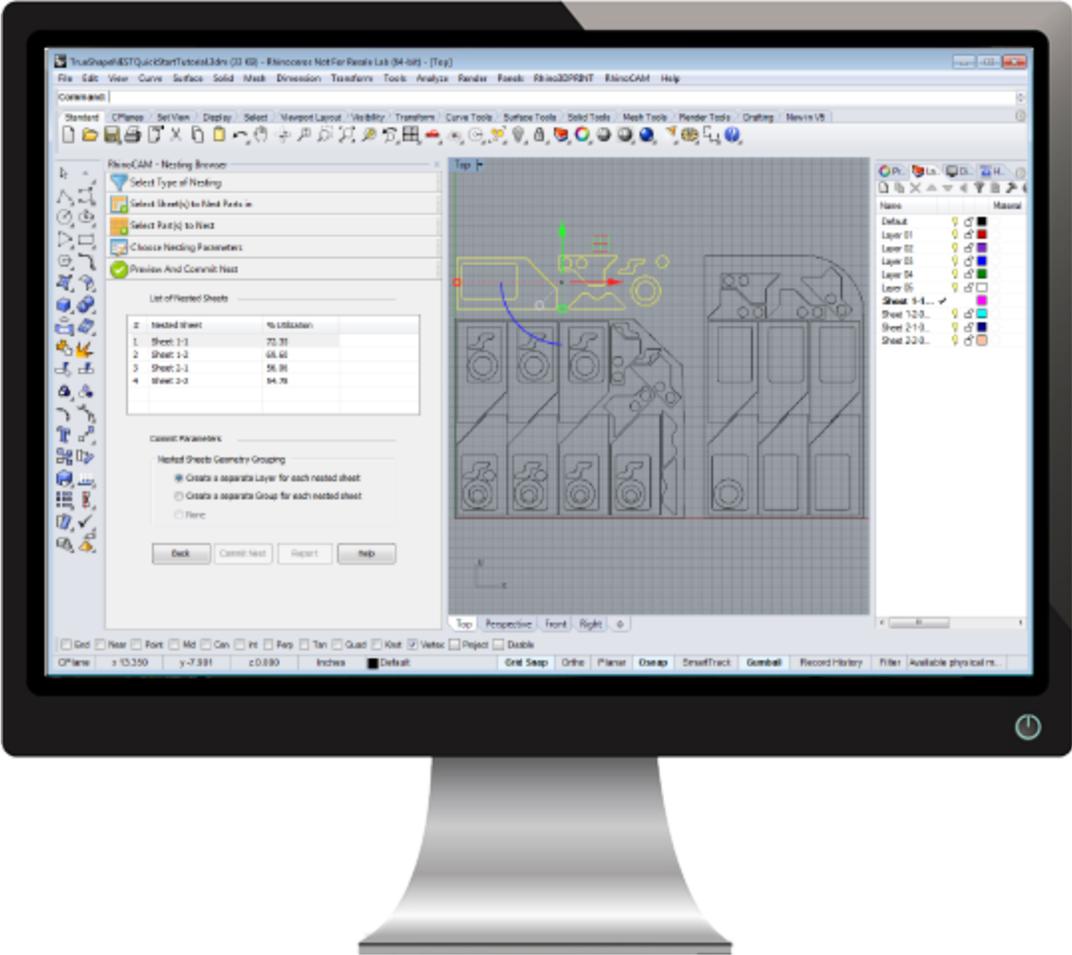


# RhinoCAM-NEST© 2017 Quick Start Guide

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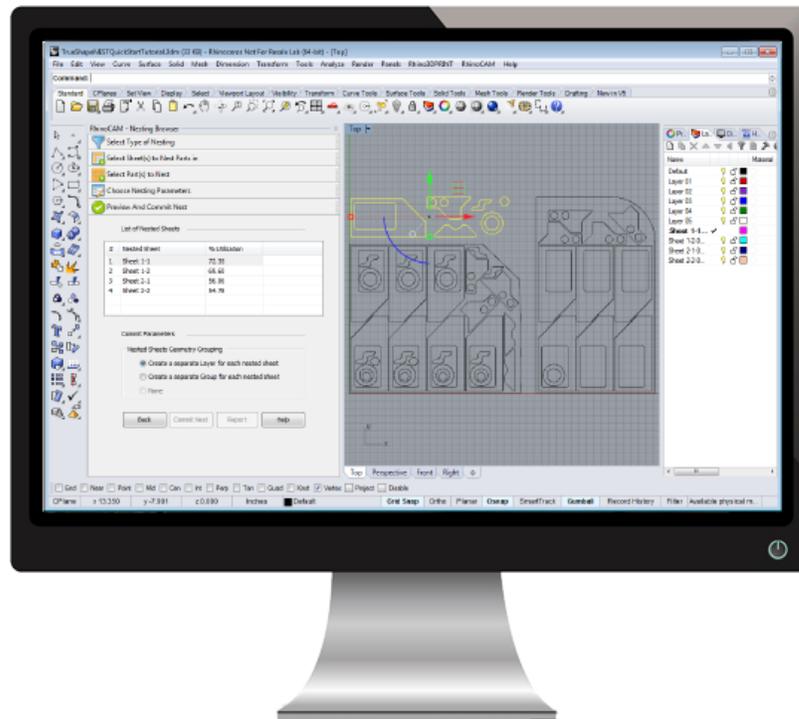


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## About RhinoCAM-NEST

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.

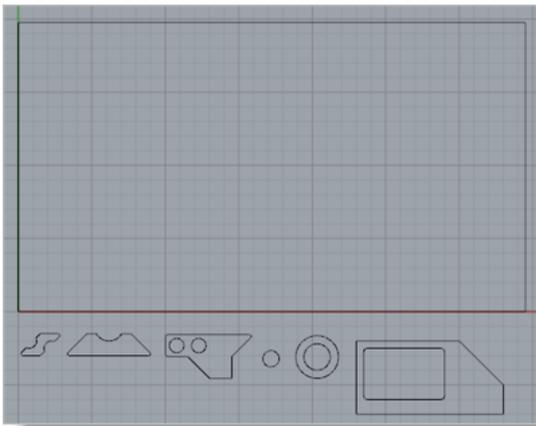


RhinoCAM-NEST 2017 Quick Start Guide

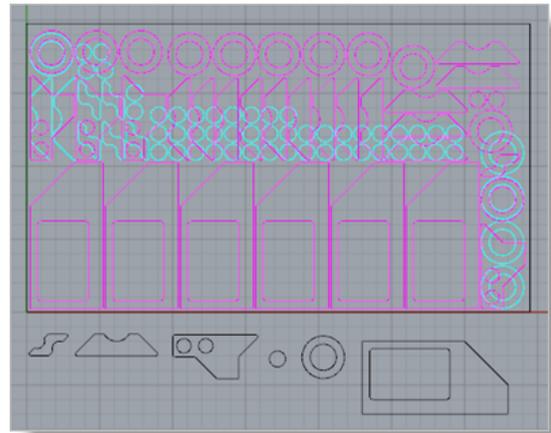
## Using this Guide

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.

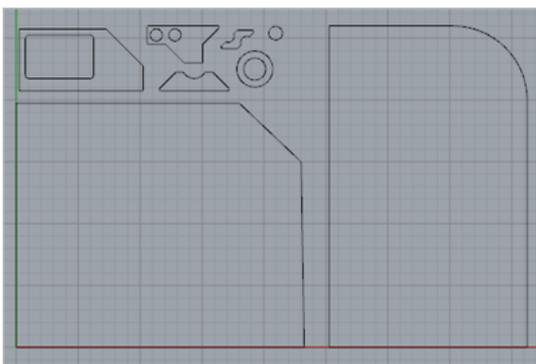
This guide has two associated [Rhino](#) files each for both the [Rectangular](#) and the [True Shape](#) nesting sections that you can find located in the [QuickStart](#) folder under the [RhinoCAM-NEST](#) installation folder. The first file is a completed file that contains the committed nest CAD 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.



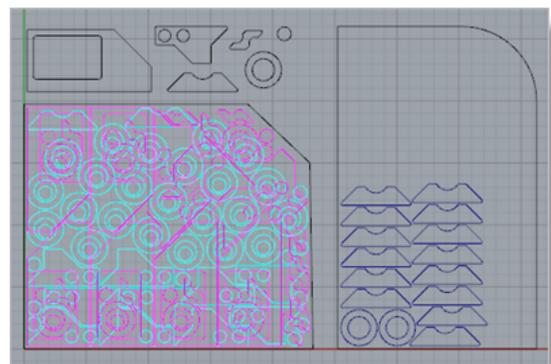
RectangularNestQuickStartTutorial.3dm



RectangularNestQuickStartTutorial\_Completed.3dm



TrueShapeNestQuickStartTutorial.3dm



TrueShapeNestQuickStartTutorial\_Completed.3dm

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## Useful Tips

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

1. Copy the tutorial part files in a location other than the installation folder to make sure you have read/write privileges to the files.
2. Once you start working with the tutorial file, save your work periodically!
3. 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.
4. Most of all have fun!

## About RhinoCAM-NEST

### 4.1 Running RhinoCAM

Locate the [Rhinceros 5](#) shortcut on your desktop and double click to launch the application.

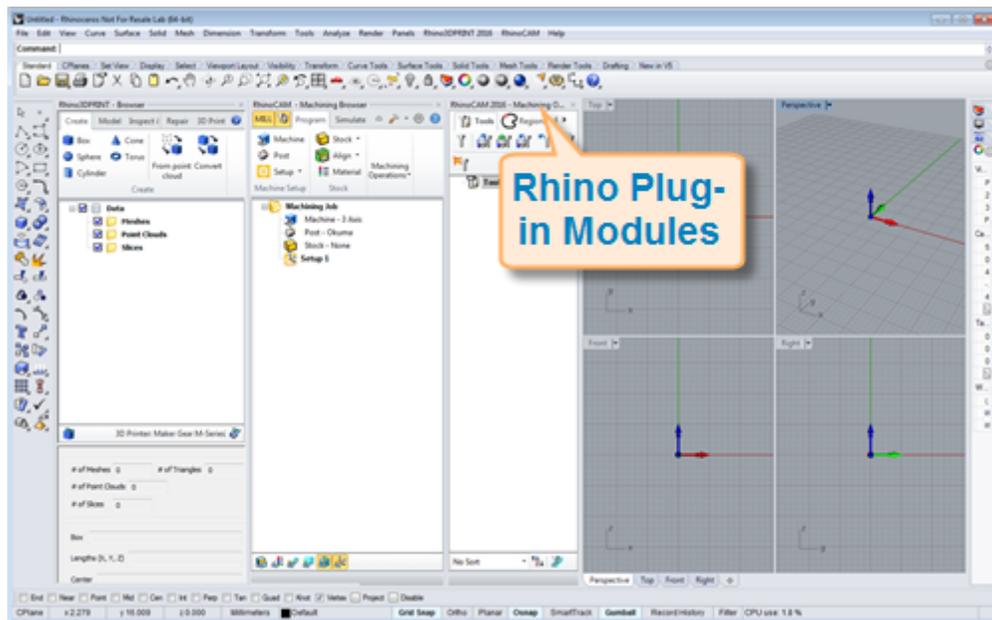
Alternatively you can also click on the Windows [Start](#) button and select [All Programs](#). Go to the program group containing [Rhinceros 5](#). (The name of this program group will usually be called [Rhinceros 5](#), unless you specified otherwise during setup.)

Once you locate the program group, select it and then select [Rhinceros 5](#) to launch the application.

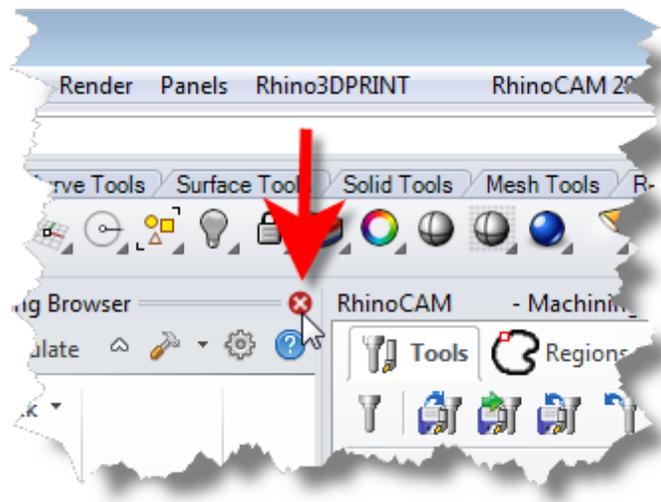
If the installation was successful, upon launching of [Rhinceros 5](#) you should observe a menu entry called [RhinoCAM](#) in the main menu bar of [Rhino](#).

### 4.2 About the RhinoCAM Display

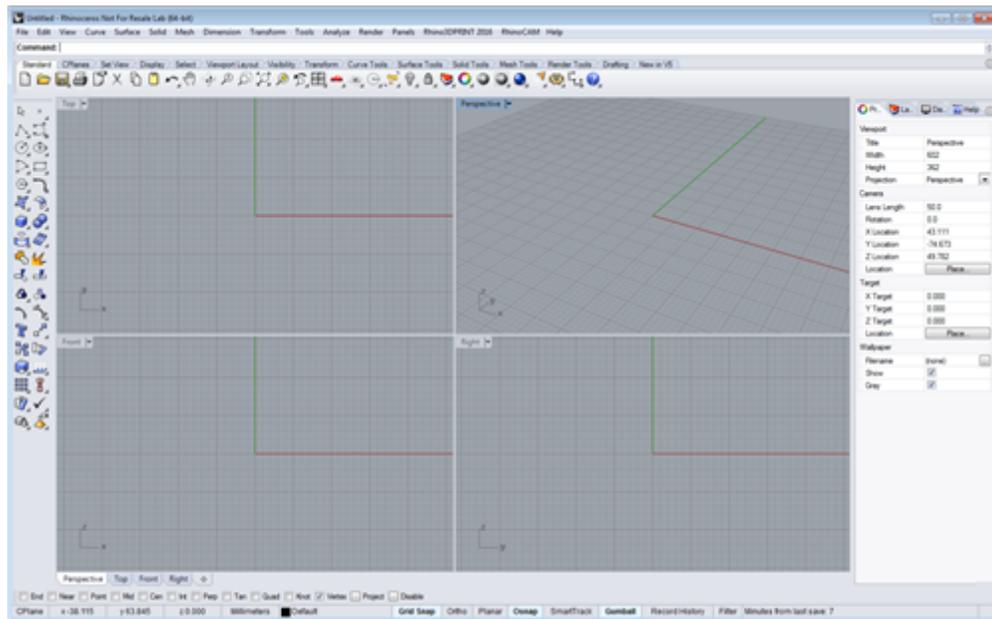
Before we begin, let's talk a bit about the [RhinoCAM](#) display. When you run [RhinoCAM](#) for the very first time, your screen may look this.



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



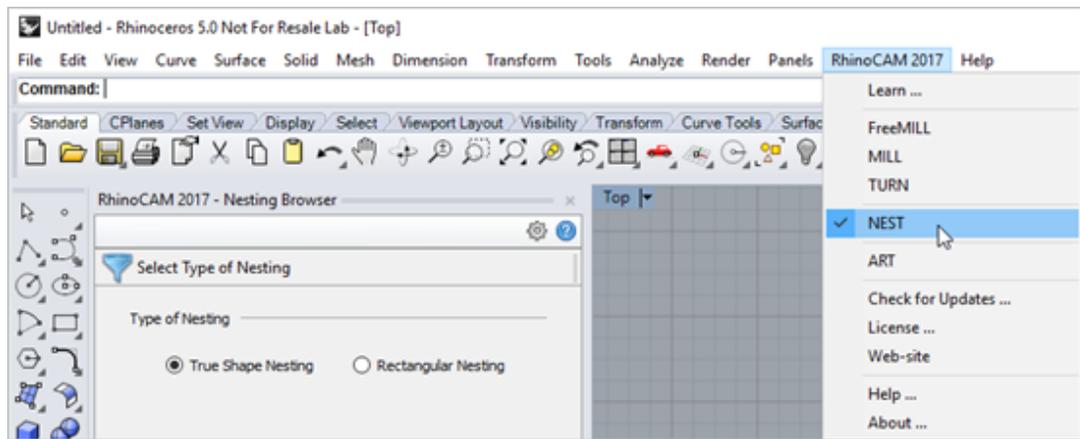
With all plug-in modules closed your screen will look like this:



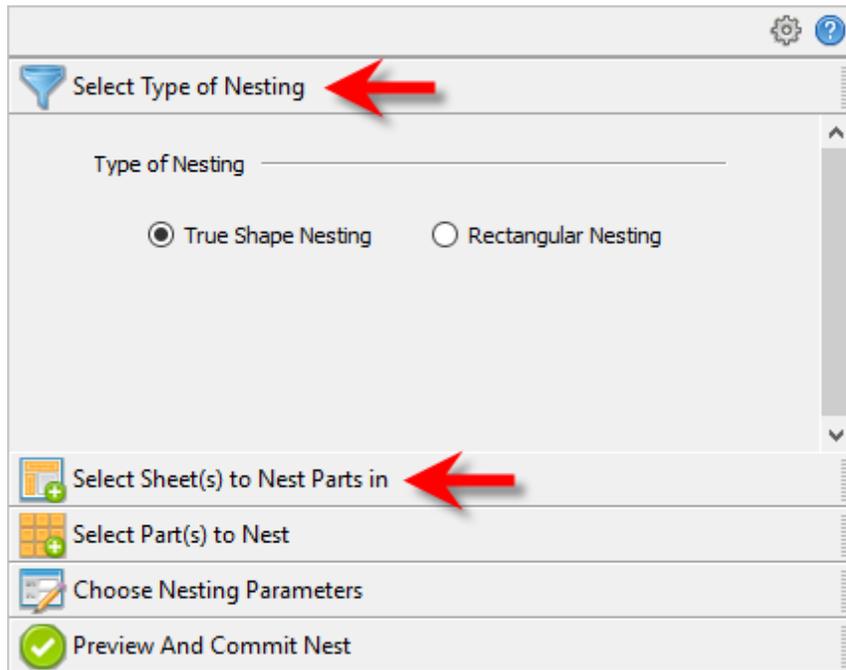
### 4.3 Launching the NEST Module

Now, let's begin by launching the [RhinoCAM-NEST](#) module.

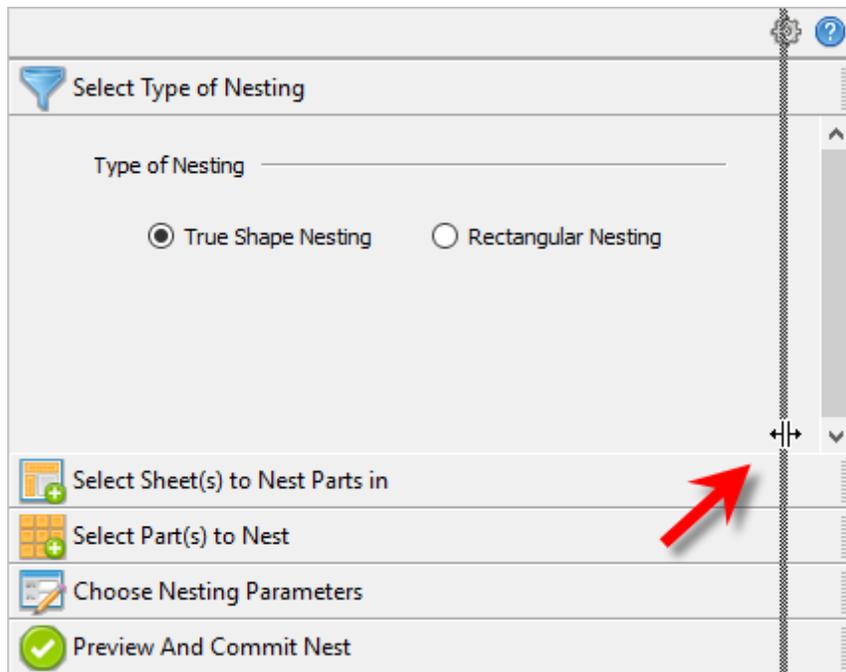
1. From the [Rhino](#) main menu bar, you will see the [RhinoCAM 2017](#) menu item.
2. Drop-down the menu and pick [NEST](#) to load the [NEST](#) module.



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 resize the width of the browser making sure that all of the command icons and menus are easily accessible.



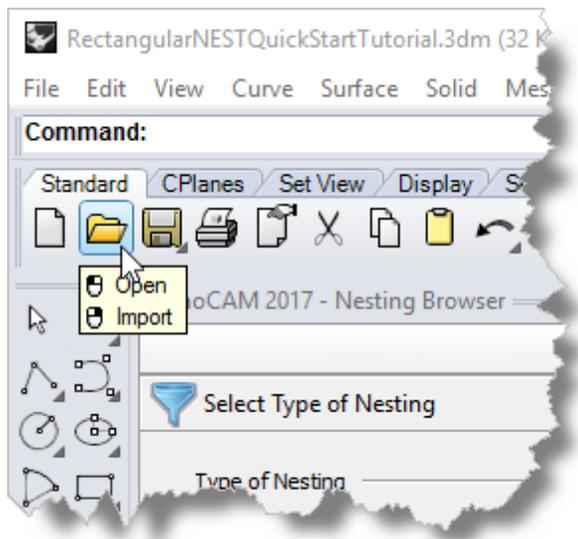
## Rectangular Nesting

### 5.1 Getting Ready

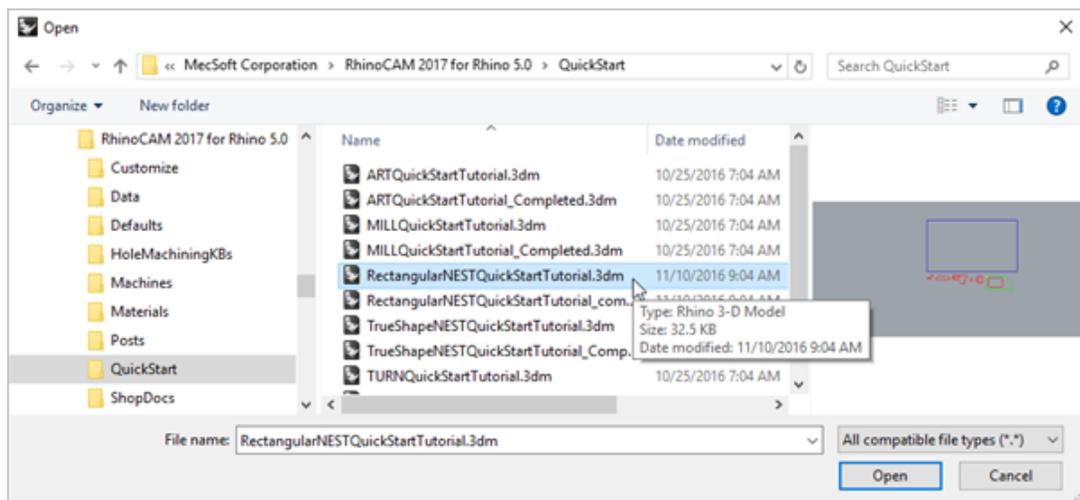
#### 5.1.1 Load the Part File

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.

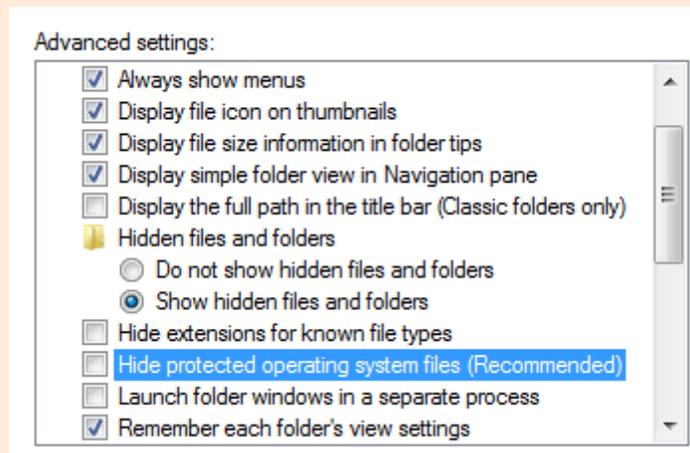


2. From the [Open](#) dialog box, select the [RectangularNestQuickStartTutorial.3dm](#) file from the [C:\ProgramData\MecSoft Corporation\RhinoCAM 2017 for Rhino 5.0\QuickStart](#) folder. As mentioned before, it is advisable to make a copy of this part at a suitable alternative folder so that you have write privileges to modify the part.



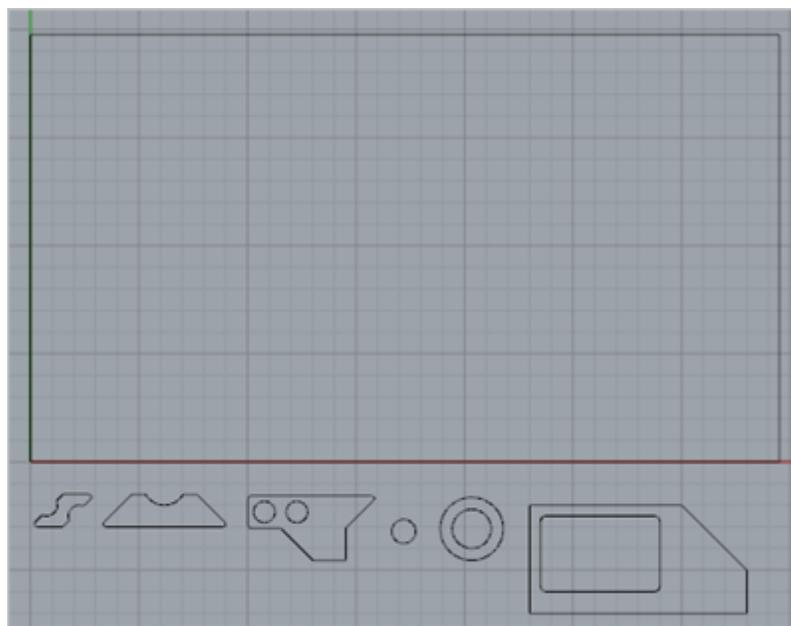
**!** By default, the `ProgramData` folder is "hidden" from view. Here are the steps to Show hidden files and folders:

1. For Windows 7/8 users: Go to **Control Panel > Appearance and Personalization > Folder 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.



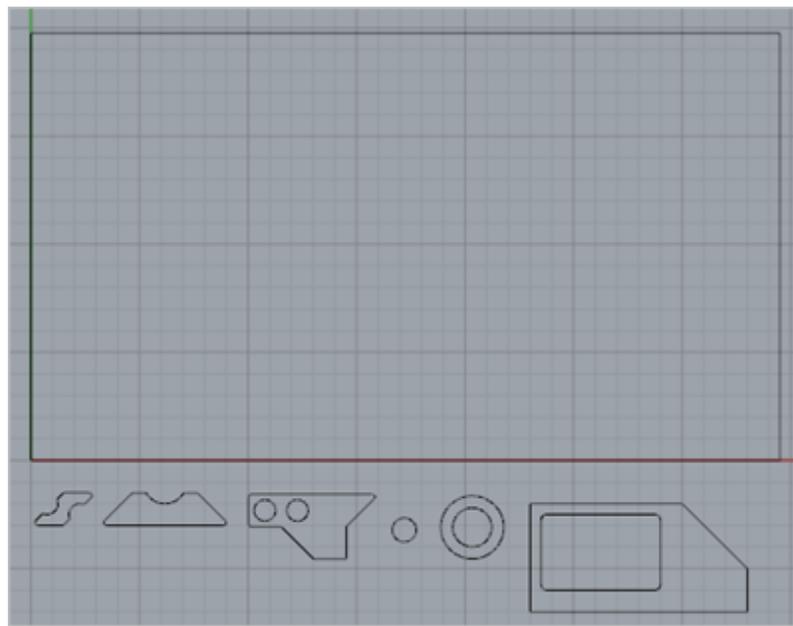
### 5.1.2 Basic Steps

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

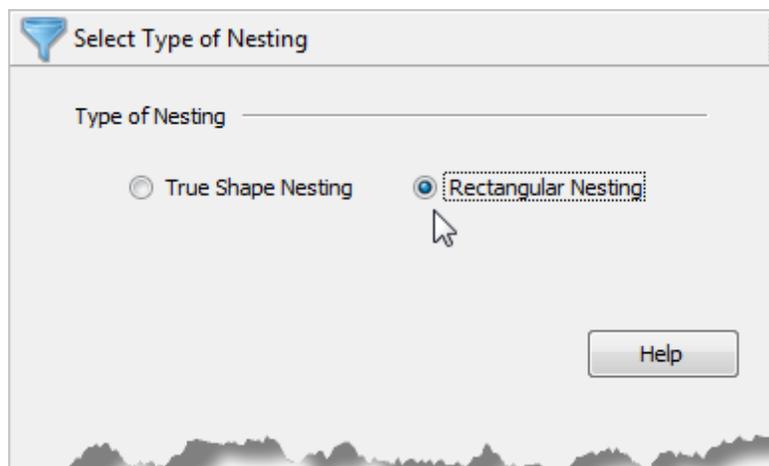
place the parts in the stock for you.

💡 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.

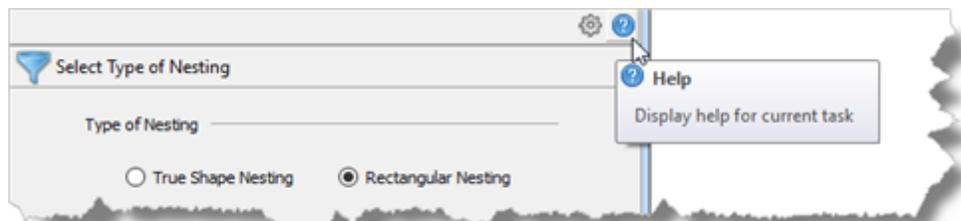
## 5.2 Creating a Rectangular Nest

### 5.2.1 Choose Nesting Type

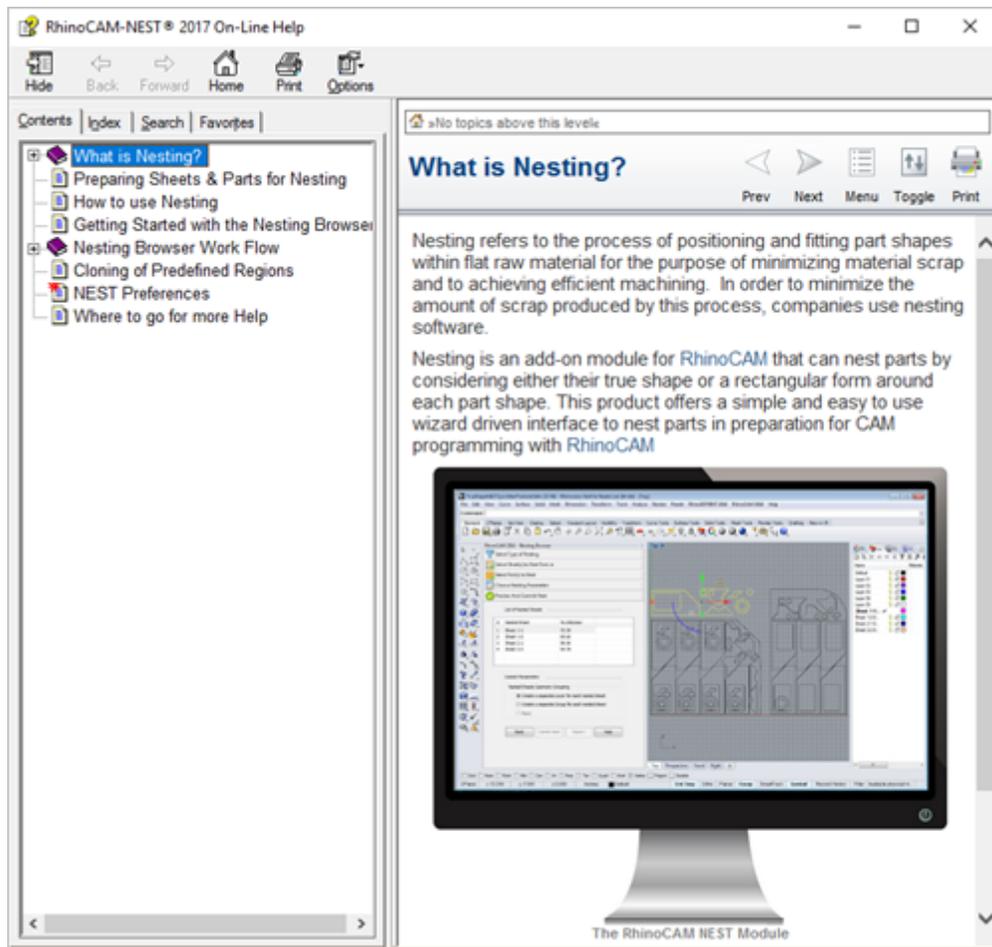
1. Now, from the nesting browser, choose the [Select Type of Nesting](#) tab.



2. In this guide we will be demonstrating [Rectangular Nesting](#) so we will select that option.
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.

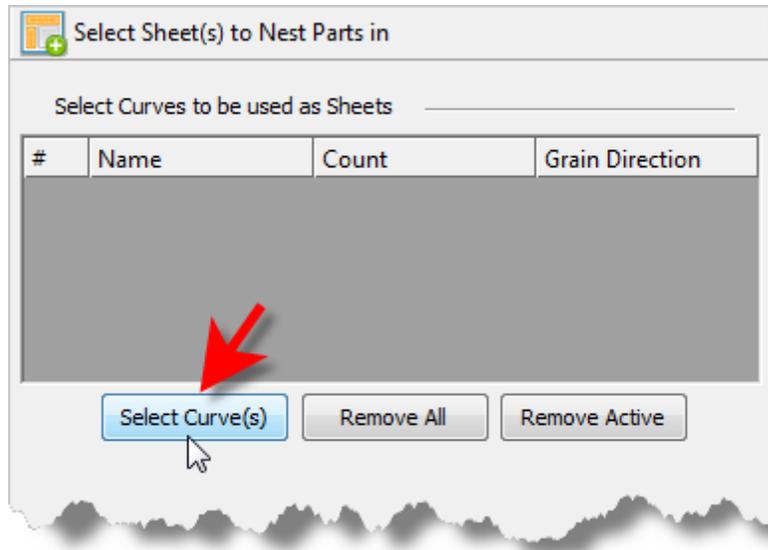


Locate the Help icon

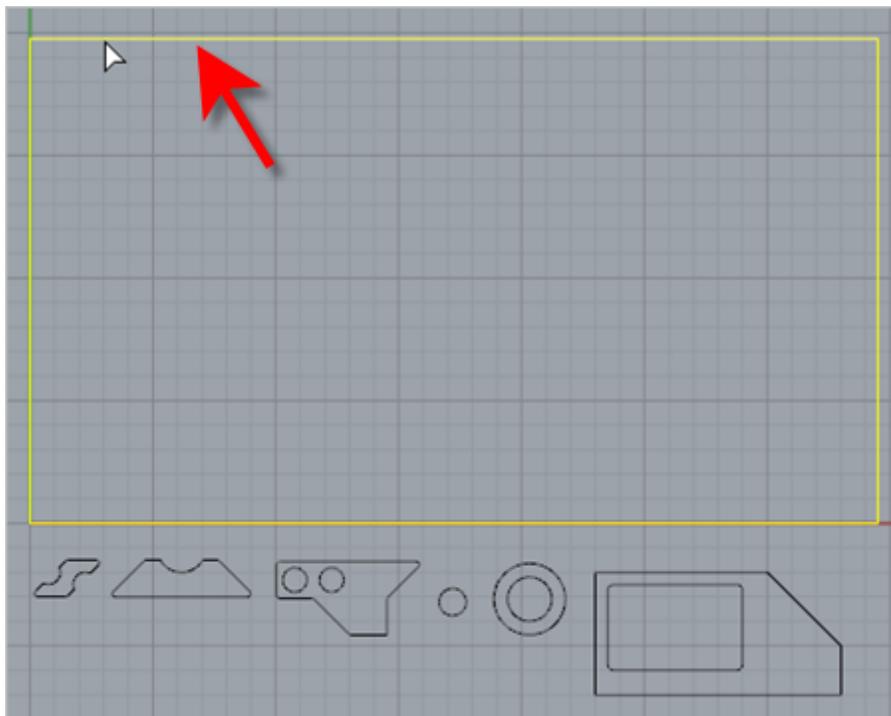


## 5.2.2 Define Your Sheet Geometry

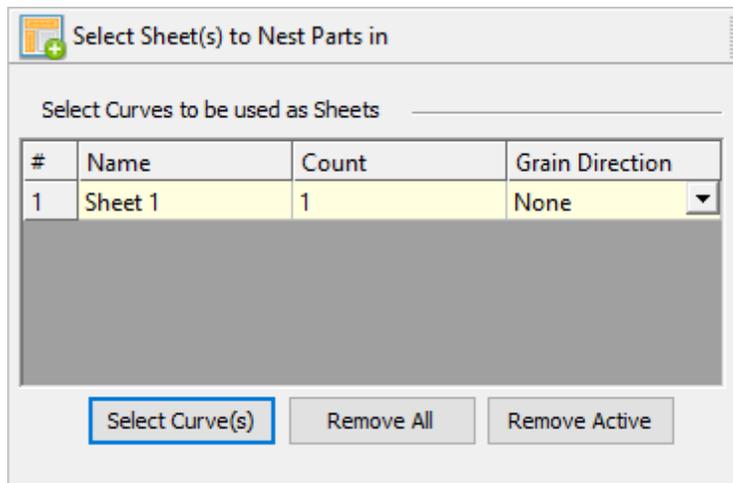
1. From the [Select Sheets](#) tab, pick [Select Curves](#).



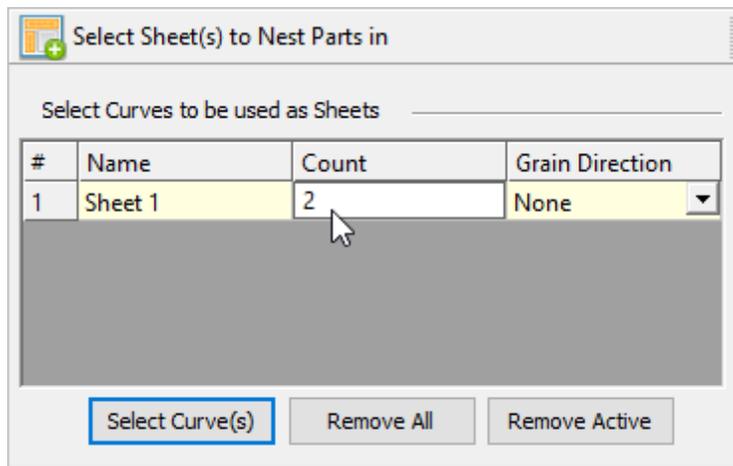
2. Now, we select the shapes that represent the stock material and [right-click](#) or press [Enter](#) to end the selection.



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.

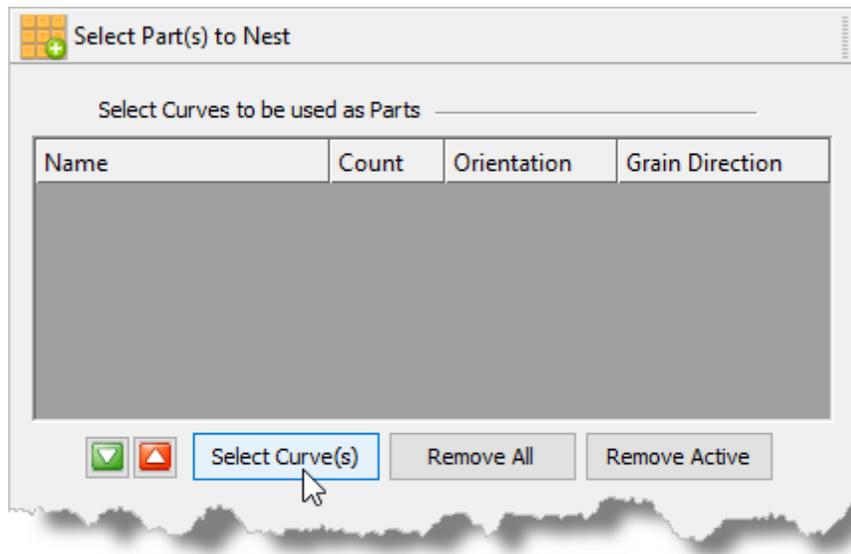


In the future, you can select additional shapes for stock but all of them must be rectangular.

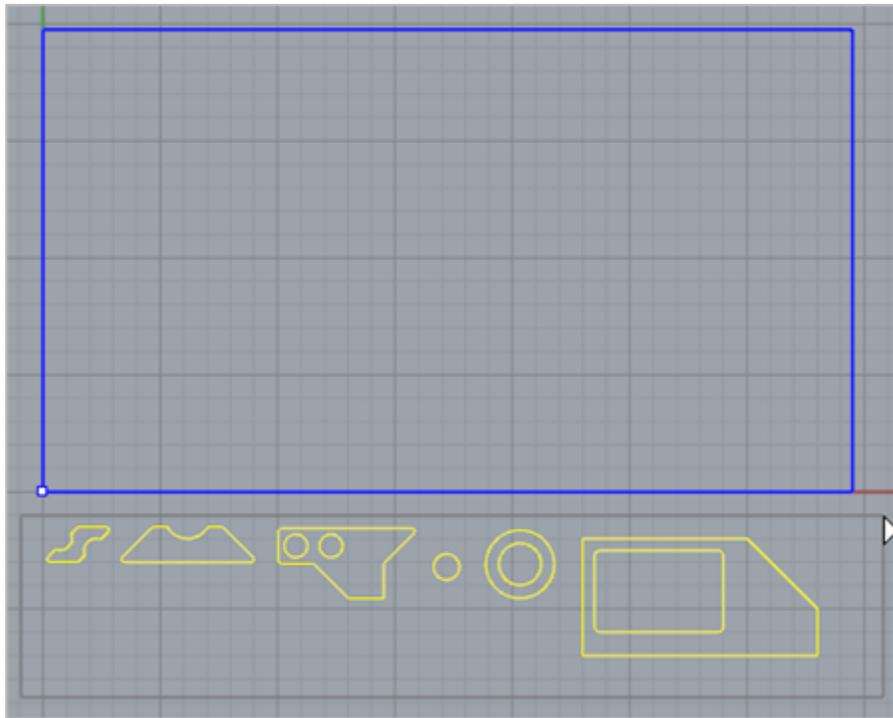
### 5.2.3 Define Your Parts to Nest

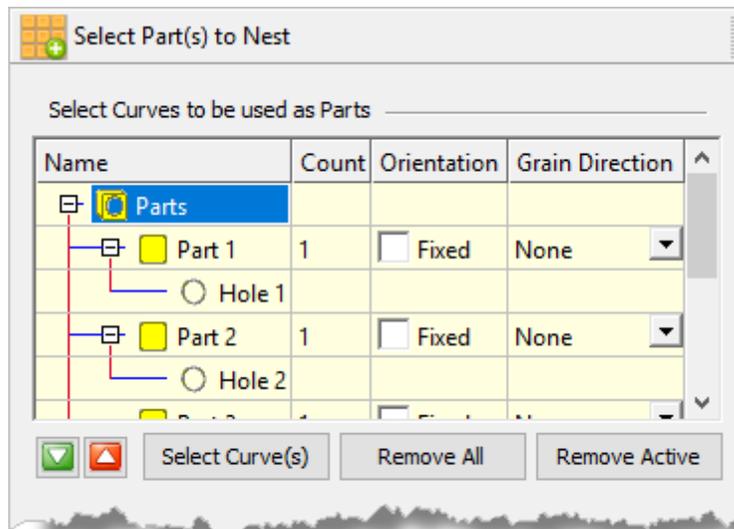
Next, we'll select our **Parts** to be **Nested**.

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**.

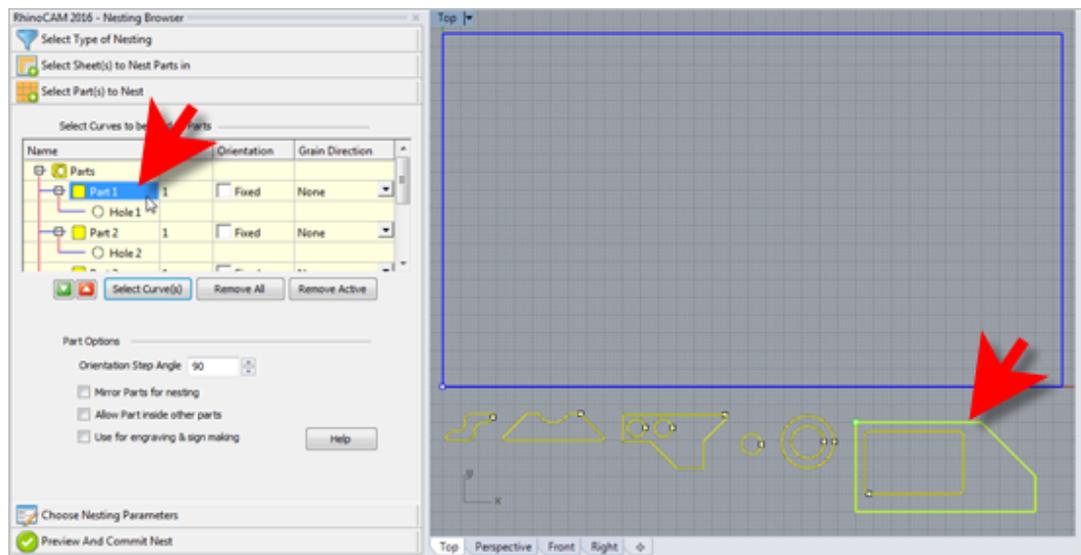




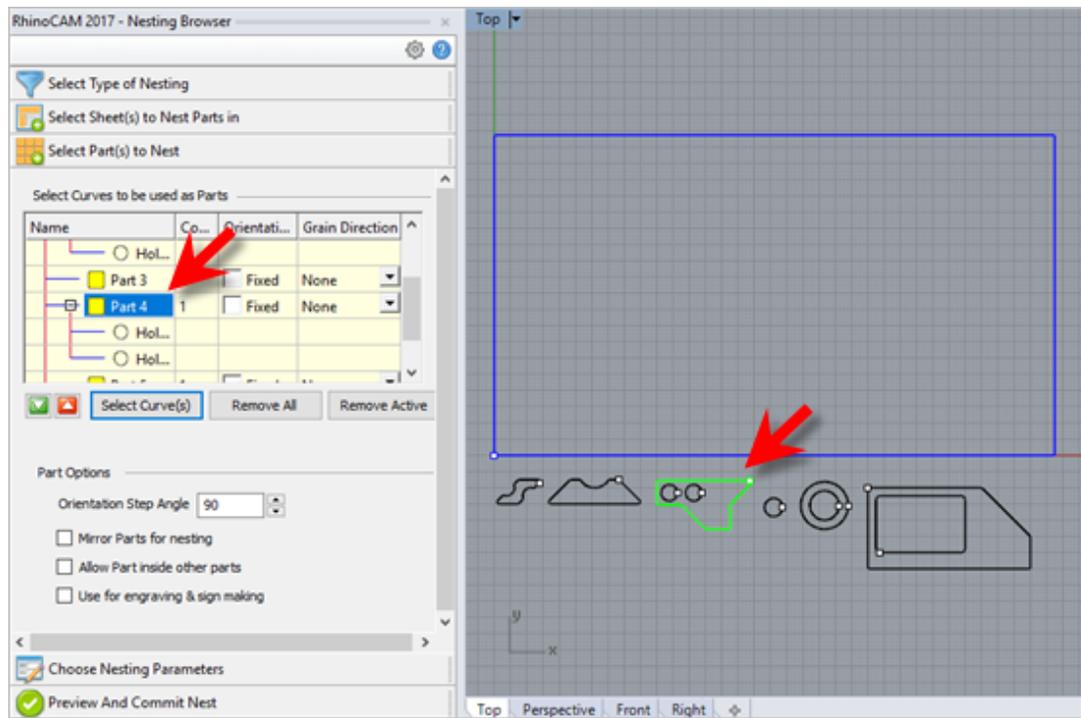
The Nesting software determines the exterior and interior of each selected part.

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](#).

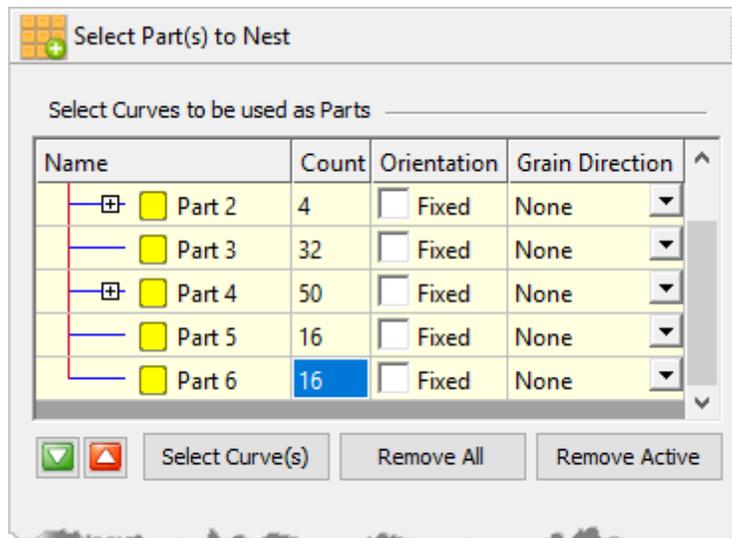
3. If we select a part from the parts list we see that it is highlighted in the graphics window.



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. For this tutorial, you can use these amounts or adjust them to see different nesting results.



- For **Part 1** the count will be 6
- **Part 2** will be 4
- **Part 3** will be 32
- **Part 4** will be 50

- [Part 5](#) will be 16
- and for [Part 6](#) will have a count of 32

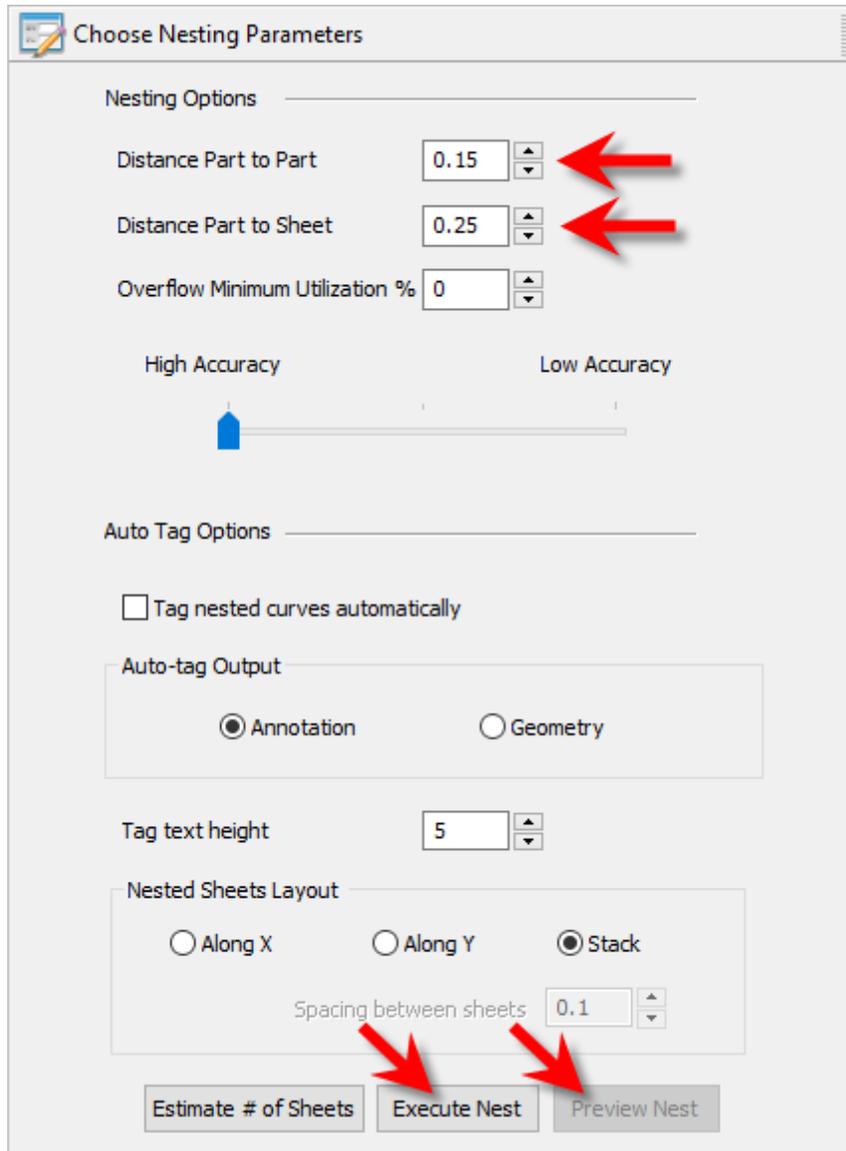
#### 5.2.4 Choose Nesting Parameters

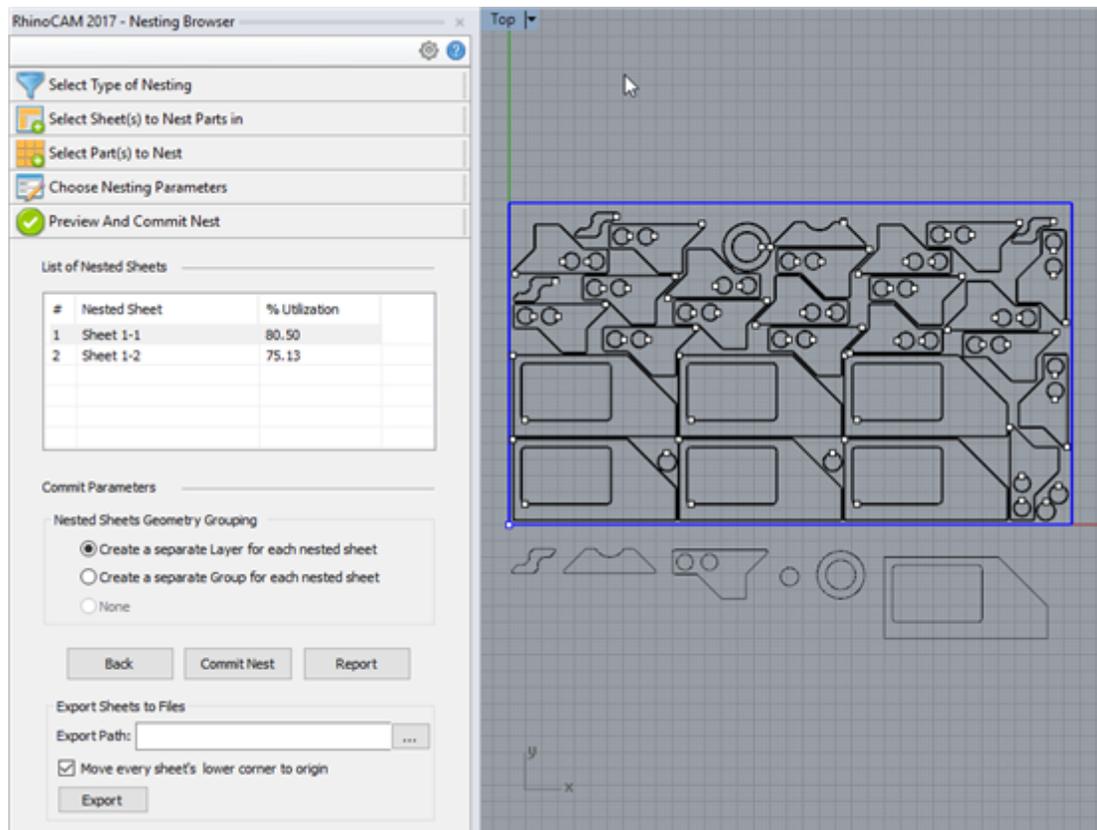
Now, we'll select the [Choose Nesting Parameters](#) tab of the [Nesting Browser](#) to set two final parameters.

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 [Execute Nest](#) and then [Preview Nest](#). Notice that you are moved to the [Preview and Commit Nest](#) tab automatically and you see that 2 sheets will be used.

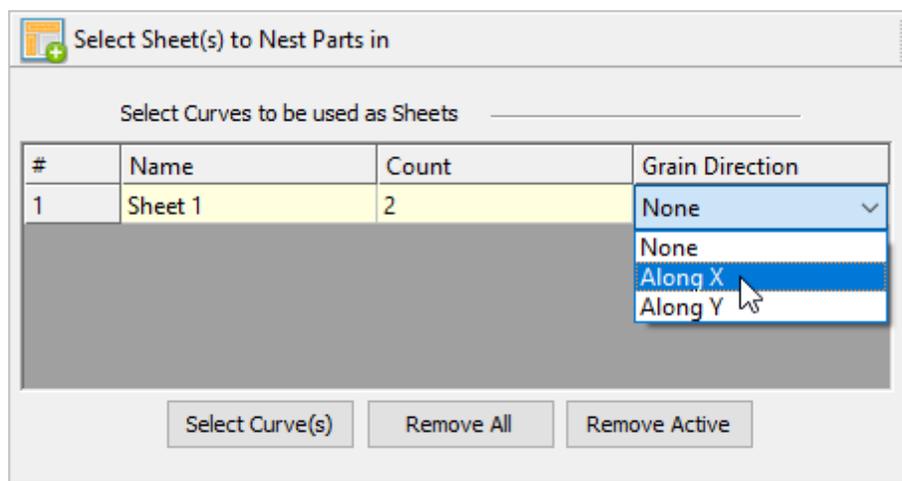




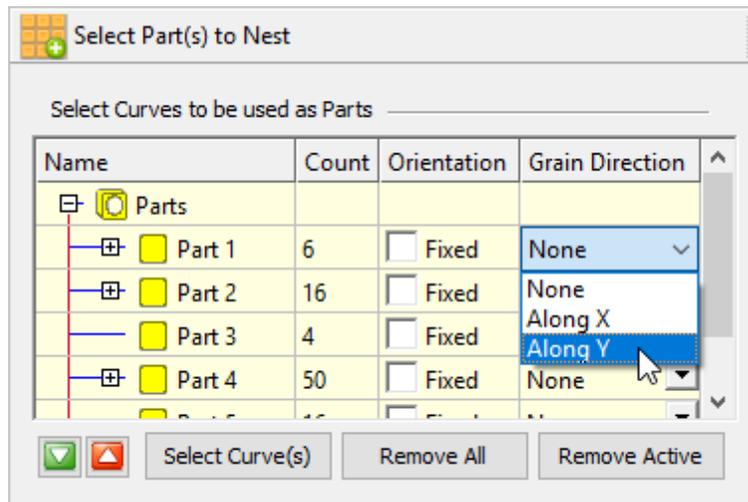
### 5.2.5 Grain Direction Control

The last thing I would like to do is to impose a [Grain Direction](#) control on this larger to force it to be vertical. In order to do that I need to specify the [Grain Direction](#) on the stock material as well as that part.

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

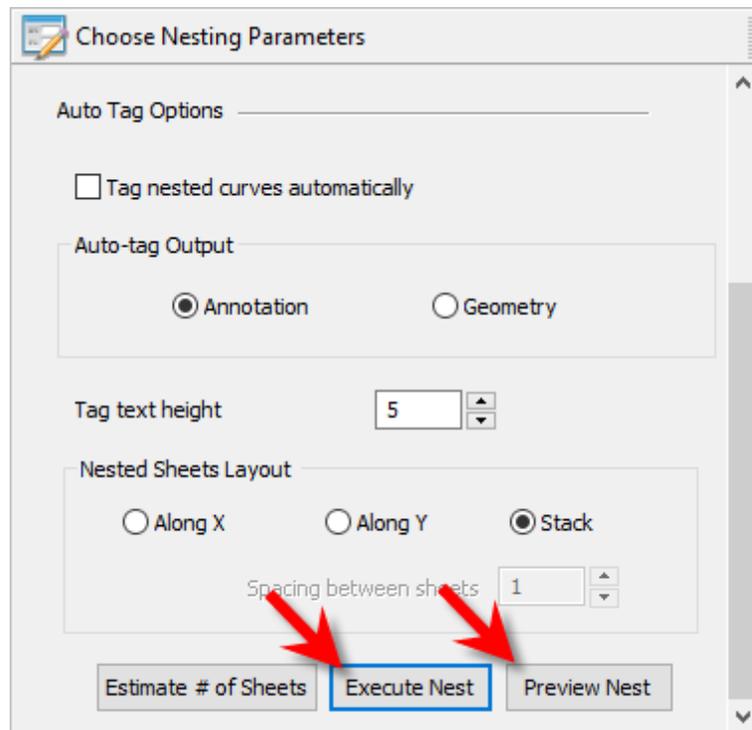


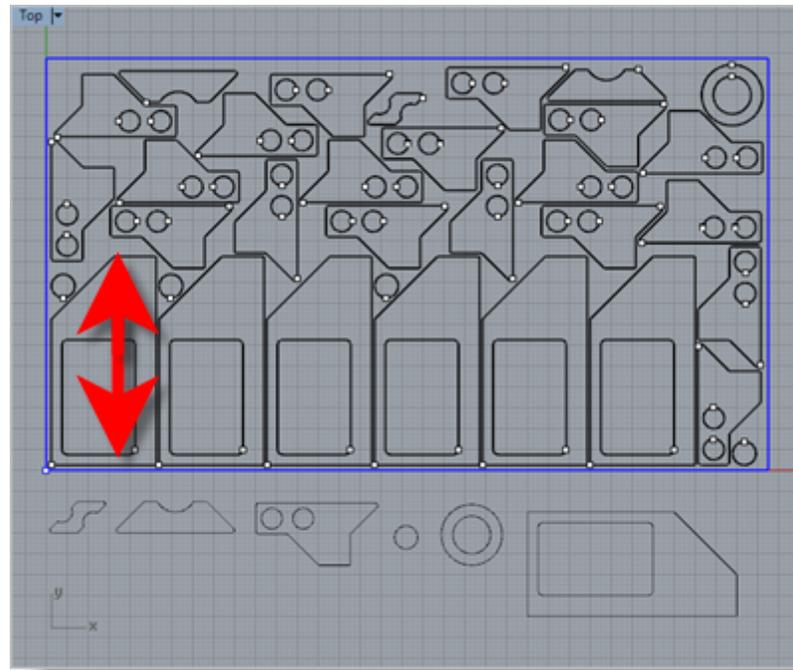
- Then on the **Select Parts** tab I will set the **Grain Direction** on this larger part to be **Along Y**.



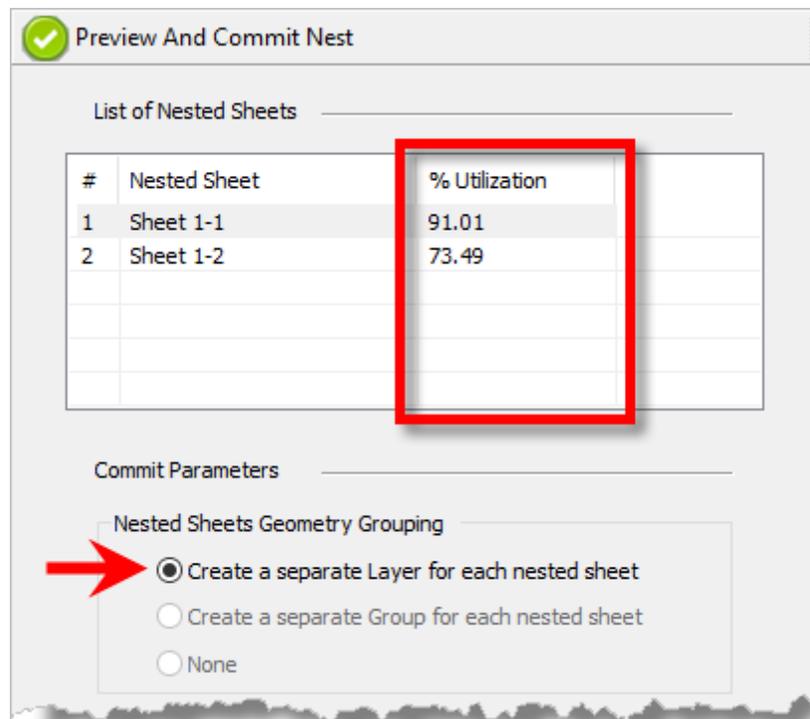
### 5.2.6 Execute, Preview, Commit the Nest

Now we'll select the **Choose Nesting Parameters** tab, we'll **Execute** and **Preview** the nest again and we see that the part is now aligned vertically.



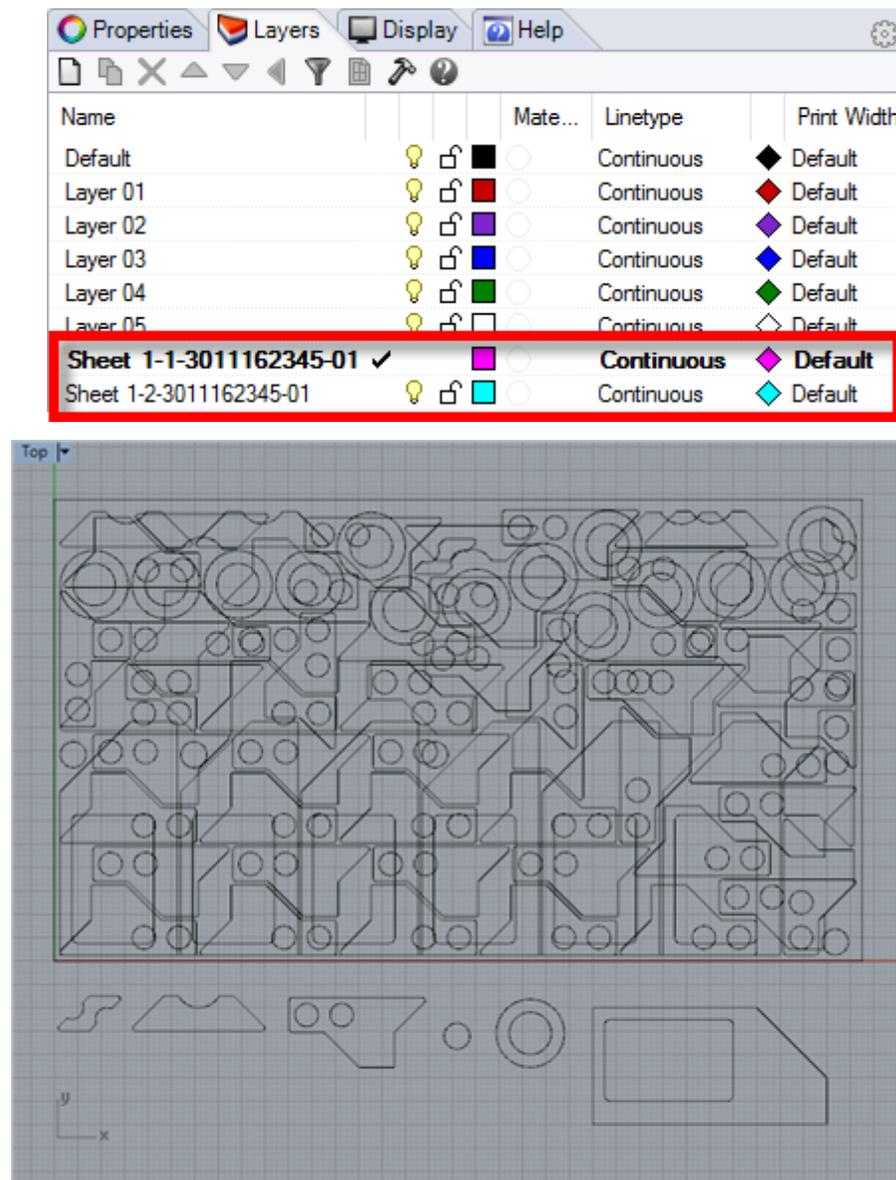


Each time the nest is generated, the system will calculate an **Efficiency Factor** referred to as **% Utilization** of the stock material.



For **Nested Sheet Geometry Grouping** we'll select the **Separate Layer** option.

Once we're satisfied with the layout of the nest, we will select the [Commit Nest](#) button. This writes the geometry of the individual sheets onto individual layers in your current [CAD](#) part file.



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 the [True Shape](#) nesting type.

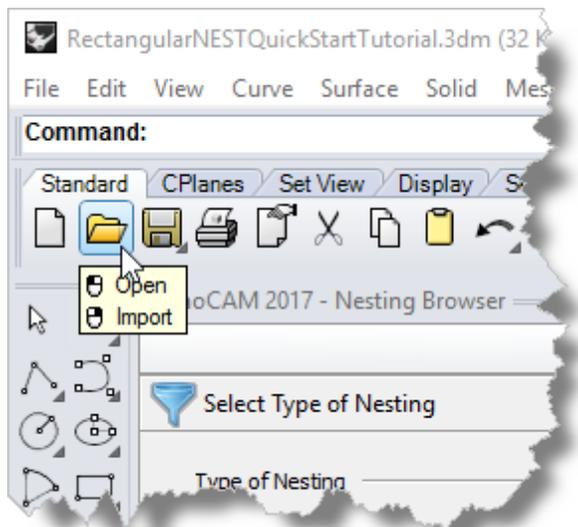
## True Shape Nesting

### 6.1 Getting Ready

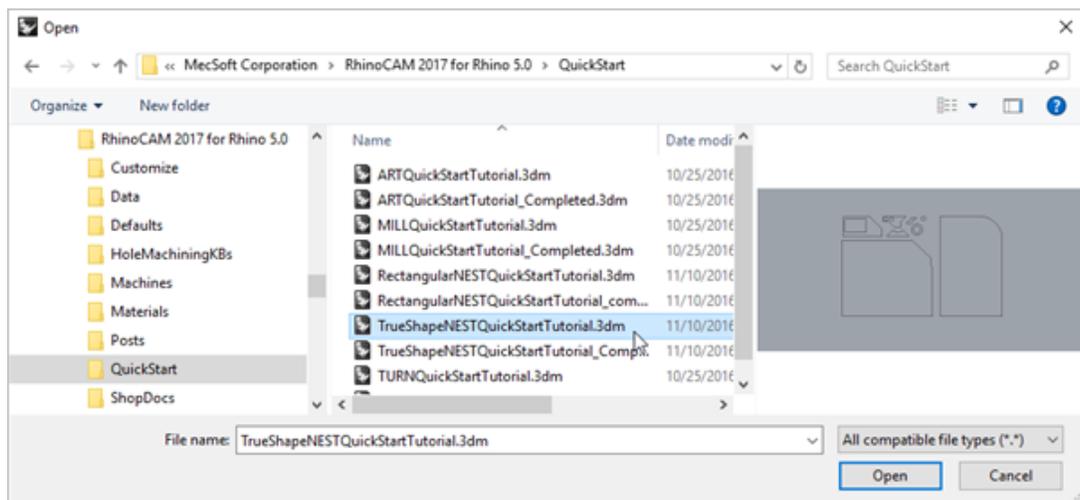
#### 6.1.1 Load the Part File

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.

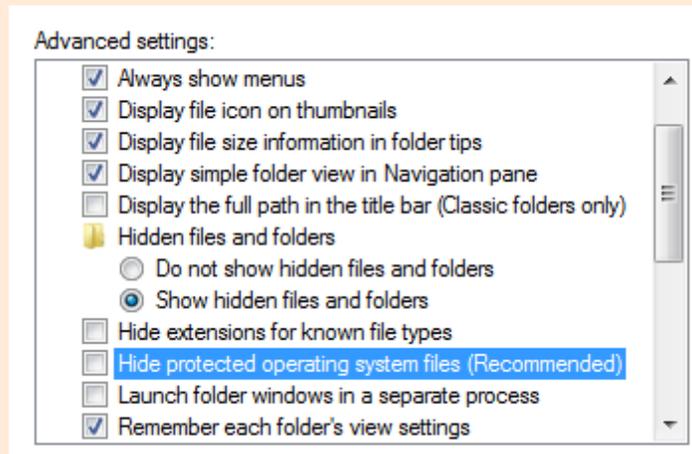


2. From the [Open](#) dialog box, select the [TrueShapeNestQuickStartTutorial.3dm](#) file from the [C:\ProgramData\MecSoft Corporation\RhinoCAM 2017 for Rhino 5.0\QuickStart\](#) folder. As mentioned before, it is advisable to make a copy of this part at a suitable alternative folder so that you have write privileges to modify the part.



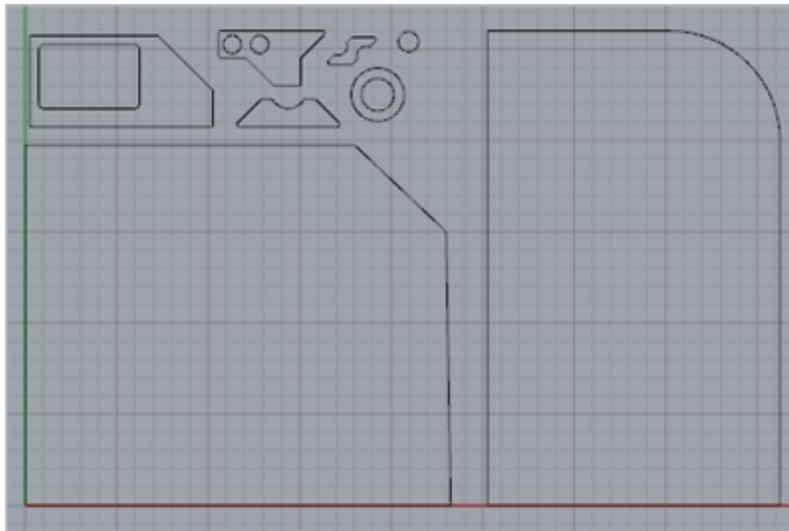
**!** By default, the `ProgramData` folder is "hidden" from view. Here are the steps to Show hidden files and folders:

1. For `Windows7/8` users: Go to `Control Panel > Appearance and Personalization > Folder Options` (`Windows XP` users can locate folder options under `Control Panel`).
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.



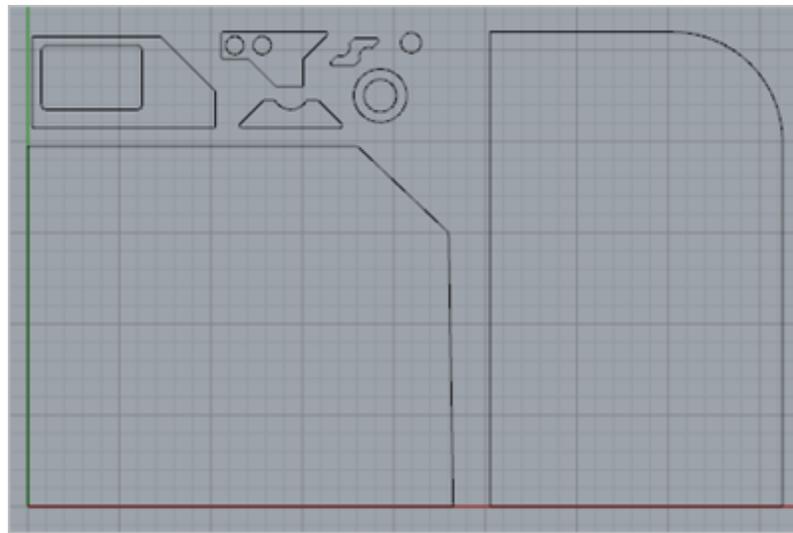
## 6.1.2 Basic Steps

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 or 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.

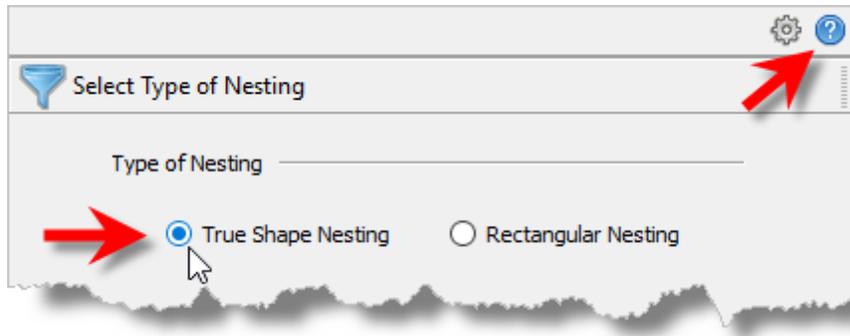
💡 Secondly, do not place parts inside the cutouts of larger parts as this may confuse the Nesting software into thinking that it is a detail of the larger part.

Keep all of your parts separated.

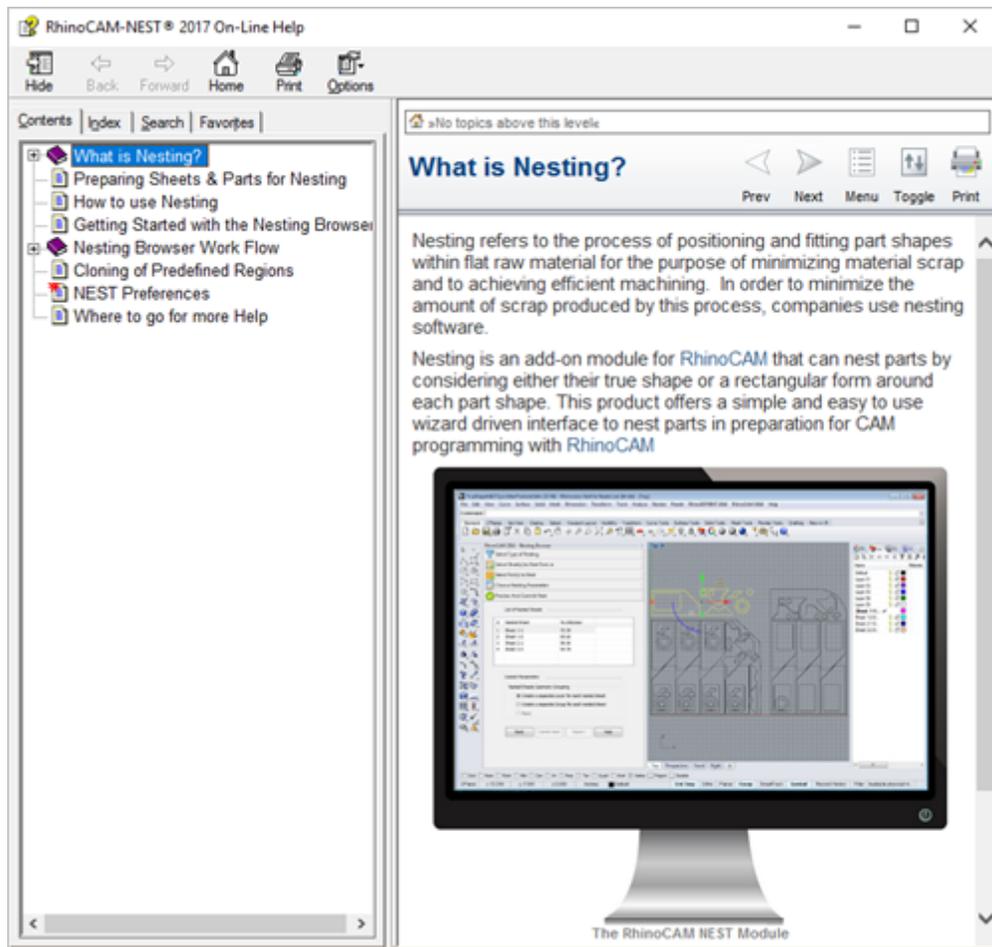
## 6.2 Creating a True Shape Nest

### 6.2.1 Choose Nesting Type

1. Now, from the nesting browser, choose the [Select Type of Nesting](#) tab.

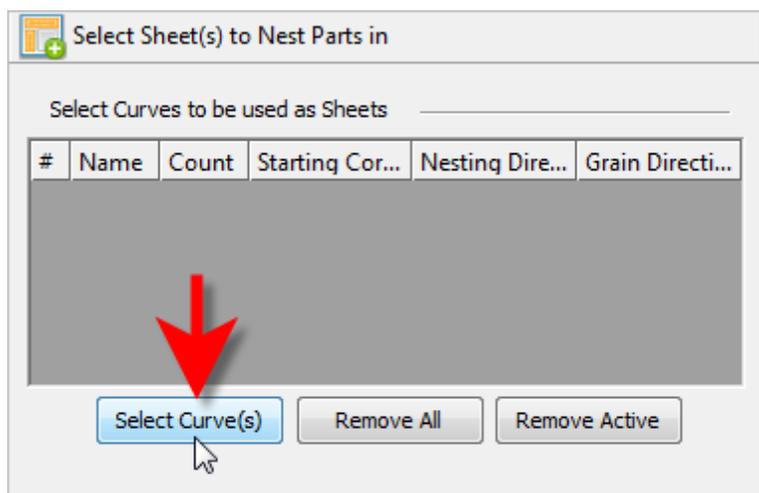


2. In this guide we will be demonstrating [True Shape Nesting](#) so we will select that option.
3. You will notice a [Help](#) icon located at the top-right of the [Nesting Browser](#). Selecting it will display documentation for each option on the active tab.

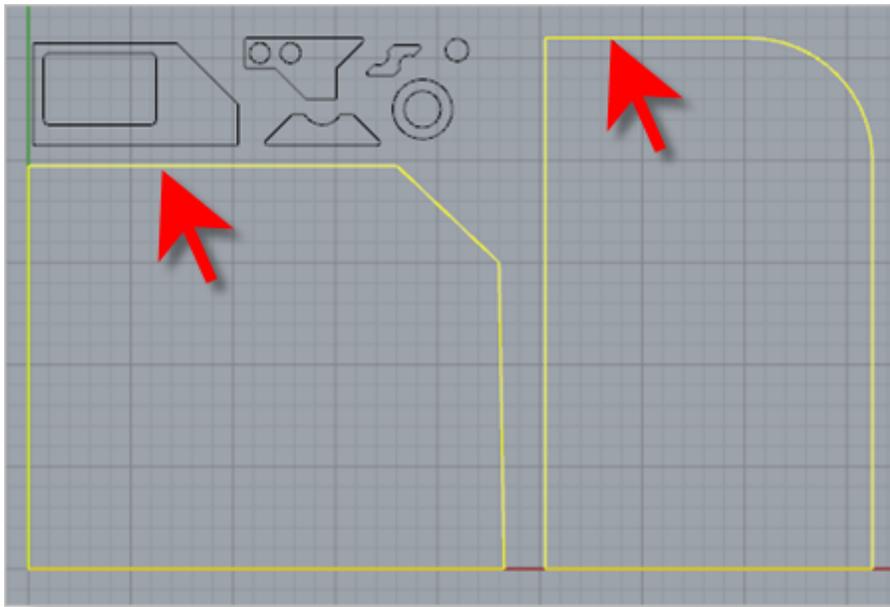


## 6.2.2 Define Your Sheet Geometry

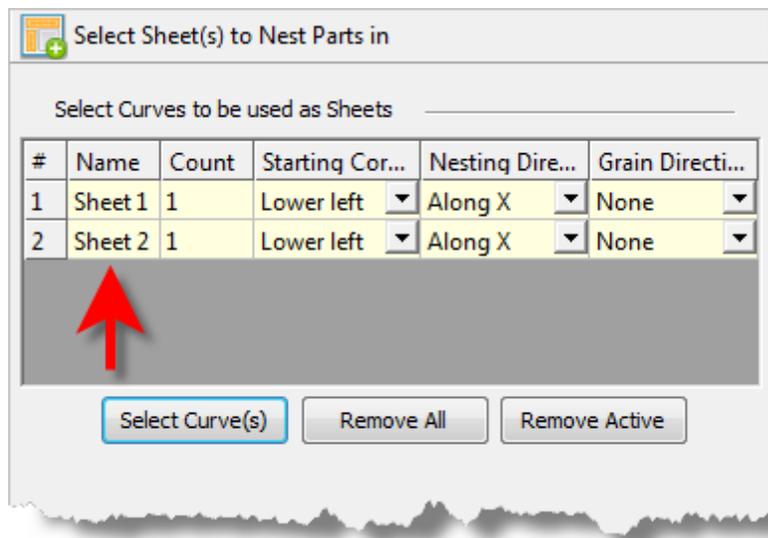
1. From the [Select Sheets](#) tab, pick [Select Curves](#).



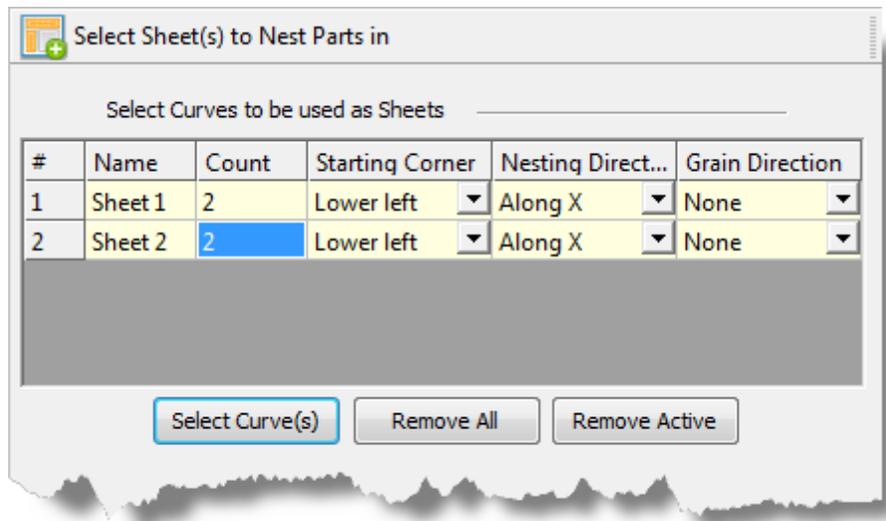
- Now, we select the shapes that represent the stock material and **right-click** or press **Enter** to end the selection.



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



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



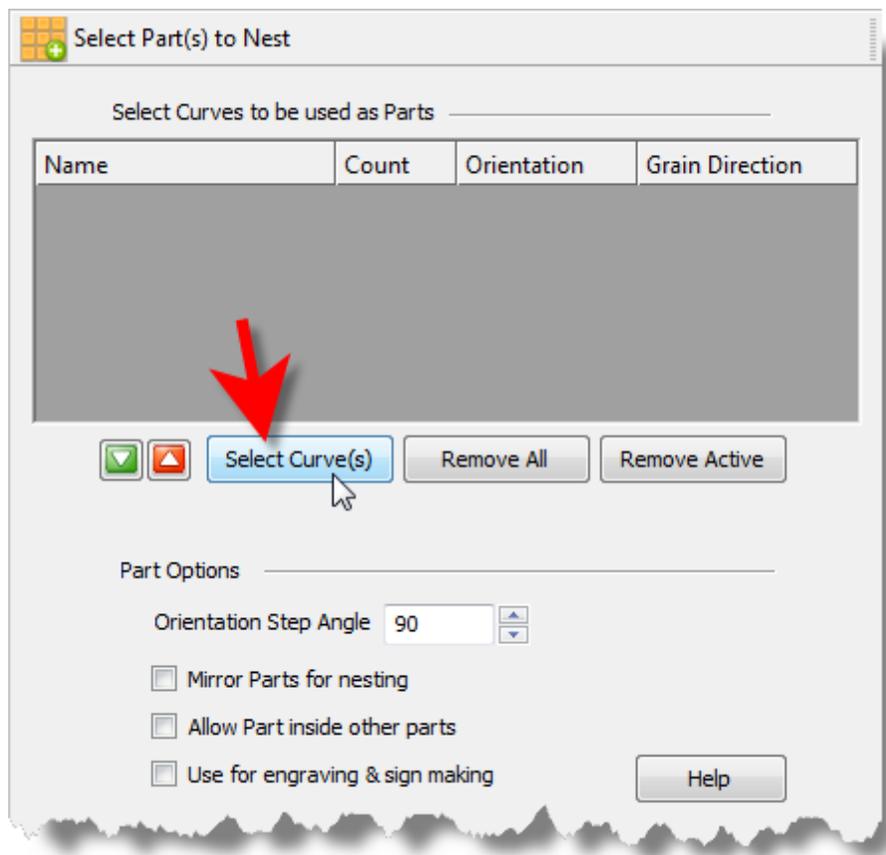
The **Starting Corner** and **Nesting Direction** columns allow you to control where the nesting should begin and in what direction it should proceed. This is good for remnant control.

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

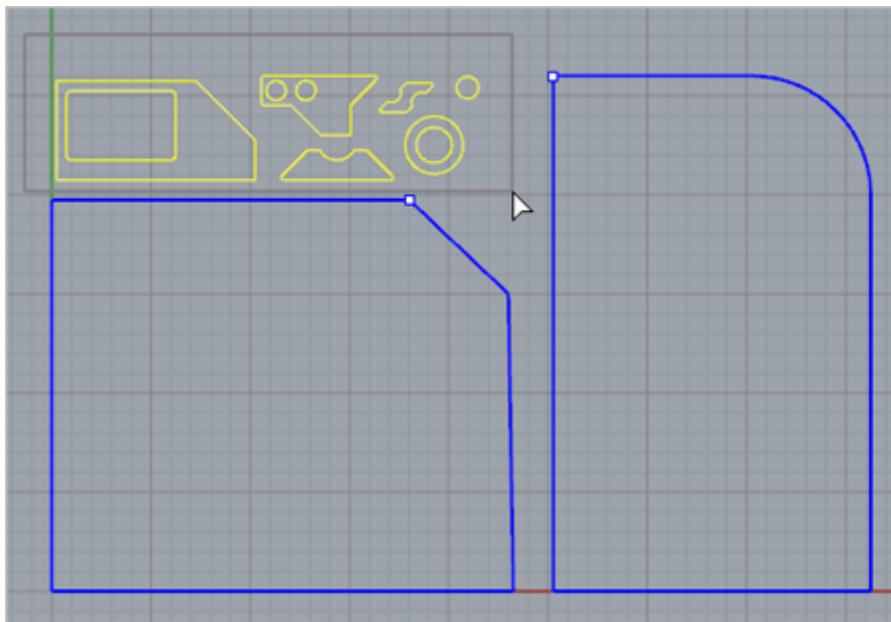
### 6.2.3 Define Your Parts to Nest

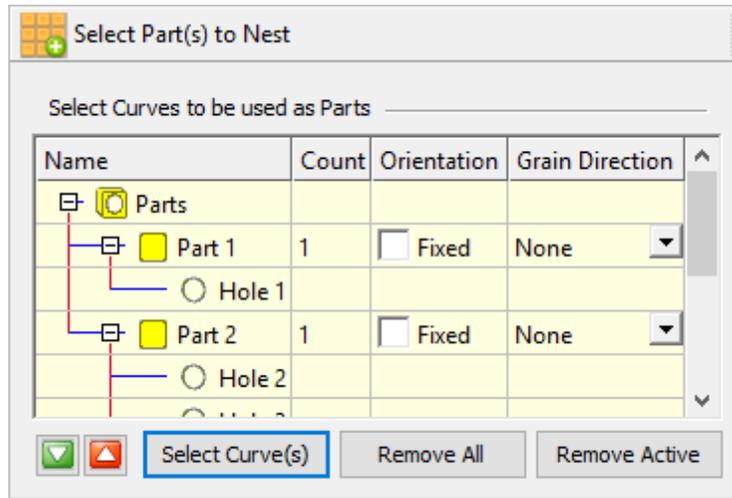
Next, we'll select our **Parts** to be **Nested**.

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](#).

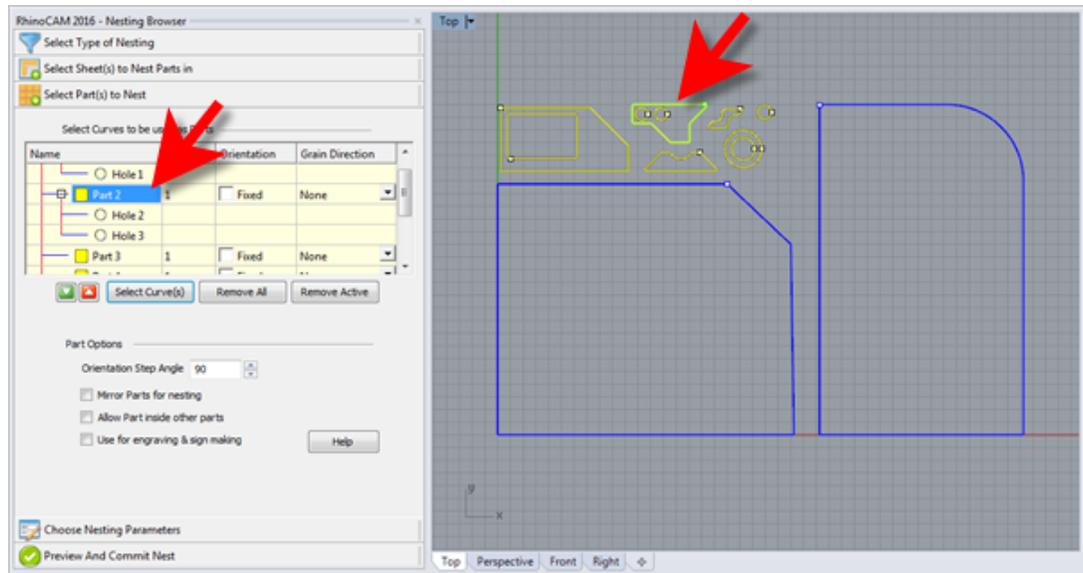




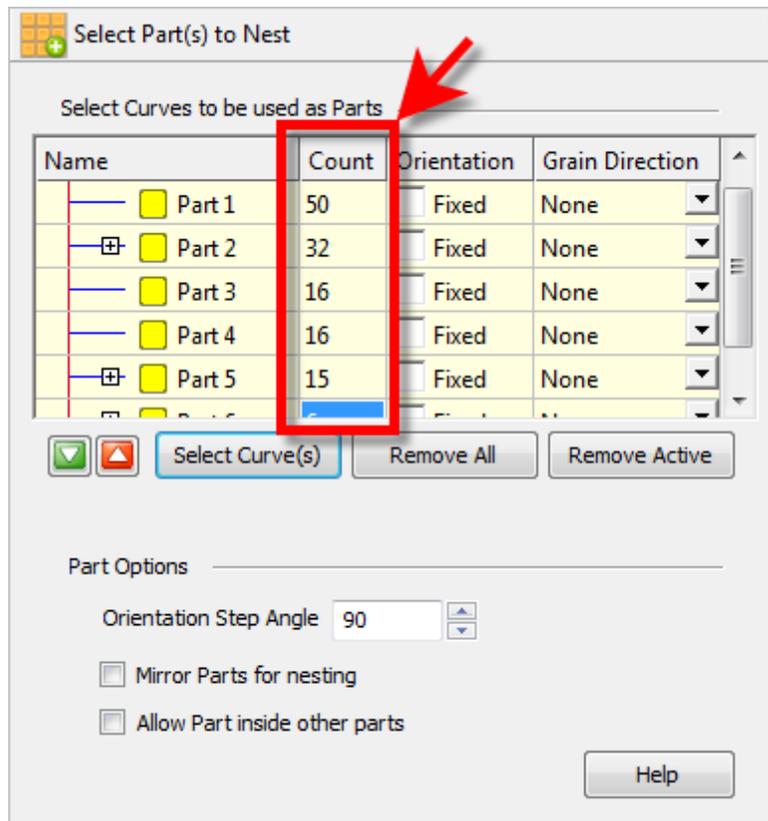
The Nesting software determines the exterior and interior of each selected part.

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: Due to algorithmic nature of the Nesting software, your parts might be assigned different numbers as we see here in the tutorial.



4. Selecting a Hole under a part in the 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 1, Hole 2, etc., under its associated Part.
5. Now we'll enter the Count for each of the parts that are needed in the nest.



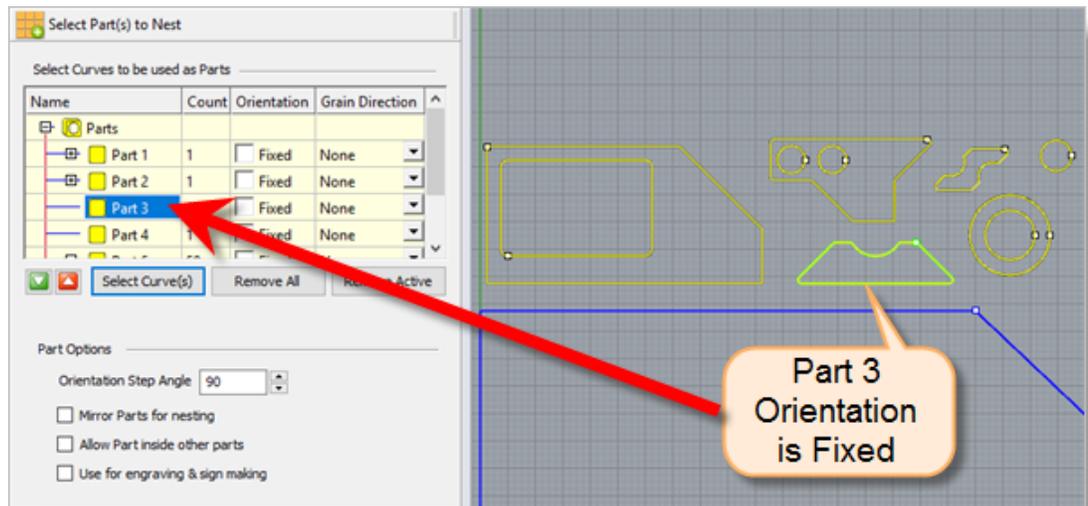
- For Part 1 the count will be 66
- Part 2 will be 32
- Part 3 will be 50
- Part 4 will be 16
- Part 5 will be 16
- and for Part 6 will have a count of 4

There are [Part Options](#) below the table that will apply to all of the parts.

- 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.
- Let's enable the [Mirroring Parts for nesting](#) option.
- Also enable the [Allow Part inside other parts](#) option. This will allow smaller parts to be nested within the cutouts of larger parts.
- 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 like this:



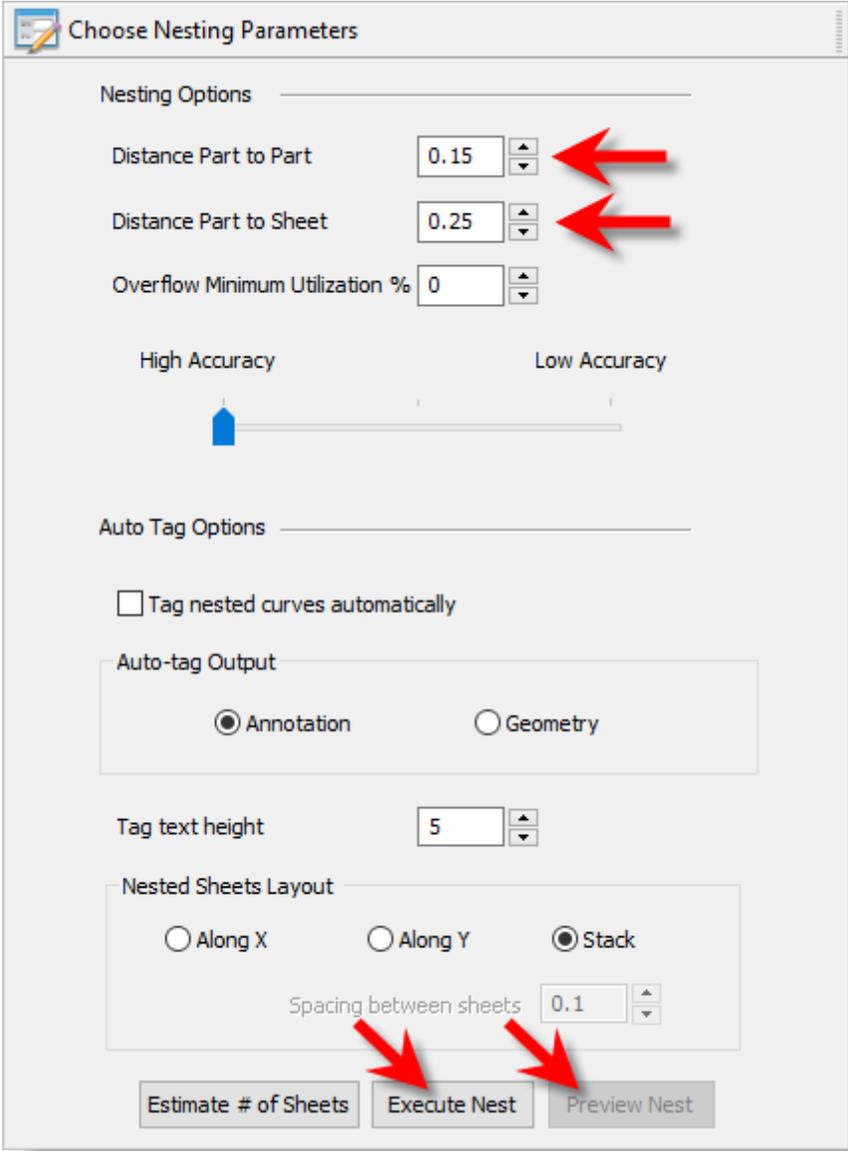
## 6.2.4 Choose Nesting Parameters

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 [Execute Nest](#) and then [Preview Nest](#). Notice that you are moved to the [Preview and Commit Nest](#) tab automatically and you see that 4 sheets will be used.

The image shows a software dialog box titled "Choose Nesting Parameters". It contains several sections for configuring nesting options. The "Nesting Options" section includes three input fields: "Distance Part to Part" (0.15), "Distance Part to Sheet" (0.25), and "Overflow Minimum Utilization %" (0). Below these is a slider for accuracy, currently set to "High Accuracy". The "Auto Tag Options" section has a checkbox for "Tag nested curves automatically" which is unchecked. The "Auto-tag Output" section has two radio buttons: "Annotation" (selected) and "Geometry". The "Tag text height" is set to 5. The "Nested Sheets Layout" section has three radio buttons: "Along X", "Along Y", and "Stack" (selected). Below this is a "Spacing between sheets" input field set to 0.1. At the bottom are three buttons: "Estimate # of Sheets", "Execute Nest", and "Preview Nest". Red arrows point to the "Distance Part to Part" and "Distance Part to Sheet" fields, the "Execute Nest" button, and the "Spacing between sheets" field.

**Choose Nesting Parameters**

**Nesting Options**

Distance Part to Part: 0.15

Distance Part to Sheet: 0.25

Overflow Minimum Utilization %: 0

High Accuracy | Low Accuracy

**Auto Tag Options**

Tag nested curves automatically

**Auto-tag Output**

Annotation |  Geometry

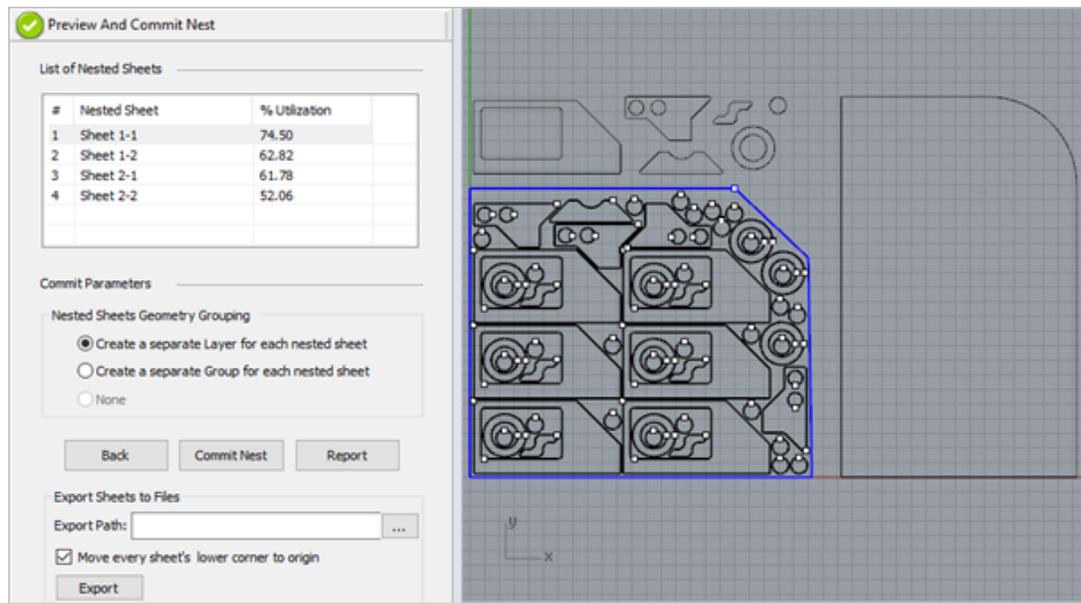
Tag text height: 5

**Nested Sheets Layout**

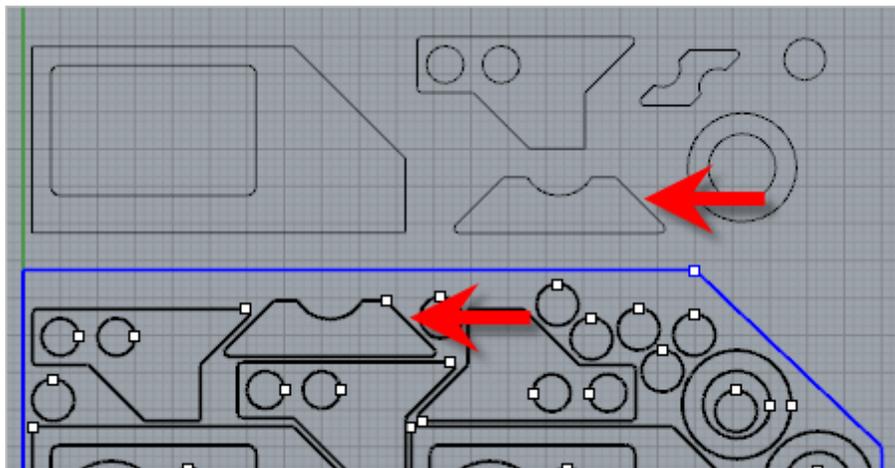
Along X |  Along Y |  Stack

Spacing between sheets: 0.1

Estimate # of Sheets | Execute Nest | Preview Nest



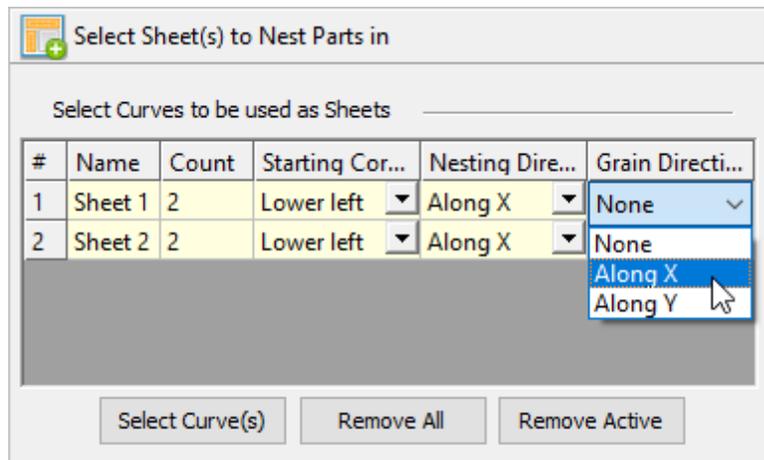
Also notice that **Part 4** (pointed to in the image below) was the one we **Fixed** in its orientation, exactly as it was when it was staged.



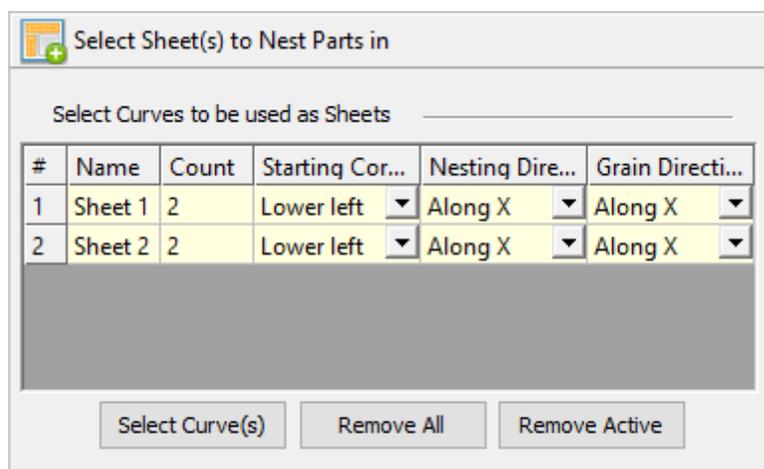
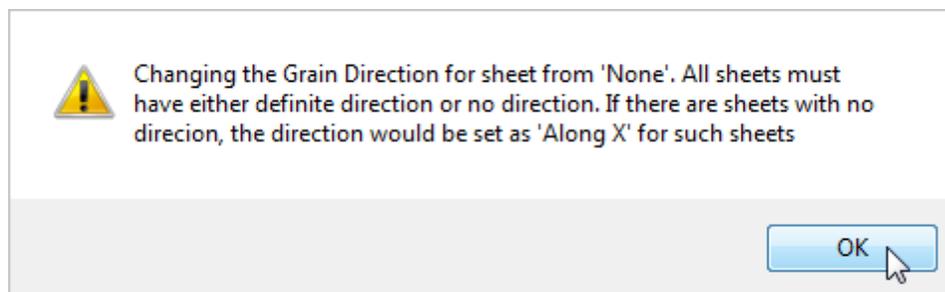
## 6.2.5 Grain Direction Control

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

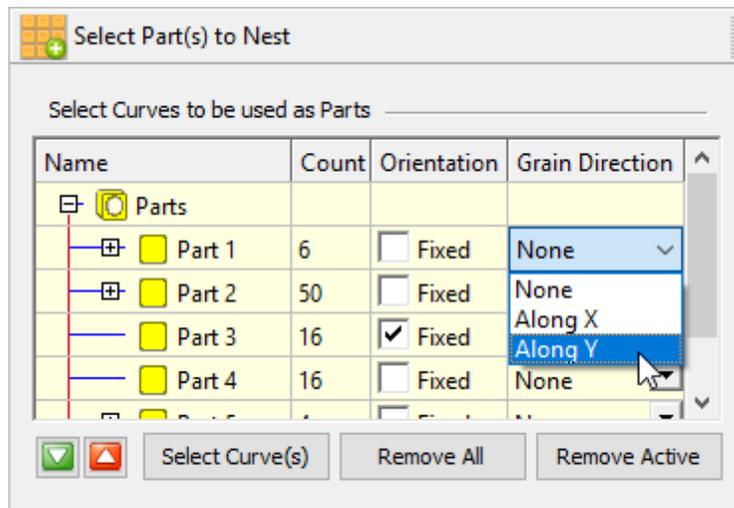
1. First we'll go back to the **Select Sheet(s) to Nest Part** in tab and set the **Grain Direction** to **Along X**.



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.



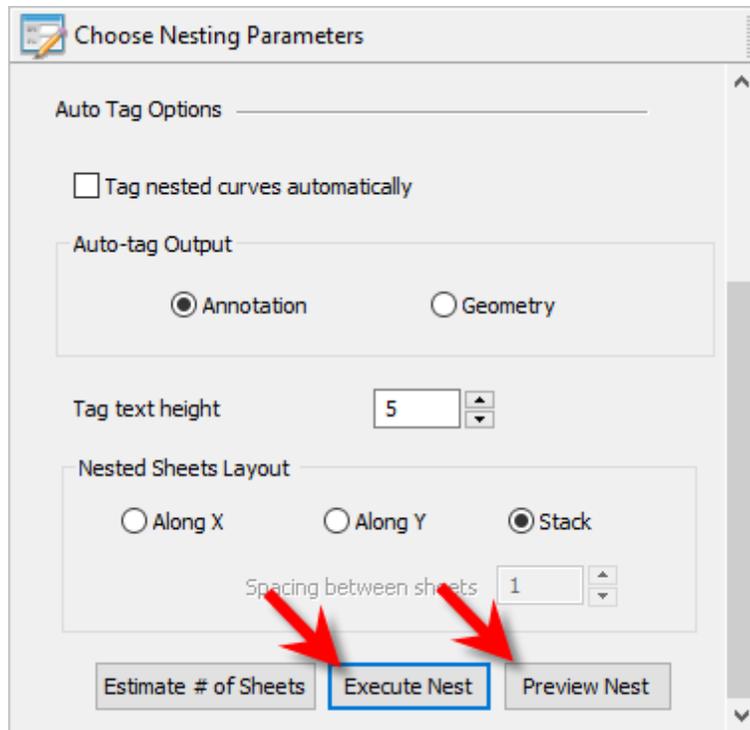
3. Now, on the **Select Parts to Nest** tab I will set the **Grain Direction** on **Part 1** to be **Along Y**.

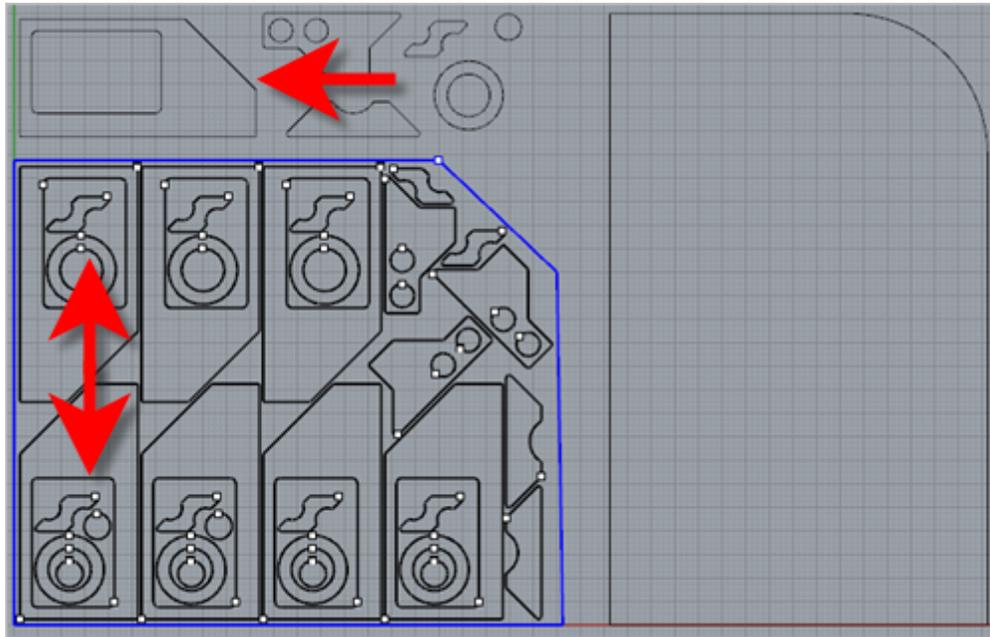


## 6.2.6 Execute, Preview, Commit the Nest

Now we'll [Execute](#) and [Preview](#) the Nest once again:

1. Select the [Choose Nesting Parameters](#) tab
2. Select [Execute Nest](#) and then select [Preview Nest](#) and we see that [Part 6](#) is now aligned vertically.

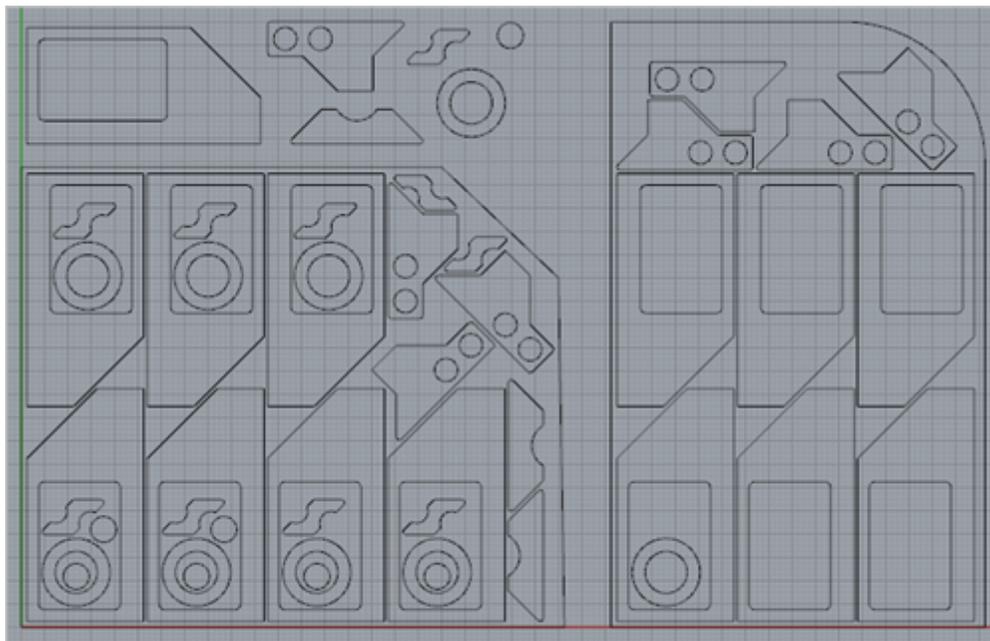
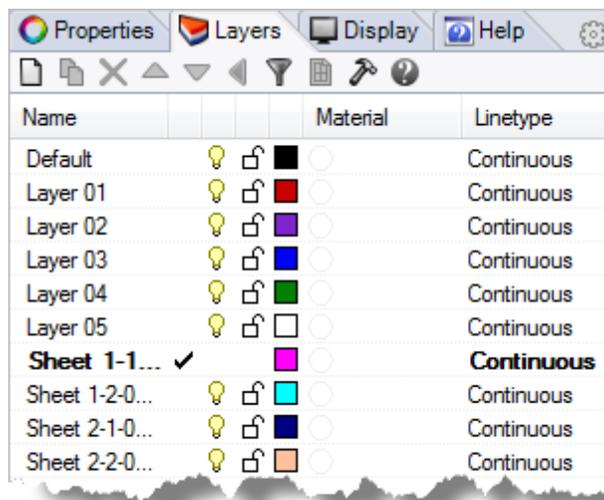




- Each time the Nest is generated, the system will calculate an Efficiency Factor referred to as % Utilization of the stock material for each Sheet, shown below.

#	Nested Sheet	% Utilization	
1	Sheet 1-1	72.35	
2	Sheet 1-2	69.60	
3	Sheet 2-1	56.06	
4	Sheet 2-2	54.78	

- Once we're satisfied with the layout of the nest, we will select the Commit Nest button. This writes the geometry of the individual sheets onto individual layers in your current CAD part file.



The geometry can then be used for machining or any other application that you wish.

---

## Where to go for more help

We have come to the end of the [Quick Start Guide](#) for [RhinoCAM-NEST](#). This tutorial is just sample of the many functions and controls available in the [NEST](#) module. Please explore the product in more depth to get a feel for how these functions and controls operate.

If you need additional help please use the following resources:

- The on-line help distributed with the product is a great resource to find reference information on the various functions available.
- Apart from the on-line help system you can download other tutorials and projects from [MecSoft Corporation's](#) web site at [www.mecsoft.com](http://www.mecsoft.com).
- If you need additional help, or if you have any questions regarding [RhinoCAM-NEST](#), you may contact us via e-mail at [support@mecsoft.com](mailto:support@mecsoft.com)
- [MecSoft](#) offers Online training as well as personalized full day training sessions. Please look up our website or email us at [sales@mecsoft.com](mailto:sales@mecsoft.com) for further details
- Please do continue to visit our home page to learn about the latest updates to [RhinoCAM-NEST](#) and any other help material.

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