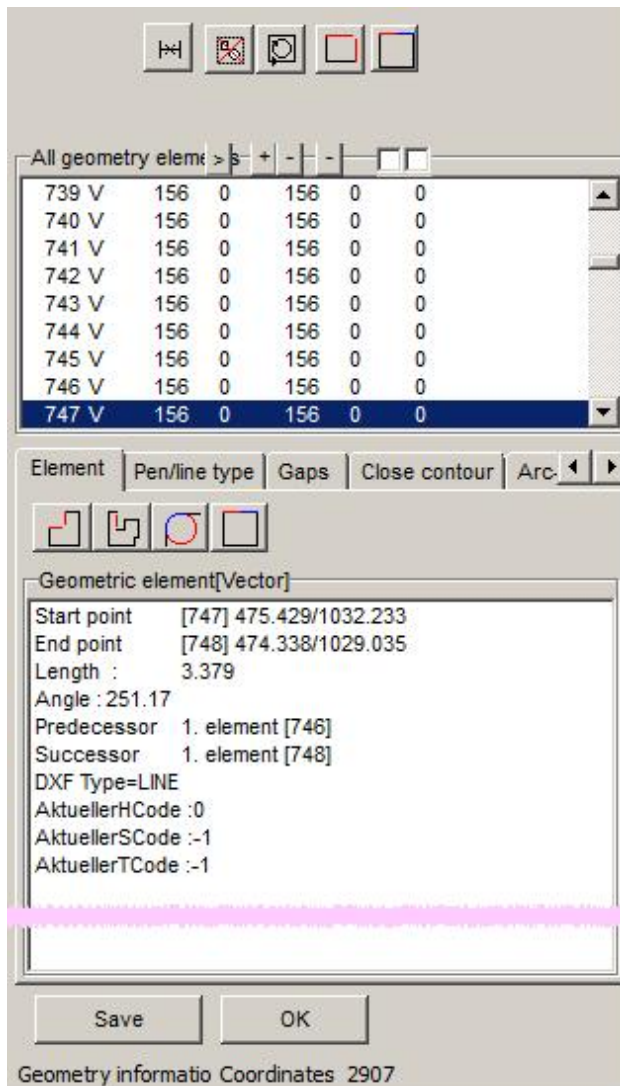
The vectors in the zoom window can be checked directly in the zoom window. Click to select a contour and the corresponding element will be highlighted in the Checker's element list.



Click a point to mark an element, and the corresponding element will be highlighted in the checker. See the Checker's own help page for more details.



1



The dialog showing the results of the analysis, and the available tools for fixing errors.

- o The top list lists all elements in the drawing. Flawed elements are marked with a '>'.
- o An additional button panel directly over the top frame allows you to change the display in the parent (Zoom) window.
- o You can repair flaws quickly using the buttons in the header panel.
- o You can display errors sorted by category. The buttons in the middle panel allow this.
- o The bottom panel shows either the details of an element selected from the top list or a list of all elements with the same type of flaw.
- o Close the dialog box and return to the zoom window.

2

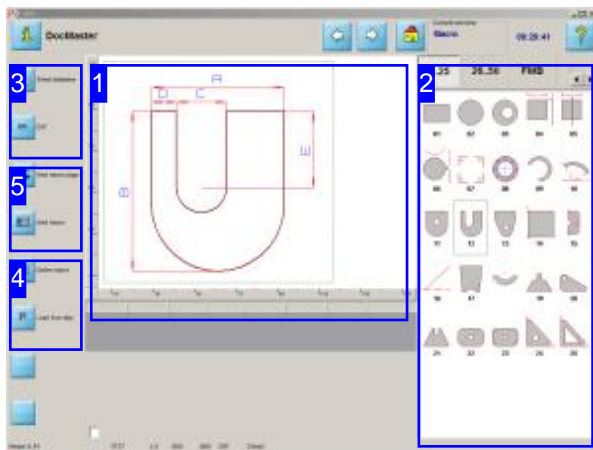


These buttons allow you to leave the zoom window and return to the next step.



## Macro Selection - 'Select Macro'

Select a Macro from your Stock.

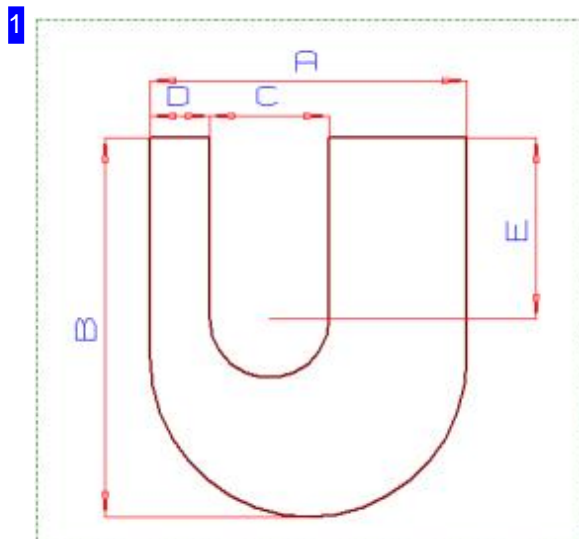


The 'Macro Selection' screen allows you to choose macros from your stocklist.

- o The middle frame [1] shows you a preview of the macro.
- o You can see all available macros in the right frame [2]. These are in the 'Macro' folder. The macros are divided into blocks: select a block using the tabs above.
- o Once you have chosen a macro press the 'Forwards' button in the header panel or the 'Define Macro' button in the navigation panel [4] to define the template's values, designing your component.

All macros available from your database are shown on this screen.

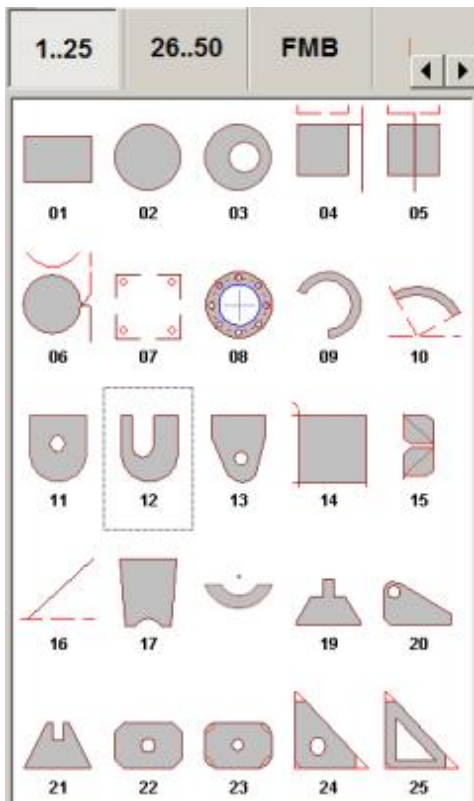
If your system is capable of editing HTML macros then the 'HTML' tab will be enabled in the selection list.



This frame shows you the selected macro.



2

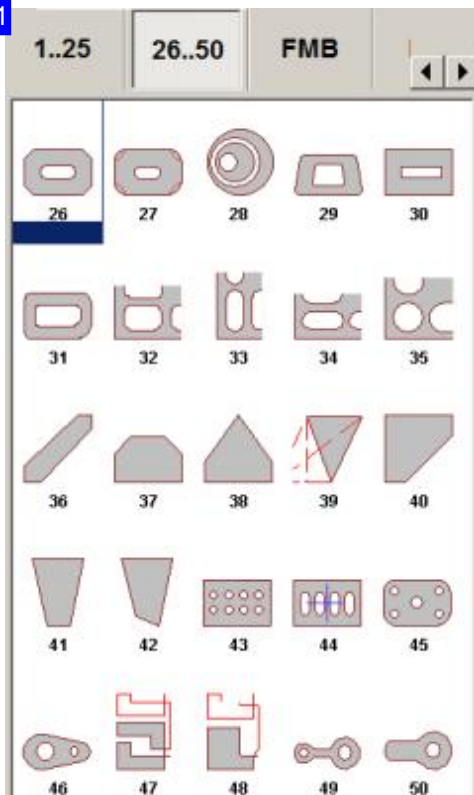


The macros available on your system are displayed in this frame. The macros are divided into blocks. Select the required tab above the macros to select the corresponding block.

There is a separate tab 'html' for HTML programmed macros. More details can be found in the 'Technologies' help page.

Here you see the standard macros 1 bis 25. You see the macros from 26 to 50 on the next tab.

21



Here you see the standard macros from 26 to 50. You see the macros from 1 to 25 on the preceding tab.



3



These two buttons serve to navigate the program:

- o Press the upper button to return to the sheet database.
- o The lower button leads to the 'DXF Selection' screen.

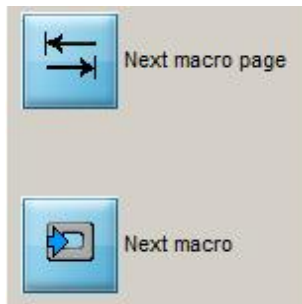
4



The upper button progress to the 'Macro definition' screen. There you can define the macro's variables.

Please press the lower button if you want to load a new macro from a disk. A file manager window will open for you to find the macro with.

5



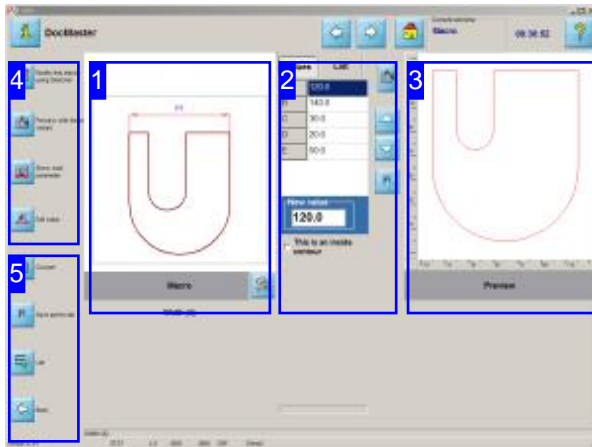
The upper button toggles beetween macro blocks.

The lower button cycles sequentially through the macros in a block.





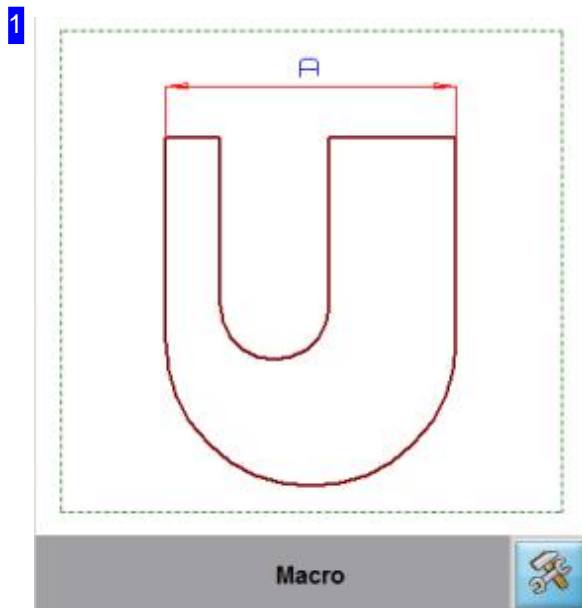
## Defining the macro.



This window allows you to set the values for a macro, thus defining the form of your component.

The 'Define Macro' screen allows you to set the values for your macro, bringing your component to the desired form.

- o The left frame [1] of the main window shows the selected macro.
- o The middle frame [2] allows you to set the macro's variables' values, thus modelling your component. The 'List' tab gives you a storage area for multiple parts created based on the same macro, but with different values. The table is saved for the next time you run the application.
- o You can see a preview of the component as defined in the values tab in the right frame [3].
- o The buttons in the navigation panel [5] allow you to save macros to the table, switch to the table and to continue to the next step.



This frame shows you the macro with its variables. The selected setting will always be shown in the drawing.

To undo any changes you make to the macro and reset it to its original values, click the bottom right button.



2

Values	List
A	120.0
B	140.0
C	30.0
D	20.0
E	50.0
<div style="border: 1px solid black; padding: 5px;"> <p><b>New value</b></p> <p>120.0</p> </div>	

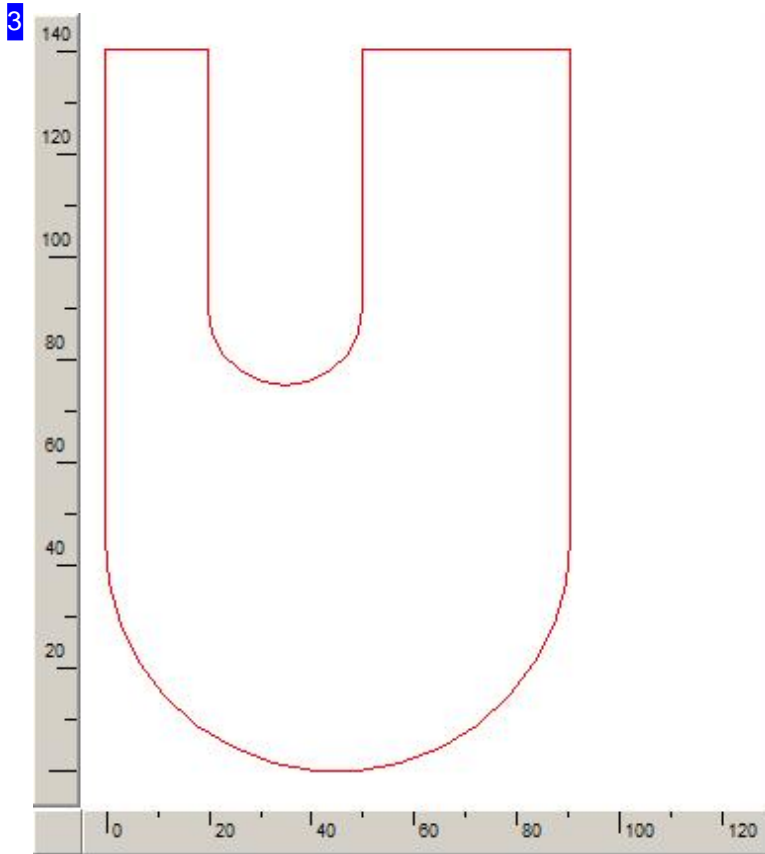
This is an inside contour

Enter your required values for the macro here, either directly into the relevant cell or into the 'New value' cell. Use the buttons to the right to navigate the values table; the top button previews the part in the frame to the right [3].

The 'List' tab gives you a Storage area for multiple parts constructed based upon the same macro, but with different values defined. The table is saved for further use when you restart the application.




Click the bottom button to apply the values in the table.

Mark the bottom checkbox to set a contour to internal contour (hole).



This frame shows a preview of your component as it will look with the values you entered in the 'Values' tab.

4

- 
Modify this macro using Sketcher
- 
Preview with these values
- 
Show next parameter
- 
Edit value

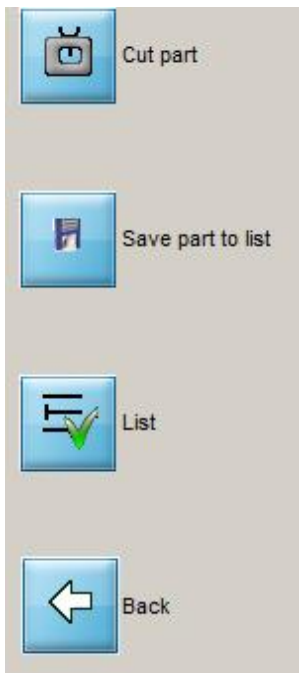
Click the top button to switch to the 'Sketcher' module and edit your drawing. The 'Sketcher' module has its own Online help files in which all functions are described in detail. The second button shows a preview of the component in the preview frame [3].

With the third button you change between the parameters [1]

The last button opens the Editfield [2] for the parameter input.



51



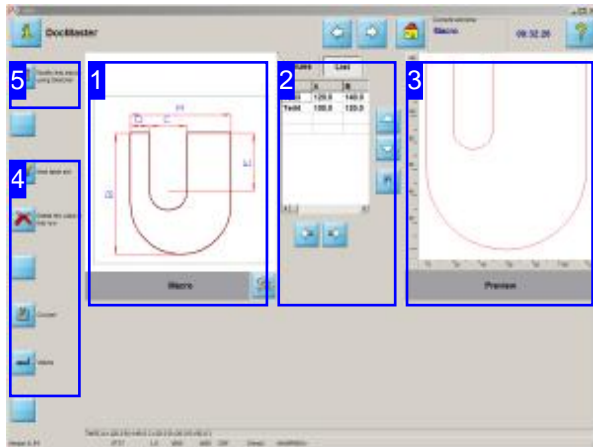
The upper button goes to the next step; defining your machine's cutting values for this part.

If you would like to save the part to the Clipboard (table accessible from the second tab in the middle frame [2]) click here.

The third button switches to the 'List' tab.



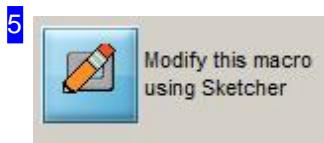
## Selection from the macro storage area.



This window shows you the components you have created and saved from macros. Select a macro to edit it for further use.

The 'macro clipboard' screen allows you to select saved macros and change their saved variables for further use within the program.

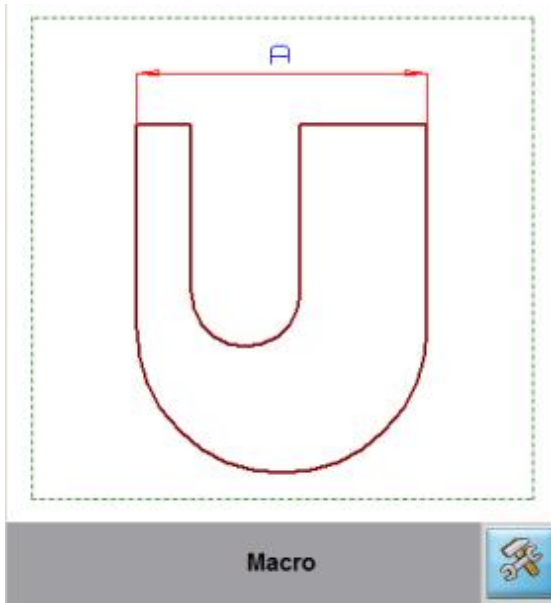
- o The left frame [1] of the main window shows the selected macro.
- o The 'List' tab in the middle frame [2] functions as a storage area for multiple macros you have saved that are based on the same macro template, but defined by different values. The 'Values' tab allows you to see the defined values, and edit them to modify the component.
- o The part as currently defined is previewed to the right of the screen [3].
- o The buttons in the navigation panel [4] allow you to delete lines from the table and progress to the next step.



If you wish to make alterations to the previewed drawing, the 'Sketcher' module offers the functionality you require; click here to open it.



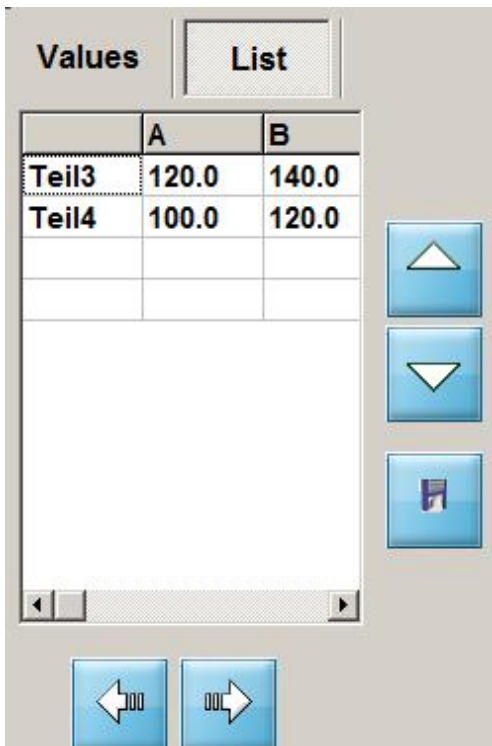
1



This frame shows the macro with its variables. The values are shown in the value table.

Click the bottom right button to reset the macro back to its default values.

2



This table represents a storage area for the macro with various user-defined sets of values. Click on a cell in the table to see a preview of the part you clicked on.

The arrow buttons allow you to navigate the saved parts (vertical) and their values (horizontal).

When you move to the next step only the selected component will be transferred.

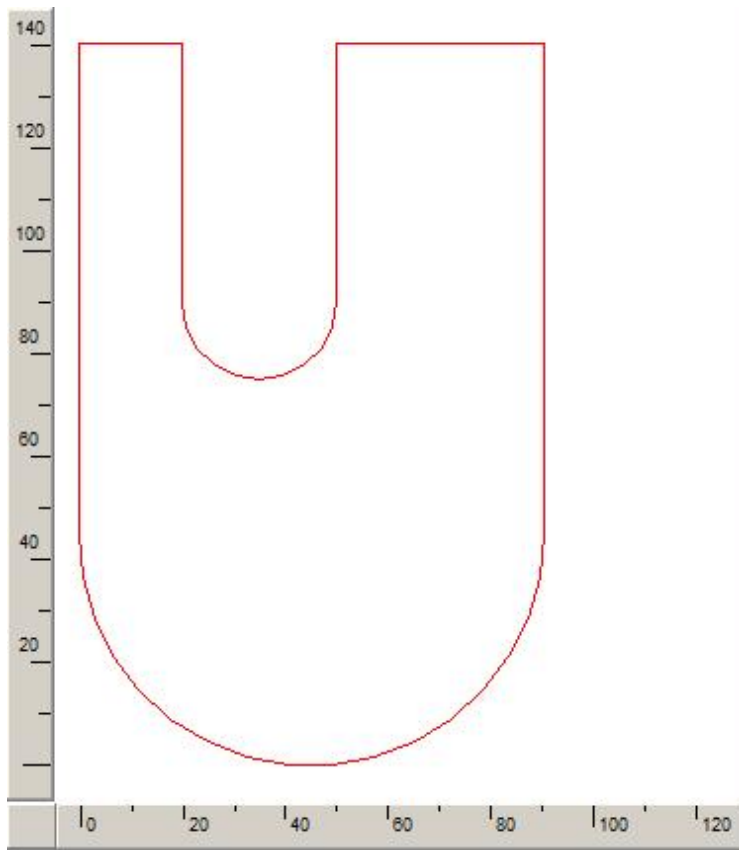
The table is saved for the next time you run the application.

The 'Values' tab allows you to set the values for the macro's variables, thus modelling the component to your requirements.

The function of the remaining buttons is as well as by defining a macro.



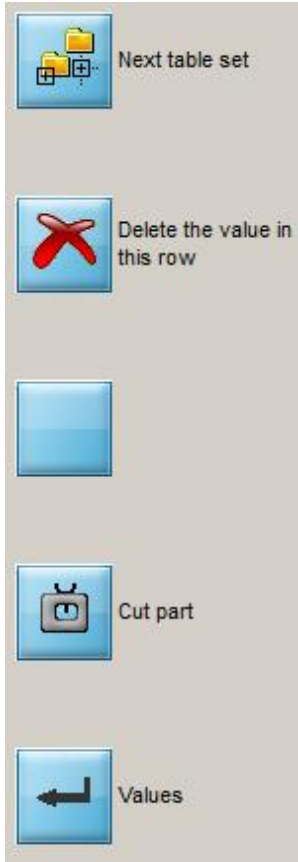
3



This frame shows you a preview of the component with the values you have given for it.



4



The upper button allows you to navigate the table entries.

The second button deletes a line from the table [2].

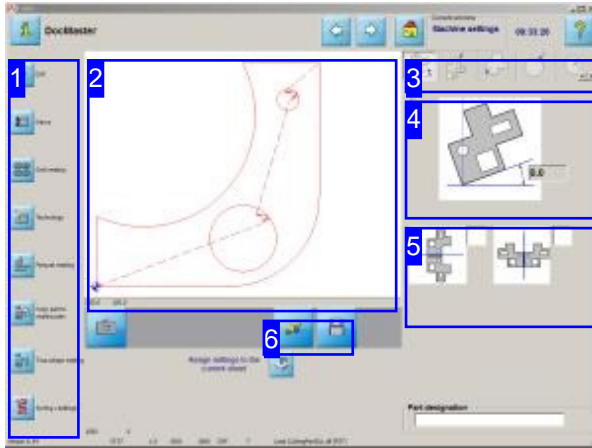
The penultimate button advances to the next step, where you can set the cutting values for your component.

The lower button switches to the 'Values' tab.



# Cutting settings

Set Lead-ins, Mirroring and Turning.



The Cutting settings screen allows you to set how your component should be worked.

- o Bring your component to the correct orientation, set the basis for lead-ins.
- o Set the Lead-ins for external and internal contours which are not circular.
- o Set the Lead-ins for circular external and internal contours.

Oval parts also count as circular here!

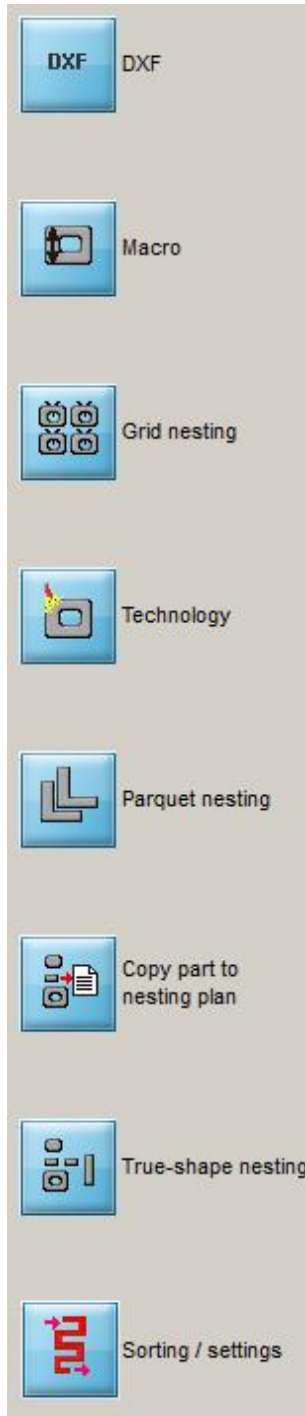
There are various options for editing your component in the settings screen. You can rotate, mirror and angle it. Every internal contour can be lead into using a straight line (vector) or an arc. You can set the angle and length of the vector or arc respectively, amongst other properties. You can decide whether and how to nest the part and whether to carry it over into a cutting plan.

Depending on your post-processor there may be further settings to be made. Find out more in the help page for your post-processor.

Parts usually comes from different sources like DXF, DIN, DWG and so on, but all of them do not include technologies. The internal format ZEW is needed, to store parts including technologies. You need the DLLs DZIP32.dll and DUNZIP32.dll stored in the cncCUT-directory for handling ZEW-files. The function has to be released in the post-processor.



1



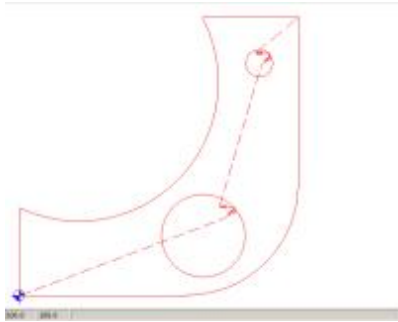
The navigaton panel allows you to define the coming steps.

- o Button 1: Switch to the DXF selection screen
- o Button 2: Switch to the Macro selection screen
- o Button 3: Switch to the next step; 'Grid nesting'
- o Button 4: Switch to the Cutting settings window
- o Button 5: Switch to the next step; 'Parquet nesting'
- o Button 6: Copy the part to the Nesting plan
- o Button 7: Switch to the next step; 'True-shape nesting'
- o Button 8: Switch to the Zoom window to sort contours and set lead-ins.

Although the 'Basic version' of the program does not allow true-shape nesting, you can still place multiple different parts in a nest on a sheet. As described under true-shape nesting, these parts can be positioned manually. In this case the penultimate button will show 'Sort manually', click it to reach the sorting window.



2



This frame shows you the component with the lead-out point for the cutting tool, the cutting path and the lead-ins for each individual contour.

You should also check whether lead-ins collide with contours. Use the tab in the right tab list.

3



Use the tabs to access the individual processes and define the lead-ins for your component.

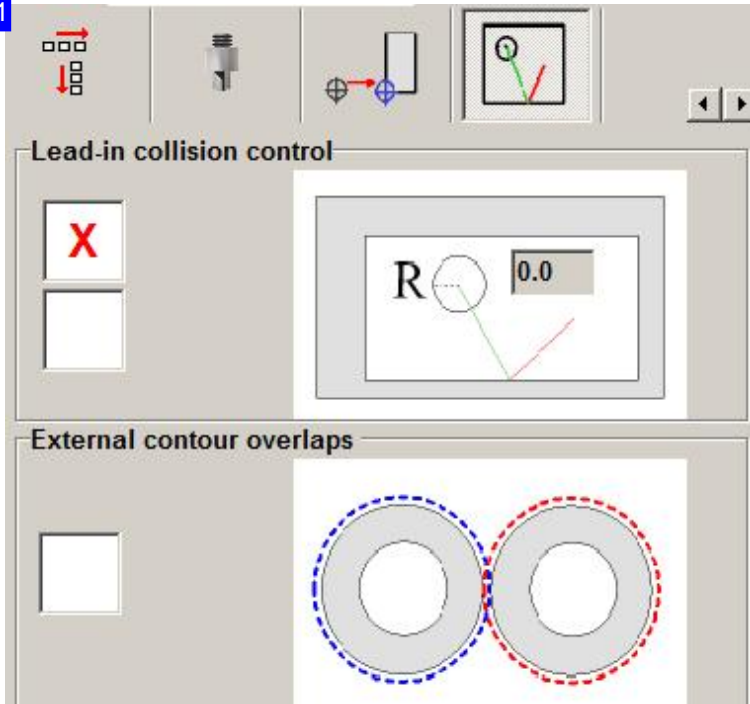
- o The 'Part parameter' tab allows you to set the orientation of the part, and the lead-out point.
- o 'External Contours' allows you to set lead-ins for non-circular external contours.
- o 'Internal Contours' allows you to set lead-ins for non-circular internal contours.
- o Set the lead-ins for any external circles in the 'External Circles' tab.
- o Set the lead-ins for any internal circles in the 'Internal Circles' tab.
- o The 'Cut open contours' tab allows you to cut open contours with tool cutting-path corrections from the left or right.
- o If you wish to set the cutting sequence for a part's internal contours, you can do so in the 'Sort internal contours' tab.

Depending on the post-processor in use there may be further tabs available here for making further settings. To access these tabs, use the arrow button to slide further along the tab bar. There is more help for these post-processor dependant features in the post-processor's own help file.

Press the <Ctrl>-Key and click on in the 'Technology' button in the navigation bar on the left [1]. The Tab 'common cuts' will become active. For further details look in the online help for technologies.



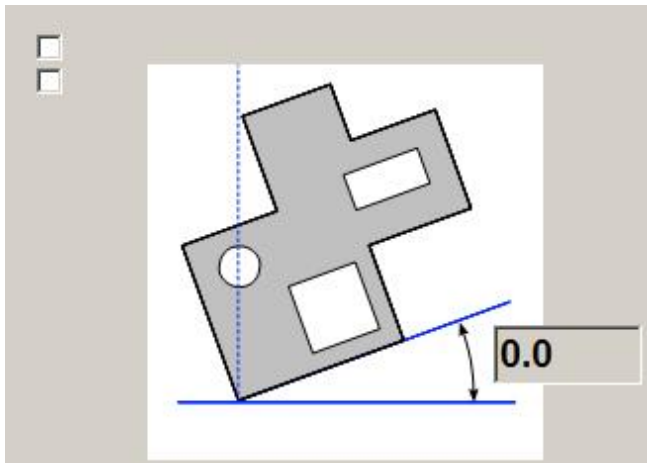
31



It is important to check for collisions in areas where parts are close together. To stop a contour being damaged when punching-in, you can set a minimum radius to be kept clear from any punch-in. Mark the check-box to activate the collision checker. Note also the test for checking cutting contours when 'sorting the cutting contours'.

If a sheet has a preset offset then you can check for possible overcuts on parts' external contours in the bottom frame. Mark the bottom checkbox to do this.

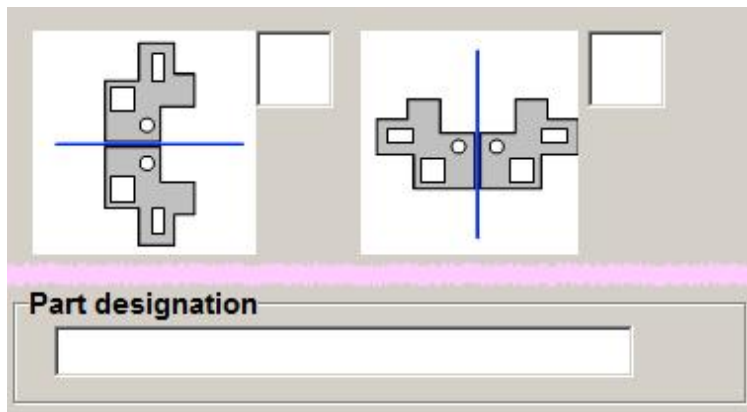
4



To turn your component, enter the angle to turn by in the input field to the right. The angle is relative to the X-axis. Please note that a negative value turns the part clockwise, while a positive number turns it counter-clockwise.



5



You can mirror the part both horizontally and vertically. If you mark the checkbox belonging to the further left of the mirroring options, the part will be mirrored vertically across a horizontal axis. The right hand checkbox mirrors the part horizontally, across a vertical axis.

The 'Part identifier' field allows you to allocate a part an identifying tag for easier management.

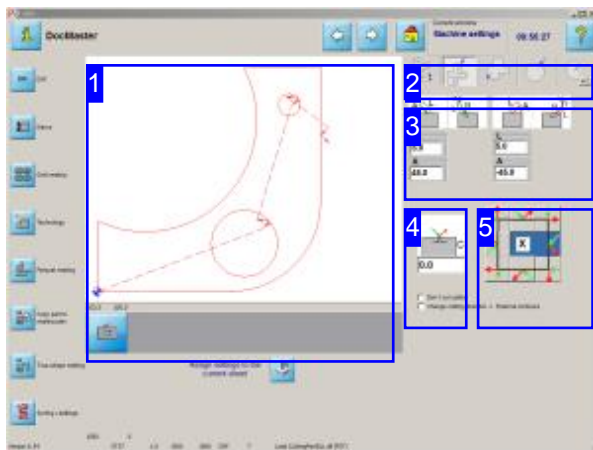
6



You can store and retrieve ZEW-files with this two buttons. A dialog appears, for selecting the storage location.



## Set the Lead-ins for External Contours.



This window allows you to set up lead-ins and -outs for non-round external contours.

You can suppress cutting of external contours and change their cutting directions.

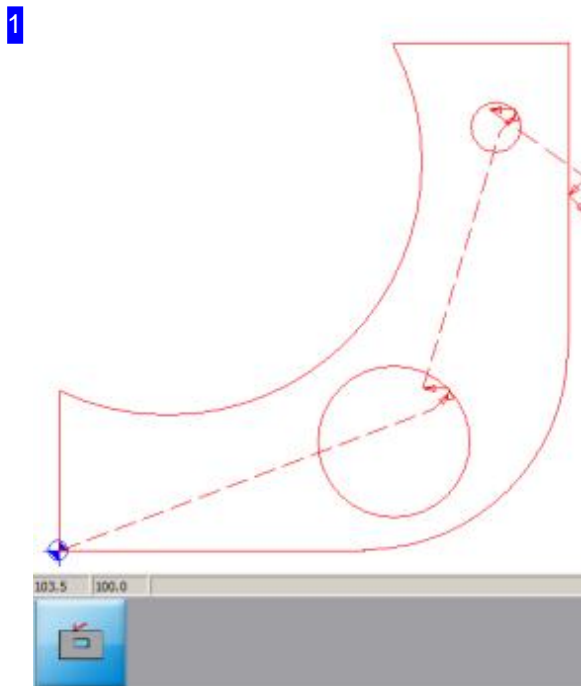
Set your lead-ins from this screen.

You can set the properties for lead-in as well as lead-out elements. Lead-ins are always shown in green, lead-outs always in red.

Lead-ins and -outs can have straight or arced paths.

- o Set the the positions of lead-ins and lead-outs [5].
- o Set the lead-ins' and lead-outs' forms [3].
- o Set the cuts' sizes .
- o Set where cutting bridges should be added [4].

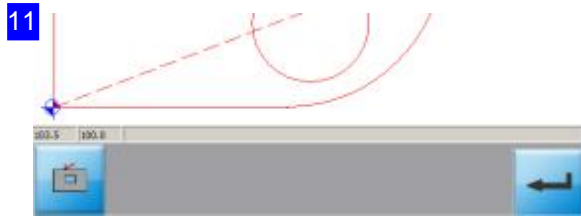
The help for the left navigation panel is in the 'Cutting settings' page.



This frame (the preview) shows you the component with its final lead-out point, cutting path and all lead-ins for each contour that makes up the component.

The Zoom button below zooms in on the lead-in you are currently editing and displays it in close-up in the preview window.

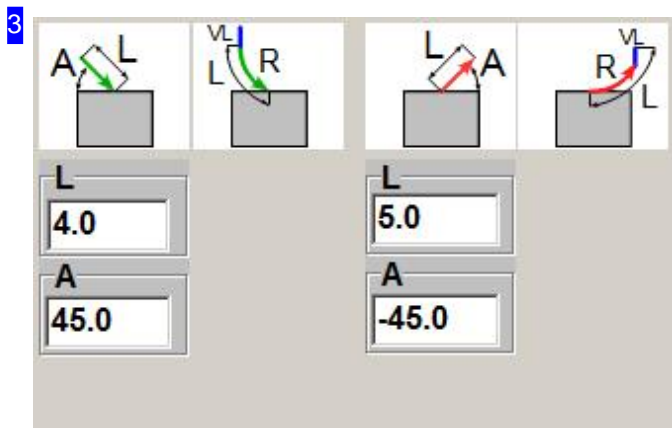
If you make any changes to the lead-ins then an additional 'Enter' button will appear.



Changes made to the lead-ins will only become effective once you have clicked the 'Enter' button to the right. If you do not press this confirm button then the previous values will be restored when you leave this window.



The second tab 'External contours' allows you to set the lead-ins and -outs for non-circular external contours.



This frame allows you to set the form and size of lead-ins and -outs. You can set both the length and angle of straight lead-ins.

When entering the angle you should note that both negative and positive values are valid. A negative angle turns the lead-in clockwise, a positive number turns it counter-clockwise.

The parameters for a corner lead-in are different.

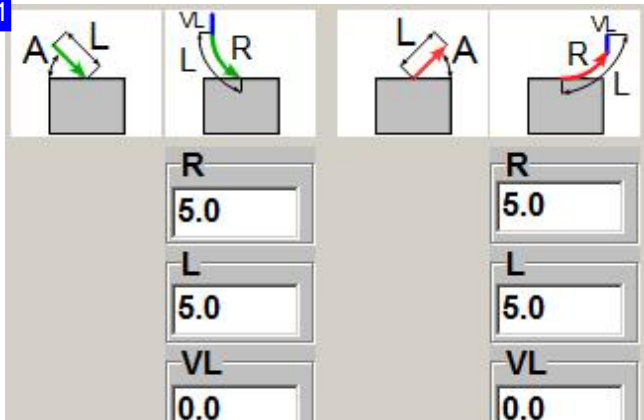
Lead-ins are always shown in green, lead-outs always in red.

The number of settings that can be made is different for arced lead-ins.

You can activate or deactivate a lead-in by clicking on an icon. On lead-ins you will be using, a list will appear into which you can enter the lead-in's settings.



31

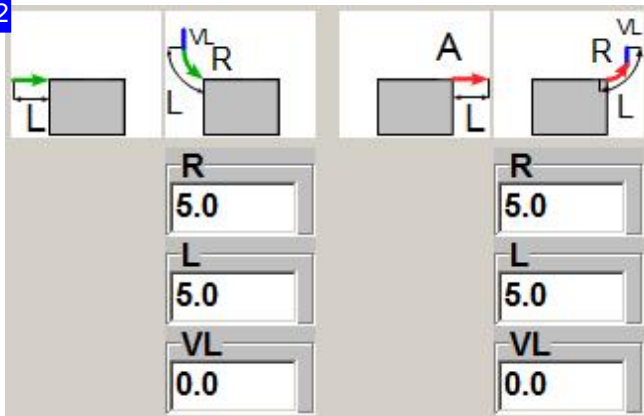


This frame allows you to set the size and angle of lead-ins. You can set the lead-in length, radius and the length of an additional vector when programming arced lead-ins. If leading-in at a corner the parameters will be different. Lead-ins are always shown in green, lead-outs always in red.

The number of parameters to be set is different for straight lead-ins.

You can activate or deactivate a lead-in by clicking on an icon. On lead-ins you will be using, a list will appear into which you can enter the lead-in's settings.

32

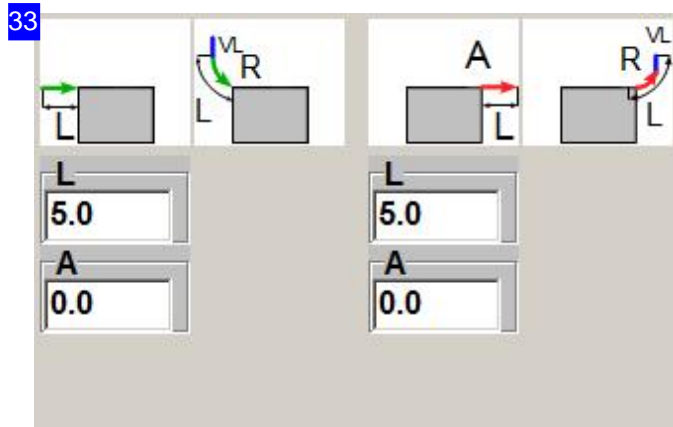


Lead-ins' lengths and forms are defined in this window. If using an arced lead-in you can set the length, radius and length of an additional vector before the arc. If leading-in at a corner the parameters will be different.

If using a straight lead-in the number of parameters to be defined is different.

You can activate or deactivate a lead-in by clicking on an icon. On lead-ins you will be using, a list will appear into which you can enter the lead-in's settings.





If making a straight lead-in at a corner you will be able to set the length and angle for the lead-in.

If leading-in at an edge the parameters will be different.



The parameters and their meanings:

- o A - Angle in degrees. A positive angle turns the lead-in or -out counter-clockwise. A negative angle turns the cut clockwise.
- o R - Radius of an arced lead-in or -out in mm. If you enter a negative value the lead-in will be mirrored.
- o L - Length of the cut for straight or arced cuts, given in mm.
- o VL - The length of a straight vector to cut before an arced lead-in in mm. If you enter a negative value the value will be treated as an angle entry (absolute).

The text fields for vector length need not just be real decimal numbers (ie, 1.0 or 5.6); mathematical formulae are also permissible, such as  $(4*5$  or  $2/3)$ .

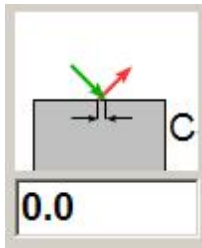
It is often useful to set your lead-ins to be dependant on sheet thickness or, for circles, dependant on radius. You can do this in *cncCUT* using variables. These are identified with fixed tags. For a circle you could, for example, enter this formula into the input field: '\$GEOM.RADIUS/2'.

The most important variables are: \$SHEET.THICKNESS for the material thickness and \$GEOM.RADIUS for the radius of the element being lead-into.

There are also functions available for the costing calculation, which adapt to generally valid expressions in most programming languages. The most important are SIN, COS and TAN for the angle function, together with their opposite function ACOS, ASIN and ATAN which can calculate the required angle automatically. The function SQRT calculates the square root for you.



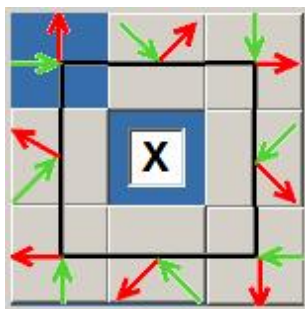
4



In some cases it can make sense not to cut the component out completely, but to leave it hanging using so-called micro-bridges, or cutting-bridges. This practice is useful for larger contours which should not be allowed to fall once they have been cut but should rather be punched out.

If you do not make an entry into this field, or enter 0, then no cutting bridges will be used. Negative values create an overlap. The changes made in this field will be shown in the preview immediately.

5



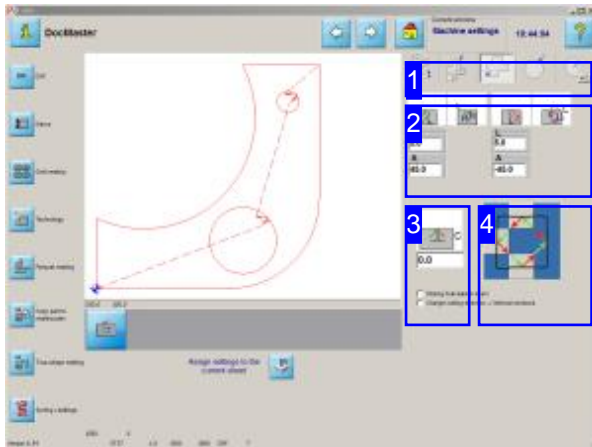
You may lead-in to your component at a corner or an edge. Mark one of the eight checkboxes to select the position to lead-in at. This will then be shown in the preview window [1].

The middle checkbox represents something of a speciality. If you select this checkbox *cncCUT* will look for the optimal place to lead-in at on the selected side. If you do not highlight this checkbox, *cncCUT* will simply cut at the middle of the edge. The checkbox has no affect on corner lead-ins.

The parameters for the lead-in will change depending on whether you select a corner or edge lead-in.



## Set the Lead-ins for Internal Contours.



As with external contours you can make settings for internal contours' lead-ins and lead-outs.

Lead-ins are always shown in green, lead-outs always in red.

Lead-ins and -outs can have straight or arced paths.

- o Set the the positions of lead-ins and lead-outs [4].
- o Set the lead-ins' and lead-outs' forms [2].
- o Set the cuts' sizes [2]. A definition for sizes is given in the help page for external contours.
- o Set where cutting bridges should be added [3].

This window allows you to set up lead-ins and -outs for non-round internal contours.

You can change the cutting direction for internal contours.

You will find a description of the preview and the settings in the page for external contours.

Help for the navigation panel to the left is available in the 'Cutting settings' page.



The third tab 'Internal contours' allows you to set the lead-ins and -outs for non-circular internal contours.



2



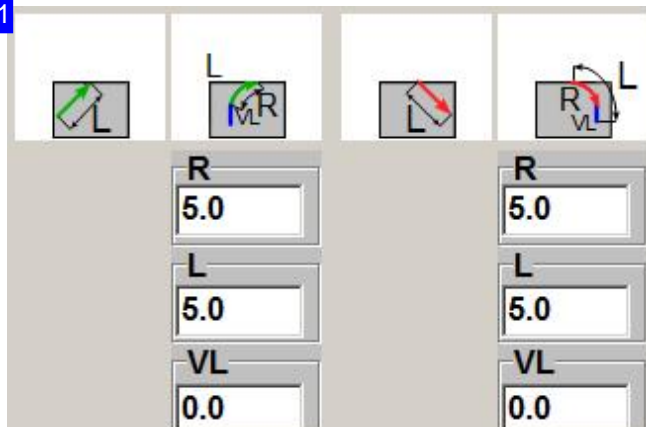
This frame allows you to set the form and size of lead-ins and -outs. You can set both the length and angle of straight lead-ins.

When entering the angle you should note that both negative and positive values are valid. A negative angle turns the lead-in clockwise, a positive number turns it counter-clockwise. Lead-ins are always shown in green, lead-outs always in red.

The number of settings that can be made is different for arced lead-ins.

You can activate or deactivate a lead-in by clicking on an icon. On lead-ins you will be using, a list will appear into which you can enter the lead-in's settings.

21



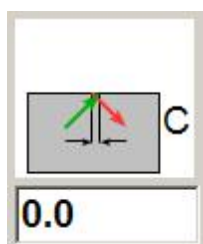
This frame allows you to set the size and type of lead-ins. You can set the lead-in length, radius and the length of an additional vector when programming arced lead-ins.

Lead-ins are always shown in green, lead-outs always in red.

The number of parameters to be set is different for straight lead-ins.

You can activate or deactivate a lead-in by clicking on an icon. On lead-ins you will be using, a list will appear into which you can enter the lead-in's settings.

3

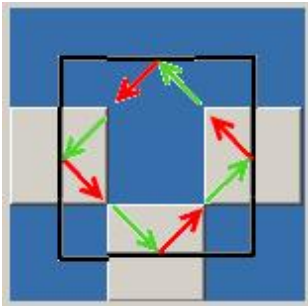


In some cases it can make sense not to cut the component out completely, but to leave it hanging using so-called micro-bridges, or cutting-bridges. This practice is useful for larger contours which should not be allowed to fall once they have been cut but should rather be punched out.

If you do not make an entry into this field, or enter 0, then no cutting bridges will be used. Negative values create an overlap. The changes made in this field will be shown in the preview immediately.



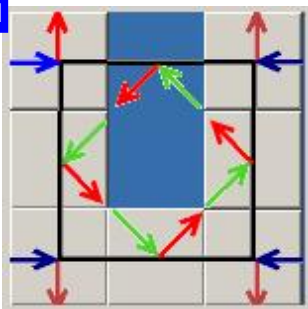
4



You can lead-in to your component from any side. Click one of the four checkboxes to select which one, and this will be shown in the preview window.

If you wish to use corner lead-ins, you can access this option by holding <CTRL> and double-clicking the middle box. The Input field will then be supplemented with the options for corner lead-ins.

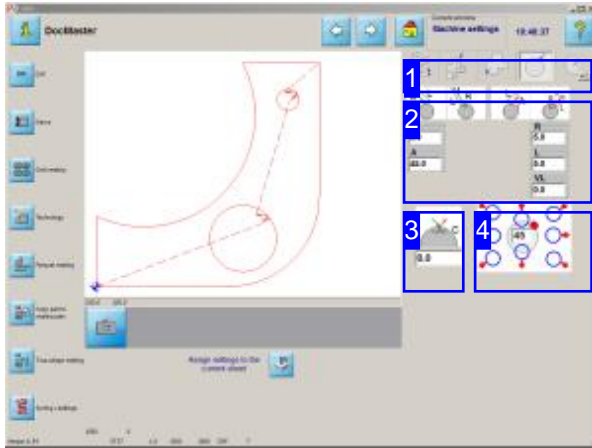
41



This frame gives you the option to lead-in to your workpiece's internal contours from a corner. Click one of the four corners' boxes to set, and see a preview of the lead-in made at that corner.



## Set the Lead-ins for External Circles.



This window allows you to set up lead-ins and -outs for round external contours.

You can cut the circular external contours of your component however you wish. The standard options are shown in the bottom right window. Lead-ins are always shown in green, lead-outs always in red. Lead-ins and -outs can have straight or arced paths.

- o Set the the positions of lead-ins and lead-outs [4].
- o Set the lead-ins' and lead-outs' forms [2].
- o Set the cuts' sizes [2]. A definition for sizes is given o in the help page for external contours.
- o Set where cutting bridges should be added [3].

You will find a description of the preview and the settings in the page for external contours.

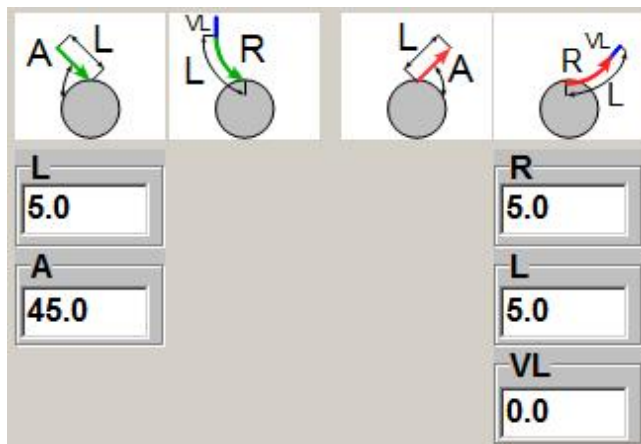
Help for the navigation panel to the left is available in the 'Cutting settings' page.



The forth tab 'External circles' allows you to set the lead-ins and -outs for circular external contours.



2

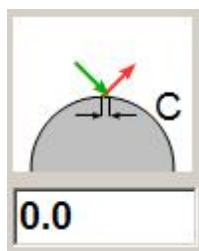


This frame allows you to set the form and size of lead-ins and -outs. You can set both the length and angle of straight lead-ins.

When entering the angle you should note that both negative and positive values are valid. A negative angle turns the lead-in clockwise, a positive number turns it counter-clockwise. Lead-ins are always shown in green, lead-outs always in red.

You can activate or deactivate a lead-in by clicking on an icon. On lead-ins you will be using, a list will appear into which you can enter the lead-in's settings.

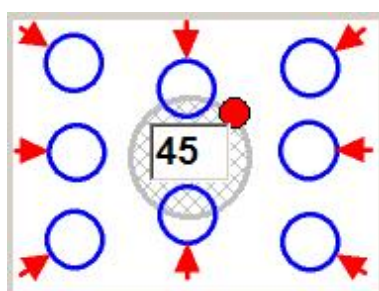
3



In some cases it can make sense not to cut the component out completely, but to leave it hanging using so-called micro-bridges, or cutting-bridges. This practice is useful for larger contours which should not be allowed to fall once they have been cut but should rather be punched out.

If you do not make an entry into this field, or enter 0, then no cutting bridges will be used. Negative values create an overlap. The changes made in this field will be shown in the preview immediately.

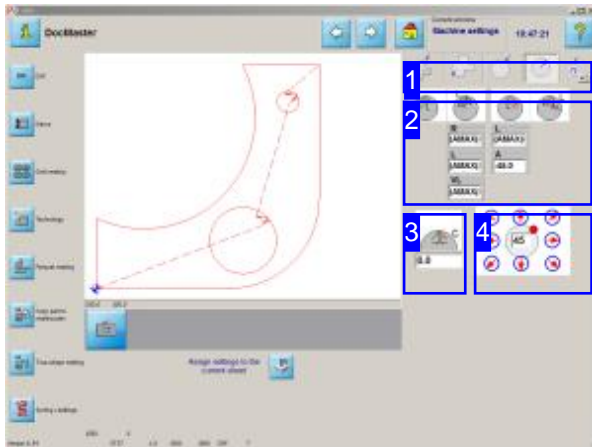
4



You can lead-in to your round external contours from any direction. Simply enter the angle in the text field in the middle. The blue circles around the central circle offer you 8 standard lead-in angles at 45° steps. Simply click one of the eight markings around the circle to make the lead-in there, and the change will be displayed in the preview window.



## Set the Lead-ins for Internal Circles.



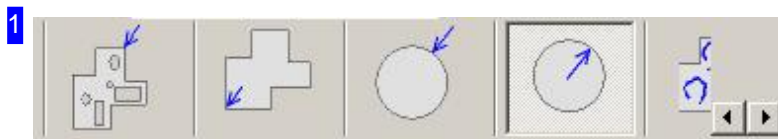
This window allows you to set up lead-ins and -outs for round internal contours.

You can cut the circular internal contours of your component however you wish. The standard options are shown in the bottom right window. Lead-ins are always shown in green, lead-outs always in red. Lead-ins and -outs can have straight or arced paths.

- o Set the the positions of lead-ins and lead-outs [4].
- o Set the lead-ins' and lead-outs' forms [2].
- o Set the cuts' sizes [2]. A definition for sizes is given in the help page for external contours.
- o Set where cutting bridges should be added [3].

You will find a description of the preview and the settings in the page for external contours.

Help for the navigation panel to the left is available in the 'Cutting settings' page.

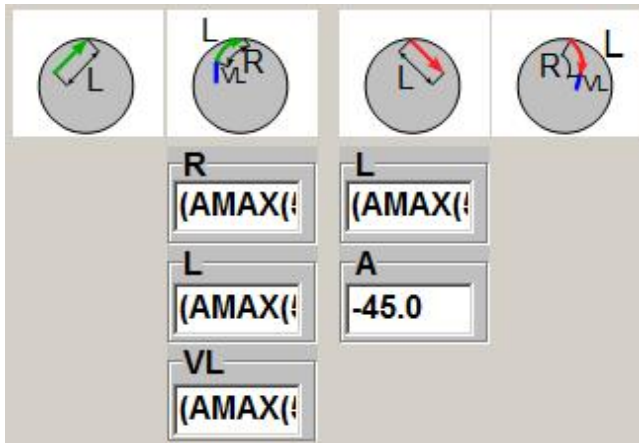


The fifth tab 'Internal circles' allows you to set the lead-ins and -outs for circular internal contours.





2



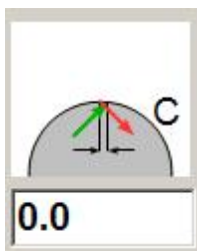
This frame allows you to set the form and size of lead-ins and -outs. You can set both the length and angle of straight lead-ins.

When entering the angle you should note that both negative and positive values are valid. A negative angle turns the lead-in clockwise, a positive number turns it counter-clockwise. Lead-ins are always shown in green, lead-outs always in red.

You can activate or deactivate a lead-in by clicking on an icon. On lead-ins you will be using, a list will appear into which you can enter the lead-in's settings.

If formulae have been used here, right-click the cell to view them. If there are changes, click the display to restore.

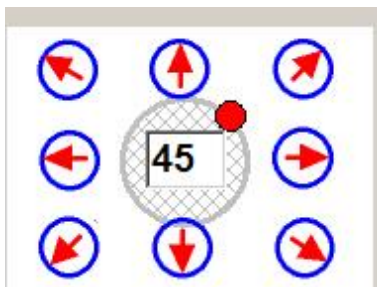
3



In some cases it can make sense not to cut the component out completely, but to leave it hanging using so-called micro-bridges, or cutting-bridges. This practice is useful for larger contours which should not be allowed to fall once they have been cut but should rather be punched out.

If you do not make an entry into this field, or enter 0, then no cutting bridges will be used. Negative values create an overlap. The changes made in this field will be shown in the preview immediately.

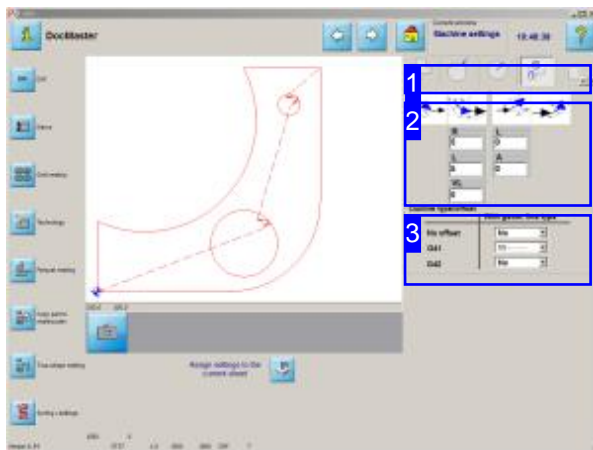
4



You can lead-in to your round external contours from any direction. Simply enter the angle in the text field in the middle. The blue circles around the central circle offer you 8 standard lead-in angles at 45° steps. Simply click one of the eight markings around the circle to make the lead-in there, and the change will be displayed in the preview window.



## How to Cut an Open Contour.



*cncCUT* usually treats open contours as faulty. This screen allows you to mark open contours and allocate them cutting settings.

The cutting path can lie exactly on the contour, or be given a cutting-tool corrected path. The corrected path can lie to the left (G41) of the contour, or the right (G42). With a normal closed contour the routine will automatically decide where to set the cutting path relative to the contour, but with an open contour you must decide, since both options are possible. The setting is made through the line type you assign the open contour from the Checker .

Each line type can be allocated a path correction type.

You can cut your open contour with a straight or an arced lead-in.

- o Set the forms of the lead-in and -out [2].
- o Allocate a correction type to the line type.

You will find a description of the preview and the parameters in the 'External Contours' page.

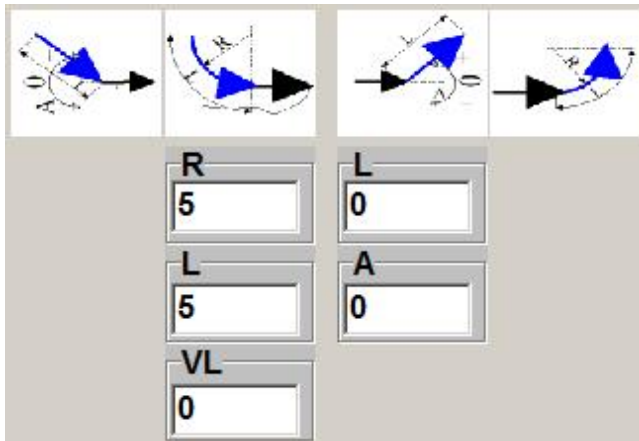
The description for the navigation panel to the left is in the 'Cutting technologies' screen.



The tab 'Cut Open Contours' allows you to set cutting information including cutting-path corrections, lead-ins and lead-outs for open contours using predefined line-types.



2



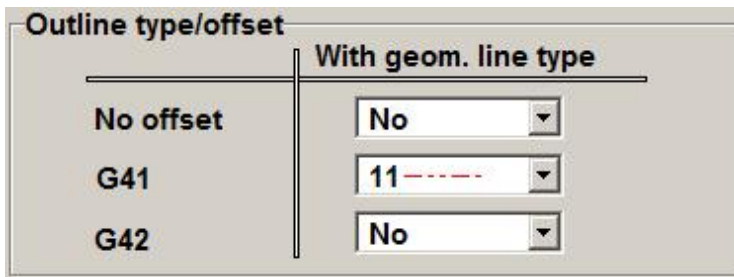
This frame allows you to set the size and form of lead-ins and lead-outs.

You can set the length and angle of a straight lead-in.

You can set the length and radius and the length of an additional straight lead-in vector for arced lead-ins.

Click on an icon to activate or deactivate the lead-in. When you've decided on a lead-in type, a panel will appear for you to enter its parameters.

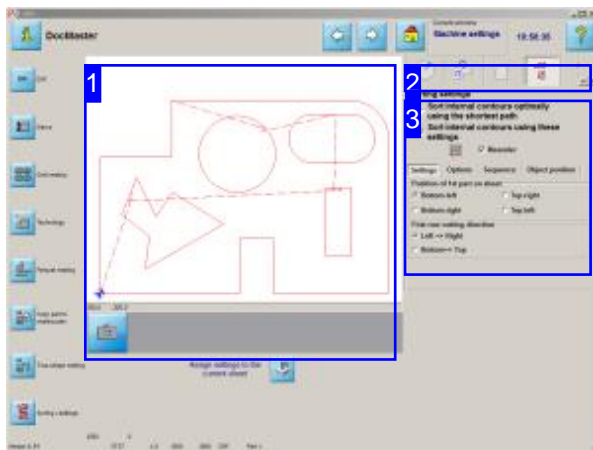
3



You can lay the cutting-path exactly onto the contour (no offset) or allocate the cutting-path a tool-corrected path. The correction can take the path left (G41) or right (G42) of the contour. Use line-types to define how a path should be cut. You can allocate the contour a line-type using the Checker .



## Sort Your Component's Internal Contours.

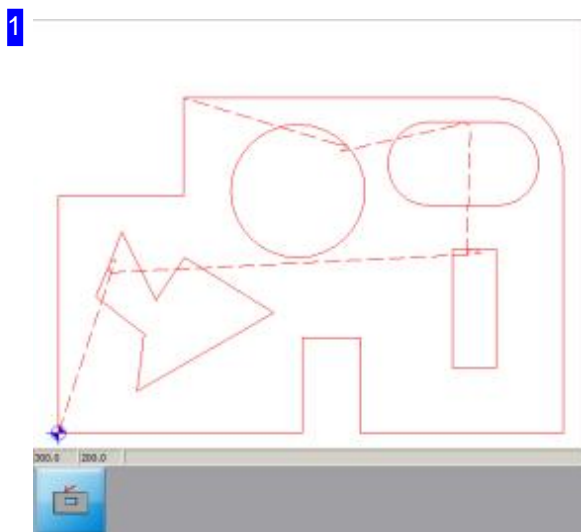


The preview window [1] shows you the workpiece with the processing path for cutting internal contours.

You can optimize the processing path automatically with *cncCUT* (using the shortest cutting path) or set it manually using the targeted settings [1]. You can also use this function for internal contours spread across several parts in a DXF drawing. Such a drawing might be a complete nesting plan from an external CAD system.

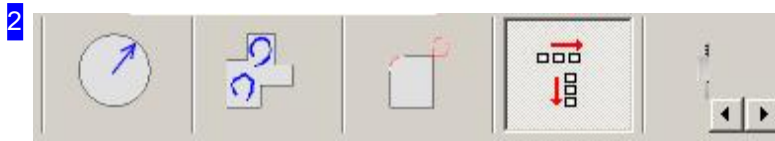
You will find a description of the left Navigation panel in the 'Cutting Settings' chapter.

This screen allows you to set the cutting sequence for your workpiece's internal contours.

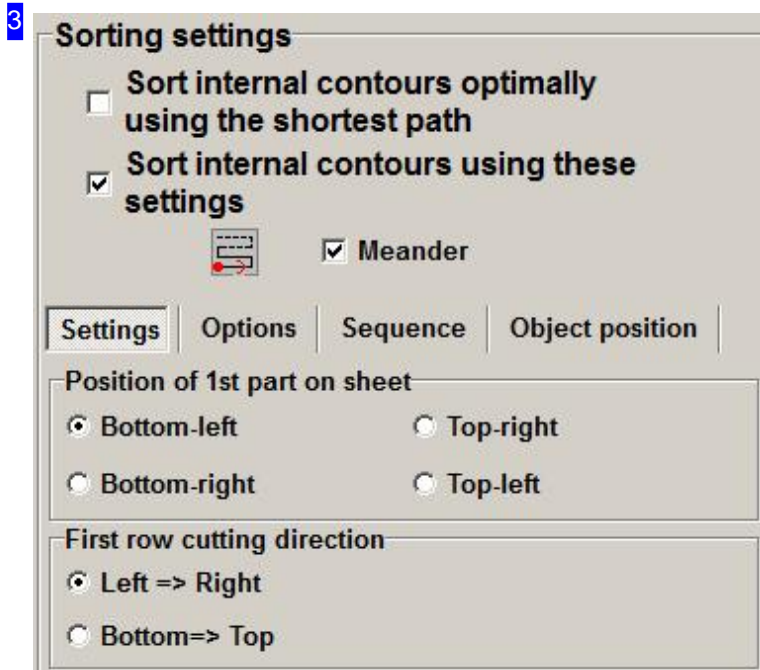


This preview frame shows you the workpiece with the cutting tool's lead-out point marked on, and the cutting path for cutting its internal contours.

Use the zoom button at the bottom to zoom in on the workpiece; you will jump into the zoom window.



You can set the cutting sequence for your part's holes in the tab: 'Sort internal contours'.



Mark the top check-box if you would like *cncCUT* to automatically calculate the cutting path. This will be set using a shortest-path algorithm.

If you prefer to set the cutting path yourself, mark the second check-box, then use the options available from the bottom tab panel to set the cutting sequence..

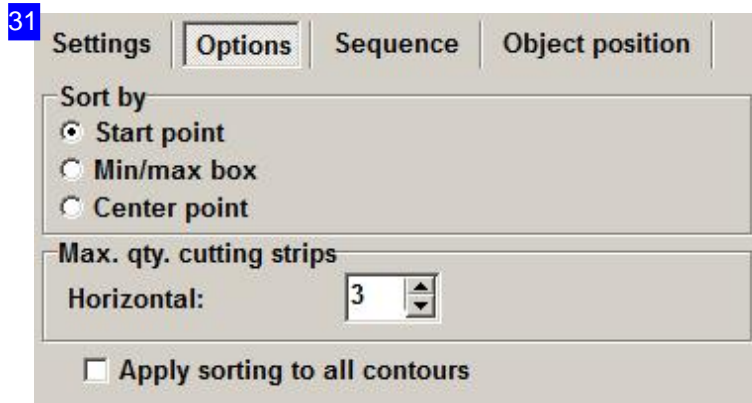
The central icon will always show the pattern your current settings result in. The position of the first contour to be cut is shown with a red dot, the cutting direction is indicated with a red arrow.

If you wish to change the cutting direction after each pass, mark the 'Meander' check-box. This saves time in non-cutting movements. Leave the box blank if there is a risk of your material warping under the heat.

The 'Parameter' tab allows you to set the position of the first contour from the part to be cut, and dependant on this, you can then set the direction for the head to travel to cut the other contours in the first row.

The 'Options' tab allows you to set the lead-in point for sorting. If you wish to change the sequence, you may do so from the 'Sequence' tab.

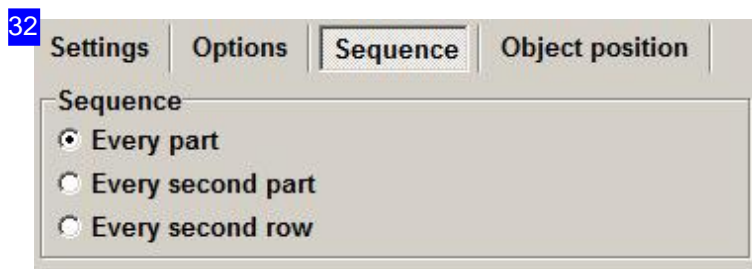
To set the sequence of processing method go to the 'Contour Position' tab.



The 'Options' frame allows you to set the lead-in point for sorting by.

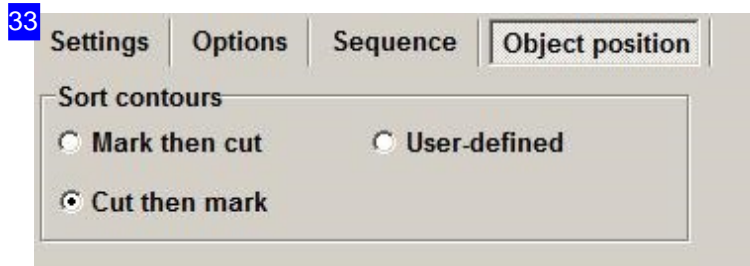
- o The 'Start-point' option tells the program to take the start-points for all contours and sort the cutting sequence such that these are optimized.
- o The 'Mid-point' option has the program optimize the cutting sequence by the contours' mid-points.
- o Select 'min/max Box' and the program sorts the contours as if they had an invisible rectangle enclosing them.

A further option allows you to sort the cutting sequence in 'strips'. This breaks it down into 'mini-parts', which are processed by the strip. This option allows brachiated sequences to be brought into a better order through the use of narrower bands.

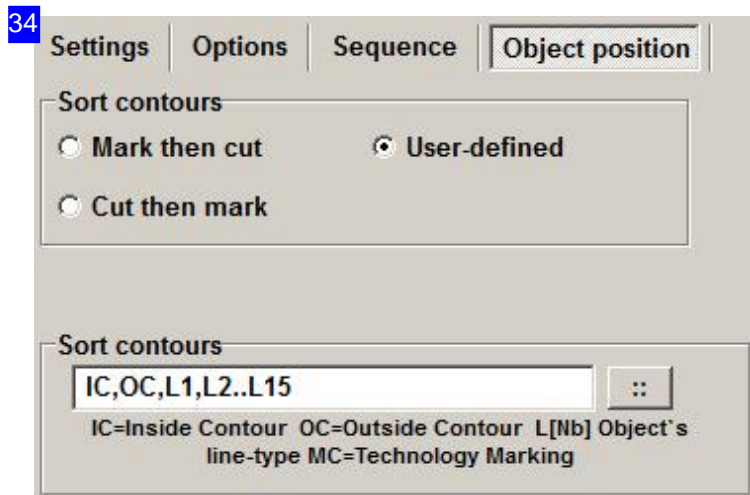


The 'Sequence' frame allows setting of the sorting sequence.

- o The 'Every Part' option sets the program to cut the parts one after the other, as they lie.
- o The 'Every 2nd Part' option cuts each second contour. This option is most useful when, for example, a thin sheet is having complex parts cut from it, and there would be a risk of heat-deformation if each part were cut one one after the other.
- o If you feel it safer to select 'Every second part', you may also wish to consider cutting alternate strips. Take note though that the non-cutting movements will increase.



The 'Contour Position' frame allows you to set the sequence for processing. Choose between 'Mark, cut' or 'Cut, mark', or set the sequence individually to your own requirement using 'User defined'. This opens a Text-box for inputting the sequence.



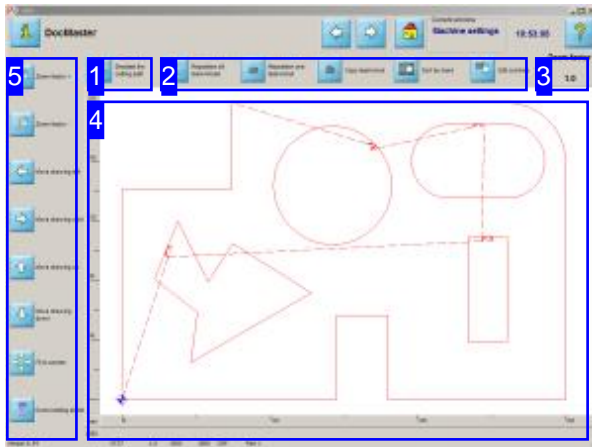
The 'User defined' option for setting the processing sequence calls a text-box for inputting the sequence. The following options are available when inputting the sequence:

- o IC - Internal contour
- o OC - External contour
- o L[Nb] - Contour by Line type

If you wish to define via line types, you may separate numbers with commas, or define a region using two points: '..'



## Sort or Reposition the Lead-ins.



Zoom in on your part and check the cutting path. Use the options in the navigation panel [2] to zoom in on, and move the drawing into the desired position.

Start a simulation to check the cutting process. You can then observe the sequence in which the machine will cut the part's contours.

Use the exact data for your costing calculation.

This screen allows you to zoom in and out, and move your drawing in any direction, so that you can check it thoroughly. A simple keypress displays exact cutting data for you in an MS Excel® table.



Clicking this button starts a simulation of the cutting process. You can see in which sequence the contours will be cut.

While the simulation is running you will see a Slider in the top right corner of the screen. This allows you to set the speed of the simulation.



You can change the speed of a simulation while it runs. Move the slider bar right to slow the simulation down, or left to speed it up.





2



These buttons allow you to sort or reposition the lead-ins of your contour, or copy a lead-in from any contour to another.

To redefine all lead-ins, use the mouse to define the new cutting path. Use the left-most button for this.

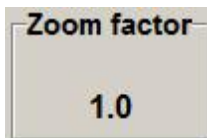
To move just one lead-in, press the second button.

The third button allows you to copy any lead-ins to other contours.

If you wish to sort contours manually, use the before last button.

The right button opens a dialog for manipulating contours and elements.

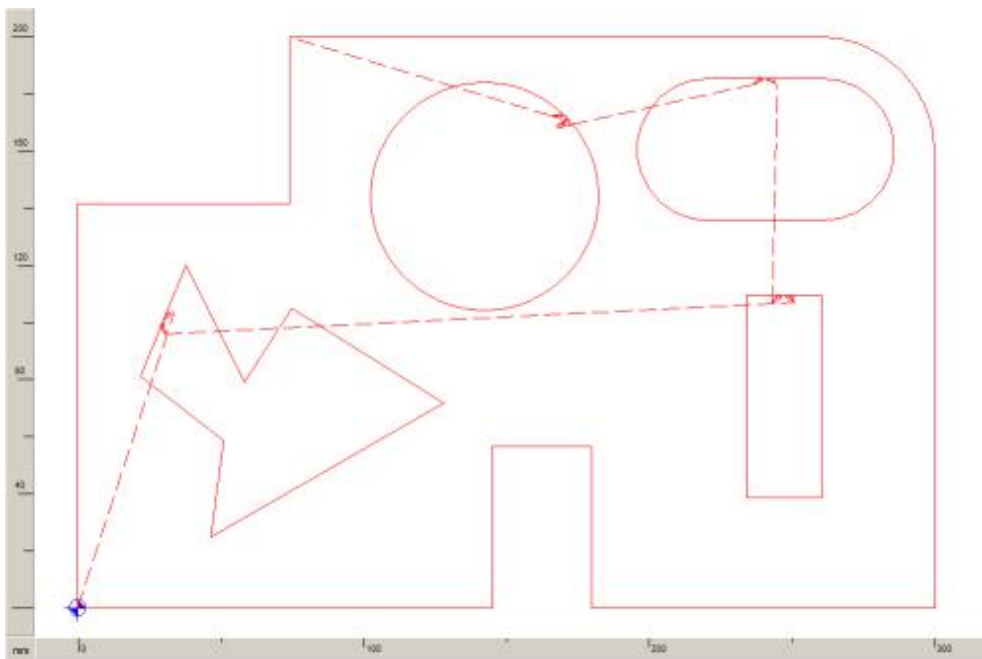
3



The current zoom factor is shown here.

The zoom buttons in the navigation panel [5] allow you to increase (+) or decrease (-) the zoom factor.

4




This frame shows you the cutting-path for the current component. You can zoom in and out to check the part, and move the part within the viewer. To zoom in or out, click the navigation panel [5] buttons to



increase (+) or decrease (-) the zoom factor. If your mouse has a scroll wheel, then you can use that to zoom in or out around the cursor's location.

**21** **Move all lead-in/outs**

Drag cursor from object to object in the required order with the outline last, holding the left mouse button until complete (where line is crossed = new lead-in/out position)



You are given detailed instructions as to what to do for the next step. If you wish to use the function more than once, mark the bottom checkbox. Use the right button to exit the function. A second, top checkbox is post-processor dependant, and its function will be explained in more detail in the post-processor's help page.

**22** **Move one lead-in/out**

Left-click the new lead-in/out position



Use the mouse to indicate the required new lead-in position on one of the component's contours.

**23** **Copy one lead-in/out**

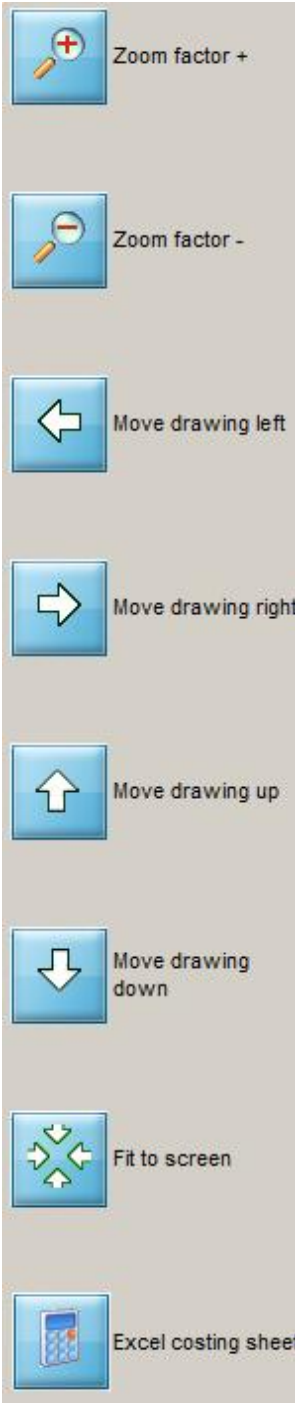
Click a contour at the insert position for the copied lead-in/out .



Use the mouse to indicate the required new lead-in position on one of the component's contours.



5



Use this chance to zoom in on your part and move it around to examine your component carefully.

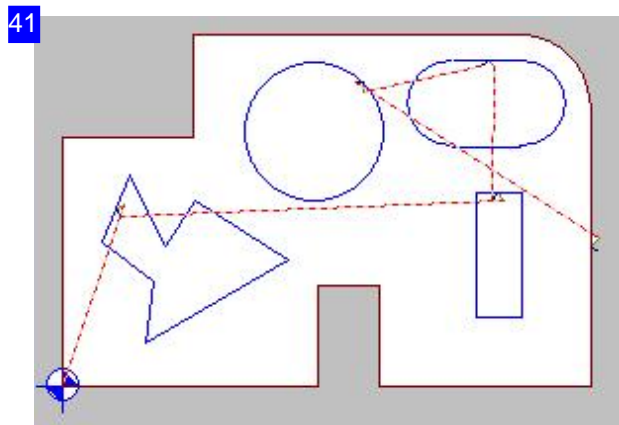
To zoom in or out, click appropriate button to increase (+) or decrease (-) the zoom factor.

Click on the 'Calculation' button to see an Excel® sheet with the exact cutting data. The simulation will be run to gain exact data! This function is enabled from a setting in the POSTPR.INI file.



	A	B	C	D	E
1	Numbers of moves	4		2	
2	Length of moves	572,31		0,6359	
3	Length of cutting	2165,07		10,82535	
4	Cutting speed	900			
5	Time	144,34			
6				13,46125	
7	Material	ST37			
8	Thick	1			
9	Widht	1000			
10	Height	1000			
11					
12	Abrasiv	1			
13		0			
14					
15					
16					
17					
18					
19					
20					
21					

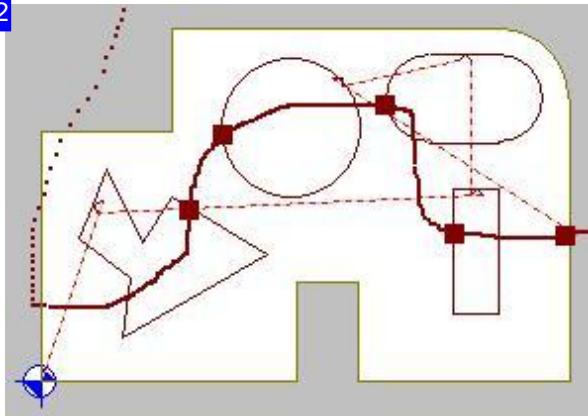
This excel® table gives you the exact cutting data.



This is what the original cutting path looks like. To set the new cutting path use the mouse to go to the cutting process's start point. You must enclose all contours when doing this.

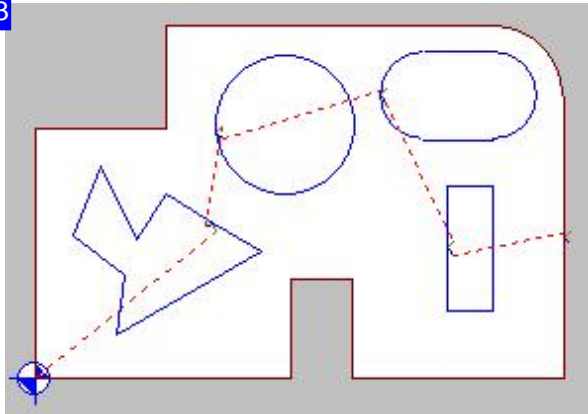


42



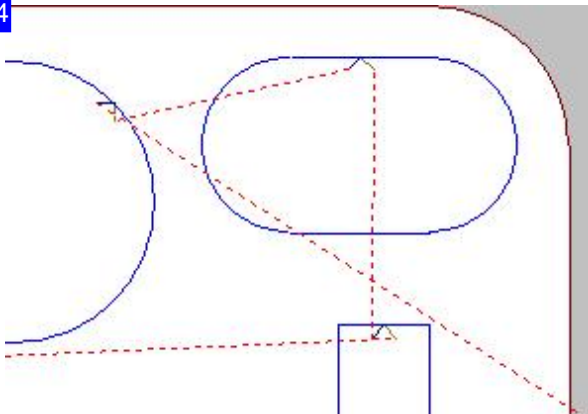
Press the left mouse button and drag the cutting path across the drawing. Next you will see the new cutting path superimposed on the component.

43

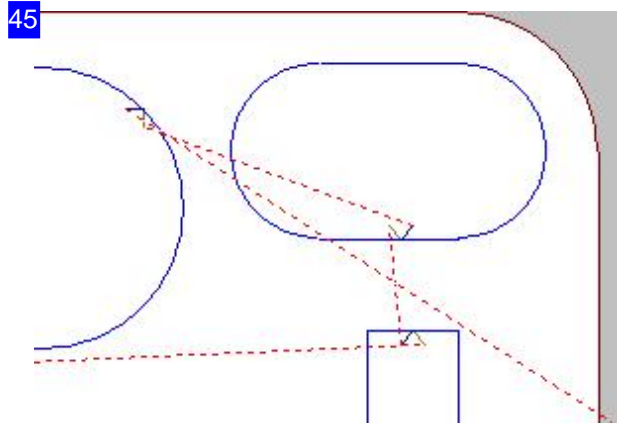


The new cutting path would run like this.

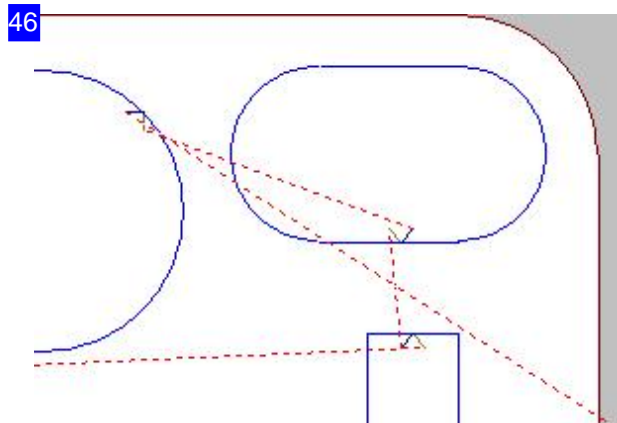
44



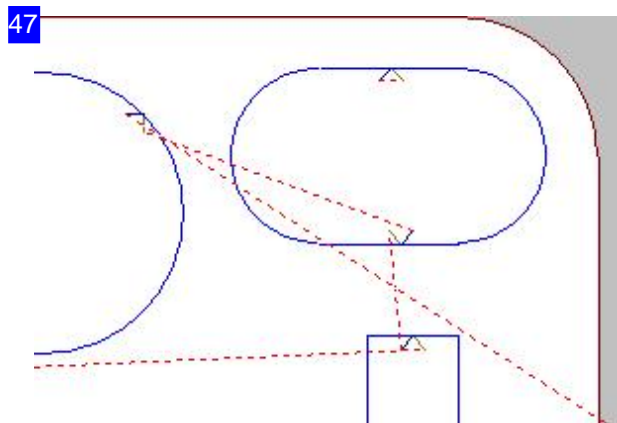
Clicking the new position repositions the lead-in to this point.



The cutting path with its repositioned lead-in looks like this.



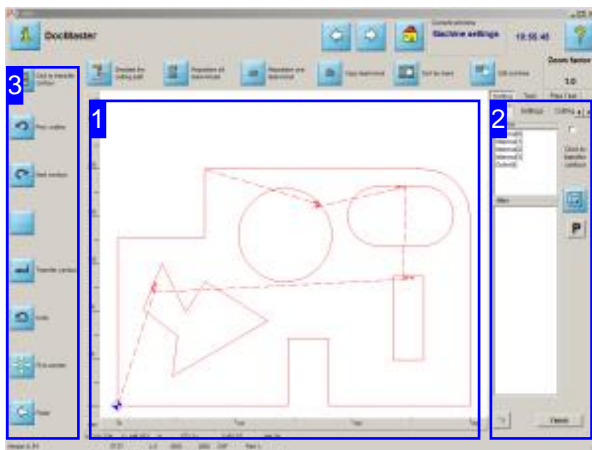
Clicking the new position copies the lead-in to this point.



The result - a copy of the lead-in, placed on this contour.



## Sorting your Cutting Parts Manually.

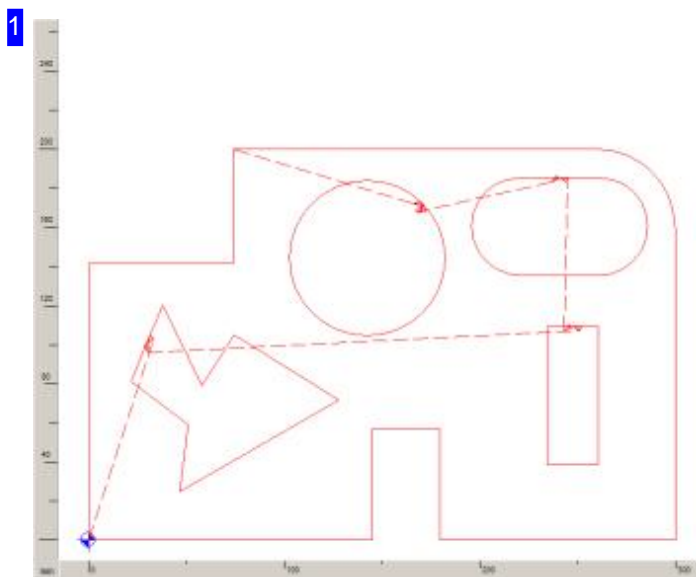


The preview [1] shows you the workpiece with its individual elements.

The frame to the right presents the elements ready for further processing. You can set the elements into the required sequence simply by using the mouse.

A second tab (Test) allows you to check for and remove collisions between lead-ins and contour elements.

This screen allows you to sort your contour's elements manually and remove any collisions between lead-ins and contour elements.

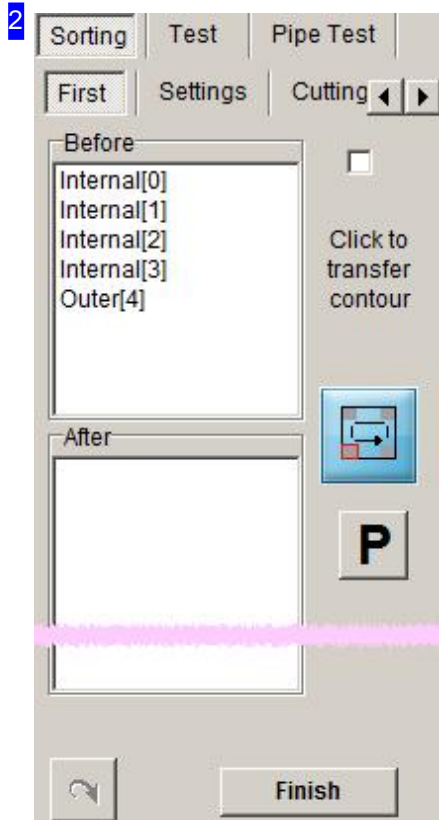


You can bring the drawing to the desired position in the window using your mouse's scrollwheel. Move the cursor to the desired center and use the mousewheel to zoom in and out about this center.



Selecting an element from the selection list to the right [2] will see it highlighted in the drawing using a different color. Transferring the element to the new sorting list will see it drawn in a third color, thereby allowing you to easily keep track of what you have done.

Click on a contour to mark it in the contour list at the top of the window [2]. If you have marked the 'Mouse-click = Transfer Contour' checkbox in the sorting window [2], then selecting a contour will transfer it into the new list.



All elements in the drawing are listed in the top list within this frame. Selecting an entry in the list will see the corresponding element highlighted in the drawing with a different pen color. Click the button to the right to transfer the element to the new list.

You can also mark and transfer multiple elements to the new list simultaneously.

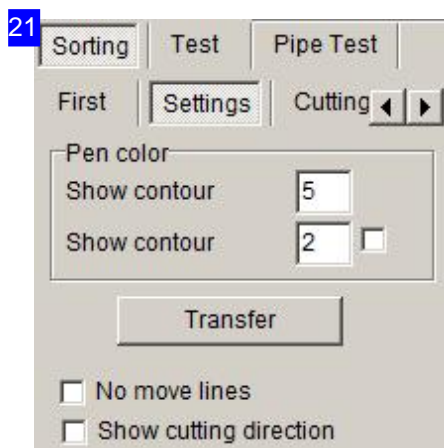
The button at the bottom left allows you to undo the previous action.

The 'Parameter' tab allows you to allocate different colours to your contours.

The 'Cut Parameter' tab allows you to change the cutting parameters.

The 'Lead-ins' tab allows you to modify the lengths of the lead-ins.

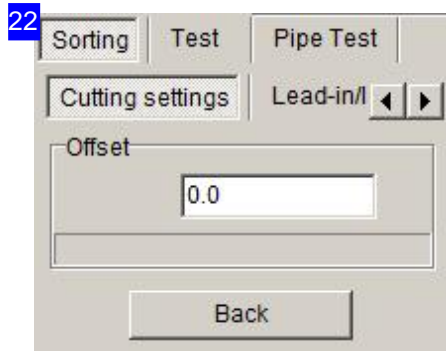
You can click the 'End' button at the bottom right or the bottom of the navigation panel [3] to finalize the sorting process and confirm the application of the new list in the dialog box that appears once all elements are in the required sequence.



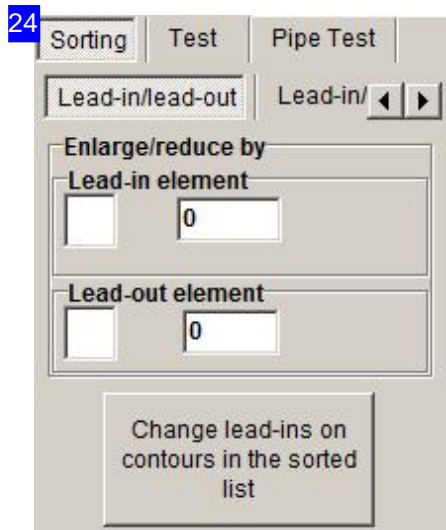
You can allocate different colors to your contours here. Enter a color number for the contour type and click the 'Apply' button. When the contour is selected from the preview window or the sorting list it will be displayed in the color you defined.

The bottom select boxes allow you to suppress display of the cutting path or show the cutting direction on the contours, simply mark the corresponding check-box.

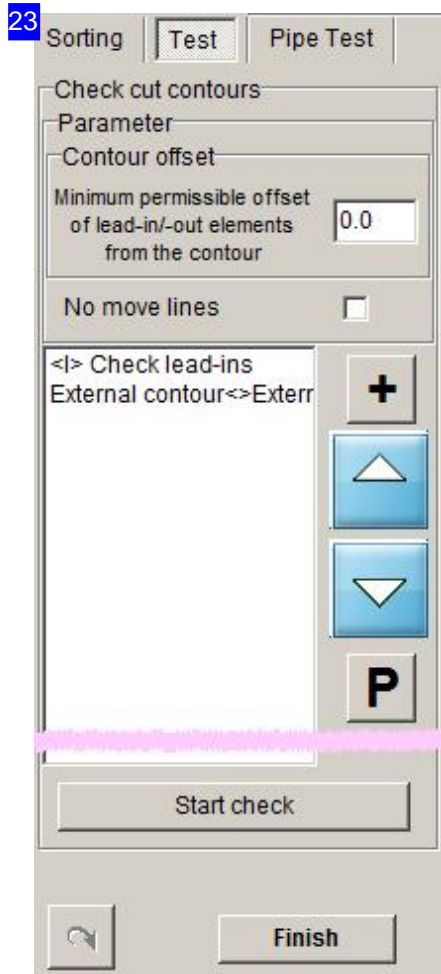




You can adapt the cutting path offset here. Enter the desired value in the text box.



You can modify the length of the lead-ins here. Enter the desired value in the text box mark the corresponding check-box. To enter absolute length values, switch to the next tab, titled 'Lead-in and -out elements'.



You can test the offsets to your lead-ins and -outs here, and set a minimum offset to be kept clear. Collisions are shown in the list, allowing you to make modifications on an individual basis. Click the 'P' button for a menu allowing you to make targeted changes to lead-in lengths.



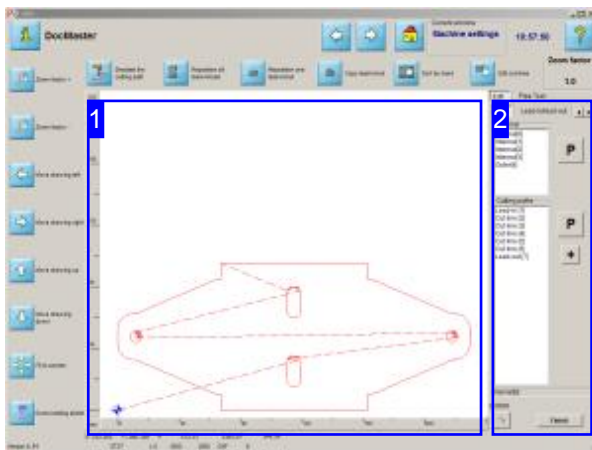
3



The navigation panel offers all options required for working in the sorting frame, and allows you to use the second and third buttons to navigate the contour elements.



## Edit your Cutting Paths in Detail.

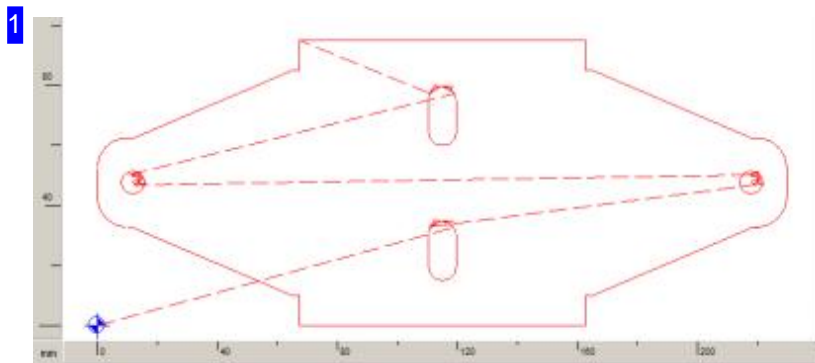


The preview [1] shows you the workpiece with its individual elements.

The frame to the right [2] presents the elements ready for further processing in the upper list. The lower list shows all elements from a contour, selected from the upper list. Menus allows you to edit contours or elements or add attributes to them.

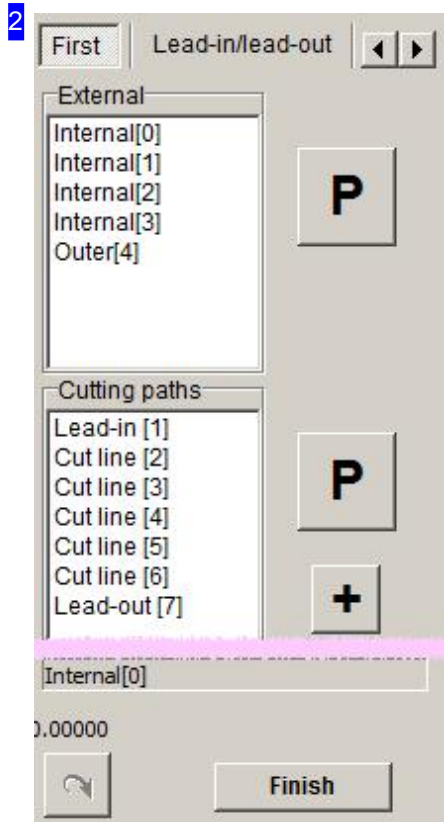
The tabs in the top of the frame gives you access to functions for modifying contours.

This screen allows you to edit your individual contour elements specifically. All elements are provided for selection in the frame right [2].



You can bring the drawing to the desired position in the window using your mouse's scrollwheel. Move the cursor to the desired center and use the mousewheel to zoom in and out about this center.

Selecting an element from the selection list to the right [2] will see it highlighted in the drawing using a different color or marked with the cursor.



All contours in the drawing are listed in the top list within this frame. Selecting an entry in the list will see the corresponding contour in the drawing with a different pen color and all corresponding elements are listed in the list below. Selecting an entry in the bottom list, the corresponding element will be marked with the cursor in the drawing.

The tabs in the top give you access to functions for modifying the elements.

The 'Lead-in/lead-out' tab allows you to set the leads. The 'Settings' tab allows you to change the cutting parameters for pen colors and set and edit markings.

You can divide or split contours and elements. Click 'Divide' or 'Split'.

If you right-click a list-item with the mouse, menus are opened in addition for contours or elements, making more manipulations. Additional menus allow you more manipulations for contours and elements, if you right-click a list-item with the mouse.



21

Lead-in (Vector)
Lead-out (Vector)
✓ Lead-in (Arc)
✓ Lead-out (Arc)
New lead-in on current contour
Change cutting direction
Change G41 / G42 direction
Show cutting direction
Cut with C axis
Cut without C axis
Markings at element end points
Triangle marking at cursor position
Delete all markings
Weld cutting contour
External contour: remove horizontal + vertical elements on the outer shell
Zero point = lower left edges
Create closed outer contour for nesting
Accept new outer contour lead-in for nesting
Manually sort the cutting paths of the list
Delete cutting contour

This menu shows you functions modifying contours.



22

- Lead-ins before/after element (Settings)
  - Lead-in element (Vector)
  - Lead-out element (Vector)
  - Lead-in element (Arc)
  - Lead-out element (Arc)
- Separate element (Parameter)
  - Separate
- Normal cutting element
  - Lead-in
  - Lead-out
- Don't cut element
  - Turn cutting direction
  - Make element start element
  - Machine stop after element
  - Pierce (in/out)
- Move element at start/end point
  - At Start Point
  - At End Point
- Activate C axis from this element
- Deactivate C axis by this element
- Deactivate C axis for this element
- Delete element

This menu shows you functions modifying contour elements.

23

First  ◀ ▶

Set the lead-in properties here

|

L

A

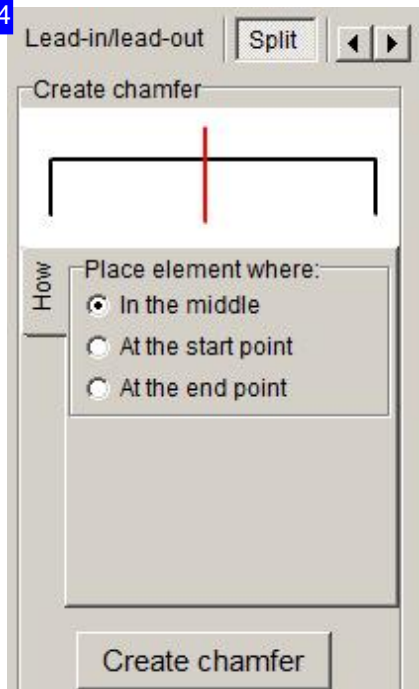
L

A

Here you can modify the shapes and lengths for lead-ins and lead-outs.

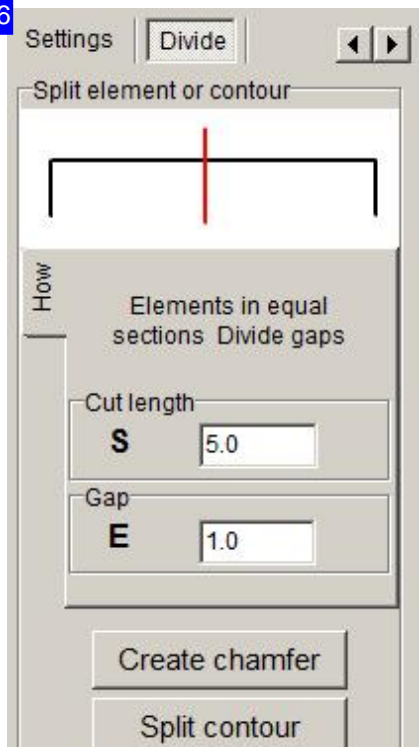


24



Select a position and click the button at the bottom for splitting an element. Click the 'Divide' -tab for dividing an element.

26



You can divide contours and elements in several parts. Enter the length of a part and the gap between the parts and select the item. The elements list will extend. Click the 'Split' -tab for splitting an element.





25

Split   Settings   Divide ◀ ▶

Pen color

Show contour   5

Show contour   2

Transfer

No move lines

Show cutting direction

Marking lines

Element length   5.0

Elements` line type   2

Triangle marking

Length X   30

Length Y-offset   10

Orientation angle   90

Only the triangle corners

Corner length   5

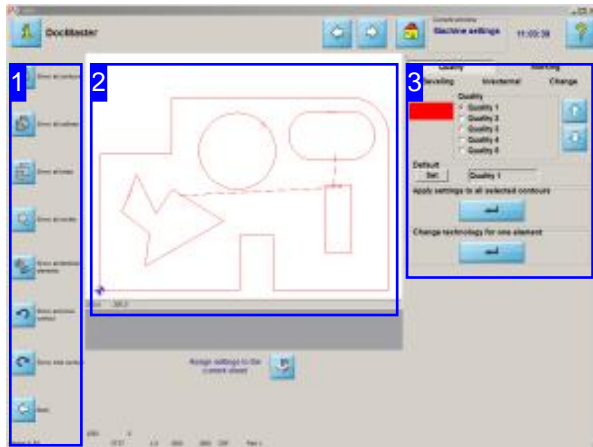
Elements` line type   2

Back

You can set the pen colors and markings in this frame.

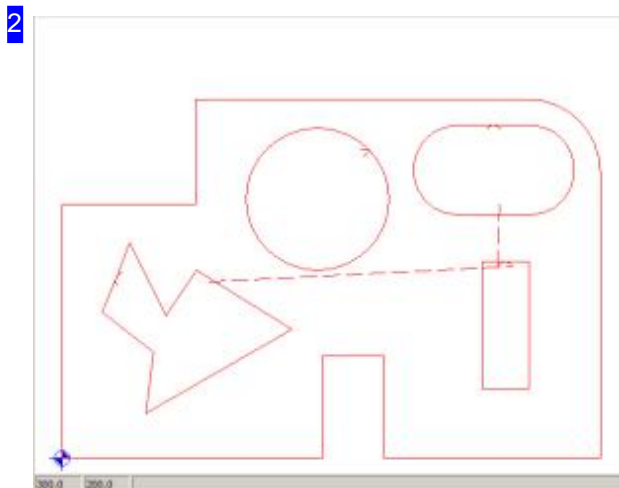


## Cutting Settings for Individual Contours.



A component's contours can have very different settings for cutting speed and method; they can be marked out for 'Cutting', 'Marking', 'Bevelling' or 'Piercing' or many others [3].

This screen lets you look at individual groups of contours. Cutting speed and type can be entered for the contours, though this is post-processor dependant. More information about cutting types can be found in the help pages for your post-processor.




This frame shows you a preview of the contours according to your input. The contours will be shown in a different colour and form when selected.

Click in the preview to enter the technologies zoom window.



3

Quality		Marking	
<b>Beveling</b>	<b>In/external</b>	<b>Change</b>	
	<b>Quality</b> <input checked="" type="radio"/> Quality 1 <input type="radio"/> Quality 2 <input type="radio"/> Quality 3 <input type="radio"/> Quality 4 <input type="radio"/> Quality 5	<input type="button" value="↑"/> <input type="button" value="↓"/>	
<b>Default</b>			
<input type="button" value="Set"/>	<input type="text" value="Quality 1"/>		
<b>Apply settings to all selected contours</b>			
<input type="button" value="←"/>			
<b>Change technology for one element</b>			
<input type="button" value="←"/>			

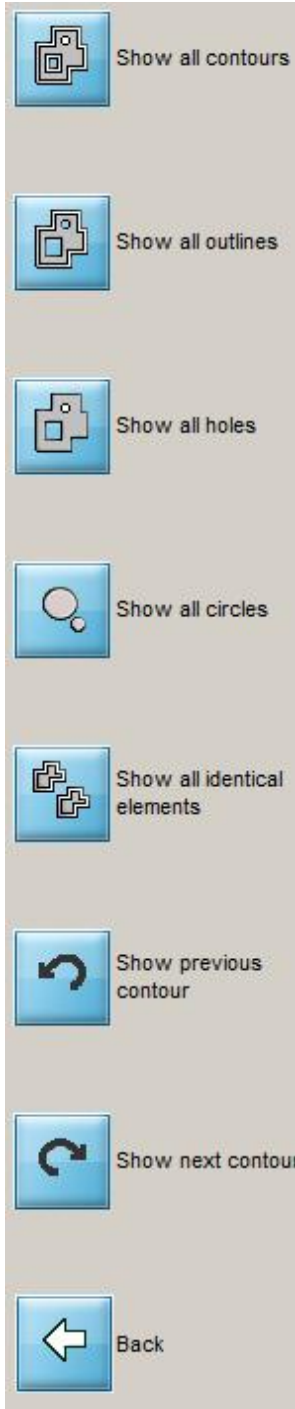
This frame is dependant on the post-processor you are using. The available options will be described in the help files for your post-processor.

This frame allows you to make changes (cutting speed, contour type and quality, etc.) to the machine settings for your cutting parts

Enter the values and mark the check-boxes if a change should be made, and click the button at the bottom to make that change to all highlighted contours.



1



Use the navigation panel [4] to select individual elements specifically. The upper button always shows you the whole component. The buttons underneath display elements according to groups, as described. The bottom buttons allow you to cycle through elements sequentially.

# The Nesting Screen

Nesting the parts in a grid.



You can nest your component onto the selected sheet in the nesting screen. You can set the desired quantity of components to nest. Define the rows and columns and set the offsets between components and the sheet margins. The program will calculate how many sheets are required and show you this in terms of how many whole sheets will be used, how many sheets will be partially used and how many parts will be made from each of those sheets.

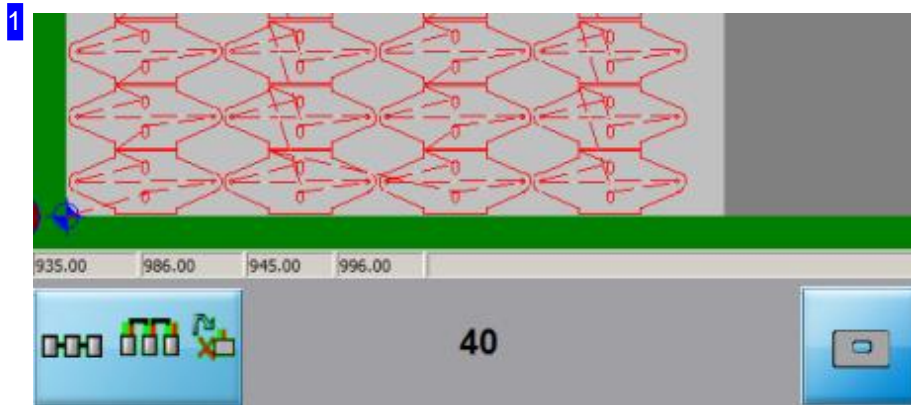
Furthermore you can set the cutting direction in the rows and columns with a simple keystroke.

In the nesting screen the quantity of parts, their offsets and the cutting direction will be set.

Choose the settings to work on in the tab bar [2].

- o The first tab 'Component quantity' allows you to set the number of parts per row, per column and in total.
- o The second tab 'Offsets' allows you to define the offsets between parts and up to the sheet's edge. You can also select the cutting direction here.
- o Depending upon the selected post-processor you may be offered a tab allowing you to set the number of cutting torches to cut the sheet with.

Finally you can switch to a screen for editing the nesting plan, joining the parts with a chain-cut or bridge-cut, and setting the lead-in positions.



In this frame you will see a preview of the nested sheet you select. This can be either a 'full' sheet, or the 'last' sheet, as selected by clicking the respective icons in the sheet overview [4].

Under the preview is the quantity of parts to be nested on this sheet, and a button which toggles the preview between a view of the whole sheet, and a view of one component.

If you have changed the settings [3] then a button will be shown for confirming your inputs.

Click on the preview to switch to a 'Zoom' window for a detailed view, and the option to simulate the cutting process.

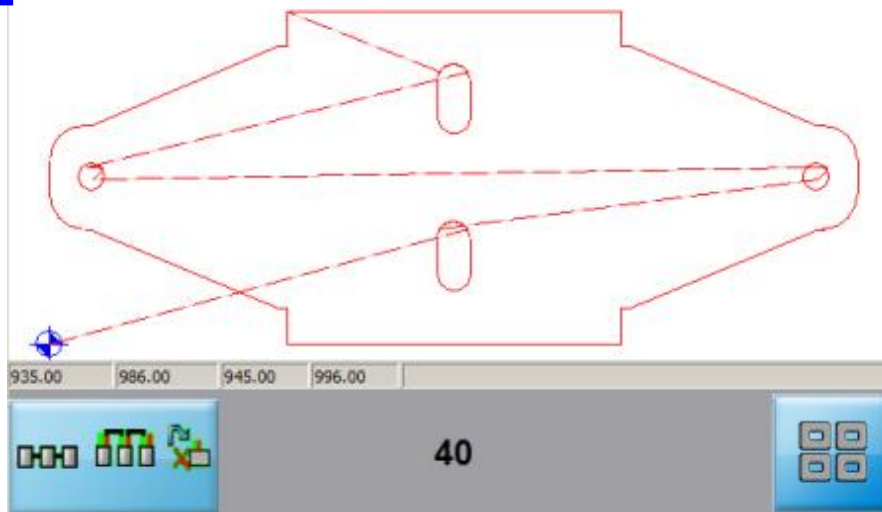
The left button allows you to switch to a screen for editing the nesting plan. This screen allows you to:

- o Join parts with a chain-cut.
- o Join parts with a bridge-cut.
- o Set the lead-in positions.

There is more detailed help for these functions in the machine settings help pages.

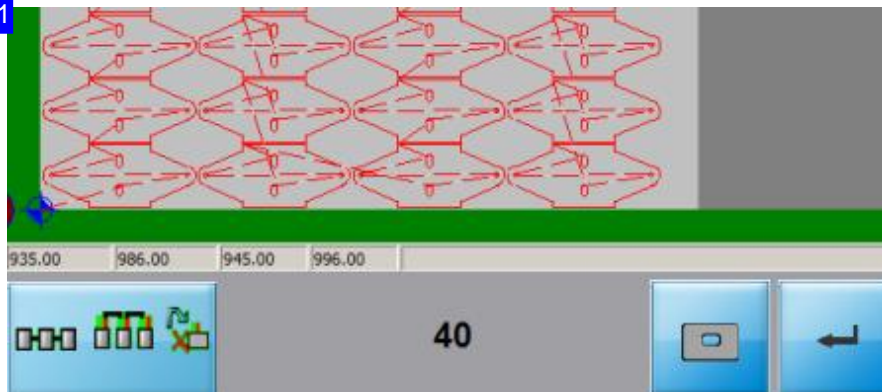


12



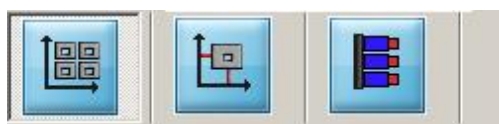
You can switch back to the all parts view with the button below the preview and to the left.

11

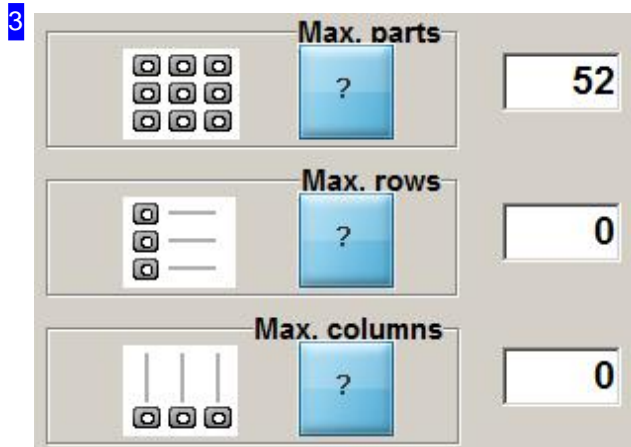


You must confirm any changes you make in the text boxes [3] with the 'Enter' button below the preview and to the right.

2

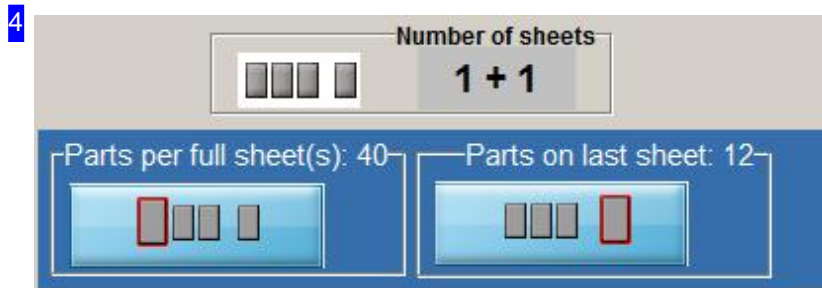


You can set the quantity of parts to be made in the first tab. Change to the second tab if you wish to change settings regarding the cutting direction and offsets for your parts, switch to the second tab. The third tab is available optionally and dependant on your post-processor, and concerns multi-torch machines.



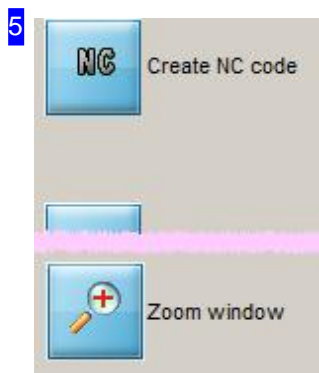
The program will help you find out how many parts fit in the rows and columns, as well as on the whole sheet. Press the respective question mark button to show how many parts can be nested..

Change the values as you require and confirm your inputs with the 'Enter' button under the preview frame [1].



Here you can see the quantity of sheets needed for nesting. The 'full' sheets are counted to the left, and the 'last' sheet which takes any remaining components is on the right.

Click on the icons below the quantities to see a preview [1] of the respective sheet.



Click the top button to go to the next step in generating your NC-program.

The bottom button takes you to the zoom window, where you can simulate the cutting process and check the parts and cutting direction.





## Part offsets and cutting direction

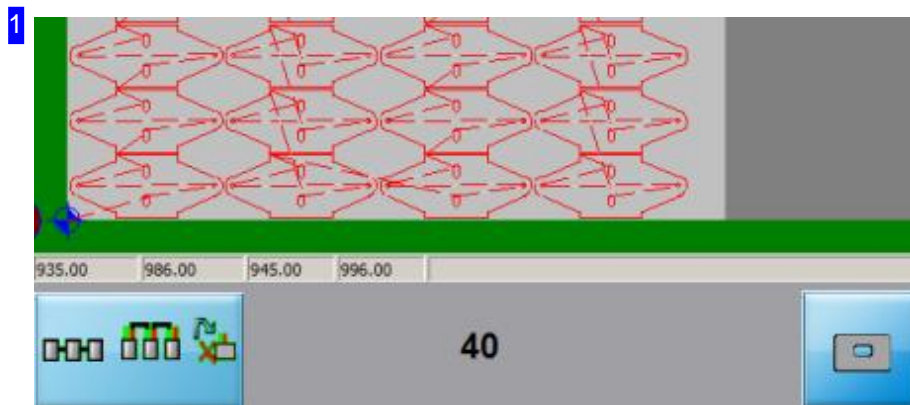


Set the parts' offsets and the cutting direction.

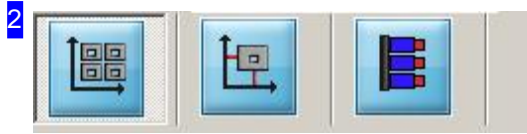
Choose the settings to work on in the tab bar [2].

- o Set the number of parts on the sheet, in the rows and columns from the 'Component quantity' tab.
- o The second tab 'Offsets' allows you to set the offsets between each part and up to the sheet margins. You can also select the cutting direction here.
- o Depending upon the selected Post-processor you may be offered a tab allowing you to set the number of cutting torches to cut the sheet with.

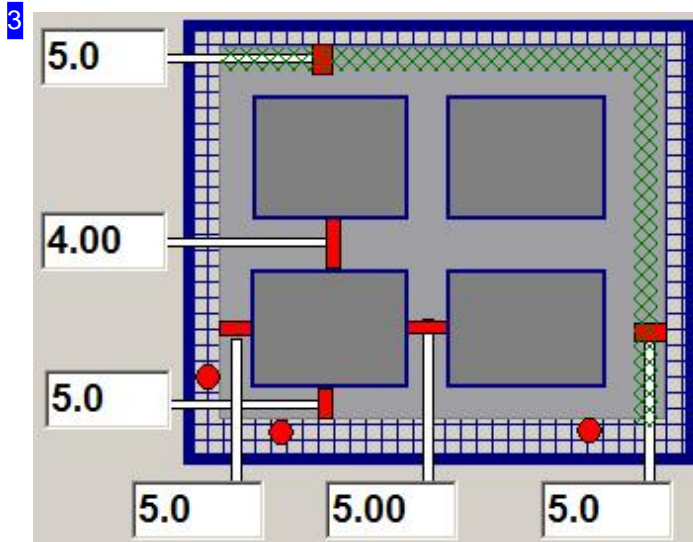
In the nesting screen you can nest your component to the selected sheet. You can enter the desired number of components to be nested. Furthermore you can set the cutting direction in the rows and columns with a simple keystroke.



In this frame you will see a preview of the nested sheet you select. A description of the previews can be found in the help page for Component quantity.



You can make inputs concerning the offsets and cutting direction in the second tab. If you wish to set the number of parts on the sheet, switch to the first tab.



You can set the offsets of parts from one another as well as from the margins by entering values into the text boxes.

Change the values as you require and confirm your input by pressing the 'Enter' button underneath the preview [1].



A simple click is all that is required to set the parts' cutting direction.

In the left group of options you can choose between alternating and continuous cutting paths for both rows and columns.

In the right group of options you can choose whether to cut every row or every second row and every part or every other part. You should consider speed versus potential overheating of the plate.



5



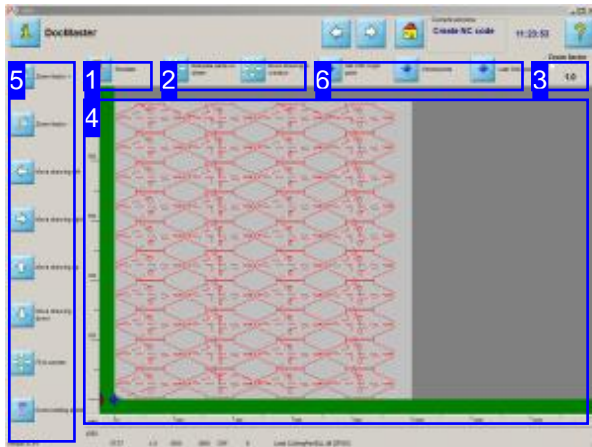
Use the top button to toggle the cutting direction options [4].

The lower button changes between the continuity options [4].



# Simulation

## Simulating a Sheet's Cutting Process.



Zoom in on your sheet and check the nesting and cutting paths. Use the options in the navigation panel [2] to move the drawing into the desired position.

Start a simulation to check the cutting process. You can then observe the sequence in which the machine will cut the parts.

Use exact cutting data in your price estimates.

This screen allows you to zoom in and out, and move your drawing in any direction, so that you can check it thoroughly. A simple keypress displays exact cutting data for your price estimates in an excel® table.



Clicking this button starts a simulation of the cutting process. You can see in which sequence the parts will be cut.

While the simulation is running you will see a slider in the top right corner of the screen. This allows you to set the speed of the simulation.



You can change the speed of a simulation while it is running. Move the slider bar right to slow the simulation down, or left to speed it up.

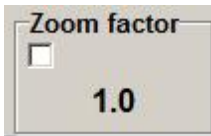


2



You can choose to move the Drawing in the screen, or the Parts on the sheet. Each option has a different control panel in the navigation panel [5].

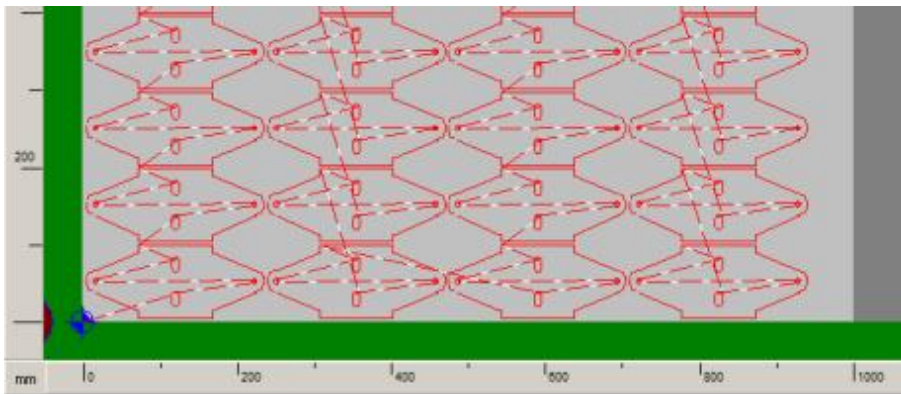
3



The current zoom factor is shown here. This factor sets how clicking on it will change the display. If the value is smaller than 1.0, the view will be zoomed out. To zoom in or out, click the navigation panel [5] buttons to increase (+) or decrease (-) the zoom factor.

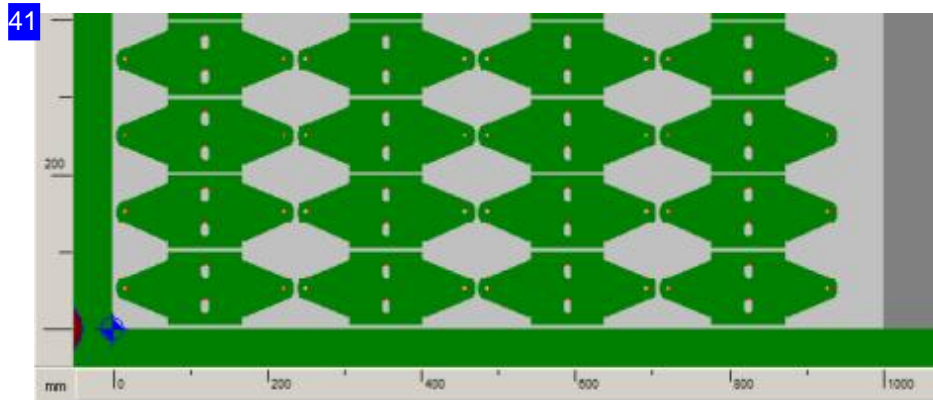
If you mark the checkbox then the parts in the drawing will be made opaque. This option is particularly useful when making a presentation.

4



This screen shows you how the parts will be nested onto the sheet. You can zoom in to check the parts, and move the drawing around the screen. To zoom in on the parts, click on one of the 'Zoom' buttons in the navigation panel [5] to set the zoom factor and then on the drawing to apply the zoom tool.

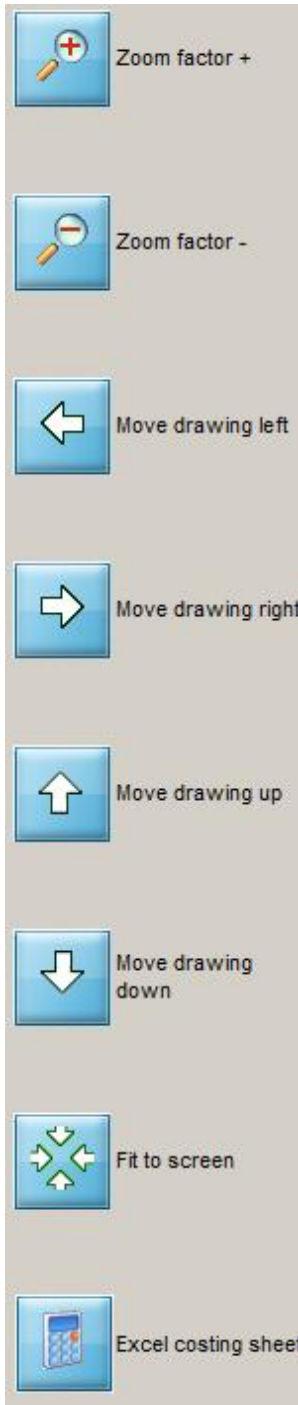
If you mark the checkbox at the top right [3], the parts will be shown opaque.



This graphical representation of the sheets is particularly well-suited to making presentations.



50



Use this chance to zoom in on your drawing and move it around to examine your component carefully.

To zoom in or out, click the appropriate button to increase (+) or decrease (-) the zoom factor. The zoom factor must be more than one to zoom in.

When moving the parts, the content of the navigation panel changes.

Click on the 'Excel cost sheet' button to see an Excel® sheet with the exact cutting data for your cost estimation. A cutting simulation will be run from which the cutting data will be taken. This function must be permitted from the 'POSTPR.INI' settings file.

51

Parts start pos.		Part distance	
X	<input type="text" value="5.00"/>	Row	<input type="text" value="4.00"/>
Y	<input type="text" value="5.00"/>	column	<input type="text" value="6.00"/>

If the buttons for moving parts are shown at the bottom of the navigation panel and the parts are moved using them, the header panel for both frames will change accordingly with the part offsets.



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The buttons in this navigation panel allow you to visually move the parts. Click the top button while holding the <Ctrl>-key to show the components in min/max boxes.

The four bottom buttons are important. They let you set the offsets from part to part in rows and columns. These buttons have a different function when used on a true-shape nested sheet. The parts can be moved in both directions (x and y) and renested.





53

	A	B	C	D
1	Numbers parts	40		
2	Nb. of sheet	1		
3	Eilganglänge	1518,2972		
4	Schneidlänge	4383,2913		
5	Schneidzeit	292,2194		
6	Numbers of moves	200		
7	Length of moves	24060,36		
8	Length of cutting	29937,94		
9	Zeit (Std)	00:05:34		
10	Material	ST37		
11	Widht	1000		
12	Height	1000		
13	thick	1		
14	Cutting Speed	900		
15	Vorlochzeit (sec)	4		
16	Markierungszeit(sec)	0,5		
17			TR	
18				
19				
20				
21				
22				
23				
24				

This excel® table gives you the exact cutting data for your cost estimation. A cutting simulation will be run from which the cutting data will be taken. This function must be permitted from the 'POSTPR.INI' settings file. You get the data also directly in the 'Time calculation' in the JOB-list.

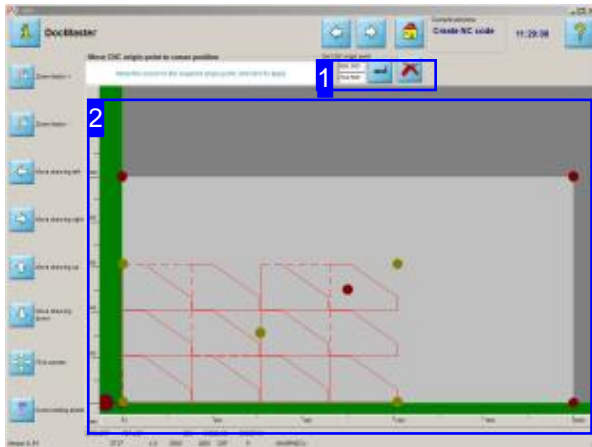
6



Once your sheet is finished, you can still move the null point. Click the left button to move the null point. This changes to a window where you can enter the new null point. You can edit the checkpoints in the cutting path and the endpoint in the cutting process in the same manner. Checkpoints and the endpoint have particular symbols.



## Placing a new origin point.

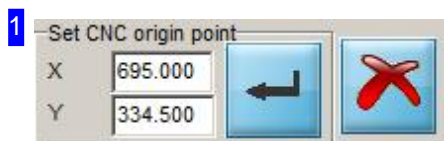


Various points are offered on the sheet for direct selection as the origin point. The sheet is shown in two areas - the entire sheet (red points) and the parts' area (green points). Each area has 5 points, the 4 corners and the centre point where diagonal lines from the corners would intersect.

You can also set the origin point by entering its coordinates.

You can edit the checkpoints in the cutting path and the endpoint in the cutting process in the same manner. Checkpoints and the endpoint have particular symbols.

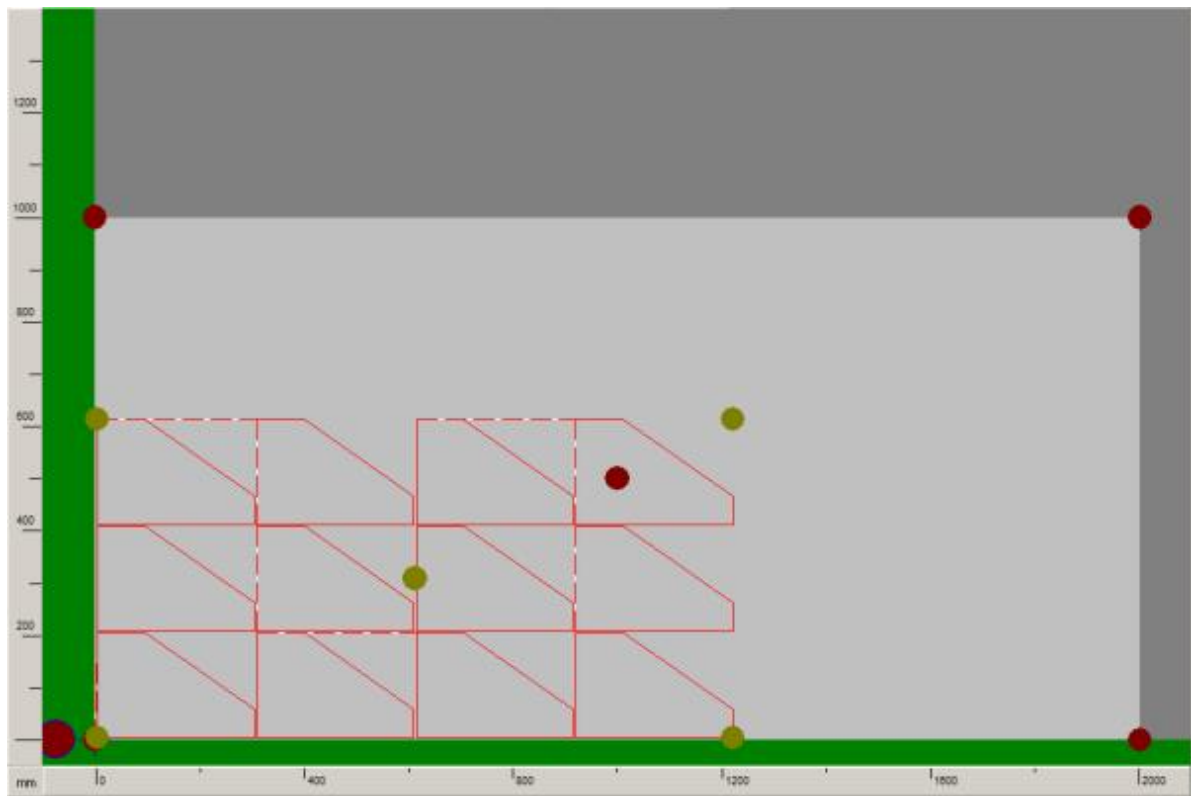
This screen allows you to set a new null point.



To set the origin point to an absolute coordinate value, simply enter that value in terms of X&Y here, and click 'enter' to confirm.



2

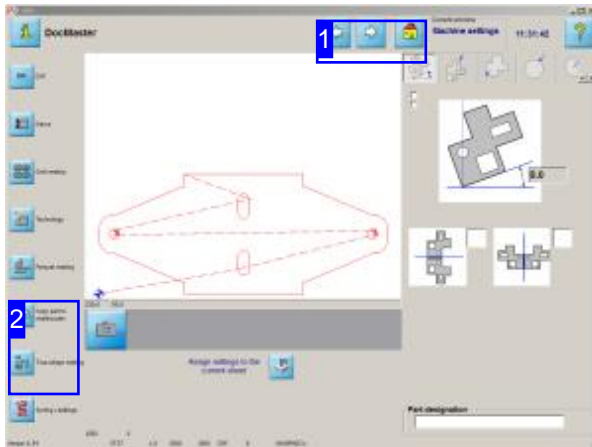


The sheet is shown in two areas - the entire sheet (red points) and the parts' area (green points). You can use this frame to quickly set any corner or the centre of either of these two areas as the origin point by simply clicking that point.



# True-shape Nesting

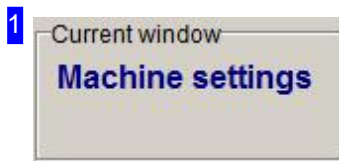
Working from a nesting plan.



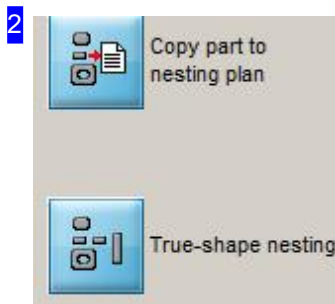
The 'Machine Settings' screens [1] allow you to transfer individual parts to a nesting plan [2].

- o Select parts from DXF files to be added to your nesting plan.
- o Select parts from macros to add to the nesting plan.
- o Switch to the true-shape nesting window [2] - and all selected parts will be ready to proceed with.

True-shape nesting proceeds from a nesting plan, that is, all parts that are present in the nesting plan will be nested onto the selected sheet. The 'Machine Settings' windows [1] allow you to add further parts to the true-shape nesting process.



The 'Machine Settings' windows have a button in the navigation panel [2] with which you can add parts to your nesting plan.

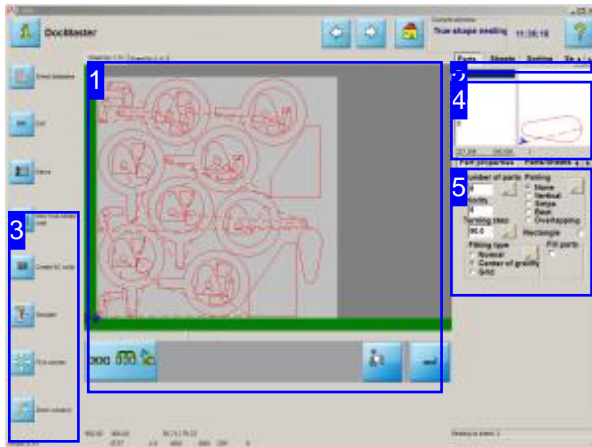


Press the top button to transfer a part to the nesting plan. A dialog box will open in which you can enter the quantity of the part required. This quantity can be modified later.

Clicking the bottom button switches to the true-shape nesting window.



## Input priority, turning angle, fitting type and quantity.



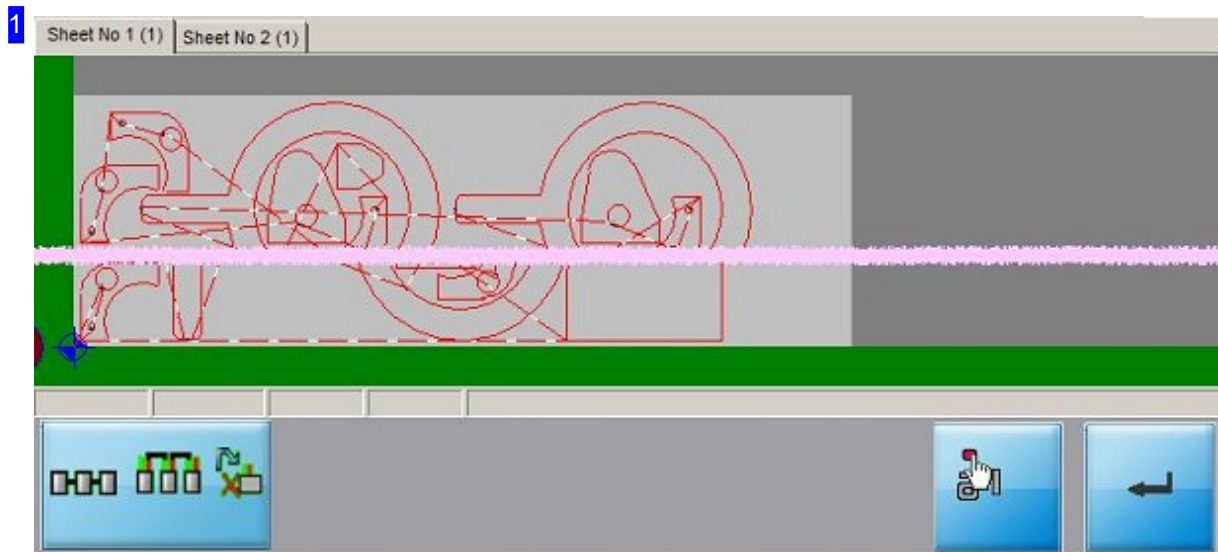
You can enter settings for nesting here. Entering priority, step angle, fitting type and pair building settings allows you to influence the nesting procedure.

You can switch to concatenate parts to groups with an endless cut, depending on the post-processor, on this screen.

The 'Parts' Screen allows you to make inputs about the fitting of your parts, the priorities to nest them with, the step angle to turn them by when nesting. If you enter the same priority for all parts (Default = 5) then *cncCUT* will nest parts without preference.

- o Select a part from the summary [4].
- o Make settings about priority and step angle when nesting in the 'Part Settings' tab [5]. Entering a smaller value increases the calculation time severely when nesting, as more fitting steps will have to be tried.
- o Make settings about the fitting type and pair building.

If your machine is capable of handling multiple cutting heads and you have the corresponding post-processor installed, you will be offered a 'Multi-torch' tab in tab panel [2] from which you may make options concerning multi-torch cutting. You will find help relating to this tab in the corresponding post-processor's help file. An optional function allows you cutting nesting-plans multiple. You can cut nesting-plans in multiple regions parallel.



This tab panel takes you to the results of the nesting process.

There is a tab present for each sheet required, with which you can switch to that sheet to see a preview of it. The number in brackets represents the number of 'copies' of this sheet to be made. There is a tabular listing of the parts on your sheets in the 'Parts/Sheets' tab [5].

Clicking in the drawing jumps to the Simulation screen. Use this screen to check your sheet.

Any changes you make in the right window must be confirmed using the 'Enter' button below the preview.

The second button to the right 'Autom. manual nesting' switches to a screen where the system will help you manually nest the selected parts. This function must be enabled by the administrator.

The left button allows you to switch to a screen to edit the nesting plan. There is more detailed help for these functions in the machine settings help pages.



This tab panel gives access to settings for sheets and parts, such that the nesting process can be executed according to plan.

Set the parts' quantities, priorities, step angles and fitting parameters in the 'Parts' tab.



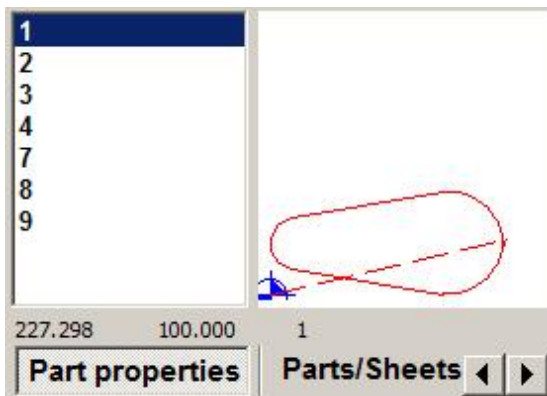
3



The navigation panel allows you to:

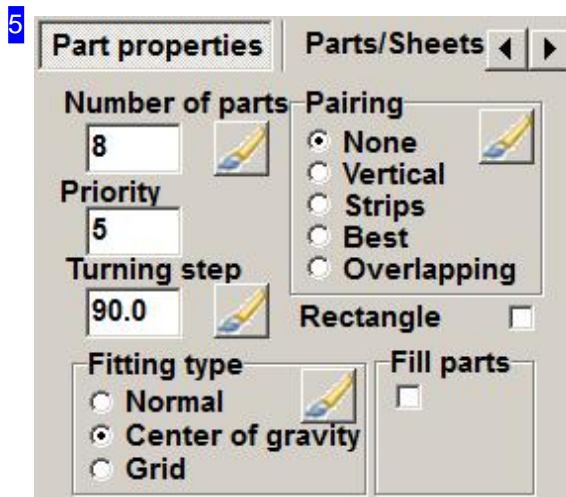
- o Re-nest with the top button.
- o Progress to the next screen and generate your NC code with the second button.
- o Start a simulation of the sheet's cutting path in the preview window [1] using the middle button.
- o Bring everything into the viewing window with the penultimate button.
- o Jump to the Simulation window using the bottom button.

4



Select a part to make individual settings for from the summary to the left. The part will then be shown in the preview to the right. The drawing is fitted to the preview window, and is not to any scale!

To delete a part from the list, right-click on it and select 'Delete' from the context menu.



The 'Part Settings' tab allows you to make the following settings:

- o Quantity of parts to be nested. If the number is marked then the quantity will be applied to all parts when applied.
- o Priority - determine the order to nest your parts to the sheet in. Parts with higher priorities will be nested first.
- o Step angle - this determines the angle to turn your parts by when nesting them. Entering a smaller value increases the calculation time when renesting, as more steps will have to be run through. For this, the material will be used more efficiently. Small values do not always give the best results. It is quite possible that 'coarse' resolutions for single parts will give better results when the whole sheet is considered!
- o Fitting type - this determines the position of the first part on the sheet. 'Normal' takes the first suitable position, 'Center of balance' sets *cncCUT* to try to find the best possible solution. 'Grid' fits the part or parts in an invisible rectangle.  
All subsequent parts are aligned against the first part.
- o Rectangle - Mark this option and every part or pair of parts will be enclosed in an imaginary rectangle. No other part will then be nested inside this rectangle. The parts lie on the sheet in an invisible grid with this option.
- o Pair building - sets the alignment of two parts to one another, which can then be nested as a pair of parts, which can be prioritised.
- o Fill parts - this option allows you to choose a part which will be used to fill any available space on your sheet. You can set the maximum required quantity of this part, and as many as possible up to that number will be fit into the gaps on your sheet. You can limit fill parts to the nesting height (leaving a rectangular offcut) under the 'Sheets' tab.

The ' Parts/ Sheets ' shows you the exact number of each type of part on each sheet.





51

Parts/Sheets		Multi-torches	
Name	Total	This sheet	
1	8	1	
2	8	8	
3	8	8	

The 'Parts/ Sheets' tab shows you the exact number of parts on the sheet you have selected to view in the overview [1].

52

Multi-torches	Part info	Se
Part designation		
<input type="text"/>		
<b>Apply</b>		

The 'Part info' tab allows you to allocate a part an identifying tag for easier management later on.

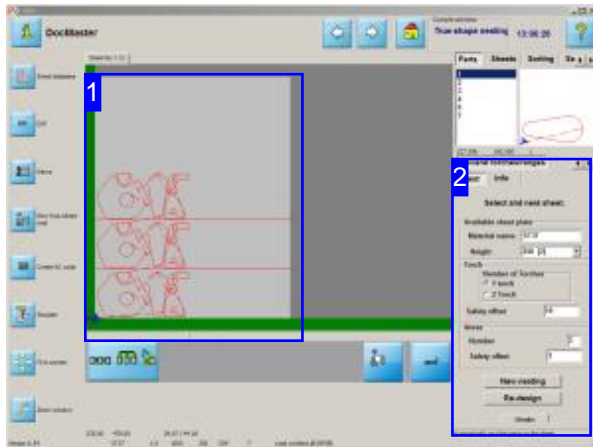
53

Multi-torches	Part info	Se
Automatic multi-torch		
Auto - Nesting using multi-torches <input type="checkbox"/>		
Mode		
<input type="radio"/> Automatic <input checked="" type="radio"/> Fixed torch qty. <input type="radio"/> Fixed torch qty / offset		
Use this torch qty.	<input type="text" value="1"/>	
Minimum torch offset	<input type="text" value="100"/>	
Use single torch <input type="checkbox"/>		

The 'Multi-torch' tab is post-processor dependant and allows you to make settings which allow parts to be nested in tracks according to how many cutting heads will be used.



## Multiple laying of a nesting plan.



The tab 'Multiple torches/areas' will appear in the working field if the appropriate setting is made in the post processor.

You can do the settings for multiple laying on this tab, and adapt to the requirements of your cutting table. Note that the nesting plan is completely cut several times and the number of parts increases accordingly! You have a list of parts at the tab 'Info' to check this.

A nesting plan can multiply laid out in areas adjacent to each other. This optional feature allows you for example cutting parts parallel on sheet metal strips, taken from a coil, placed side by side on the cutting table. The use of multiple torches is taken into consideration.

The sheet's high, selected in the sheet database, is determining the height of the nesting area!



The preview shows the current layout, using the selected number of torches. The nesting plan at the bottom is executed multiple times (here 3 times with 1 torch).



If the optional function is enabled in the post processor, the tabs 'Nest' and 'Info' appear on the tab 'Multiple torches/areas'.



21

**Nest** | **Info**

**Select and nest sheet.**

Available sheet plate

Material name

Height

Torch

Number of Torches

1 torch

2 Torch

Safety offset

Areas

Number

Safety offset

Select a virtual disk under 'Existing sheets of metal', to create a nesting plan. The sheet dimensions determine the area for nesting.

You specify the number of interpretations under 'Areas' and determine the distance between the areas. For example, if you have two sheets from a coil on the cutting table, you can specify the distance of the sheets from one to another here.

Select one or two torches and determine the distance of them one to each other on 'Torches' . The predefined areas are then carried out by each torch. This means that the number of items in stock multiplies!

You can nest the sheets new and carry out the new layout respectively in the lower area. Check the result of the layout under the tab 'Information'.

22

**Nest** | **Info**

Distance between tor

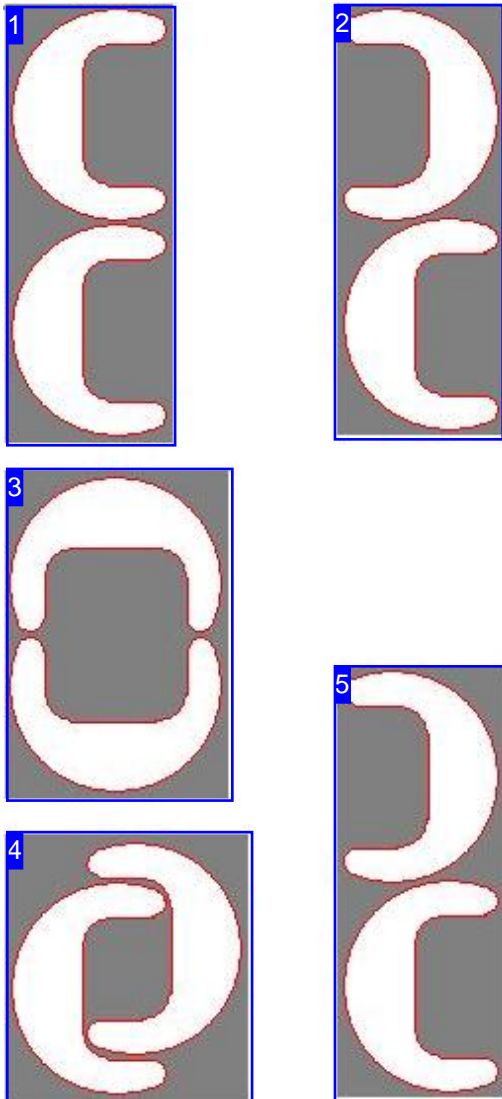
Max. height

Name	Number of	Total amou
1	1	3
2	0	0

You can check the total number of pieces to be cut according to the nesting plan on the tab 'Info'.



## Pair building



*cncCUT* offers five options for pair building. A pair consists of two parts set in fixed alignment to one another.

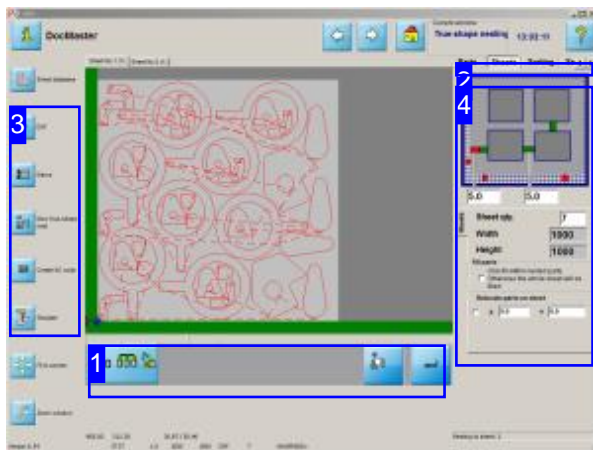
Pair building has the goal of enclosing the parts in the smallest possible box. Normally you can achieve this simply by selecting 'Best'. If you would like a different alignment, there are other options.

1. Do not align the parts.
2. Vertical alignment of the parts. 'Nest' the two parts in as small a box as possible vertically.
3. Align and nest horizontally.
4. Build an overlapping pair.
5. *cncCUT* finds the optimal result when you click 'Best'. In this case, the result is as shown.

If you select 'Best' then *cncCUT* will find the optimal solution for you.



## Positioning the Parts on the Sheets.



The 'Sheets' screen allows you to enter the offset of the parts to the sheet margins, and the parts to one another. Press the 'Enter' button [1] after any changes you make, or they will not be applied.

You can enter the number of sheets available to nest on, and the part and margin offsets. If you enter fewer sheets than are required, then not all parts will be nested!



You must confirm any changes you make in the right window by clicking the 'Enter' button.

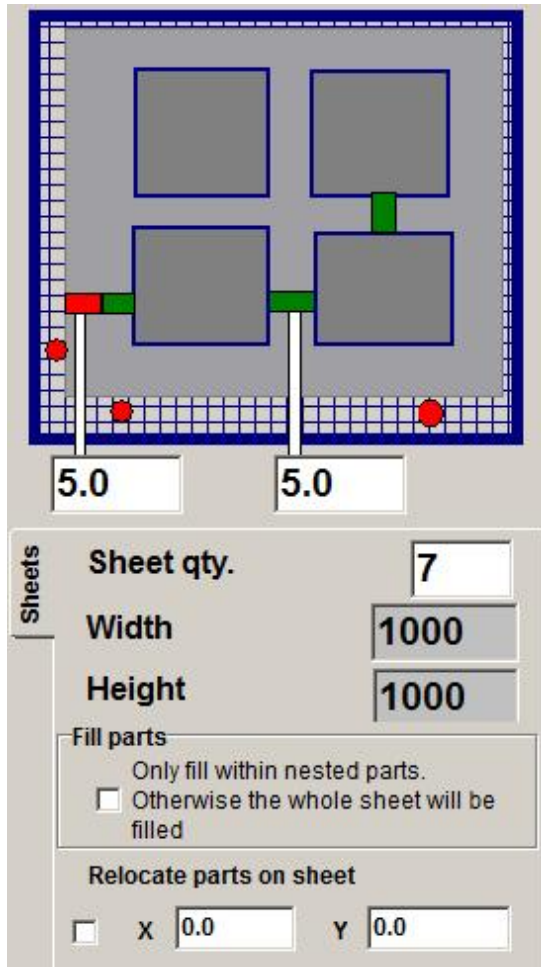


This tab panel allows you to make settings about sheets and parts, such that the nesting operation goes according to plan.

The 'Sheets' tab allows you to set the part and margin offsets as well as the quantity of sheets.



4



The upper input fields define: left, the margin offset; and right, the parts' offset. Please note that the margin offset is for every margin on the sheet.

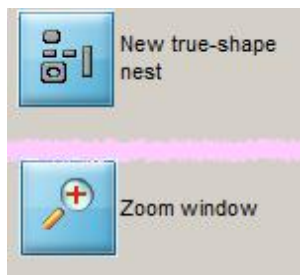
You can use the 'Max available sheets' field to set how many sheets are to be used. If you enter a value smaller that *cncCUT* requires, then not all parts will be nested. So unless you really do have a limited stock of the material to be used, leave this value blank, or enter as large a number as possible.

The 'Width' and 'Height' fields show you the dimensions of the selected sheet. To change these values you must return to the 'Sheet database'.

If fill-parts have been entered in the 'Parts' tab, you can limit them to the normal nesting height here. Mark the checkbox in the 'Fill-part' frame to do so.

You can move all the parts on the sheet. Check the tickbox at the bottom left and enter the required values to move the parts by in the x and y axes. Positive values move parts left and upwards respectively. Confirm any entries made using the 'Enter' button. [1].

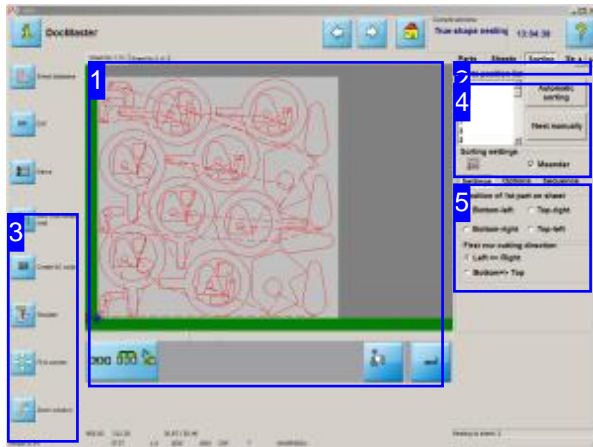
3



You will find help for the Navigation window in the 'Parts' tab.



## Set the Sequence for the Cutting Process.



The 'Sorting' screen allows you to set the sequence in which the parts will be cut from the sheet.

You can set whether the parts should be cut automatically [4] according to a pre-given pattern, or according to an individual, manually [4] defined plan.

There are various options for which automatic sorting template to use [5].

You will switch to a sorting window when sorting manually.

You can define the cutting sequence for each individual part from the positions list [4]. Clicking a part in the positions list will fill it in the overview window [1].

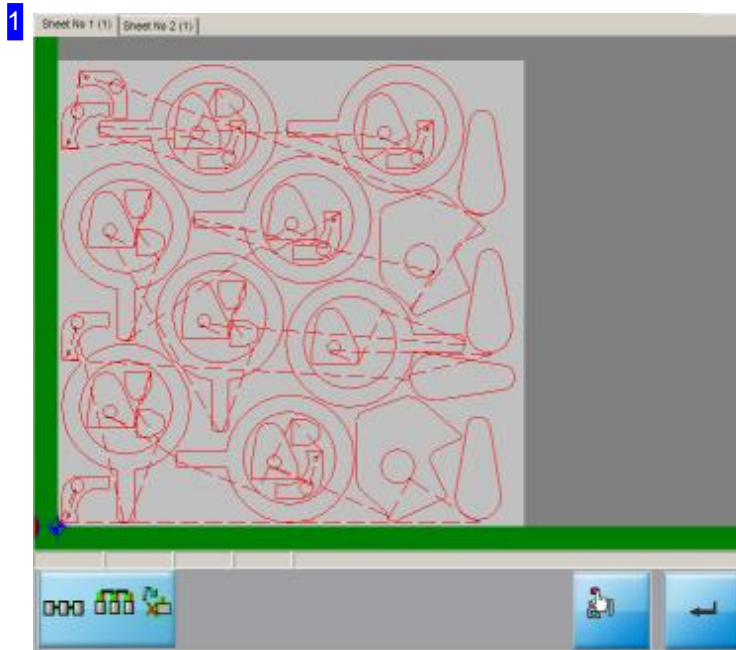
You can sort your parts using a predefined template, or create the sequence by defining a pattern manually.



This tab panel gives access to settings for sheets and parts, such that the nesting process can be executed according to plan.

You set the sequence in which the parts should be cut under this tab 'Sorting'.





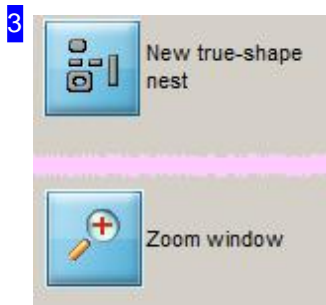
This tab panel takes you to the results of the nesting process.

There is a tab present for each sheet required, with which you can switch to that sheet to see a preview of it. The number in brackets represents the number of 'copies' of this sheet to be made.

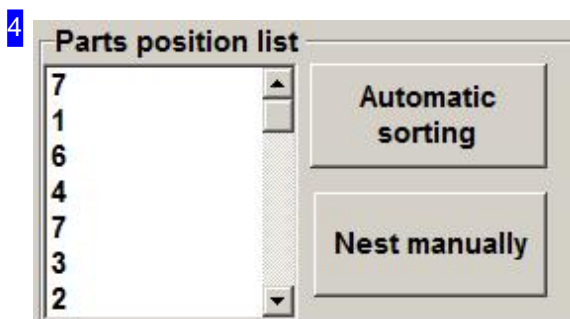
There is an inventory of all the parts on the sheet in the 'position list' [4].

Clicking in the drawing jumps to the Simulation screen. Use this screen to check your sheet.

Any changes you make in the right window must be confirmed using the 'Enter' button below the preview.

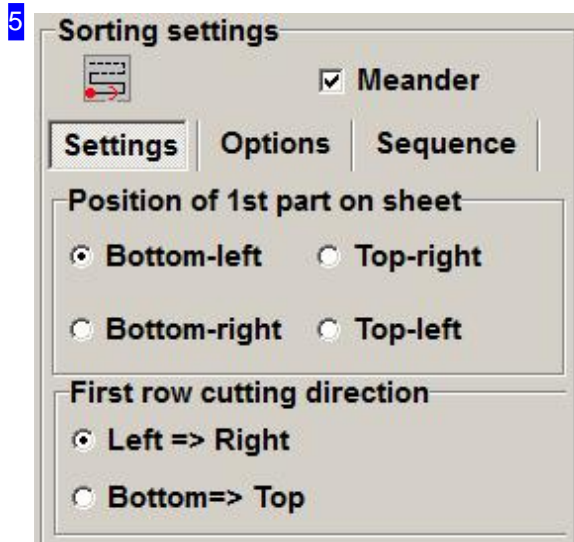


You will find help for the Navigation window in the 'Parts' tab.



The summary to the left shows the parts on the sheet listed. Clicking a list entry marks the corresponding part in the drawing [1].

The list is populated when nesting. This can either be done using the 'Automatic sorting' button, or by using the manual nesting option 'Nest manually'. If you choose to nest manually, a sorting window will be opened (see next chapter).

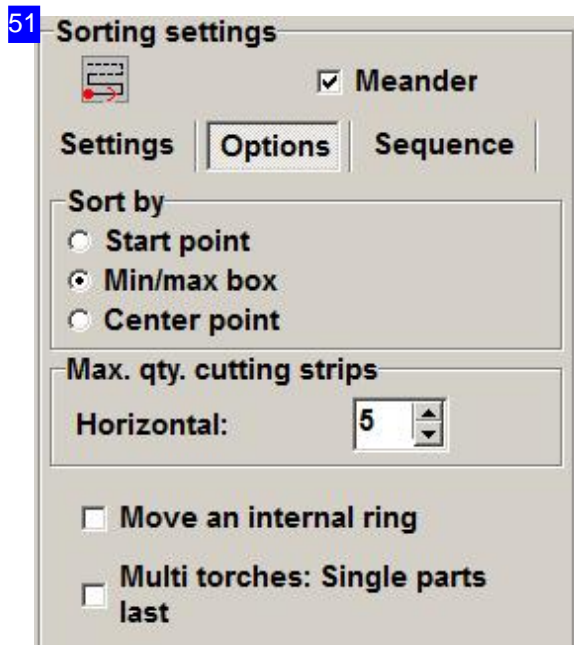


The 'Sorting settings' frame allows you to set the cutting path according to some predefined templates. The icon at the top left shows the setting that the current options give. The position of the first part is shown with a red dot, the cutting direction with red arrows.

In order to change the cutting direction after each pass, mark the 'Meander' checkbox. Changing direction in this way saves long idle travel paths before the next row.

The 'Parameter' tab allows you to choose the location of the first part on the sheet. Dependant on this, you may then set the cutting direction for the parts in the first row.

The 'Options' tab allows you to set the start point for each part when sorting. Use the 'Sequence' tab to change the sequence.



The 'Options' tab allows you to set the run up point for sorting.

- o The 'Start point' option sets the application to use the starting point for each part as the basis for sorting it. The cutting sequence will be determined by keeping the idle travel distance from lead-out to lead-in as short as possible.
- o The 'Center point' option sets the application to align the parts such that their center points are optimally situated.
- o If you enter 'Min/Max box', the program will base its alignment on imaginary boxes placed around the parts.

A further option available is to cut the sheet into 'strips'. This effectively divides the sheet into smaller sheets, which will be processed individually as strips. This method of sorting allows 'rows' which otherwise cause overly zig-zagged paths to be narrowed, and the cutting path can be reduced.

The strips will be shown in the drawing [1].

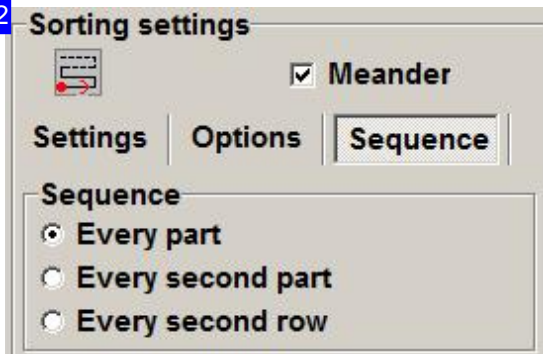


11



The strips will be shown using blue lines. When using strips the sheet is effectively divided into smaller sheets which are processed individually, according to the rules already defined.

52

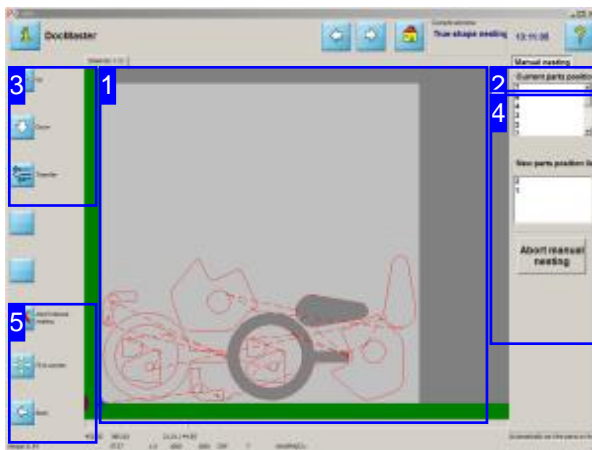


The 'Sequence' tab allows you to set the sorting sequence.

- o The 'Every part' option cuts every part one after the other, as they lie on the sheet.
- o The 'Every second part' option cuts each other part. This option is particularly useful when the complexity of the parts, or thickness of the sheet, mean that the material could tend to warp if every part were cut on sequence.
- o Select 'Every second row' to gain the advantages of 'Every second part', but even more security against warping. Please note, however, that the travel paths are longer with this option.



## Sorting the Components Manually.



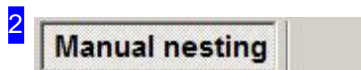
This screen allows you to define the components' sorting sequence manually.

Access this screen by clicking 'sort manually' when setting the cutting sequence.

If the result of the automatic sorting process does not meet your requirement, you may also sort the parts manually.

There are two ways to do this:

1. Work within the drawing. To do this, click each part in turn. As you do so, it will be copied to the position list [4], and marked as 'done' by striking through the part in the drawing.
2. Work within the list. Highlight an item in the list [4] and a 'Transfer' button will appear below the list. The part will be highlighted within the drawing. Click the 'Transfer' button to copy the part to the new position list, and strike it through in the drawing.



This tab panel allows you to manually sort the cutting sequence for your parts, or position the parts manually on the sheet.



You can transfer every part from the drawing to a new position list [4]. Click each part in the drawing in turn to do this. The parts will be copied into the new position list and marked as 'done' in the drawing by striking through. Go through each part in this way until all parts have been transferred to the new list.



4



The current position list (the top list) shows the parts on the sheet listed as they are currently sorted. Click on an item in this list and it will be marked in the drawing [1] with a green outline. The 'Transfer' button will appear under the list.

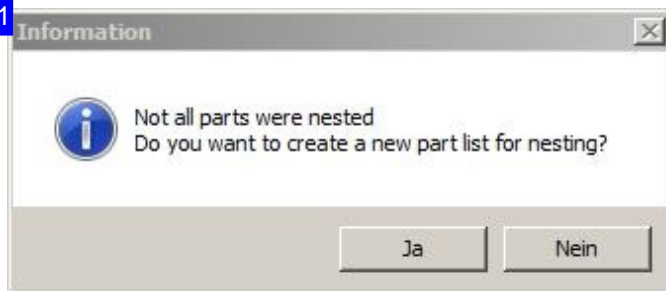
Click the 'Transfer' button to copy the part to the new positions list. The part will be marked as 'done' in the drawing by striking through and 'Sorted' in the list.

To abort manual sorting, click the bottom button.

When aborting manual sorting you will receive a dialog box asking if you wish to use the new positions list as it stands.

Right click on the new positions list to access a menu with an option to put parts back in the old positions list.

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If you have made a manual positions list you will be asked to confirm that it should be used in a dialog box.



3



These buttons allow you to select the parts in the current positions list. Click 'Apply' to place a part in the new positions list.

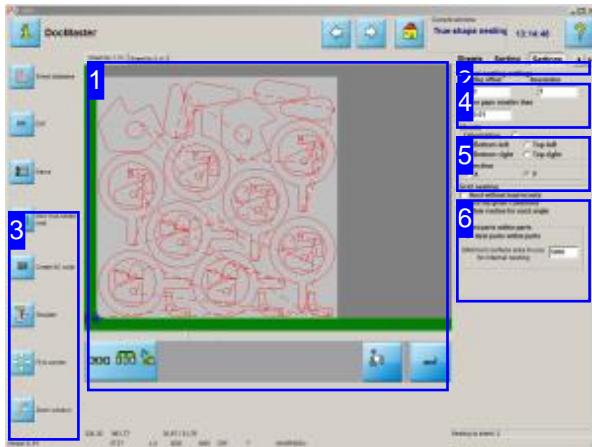
5



Use the top button to stop sorting.  
Click 'Show all' to view the whole sheet.



Enter the cutting offset and resolution.



Use this tab to set the positions, offsets and the direction for aligning parts onto the sheet.

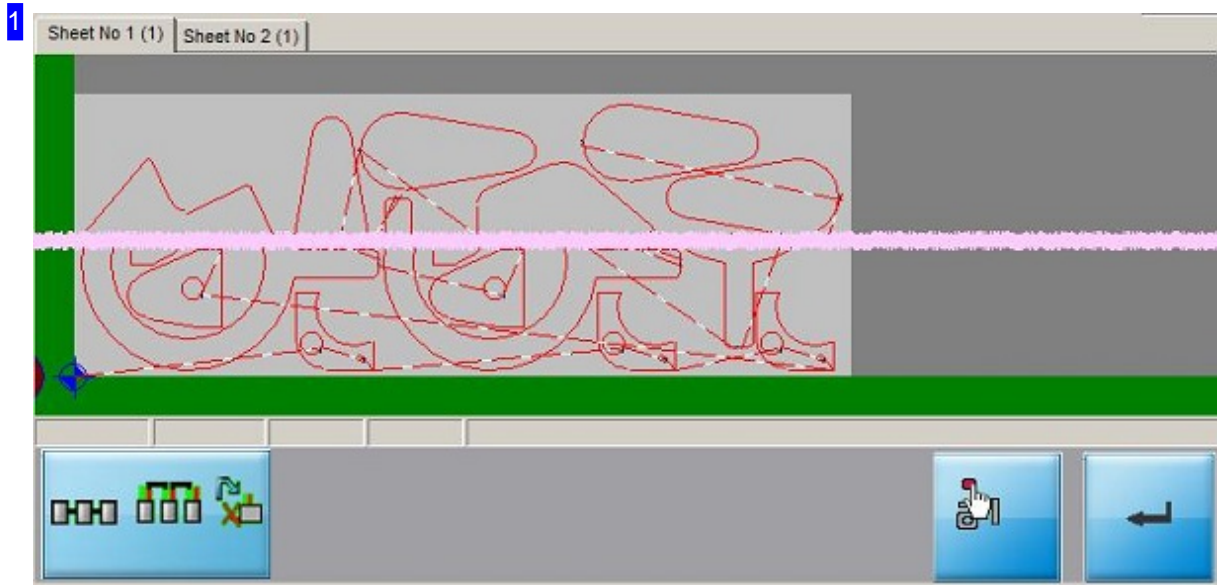
- o Make all inputs about nesting in the 'Global nesting settings' frame [4].
- o Set the orientation of the parts and the direction for the nesting routine in the 'Sheets' tab [5].
- o Set how to use the sheet when nesting [6].

Set the cutting offset and the resolution for aligning parts onto the sheet here.



This tab panel allows you to make settings about sheets and parts, such that the nesting operation goes according to plan.

The 'Settings' tab allows you to set the cutting offset and resolution.

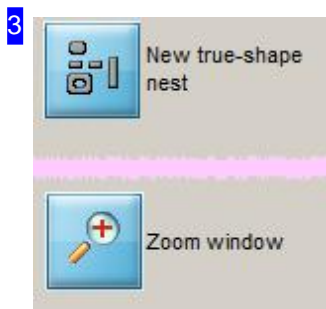


This tab panel shows you the results of the nesting procedure.

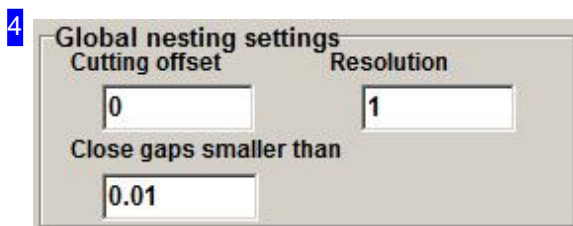
There is a tab present for each sheet. You can switch between the sheets using the corresponding tabs. The number in brackets shows how many 'copies' of the sheet must be made.

Click in the drawing to switch to the Simulation screen, where you can examine your sheet.

You must confirm any changes you make in the right-hand window with the 'Enter' button.



You will find help for the Navigation window in the 'Parts' tab.



The 'Global nesting settings' frame allows you to access the following options.

- o Cutting offset - this describes the 1/2 cutting beam's width. This determines the offset for the cutting path which should be maintained for every component. The minimum setting here must be the 1/2 cutting beam's

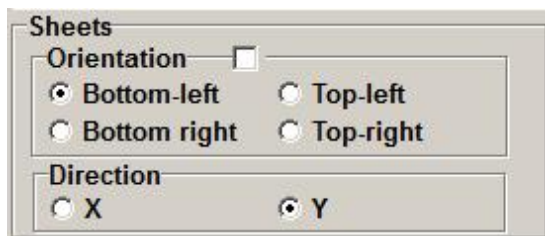




width.

- o Resolution - determines the step width with which parts should be moved closer together when fitting up. Make an entry here in mm. if you enter a small value, the nesting time will be increased, since more steps will have to be tried. However, the nesting is more precise, and the material will be used more effectively.
- o Close Gaps smaller than - Enter the maximum width of gaps which should be closed in your drawing. Wider gaps will be treated as closed contours.

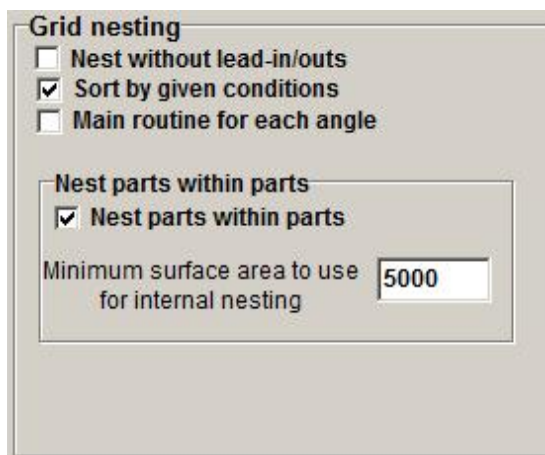
5



The 'Sheets' tab allows you to set the following variables:

- o Orientation - set the corner from which to begin nesting.
- o Direction - set the axes to nest along; to move parts across through. Set X to add parts horizontally, Y to lay them vertically.

6

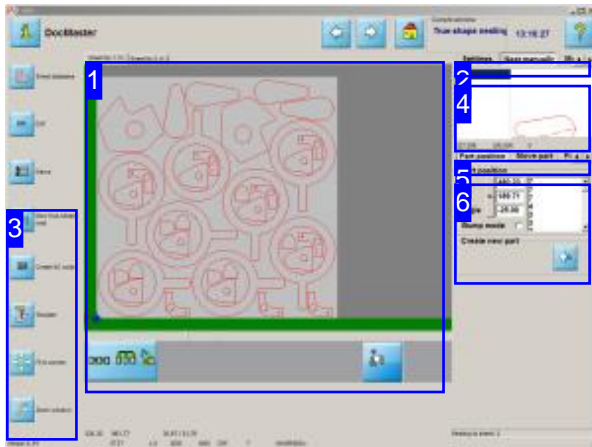


The 'When nesting' tab allows you to make the following settings:

- o Nest without lead-ins/outs. Mark the checkbox to nest without lead-ins or -outs, otherwise called technology cuts.
- o 'Sort by given conditions' - if you mark this checkbox then the conditions you stipulated in the 'Sorting' tab will be adhered to every time the sheet is renested when you press 'Enter' [1]. Uncheck the box to ignore those conditions, resulting in a quicker nesting routine.
- o Nest parts within parts - marking this checkbox allows cncCUT to nest smaller components on the free space left inside larger internal contours. Set the minimum area an internal contour must cover to be considered, so that while material is saved, the time taken to access it with the cutting head does not become wasteful.



## Position the components manually.



This screen allows you to manually reposition and reorient the parts on your sheet. The components can be turned and positioned individually.

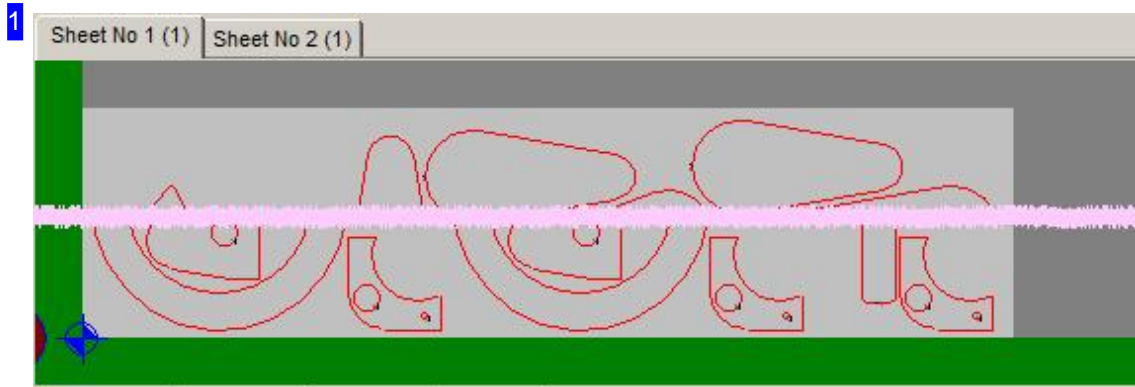
You can set the positions of individual components on the sheets manually from here.



This tab panel allows you to make settings about sheets and parts, such that the nesting operation goes according to plan.

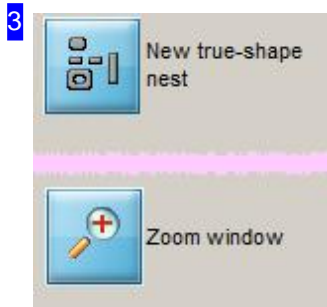
'Nest manually' allows you to set the positions and orientations of the parts on your sheets manually.

There may be an optional tab for 'Multi-torches' here. There is more help for that function in the online help files for machine settings.



This tab panel shows you the results of the nesting procedure.

Clicking a part in the drawing highlights the item in the 'Parts positions' list [5].

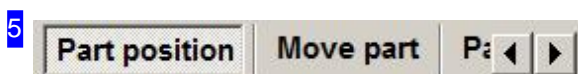


You will find help for the Navigation window in the 'Parts' tab.



Select a part for which you would like to make individual settings from the overview to the left. The part will be shown in the preview frame at the top right. The diagram is fitted to the frame, and is not to any scale.

To delete a part, right-click its entry in the list and select 'Delete' from the menu.

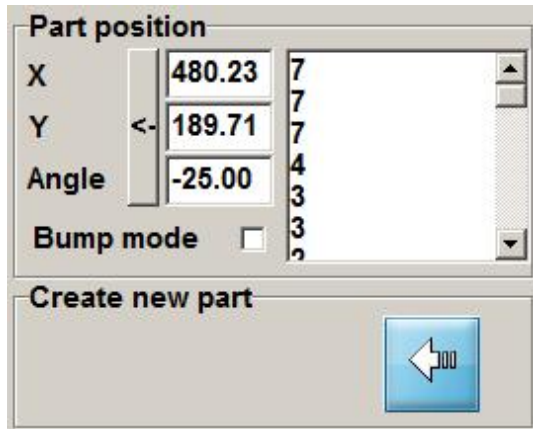


This tab panel allows you to change your parts' positions. Depending on your post-processor there may be an optional tab for 'Multi-torches' here. There is more help for that function in its own online help file.



- o Position parts.
- o Move parts.
- o Set part offsets.
- o Multi torches.

6



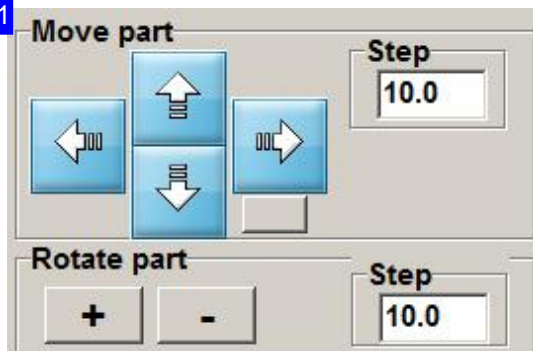
The 'Part position' frame allows you to see and edit the exact positions and rotation angles of your parts. Select a part from the list; its position and angle are shown in the corresponding text fields. Change the values in the text fields and confirm your inputs by clicking the 'New Position' button.

Right-click on the list and a menu will appear with options including deleting your part from the list.

Mark the 'Bump mode' checkbox to set cutting paths to be placed directly on the sheet margin / the last cutting path.

Click the 'New Part' button to place a new part on the sheet, then use 'Move part' to position the part as required.

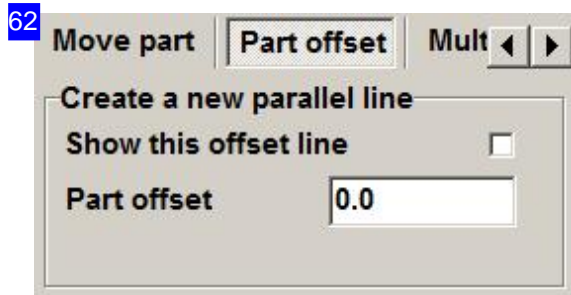
61



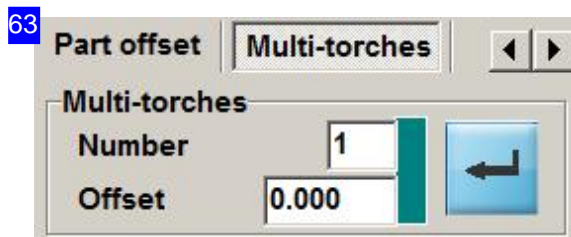
The 'Move Parts' frame allows you to move or turn the parts on the sheet visually using the arrow icons.

The text fields allow you to enter exact values for the step width and turning angle to 'step' by each time an adjustment is made.

The small button next to the arrows icons shows you the otherwise invisible enclosing box around each part in the drawing.



The 'Part offset' tab allows you to allocate your parts an enclosing box into which other parts may not be nested. Mark the 'Show offset line' checkbox to make the offset frame visible in your preview window.

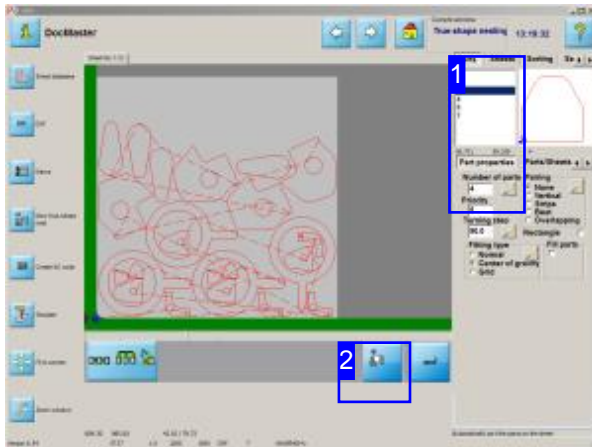


The 'Multi torches' tab may appear here, when a specific program version is running.



## Automated Manual Nesting

Select parts to be nested.



You can switch to automated manual nesting from the 'true-shape nesting' tab. In this window, enter the quantities of individual parts you require [1] and switch to the automated manual nesting tab [2].

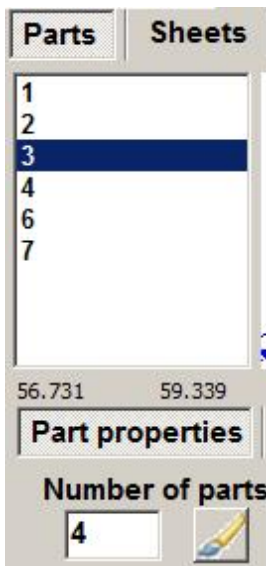
This feature is an option, and must first be enabled.

Automated manual nesting allows you to put each part on the sheet manually. The program helps you do this in the most efficient manner. Mistakes are avoided using the program's automatic sliding routine, which also allows your machine to use the material as efficiently as possible.

You have the option to manually nest the first parts, then allow the program to automatically nest remaining parts.



1



The 'true-shape nesting' tab allows you to enter quantities required for each part. Mark a part in the list, and enter the required quantity.

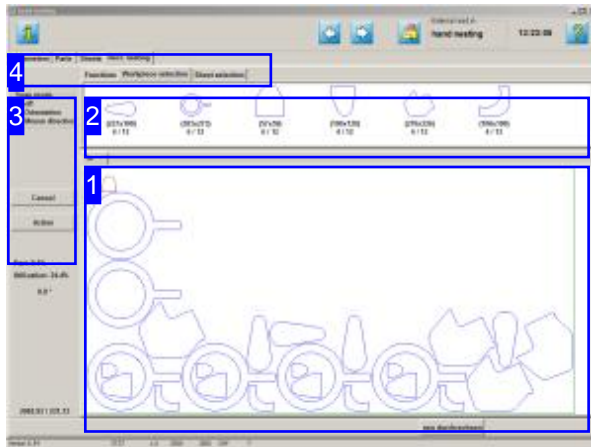
2



Click here to switch to Automated manual nesting (option).



## Select and Position Parts.



The top frame [2] shows all parts selected for nesting. You can now put these parts on the sheet [1] and position them individually or in groups. Select a snap mode [3] and the program will help you slide parts together as efficiently as possible.

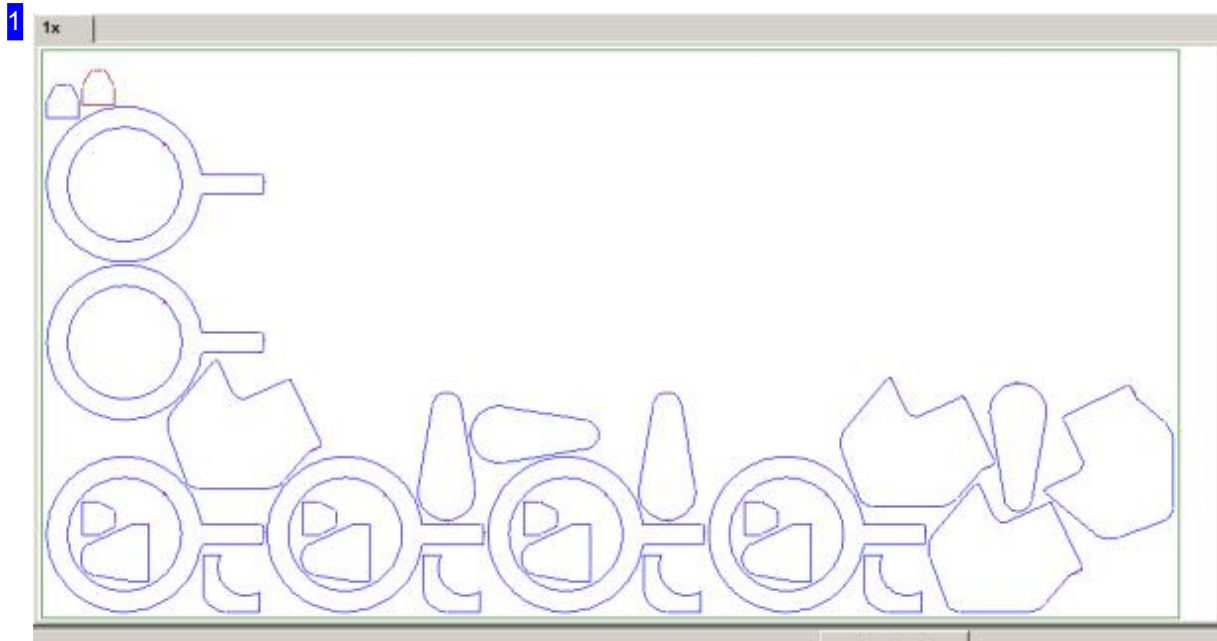
If you select the 'Sheet selection' tab in the second tab panel [4], you'll see the stock of the selected sheet in the top frame [2]. If you click the sheet, it will be placed ready to be nested to. Individual sheets will be illustrated in the bottom frame's tab panel and can be selected by clicking.

Automated manual nesting allows you to manage sheets and parts relative to one another, sliding parts easily between the requirements list and your sheets.

Once nested on your sheets, parts are removed from the requirements list. This process is of course two-way.

Management of your sheet stock works in the same way - pluck sheets from stock with a click, and return them just as easily.

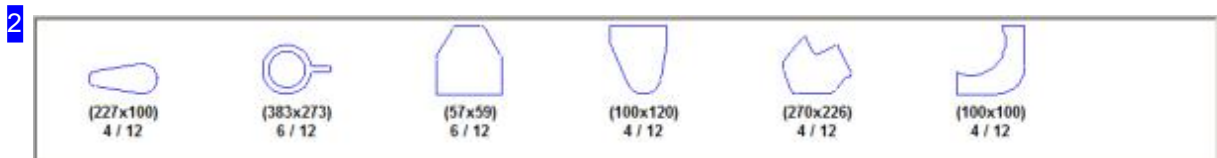




This frame shows your sheets with nested parts. Use the mouse wheel to zoom in and out for a more detailed view.

To move a part, simply drag and drop. When you drop, the program will use your choice of snap mode to slide the part to its final spot.

Right-click for a menu for editing the part or sheet.



This frame shows all parts you have selected for nesting. The required quantity is shown under the part's symbol, as does a display of how many are already nested. For example, 1/4 means you have nested 1 out of 4 parts required.

Mark a part to place it on your sheet. Click the sheet at the position you wish to place your part, and the program will slide it into its final position using the selected snap mode.

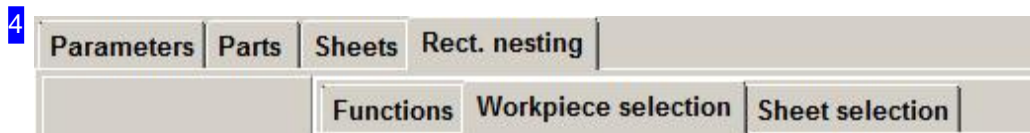


The top frame allows you to select an automated snap mode.

'Orientation' allows you to set the null point as the orientation. Parts will slide together in the direction of the null point.

The 'Mouse direction' mode slides the part towards existing parts in the direction of a mouse gesture.

Click the 'Action' button for a Menu for editing the parts or sheets.



The tabs give you access to individual fields for:

- o General settings for nesting and defining parameters.
- o Settings for individual parts.
- o Settings for your sheets and multiple cutting heads.
- o Nesting:
  - o Functions for editing.
  - o Selecting individual parts.
  - o Sheet selection.

You should first check all settings and parameters, and adjust to meet your requirements. Only then should you begin nesting, to avoid potentially costly mistakes.



50

Parameters | Parts | Sheets | Rect. nesting

**Dimensions**

Border distance all sheets  
0

Cutting gap  
0

Resolution  
1

offset  
5

**Nest retrospectively**

Part in part

No  
 Yes (always)  
 Yes (multiple torches, only)  
 Use holes first

Filler parts

Fill up last sheet

Fill up only to nesting height

No  
 auf allen Platten  
 nur auf letzter Platte

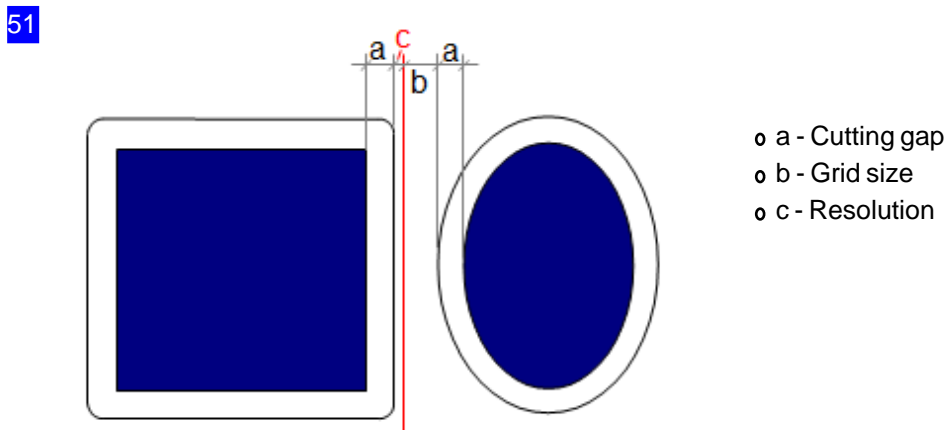
Nest pairs first  
 Ignore lead ins

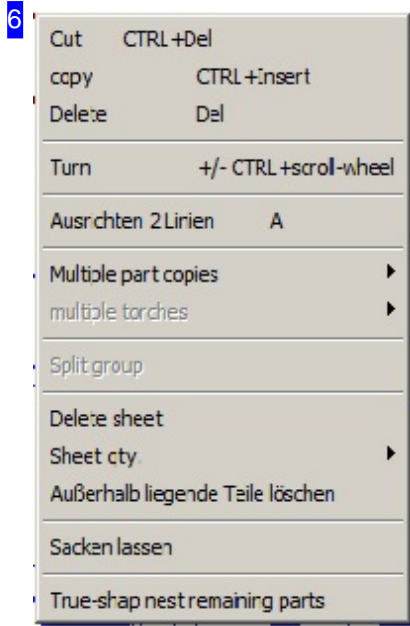
Nest polygons

Enter the part offset settings in the left frame (see Sketch ).

- o The cutting gap is the width of the cutting tool (Double cutting offset).
- o The resolution sets the step sizes (in mm/inch) in which the parts should be slid together when nesting. Please note, a very small step size can lead to very long calculating times!
- o The grid size sets the offset up to which the parts including the cutting gap may approach one another.

The right frame allows you to still make changes to your nesting settings.





This menu allows you to copy, cut or delete parts, and move them between your requirements list and the sheet. If you try to make an impossible action, eg nest a part which is no longer required, click 'Abort' to abort that action.

Use the menu item 'Turn' to allow turning of a part using the '+' and '-' keys, or by turning the mouse wheel while holding the <Ctrl> key.

You can define an area of your sheet to be populated with a certain part or part-group using the 'stretch area' command. Move the mouse slowly in the direction the parts should be laid in to set them out visually and easily, quickly filling rows and columns. End this function by clicking your mouse. This function can also be triggered using the <x> key.

The last item 'Remaining points with true-shape nesting' allows one-click automatic nesting of all remaining parts in your requirements list.



The four buttons on the left hand side activate functions for editing your parts:

- o Cursor: Switches to the 'normal' cursor mode for marking parts and view areas, where you can also use the mouse wheel to zoom. Double click the sheet to view the whole work area.
- o Zoom: Like 'Cursor' except without the part marking function.
- o Allow overlapping: allows you to drag a marked part across current parts. This means you can change areas that have already been nested with individual parts.
- o Group: Groups parts together to allow working with them as a group. You can release a group of parts from the 'Action' Menu.

To move or turn parts or groups of parts, select the corresponding tab on the right hand side.

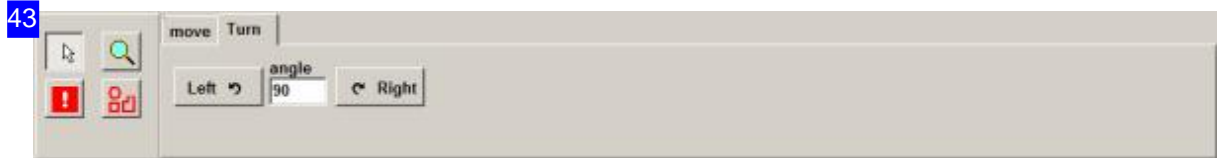


To move parts, mark a part or parts group, enter the number of pixels in a step, and press the button for



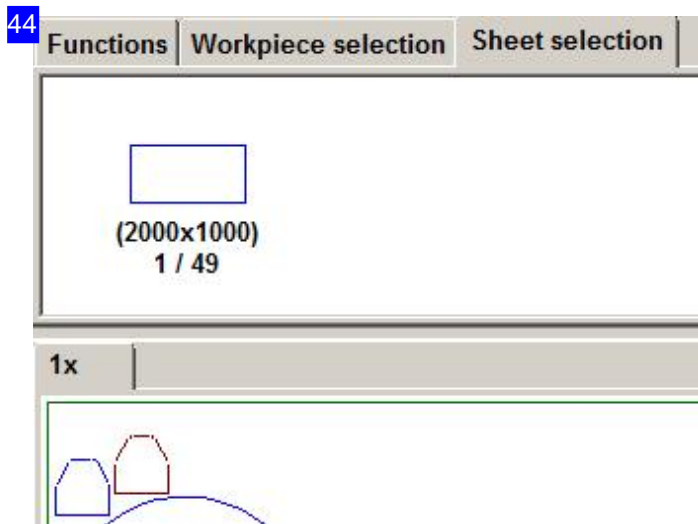
the required direction. To move one part over others, select the 'Allow overlapping' function. Click the 'Snap' button to slide a part to its optimal position against an existing part.

The second tab on the right allows you to turn parts and part groups.



To turn parts, mark a part or parts group, enter the degrees in a step, and click the required button representing direction of rotation.

The first tab on the right side allows you to move individual parts, or groups of parts.

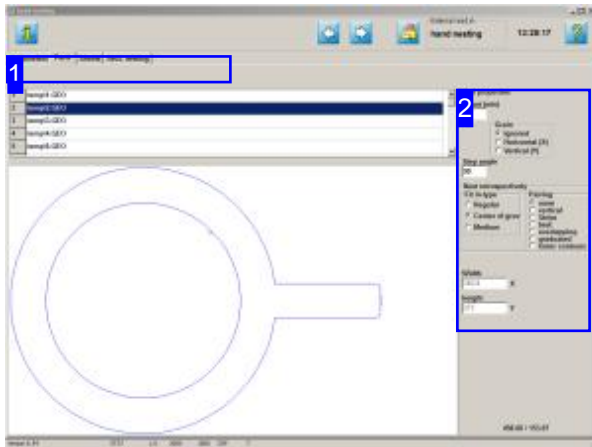


The top frame shows your sheet stock. The quantity of sheets is shown under the sheet symbol, along with a detail of how many sheets are already being used. 3/50 would mean there are 50 sheets available, and 3 of those are being worked now. Each sheet which is being worked has a tab above the bottom frame, allowing you to quickly select it.

Click on the stock list to open a new tab for a new sheet to be worked. The 'Action' Menu allows you to return sheets to your stock list.



## Part Properties.



The top frame shows a list of all parts you have selected for nesting. Mark a part to see a preview of it and set its Nesting properties.

This window shows you a list of all the parts you selected in the true-shape nesting window. You can set nesting properties for individual parts here.



The tabs give access to individual frames for:

- o General settings for nesting and defining parameters.
- o Settings for individual parts.
- o Settings for your sheets and multiple cutting heads.
- o Nesting.

You should first check all settings and parameters, and adjust to meet your requirements. Only then should you begin nesting, to avoid potentially costly mistakes.



**2** Part properties

Count (min)

Grain  
 Ignored  
 Horizontal (X)  
 Vertical (Y)

Step angle

Nest retrospectively

Fit in-type <input type="radio"/> Regular <input checked="" type="radio"/> Center of grav <input type="radio"/> Medium	Pairing <input checked="" type="radio"/> none <input type="radio"/> vertical <input type="radio"/> Strips <input type="radio"/> best <input type="radio"/> overlapping <input type="radio"/> graduated <input type="radio"/> Outer contours
---	--

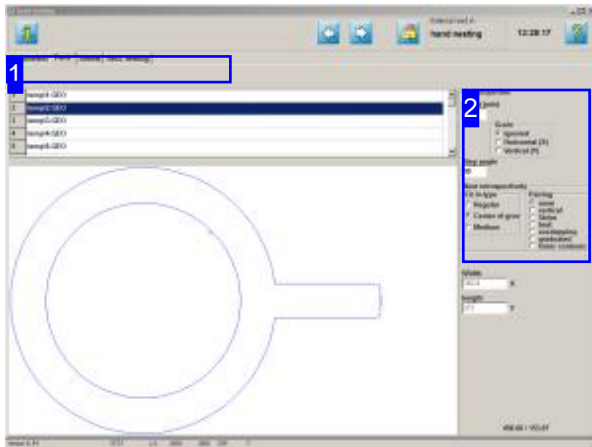
Width  
 X

height  
 Y

Enter presets for nesting your parts here.  
 Set the rolling direction of your parts and select the slide method for pushing your parts together. There is a more detailed description in the true-shap nesting chapter.  
 You can also still change the parts quantity here.



## Sheet Properties.



The top frame shows the sheets listed, if they are from an external source. The preview shows the sheet as selected complete with dimensions, with properties which can still be modified.

This window shows the sheet you selected, and allows you to set properties for it.



The tabs give access to individual frames for:

- o General settings for nesting and defining parameters.
- o Settings for individual parts.
- o Settings for your sheets and multiple cutting heads.
- o Nesting.

You should first check all settings and parameters, and adjust to meet your requirements. Only then should you begin nesting, to avoid potentially costly mistakes.





2

properties | **multiple torches**

Count  
49

Width  
2000

Height  
1000

Thickness  
0

Border offset  
5

Rolling direction  
 Ignored  
 Horizontal (X)  
 Vertical (Y)

Orientation  
 Bottom left  
 Bottom right  
 Top left  
 Top right

Enter presets for your sheets here.

Set the rolling direction of your sheets and select the orientation for nesting.

You can also still change the dimensions of the sheet to be nested on here, and the quantity of sheets available.

Switch to the next tab for settings relating to Multi-torch cutting.

21

properties | **multiple torches**

max. no. torches  
2

min. torch offset  
200

rounding factor (0.0, 0.01, 0.1 .. 1.0)  
1

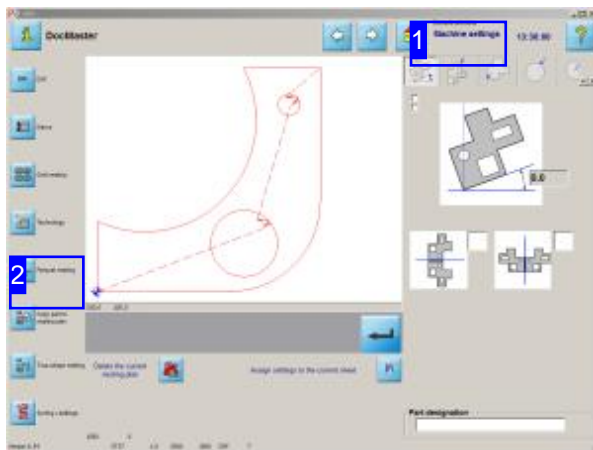
Manual nesting also allows you to organise parts in strips suitable for multi-torch cutting. Enter the number of cutting torches and the torch offset.

When nesting, select the part and click 'Action'; the context menu will be displayed. Select 'Create area', 'Multi-torch cutting' and then use the mouse to stretch a box in the Y axis, laterally to the cutting paths. The part will be placed on your sheet in rows according to how many torches you are using. This function can also be selected using the shortcut key <b>.

The 'Multi-torch cutting' function does not effect the function 'True-shape nest remaining parts'.

# Parquet nesting

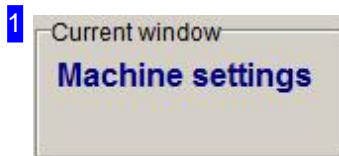
Efficient nesting using parquet tessalation.



You can switch directly to grid nesting and parquet nesting from the 'Machine settings' windows [1]. Select a DXF file or define a Macro, then go to parquet nesting [2].

A dialog box opens, into which you should enter the required quantity of parts to nest before proceeding. Further steps are much like those for true-shape nesting. You will find help for these steps in the help for true-shape nesting; they will not be described further here.

Parquet nesting allows you, should you only wish to nest one type of component, to efficiently use your materials, since parts can be nested 'inside each other' or over-lapping, unlike grid nesting where parts must be nested as if they were in boxes. If you wish to nest more than one type of component, you should create a nesting plan and use true-shape nesting to organise them onto a sheet as normal.

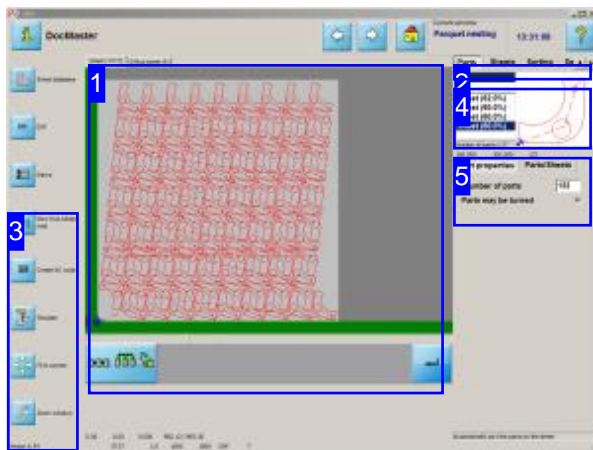


The 'Machine settings' windows have buttons in the left navigation panel [2] with which you can proceed to each nesting type.



Clicking the button switches to parquet nesting. A dialog box opens for you to enter how many parts you require.

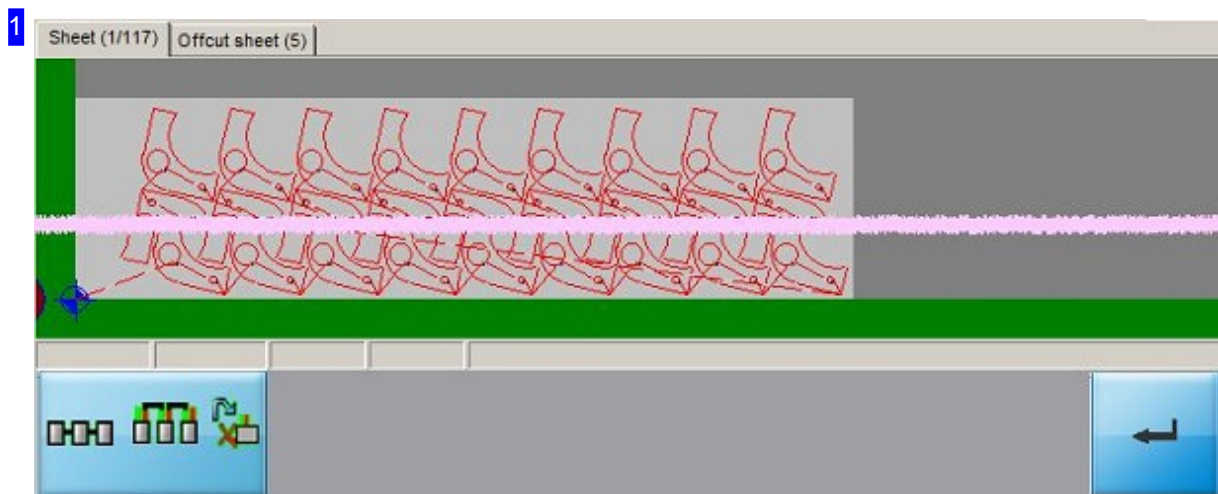
## Enter the parts Quantity.



The parts screen lists various parquets with their material usage in percent for you to choose from.

- o Select a parquet from the overview [4].
- o Set the part and margin offsets to nest with.
- o Set the sorting sequence for cutting.

You can enter parameters for the nesting process here. Influence the nesting routine by entering the part and margin offsets you require.



This tab panel shows you the results of the nesting procedure.

There is a tab present for each sheet. You can switch between the sheets using the corresponding tabs. The number in brackets shows how many 'copies' of the sheet must be made.



Click in the drawing to switch to the Simulation screen, where you can examine your sheet.

You must confirm any changes made in the right-hand windows with the 'Enter' button.

The left button allows you to switch to a screen for editing the nesting plan. There is more detailed help for these functions in the machine settings help pages.

2



This tab panel allows you to make settings about sheets and parts, such that the nesting operation goes according to plan.

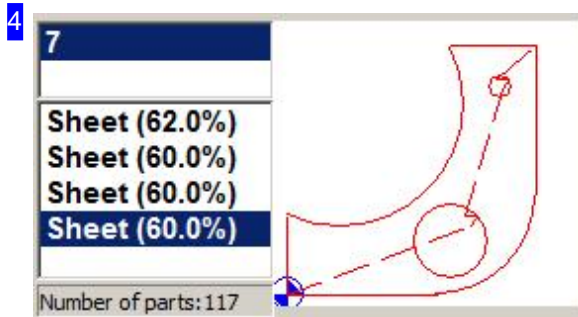
The 'Parts' tab allows you to set the number of parts to be nested.

3

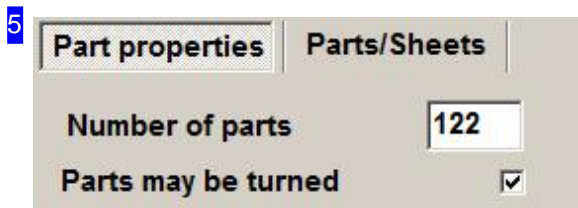


The navigation panel allows you to:

- o Click the top button to renest.
- o Click the second button to go to the next work step and generate your NC code.
- o Click the middle button to start a simulation of the cutting path in the sheet overview [1].
- o Click the penultimate button to 'show all'.
- o Click the bottom button to switch to the Simulation window to check your sheet more carefully.

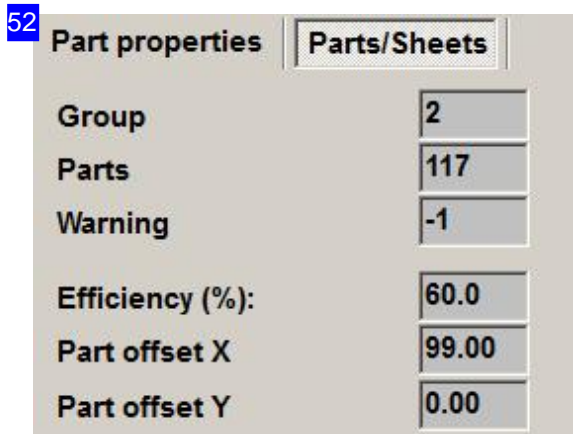


Select a parquet from the summary to the left.  
The component is previewed in the frame to the right.  
The drawing is shown fit to the frame, and is not to any scale.



The 'Part properties' tab allows you to redefine the quantity of parts to be nested and renest the sheet. If you wish to stop the parts being turned when nesting then clear the checkbox labelled 'Parts may be turned'.

The 'Parts/Sheets' tab allows you to see the results of nesting for each individual sheet.

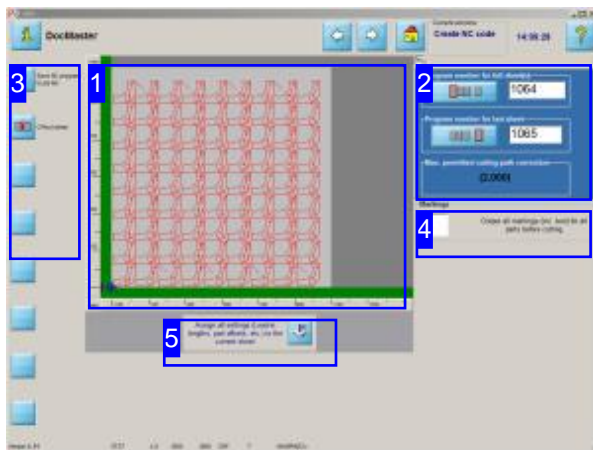


The 'Parts/Sheets' frame shows you the exact number of parts on the sheet whose tab you have selected at the top of the overview [1].



## Creating an NC Program

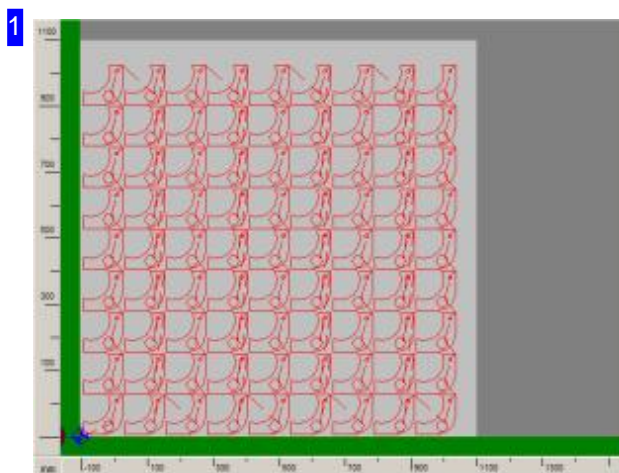
Creating an NC Program and saving it in the Job List.



Once you have all your parts on the sheet and nested you can create your NC program. Click the top button in the navigation panel [3] and *cncCUT* generates the code automatically.

The summary to the right shows the sheets created. They will be assigned the next free program numbers, though you can set these manually, or give them a name instead.

In this window you will see the result of the nesting process and the program number assigned to it.



The result of the nesting process is shown in this frame. Use the icons in the summary [2] to switch between previews of the various sheets.



2

Program number for full sheet(s)  
1064

Program number for last sheet  
1065

Max. permitted cutting-path correction  
(2.000)

You may need one or more sheets according to the quantity of parts to be nested. If you needed more than one sheet then the 'full' sheets are listed in the upper frame and the last sheet below.

The bottom frame shows - dependant on nesting method - the maximum permissible cutting-path correction. This correction value comes from the internal radii to be cut, and the smallest offset between the parts when fitting. The cutting beam's width should be the minimum value here. If *cncCUT* cannot calculate the correction value, a hint will be displayed.

The ' Job number ' frame allows you to enter a job number or name so that you can easily associate all linked sheets.

21

Sheet No 1 | Sheet No 2

Program number  
1063

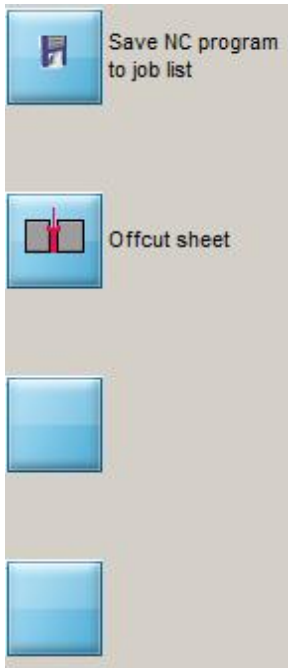
Job name  
4712

Max. permitted cutting-path correction  
( )

Enter a job name or number. All sheets that belong to this program will be given the same job designation.



3

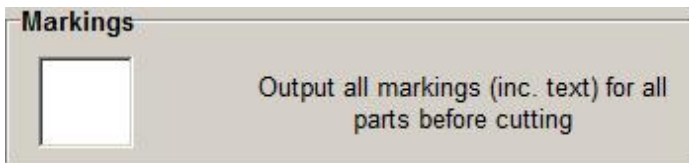


Clicking this button makes *cncCUT* create and save the NC program code. You can then access the program for later use and editing from the ' Job list '.

The 'Remnant sheet' button switches to offcut editing, where you can cut any waste material into offcuts and add them to your sheet database.

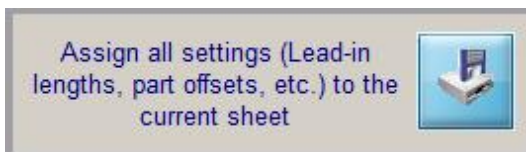
The fourth button is post-processor dependant and allows access to a setup-window for your post-processor. You will find a more detailed description in the help files for your post-processor .

4



Mark this check box to make all markings before cutting.

5



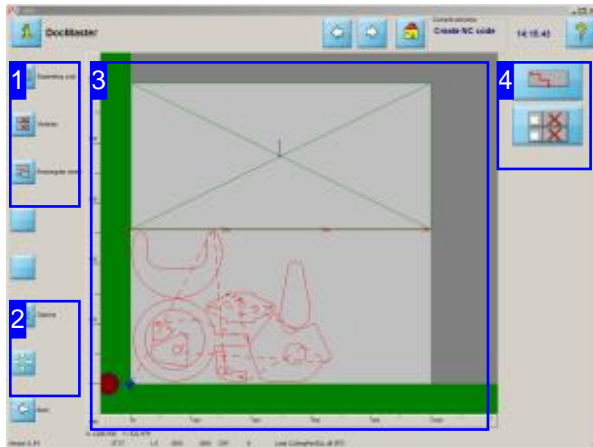
Click the button to the right to allocate settings such as clearances and lead-in lengths to the selected sheet.





## Offcuts

### Saving waste material as a sheet.



This screen allows you to cut unrequired material into sheets and save them to the sheet database for later use.

You can access this screen from the 'Create NC code' window; click 'Offcuts' in the left navigation panel.

*cncCUT* offers you the ability to define one or more offcut sheets to be cut from the waste material left over after nesting.

- o Cut all remaining material as one offcut using a separating cut. The offcuts option must first be enabled in the POSTPR.INI file.
- o Cut the remaining material into multiple offcuts automatically.
- o Cut the remaining material into multiple offcuts manually.

Each offcut can be given a marking text which will help you store the material. The sheet's description is then saved to the Sheet database for use at a later date.

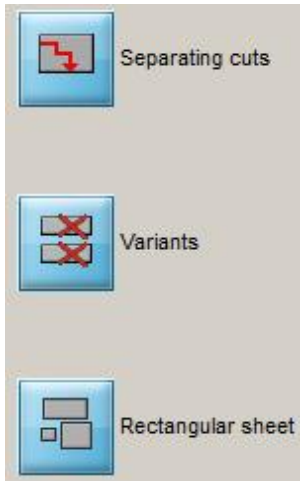
If you wish to make individual settings for your offcuts, do so from the Options [2] before saving your sheet. Calling the Options will cause the program to recalculate the available cutting variants.

Prerequisites for using offcuts:

1. The current sheet's dimensions (Width/Height) must be present in the sheet database.
2. The sheet must be rectangular (No imported DXF-Files allowed).



1

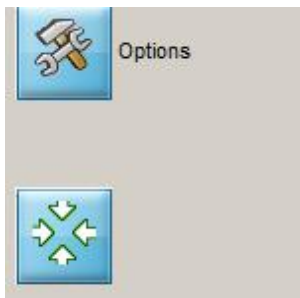


Click the top button to access the Separating cuts screen.

The middle button opens the screen for selecting from an automatically generated set of cuts.

Click the bottom button to access the manual separating cut screen.

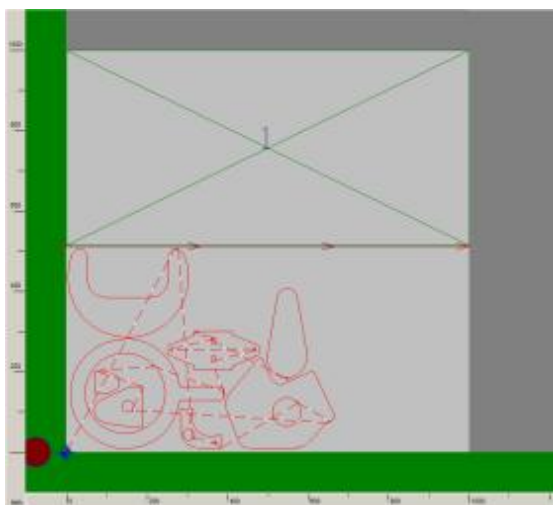
2



Clicking the top button opens the Options, where you can make various inputs about offsets, separating cuts and text markings.

The bottom button calls the parts back in to the preview's visible area [3].

3



This frame shows you a defined offcut sheet.

You can see the separating cut with its direction arrows at the bottom of the offcut, and the identifying number (1) in the middle. If you entered a Marking text you will also see this at the given position.

Use the mouse wheel to zoom in on the sheet and Use the mouse wheel to zoom in and check details about the separating cut and the markings.



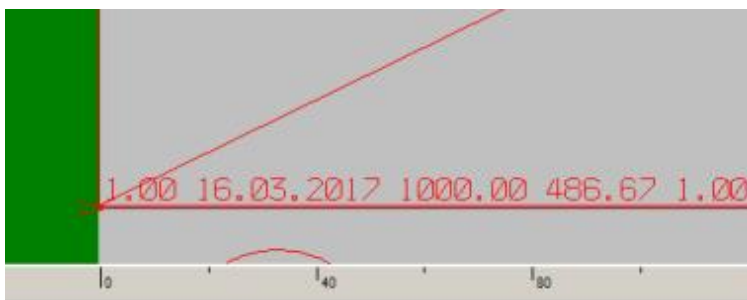
6

**Sheet database**

Material	Thickness	Width	Height	Speed	Offset	Offcut sheet	Offcut sheet name
ST37	1.0	721.000	176.600	900.000	0	D	RestSheet\1035_2.DXF
ST37	1.0	1000	250	900	0	X	
ST37	1.0	1000	1000	900	0		

If you continue in the program and generate your program code, the offcuts will be cut, marked where this option was selected, and saved into the sheet database marked as offcuts.

5

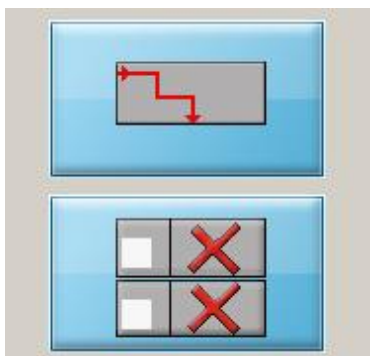


The marking text can be set to include:

- o Material
- o Date
- o Width
- o Height
- o Thickness
- o DBText or plain text

The settings for these field can be made in the 'Option' window. The text fields have a fixed location in the marking field.

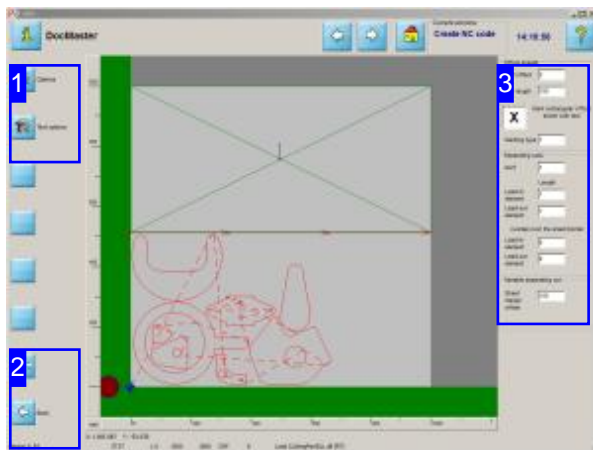
4



These buttons have exactly the same function as the top buttons in the navigation panel [1].



## Options for cutting offcut sheets.



Set the options for separating cuts, lead-ins and -outs and marking texts in this screen.

Make all necessary entries in this screen before you define your offcut(s). Calling the options screen will always lead to the possible cuts being recalculated.

This screen allows you to set the options for cutting your offcuts.



Click the top button to show the screen for entering Cutting parameters in the frame to the right [3].

The bottom button opens the frame for setting the Values to be used in the marking field.



2



The top button calls the parts back in to the preview's visible area [4].

Click the bottom button to switch back to the called screen.

3

<b>Offcut sheets</b>	
Part offset	<input type="text" value="5"/>
Min. length	<input type="text" value="100"/>
<input checked="" type="checkbox"/> <b>X</b>	Mark rectangular offcut sheet with text
Marking type	<input type="text" value="1"/>
<b>Separating cuts</b>	
Kerf	<input type="text" value="1"/>
	Length
Lead-in element	<input type="text" value="1"/>
Lead-out element	<input type="text" value="1"/>
overlap over the sheet border	
Lead-in element	<input type="text" value="0"/>
Lead-out element	<input type="text" value="0"/>
<b>Variable separating cut</b>	
Sheet margin offset	<input type="text" value="100"/>

The 'Offcut sheets' frame allows you to set the offsets to the other cut parts and set the minimal size of an offcut to be saved.

'Separating cuts' gives you options for setting the width of the cut between the offcut sheets, and the length of a lead-in and -out to use. If you wish to set lead-ins/-outs before/after the sheet, set their lengths here.

You can see lead-ins and -outs in the drawing.

If you wish to enable marking fields, set the relevant flag here. The contents of the marking fields are set in the Text options frame.



31

%D %F %A %B %C

%A = Width  
 %B = Height  
 %C = Thickness  
 %D = Material  
 %E = DBText  
 %F = Date

Font size

Line pitch

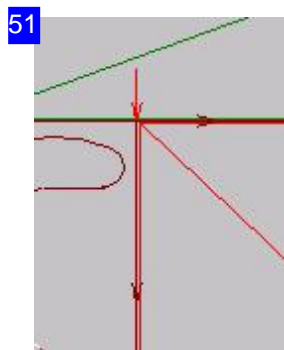
Offset from sheet

The required properties to be listed in a Marking field are listed in the top text field. Change the properties to write according to your requirements. The parameters are read from the program as variables, identified with a "%" symbol. Available variables are listed below the text field. The 'DBText' field allows you to input a free alphanumeric string.

Enter the settings for the marking field and the text in it in the bottom fields.



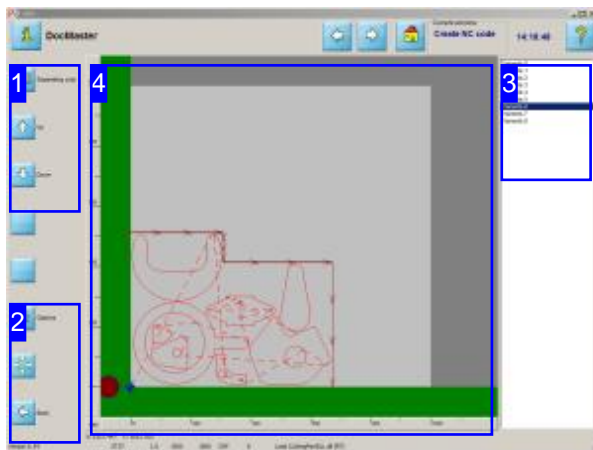
When defining offcuts manually, the cutting direction can be changed to optimise the cutting path. The red arrow at the top shows a lead-out 'after' the sheet.



When defining offcuts manually, the cutting direction can be changed to optimise the cutting path. The red arrow at the top shows a lead-in 'before' the sheet.



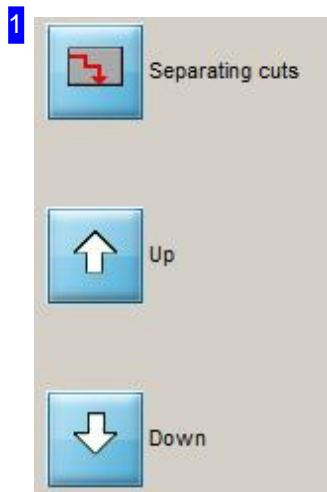
## Using a separating cut to save left-over material as an offcut.



*cncCUT* offers you the ability to define an offcut sheets to be cut from the waste material left over after nesting using one separating cut, and save it in the Sheet database for use at a later date.

Conditions for making offcuts are described [here](#).

This screen allows you to cut material that was not required when nesting into an offcut sheet, and save it to the Sheet database.



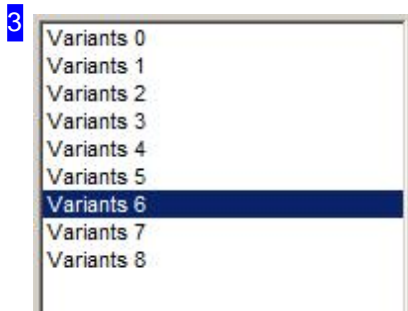
Use these buttons to toggle through the various types of separating cut available in the list [3]. The selected variant will be displayed in the preview window [4].



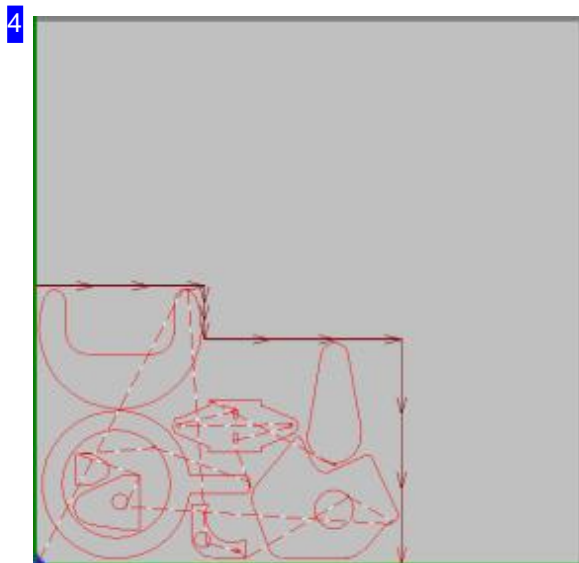
Clicking the top button opens the Options , where you can make various inputs about offsets, separating cuts and text markings.

The middle button calls the parts back in to the preview's visible area [4].

Click the bottom button to go back one step to the Offcut processing selection screen.



This frame shows the various possible separating cuts. Click a list entry to show it in the preview window [4].

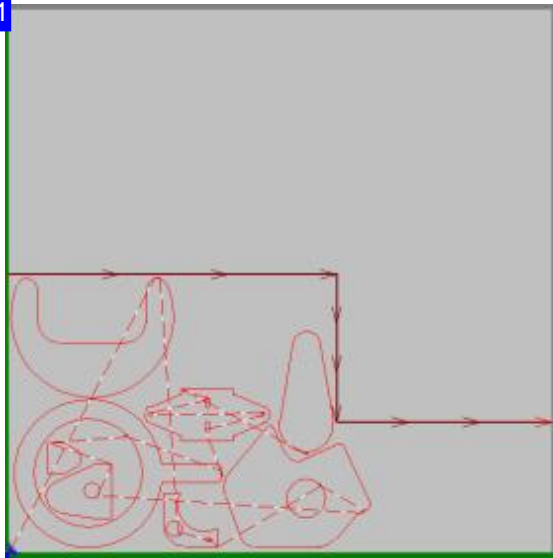


Possible separating cuts are worked out by the program and a selection offered. This preview shows you the selected variant. The separating cut's Course will be selected according to the chosen variant [3].





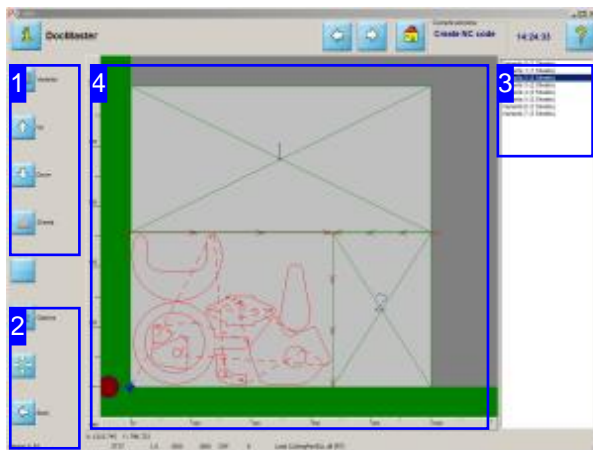
41



Here you can see a further Variant of the separating cut.



## Using simple cuts to save left-over material as offcuts.



*cncCUT* offers you the ability to define offcut sheets to be cut from the waste material left over after nesting using simple cuts, and to save them in the Sheet database for use at a later date.

Conditions for making offcuts are described here.

This screen allows you to cut material that was not required when nesting into offcut sheets, and save them to the Sheet database.



Use the top three buttons to toggle through the various types of simple cut available in the list [3]. The selected variant will be displayed in the preview window [4].

Click the bottom button to modify the offcuts. The right frame [3] will display a Screen for this purpose.



2

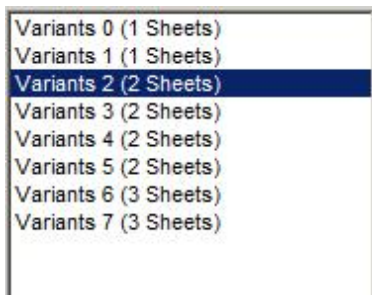


Clicking the top button opens the Options, where you can make various inputs about offsets, separating cuts and text markings.

The middle button calls the parts back in to the preview's visible area [4].

Click the bottom button to go back one step to the Offcut processing selection screen.

3



This frame shows the various possible simple cuts. Click a list entry to show it in the preview window [4].



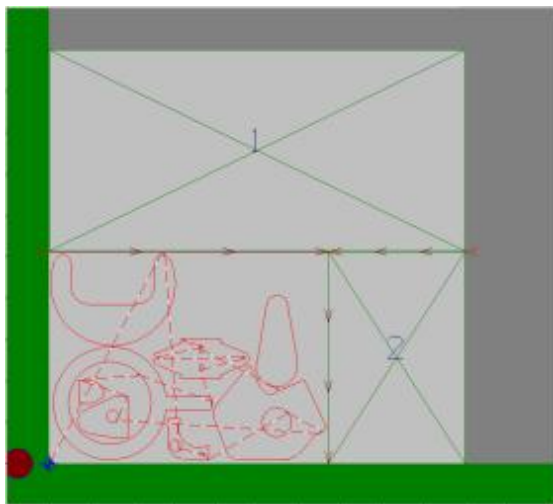
31



Use the top buttons to toggle through the offcuts. The active sheet is highlighted in colour and an entry can be made for its marking field.

- o Enter the text in the input field labelled 'DBText'.
- o Check the 'Marking text' flag.
- o Select the position to mark the text on the offcut by clicking the button second to bottom.
- o Confirm your input by clicking the bottom button.

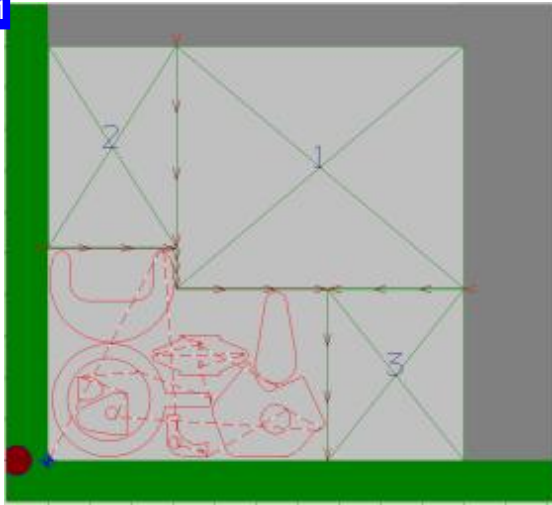
4



Possible dividing cuts are worked out by the program and a selection offered. This preview shows you the selected variant. The offcuts' Alignment will be selected according to the chosen variant [3].



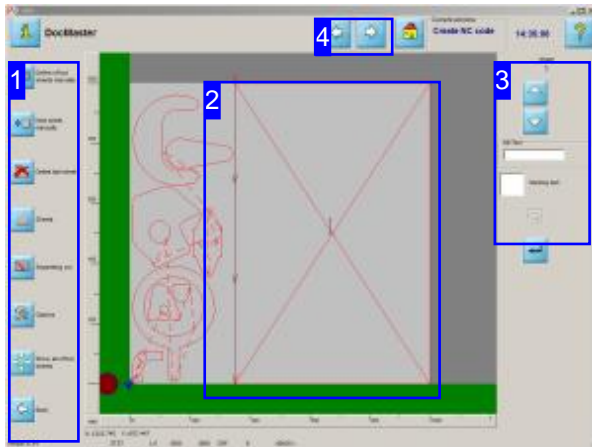
41



Here you can see a further Variant of the dividing cut.



## Save left-over material in manually defined offcuts.



This screen allows you to cut up the unused areas of a whole sheet and add them to the Sheet database .

*cncCUT*'s offcut saving feature offers you the very best material usage using manual cuts. The left-over area of a sheet after nesting can be cut into multiple 'offcuts' or 'remnant sheets'. If offcuts should be deleted, simply reverse the procedure of creating them.

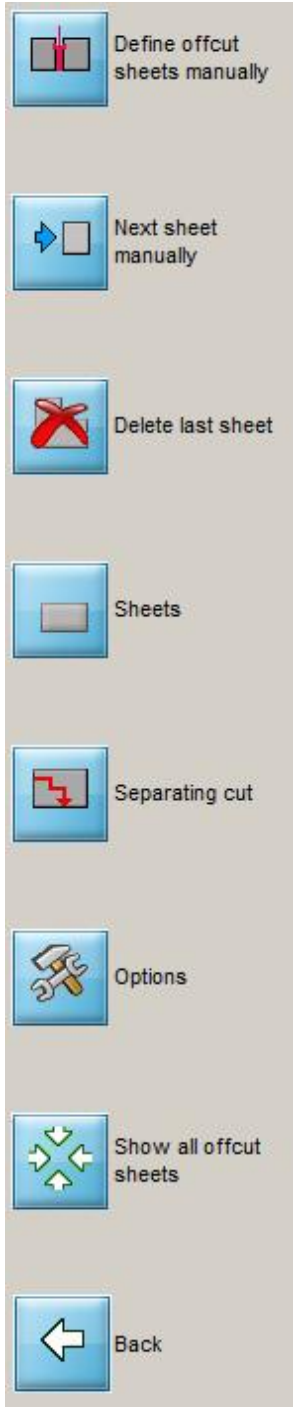
Every sheet can be given a marking which can then prove useful for sheet storage. Offcuts are added to the Sheet database for further use.

If you wish to make individual settings (Options), do this before saving your offcut sheet.

Conditions for making offcuts are described here.



1



Click the second button 'Remnant sheet manually' to begin defining offcuts. Any offcuts already present will be deleted.

If you wish to create the 'Next sheet manually', you can do so by clicking the second button.

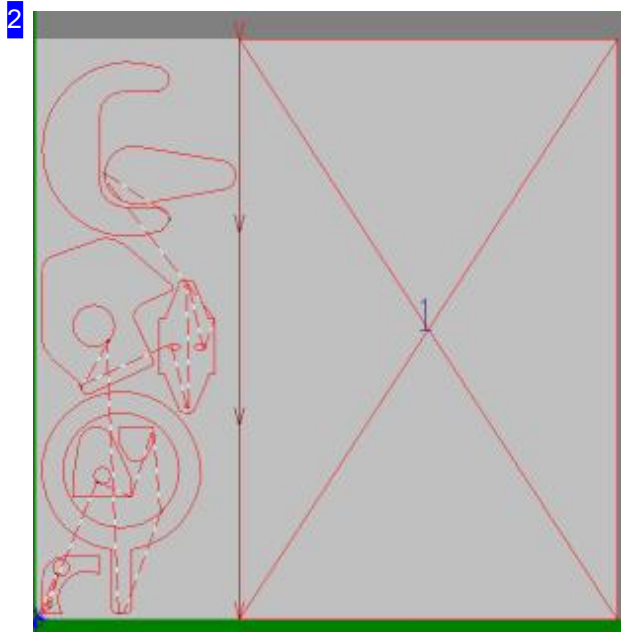
The 'Delete last sheet' button deletes the previously created sheet.

The 'Sheets' and 'Separating cut' buttons show a new screen on the right side [3] respectively for working on the Marking fields or setting of the cutting direction.

'Options' takes you to the window for inputting cutting parameters. Enter these before saving the offcut.

The penultimate button displays all offcuts. The parts in the drawing [3] are shown in the visible area.

The last button takes you back to the main 'Offcuts' screen.



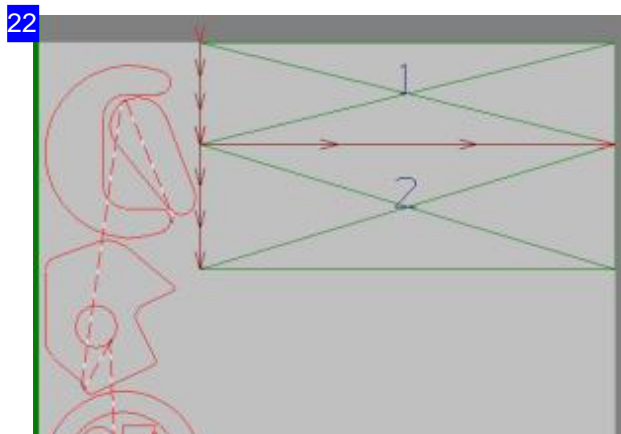
This frame shows you the result of the nesting procedure and the offcuts set by you.

There is only one offcut present here. You can see the separating cut on the left of the sheet, and the offcut's identifying number in its center (1). To the bottom left you will notice a set of markings for individually identifying this offcut.

Use the mouse wheel to zoom in and check details about the separating cut and the markings.

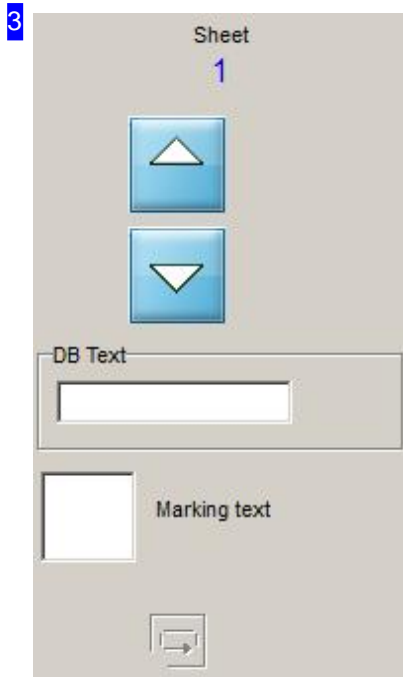


When defining an offcut manually, possible offcuts will be suggested depending on where the mouse cursor lies. Use the cursor to define an offcut's position and size. Use the second button in the navigation panel [1] to define further offcuts.



This picture shows you two offcuts. All 'further' offcuts are created like the first and initiated by clicking the second button in the navigation panel [1].

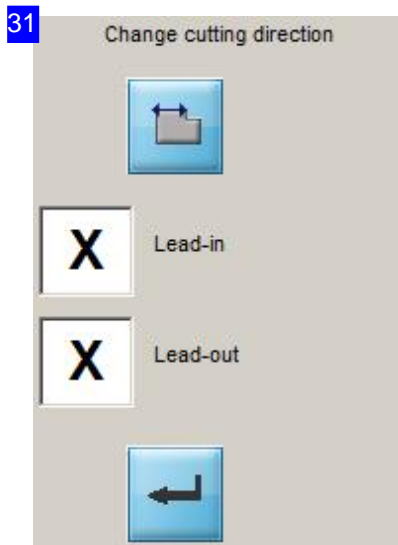




This frame allows you to navigate through the offcuts you have cut using the top buttons. You can see each offcut's number at the top.

The 'DB Text' input field allows you to enter a free alphanumeric string which can be added to the Marking field to aid management of your sheets.

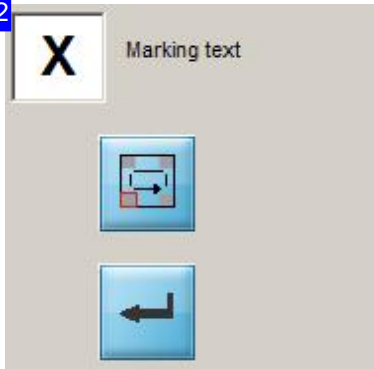
Mark the 'Marking text' checkbox to mark the offcut with the text you set up in the 'Text options' tab. If you mark this checkbox you will see a button underneath with which you can cycle through possible locations for the text.



Set the cutting direction and how to make lead-ins and lead-outs for the separating cut. You can see both in the Drawing [2], shown by the arrows into and out of the separating cut.



32



Click the top button to cycle through the corners of the offcut as the location for the marking text. Press the bottom button to write the marking in.

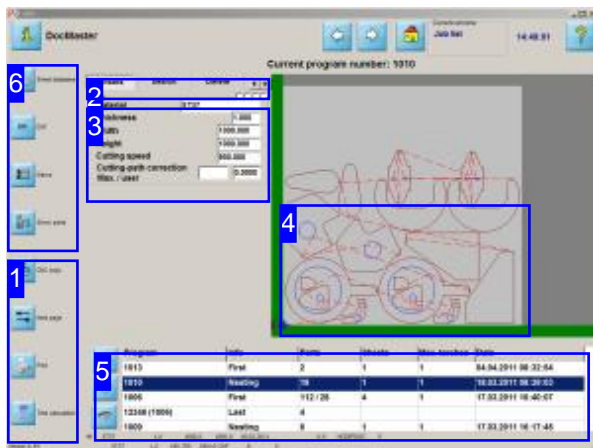
4

Sheet database			
Speed	Offset	Offcut sheet	Offcut sheet nam
900.000	0	D	RestSheet1069_
900.000	0	D	RestSheet1035_

If you continue in the program and generate your program code, the offcuts will be cut, marked where this option was selected, and saved into the sheet database marked as offcuts.

# The Job List - Sheets

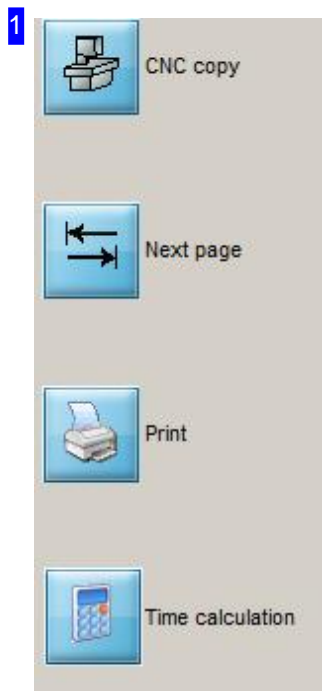
## Sheets in The Job List.



This screen has different windows with varying functions. Use the buttons in the header panel [2] to switch between those windows.

The Job List [5] and the preview frame [4] are always visible, but the input fields [3] will adapt to the requirements of the tab selected.

This screen allows you to manage all jobs done and saved to this point, and send them to your NC cutting machine. You can also make last-minute corrections to the code before sending it to the machine.



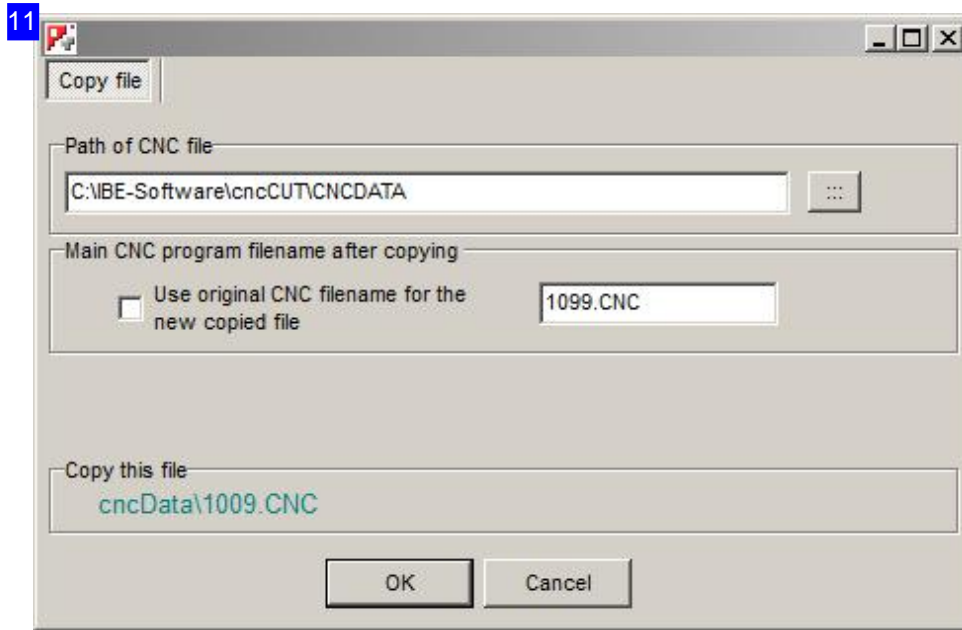
Click the top button to save the NC program. A dialog is opened to select the save path.

The second button 'Next page' proceeds to the next job phase.

The middle button switches to working on the next job.

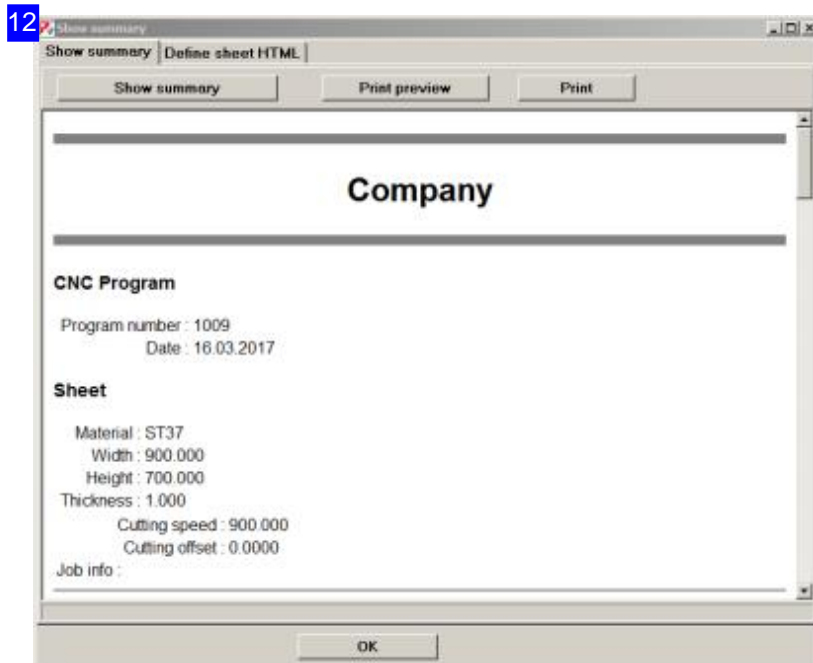
Click the third button for a summary of the job in HTML form, ready to print. You will see a print preview and dialog for printing.

The last button opens the program's estimate-reckoning module.

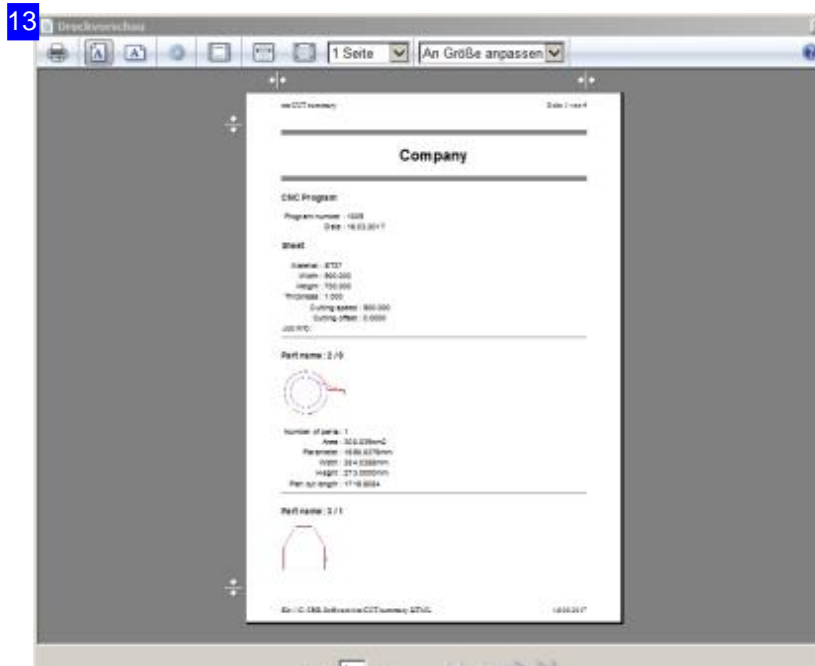


Select your program's save path and click 'ok'.

You can also send your program to an RS232 port. There is a description of the interface in the online help for the Administrator .



The summary allows you to make settings regarding the layout of HTML files, view the print preview and then simply click 'Print' to send to a printer. A description of the HTML file's building blocks can be found in the online help file for the Administrator.



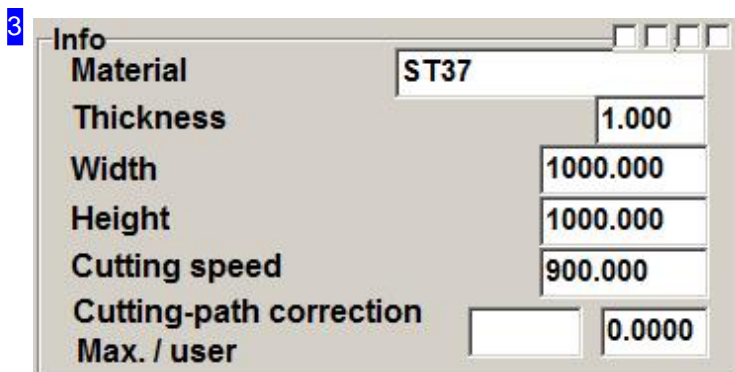
The preview window allows you to check and print the result of the summary.



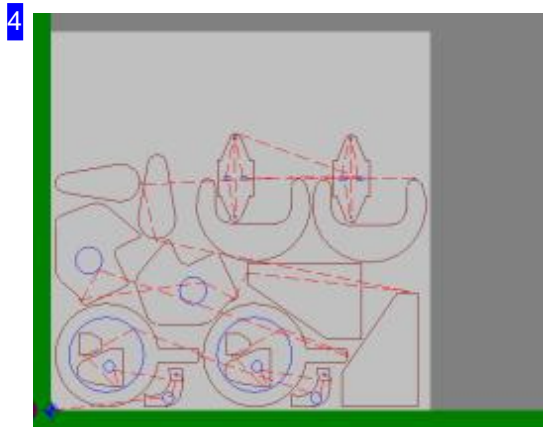
This button panel allows you to switch directly between the various windows available for working on your jobs from this screen. Click on the 'Next Page' button in the left navigation panel [1] to flick through the tabs.

Depending upon the Post-processor being used, there may be a further button 'torches'. This will be described in more detail in the post-processor's help file.

To save or load NC programs for single sheets to or from external drives, use the 'Copy list' and 'Apply' buttons.



This frame shows you the individual data for the sheet selected from the Job List. Mark the 1. check-box to get the parts colored. Marking the 2. check-box shows in addition the part-numbers.



This frame shows you a preview of the sheet selected in the Job List [5].

5

	Program	Info	Parts	Sheets	Max. torches	Date
▲	1013	First	2	1	1	04.04.2011 08:32:54
▼	1010	Nesting	18	1	1	18.03.2011 08:39:03
	1006	First	112 / 28	4	1	17.03.2011 16:40:07
	12346 (1006)	Last	4			
	1009	Nesting	6	1	1	17.03.2011 16:17:45

This is the 'Job List', which contains all programs you have created and saved to the program's default folder; 'CNCDATA'. If you would like to load jobs from another folder, press <Ctrl> and the first button in the navigation panel [6]. A dialog will appear for selecting the new folder to load from.

There is a row for each sheet; for jobs with full sheets and the last sheet, there will always be two rows displayed. If you wish to edit the job, you must edit these sheets separately!

Different program identifiers will be shown according to the nesting method used to create the sheet. There are different displays for 'True-shape nesting' and 'Grid-nesting'. This way you can quickly recognize how the program was created.

The bottom button opens a Copy list which allows you to group your programs together in a list and copy them to any other path.

51

Program	Info	Parts	Sheets
1006	First	112 / 28	4
12346 (1006)	Last	4	
1009	Nesting	6	1

Programs created using grid nesting are allocated a job number automatically in sequence, and the 'last' sheet will be marked as such. Last sheets will have a number in brackets next to their own

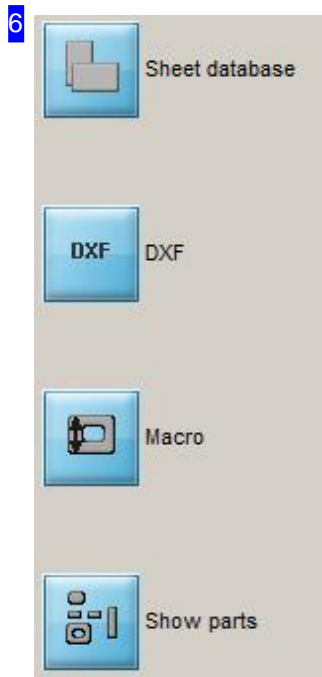


program number; this gives the program number of the full sheet that this last sheet belongs to. The 'Parts' column shows the number of parts on each full sheet, as well as the number of parts on the last sheet that was created.

52

Program	Info	Parts	Sheets
1009	Nesting	6	1
1008	Nesting	6	1
1007	Nesting	6	1

If the program was generated using true-shape nesting and a job name or number was entered when it was created, then the sheets will be listed under that job name. Full and last sheets are listed with the same job name in the 'Info' column, and so can be easily identified as belonging together.



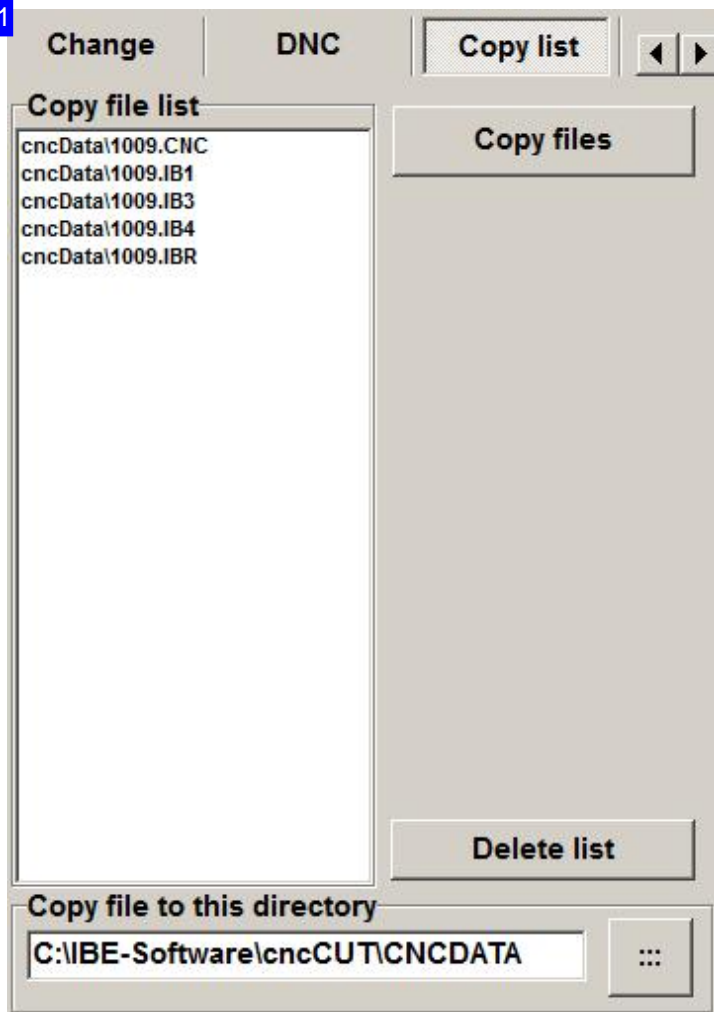
Click the top button to go to the sheet database, or hold the Ctrl button and click it to open jobs from a different folder.

The second and third buttons allow you to go to the screen for opening DXF files and macros.

Click the last button to show a part in the preview window [4].



31



This list allows you to collate all your individual sheets' programs, and save them to a given path. Mark a program in the selection list [5] and press the bottom button. The programs for individual sheets will be added to your copy list. Enter a target in the input field at the bottom, or use the button at the bottom right to select one from a dialog box. To copy the files, click the top right button.

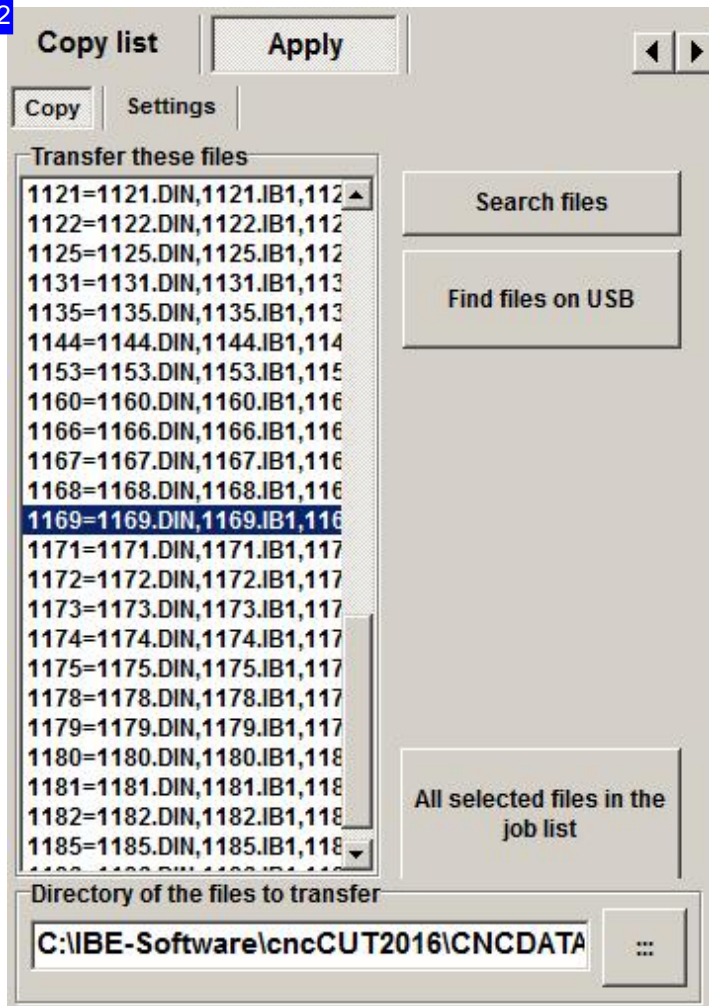
If a USB stick is attached then an extra button will be displayed allowing you to copy to it without first selecting it as a drive. The file marked in the copy list is shown in the status list below.

You can import files in a similar way using the 'Transfer' button in the header panel.





32



Here you can import programs to *cncCUT* from any given path. First create a list of the files to be imported, then click '...transfer to the job list'.

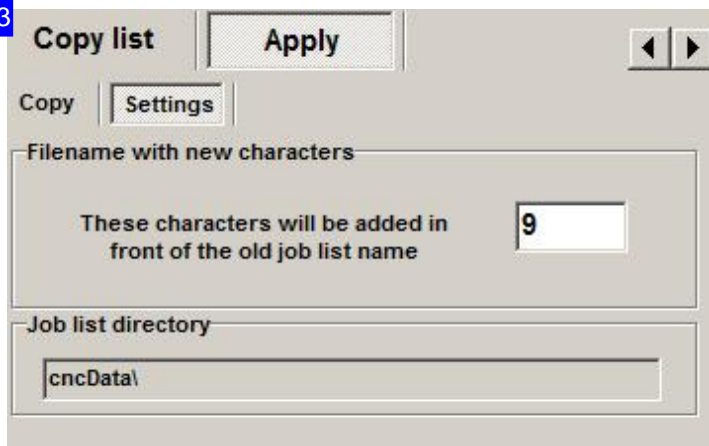
To search for files, enter the search path in the input field, or use the button at the bottom right to select one from a dialog box.

If a USB stick is attached, then you can search for files on it by clicking on the second search button.

Next, click the 'Search files' button to transfer the files to the list.

The 'Settings' tab allows you to enter a search path and prefix for the files to be saved with. Thus *cncCUT* offers you a method of managing your contracts.

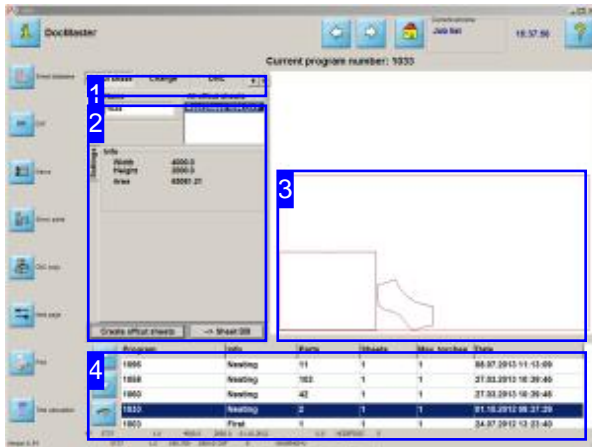
33



You can enter a prefix for better grouping when reading data and avoid overwriting programs in the aimed folder.



## Saving Offcut Sheets or Offcut Grids.



The orders listed in the job list [4] may contain offcut cuts if these are entered in the offcut screen . Click 'Offcuts' in the header panel [1] to switch to the screen for editing offcuts.

If the order has offcut sheets, they will be displayed in the frame 'All Offcuts'.

If the order has no offcut sheets then you can still save any spare material as an offcut.

If you've created and defined offcut sheets while creating your nest then you can use this screen to put them in the sheet database ready for future use.

If no offcuts were defined you can use the 'Offcut Grid' to turn any leftover material into usable offcuts and save them to your sheet database. These 'Offcut Grids' are saved as DXF contours.

Program	Info	Parts
1096	Nesting	11
1058	Nesting	102

Select the order to edit from the job list [4].



Click on 'Offcuts' to reach the screen for creating the selected order's offcuts.



**2**

**Offcut sheets**

Name

**All offcut sheets**

**RestSheet\1034.DXF**

**Settings**

**Info**

Width	4000.0
Height	2000.0
Area	65081.21

Create offcut sheets

--> Sheet DB

The 'Offcuts' tab lists all offcut sheets entered in the order. Offcuts have the same name as the order, suffixed with a sequential offcut number. Select a sheet in the list to display its dimensions in the 'Info' frame. Click on '--> Sheet Database' to transfer the offcuts to the sheet database and mark them as offcuts .

The 'Settings' tab allows you to define more variables relating to offcut selection.

**21**

**Offcut grid**

Apply the offcut grid

**Transfer waste parts (internal parts)**

Accept waste parts when available surface exceeds

Area

**Path for offcut DXF files**

RestSheet\

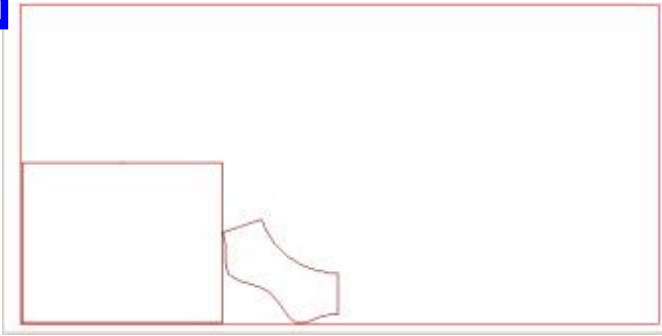
Further settings for offcut creation can be accessed in this tab. If there are no offcuts in the order then check the selection box in the 'Offcut Grid' frame. Click 'Create Offcuts' to save the 'Offcut Grid' as a DXF file which can be exported to the sheet database.



The preview shows the selected order. If offcuts are defined then this will be shown. If no offcuts are defined then the remaining 'Offcut Grid' can be saved as an offcut.

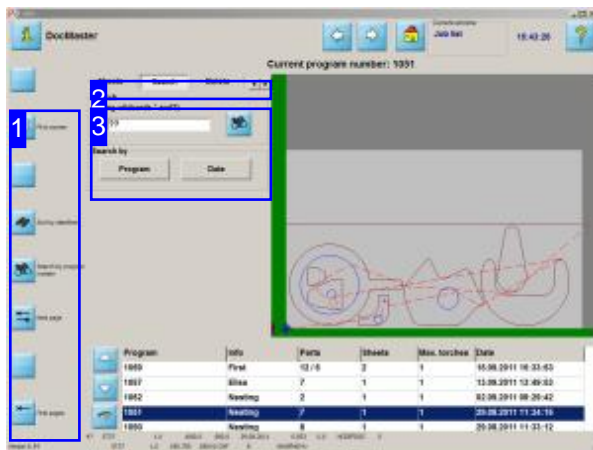


31



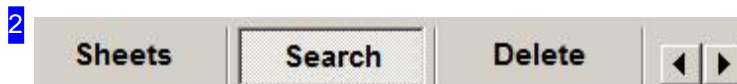
After the creation of an offcut the offcut grid will be shown in the preview [3].

## Finding a Job in The Job List.



A sheet can be identified by the program number. Enter the program number and begin the search by clicking the 'Search' button [3] or [1]. You cannot search for a last sheet. To search for a last sheet you must enter the program number of the full sheet, which will then show both.

This screen allows you to manage all created and saved jobs, and send them to an NC machine. There are various functions offered to help seek a particular job.



This button panel allows you to switch directly between the various windows available for working on your jobs from this screen. Click on the 'Next Page' button in the left navigation panel [1] to flick through the tabs. 'First page' always switches to the 'Sheets' tab.



1

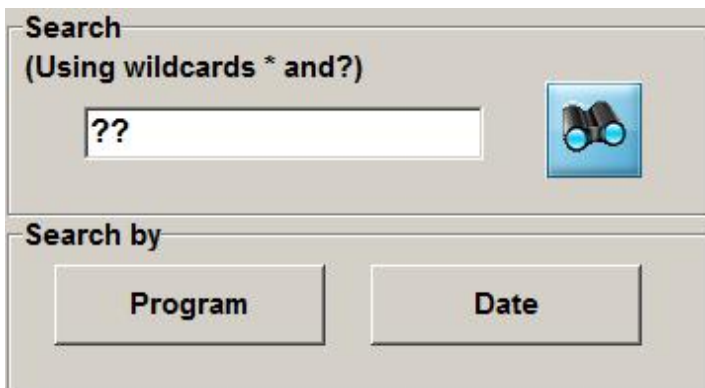


Clicking the upper button sorts all jobs by their program number. To sort sheets by time and date, click the third button.

The search for the given program number [3] is commenced by pressing the 'Search' button. This button has the same function as the button next to the input field [3].

The lower buttons call other program steps belonging to job processing, and are the same as the buttons in the header panel [2].

3



Enter the program number you would like to search for. You may use wildcards here, where '\*' signifies all further characters, and '?' signifies just one character. You may also use wildcards within search strings.

Click the 'search' button to start searching. Press the 'show all' button [1] if you would like to view all entries in the list again.

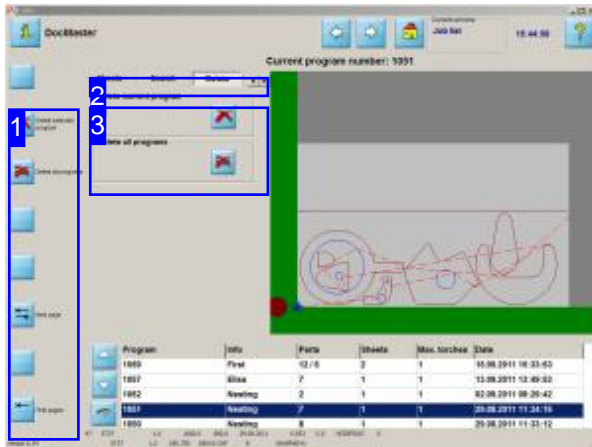


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The 'Program' and 'Date' buttons are the same as the corresponding buttons in the left navigation panel [1].



## Deleting a Job From The Job List.



This screen allows you to delete single programs or the whole Job List. You will be asked for confirmation before a delete operation is carried out; a dialog box will open, where you must confirm the operation.

This screen allows you to manage all created and saved jobs, and send them to an NC machine.

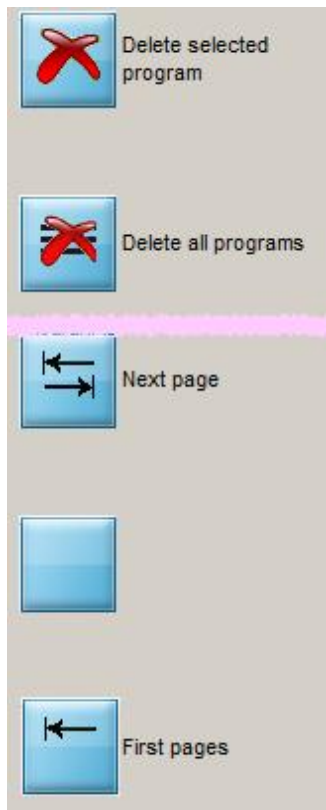


This button panel allows you to switch directly between the various windows available for working on your jobs from this screen. Click on the 'Next Page' button in the left navigation panel [1] to flick through the tabs. 'First page' always switches to the 'Sheets' tab.





1



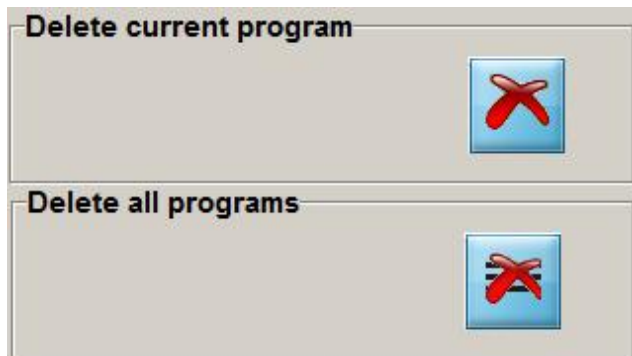
If you would like to delete a program, then highlight it in the list and click the upper button here.

Clicking the second button deletes all sheets from the Job List.

A dialog box appears asking for confirmation before each delete operation is carried out.

The lower buttons call other program steps belonging to job processing, and are the same as the buttons in the header panel [2].

3



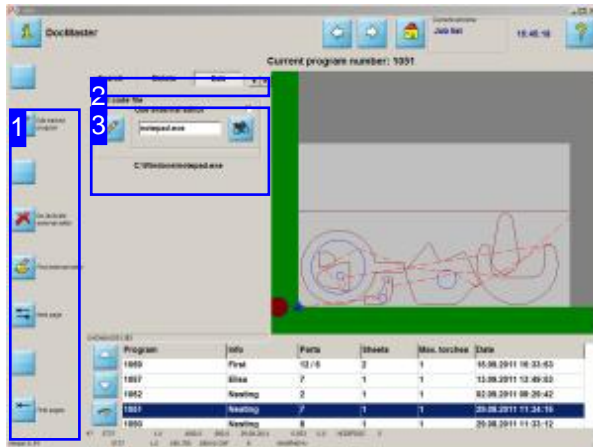
This frame offers two methods of deletion:

- o Delete the currently marked program.
- o Delete all programs in the list.

You will always be asked for confirmation before anything is deleted.

The buttons are identical to those in the navigation panel [1].

## Editing a Job in The Job List.



If you would like to check the code of a program, and potentially make changes manually, then *cncCUT*'s editor allows you to do this. You may also use an external text editor.

This screen allows you to manage all created and saved jobs, and send them to an NC machine. You may also adapt your programs individually at this last phase before manufacturing.



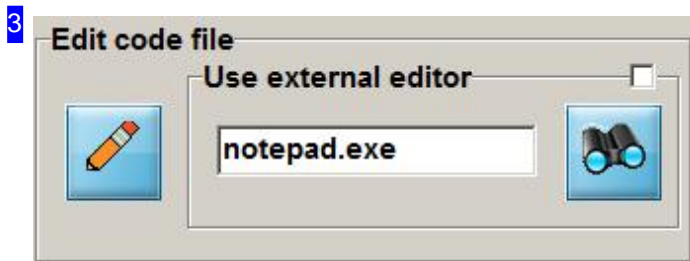
This button panel allows you to switch directly between the various windows available for working on your jobs from this screen. Click on the 'Next Page' button in the left navigation panel [1] to flick through the tabs. 'First page' always switches to the 'Sheets' tab.



Press the highest button to switch to the program editor. The left button in the 'Edit' tab [3] has the same function.

Clicking the penultimate button marks the 'Use external editor' checkbox in the 'Edit' tab [3].

The bottom button opens a file manager to select your external text editor from.

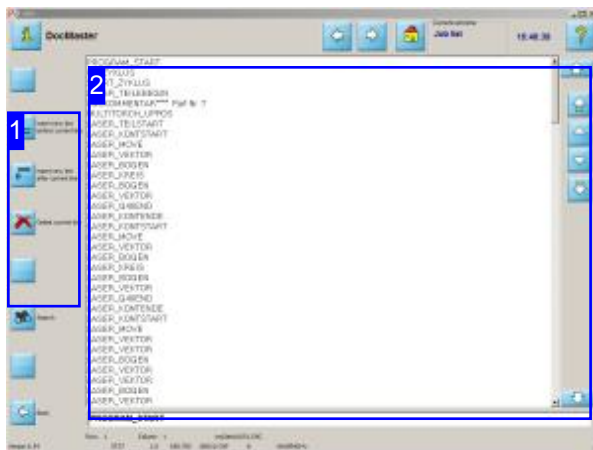


The frame allows you to open the internal Editor to edit your program code, or to define the external editor to be used.

Click the right button to select an external editor to use. Mark the checkbox at the top right to use this editor, and finally open the editor using the left button. This switches to the Editor screen. If you want to use the internal Editor that comes with *cncCUT*, simply leave the checkbox empty.

The buttons are identical to those in the navigation panel [1].

## Editing a Job with the Internal Editor.



cncCUT's built in Editor allows you to add, delete, or edit lines of your NC code. To help do this there is a search function.

The Editor is a tailor-made tool for editing your NC program.



Clicking the top buttons will add a line to the code.

Click the third button to delete the cursor position's current line.


Use the last button to search the code. This will open the 'Search' frame.

2

```

PROGRAM_START
UP_ZYKLUS
START_ZYKLUS
LASER_TEILEBEGIN
CNCKOMMENTAR**** Part Nr.:7
MULTITORCH_UPPOS
LASER_TEILSTART
LASER_KONTSTART
LASER_MOVE
LASER_VEKTOR
LASER_BOGEN
LASER_KREIS
LASER_BOGEN
LASER_VEKTOR
LASER_G40END
LASER_KONTENDE
LASER_KONTSTART
LASER_MOVE
LASER_VEKTOR
LASER_BOGEN
LASER_KREIS
LASER_BOGEN
LASER_VEKTOR
LASER_G40END
LASER_KONTENDE
LASER_KONTSTART
LASER_MOVE
LASER_VEKTOR
LASER_VEKTOR
LASER_BOGEN
LASER_VEKTOR
LASER_VEKTOR
LASER_BOGEN
LASER_VEKTOR

```



This screen shows you the code of your NC program in pure text format.

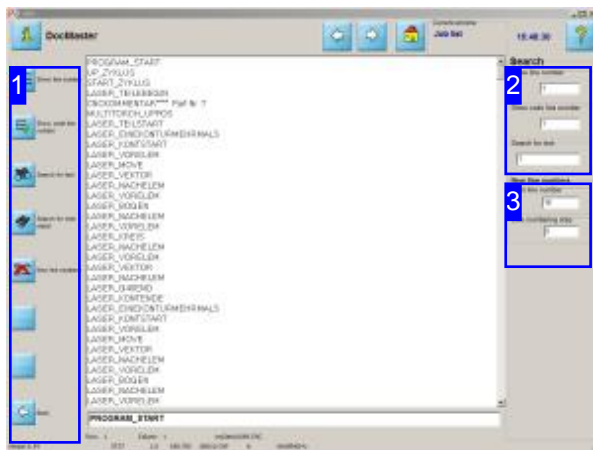
Navigate the code using the buttons to the right.

Change the code as you wish, according to the standard rules of text editing. Press enter when finishing a line of code and a new line will be added in.

You will be asked to confirm saving the new code when you leave this window.



## Search for a Line Number or Code in your NC Code.

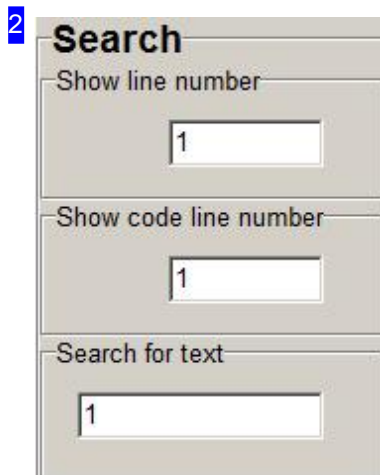


The Search window in *cncCUT*'s Editor gives you a tailor-made tool to search by line number or text string.

You may also renumber the program's lines.

Using the buttons in the navigation panel [1] calls up the input fields to the right [2] and [3].

The search window offers particularly well tailored search options.



This frame has input fields for text or numbers, to aid navigation with the buttons to the left [1].

From top to bottom:

- o Index of a line to be jumped to.
- o NC code line number to be jumped to.
- o Search string to seek.

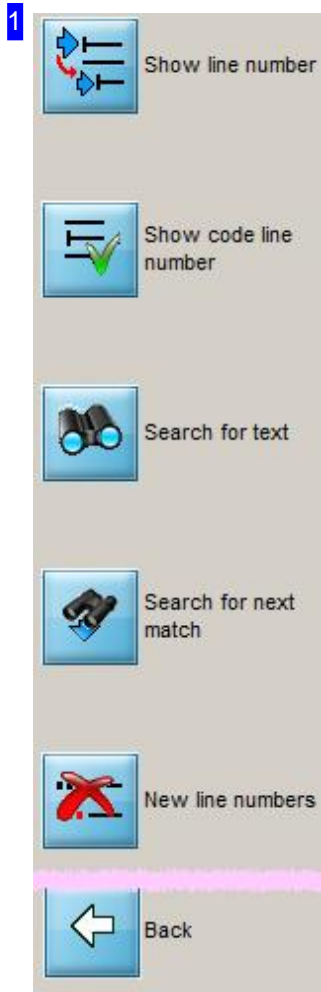


**3** **New line numbers**

First line number

Line numbering step

This frame allows you to enter the rules for renumbering your code. 'First line number' sets the number to give the first line of code. All further lines will be numbered with the increment you specify in 'Line numbering step'.



Clicking the top button jumps to the line with the index entered in the "Show line number" field [2].

Clicking the second button jumps to the line with the number entered in the 'Show code line number' field [2].

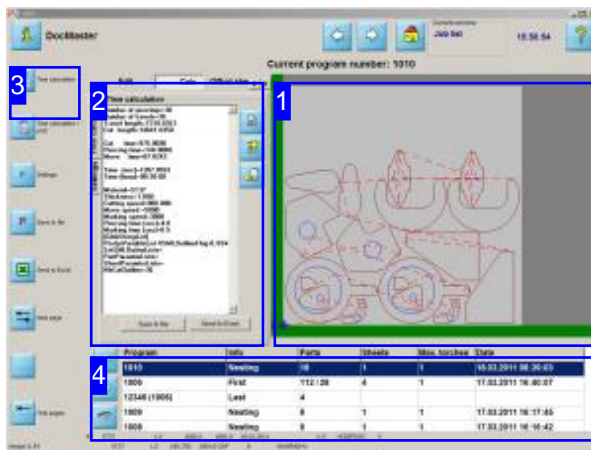
To search for text in the code, enter the search string in the 'Search for text' field [3], then click the third and fourth buttons to execute the search.

The 'New line numbering' button renumbers the lines in the code according to the rules you enter in the 'New line numbering' frame [3].

Click the bottom button to return to the normal Editor window.

# The Job List - Time Sheet

Time sheet for a cut sheet.



This screen allows you to calculate an estimate for individual tasks in your job list, or combine multiple such estimates for a job estimate.

The estimated values will allow you to create a quote for your customer. You will need Excel® installed on your computer to create a quotation.

The specified speeds are the basis for the time calculation for the cutting, the rapid moves and the pierce times. The cutting time is calculated as follows:

$$\text{Cutting lengths} * \text{Cutting speed} + \text{Rapid moves} * \text{Rapid move speed} + \text{Number of pierces} * \text{Cutting time for pierces} = \text{Cutting time.}$$

Thereby, it must be taken into account that these are always constant speeds and no linear changes are taken into account for the paths!

These are always dependent on the machine and the part to be cut and the resulting number of elements. However, you have the possibility to use empirically determined average values by adjusting the parameters, to optimize the calculation of the cutting times.

The costing of a job in order to make price quotations is carried out by *cncCUT's* optional pricing module.

The estimation software simulates cutting your sheet, then uses values garnered from this operation to make a 'time sheet' [2]. These values are then taken for creating your quotation.

**Important Note:**

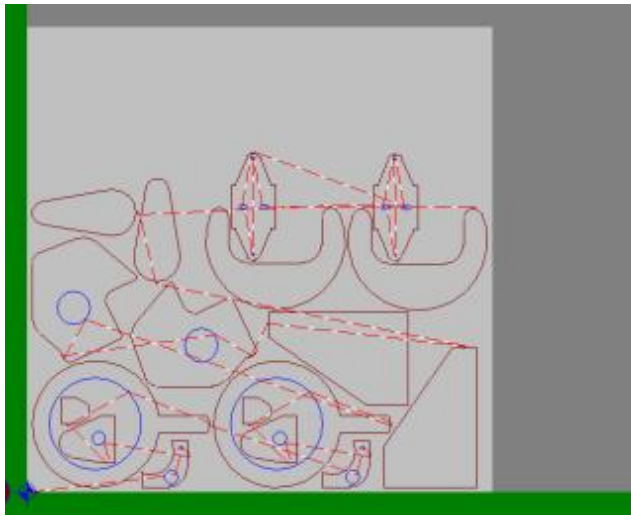
Note that with the time calculation, machines specific values (e.g. lift times) can't be taken into computing totally and therefore with the time calculation always divergences exist to the actual cutting times.

Time calculation is not possible by bevelling, caused on the complexity of the toolpath.





1



The sheet will be cut in simulation in this frame. The result is shown in the time calculation frame [2].

2

Time calculation

Time calculation

Number of piercings=36  
 Number of travels=36  
 Travel length=7318.6913  
 Cut length=14641.0350

Cut time=976.0690  
 Piercing time=144.0000  
 Move time=87.8243

Time (sec)=1207.8933  
 Time (hour)=00:20:08

Material=ST37  
 Thickness=1.000  
 Cutting speed=900.000

Settings

Save to file

Send to Excel

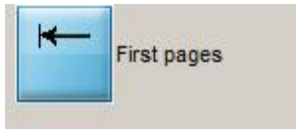
Here you can see the values arrived at through simulated cutting of the sheet based on all data in the sheet database. Set the cutting parameters for the calculation in the 'Settings' tab.

Press the 'Save to file' button to save the values. A file manager window will be opened. You can also save your data as an Excel® file. Click 'Export to Excel' to open your 'TimeCalcSheet' in an Excel® window see also (Simulation).

If you require an expanded calculation sheet, you can take several jobs, and join their estimates into one quotation. Click 'New' to start a new quotation, and supplement it with further jobs from the job list by selecting a job from the list [4] and clicking 'Add'. Each job will be represented by a separate tab. Click 'Show' to open the estimate window.



3



Click this button to generate a time sheet. If you have made changes to the settings [2], use this button to generate a new sheet.

4

Program	Info	Parts	Sheets	Max. torches	Date
1013	First	2	1	1	04.04.2011 08:32:54
1010	Nesting	18	1	1	18.03.2011 08:39:03
1006	First	112 / 28	4	1	17.03.2011 16:40:07
12346 (1006)	Last	4			
1009	Nesting	6	1	1	17.03.2011 16:17:45

Select the job from the job list for which you would like a time sheet, or the jobs for which you would like a combined quotation. Click 'New' to start a new quotation with one job [2], and supplement it by adding further jobs [2].

21

Time calculation

**Data for time calculation**

Move speed

Marking speed

Piercing time (sec)

Marking time (sec)

Settings

**Other cutting speed**

Use these settings

You can make settings for calculating cutting time here. Change the values as required and then click 'Time calculation' in the navigation panel [3].

The time calculation's result will be given in the 'time calculation' tab.



50

Jobs Summary Settings

1010

Material price [€/kg] 1.00 Utilization 54.04 [%] Sheet weight 7.84

Part no.	Description	Number	Area	Material costs	Cut length	Cutting time	Lead-ins	Punching time	Mar
grafikFile\1.dxf	1.dxf	2	30193.23	0.24	549.80	0.61	1.00	0.07	0.00
grafikFile\2.dxf	2.dxf	2	57153.83	0.45	1716.61	1.91	2.00	0.13	0.00
grafikFile\3.dxf	3.dxf	2	5413.28	0.04	217.65	0.24	1.00	0.07	0.00
grafikFile\4.dxf	4.dxf	2	15949.84	0.13	493.72	0.55	2.00	0.13	0.00
grafikFile\5.dxf	5.dxf	2	59239.94	0.46	1075.21	1.19	1.00	0.07	0.00

Total material costs 5.55 [€] Run time[h:m:s] 00:30:08 Total cost of all parts 25.88 [€]  
 Sheet price 5.55 [€]  
 Charge weight 5.55 [kg] Weight of all parts 3.00 [kg]

Calculate Delete OK

The time calculation's result for individual parts on each job are summarized in a table, and given in individual tabs. A summary of the individual results for each job can be called by clicking 'Summary'. To change the presets for your calculation, press 'Settings'. The window this opens allows you to set various settings.

51

Jobs Summary Settings

Part no.	Description	Number	Material	Sheet thickness	Area	Material costs	Lead-ins	Processing length
grafikFile\1.dxf	1.dxf	2	ST37	1.00	30193.23	0.24	1.00	549.80
grafikFile\2.dxf	2.dxf	2	ST37	1.00	57153.83	0.45	2.00	1716.61
grafikFile\3.dxf	3.dxf	2	ST37	1.00	5413.28	0.04	1.00	217.65
grafikFile\4.dxf	4.dxf	2	ST37	1.00	15949.84	0.13	2.00	493.72
grafikFile\5.dxf	5.dxf	2	ST37	1.00	59239.94	0.46	1.00	1075.21
grafikFile\6.dxf	6.dxf	2	ST37	1.00	67127.79	0.53	2.00	1078.27
grafikFile\7.dxf	7.dxf	2	ST37	1.00	7845.05	0.06	3.00	524.92
grafikFile\8.dxf	8.dxf	2	ST37	1.00	28082.09	0.22	5.00	754.53
grafikFile\9.dxf	9.dxf	2	ST37	1.00	82676.08	0.65	1.00	909.80

Excelexport Sheet usage [%] 54.04 Run time[h:m:s] 00:30:08 Total cost of all parts 25.88 [€]

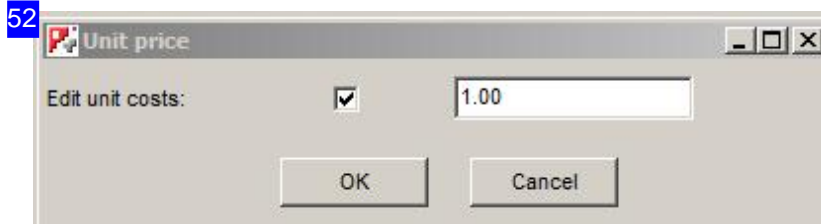
Calculate Delete OK

The summary summarizes all jobs in a single table. the summary can be exported to Excel by clicking as an Excel® sheet, this can then be formatted into a quotation.

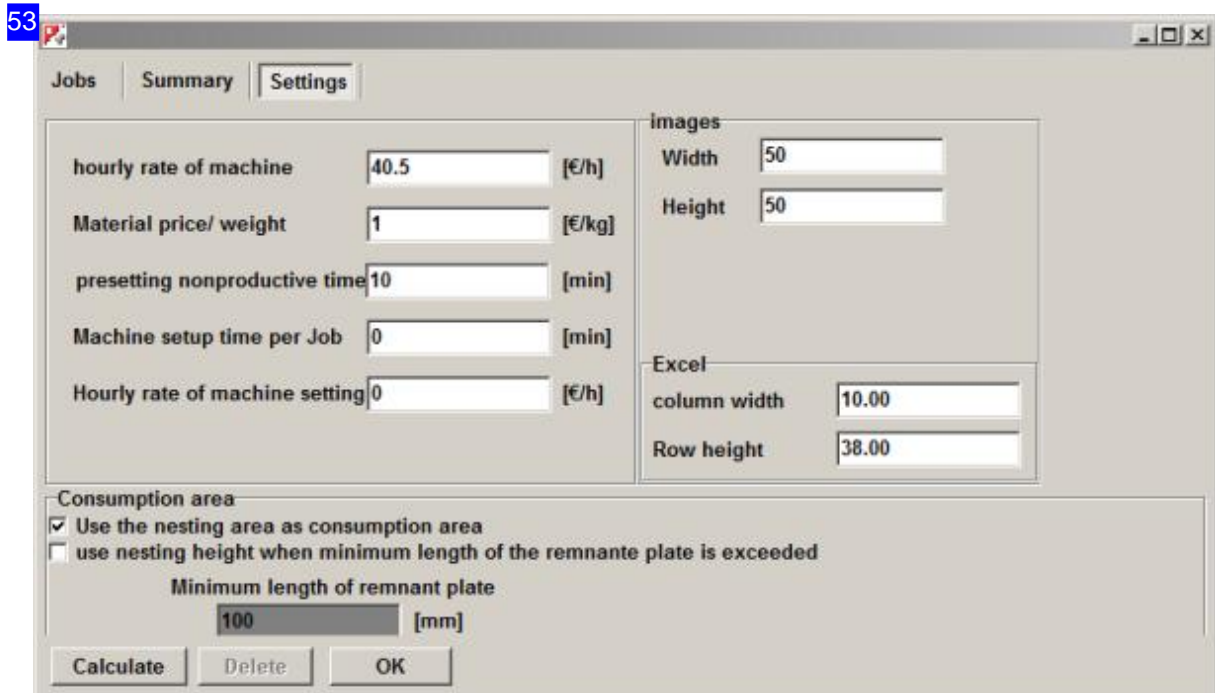


The total estimated cost is shown at the bottom right. This sum total is calculated by adding together the costs for each unit, whereby the sum of average unit costs from the penultimate column will not be undercut.

You can change the unit costs in the last column. Right-click a set of unit-costs to open a dialog for inputting a fixed unit cost. If you increase the unit cost the sum total will also increase. If you decrease the unit cost below the average unit cost the deductions will be transferred to the non-fixed unit cost, which can also lead to an increased sum total.



If you want to make any changes to unit-costs, mark the checkbox. Afterwards, make your changes and press 'ok'. The parts will be re-calculated with the given values.



Enter the rates for the calculation in the top left frame and click 'calculate'. The parts will be re-calculated and the result shown in both the Job tabs and Summary. The sheet dimensions will be read from the sheet database when calculating the usable area. You may however limit the surface to be used for nesting by defining a nesting height if this leaves an offcut that you would like to keep. Check the relevant flag to calculate the usable area.

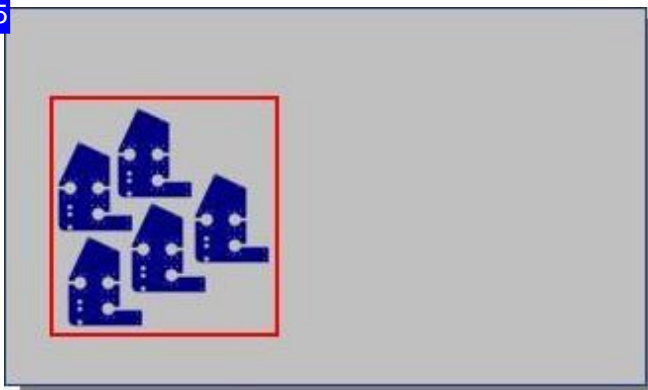


54



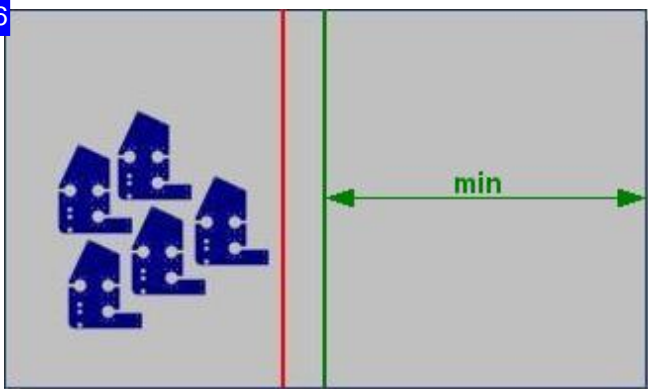
The sheet dimensions will be read from the sheet database when calculating the usable area. The entire sheet will be used.

55



When calculating the usable area, a box will be stretched around the parts, and only the material within the box will be used.





56



Definition of an offcut sheet also defines the calculation of the usable area. Enter the minimum length you require an offcut to have. When calculating the usable area a limited nesting height will be set if this allows a usable offcut to be generated.



57

1	A	B	C	D	E	F	G	H	I	J
2	Angebot	Description	Number	Material	Sheet thickn	Area	Material cost	Lead-ins	Processing le	Processing ti
3		1.dxf	2	ST37	1,00	30193,23	0,24	1	549,80	0,68
4		2.dxf	2	ST37	1,00	57153,83	0,45	2	1716,61	2,04
5		3.dxf	2	ST37	1,00	5413,28	0,04	1	217,65	0,31
6		4.dxf	2	ST37	1,00	15949,84	0,13	2	493,72	0,68

The parts are listed here with pictures. This allows a visual correlation of data to part.  
 This window is an Excel export from the Summary.  
 Click the 'Quote' button at the top left to create your quotation and export it as an Excel® sheet.

58

22	A	B	C	D	E	F	G	H	I
23	Angebot								
24									
25	Pos.	Beschreibung	Anz.	Einzelpreis €	Gesamtpreis €				
26	1	1.dxf	2	1,00	2,01				
27	2	2.dxf	2	2,66	5,33				
28	3	3.dxf	2	0,37	0,73				
29	4	4.dxf	2	0,84	1,69				
30	5	5.dxf	2	1,86	3,72				
31	6	6.dxf	2	2,00	4,01				
32	7	7.dxf	2	0,89	1,77				
33	8	8.dxf	2	1,49	2,97				
34	9	9.dxf	2	1,83	3,66				
35			-	-	-				

This form contains all quotation data, which you can then use as standard Excel information and fit to your individual requirements.  
 This form's basis is the Excel sheet 'PartCalcBase.xls'. Basic settings such as the firm's name can be changed in this sheet using Excel, and saved permanently as a template for future use.

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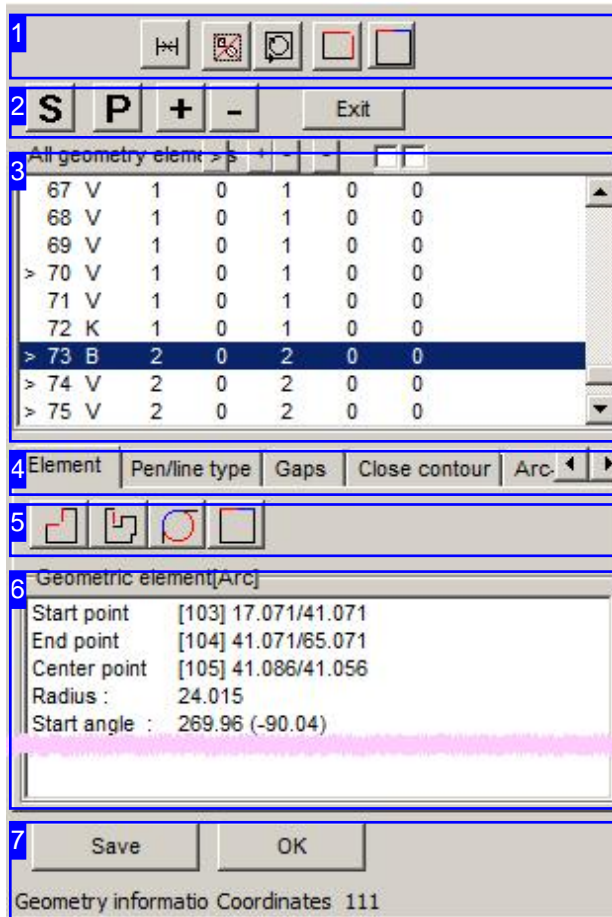
Jobs	Summary	Settings				
1010	1010					
<b>Material price [€/kg]</b>	<b>1.00</b>	<b>Utilization 54.04</b>				
Part no.	Description	Number	Area	Material costs	Cut length	Cutting
grafikFile\1.dxf	1.dxf	2	30193.23	0.24	549.80	0.61

For every job you add to your calculation, a new tab will be added with the corresponding job number.



# The 'Checker' Function - The Drawing Checker

## Repairing Errors with the Drawing Checker.



The Drawing Checker offers you a tool to check the drawing of a component for errors and repair any you find.

- o The upper panel [3] shows all elements present in the drawing. Those exhibiting errors are marked with a '>' symbol.
- o The additional button panel [2] allows you to change the view in the zoom panel.
- o Errors can be repaired quickly using the buttons in the header panel [1].
- o The 'Elements' tab [4] in the bottom panel [6] shows the details of an element selected in the top panel [3], or a list of all elements exhibiting the same type of flaw. The 'Pen /line type' tabs [4] allow you to make settings to search by.
- o You can use the buttons in panel [5] to display elements by type.



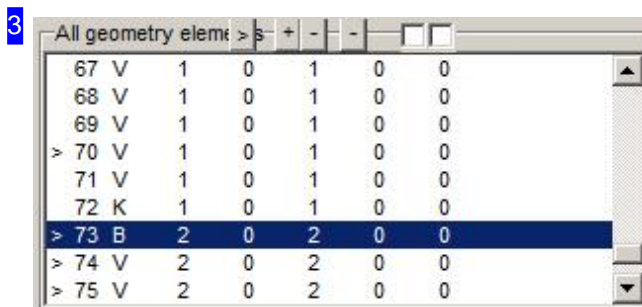
From left to right, the buttons mean:

1. Delete the selected element.
2. Delete all duplicate elements.
3. Check if all contours are closed.
4. Close all gaps up to the given size.
5. Join all vectors/arcs with tangential intersections.



The buttons allow you to change the display in the Zoom (parent) window:

- o 'S' - Show all; fit the drawing to the screen.
- o 'P' - Show the drawing centred on the currently selected element.
- o '+' - Zoom in on the current position.
- o '-' - Zoom out on the current position.



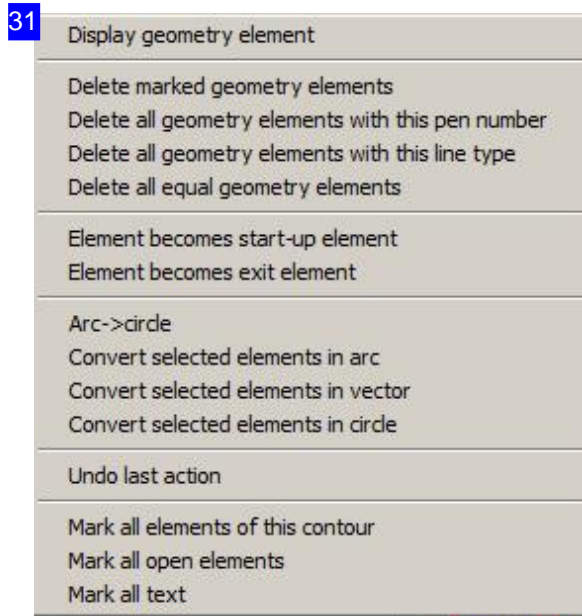
All elements that make up your drawing are listed here. Those which exhibit errors are marked with a '>':

Click on an element to show details about it in the bottom panel [6].

Flawed elements will be marked in the drawing with a cursor.

Right-click to open a context menu with options to repair errors.

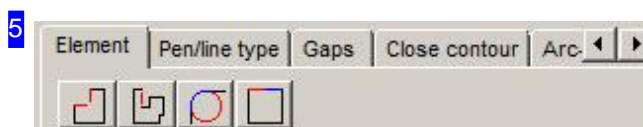




This menu allows you to directly access commands for repairing errors.



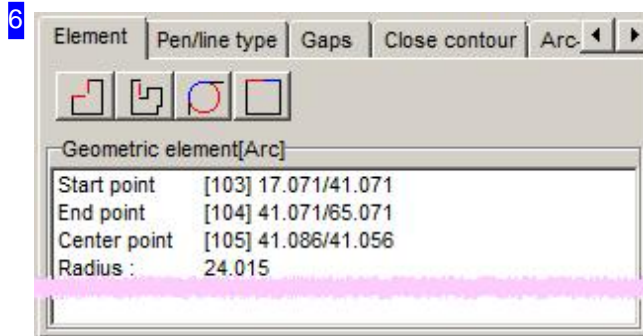
- o The 'Elements' tab shows the values for the element selected in the element list [3].
- o The 'Pen/ line type' tab offers the option to search more accurately by a line's color or consistency.
- o The 'Gaps' tab allows you to search for gaps of a given size and close them.
- o The 'Close contours' tab allows you to check if all contours are closed.
- o The 'Arcs and Circles' tab allows you to join multiple arcs and circles together.
- o The 'Save' tab allows you to save specific elements of your drawing in their own DXF files.
- o The 'Change Pen/Line types' tab allows you to modify the colors and styles of your lines.
- o The 'Settings' tab allows you to join tangential vectors.
- o The 'Join' tab allows you to join vectors and arcs according to presets such as length and angle difference.
- o The 'Hide' tab allows drawing attributes to be hidden according to pen and line types.
- o The 'Arcs' tab allows you to join multiple arc elements into one arc.



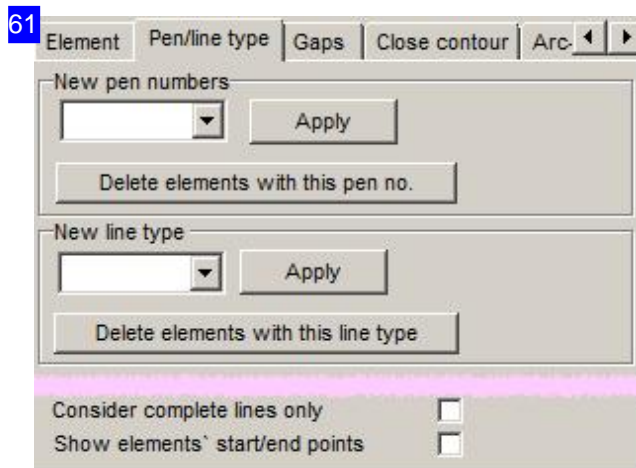
These buttons in the Elements tab allow you to seek for elements with a certain type of error. From left to right, the buttons mean:



1. Find all elements without a connection to another element; one open edge.
2. Find all elements without any connection to another element; two open edges.
3. Find all circles whose centers and radii are the same as an arc's.
4. Find all vectors/arcs whose transitions are 180°.



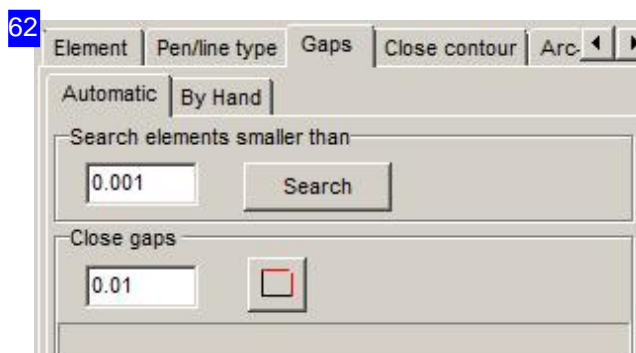
This frame describes the vectors of an element in a drawing, or lists all errors of one Error type if you are searching using the buttons in panel [5].



This frame allows individual elements to be allocated pen or line numbers. This 'marks' the element, allowing elements to be removed as a group, or searched within that group.

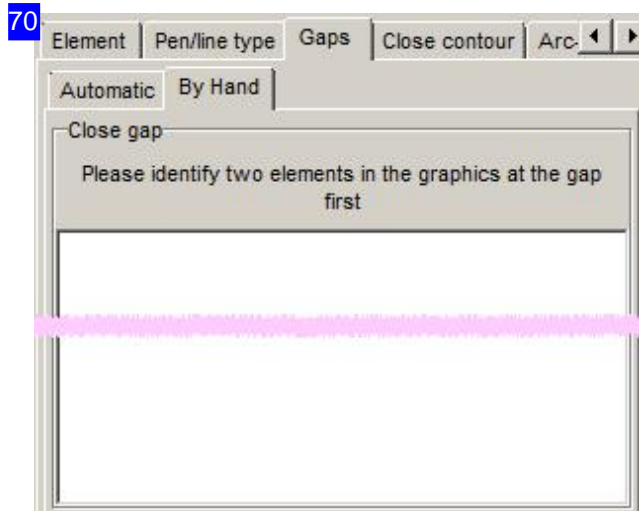
It is important to give open contours a special line type when cutting them. This line type can then be cut together as an 'open contour'.

Line-type 0 signifies 'cut', while line-types 2 and 3 are preset for 'marking'. Other types are post-processor dependant, whereby types 2 and 3 must also be activated from the post-processor. See also 'Changing pen / line-types'.

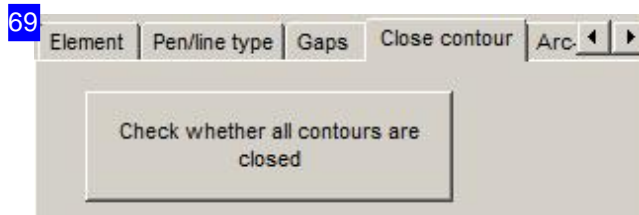


This frame allows you to seek the smallest of elements (faulty elements), or close gaps up to the given size.

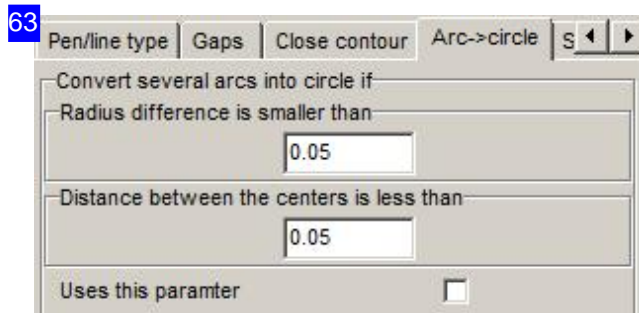
If you have larger gaps, switch to the 'manually' tab to close them yourself.



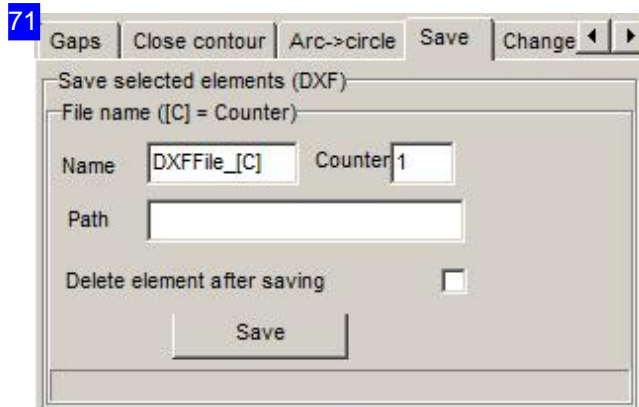
To close larger gaps manually, identify the gap in the drawing to highlight its start and end points in the list. You can then use a vector to close the gap, or trim to the correct length. Check the nature of the gap in the drawing and click the appropriate button. Switch to the 'Automatic' tab to close smaller gaps automatically.



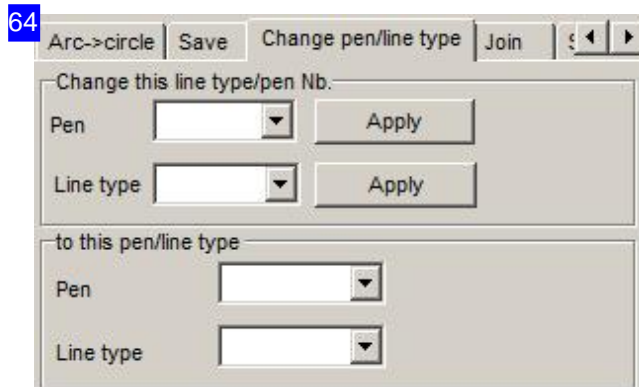
Here you can check if all contours are closed with a single mouseclick.



This frame allows multiple arcs to be fused together to form a circle. Set the threshold value above which arcs should be joined.

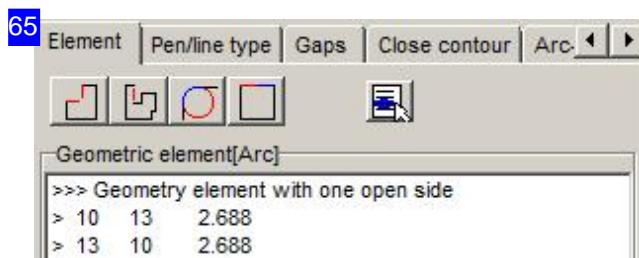


You can save identified elements as DXF files here. Enter the element's save path and name. The files will be given a counter as a suffix to the file name to keep all elements grouped together. Mark the check-box if the elements should be deleted after saving.



This frame allows you to allocate different colors and forms to your contour-elements' line-types. If the colors do not match your selection, check the color settings in the administrator's area. The colors can be individually adapted from that frame (Color values).

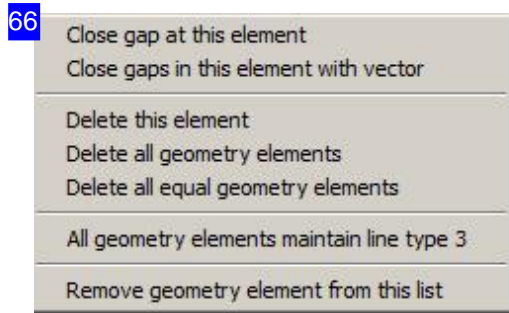
See also 'Pen/Line-type No.' .



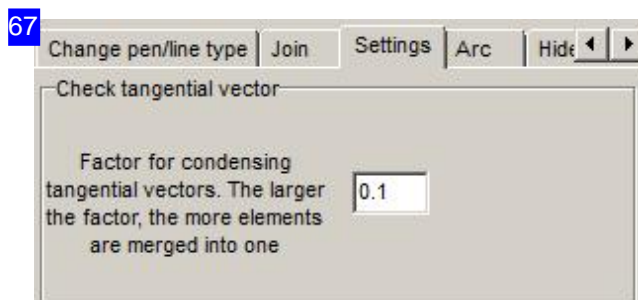
When searching specifically by error category using the buttons in panel [5], a list of the elements found under each category will be displayed.

Clicking on an entry in the list switches back to the Vectors display.

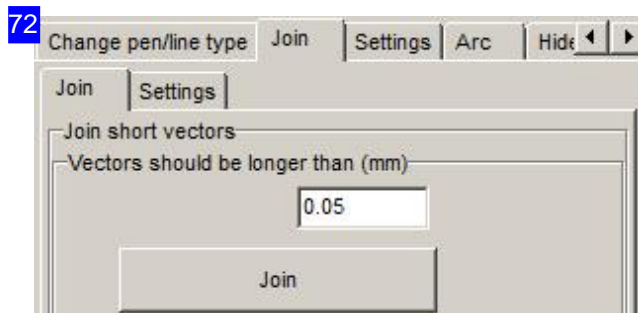
Right-click to access a context menu for repairing errors.



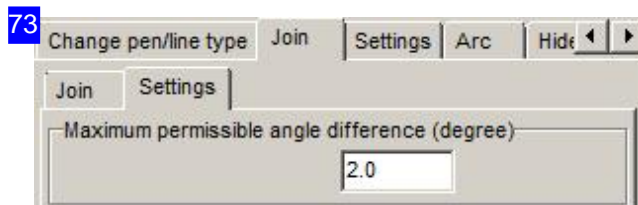
This menu allows you to directly access commands for repairing errors.



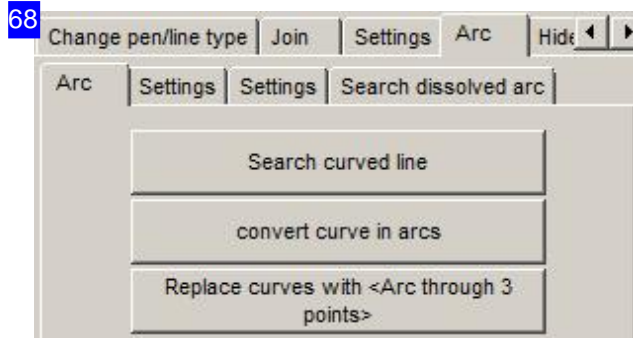
Many smaller vectors can be joined to single vectors by entering a limit. Enter the limit up to which vectors should be joined.



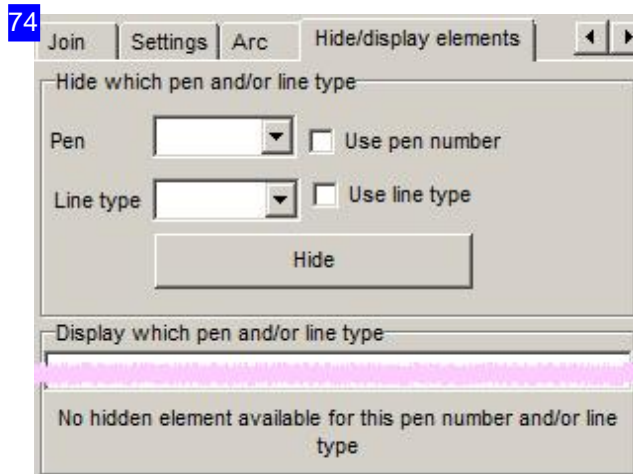
Contour groups which consist of multiple short vectors can be joined to one vector from this tab. Enter the limiting value for the maximum length of vector which should be joined. If you wish to join vectors together according to angle difference, switch to the 'Parameter' tab.



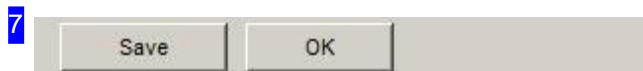
This frame allows you to set an angle difference limit for joining vectors. Enter the limiting value for the maximum angle difference which should be joined. If you wish to join vectors together according to vector length, switch to the previous tab.



There are three further tabs under the 'Arcs' tab for turning elements into arcs. More on this in the next chapter: ' Arc transformation '.



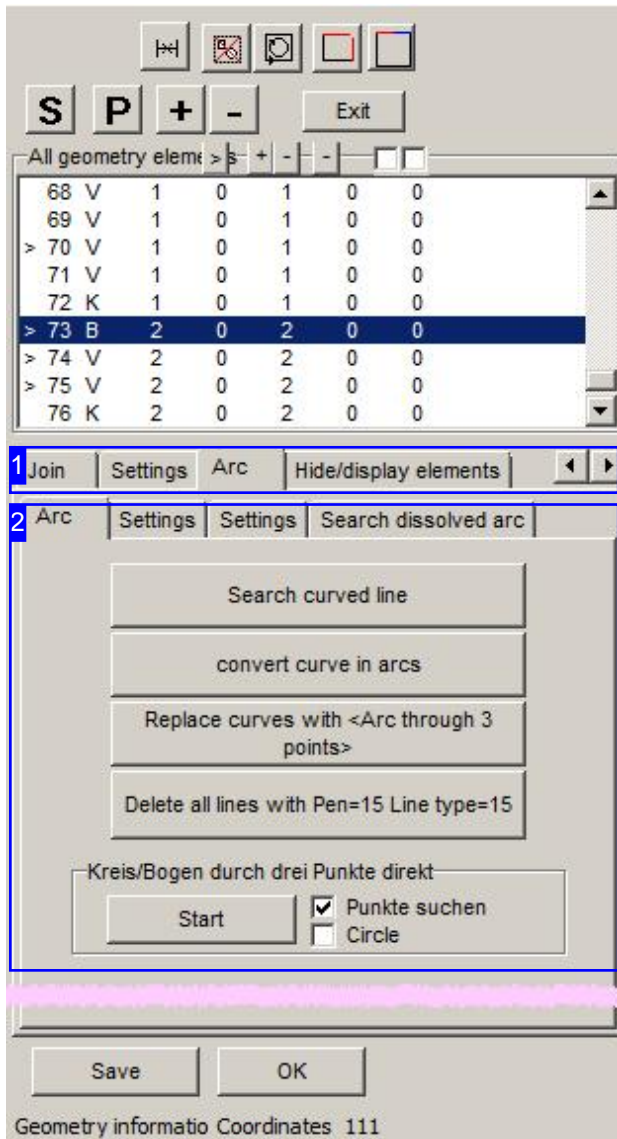
Imported drawings sometimes contain attributes which hinder your ability to process them using *cncCUT* . This tab allows you to hide elements by pen and line type, correcting such errors.



Close the DXF Checker and return to the DXF Selection screen.



## Arc Transformations in the Geo Checker.



The 'Geo Checker' allows you to transform many smaller arcs into a single longer arc series. Set the limits of arcs which should be joined to one arc series.

Once you have marked an element cluster, *cncCUT* will find the curve series, and mark the individual arcs. You can then change the curves into arcs, or replace the curve using an 'arc through 3 points'.



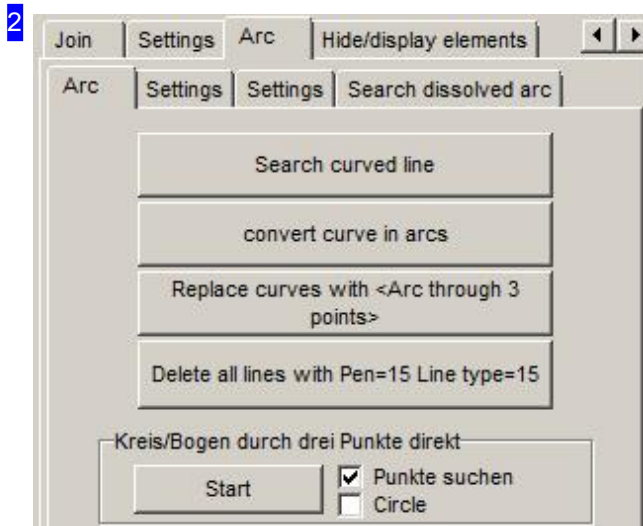
The 'Arc' tab contains 3 further tabs for making inputs on how to convert your curve series.

The 'Arcs' tab contains the buttons for making your transformation.

The first tab, 'Parameters' allows for inputs relating to pen number and type and arc type for joining.

The second tab, 'Parameters' allows for inputs relating to the transformation.

The third tab 'Search dissolved arc' allows you to recreate circular arcs.

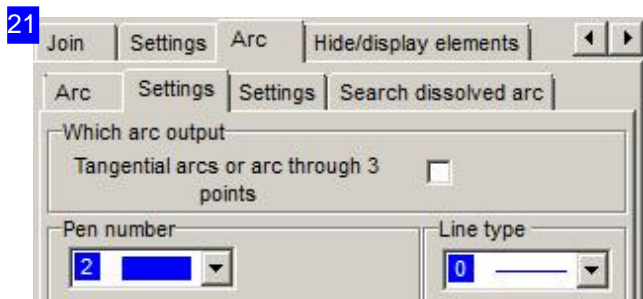


In this frame, click the top button to search for a curve series. The elements around the mouse cursor will be sought through, checked against the limits you have set, and marked.

Click the second button to join the elements as arcs.

The third button allows you to replace the curve with an 'arc through 3 points'.

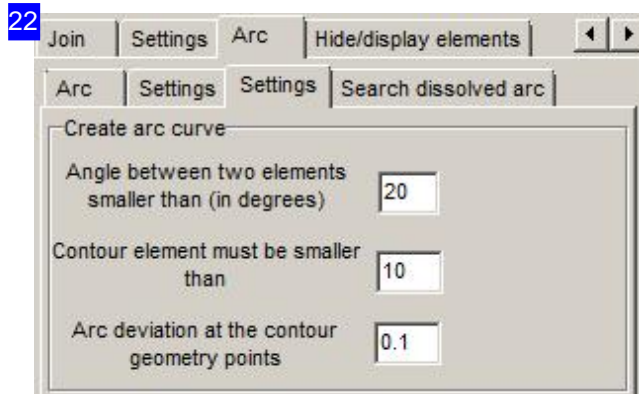
The bottom button gives a simple way to delete the replaced elements.



The 'Which arc output' frame allows you to set how to join elements. The default setting draws the arc as an 'arc through 3 points'. If you require tangential arcs as an output, check the relevant check box.

Select the pen and line types for joining from the selection lists. This option helps with processing your remaining elements.



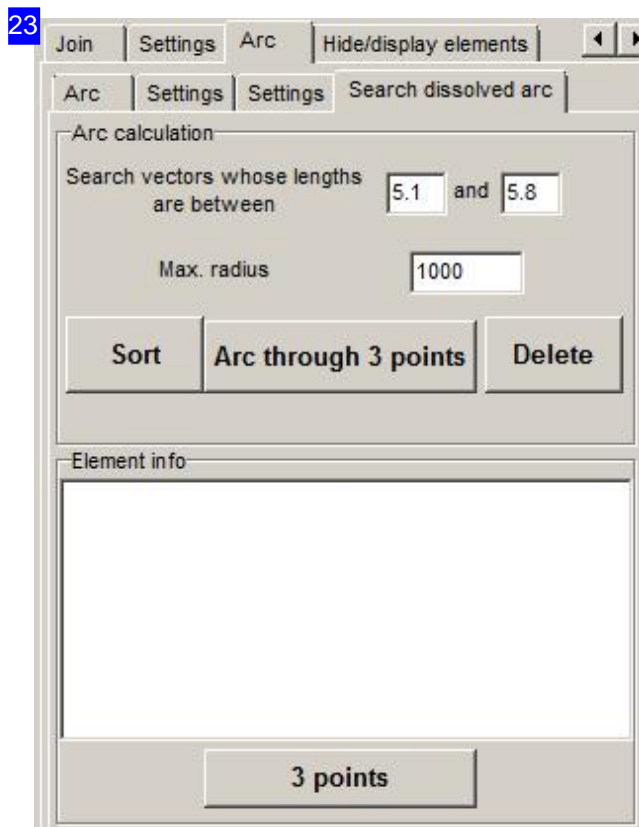


Enter the limits for joining in the input fields.

The top frame sets the angle between two elements which should still be joined into an arc.

The middle frame sets the maximum length of a contour element which may be transformed to an arc.

The bottom frame sets the permissible deviation a new arc may have from existing geometric points.



You can recreate circular arcs with this function by selecting three points on a contour. Start with setting the rules in the upper frame. Then click the 'Arc through 3 points' button and select three points from a vectorised arc in the drawing.



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The Demo version is a fully functioning version for limited use.

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License

You must purchase a license to continue using the application long-term.

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