NEST
Quick Start Guide

RhinoCAM 2025

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MecSoft Corpotation

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Quick Start

NEST Module 2025

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Quick Start Guides for each RhinoCAM-NEST module are available in both PDF and Video format. Refer to the following information to access these resources:

How to Access the Quick Start Guide Documents

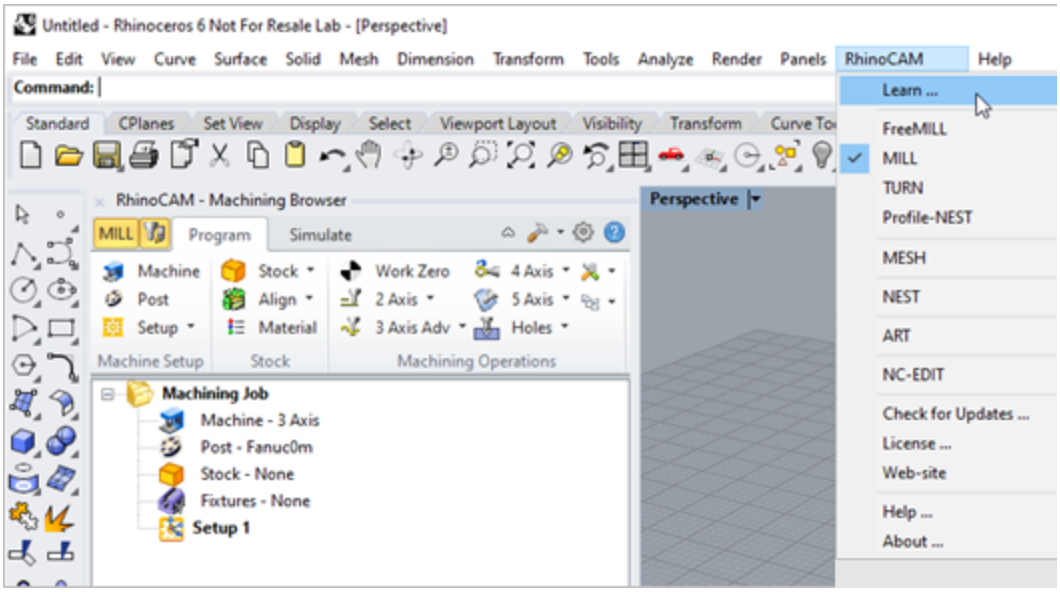
To help you quickly get started in working with each module, select one of the Help buttons located on the RhinoCAM-NEST Learning Resources dialog.

You will find:

- Quick Start Guides
- What's New documents
- Online Help links

The Quick Start Guides will help you step through an example tutorial which will illustrate how to use the module. To access the Learning Resources dialog:

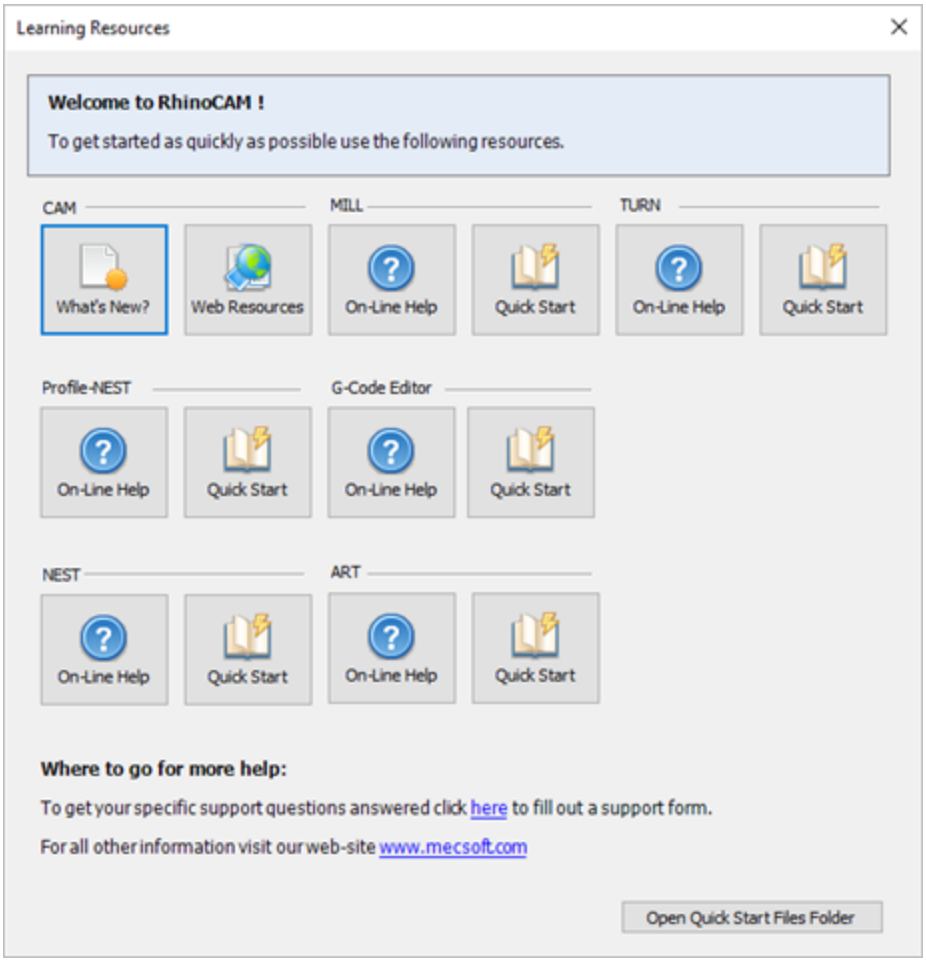
1. From the Rhino Main Menu, drop down the Main menu and select Learn ...



To access the Learning Resources dilog in RhinoCAM

2. Select a document from the Learning Resources dialog to get started using the module of your choice.

You can also select the Open Quick Start Files Folder button located at the bottom of the dialog to open the Quick Start folder where the source files (start and completed versions) are located.



Learning Resources Dialog

Resource Guide

Download this PDF Guide for a list of the available RhinoCAM-NEST Resources.

2025 RhinoCAM-NEST Resource Guide

The 2025 RhinoCAM-NEST Resource Guide!

18 Pages

Lists PDF downloads and Online resources including Quick Start Guides, Reference Guides, Exercise Guides, Tutorials and More.

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About This Guide

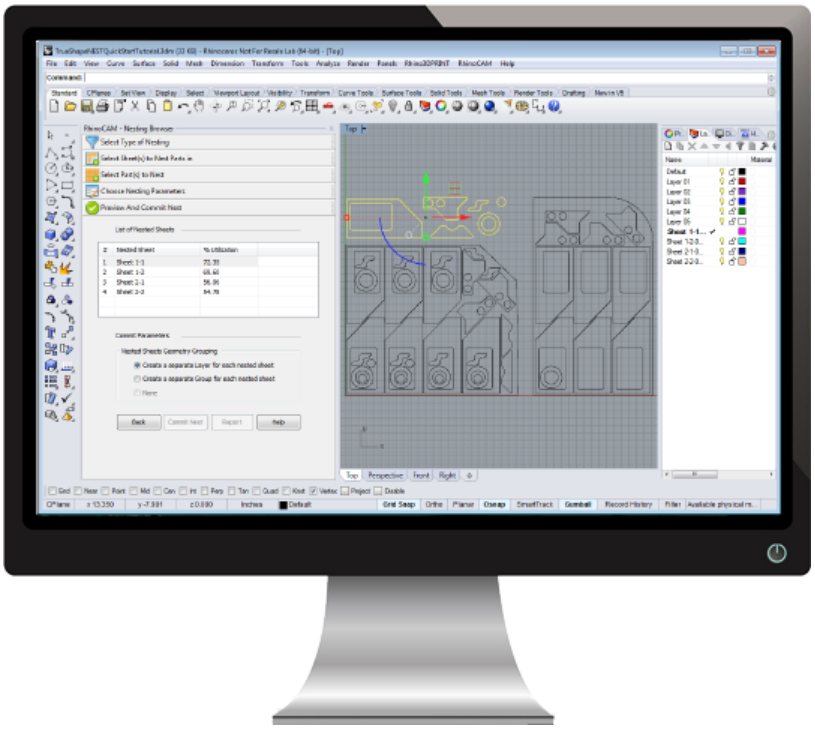
3.1 Useful Tips

Here are some useful tips that will help you use this guide effectively.

1. For purposes of brevity, Rhino refers to both Rhinoceros 6 or Rhino 7.
2. Copy the tutorial part files in a location other than the installation folder to make sure you have read/write privileges to the files.
3. Once you start working with the tutorial file, save your work periodically!
4. Don't stress out too much if you are having trouble with the tutorial. Call us or send us email and we can help you out.
5. Most of all have fun!

3.2 About RhinoCAM-NEST

RhinoCAM-NEST is MecSoft's cost effective solution for optimally arranging and fitting geometric shapes onto sheets of stock material. It provides two primary nesting capabilities: Rectangular Nesting and True Shape Nesting. For both solutions, individual 2D CAD shapes can be arranged on sheets according to user-defined quantities, spacing, and with orientation control, including material grain restrictions.

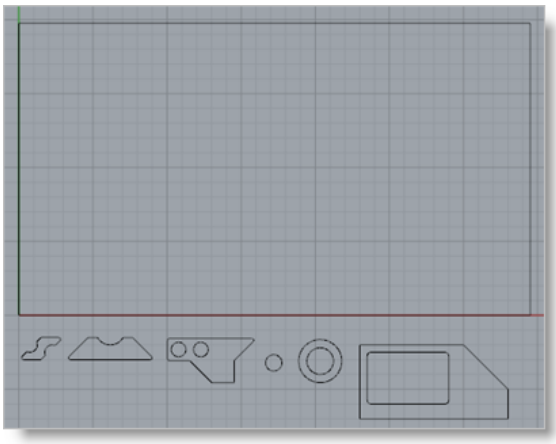


RhinoCAM-NEST Quick Start Guide

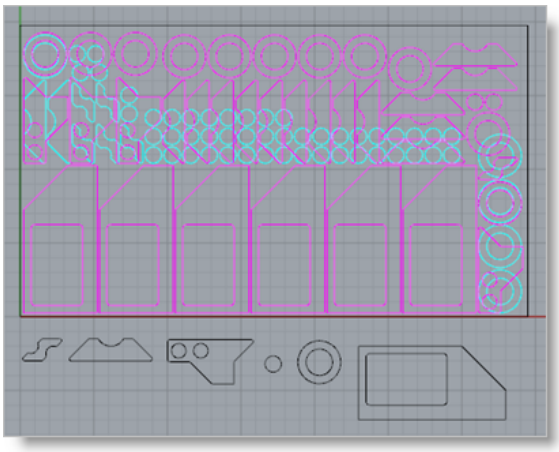
3.3 Using this Guide

Welcome to the Quick Start Guide for Rectangular & True Shape Nesting using RhinoCAM-NEST brought to you by MecSoft Corporation. In this guide we will be creating both a Rectangular and a True Shape Nest containing multiple quantities of six individually shaped parts using two multiple sheets of material. We will also specify the Grain Direction for one of our parts to maintain its orientation during the nesting process. We will also be Committing the nest to CAD geometry.

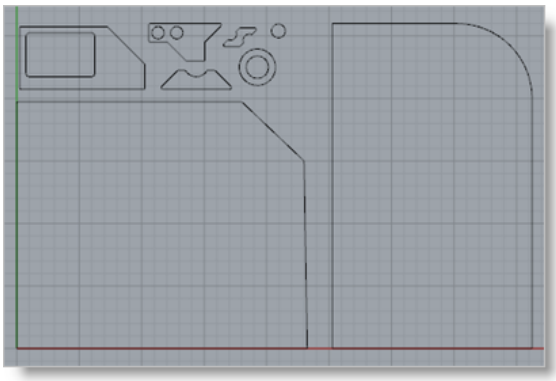
This guide has two associated Rhino files each for both the Rectangular and the True Shape nesting sections that you can find located in the QuickStart folder under the RhinoCAM-NEST installation folder. The first file is a completed file that contains the committed nest CAD geometry. It represents the file that you should end up with after working through the tutorial. The second file is a starter file that contains only the staged part geometry to be nested. Use the completed file as a reference. Copy the starter file and use it to begin each tutorial.



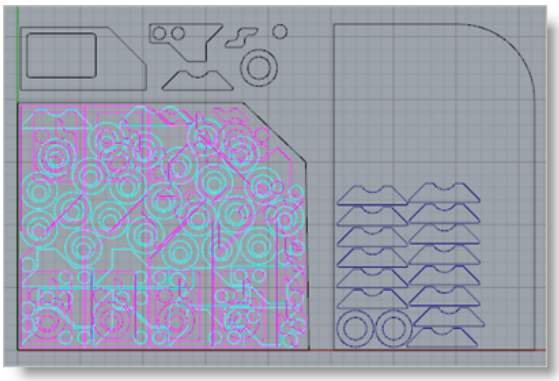
RectangularNestQuickStartTutorial.3dm



RectangularNestQuickStartTutorial_Completed.3dm



TrueShapeNestQuickStartTutorial.3dm



TrueShapeNestQuickStartTutorial_Completed.3dm

3.4 Watch the Video!

Want to see a video demonstration of this quick start guide? Just click on the play list below and watch the NEST Quick Start Guide video.

Here is a link to the complete 2023 Video Play List

About RhinoCAM-NEST

4.1 Running RhinoCAM

Locate the Rhinoceros 6 (or Rhinoceros 7) shortcut on your desktop and double click to launch the application.

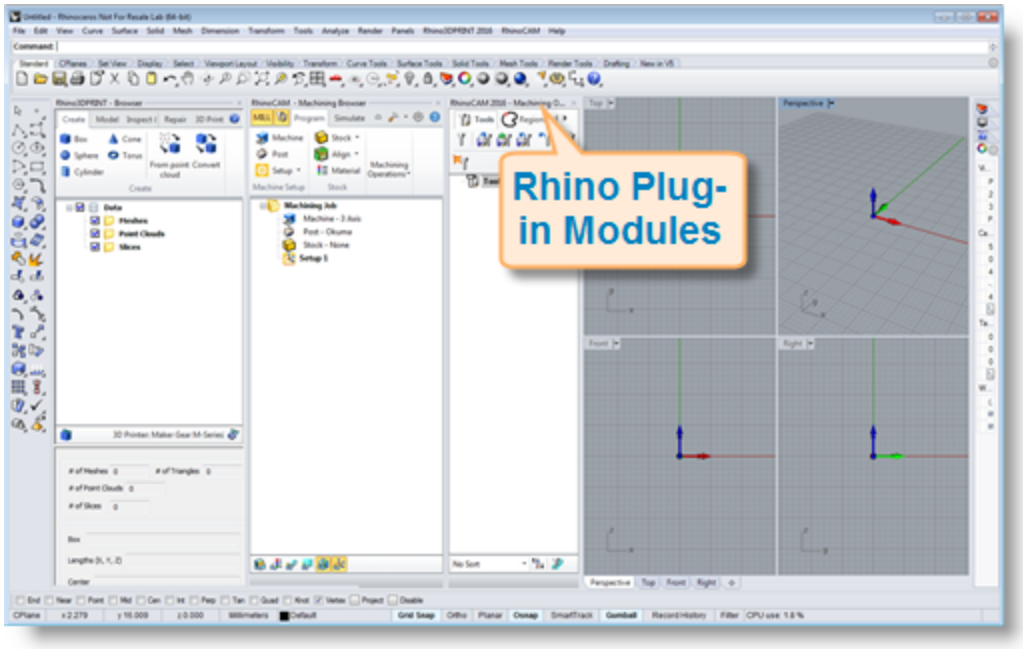
Alternatively you can also click on the Windows Start button and select All Programs. Go to the program group containing Rhinoceros. (The name of this program group will usually be called Rhinoceros, unless you specified otherwise during setup.)

Once you locate the program group, select it and then select Rhinoceros to launch the application.

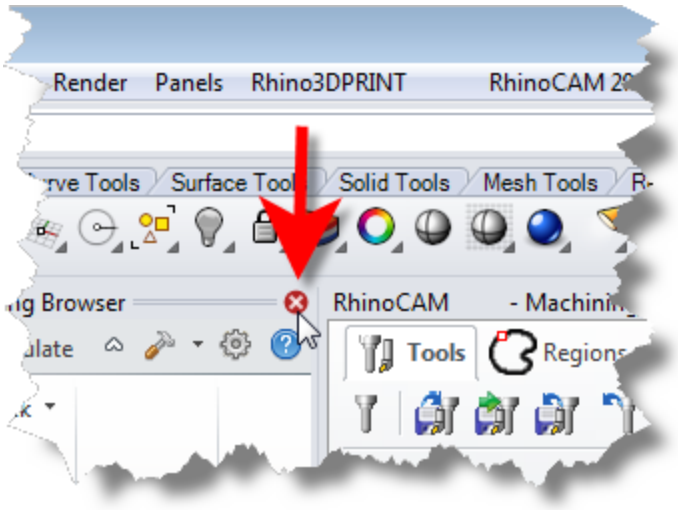
If the installation was successful, upon launching of Rhinoceros you should observe a menu entry called RhinoCAM in the main menu bar of Rhino.

4.2 About the RhinoCAM Display

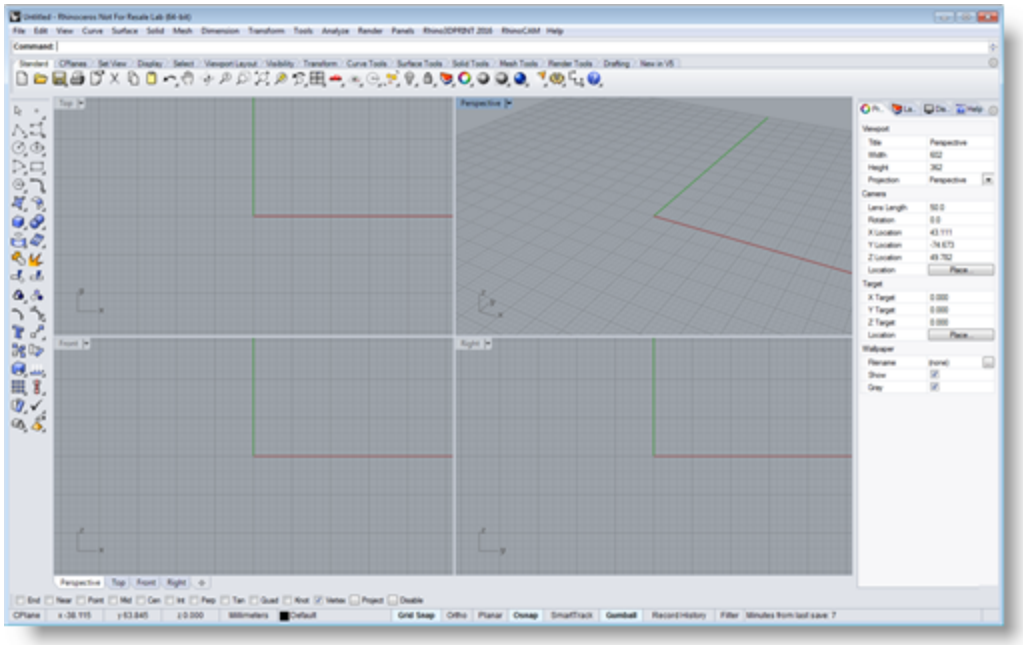
Before we begin, let's talk a bit about the RhinoCAM display. When you run RhinoCAM for the very first time, your screen may look this.



These windows on the left belong to plug-in modules that are currently loaded. For now, let's close all of them.



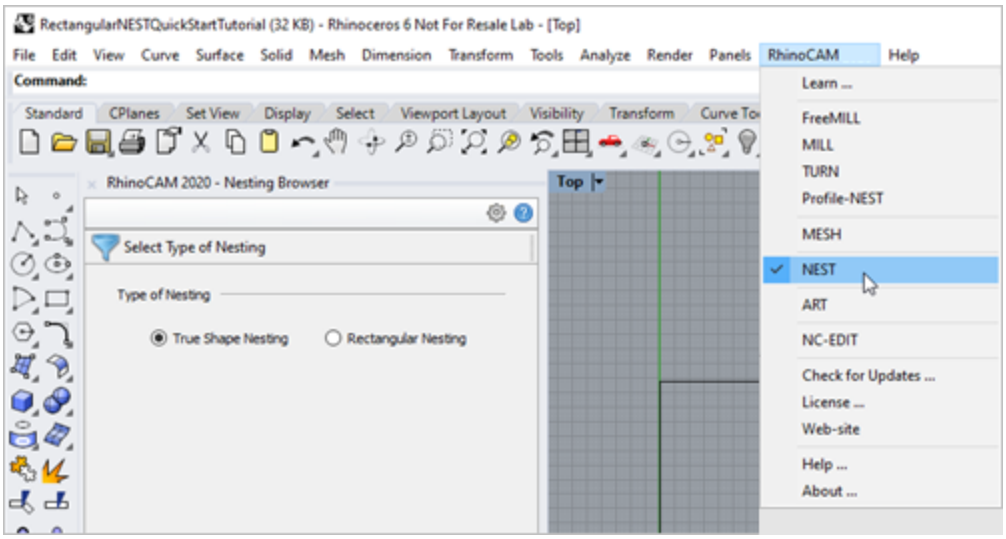
With all plug-in modules closed your screen will look like this:



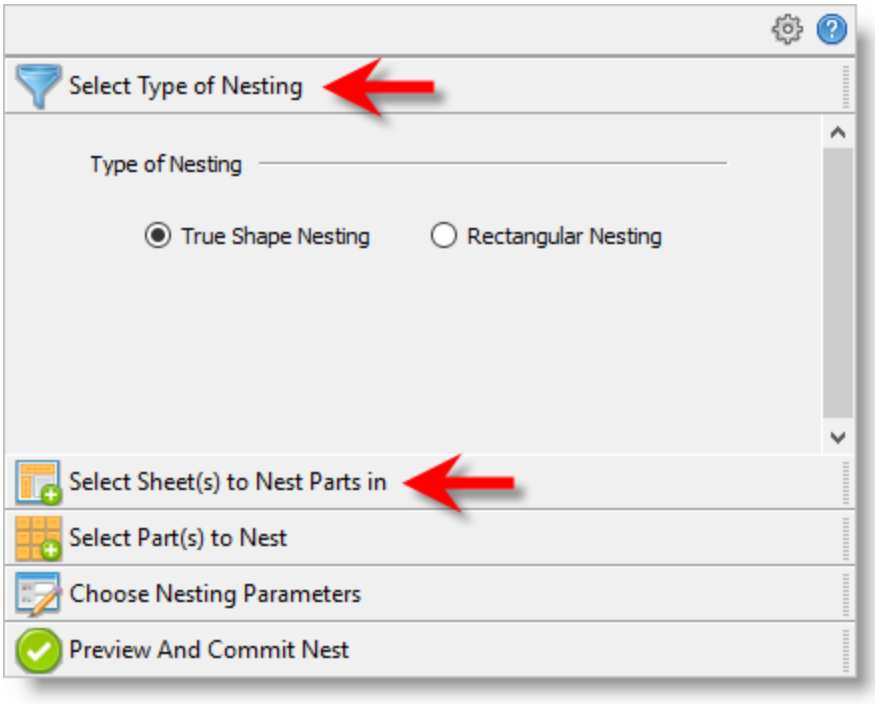
4.3 Launching the NEST Module

Now, let's begin by launching the RhinoCAM-NEST module.

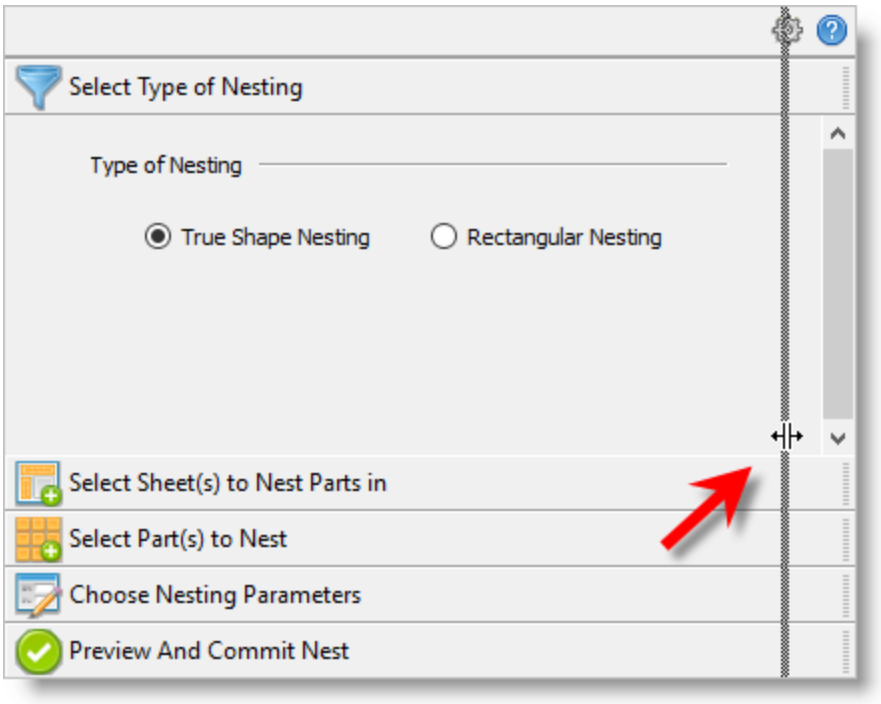
1. From the Rhino main menu bar, you will see the RhinoCAM 2023 menu item.
2. Drop-down the menu and pick NEST to load the NEST module.



3. Docked on the left you will see the Nesting Browser. Notice that it is organized into tabs representing each step in the nesting process.



4. You can re-size the width of the browser making sure that all of the command icons and menus are easily accessible.



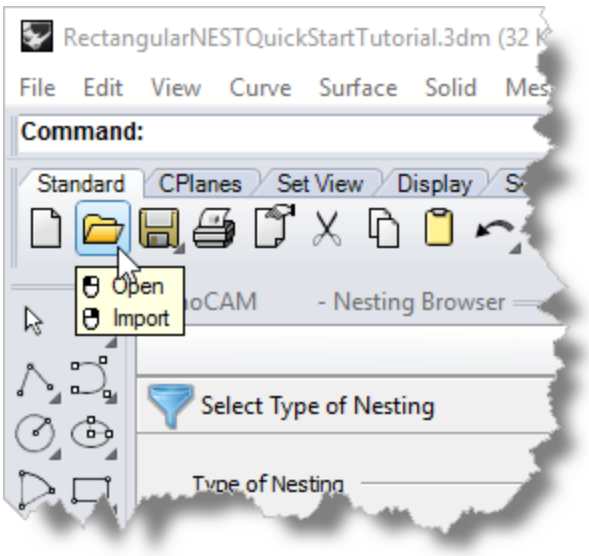
Rectangular Nesting

5.1 Getting Ready

5.1.1 Load the Part File

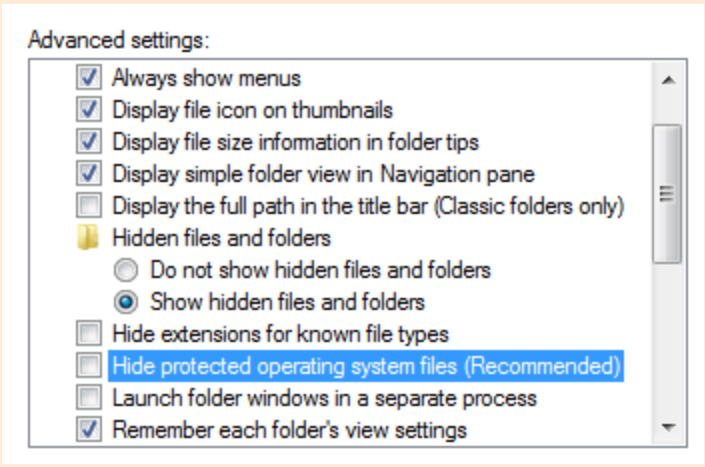
Now, let's load the Part file containing the geometry for nesting.

1. Select File / Open from the Main Menu bar, or click the Open icon from the Standard bar.



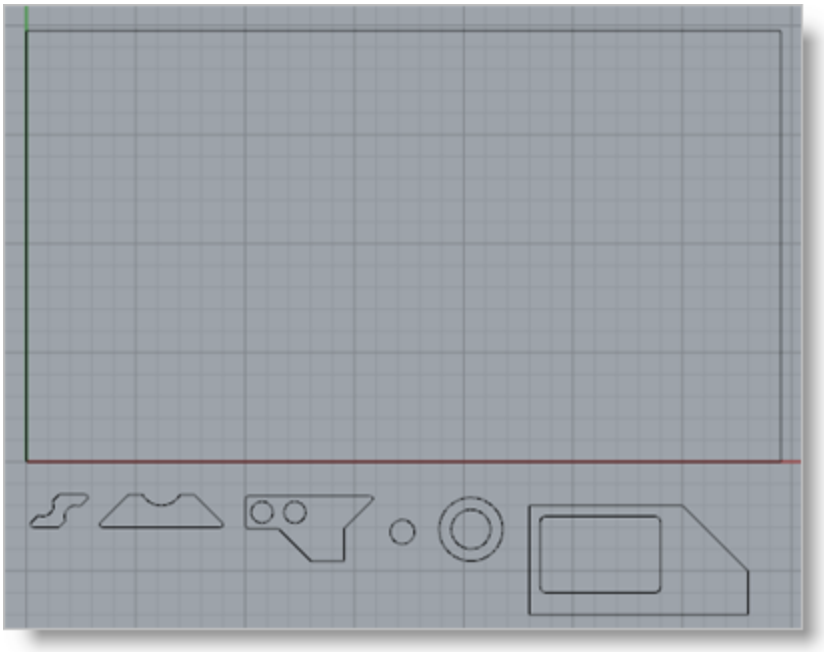
2. From the Open dialog box, select the RectangularNestQuickStartTutorial.3dm file from the C:\ProgramData\MecSoft Corporation\RhinoCAM 2023 for Rhino x.x\QuickStart\ folder. As mentioned before, it is advisable to make a copy of this part at a suitable alternative folder so that you have write privileges to modify the part.

> By default, the ProgramData folder is "hidden" from view. Here are the steps to Show hidden files and folders:
>
> 1. For Windows 8 users: Go to Control Panel > Appearance and Personalization > Folder Options.
> For Windows10 users: Go to Control Panel > Appearance and Personalization > File Explorer Options.
> 2. Select View tab and under advanced settings select Show Hidden files and folders, clear the check boxes for:
>
> - Hide extensions for known file types
> - Hide protected operating system files (Recommended)



3. Click Apply and OK.

The part appears as shown below.



5.1.2 Basic Steps

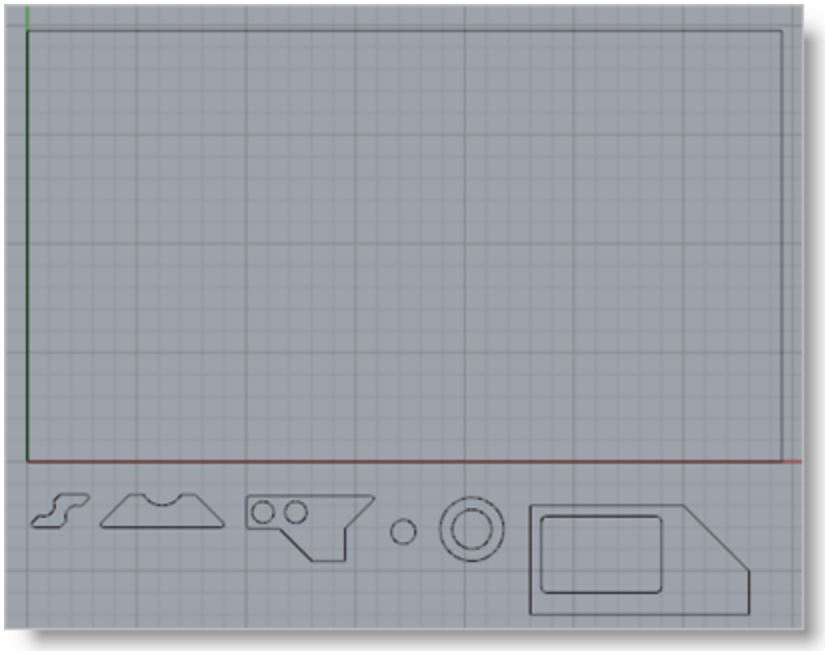
The following basic steps are included in the nesting process:

1. First, we load the RhinoCAM-NEST module and define the Nesting Type to be performed.
2. Then we open the Rhino drawing where the stock material and production parts are staged.
3. Then we select the Sheets to Nest our parts in and then select the Parts to Nest.
4. We choose our desired Nesting parameters.

5. Then we Preview the Nest making any final adjustments.
6. Finally, we Commit the Nest, creating the actual nested sheet geometry.

5.1.3 Staging your Parts

Let's take a look at what we've done in Rhino to prepare for nesting. You can refer to this as the Staging Process. We have brought together and located on the screen, the geometry that we want in the nesting process.



As you can see, we have one or more shapes that represent the stock or the remnant material. We also have one of more shapes that represent the production parts that we want to nest within the stock material.

Here are two tips to consider when staging your parts.

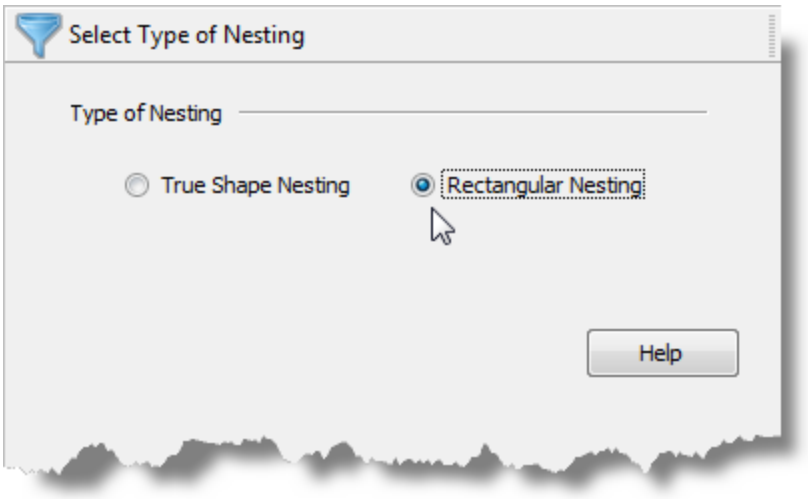
> First, when you stage your parts, stage them around the outside of the stock material, not within the stock material. The Nesting software will place the parts in the stock for you.

> Secondly, do not place parts inside the cutouts of larger parts as this may confuse the Nesting software into thinking that it is a detail of the larger part. Keep all of your parts separated.

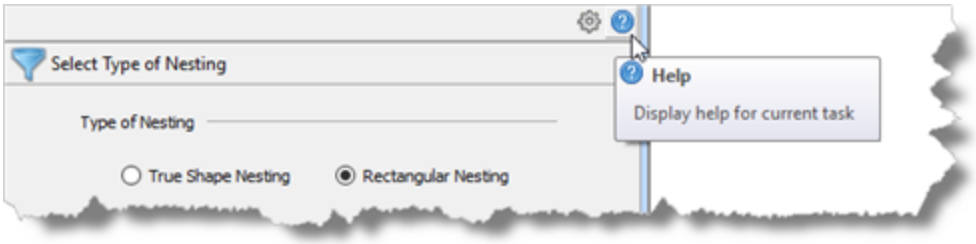
5.2 Creating a Rectangular Nest

5.2.1 Choose Nesting Type

1. Now, from the nesting browser, choose the Select Type of Nesting tab.



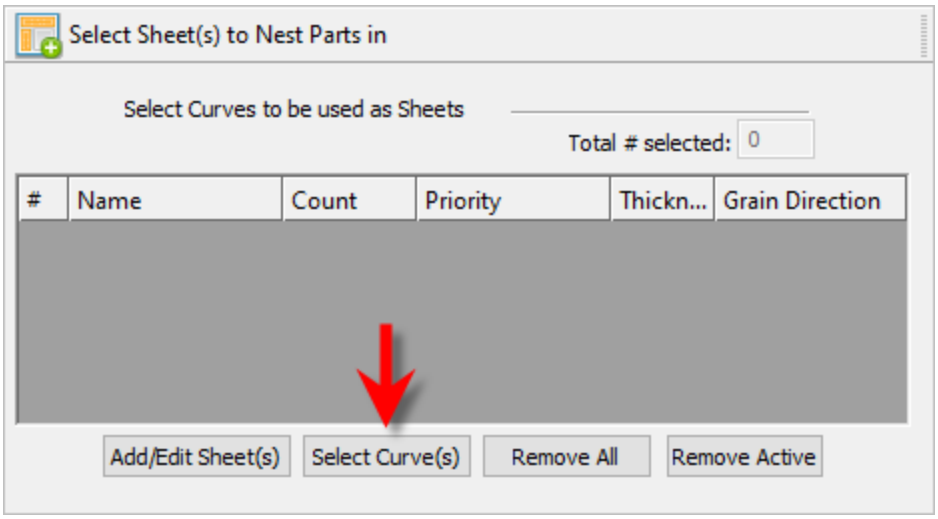
2. In this section we will be demonstrating Rectangular Nesting so we will select that option. In Rectangular Nesting, a rectangular bounding box around each part is used to place and orient each part on each sheet.
3. You will notice a Help button located on the right of each tab of the Nesting Browser. Selecting it will display documentation for each option on the active tab. Optionally, you can simply press F1 on your keyboard to display help.



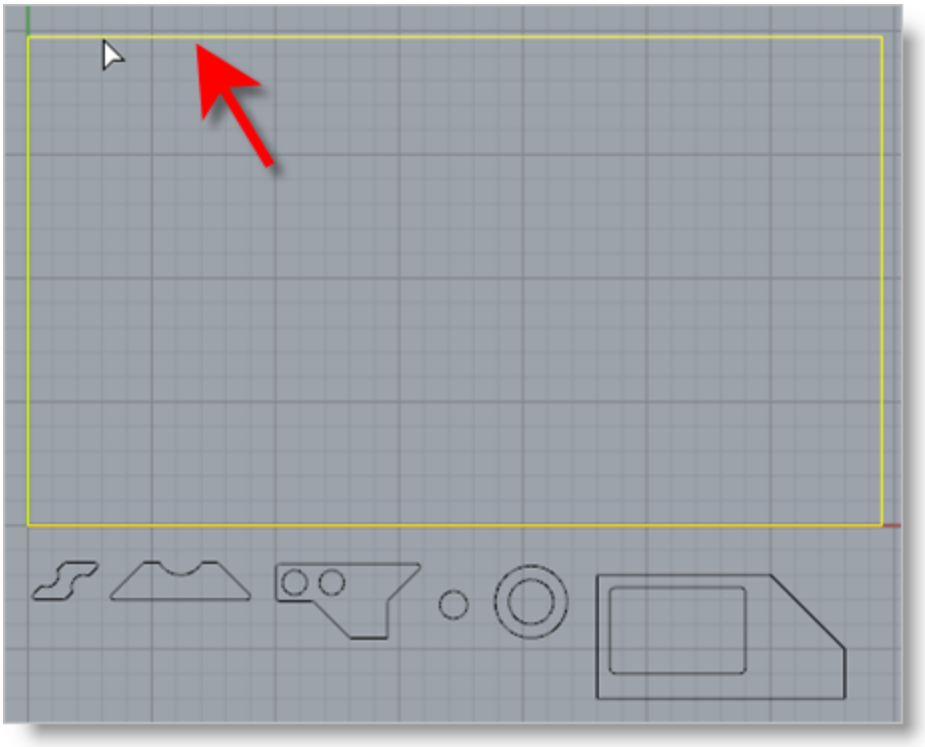
Locate the Help icon

5.2.2 Define Your Sheet Geometry

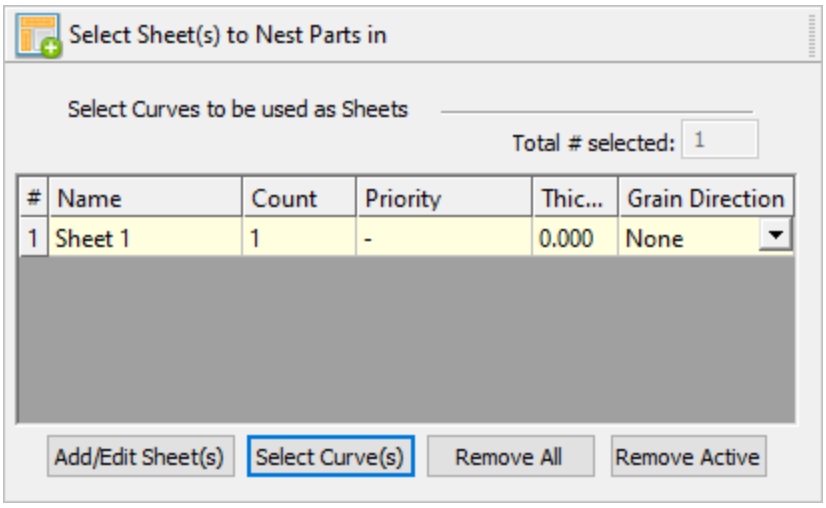
1. From the Select Sheets tab, pick Select Curves.



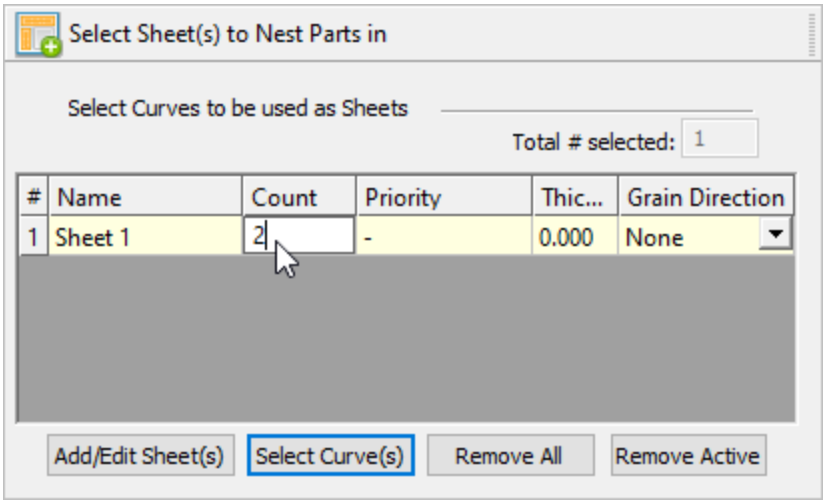
2. Now, we select the shapes that represent the stock material and right-click or press Enter to end the selection.



3. Notice that an entry is made into the table. A default name is generated as well as the count and we'll get back to the Grain Direction is just a little bit.



4. Let's change the Count to 2. This means that there are two identical Sheets used to nest the part.

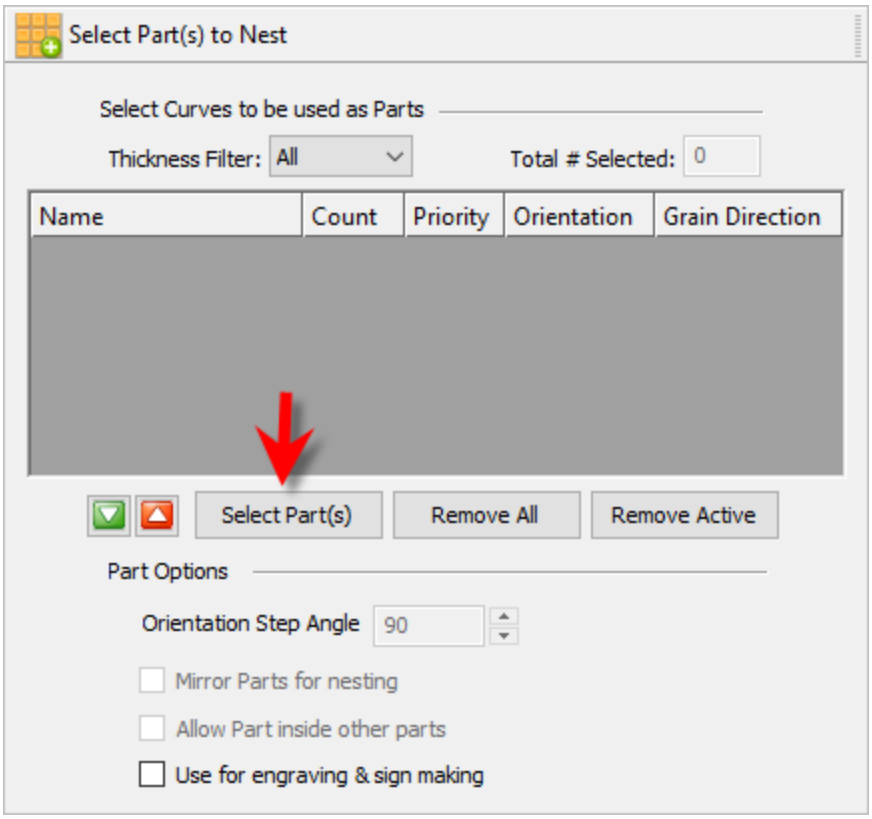


In the future, you can select additional shapes for stock but all of them must be rectangular.

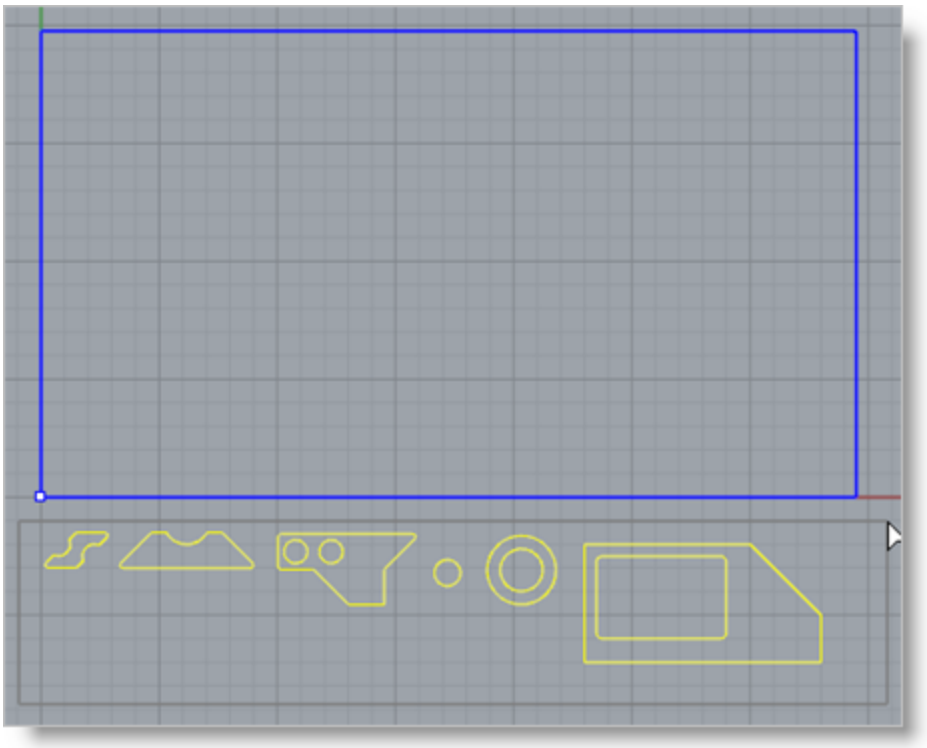
5.2.3 Define Your Parts to Nest

Next, we'll select our Parts to be Nested.

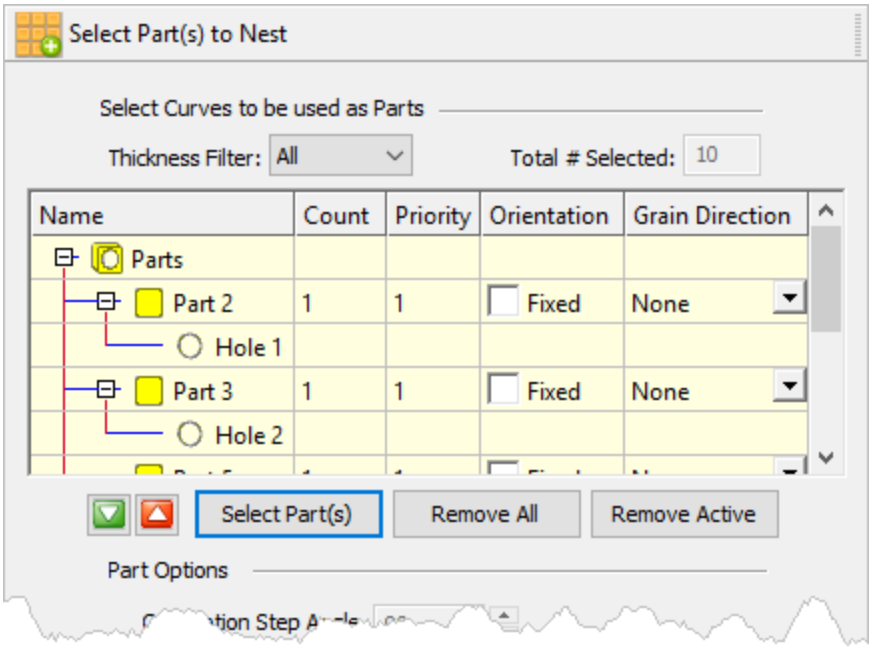
1. Pick the Select Parts tab of the Nesting Browser and then pick Select Curves.



2. Then we will window select all of our part geometry and then right-click or press Enter to add each part to the Parts List of the Nesting Browser.



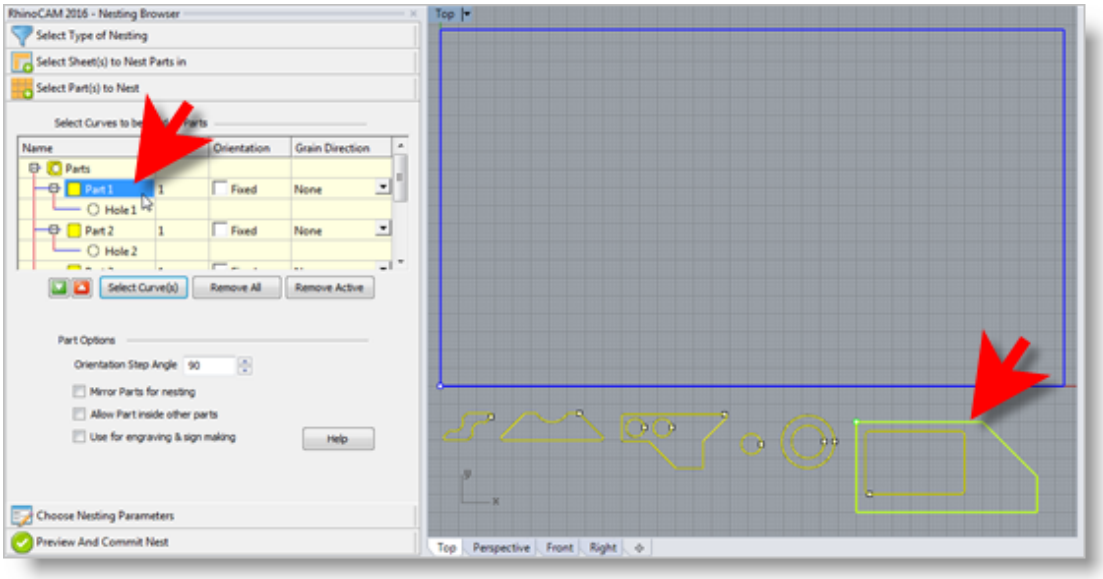
IMPORTANT NOTE: When parts are added to the NEST Parts List they are assigned an arbitrary number (i.e., Part 1, Part 2, etc.) depending on how they are selected. It is important to note that the part numbers you see on your screen may not be the same numbers you see in this guide. Please keep this in mind when you are instructed to select a part from the parts list.



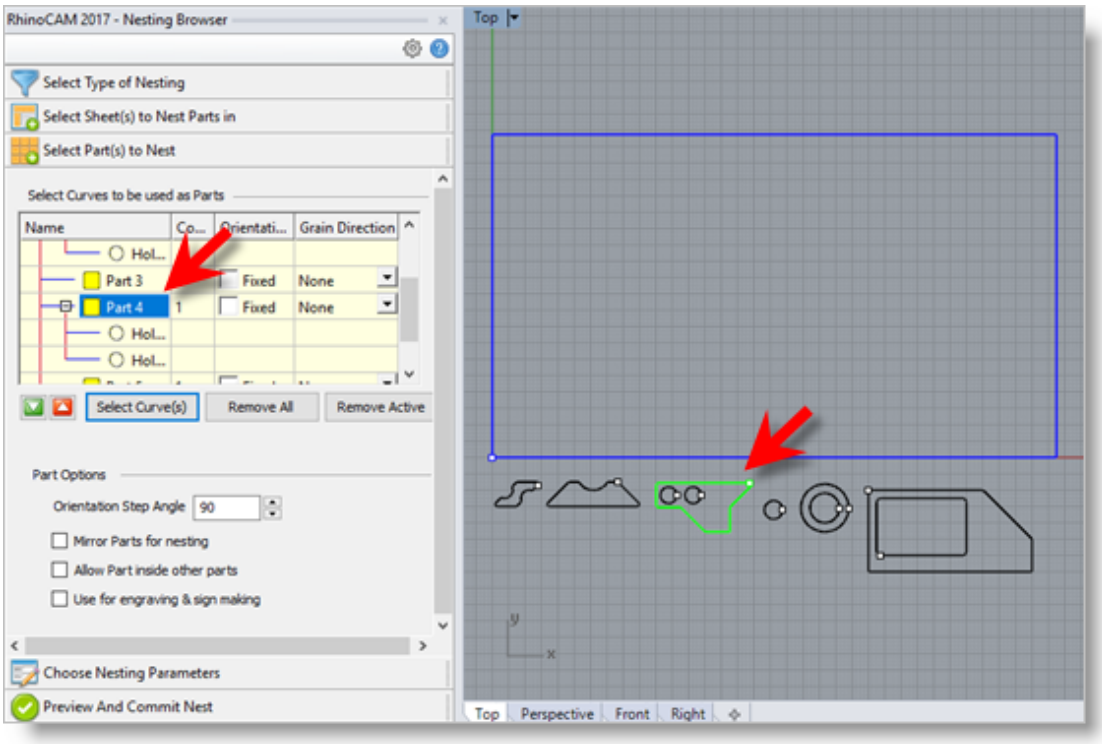
The Nesting software determines the exterior and interior of each selected part.
Note that the exact sequence numbering that you see may differ from the image above.

As we can see in the Parts List, each exterior closed curve is defined as one Part. Any interior closed curves are defined as Holes within each Part.

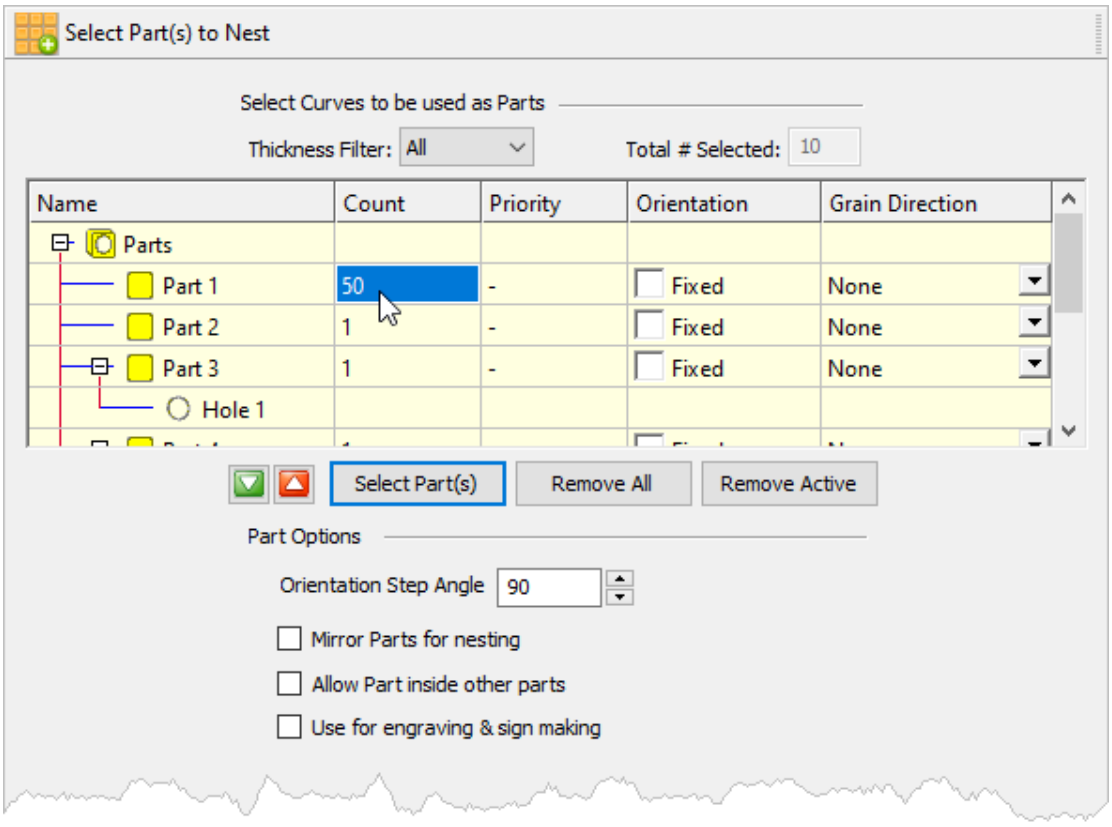
3. If we select a part from the parts list we see that it is highlighted in the graphics window.



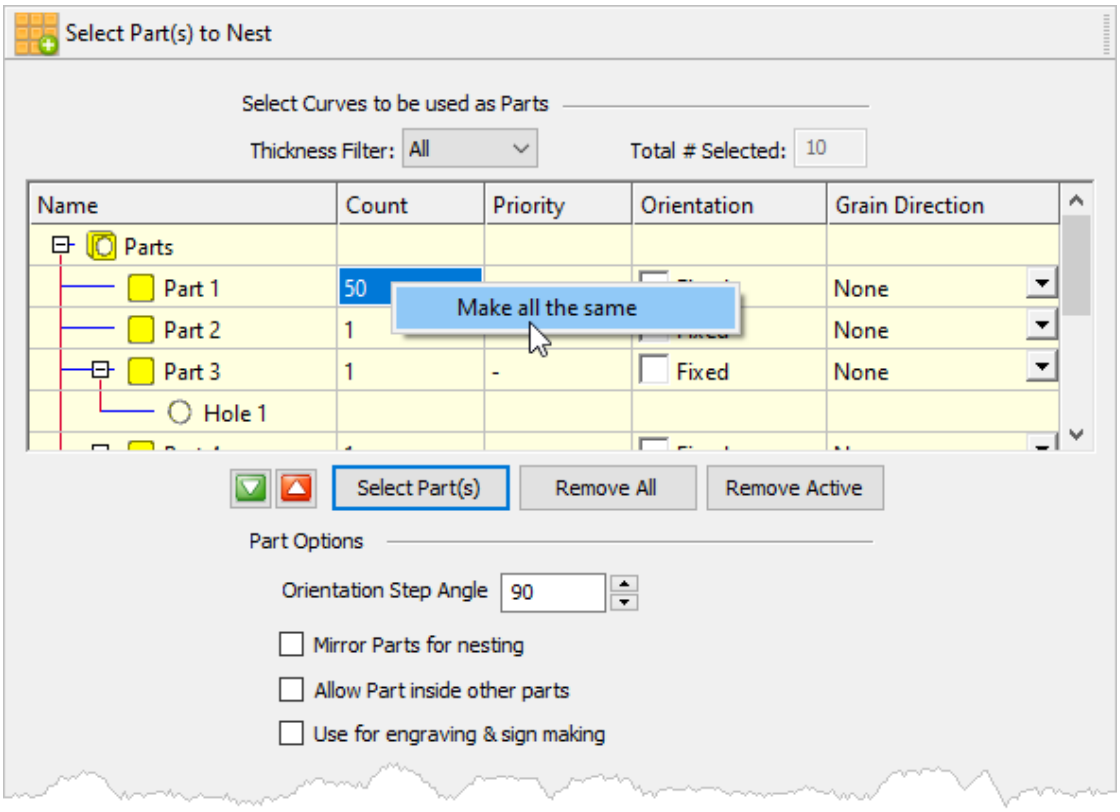
4. If a part has multiple interior cutouts, each is listed in the Parts List, under its associated part.



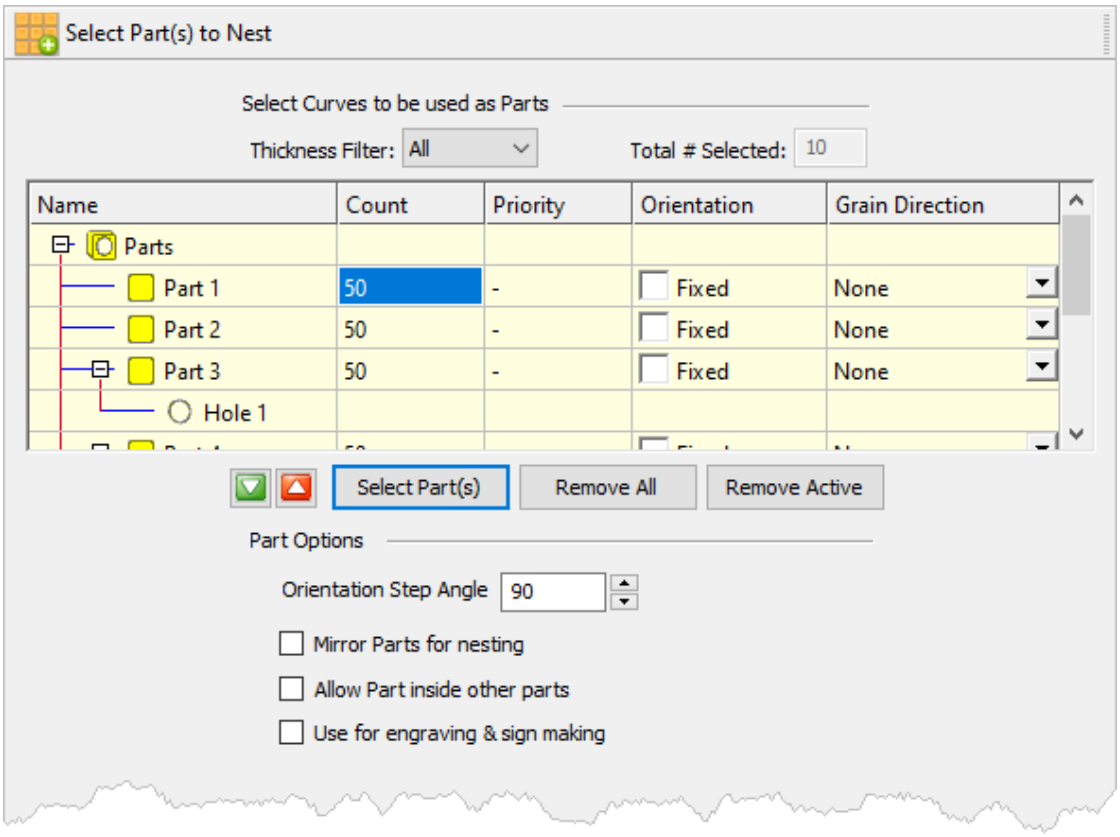
5. Now we'll enter the Count for each of the parts that are needed in the nest. Select the Count field for Part 1 and enter 50 and then press enter.



6. Now right-click on 50 and select Make All the Same.



You now see that all parts have the same count of 50.

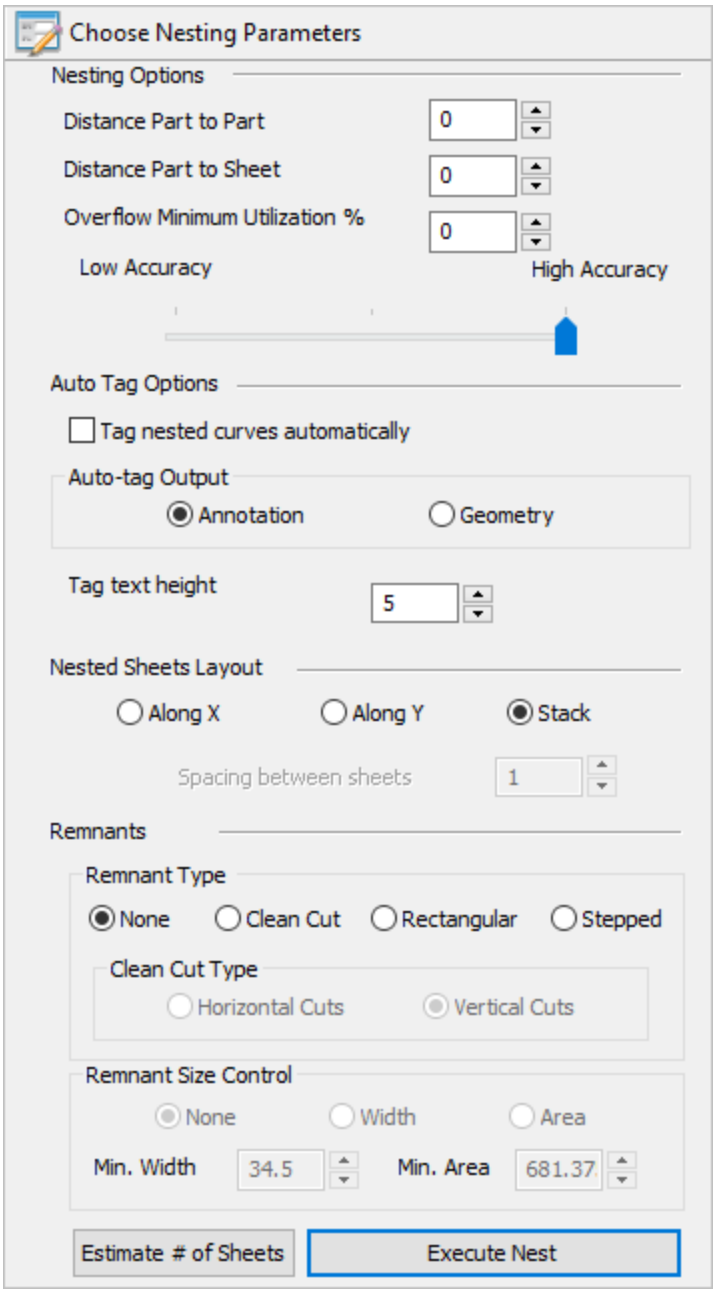


5.2.4 Choose Nesting Parameters

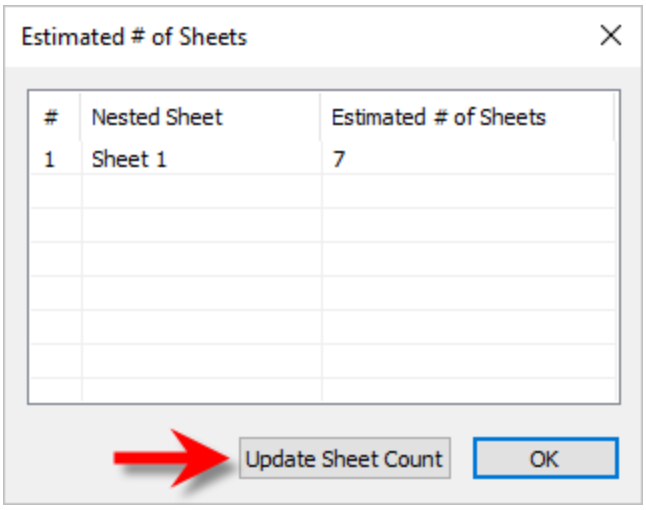
Now, we'll select the Choose Nesting Parameters tab of the Nesting Browser to set two final parameters.

1. The first one sets the Distance Part to Part. We'll enter 0.15 there.
2. The second is the Distance Part to Sheet (i.e., the distance between the outer-most parts and the outer edge of the stock material). We'll set that to 0.25.

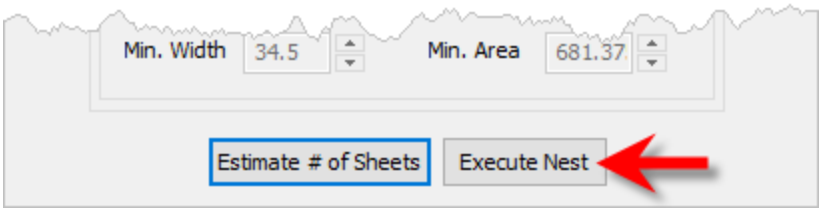
   There are also options to automatically Tag each nested part and layout options for arranging your nested sheets.

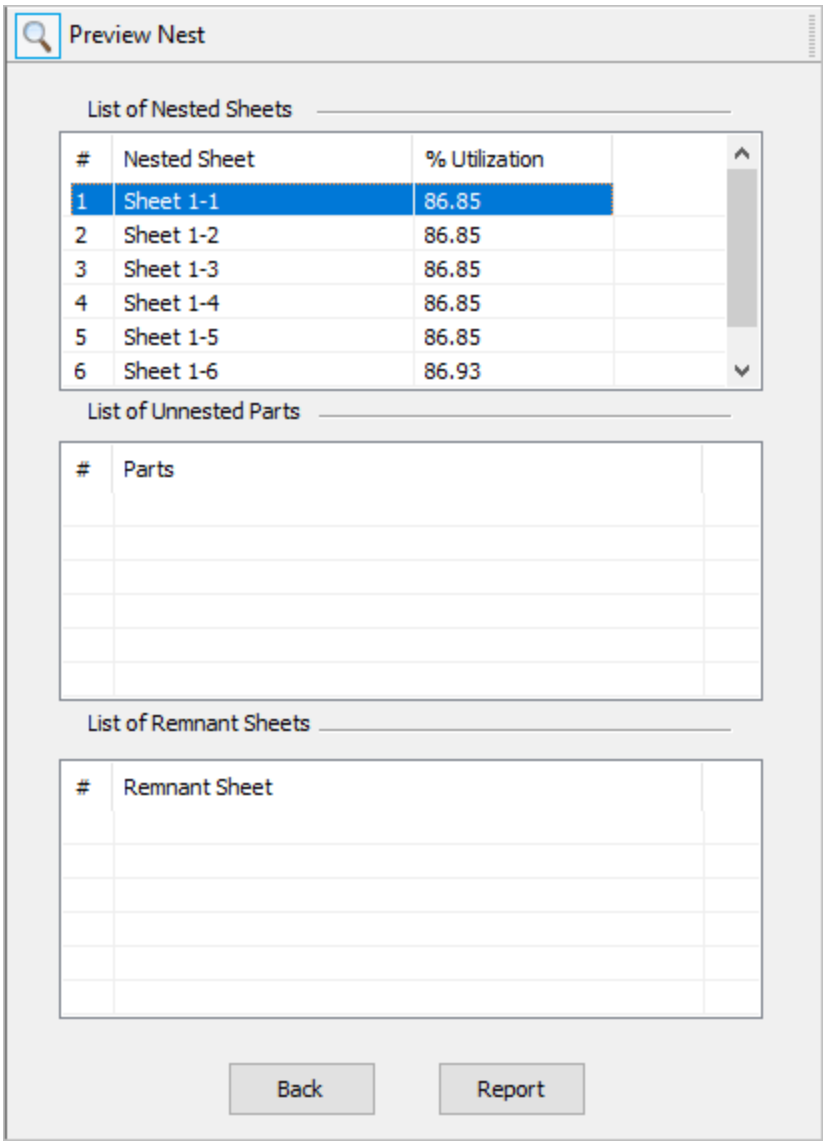


3. Now we select Estimate # of Sheets to display the dialog.

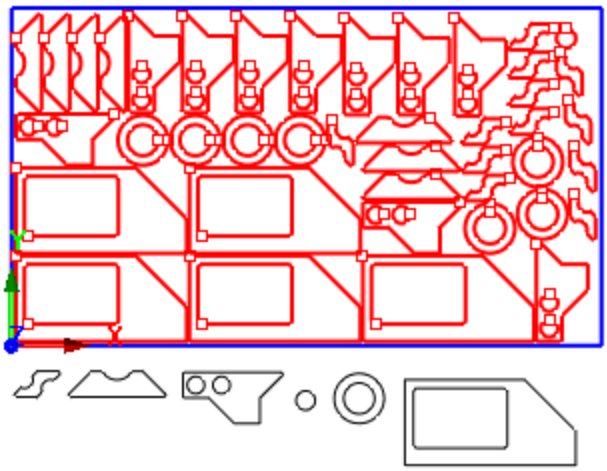


4. We see that 7 sheets will be needed so select the Update Sheet Count button and then pick OK. If you go back to the Select Sheet(s) tab you will see that the count was updated.
5. Now select the Execute Nest button and you are automatically moved to the Preview Nest tab where you can see the sheets listed.

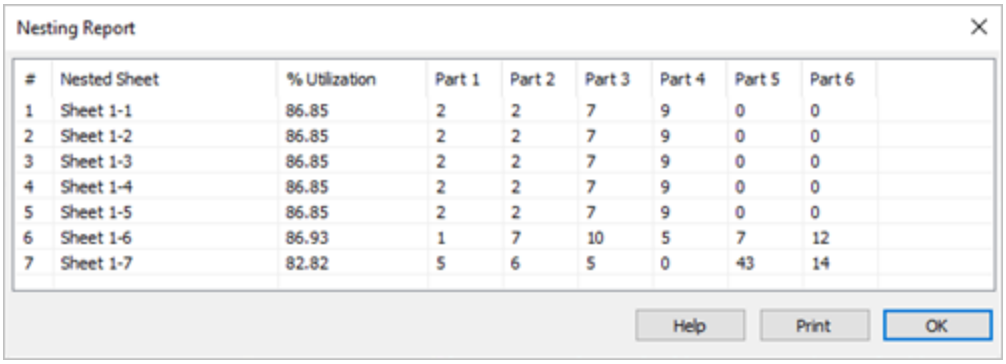




You can select each sheet to see its preview in the graphics screen.



6. Select the Report button to display the nest report.



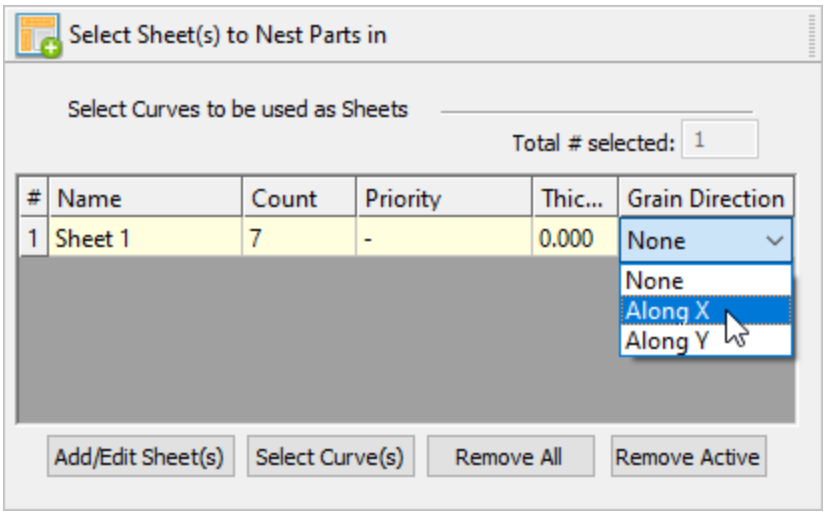
#	Nested Sheet	% Utilization	Part 1	Part 2	Part 3	Part 4	Part 5	Part 6
1	Sheet 1-1	86.85	2	2	7	9	0	0
2	Sheet 1-2	86.85	2	2	7	9	0	0
3	Sheet 1-3	86.85	2	2	7	9	0	0
4	Sheet 1-4	86.85	2	2	7	9	0	0
5	Sheet 1-5	86.85	2	2	7	9	0	0
6	Sheet 1-6	86.93	1	7	10	5	7	12
7	Sheet 1-7	82.82	5	6	5	0	43	14

7. Pick OK to close the report dialog.

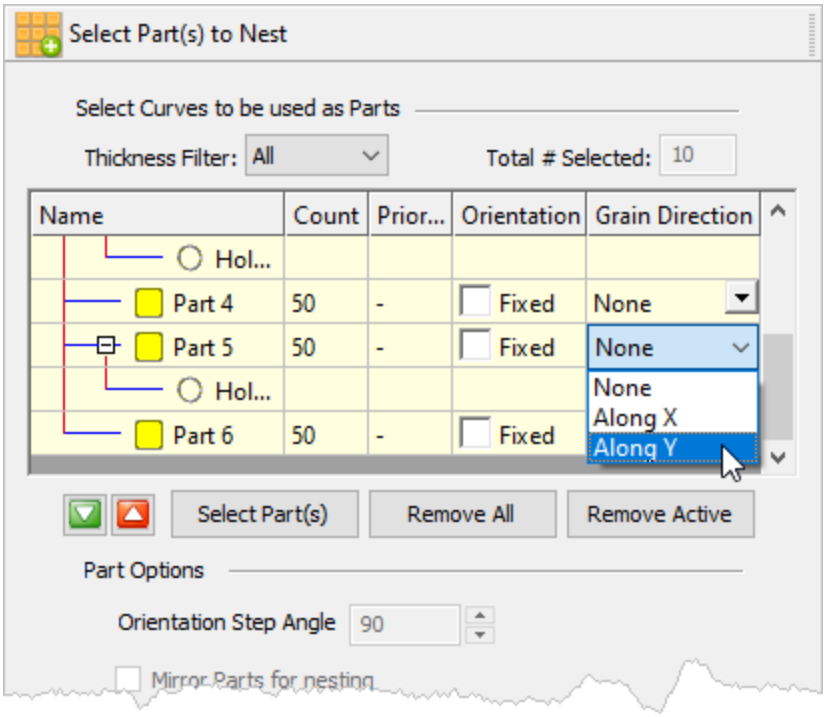
5.2.5 Grain Direction Control

The last thing I would like to do is to impose a Grain Direction control on this larger part to force it to be vertical. In order to do that I need to specify the Grain Direction on the sheet as well as that part.

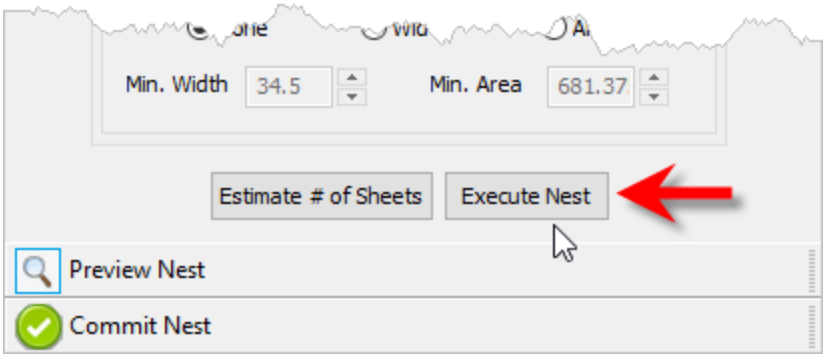
1. First we'll go back to the Select Sheets(s) to Nest Part in tab and set the Grain Direction to Along X.



2. Then on the Select Parts tab I will set the Grain Direction on this larger part to be Along Y.

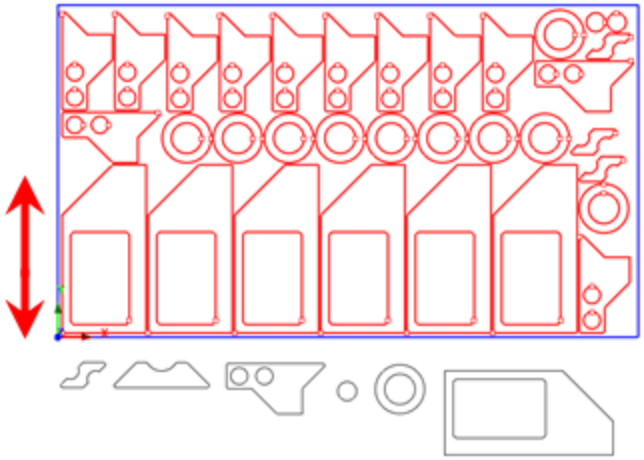


3. Then go back to the Choose Nesting Parameters tab and select Execute Nest again.

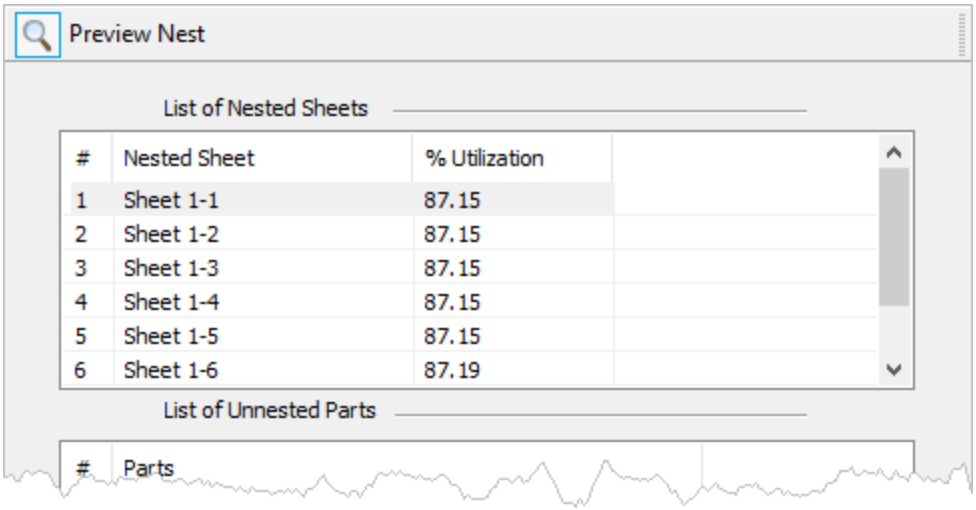


4. You are again taken to the Preview Nest tab.

   Select a sheet from the Sheets list and you see that the part is aligned vertically now.



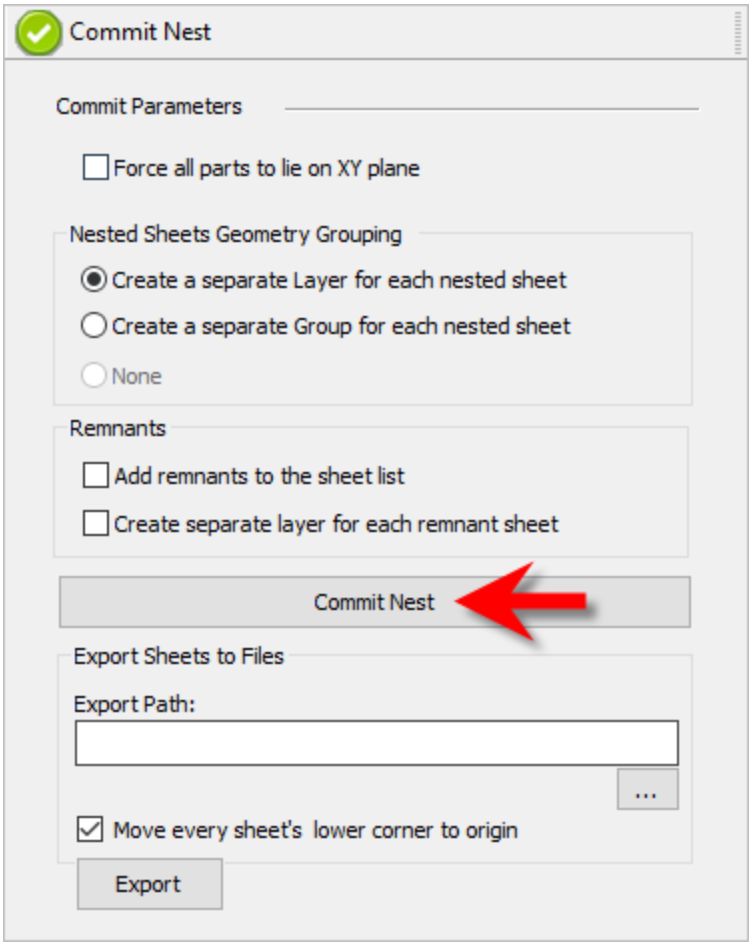
   Each time the nest is generated, the system will calculate an Efficiency Factor referred to as % Utilization of the stock material. This tells you how well each sheet is consumed by nested parts.



5.2.6 Commit the Nest

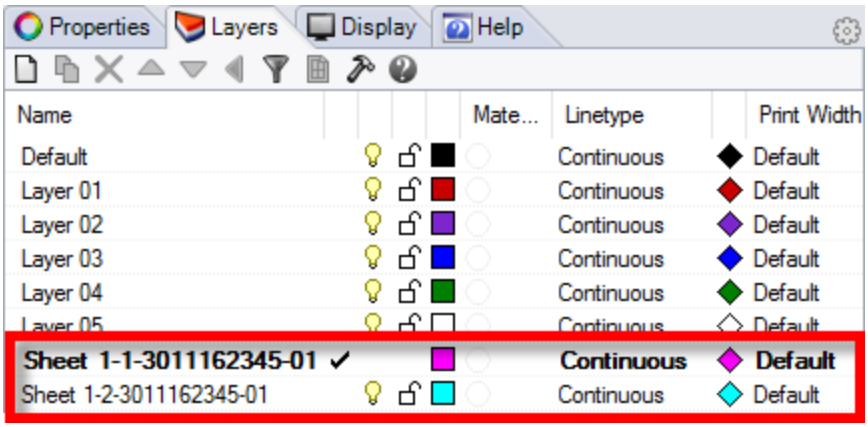
After previewing and making adjustments to your nest it is time to commit it to your drawing. This writes the geometry of the individual sheets onto individual layers in your current CAD part file.

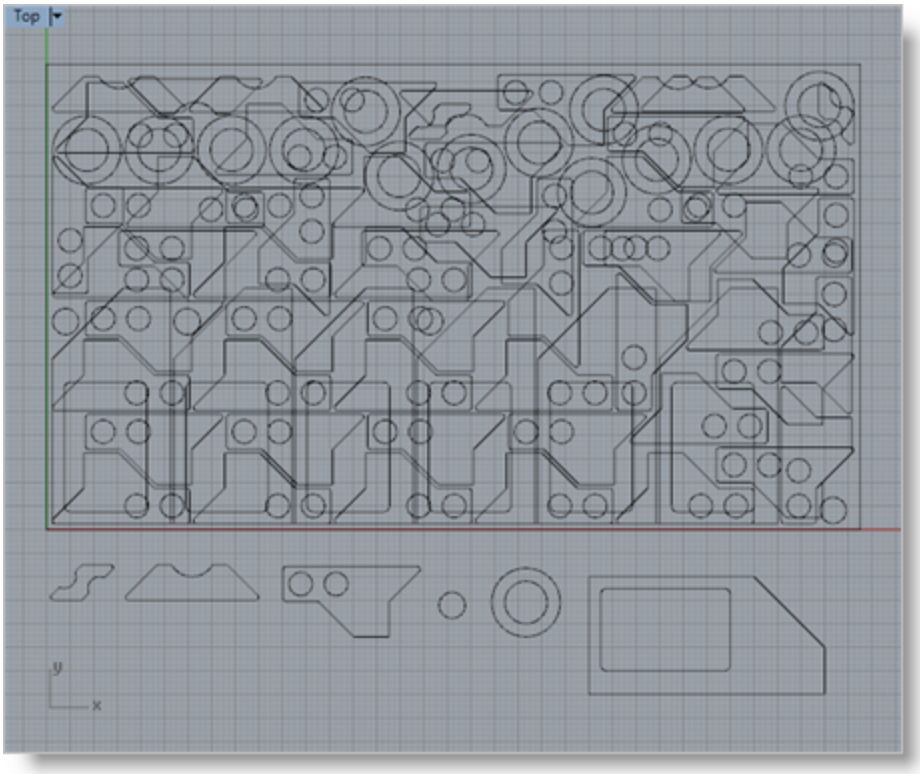
1. Select the Commit Nest tab.
2. For Nested Sheet Geometry Grouping we'll select the Separate Layer option. You can also Export the nest here.



3. When ready, select the Commit Nest button. **Note**: **Selecting this button is a commitment to create the nested geometry in the part file.**

   Layers are created for each nested sheet:





The geometry can then be used for machining or any other application that you wish. This completes this portion of the quick start guide for Rectangular Nesting in RhinoCAM-NEST. Please continue on to learn how to use True Shape nesting.

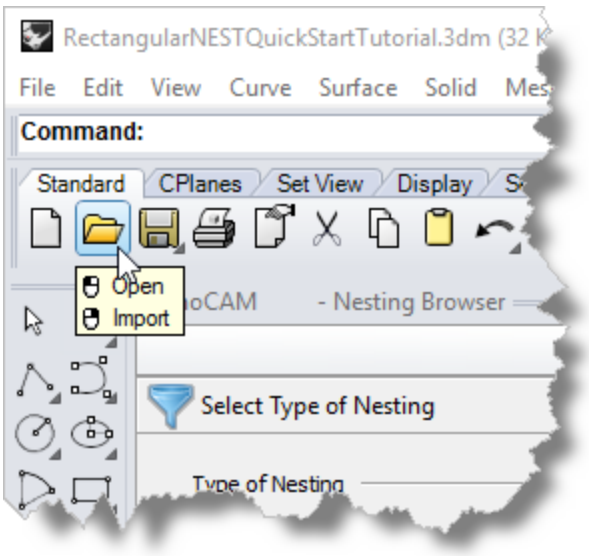
True Shape Nesting

6.1 Getting Ready

6.1.1 Load the Part File

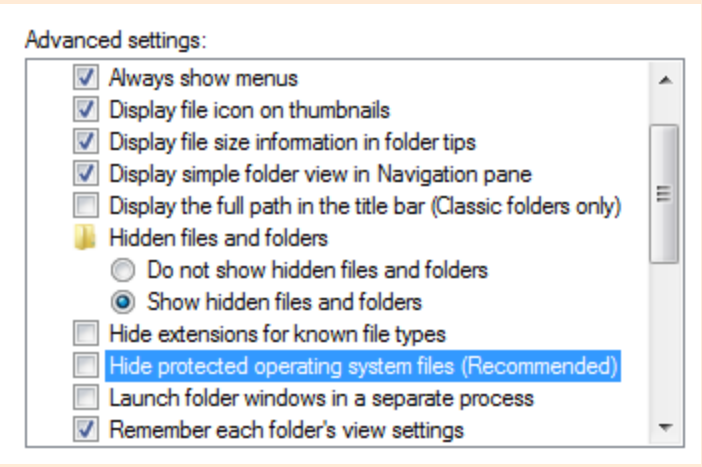
Now, let's load the Part file containing the geometry for nesting.

1. Select File / Open from the Main Menu bar, or click the Open icon from the Standard bar.



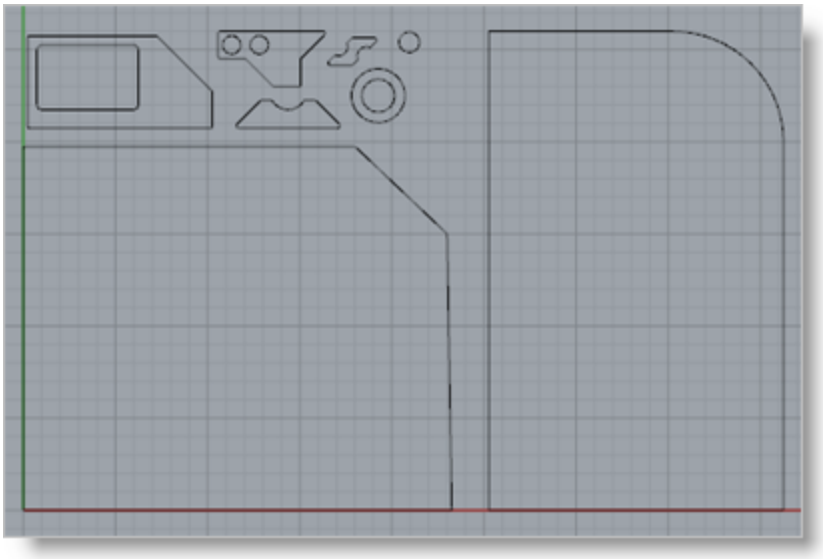
2. From the Open dialog box, select the TrueShapeNestQuickStartTutorial.3dm file from the C:\ProgramData\MecSoft Corporation\RhinoCAM 2023 for Rhino x.x\QuickStart\ folder. As mentioned before, it is advisable to make a copy of this part at a suitable alternative folder so that you have write privileges to modify the part.

> By default, the ProgramData folder is "hidden" from view. Here are the steps to Show hidden files and folders:
>
> 1. For Windows 8 users: Go to Control Panel > Appearance and Personalization > Folder Options.
> For Windows10 users: Go to Control Panel > Appearance and Personalization > File Explorer Options.
> 2. Select View tab and under advanced settings select Show Hidden files and folders, clear the check boxes for:
>
> - Hide extensions for known file types
> - Hide protected operating system files (Recommended)



3. Click Apply and OK.

The part appears as shown below.



6.1.2 Basic Steps

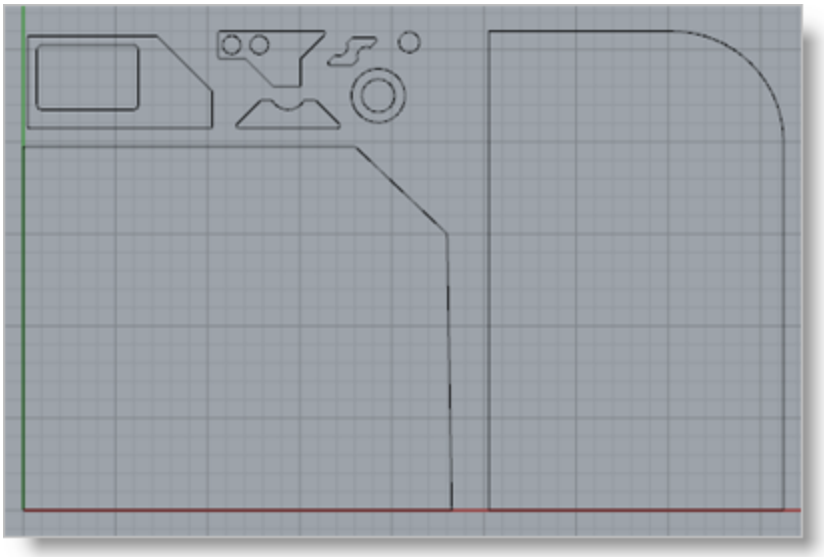
The following basic steps are included in the nesting process:

1. First, we load the RhinoCAM-NEST module and define the Nesting Type to be performed.
2. Then we open the Rhino drawing where the stock material and production parts are staged.
3. Then we select the Sheets to Nest our parts in and then select the Parts to Nest.
4. We choose our desired Nesting Parameters.
5. Then we Preview the Nest making any final adjustments.

6. Finally, we Commit the Nest, creating the actual nested sheet geometry.

6.1.3 Staging your Parts

Let's take a look at what we've done in Rhino to prepare for nesting. You can refer to this as the Staging Process. We have brought together and located on the screen, the geometry that we want in the nesting process.



As you can see, we have one or more shapes that represent the stock or the remnant material. We also have one of more shapes that represent the production parts that we want to nest within the stock material.

Here are two tips to consider when staging your parts.

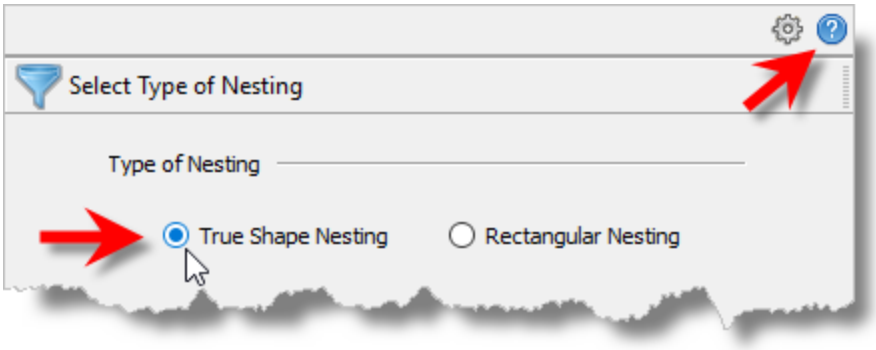
> First, when you stage your parts, stage them around the outside of the stock material, not within the stock material. The Nesting software will place the parts in the stock for you.

> Secondly, do not place parts inside the cutouts of larger parts as this may confuse the Nesting software into thinking that it is a detail of the larger part. Keep all of your parts separated.

6.2 Creating a True Shape Nest

6.2.1 Choose Nesting Type

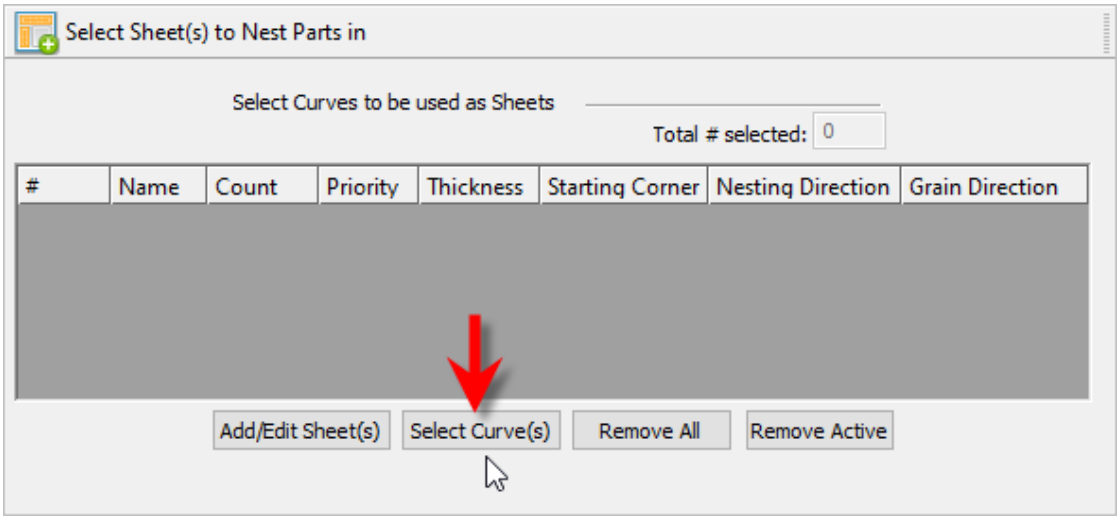
1. Now, from the nesting browser, choose the Select Type of Nesting tab.



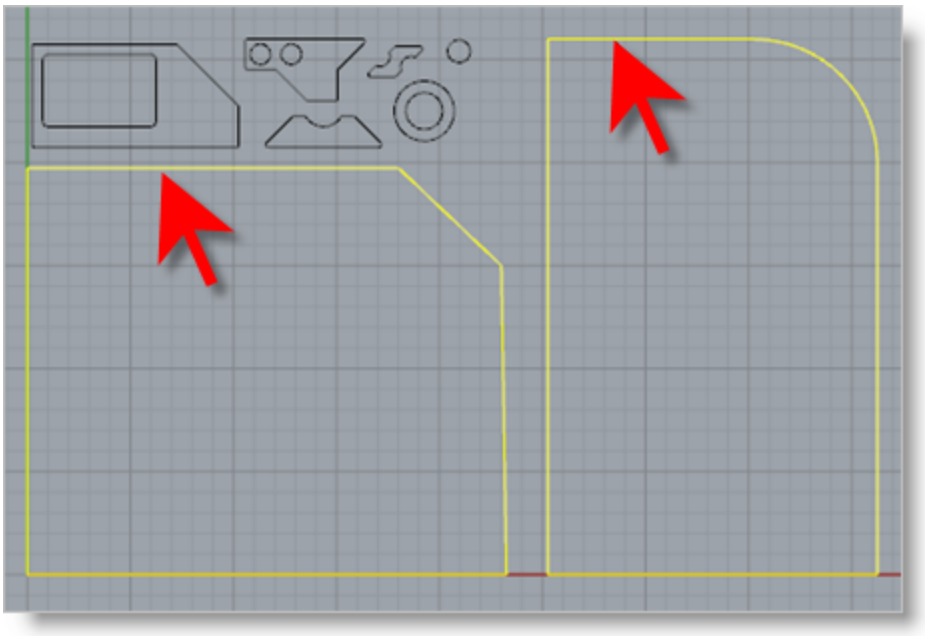
2. In this guide we will be demonstrating True Shape Nesting so we will select that option. In True Shape Nesting, the actual perimeter of each part is analyzed for orientation and placement on each sheet.
3. You will notice a Help icon located at the top-right of the Nesting Browser. Selecting it will display documentation for each option on the active tab.

6.2.2 Define Your Sheet Geometry

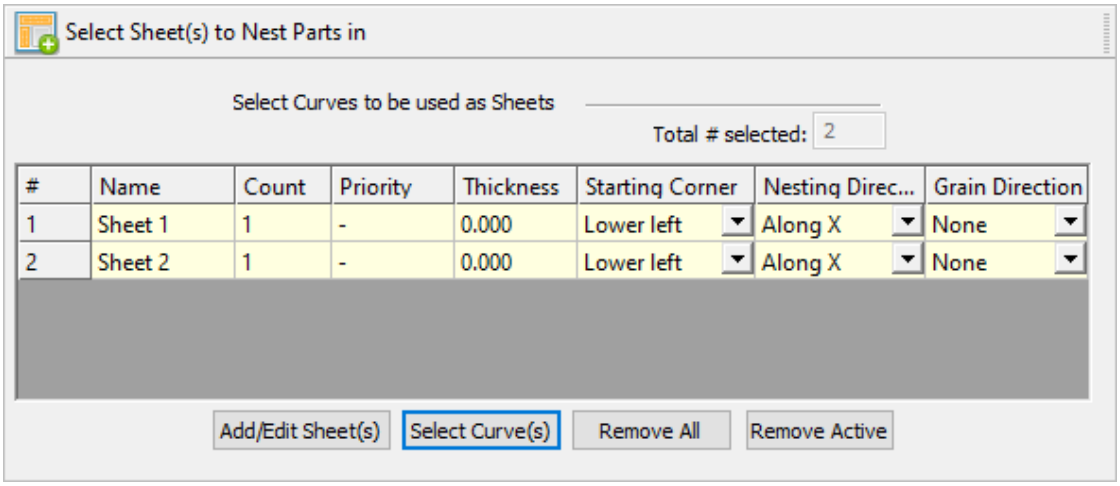
1. From the Select Sheets tab, pick Select Curves.



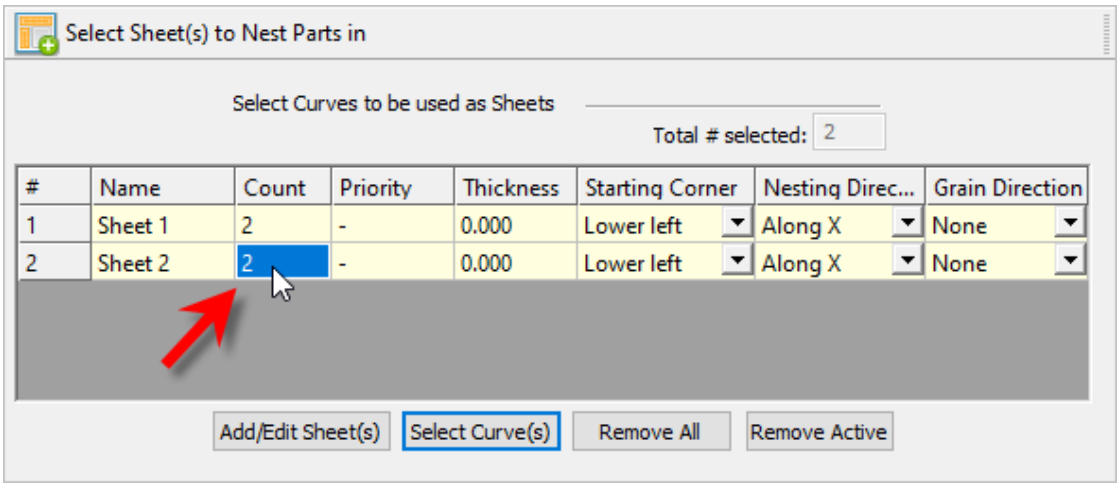
2. Now, we select the shapes that represent the stock material and right-click or press Enter to end the selection.



3. Notice that entries are made into the table for Sheet 1 and Sheet 2.



4. For the Count column, let's enter 2 sheets of each of these for the sake of nesting..



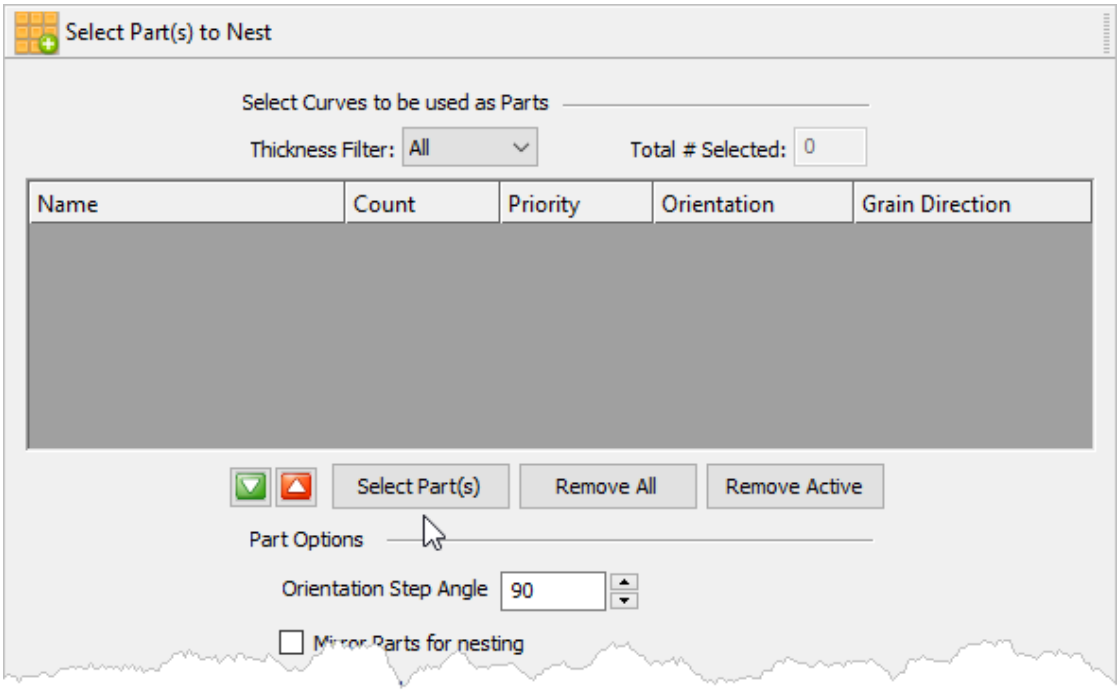
The Starting Corner and Nesting Direction columns allow you to control where the nesting should begin and in what direction it should proceed. This is good for remnant control.

We'll come back to the Grain Direction column is little bit later.

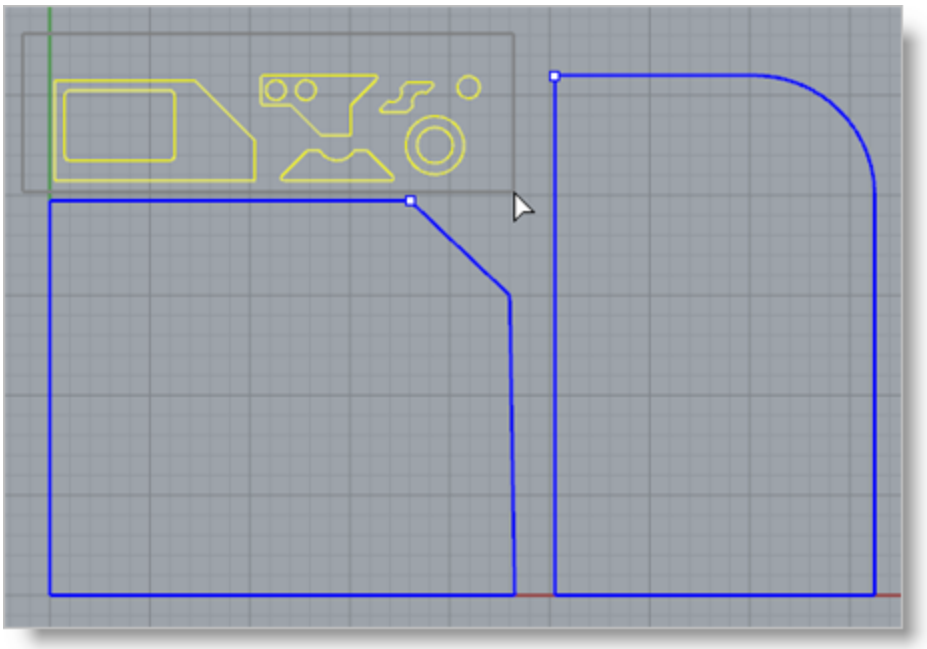
6.2.3 Define Your Parts to Nest

Next, we'll select our Parts to be Nested.

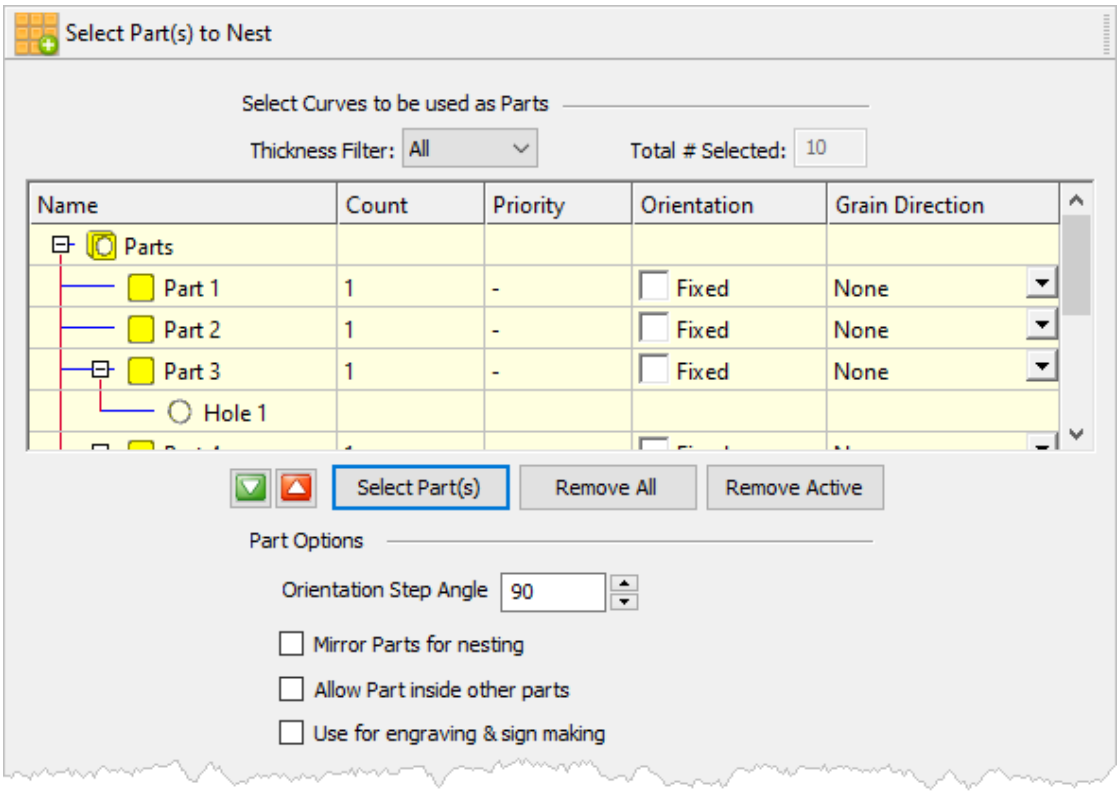
1. Pick the Select Part(s) to Nest tab of the Nesting Browser and then pick Select Part(s).



2. Then we will window select all of our part geometry and then right-click or press Enter to add each part to the Parts List of the Nesting Browser.



IMPORTANT NOTE: When parts are added to the NEST Parts List they are assigned an arbitrary number (i.e., Part 1, Hole 2, Part 3, Hole 1, Hole 2, etc.) depending on how they are selected. It is important to note that the part numbers you see on your screen may not be the same numbers you see in this guide. Please keep this in mind when you are instructed to select a part from the parts list.

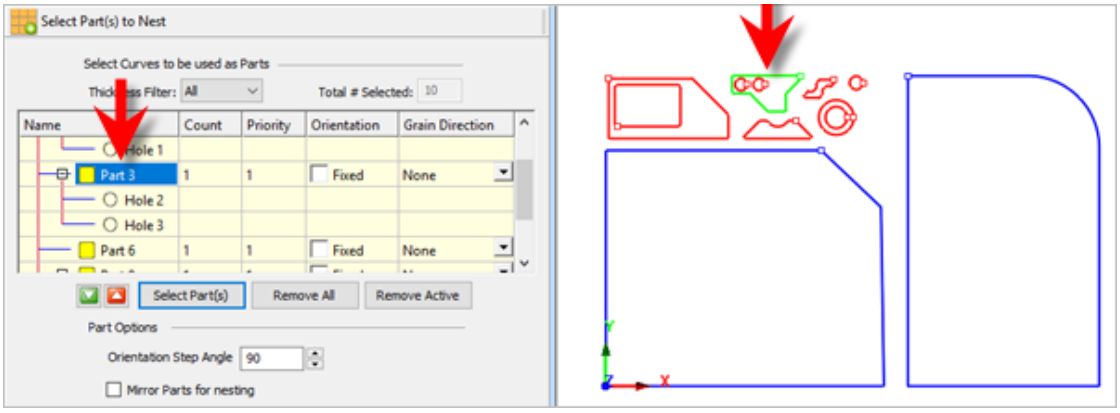


The Nesting software determines the exterior and interior of each selected part.

Note that the exact sequence numbering that you see may differ from the image above.

As we can see in the Parts List, each exterior closed curve is defined as one Part. Any interior closed curves are defined as Holes within each Part.

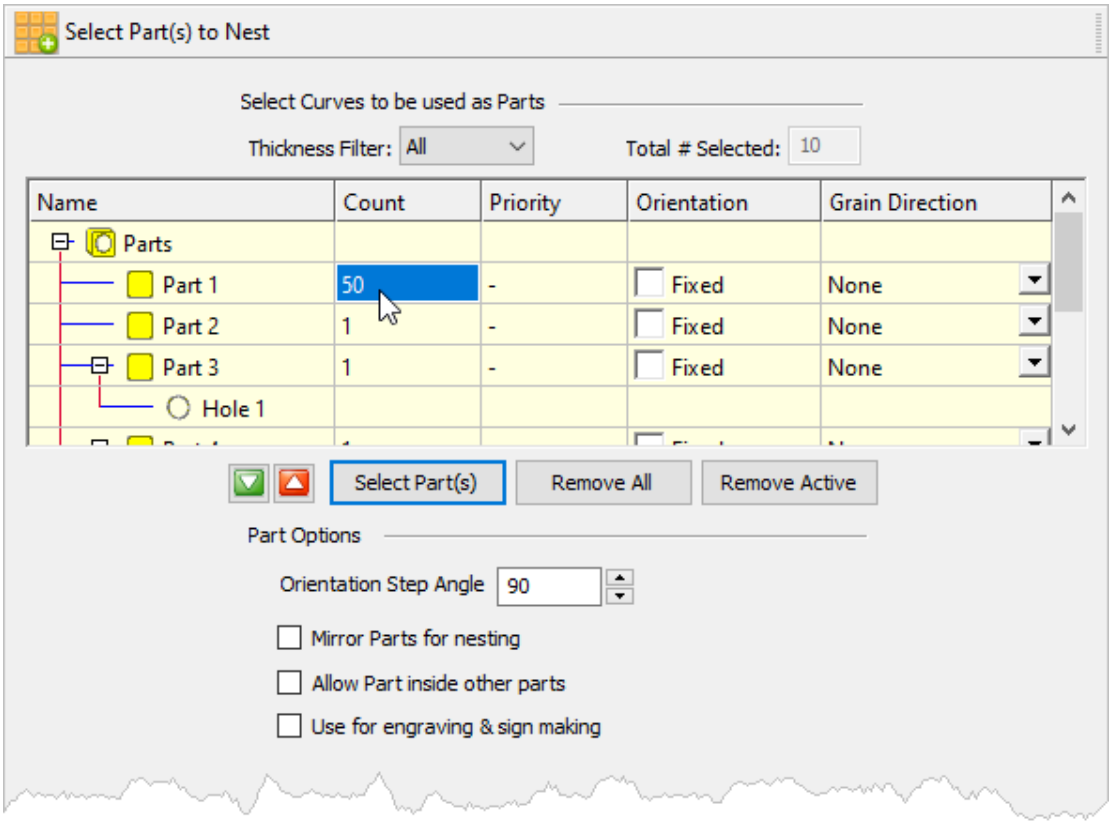
3. If we select a Part from the Parts List we see that the Part is highlighted in the graphics window.



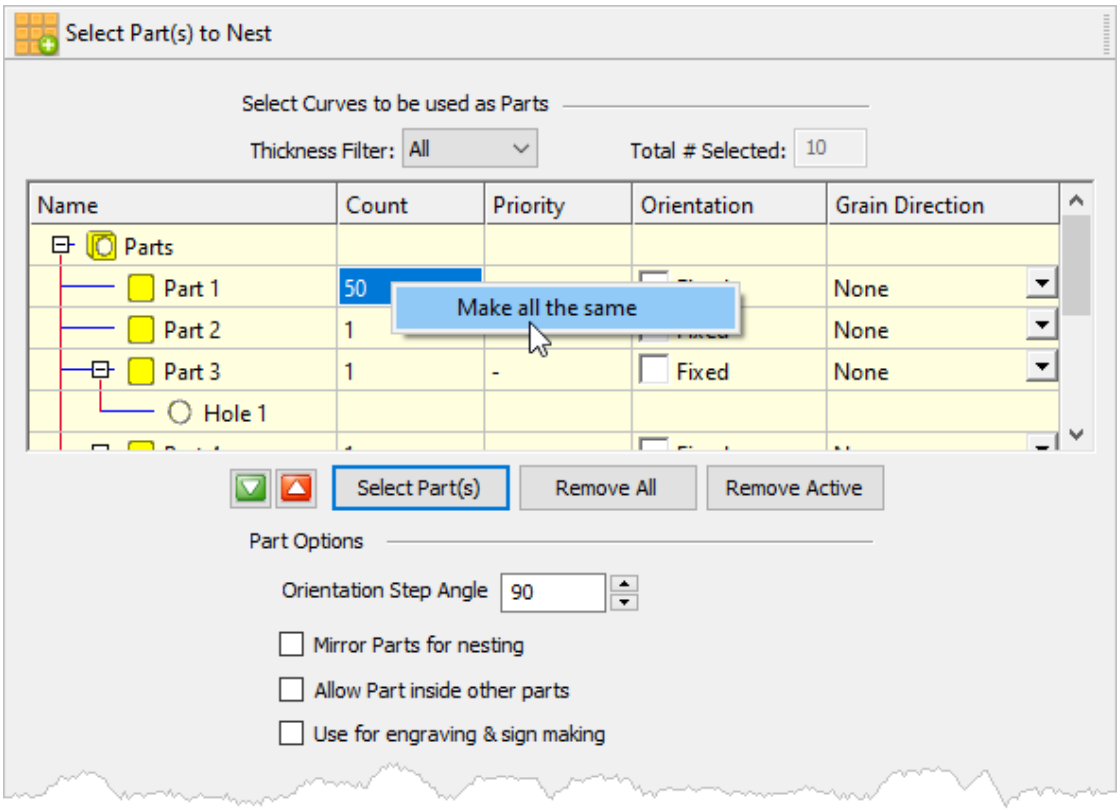
Note that the exact sequence numbering that you see may differ from the image above.

4. Selecting a Hole under a part in he Parts List highlights the associated interior curve of that part in the graphics window. As you can see, when a part has multiple interior cutouts, each is listed in the Parts List as Hole #, Hole #, etc., under its associated Part.

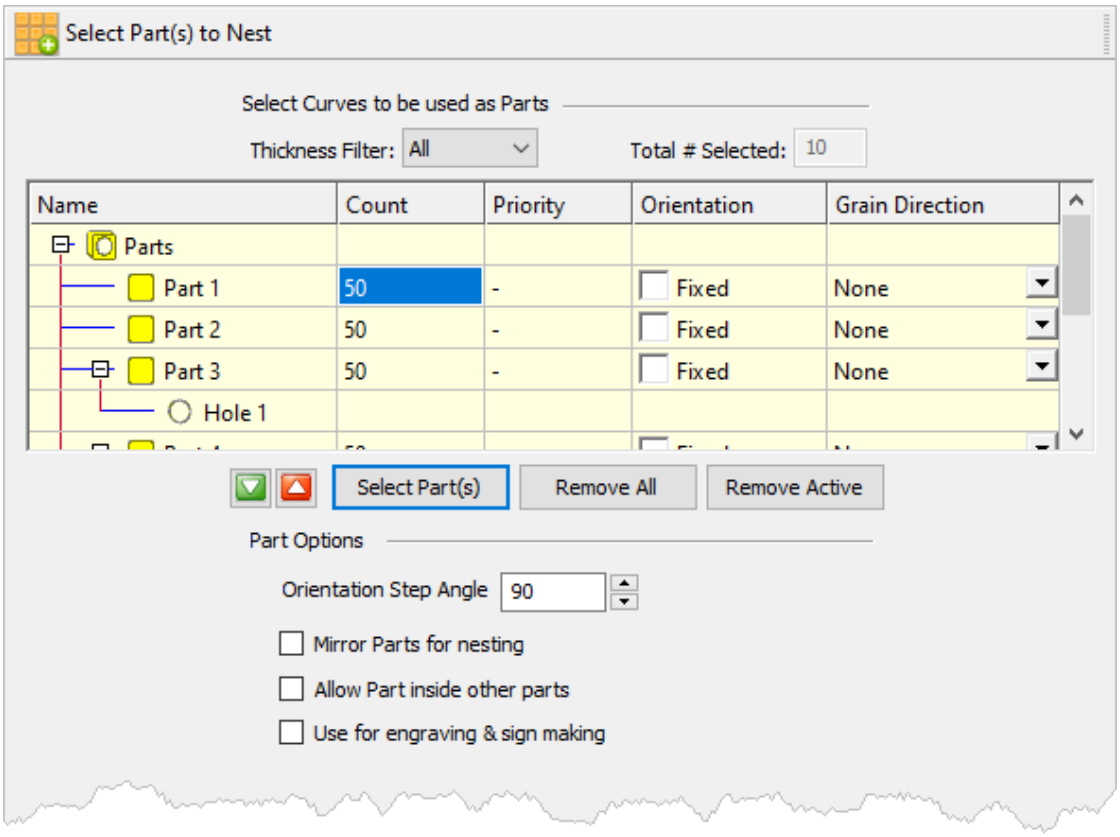
5. Now we'll enter the Count for each of the parts that are needed in the nest. Select the Count field for Part 1 and enter 50 and then press enter.



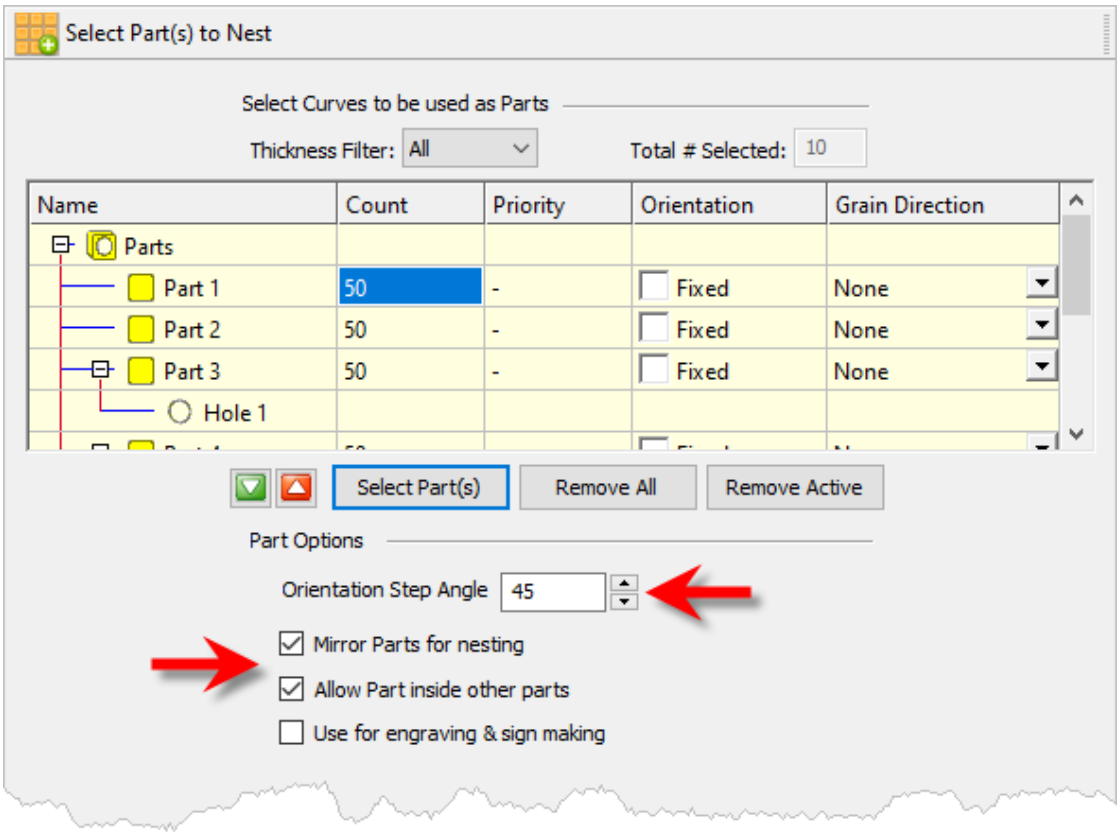
6. Now right-click on 50 and select Make All the Same.



You now see that all parts have the same count of 50.



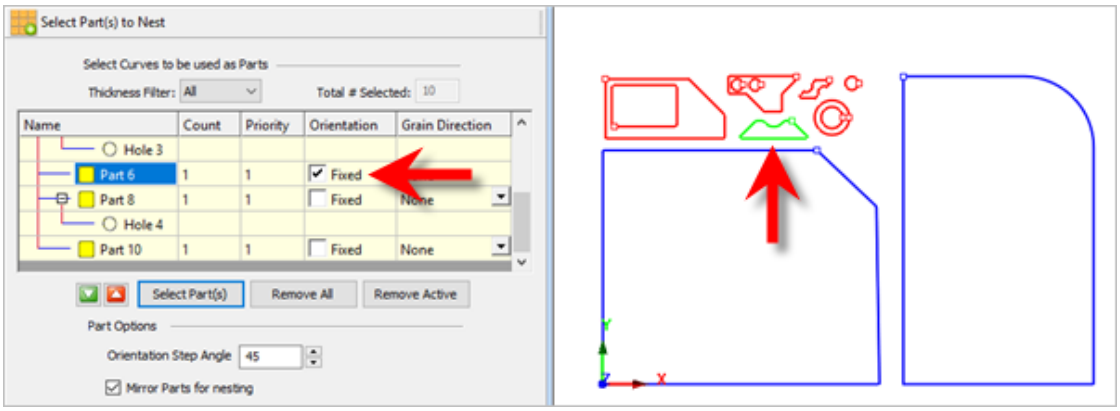
6. There are Part Options below the table that will apply to all of the parts.



7. Let's change the Orientation Step Angle to 45 degrees. This means that Nesting software will attempt to rotate any of the parts in 45 degree increments to achieve a better fit.
8. Let's enable the Mirroring Parts for nesting option.
9. Also enable the Allow Part inside other parts option. This will allow smaller parts to be nested within the cutouts of larger parts.
10. If you have a part that you do not want rotated or mirrored, such as the one shown below, you can check the box next to Fixed in the Orientation column of the Part List.

    The orientation of this part will be maintained in the exact orientation that it is staged throughout the nesting process.

    Your dialog should now look similar to this:

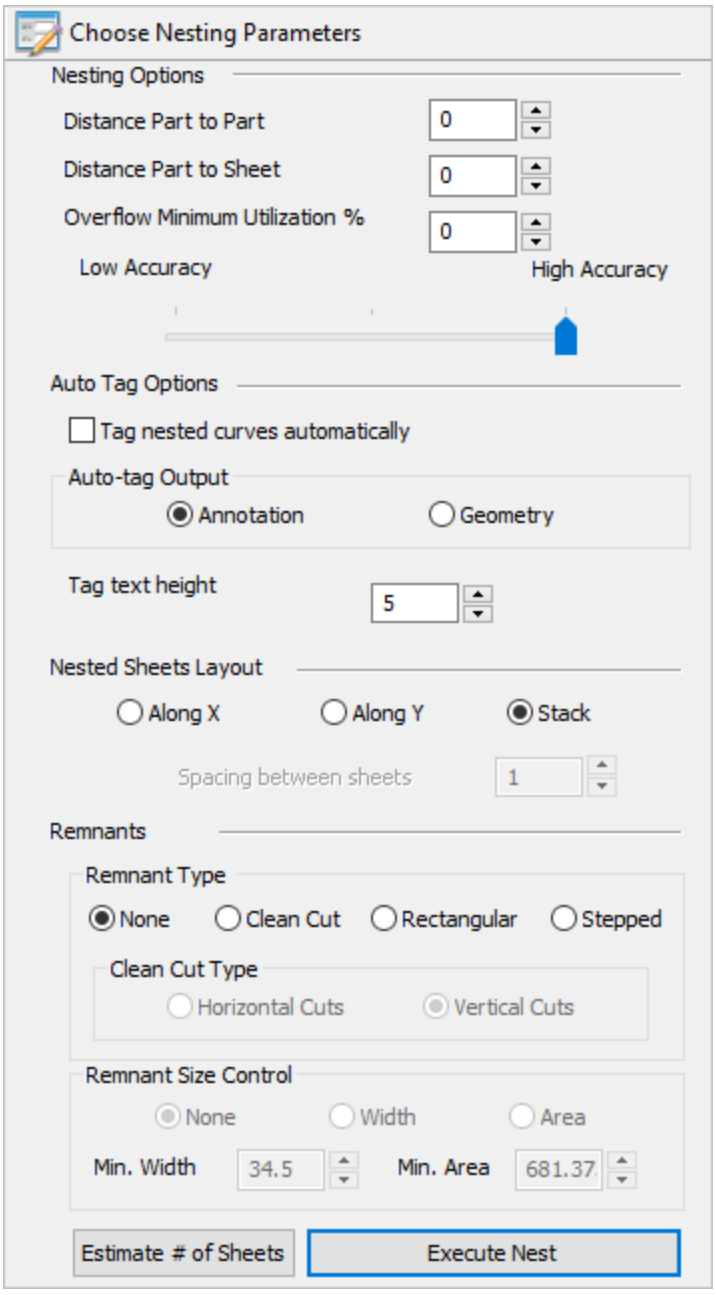


6.2.4 Choose Nesting Parameters

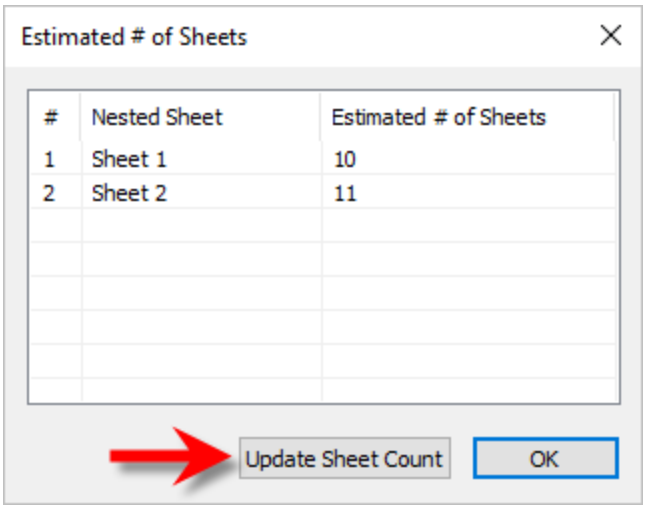
Now, we'll select the Choose Nesting Parameters tab of the Nesting Browser to set two final parameters.

1. The first one sets the Distance Part to Part. We'll enter 0.15 there.
2. The second is the Distance Part to Sheet (i.e., the distance between the outer-most parts and the outer edge of the stock material). We'll set that to 0.25.

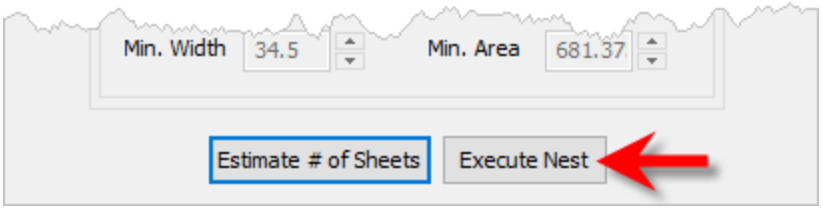
   There are also options to automatically Tag each nested part and layout options for arranging your nested sheets.

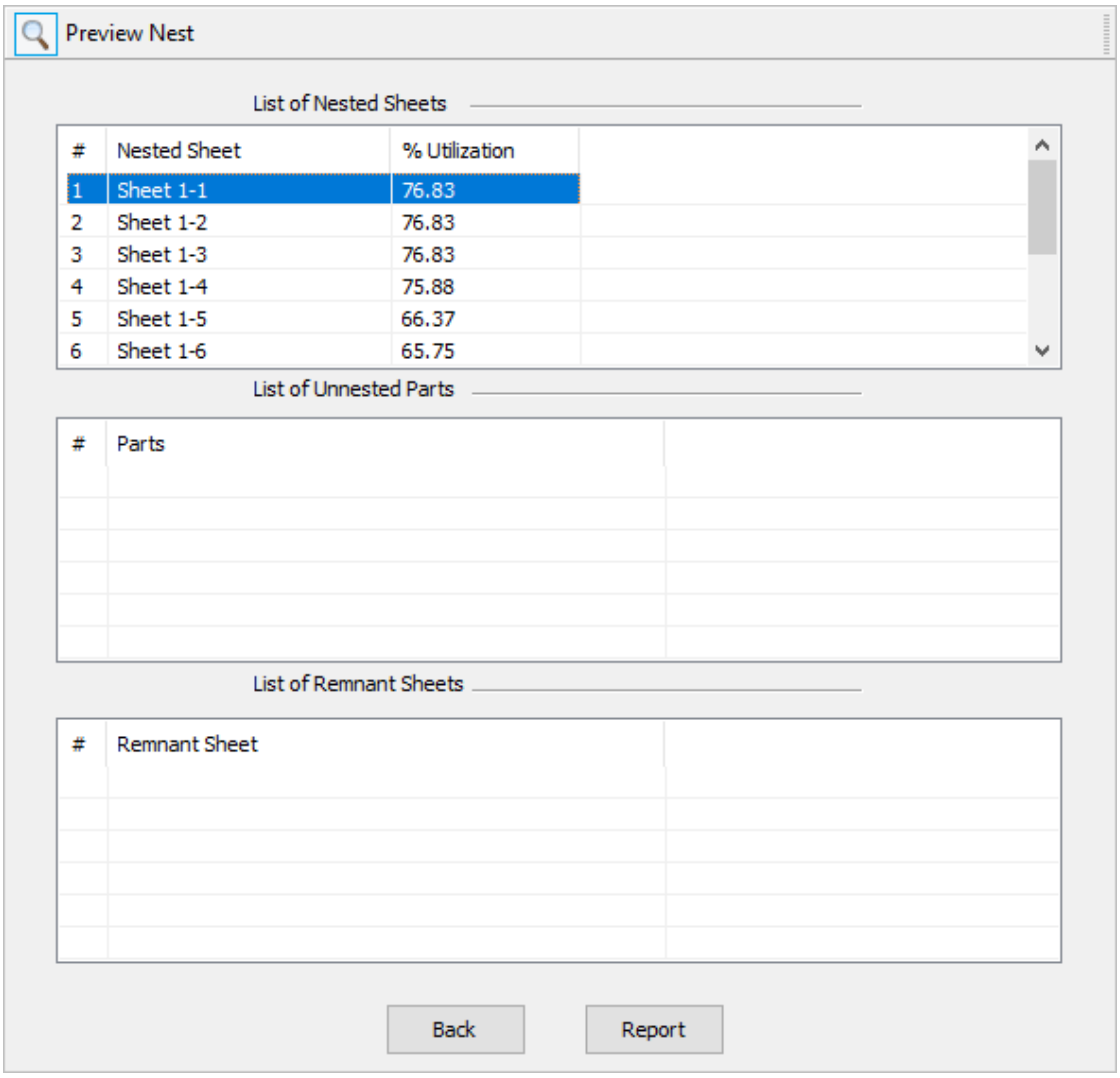


3. Now we select Estimate # of Sheets to display the dialog.

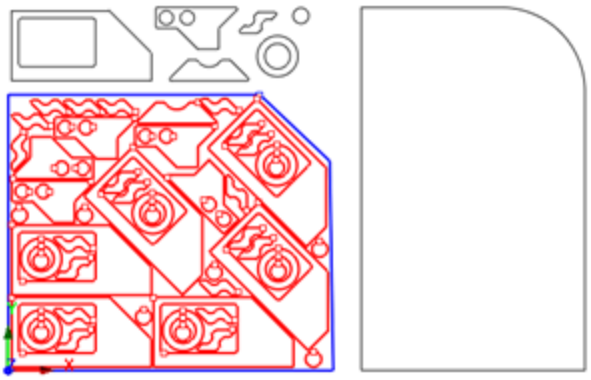


4. We see that 10 of Sheet 1 and 11 of Sheet 2 will be needed so select the Update Sheet Count button and then pick OK. If you go back to the Select Sheet(s) tab you will see that the count was updated.
5. Now select the Execute Nest button and you are automatically moved to the Preview Nest tab where you can see the sheets listed.

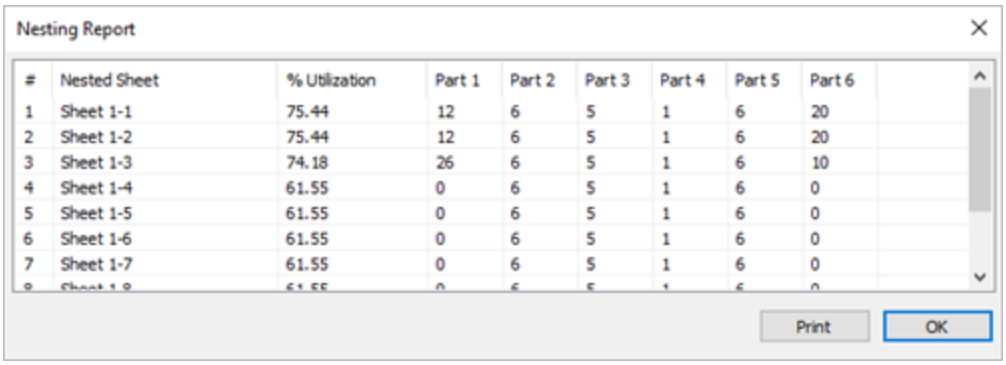




You can select each sheet to see its preview in the graphics screen.



6. Select the Report button to display the nest report.

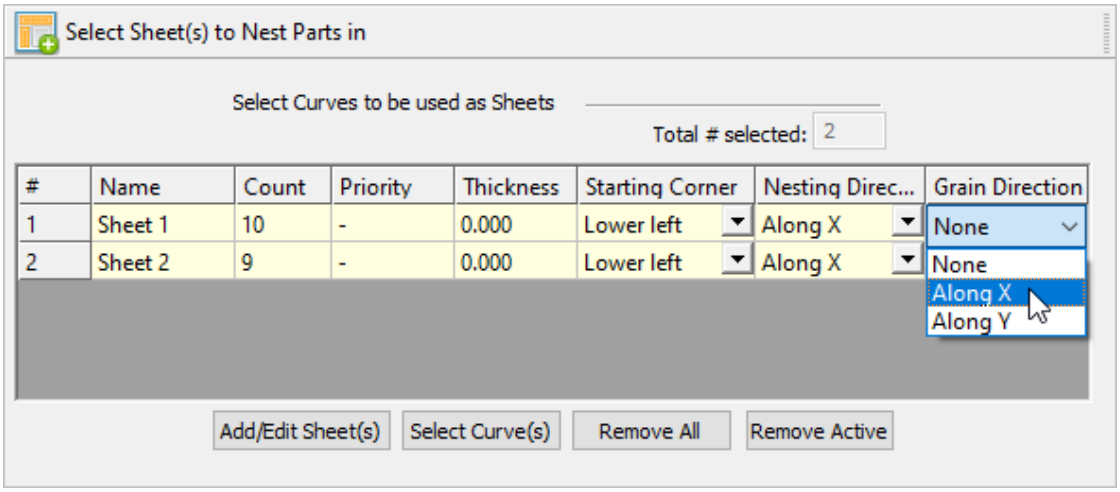


7. Pick OK to close the report dialog.

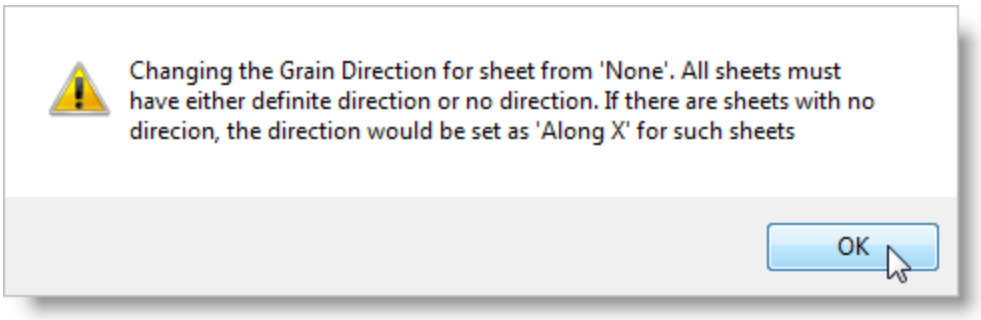
6.2.5 Grain Direction Control

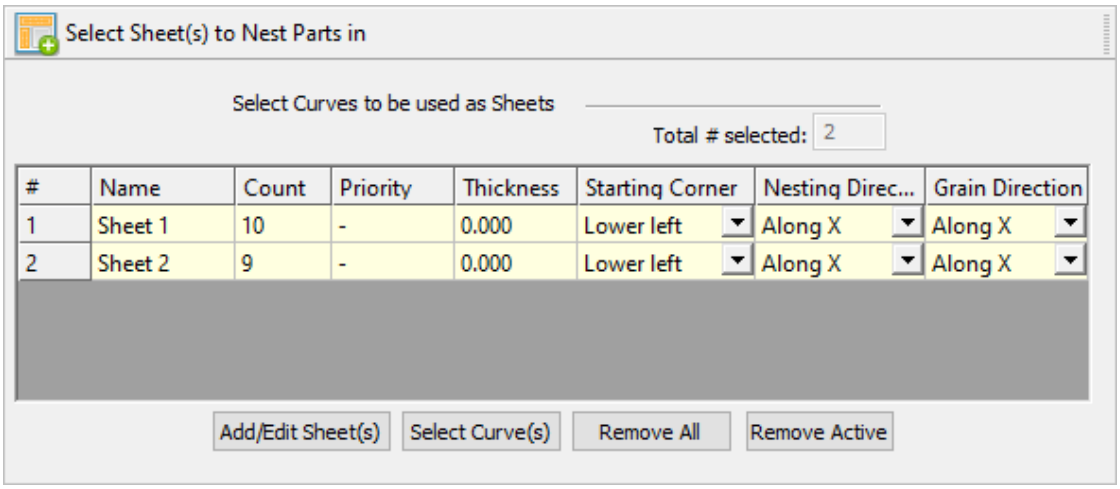
The last thing we would like to do is to impose a Grain Direction control on the largest part to force it to be vertical. In order to do that we need to specify the Grain Direction on the stock material as well as that part.

1. First we'll go back to the Select Sheets(s) to Nest Part in tab and set the Grain Direction to Along X.

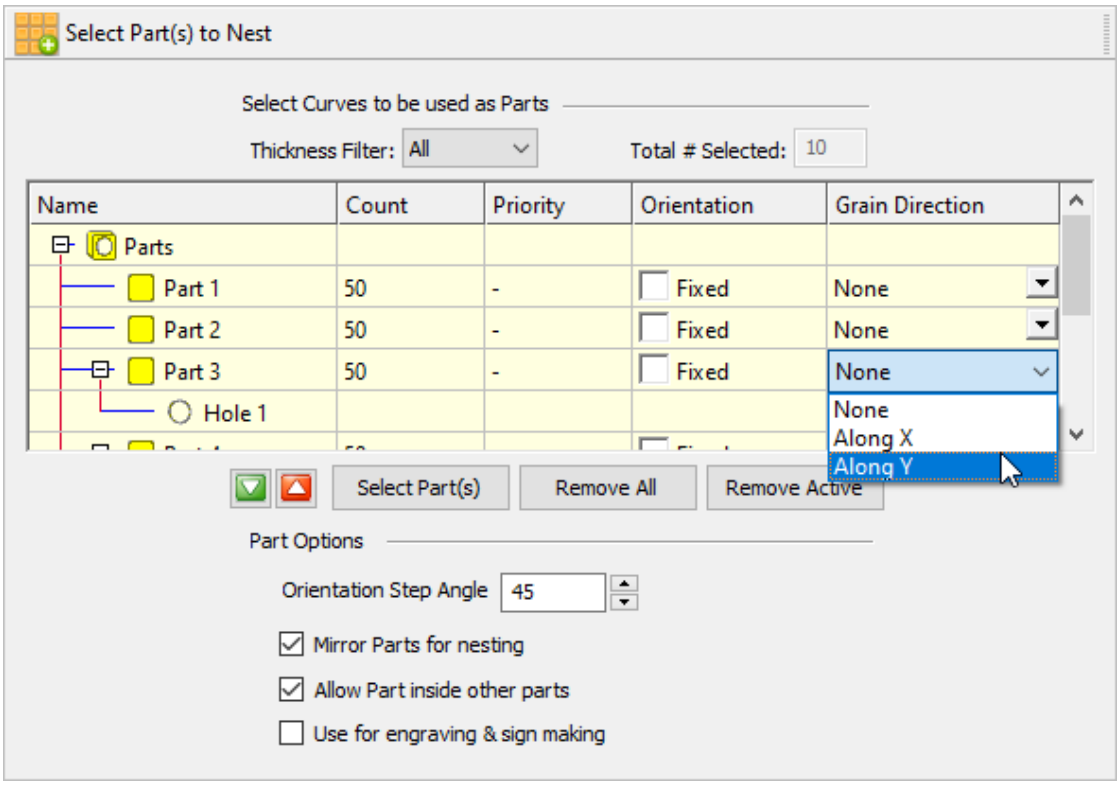


2. When the message displays warning you that all sheets must have the same Grain Direction, pick OK and the Grain Direction for both sheets will be changed. This is what we want.

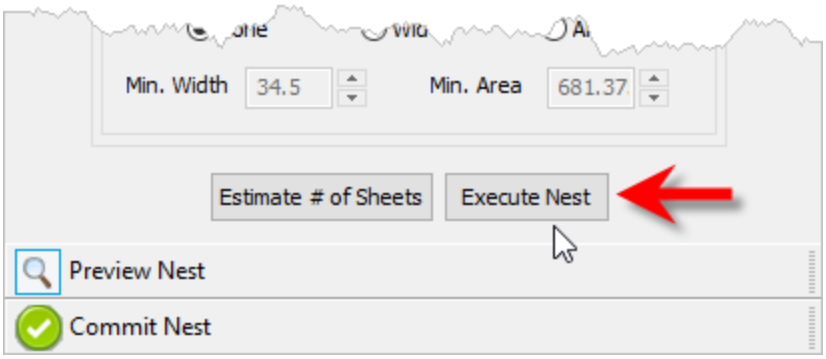




3. Now, on the Select Parts to Nest tab we will set the Grain Direction on the part in question to be Along Y. Note that your actual Part # may differ from the dialog images shown here.

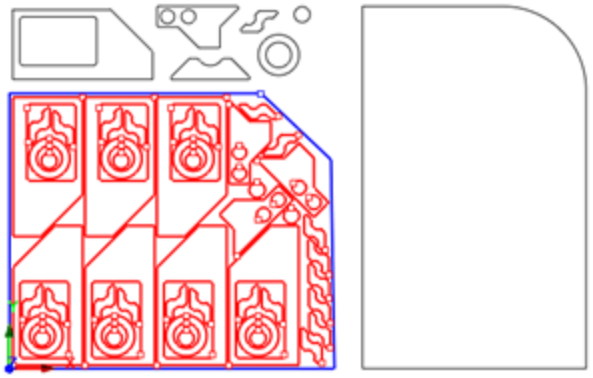


4. Then go back to the Choose Nesting Parameters tab and select Execute Nest again.

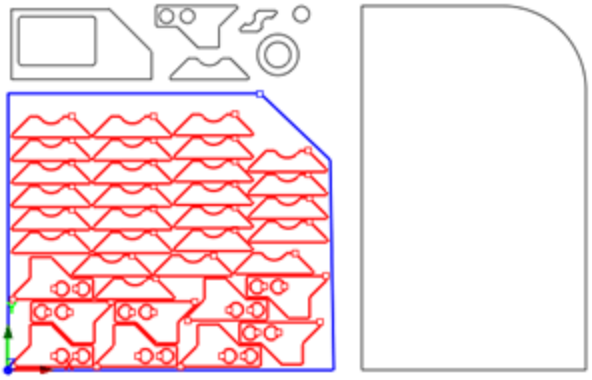


5. You are again taken to the Preview Nest tab.

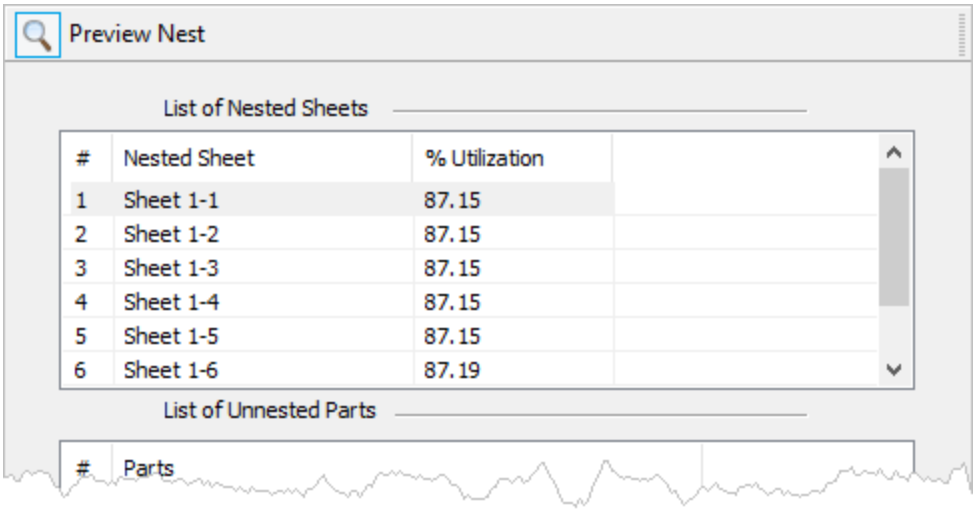
   Select a sheet from the Sheets list and you see that the part is aligned vertically now.



While previewing each sheet you will also notice that the part we Fixed in its orientation is indeed maintained.



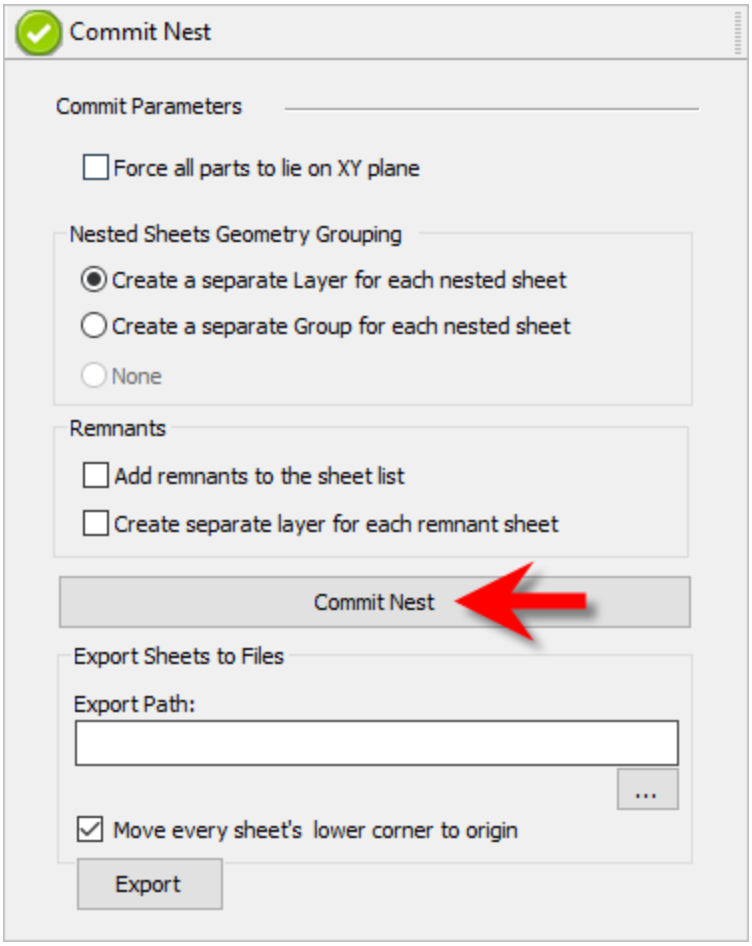
Each time the nest is generated, the system will calculate an Efficiency Factor referred to as % Utilization of the stock material. This tells you how well each sheet is consumed by nested parts.



6.2.6 Commit the Nest

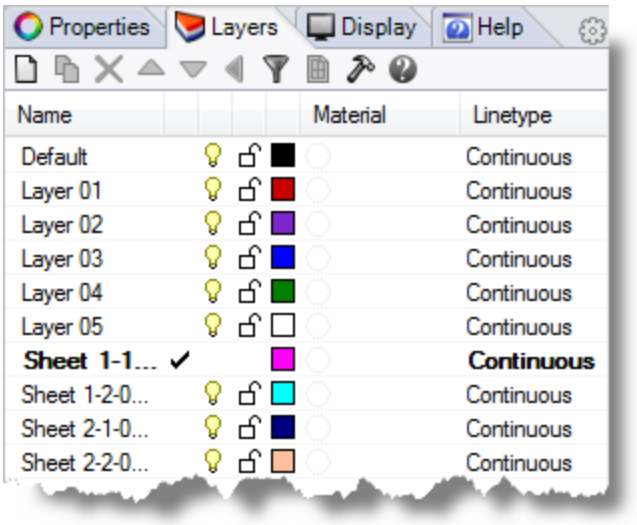
After previewing and making adjustments to your nest it is time to commit it to your drawing. This writes the geometry of the individual sheets onto individual layers in your current CAD part file.

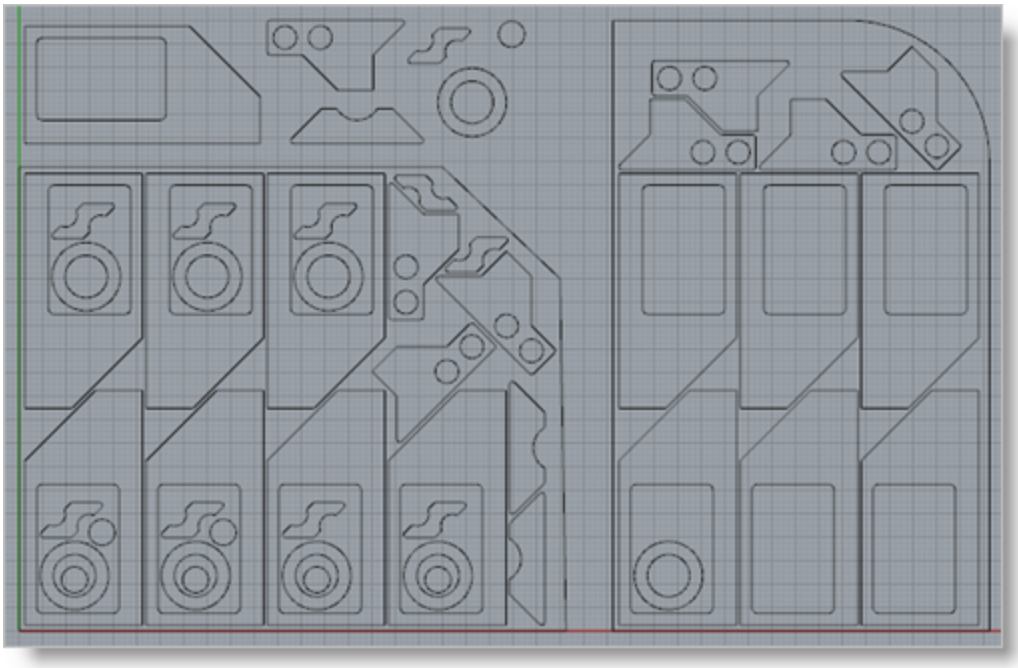
1. Select the Commit Nest tab.
2. For Nested Sheet Geometry Grouping we'll select the Separate Layer option. You can also Export the nest here.



3. When you are ready, select the Commit Nest button. Depending on your nest size this may take a minute to complete. **Note**: **Selecting this button is a commitment to create the nested geometry in the part file.**

   Once completed, the layers are created for each nested sheet:





The geometry can then be used for machining or any other application that you wish. This completes this portion of the quick start guide for True Shape Nesting in RhinoCAM-NEST. Please be sure to visit the previous section to also learn about Rectangular Nesting.

Where to go for more help

Download this PDF Guide for a list of the available RhinoCAM-NEST Resources.

2025 RhinoCAM-NEST Resource Guide

The 2025 RhinoCAM-NEST Resource Guide!

18 Pages

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