



cncCUT



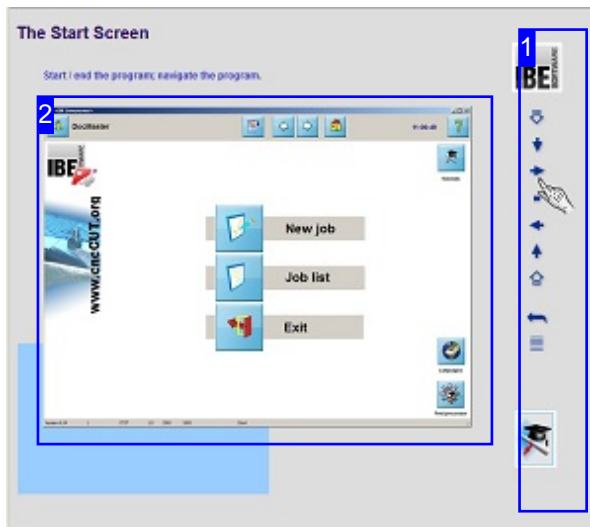
Tutorial

Automatic NC-Program Generation



Welcome to *cncCUT*'s tutorial file

General tips for using the tutorial



The screen is split into two areas: the navigation menu to the right [1] and the *cncCUT* help page to the left [2].

There is a colored box beneath the help window to illustrate which part of the program the page relates to.

Important Note

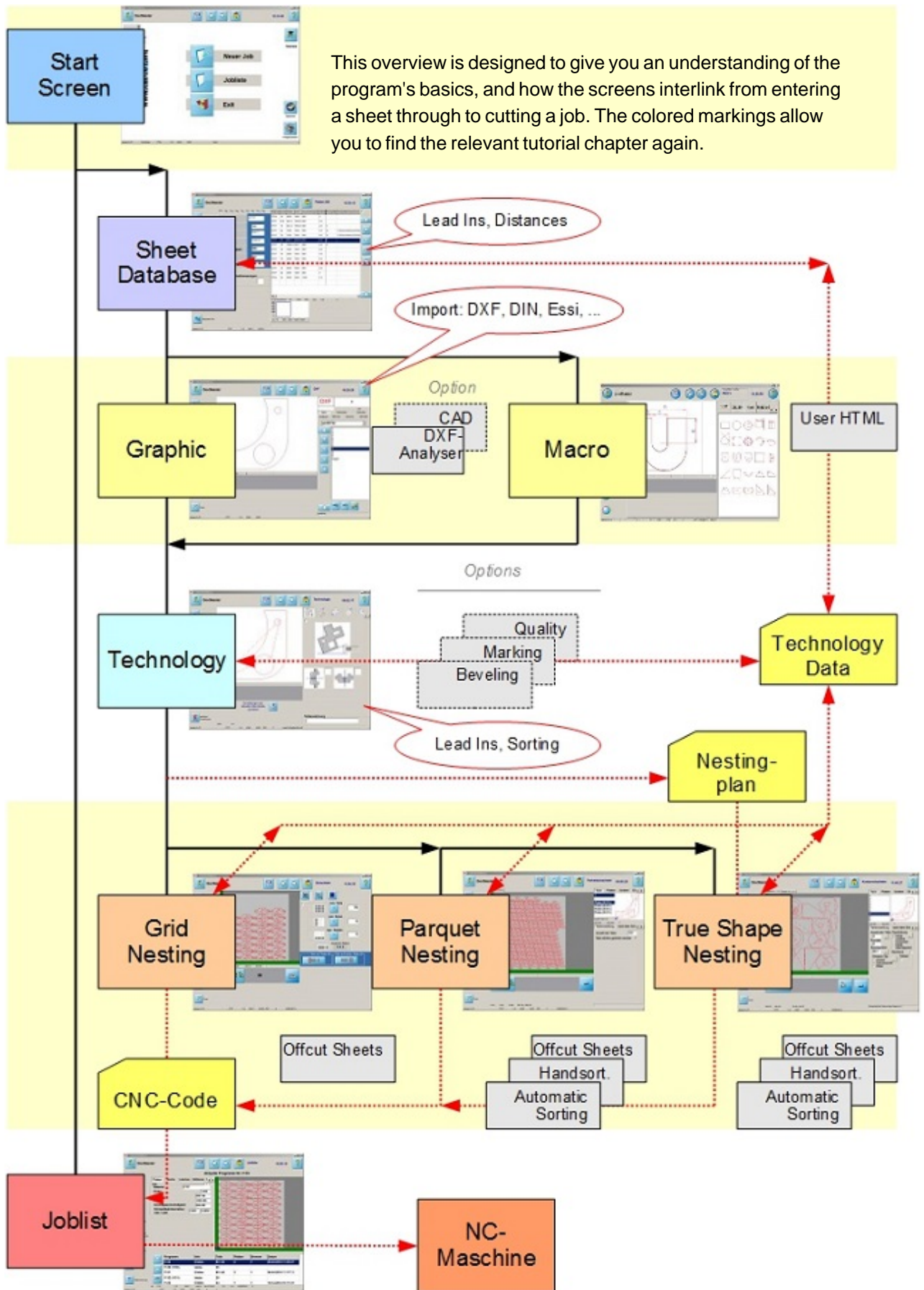
cncCUT is machine-independent and offers a complement of functions not all machines can support. The tutorial describes *cncCUT*'s general functions with illustrations that may not match what you see on your screen. The GUI changes, depending on the machine, post-processor and integrated program modules you have installed. There is a fuller description in the online help system. The most important post-processors also have their own help files. The continuous development of *cncCUT* can also mean that your version of the program may not include all of the features being described, in the form described. Please check the edition of your documentation against that of your program. Where necessary, check our homepage for any updates.

Navigation

The menu buttons allow you to navigate the tutorial.

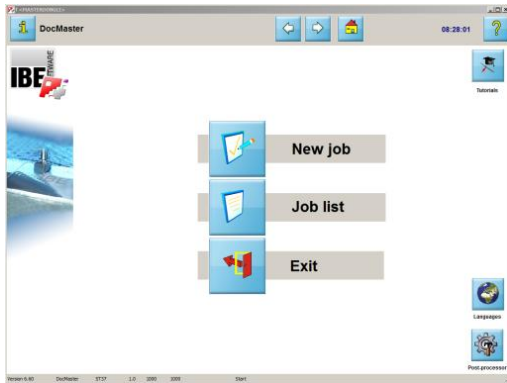
The buttons explained, from top to bottom:

- o To chapter one.
- o Next chapter.
- o Play tutorial.
- o Pause tutorial.
- o Start of this chapter.
- o Previous chapter.
- o To the last chapter.
- o Start the loop.
- o To the contents page.



The Start Screen

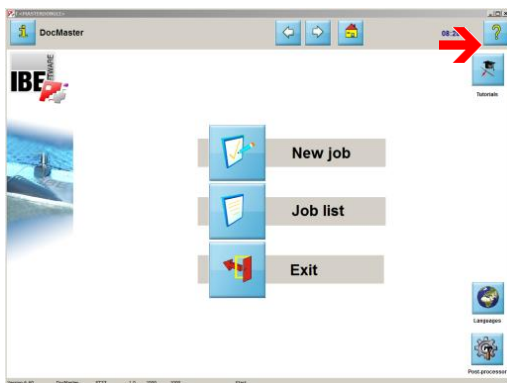
Start / end the program; navigate the program.



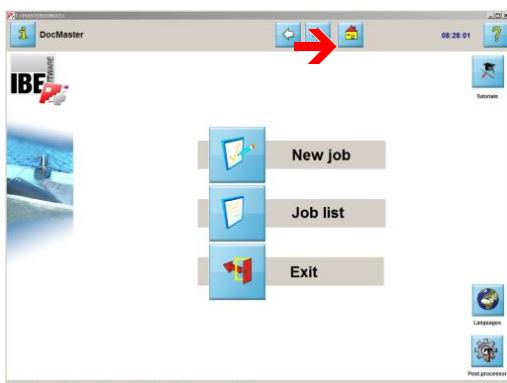
Welcome to *cncCUT*'s help files .

You can create a new NC program from this screen with just a handful of clicks, or manage existing programs.

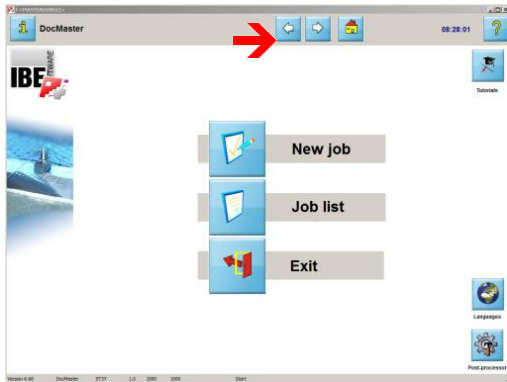
The header panel gives general information about the work area and functions you will always have access to.



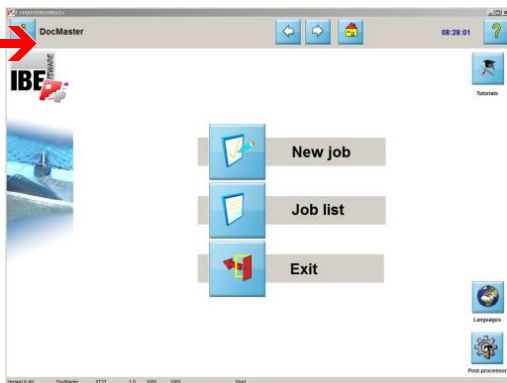
This button always opens the help page for the current screen.



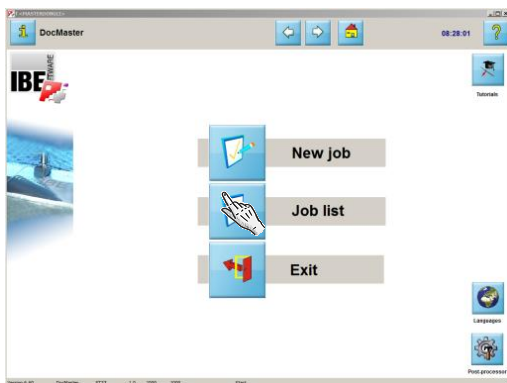
Click here to access the Start screen (this screen).



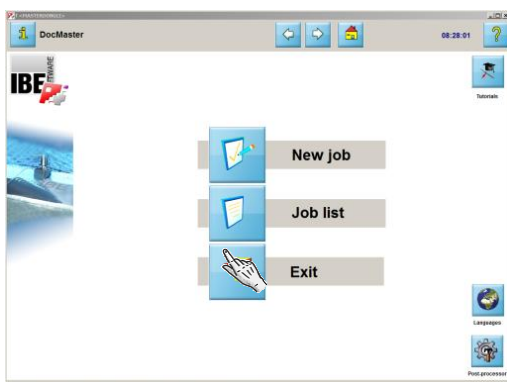
These buttons ('Back' and 'Forward') relate to the steps in making your NC program and work like an internet browser.



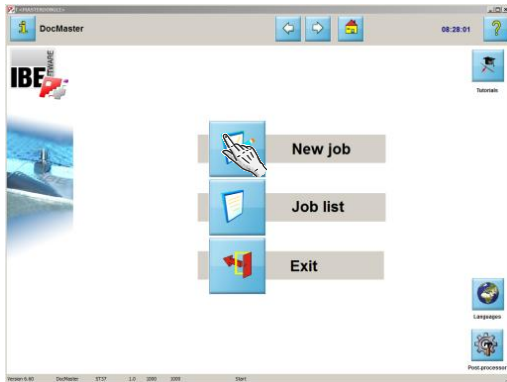
You always require a post-processor suited to your machine to create an NC program. Here you can see which one is currently loaded.



This button opens the job list, where all your NC programs are cataloged.



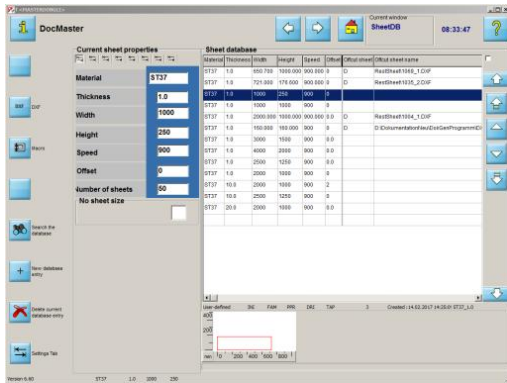
Click here to end the program.



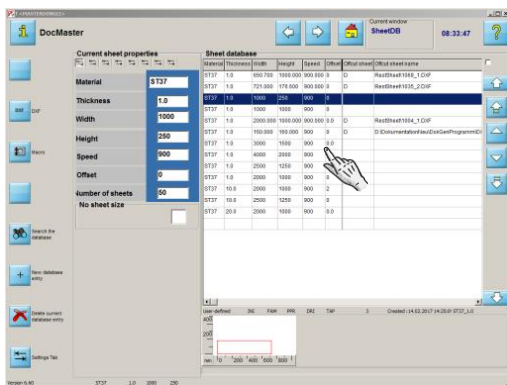
Click here, or 'forward' in the header panel, to create a new NC program. You will switch from the start screen to the sheet database.

The Sheet Database

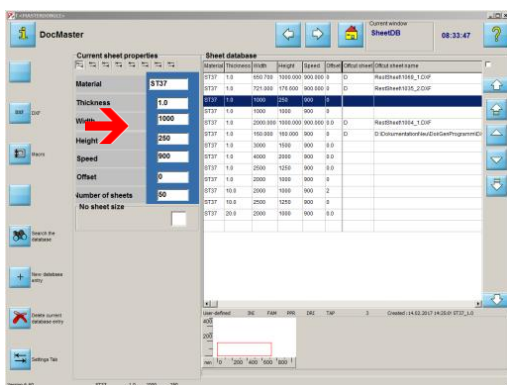
Choose a sheet from your stock.



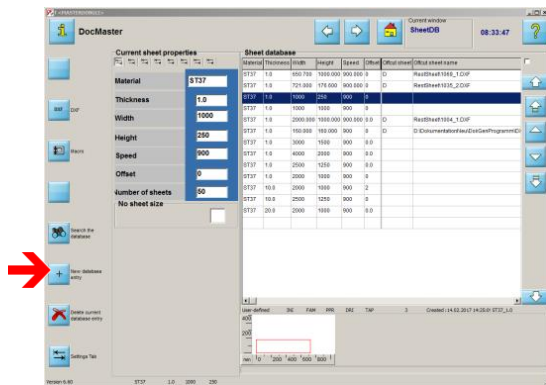
The sheet database allows you to manage your metal stock for working with *cncCUT*. You can enter sheet dimensions, then find and modify them. You can enter the machine data for your materials here too. Use this feature to reduce duplicated work for materials you use regularly.



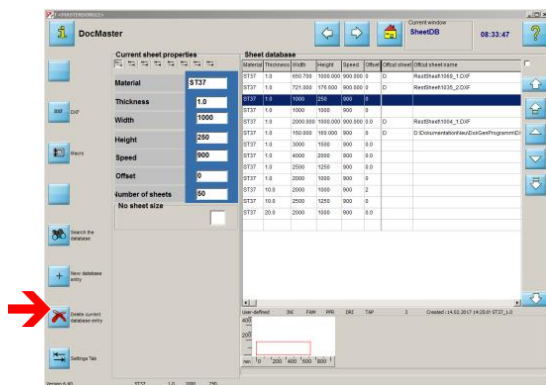
You will need to select a sheet to nest your parts to in order to create an NC program. This list (the database) shows all sheets available to you.



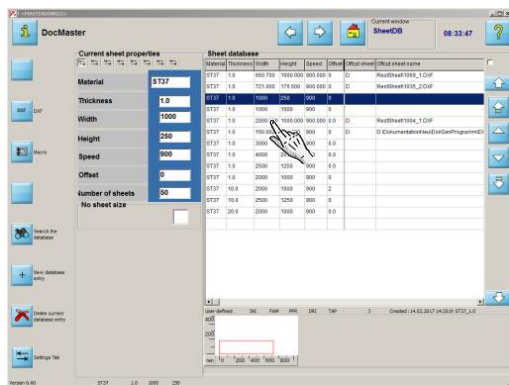
The machine data are dependant on the post-processor you have loaded. You can check and modify all data here.



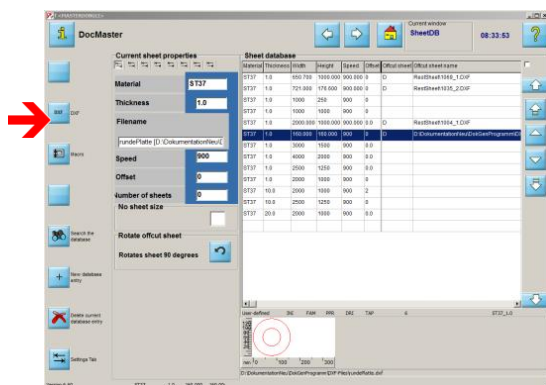
You can save a new sheet to the database here. A window will open for you to enter its dimensions.



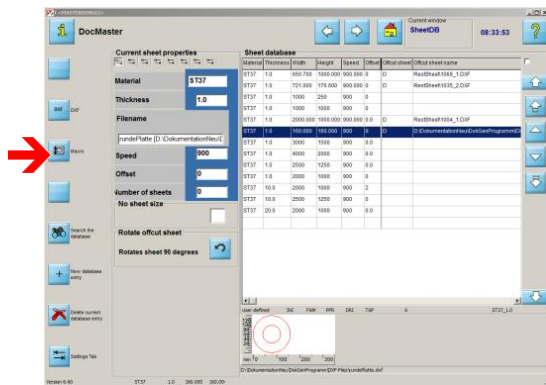
Click here to delete a sheet from the database.



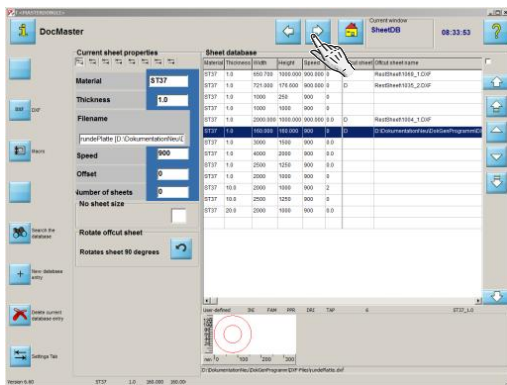
Select a sheet from the database.



Once you've selected your sheet you'll need to select the workpieces to cut. You can choose an existing drawing file (DXF, DIN, DWG, etc.)...



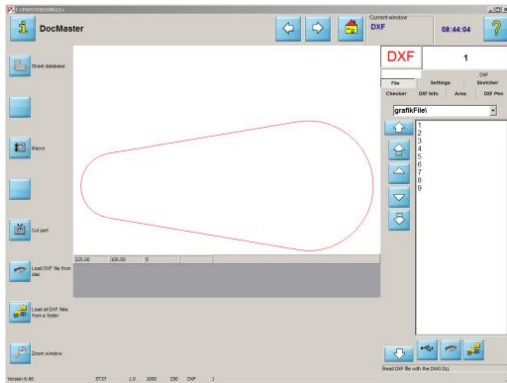
... or work from a macro.



The next screen from the sheet database is for selecting your workpieces. Click 'forward' to continue to the DXF selection screen.

Select a drawing

Select a drawing from your stock.

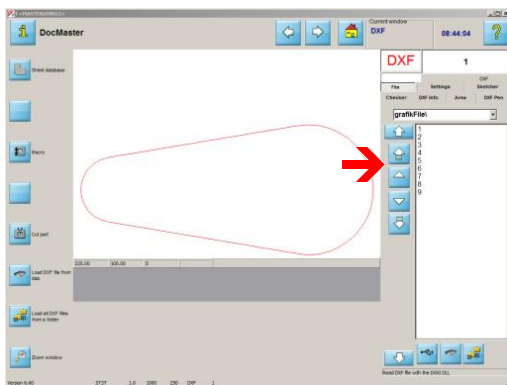


Manage your drawing files from this screen.

Here you can access drawings on your hard drive or import from an external source.

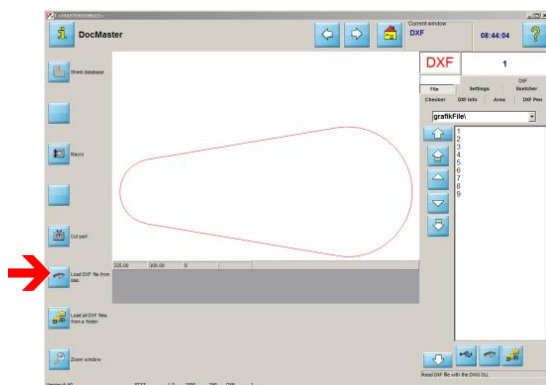
Your workpieces can come from drawing files in various formats. Acceptable formats are: DXF, DIN, Essi, DWG and EPS (extended). Conversion for use in *cncCUT* is automatic.

You will learn about macros in a separate chapter.

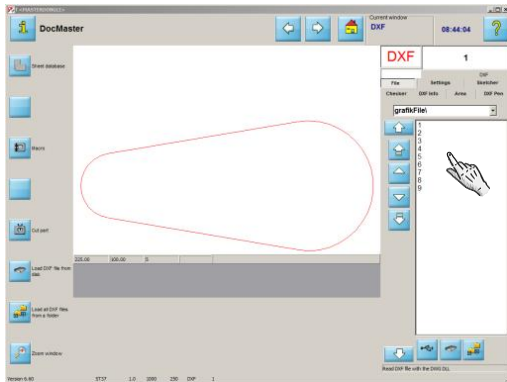
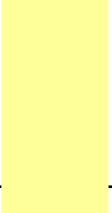


This list shows all drawings in their folders.

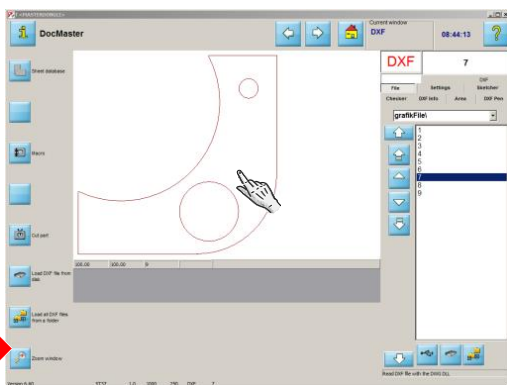
Use the buttons to navigate the list.



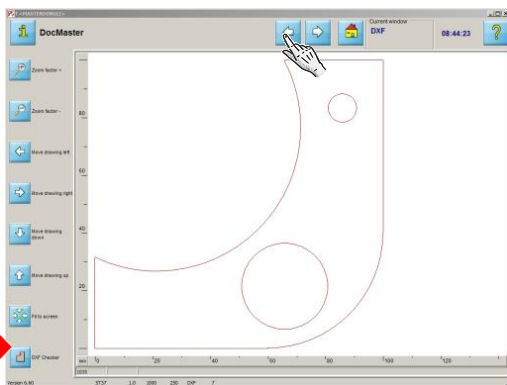
This button allows you to use a file manager window to import a file from another folder or drive.



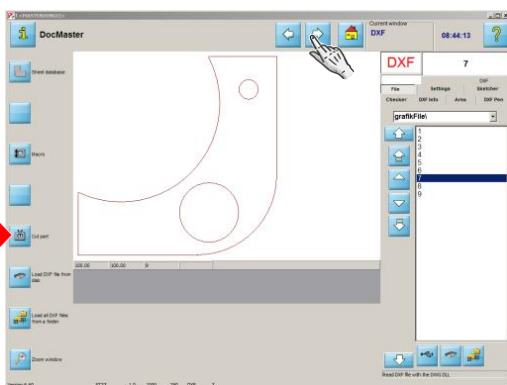
Select the required drawing from the list.
 Hold <ctrl> to load the drawing through the DWG converter (this can be set as default).
 The file name and type are displayed through the list.



Click the bottom button in the navigation panel, or simply click the preview window, to access the zoom window.
 This window allows you to check your workpiece over in close detail, and fix any errors that may be present.



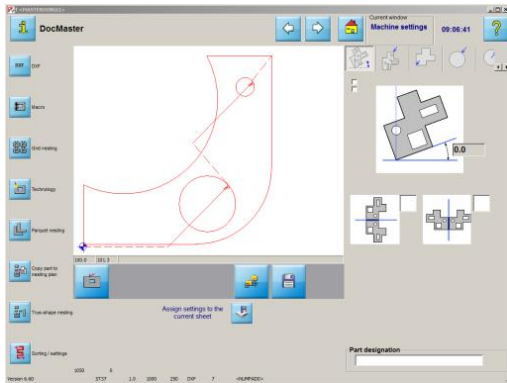
Our DXF checker allows you to check the drawing for errors.
 Click the bottom button in the navigation panel to open the checker.
 If your drawing is OK, return to the DXF selection screen.



Click the 'cutting part' button in the navigation panel or 'forward' to access the next step, the machine data window.

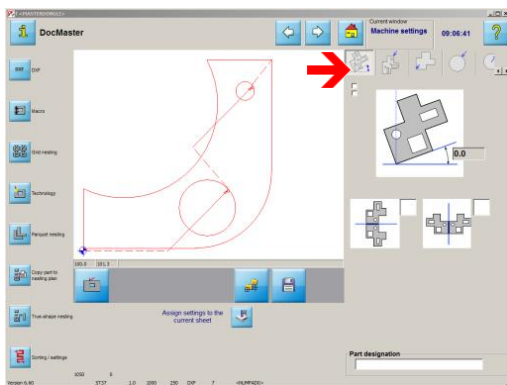
Machine Data - Lead-ins in General.

Set your workpiece's lead-ins.

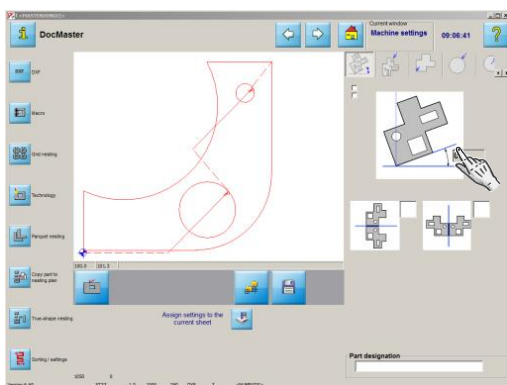


This screen allows you to set the machine data for your workpiece.

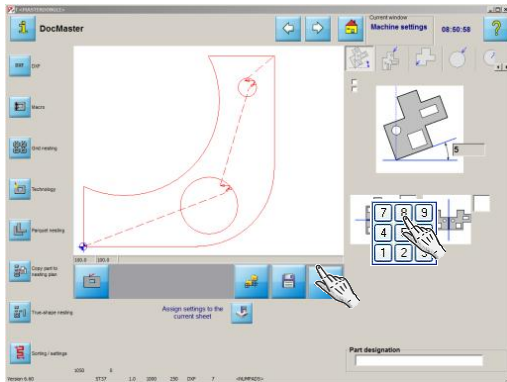
Set the lead-ins and bevels, decide which side to cut and at what speed. Enter the cutting margins, number of torches and torch offsets. Finally, use this screen to sort your parts.



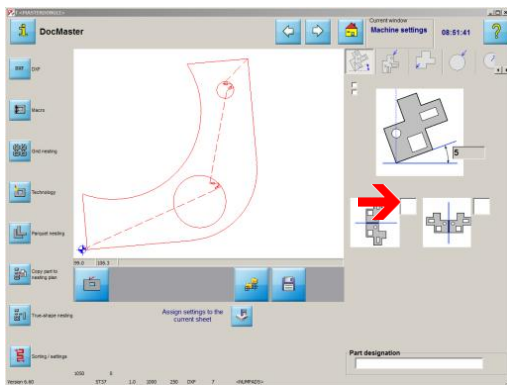
The options available are determined by the post-processor you have installed; the tabs in this panel will be changed accordingly.



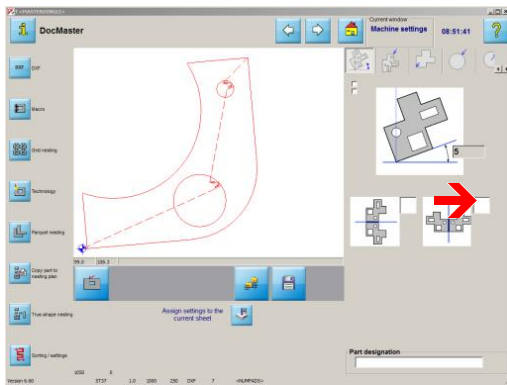
Enter the required angle in order to tilt the workpiece ...



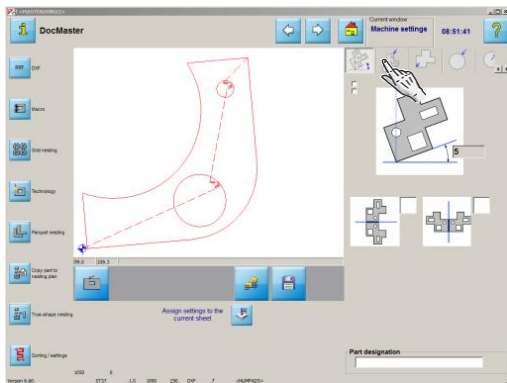
... and confirm your entry by clicking 'enter' under the preview. All settings you make must be confirmed in this way.



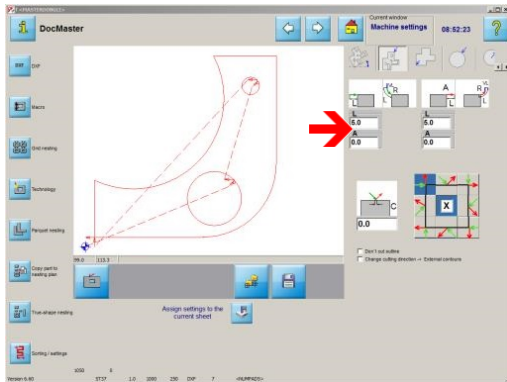
Mark this checkbox to mirror the part through the X axis...



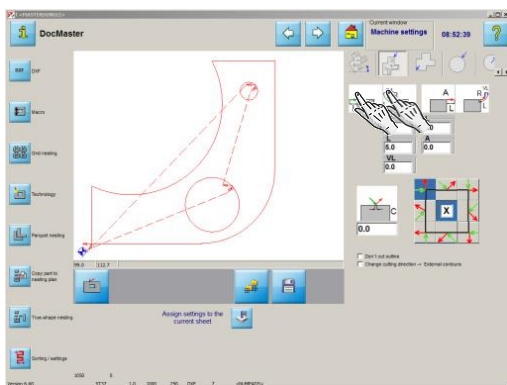
...or this one to mirror the part through the Y axis. Remember to always confirm your entry by clicking 'enter'!



Switch to the next tab to set the lead-ins.

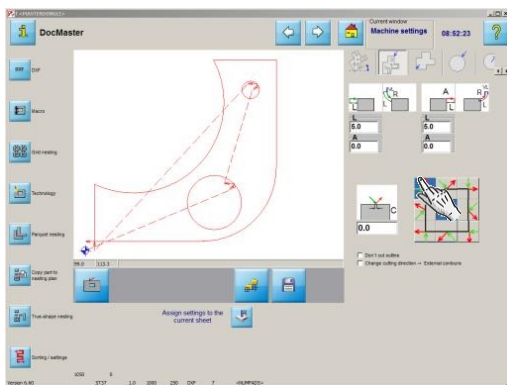


Define the size and form of your lead-ins and -outs here. Choose between an arc ...



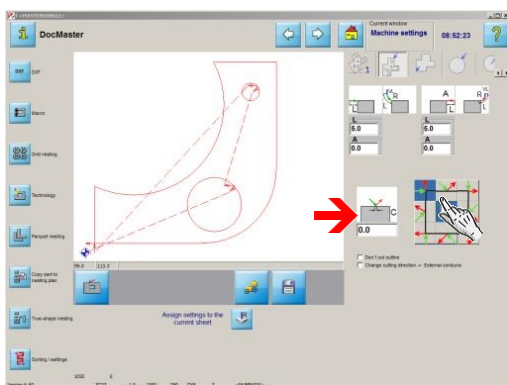
...or straight-line lead-in or -out. The input fields for defining the lead-in will be adjusted accordingly.

You may also completely switch lead-ins off; click the relevant buttons in the settings panel.

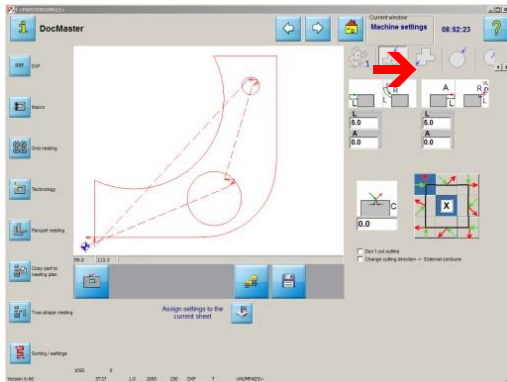


Select the lead-in point by clicking the button on the side or corner you wish to lead in on.

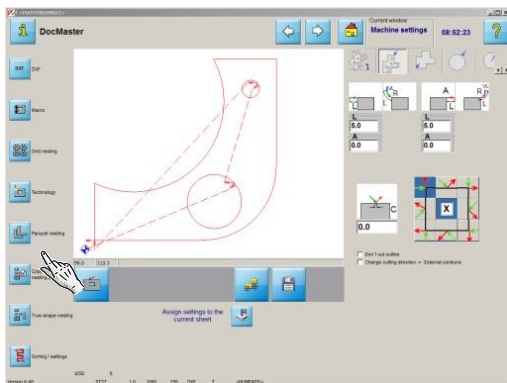
You may also allow the program to do this for you; click the button in the middle to allow the program to automatically choose the optimal position.



If you wish to leave cutting bridges in place, enter a value here. No bridges will be left if you leave the cell empty or enter 0. An overlap will be used if you enter a negative value.

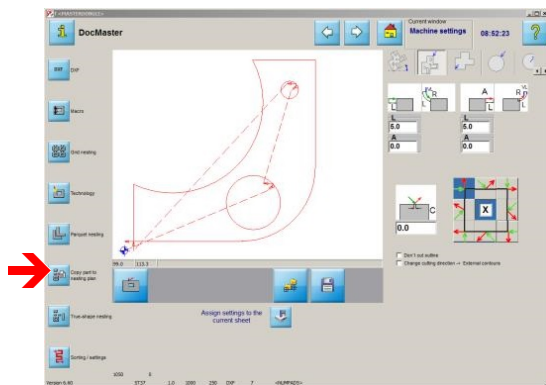


You can also define the lead-ins for internal contours, and round internal and external contours separately. Select the relevant tab and make your settings.

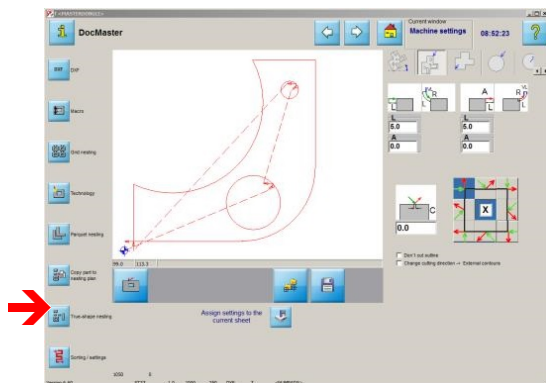


Once you have made all your lead-ins you may begin nesting. You have several options when nesting:

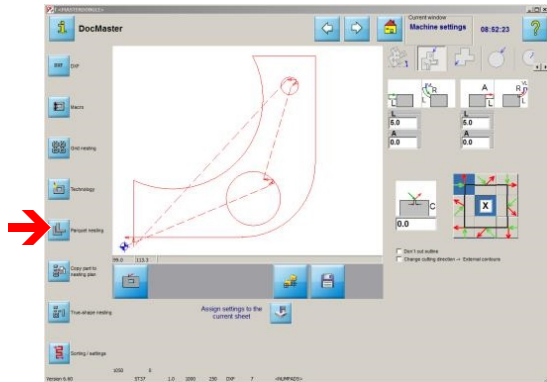
1. Grid nesting
2. Parquet nesting
3. True-shape nesting



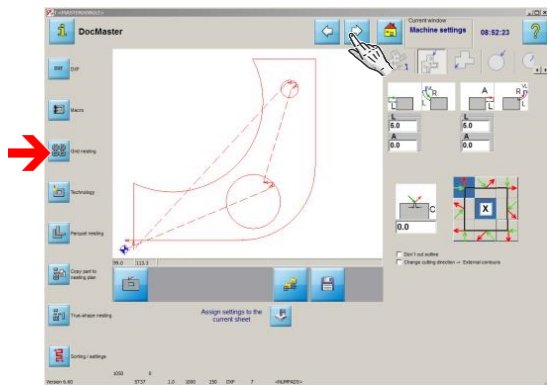
True-shape nesting allows you to nest multiple workpieces in one nesting plan. Define all workpieces as demonstrated, and transfer them to your nesting plan. Once all parts are in the list ...



... you may begin true-shape nesting. Click this button to begin true-shape nesting.



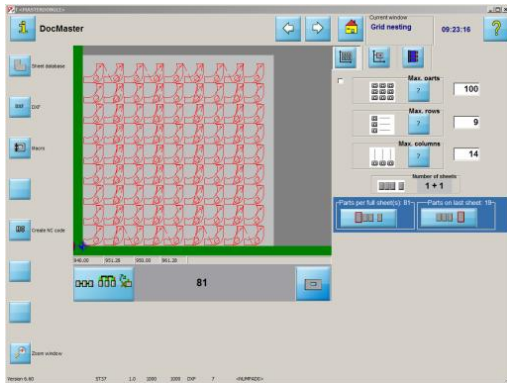
Click this button to nest your parts in a parquet.



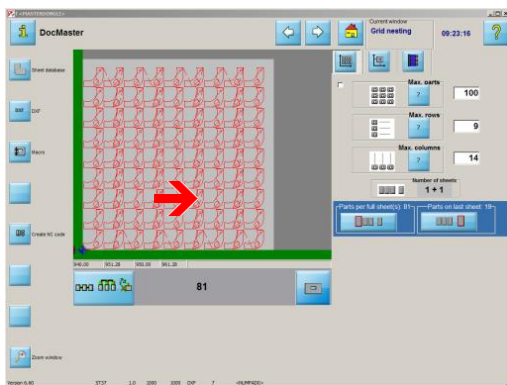
Click this button to nest your parts in a grid, or click 'forward'.

Grid Nesting

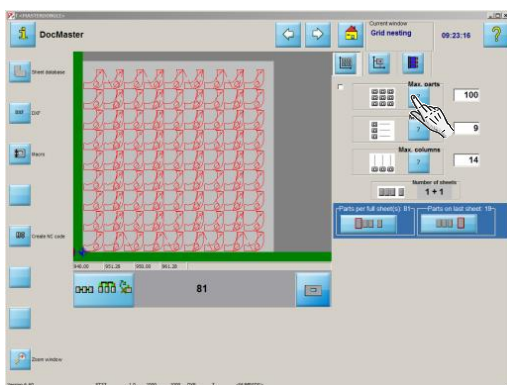
Nesting the parts in a grid.



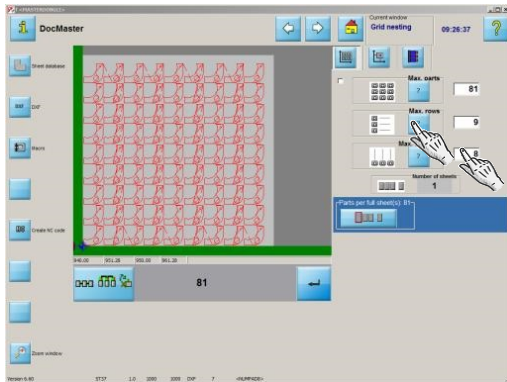
The nesting screen allows you to nest your workpiece to the selected sheet. Enter the quantity of each piece required. Set the rows and columns, and the offsets between parts and the sheet margins. The program will show you how many sheets are required, and how many parts will be cut from each sheet.



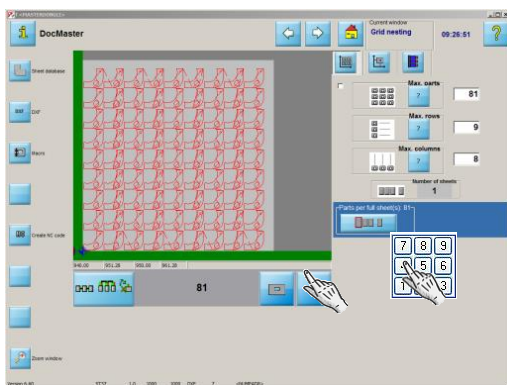
The preview shows you the result of your nesting. If multiple sheets were required then your results will be divided into full sheets, and a remainder sheet.



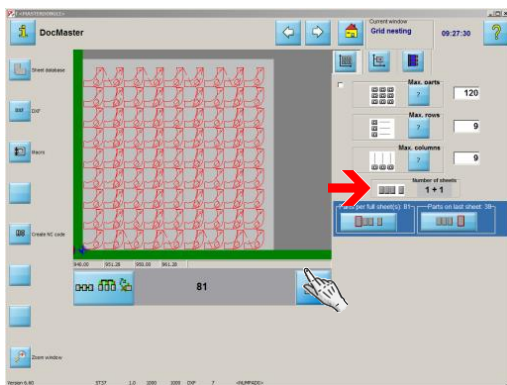
Click the question point buttons to show the respective maximum number of parts that could be nested in total, in columns and in rows ...



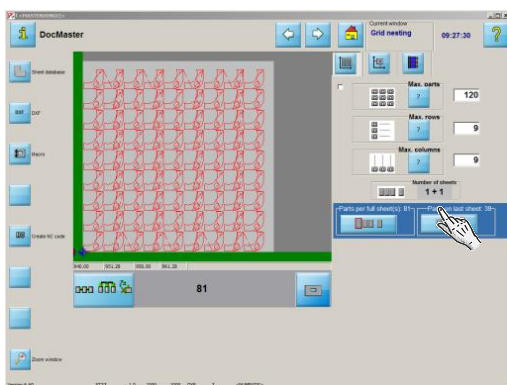
...or enter you own values as required. Select the relevant input cell and simply overwrite the system's automatic value.



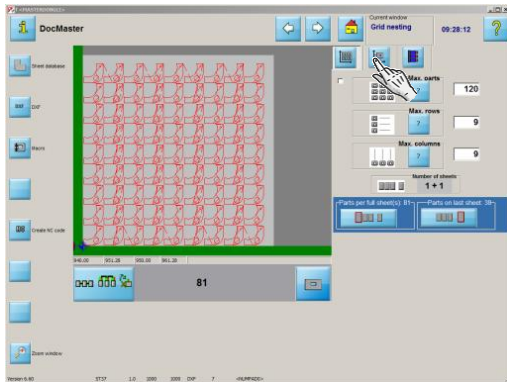
Confirm your entry by clicking the 'enter' button under the preview.



This shows the quantity of sheets required. The 'full' sheets are shown to the left with how many parts were nested to them and the 'remainder' sheets containing the 'overflow' workpieces to the right.



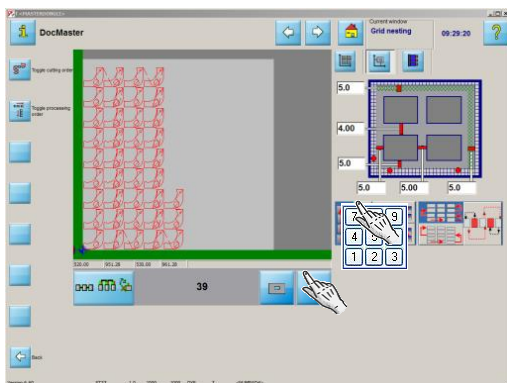
Click the 'full' and 'remainder' sheet buttons to see a preview of how they will be cut.



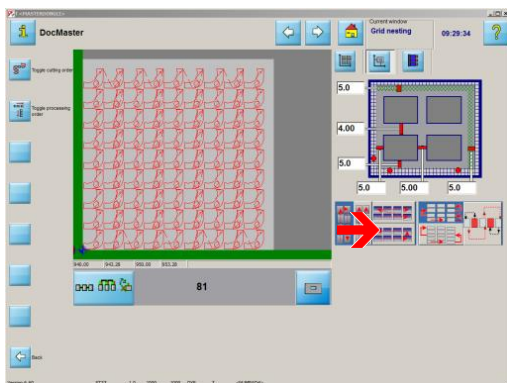
Go to the next tab to set the sheet margin and part offsets.



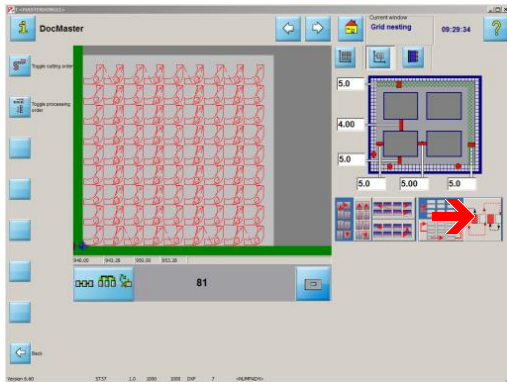
These input cells allow you to set the offsets between each part and the next, and each part and the sheet margin. Type your inputs ...



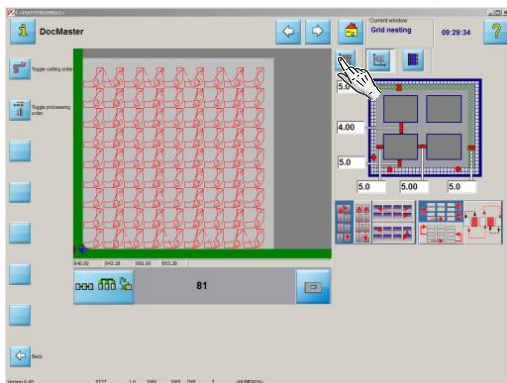
...and confirm your entry by clicking the 'enter' button under the preview.



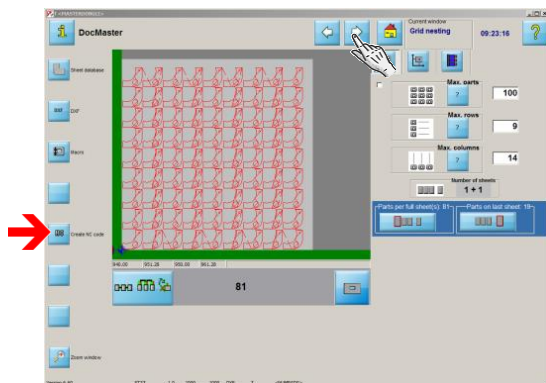
You can set the parts' cutting direction with a click. The left half allows you to choose between alternate and continuous cutting directions for each column and row.



The right half allows you to choose whether to cut every, or every second, line, and part to help avoid heat distorting your sheet.



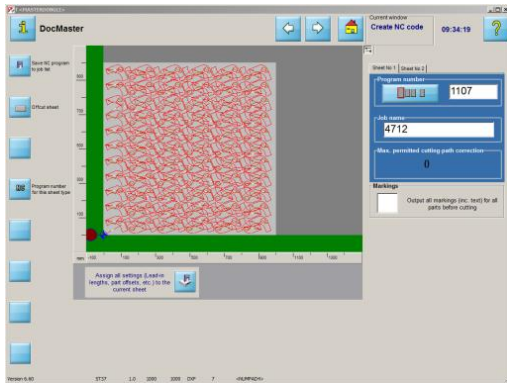
You may create your NC program once all settings are complete. Switch to the parts tab to access the correct menu in the left navigation panel.



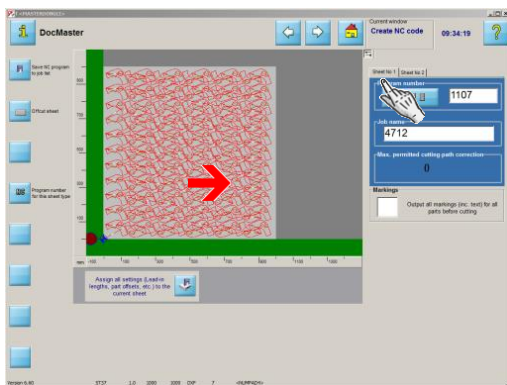
Click the 'Create' button or 'forward' to generate your NC code.

Create an NC Program.

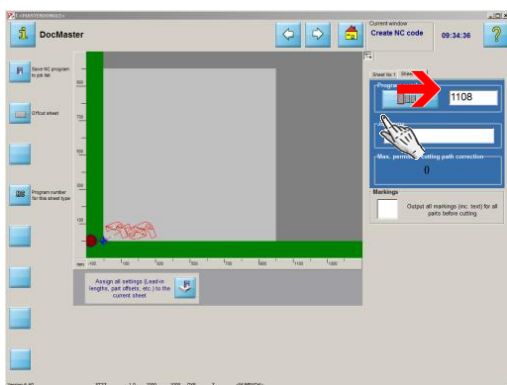
Create an NC program and save to the job list.



Once you have placed all components on your sheet in a nest, you can create the corresponding NC code with a simple click.



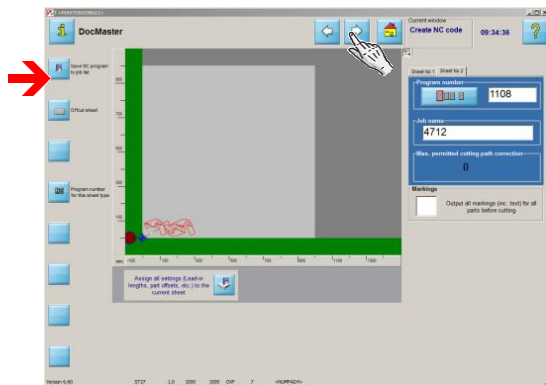
The preview shows the nesting results. If multiple sheets were required you can preview individual sheets by clicking the buttons in the overview to the right, or the corresponding tabs.



This field allows you to name or number the program so you can find it later in the job list.



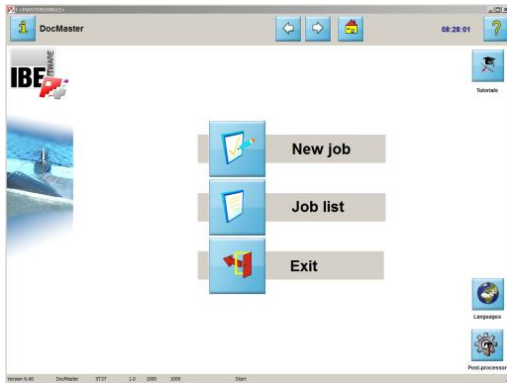
If your program comprises multiple sheets, they will be saved under the same job name to help you find them.



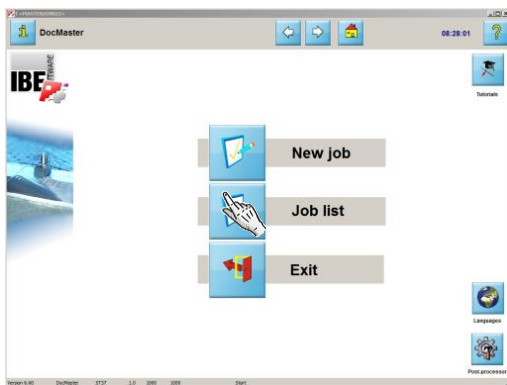
Click the 'Create' button or 'forward' to generate your NC code.

The Job List

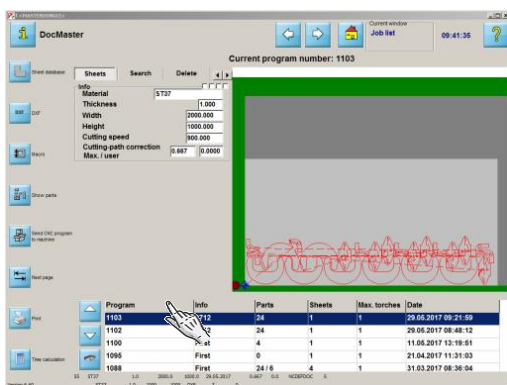
Sheets in the job list.



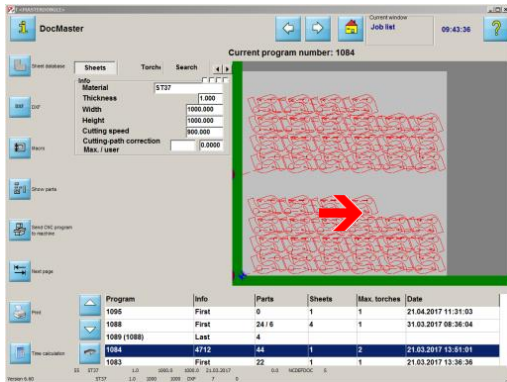
All NC programs you create will be saved to the job list. The creation and execution of NC programs is held strictly separate so that existing programs can always be quickly found and run.



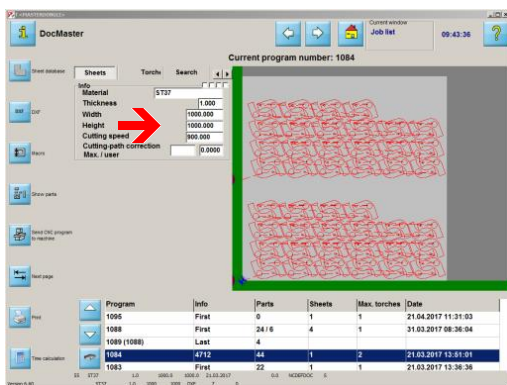
Click 'Job list' from the start screen to access this area for selecting and managing your existing NC programs.



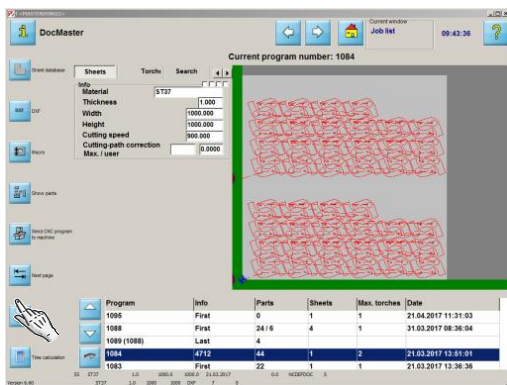
Select the program you wish to run from the job list.



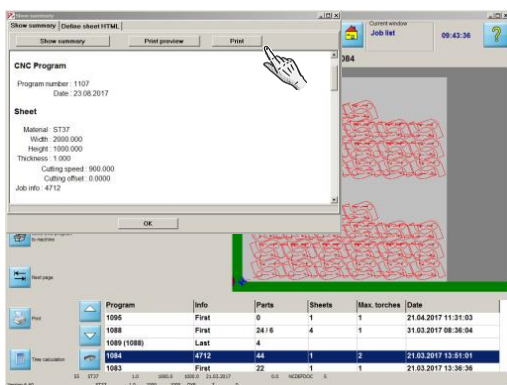
The preview shows the nested parts. Use your mouse's scroll wheel to zoom in and out.



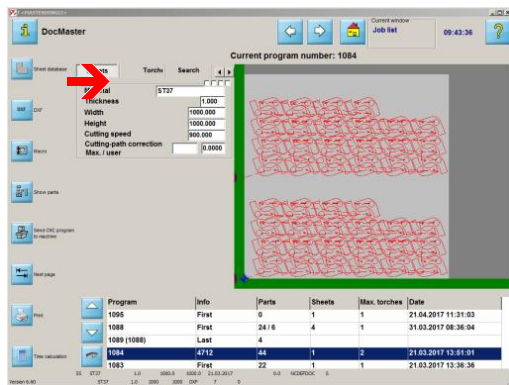
This frame shows all values about the sheet your parts were nested to.



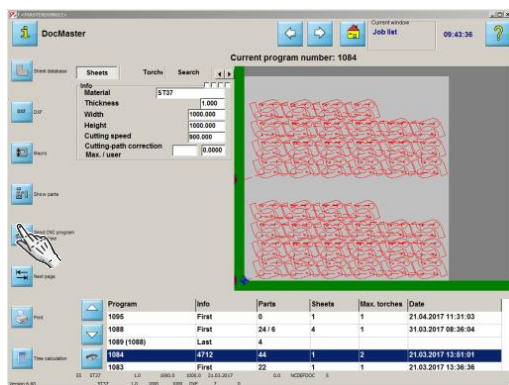
You can view your NC code in HTML format, and print it for your records.



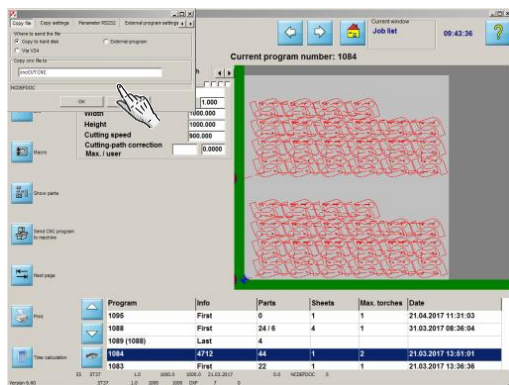
Click 'print' to get your hard-copy.



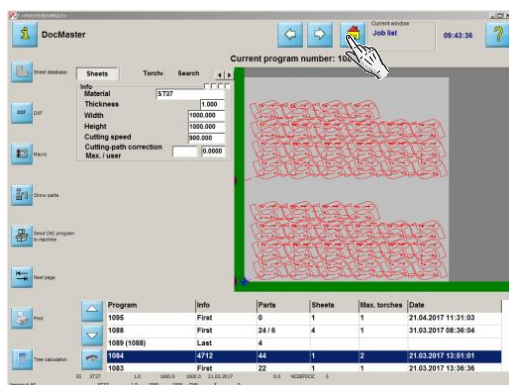
There are some buttons in the top part of the screen for you to check your code in detail, and make any last-minute adjustments or settings.



Click this button or 'forward' to send your NC code to the machine. A dialog opens for you to input the target parameters.



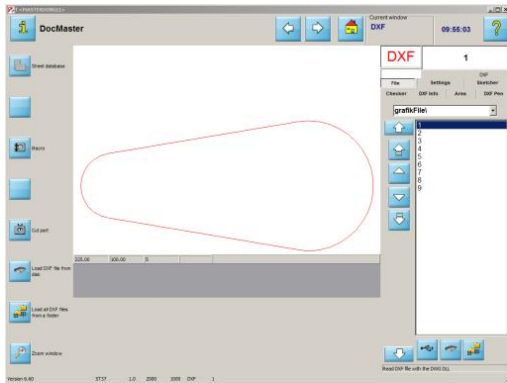
Select the target for your code and click 'OK'. This may include a direct RS232 serial link to your machine. You must already have your machine attached and set-up correctly!



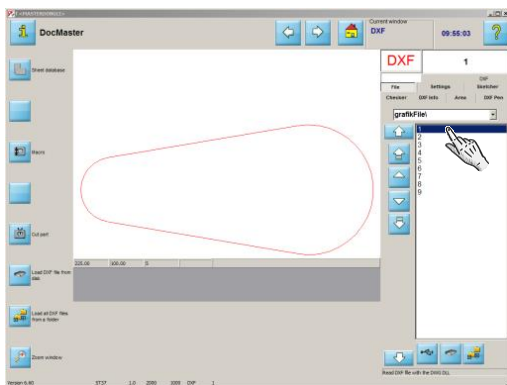
Switch to the start screen to exit the program.

True-shap Nesting

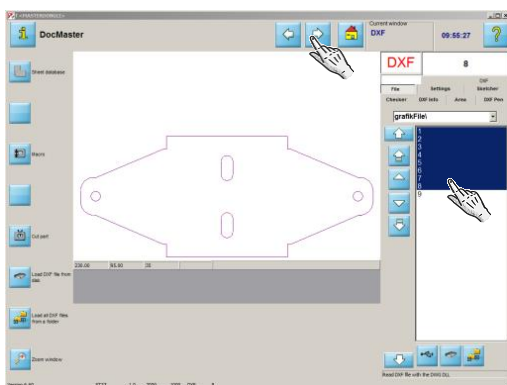
Nest varied parts as efficiently as possible.



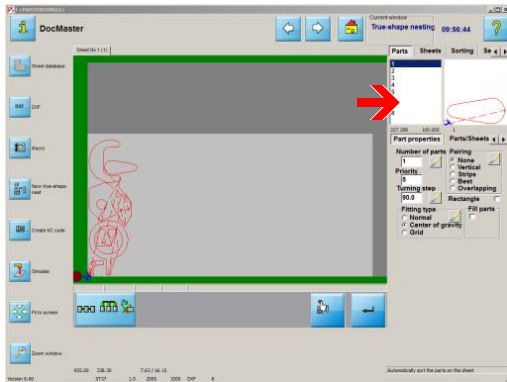
True-shape nesting allows you to nest the most varied parts into a single nesting plan, and onto a single sheet. The parts are added to your nesting plan automatically based on simple user inputs such as quantity, priority, step angle and fitting settings.



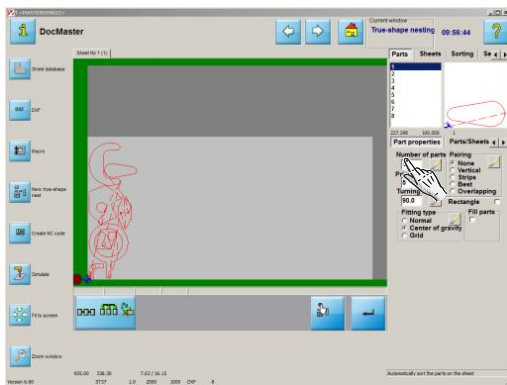
Select the parts from the list.



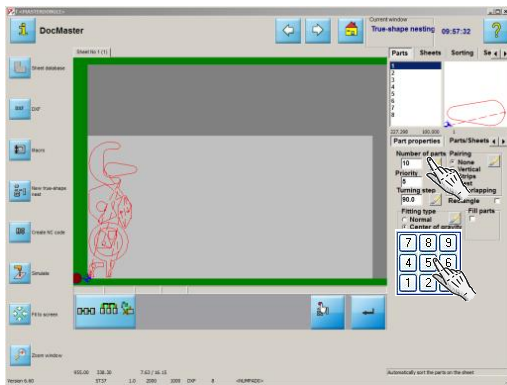
Advance to the next step - true-shape nesting.



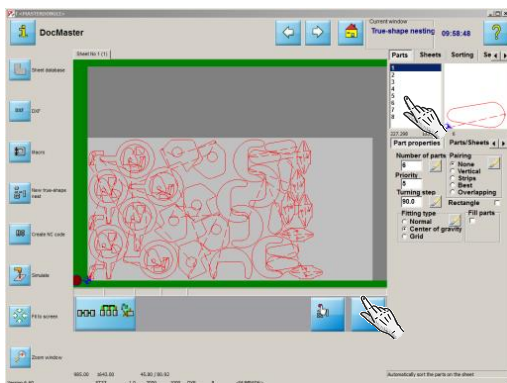
To set the parameters for a part, mark it in the list. You can make the settings for that one part, or for all parts, just mark the relevant check-box.



Enter the required part quantity.

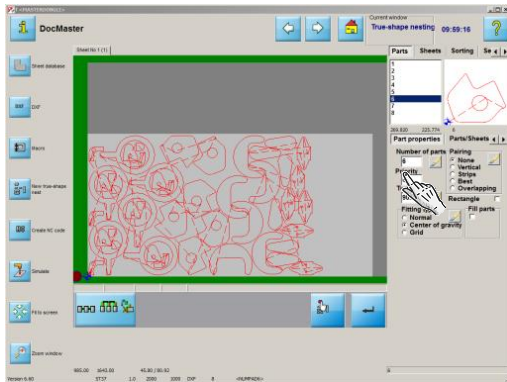


To apply your input to all parts, click the relevant button and confirm.

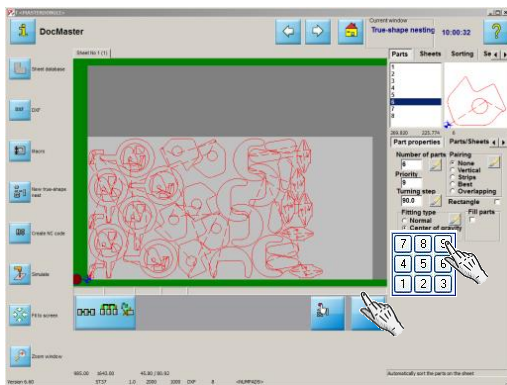


Changing the fitting settings changes the nesting result the program will output, giving you control of how your material is used.

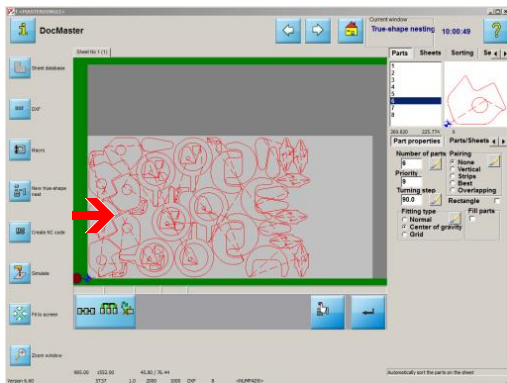
You can influence, for example, the sorting.



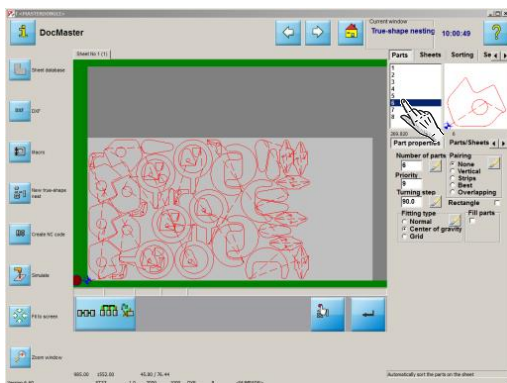
Change the priority for the largest part.



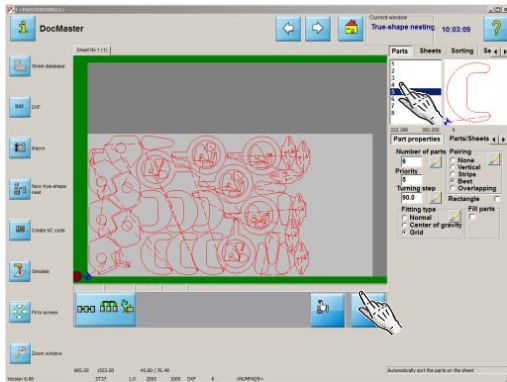
Confirm your input.



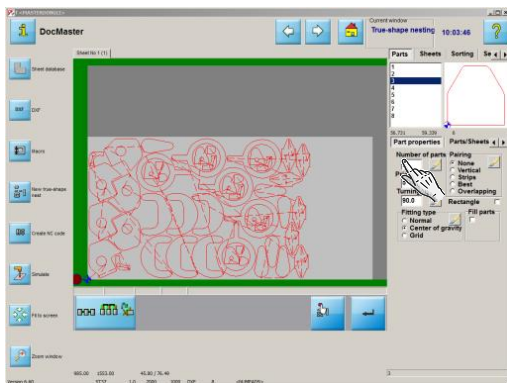
The preview shows you the effects of your changes straight away - the spacing of parts has changed.



Change the fitting type to free up space.



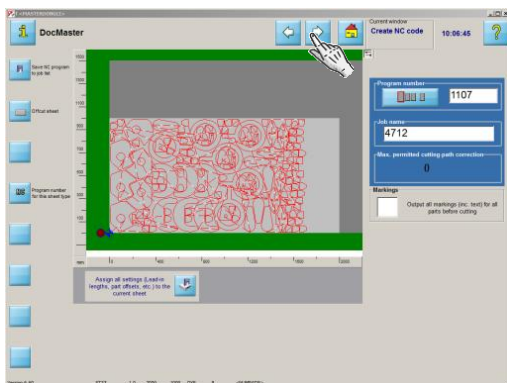
You can make good use of small parts to close up gaps.



Increase the quantity, and confirm.



Create your NC code.

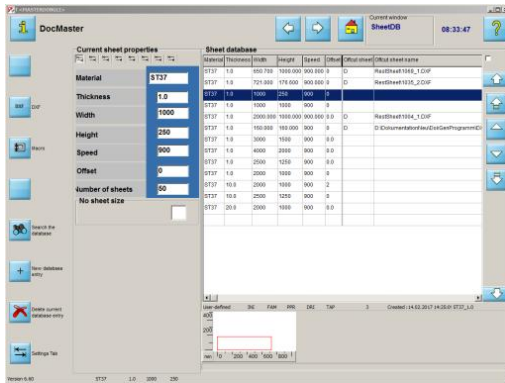


Save your NC code to the job list and proceed to the next step..

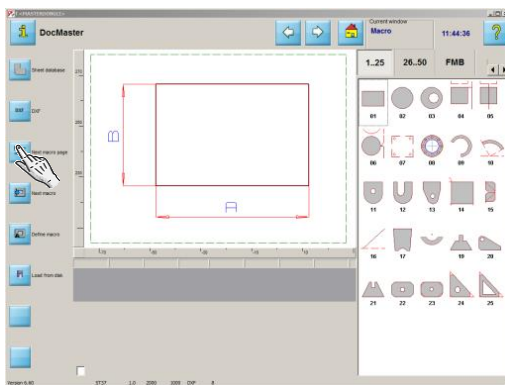
..the job list.

Select a Macro

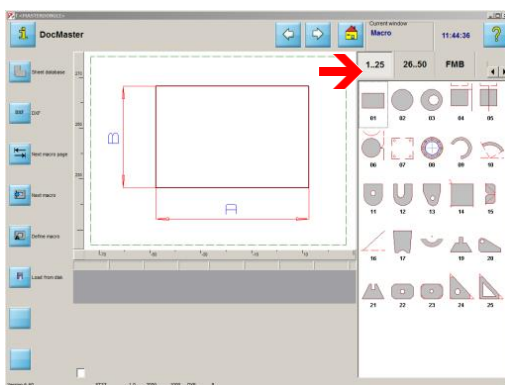
Select a macro from your stock.



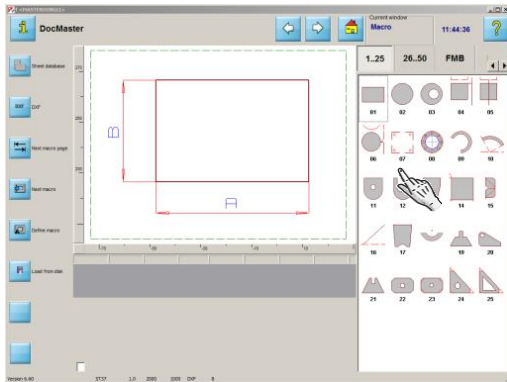
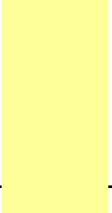
Access the macro screen from the sheet database or DXF selection screen by clicking the 'macro' button in the navigation panel.



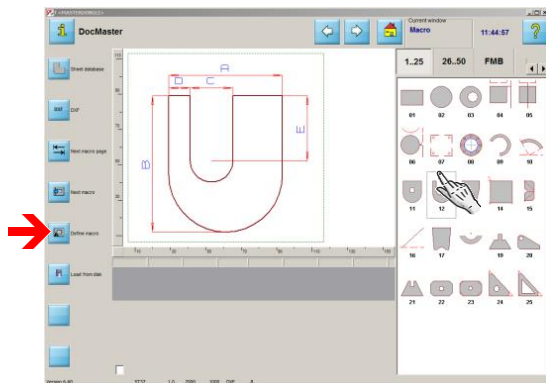
This screen allows you to manage your macros. Load macros from your own hard drive or import from an external source.



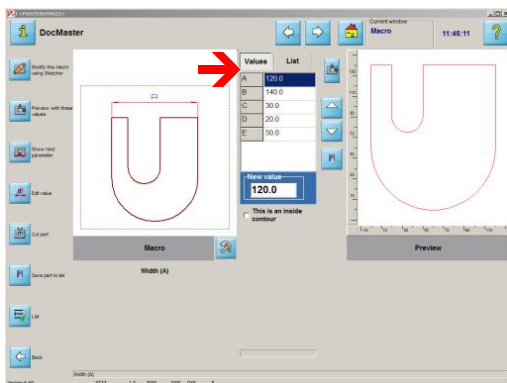
All macros are divided into groups through the tabs. You can group macros by themes within these folders. Click a tab to view the macros stored there.



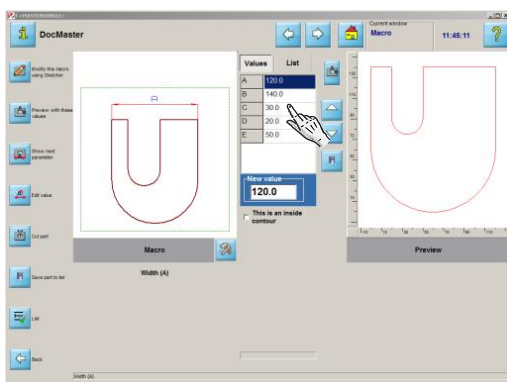
Click a macro in the overview to see its preview.



Click the 'Macro Def' button or double-click to work the macro.

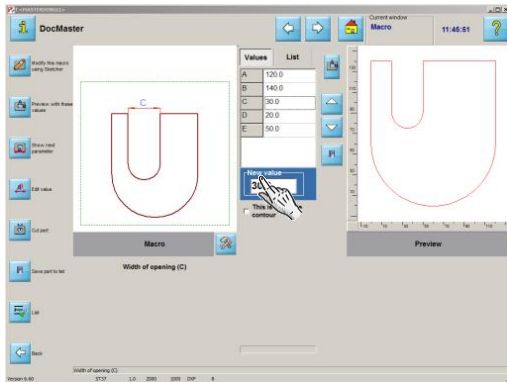
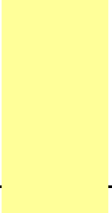


A table with the macro's settings is shown under 'Values'. Select a value from the table.

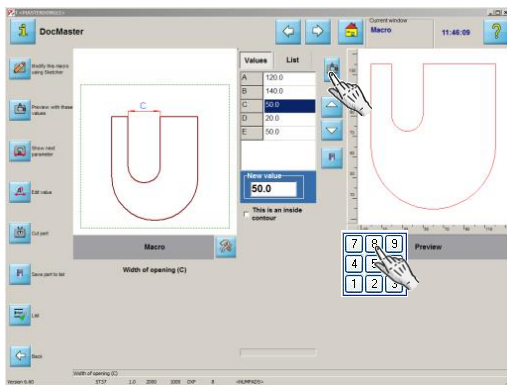


Change the value by double-clicking the relevant cell in the table

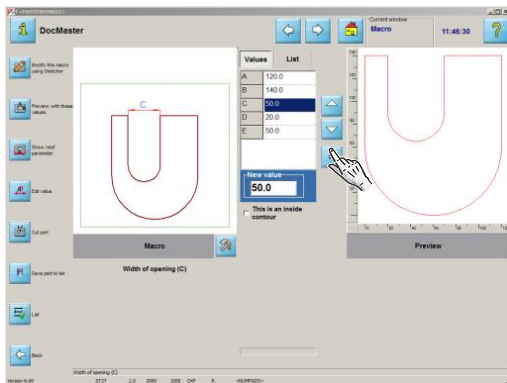
...



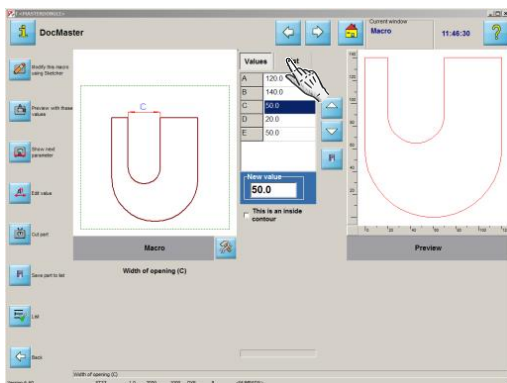
... or using the input cell below the table.



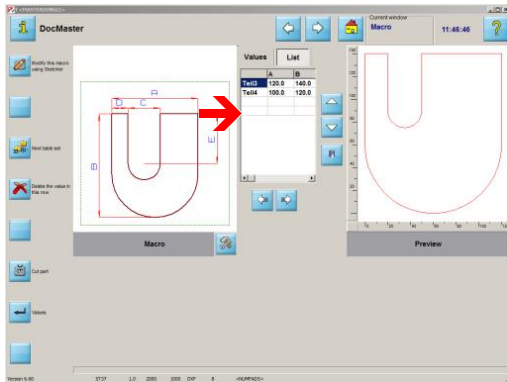
Click the top button to redraw the part.



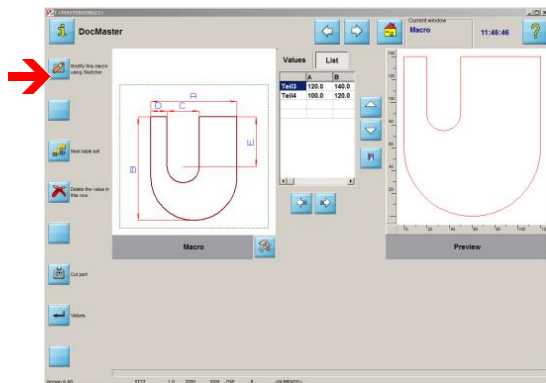
Click the last button to save the part in the part list under 'Table'. Confirm the save in the resultant pop-up.



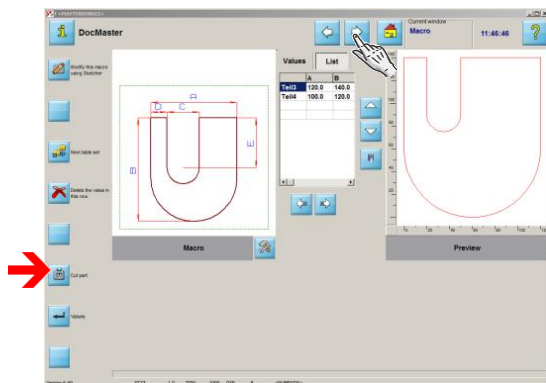
Parts saved in the parts list remain catalogued for future use. Switch to the table.



These parts can be reselected at any time. Click the corresponding list entry.



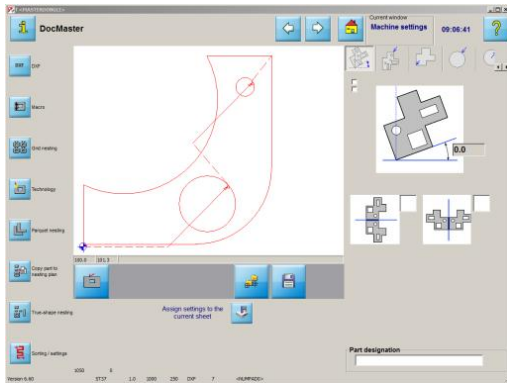
You may also individually work a part. Transfer the part to the 'Sketcher' by clicking the top button in the navigation panel.



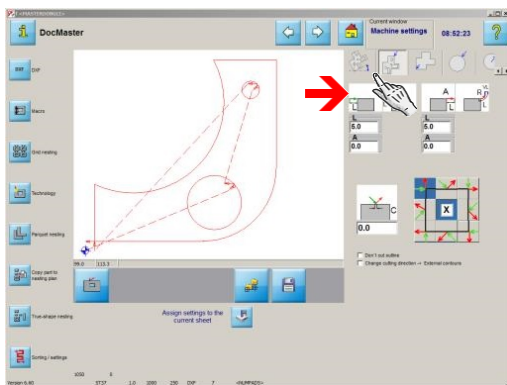
Once the part is correctly defined you may continue. Click 'Cut part' or 'forward' to move on.

Machine Data - Lead-ins in Detail.

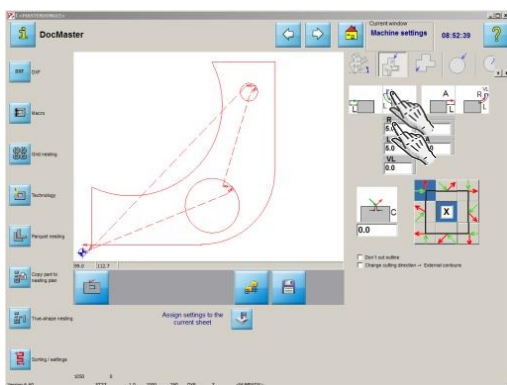
Set the lead-ins for external contours.



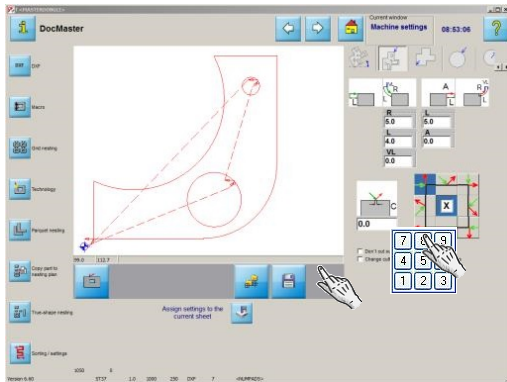
Set the lead-ins for external contours in the second tab at the right of the machine data window.



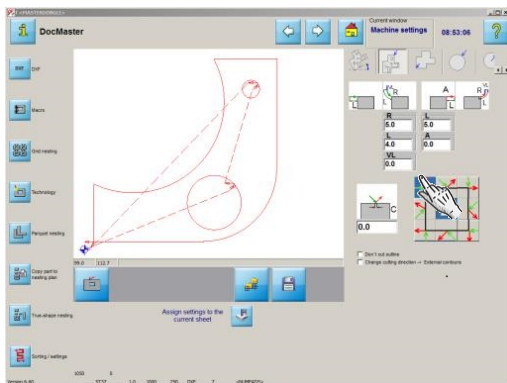
Lead-ins (left) are drawn in green, the lead-outs (right) in red. Select the lead-in's form (straight or arced) and make the settings required to define it.



Click into an input cell...

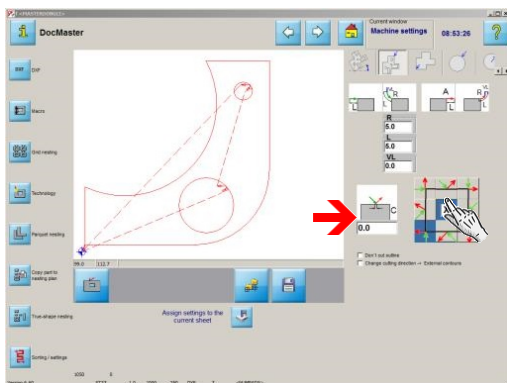


... and type the value in. Confirm your entry by clicking 'enter' under the preview.

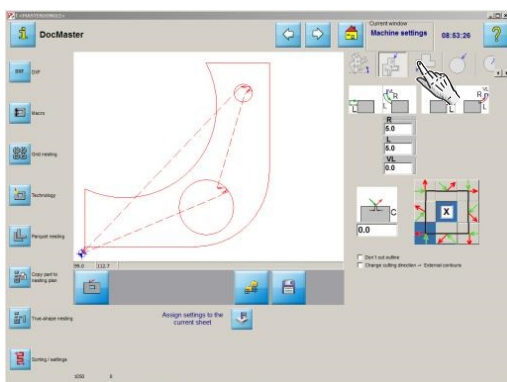


Select the lead-in point. Click the button on the side or corner you wish to lead-in at.

You can leave the decision to the program; mark the central checkbox, and cncCUT will automatically set the lead-in optimally.

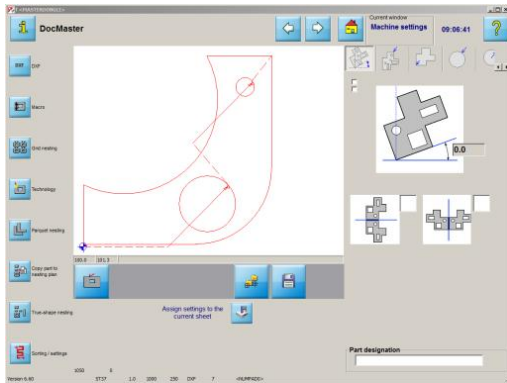


If you wish to retain cutting bridges, enter a value here. If you leave this cell blank or enter 0, no cutting bridges will be created.

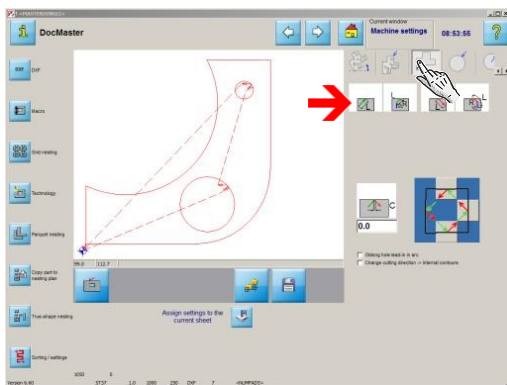


Set the lead-ins for internal and round contours next.

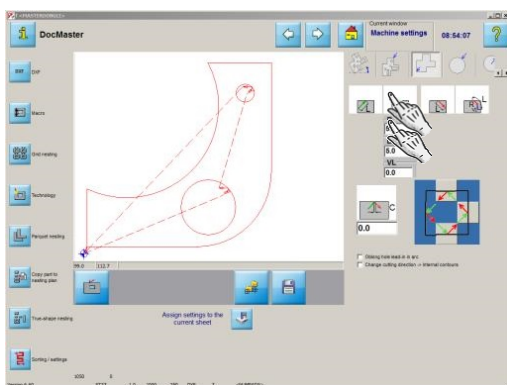
Set the lead-ins for internal contours.



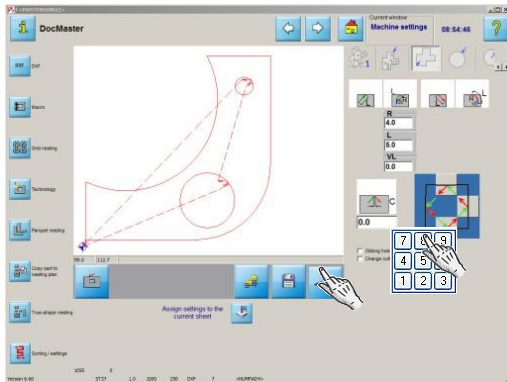
Set the lead-ins for internal contours in the third tab at the right of the machine data window. .



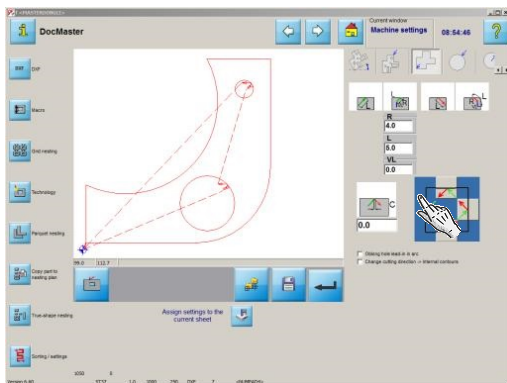
Lead-ins (left) are drawn in green, the lead-outs (right) in red. Select the lead-in's form (straight or arced) and make the settings required to define it.



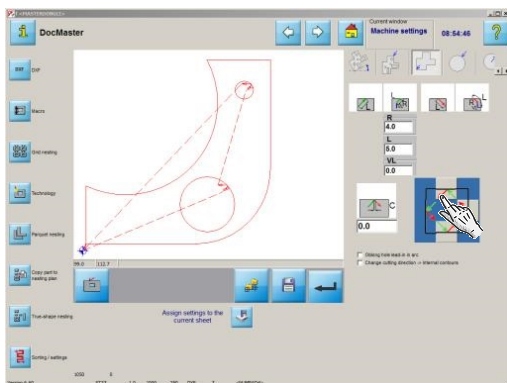
Click into an input cell...



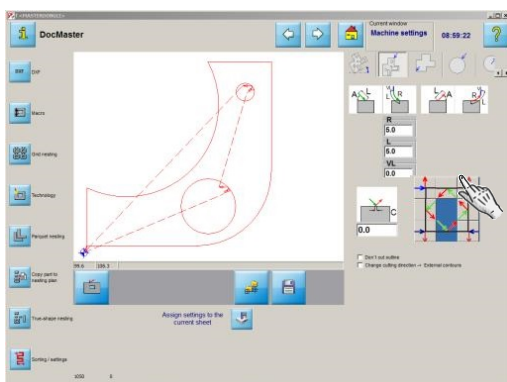
... and type the value in. Confirm your entry by clicking 'enter' under the preview.



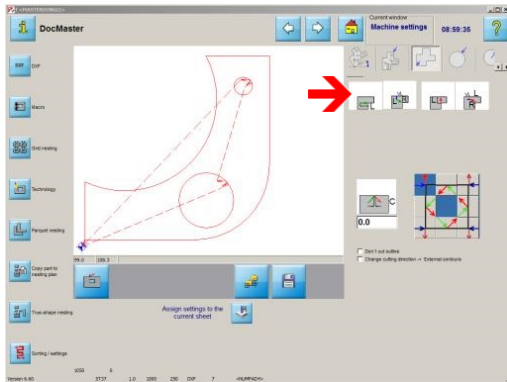
Select the lead-in point. Click the button on the side you wish to lead-in at.



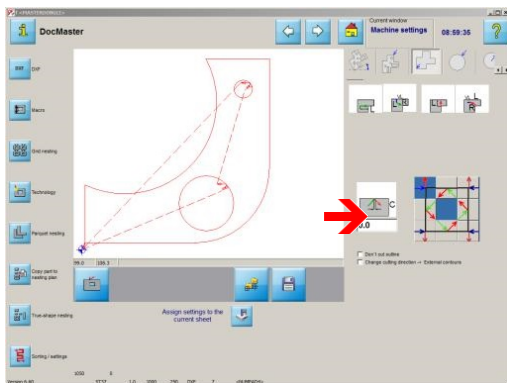
For internal contours with a pronounced corner, you may wish to lead-in to a corner. CTRL-double-click the middle of the lead-in selection to do this.



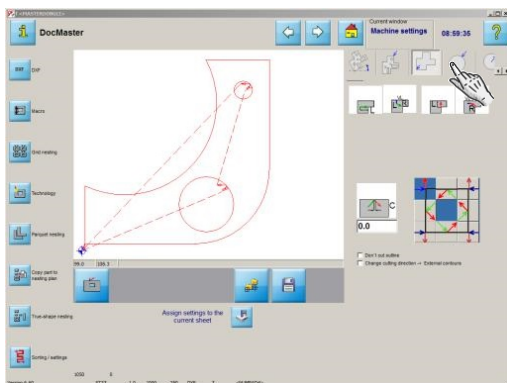
Your lead-in location options will then be supplemented with corner lead-ins. Simply click the box at the relevant corner in order to place your lead-in.



Corner lead-ins are drawn in blue.

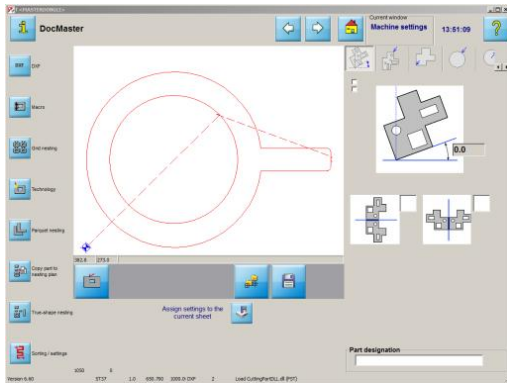


If you wish to retain cutting bridges, enter a value here. If you leave this cell blank or enter 0, no cutting bridges will be created.

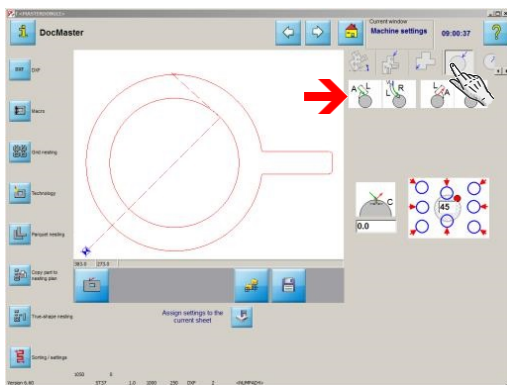


Set the lead-ins for round contours next.

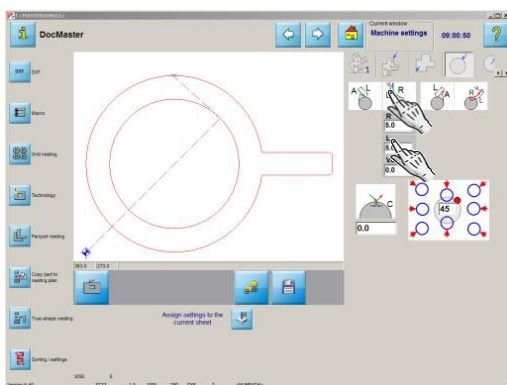
Set the lead-ins for round external contours.



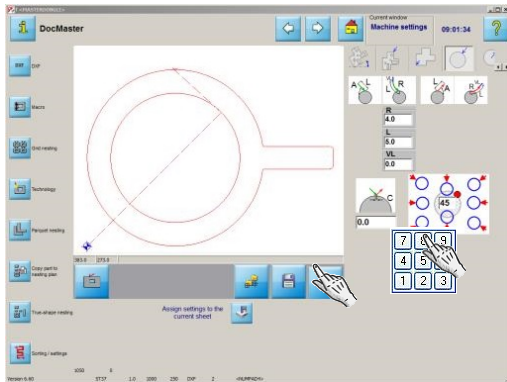
Set the lead-ins for external round contours in the fourth tab at the right of the machine data window.



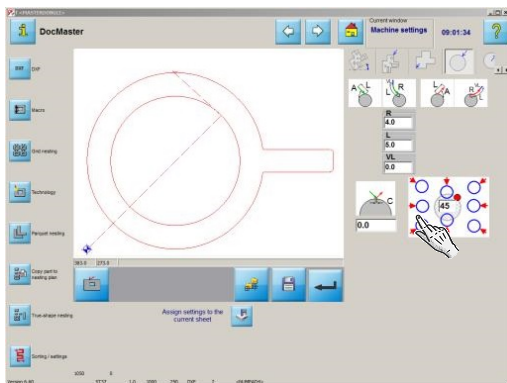
Lead-ins (left) are drawn in green, the lead-outs (right) in red. Select the lead-in's form (straight or arced) and make the settings required to define it.



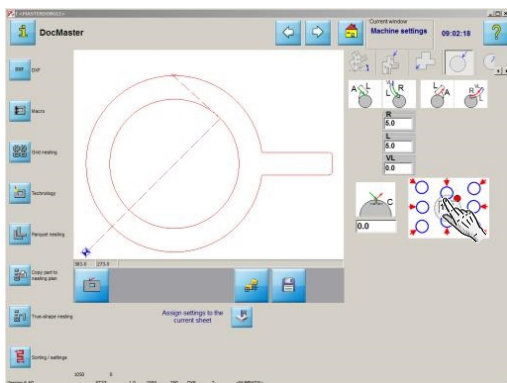
Click into an input cell...



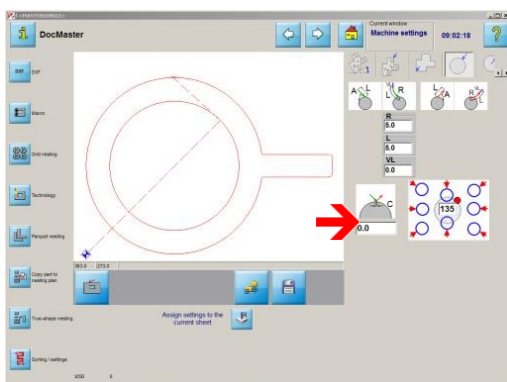
... and type the value in. Confirm your entry by clicking 'enter' under the preview.



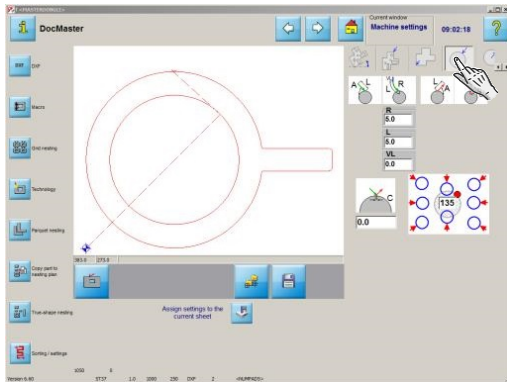
You can lead-in to your round internal contours however you wish. As well as quickly selecting an angle...



...you may also enter your own chosen angle. Simply enter the angle in the input cell and confirm your entry by clicking 'enter'.

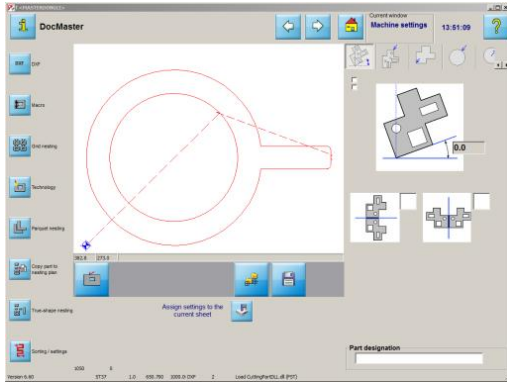


If you wish to retain cutting bridges, enter a value here. If you leave this cell blank or enter 0, no cutting bridges will be created. If you enter a negative value an overlap will be created.

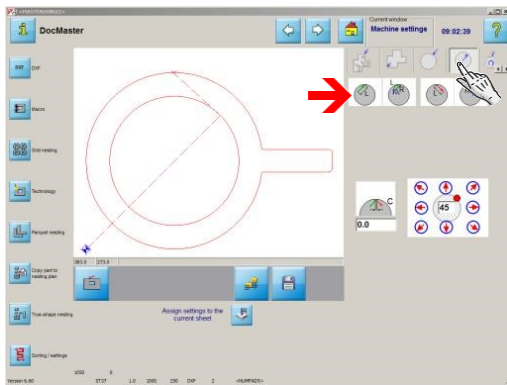


Set the lead-ins for internal round contours next.

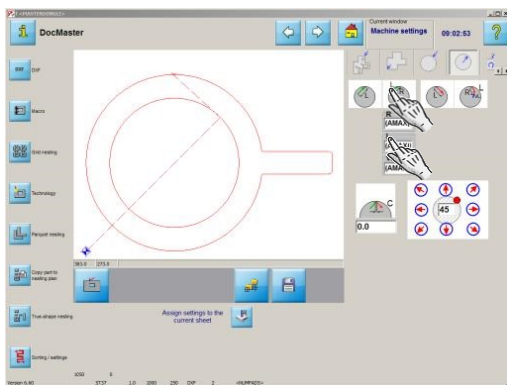
Set the lead-ins for round internal contours.



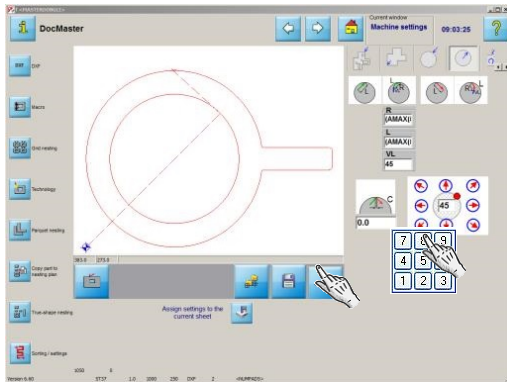
Set the lead-ins for internal round contours in the fifth tab at the right of the machine data window.



Lead-ins (left) are drawn in green, the lead-outs (right) in red. Select the lead-in's form (straight or arced) and make the settings required to define it.

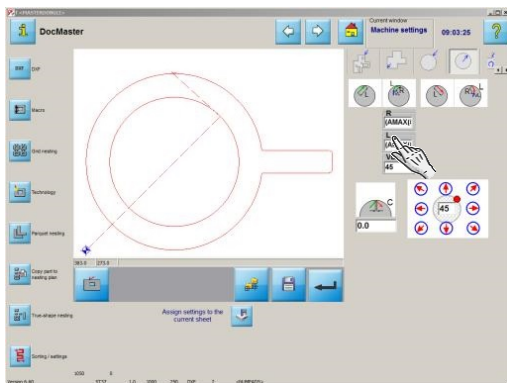


Click into an input cell...

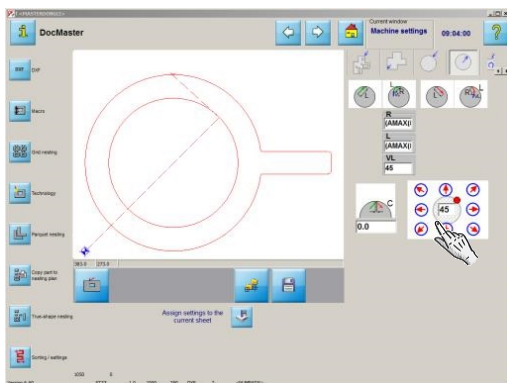


... and type the value in. Confirm your entry by clicking 'enter' under the preview.

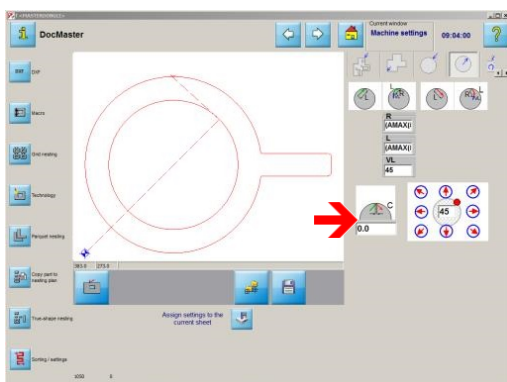
If you are using variable round lead-ins for internal circles, right-click to display the formula in a dialog box and copy it into the input field.



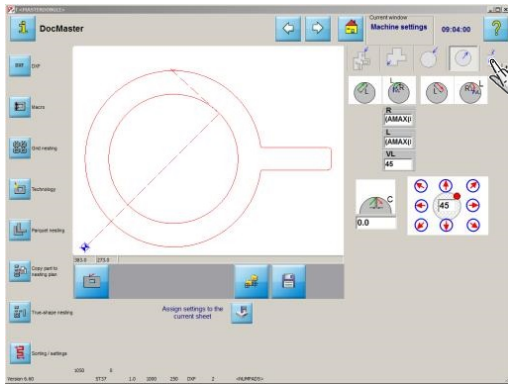
You can lead-in to your round internal contours however you wish. As well as quickly selecting an angle ...



... you may also enter your own chosen angle. Simply enter the angle in the input cell and confirm your entry by clicking 'enter'.



If you wish to retain cutting bridges, enter a value here. If you leave this cell blank or enter 0, no cutting bridges will be created. If you enter a negative value an overlap will be created.

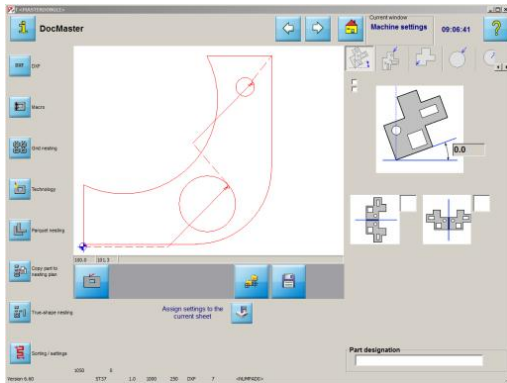


Remember to check the options for setting further machine data on your post-processor.

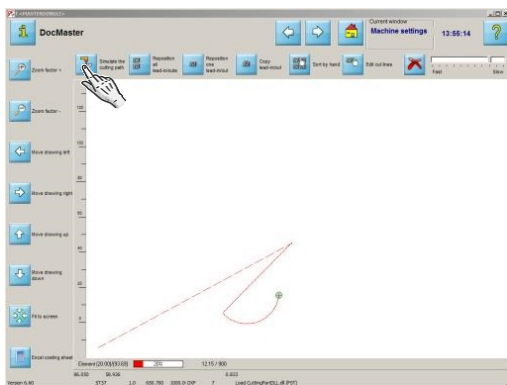
Sort your parts and set the sequence for cutting internal contours if required.

Machine Data - Lead-ins

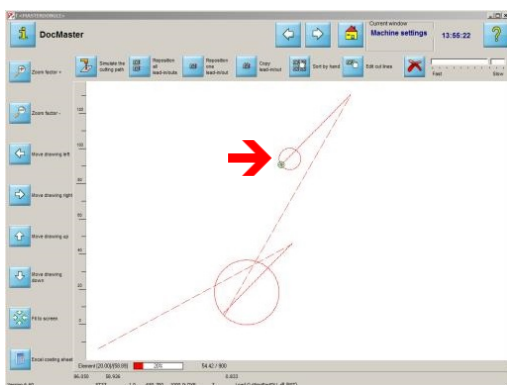
Simulating the cutting process.



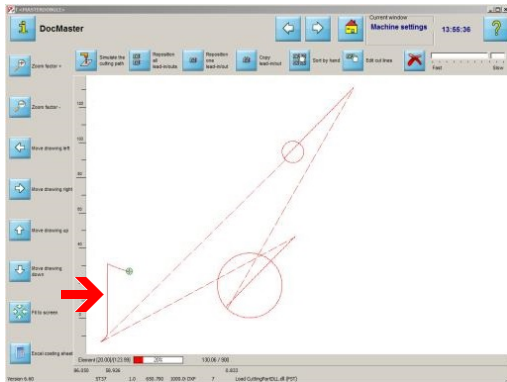
Access the sorting window by clicking the last button in the machine data screen's navigation panel - 'Sorting / settings'.



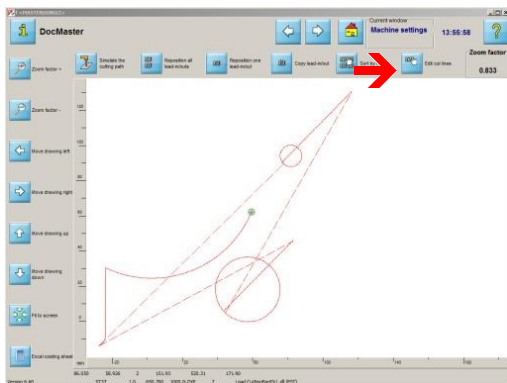
Click the left button in the header panel 'Simulate the cutting path' to simulate the cutting path and sequence for your workpiece.



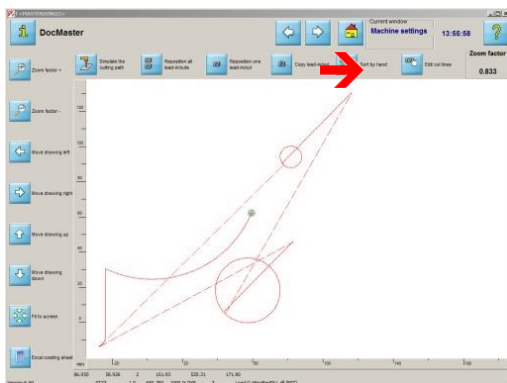
First the internal contours are cut...



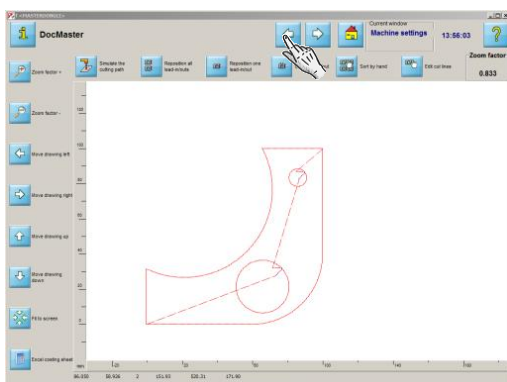
...then the external contour.



Adjust the simulation speed using this slide bar.



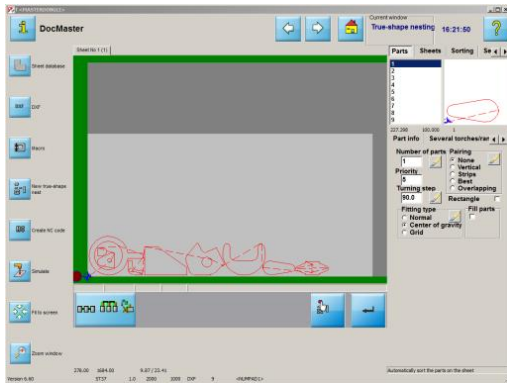
Interrupt the simulation by clicking here.



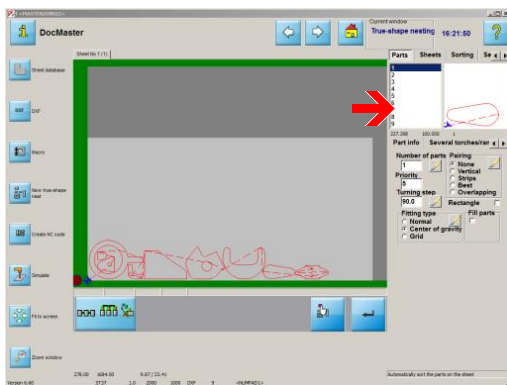
Return to the machine data window by clicking 'back'.

Automated Manual Nesting

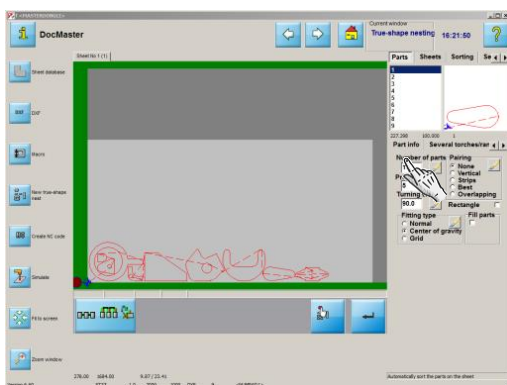
Enter the part quantity.



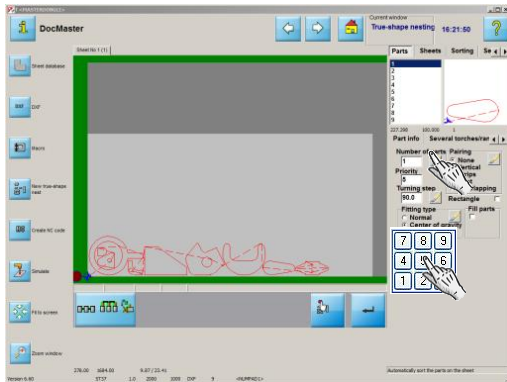
You can enter the parts quantity required for automated manual nesting in the 'true-shape nesting' window.



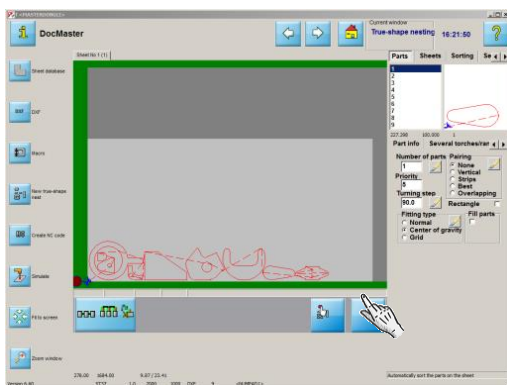
Mark the parts in the list.



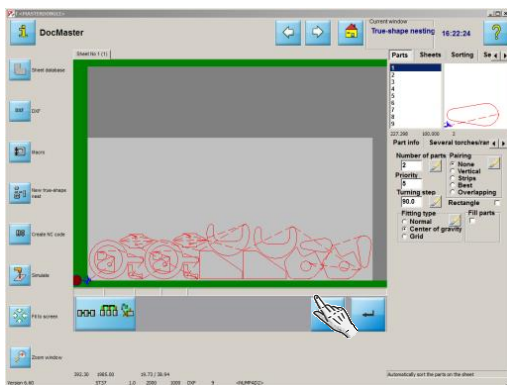
Enter the parts' quantity.



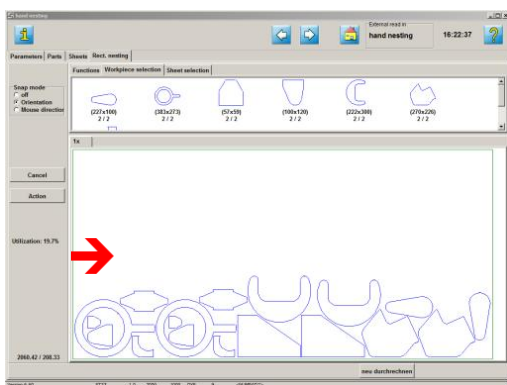
Press this button to use the entered quantity for all parts.



Confirm your input. Click the 'Enter' button to pre-nest ready the parts for the automated manual nesting screen.

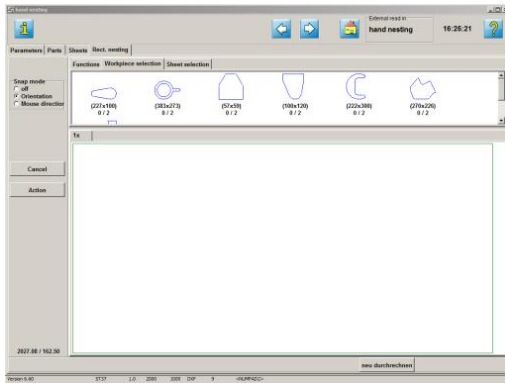


Click this button to switch to the automated manual nesting screen.

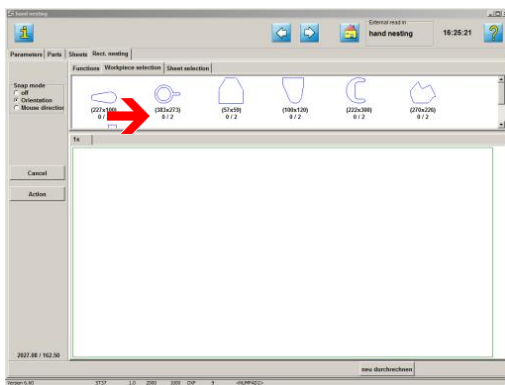


If you have a pre-nested set of parts for this screen, you will see the computer's suggestion now.

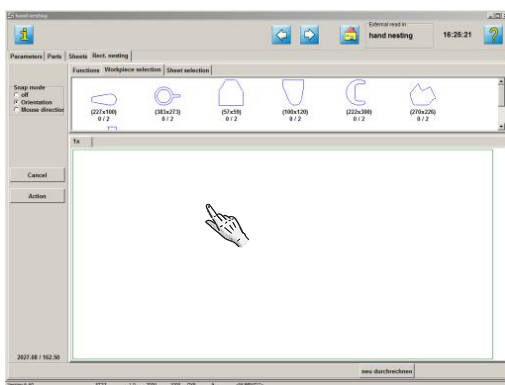
Select and position parts.



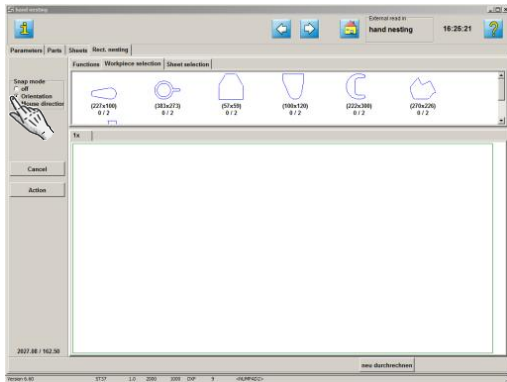
'Automated Manual Nesting' allows you to manage sheets and parts in relation to one another - take the quantity of parts you need, and shuffle them between sheets.



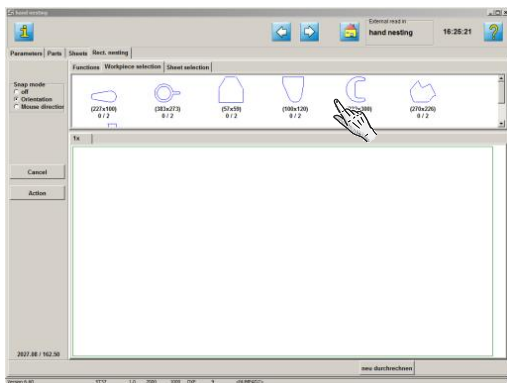
Here you can see all parts that you have selected for nesting. The quantity of parts, and how many have already been nested, is listed below the parts.



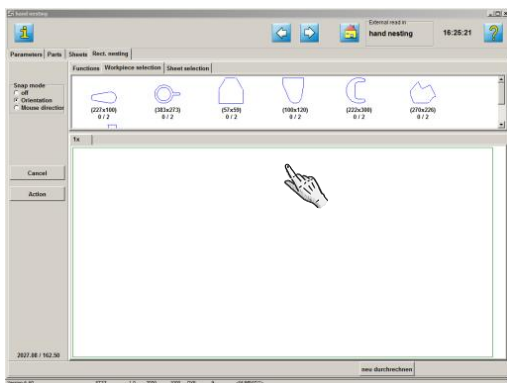
This window shows the selected sheet and the nested parts. All actions are applied to the marked object; this may be the sheet, a part, or a group of parts.



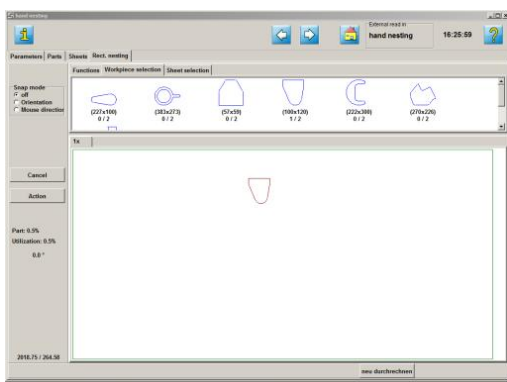
Select 'Snap-Mode' to automatically slide parts together using the program's automatic nesting subroutine.



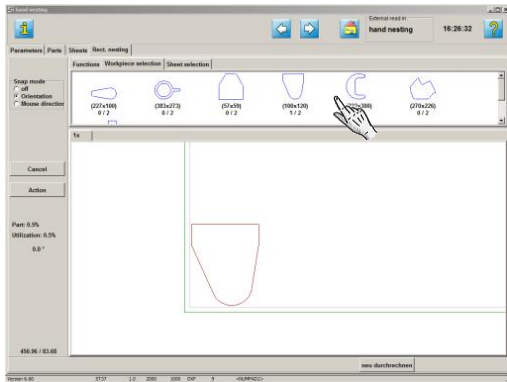
Mark a part...



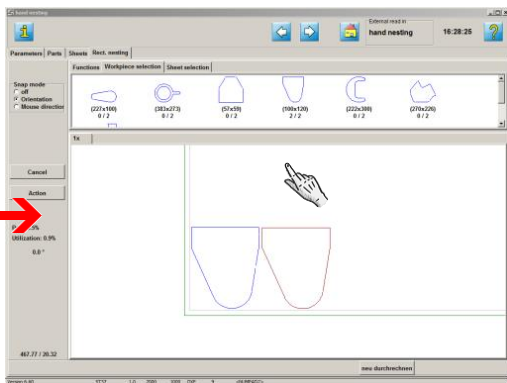
...and place it on the sheet.



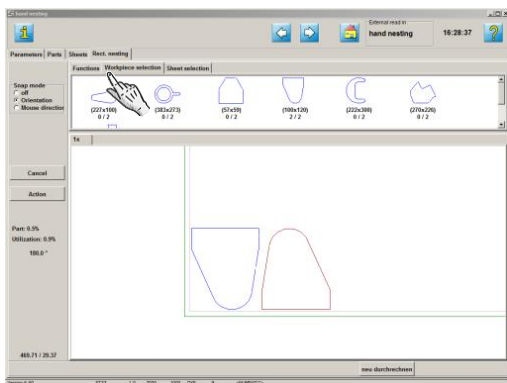
The plate will be placed on the sheet using the user-defined snap mode.



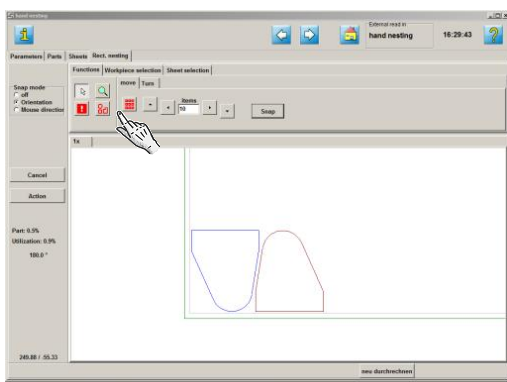
Place a second part on the sheet like so, and mark it.



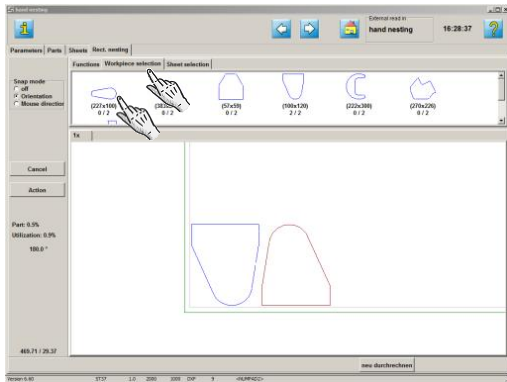
Use this button or right-click for a context menu. This allows you, for example, to rotate a part.



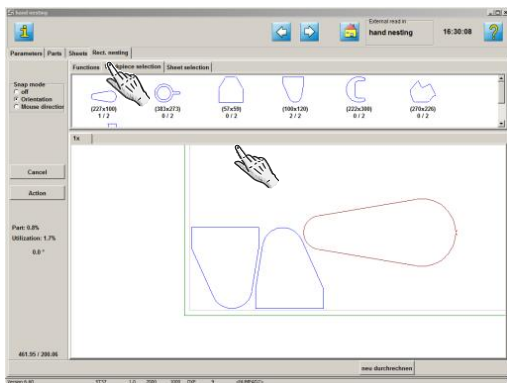
Switch to the 'functions' - 'move'.



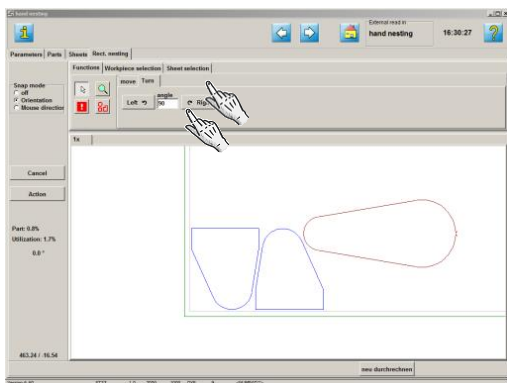
Move the part to the required position or click 'Catch' to slide the part up to the existing nest automatically. Switch to the part selection.



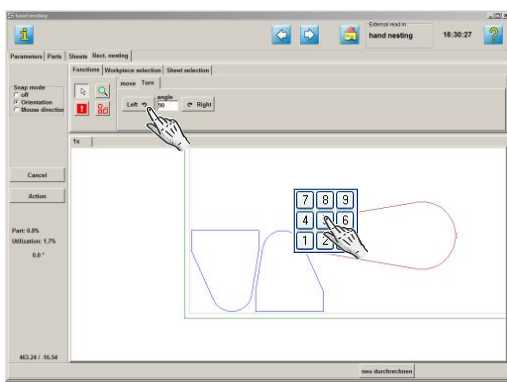
Place a third part on the sheet like so, and mark it.



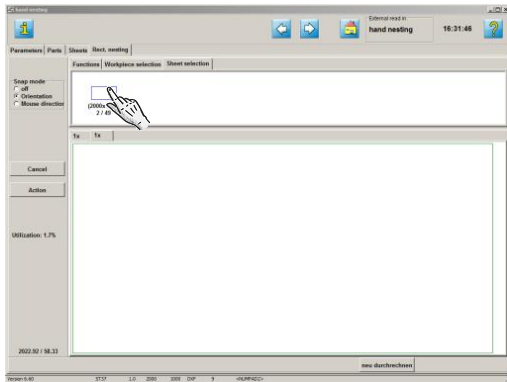
Switch to the 'functions' - 'rotate'.



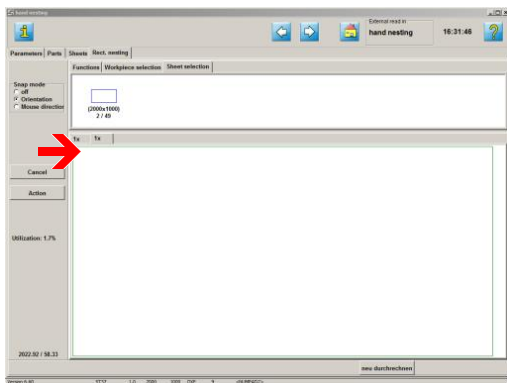
Enter the step angle to rotate a part at, and turn it in the required direction.



If you need an extra sheet, go to the 'Sheet selection' screen.



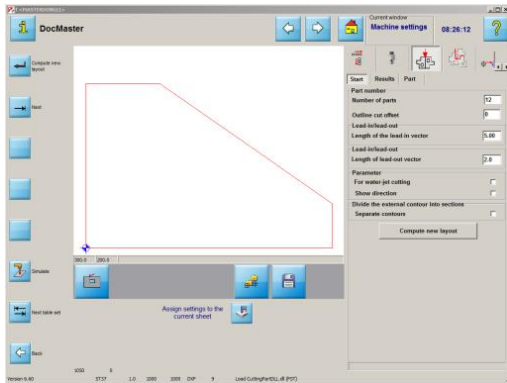
Mark a sheet.



The new sheet will be shown as a new tab. This allows you to switch between sheets directly.

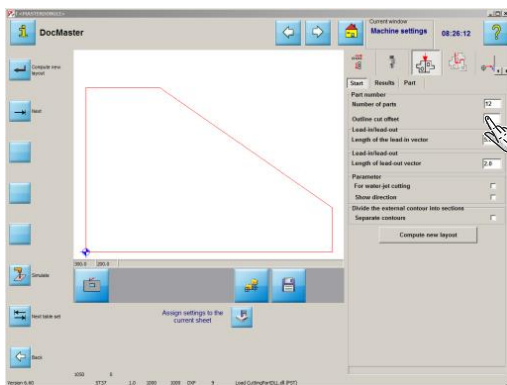
Common Separating Cuts

Parquet your parts.

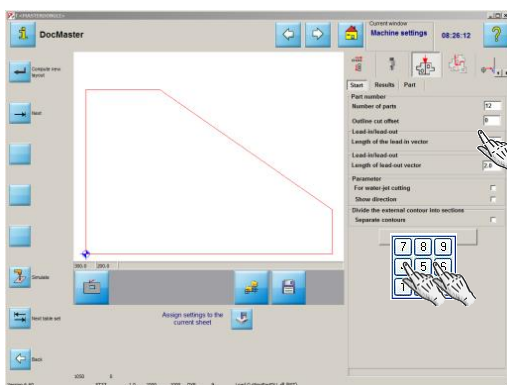


The 'Machine settings' window allows you to check if a part is suitable for parquet nesting, such that it can then be nested as a cluster. When making a cluster, it is important to note the cluster's size and the cutting offset.

The parts in the cluster will be cut using common separating cuts, and therefore do not have lead-ins. Lead-ins and -outs will be made at intersections of parts.

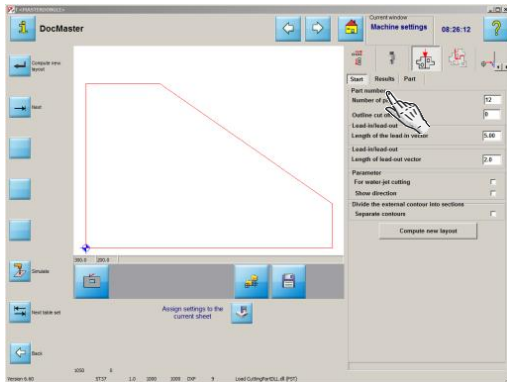


Enter the number of parts that should be added to a cluster.

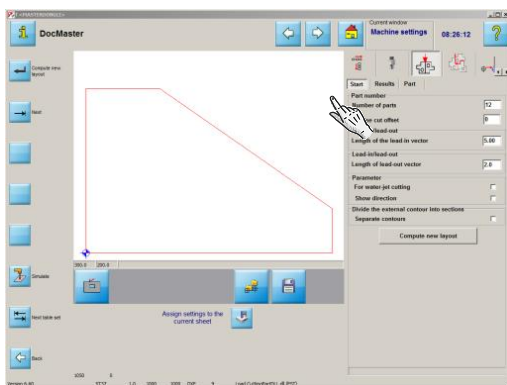


Enter the cutting offset.

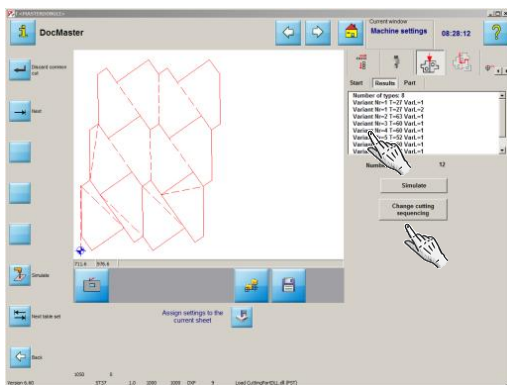
The sheet itself may not have a cutting offset; go to the sheet database to delete any that is present.



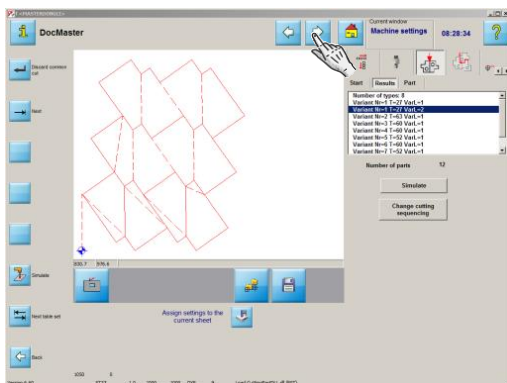
Go to the 'Parts' tab. Enter the maximum dimensions for a cluster. This is not the same as the sheet size!



Go to the 'Start' tab. Calculate the possible layouts. The result of this calculation...



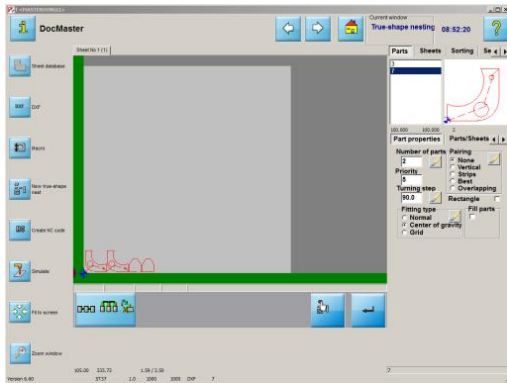
...are shown in the 'Results' tab. Check each possibility, and choose the best for your requirements.



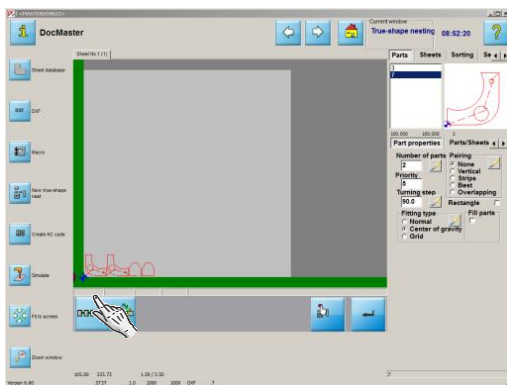
Go to the next program step and you will see your cluster in the preview window. The cluster can be nested as one part.

Joining Cuts

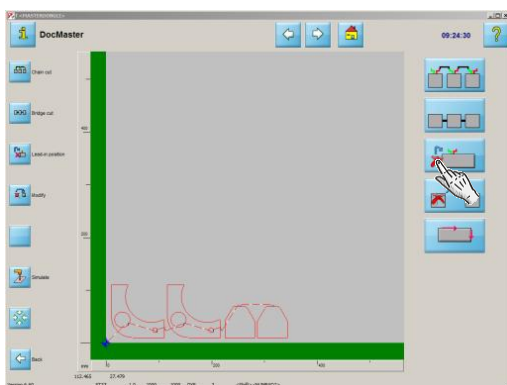
Joining parts using a chain cut.



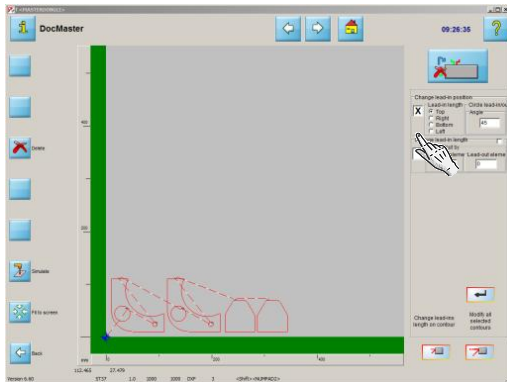
You can join parts using a chain cut from the true-shape nesting window. Preconditions are that all parts must have a lead-in, there must be a cutting offset set, and a safety offset of at least the width of the cutting head. This precludes collisions of lead-ins and contours.



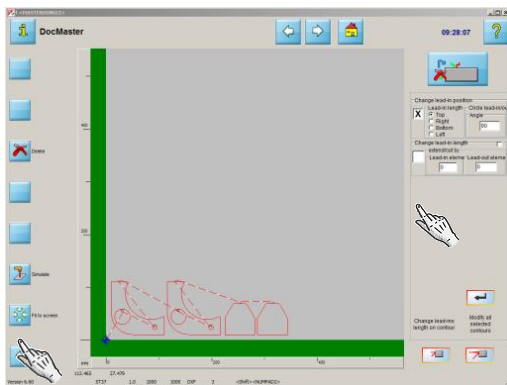
Go to the 'Joining cuts' screen and zoom to an appropriate size.



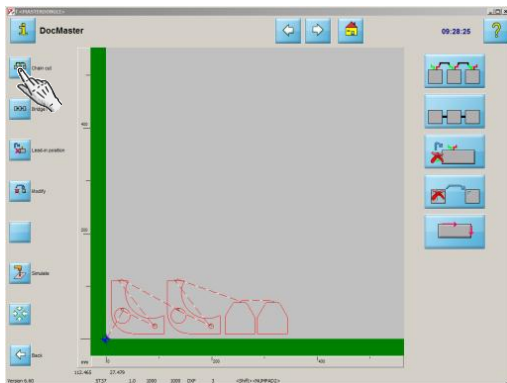
Set the lead-ins in the right sequence - go to the lead-in positions tab.



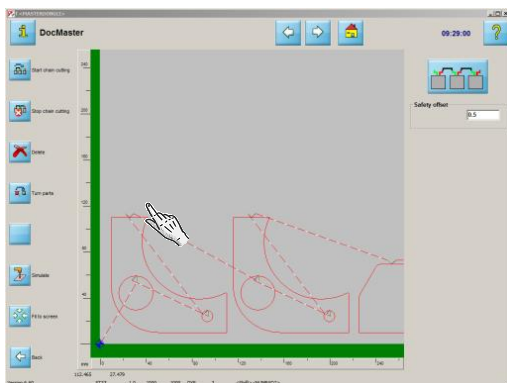
Mark the lead-in position and click the button to set the lead-in.



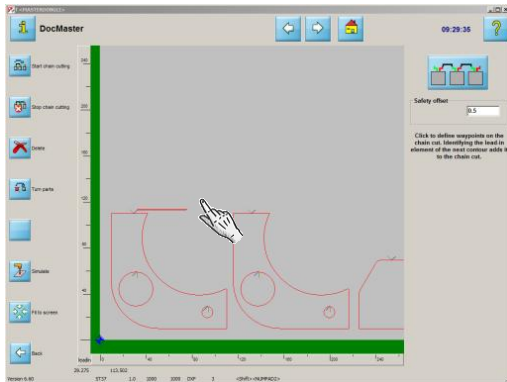
Go back to the joining cuts frame...



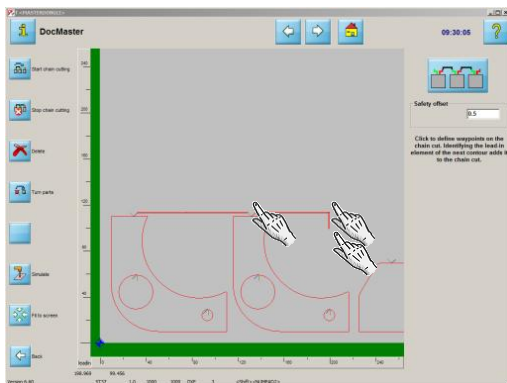
...select chain cut, and zoom in using your mouse's scroll wheel.



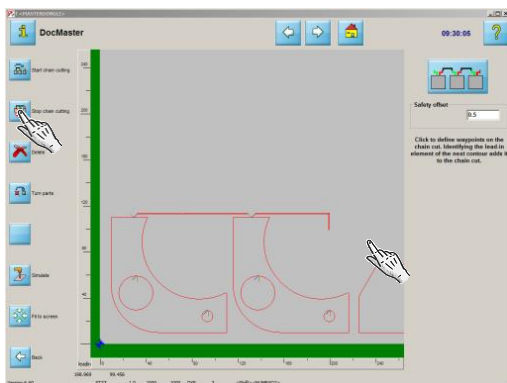
Start the chain cut function - set the first lead-in.



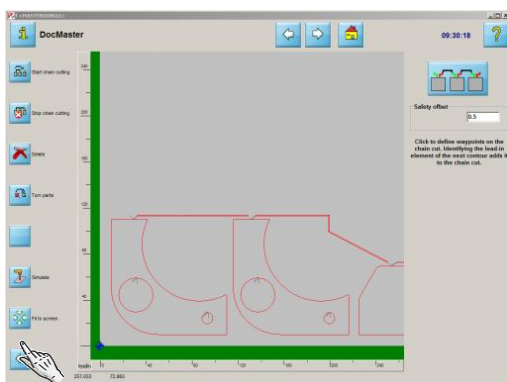
Drag the cut to the next lead-in.



Continue in this way to the last part.

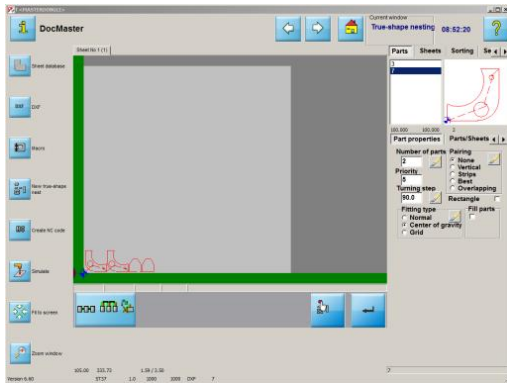


End the function by clicking the second button. Your new chain cut will be displayed.

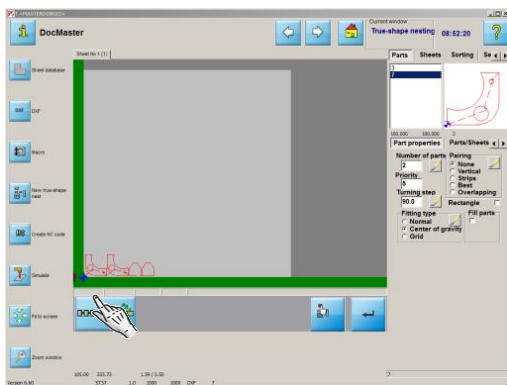


Go back to true-shape nesting.

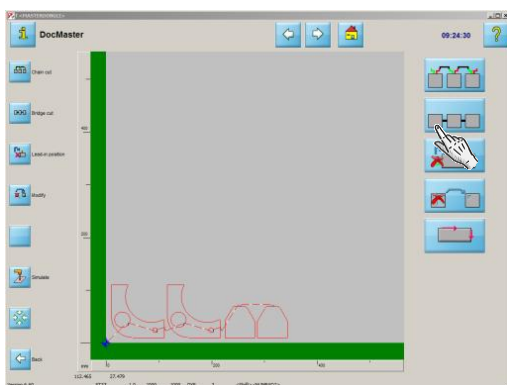
Joining parts with a bridge cut.



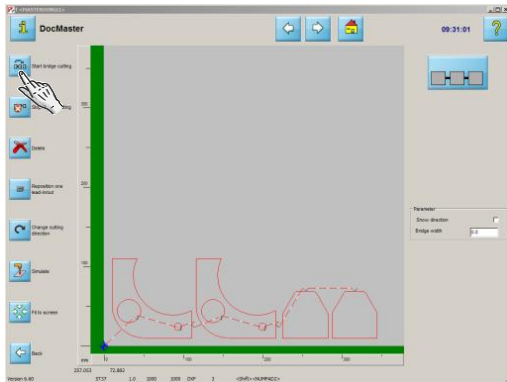
You can join parts using a chain cut from the true-shape nesting window. Preconditions are that all parts must have a lead-in, there must be a cutting offset set, and a safety offset of at least the width of the cutting head. This precludes collisions of lead-ins and contours.



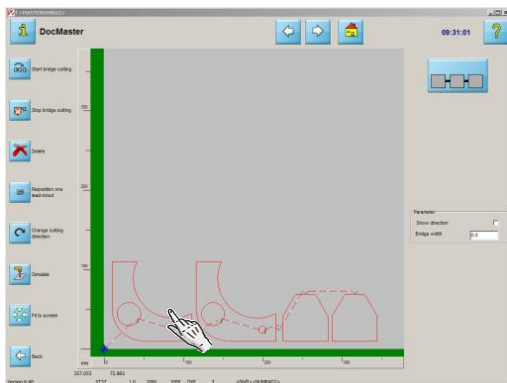
Go to the 'Joining cuts' screen and zoom to an appropriate size.



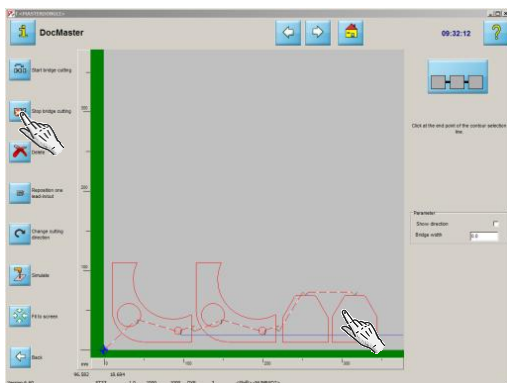
Select bridge cut, and zoom in using your mouse's scroll wheel.



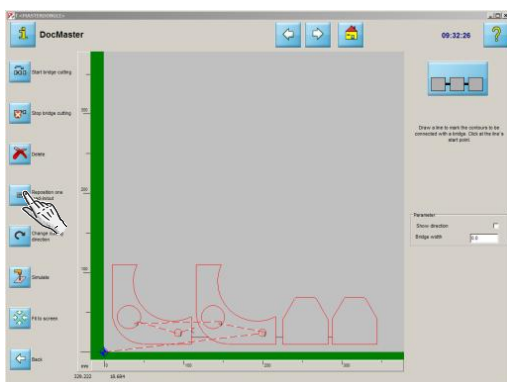
Start the chain cut function - set the start point for the bridge line.



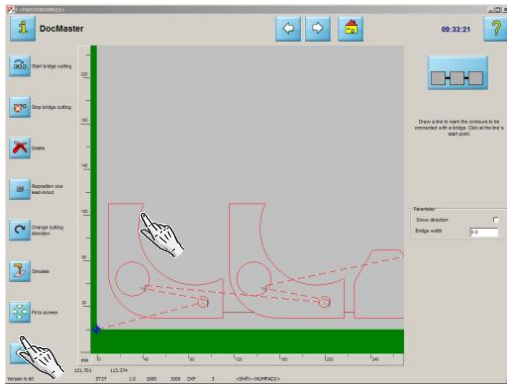
Drag the bridge line across all parts to be joined. The bridge cut will be illustrated.



Set the bridge cut across all parts in this way. End the function by clicking the second button.



Enter the lead-in position for the first part.



Go back to true-shape nesting.

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