

# CypNest

套料系统使用说明  
Automation For Laser



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## Welcome

Thank you for using CypNest nesting software!

CypNest is designed for providing nesting solutions for laser cutting industry, especially for Friendess CypCut users to meet the automation requirements of drawing processing, nesting, tool path generation and remote task transmission etc.

This document is based on CypNest 6.3.740.3, for continuous update of the program, there will be some difference from latest CypNest you are using and the document statement. We apologize for any inconvenience caused.

If you have any question or advice in use of our products, welcome to contact us.



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# Chapter 1 Installation and registration

Microsoft Windows 7 and above required for the CypNest normal operation.

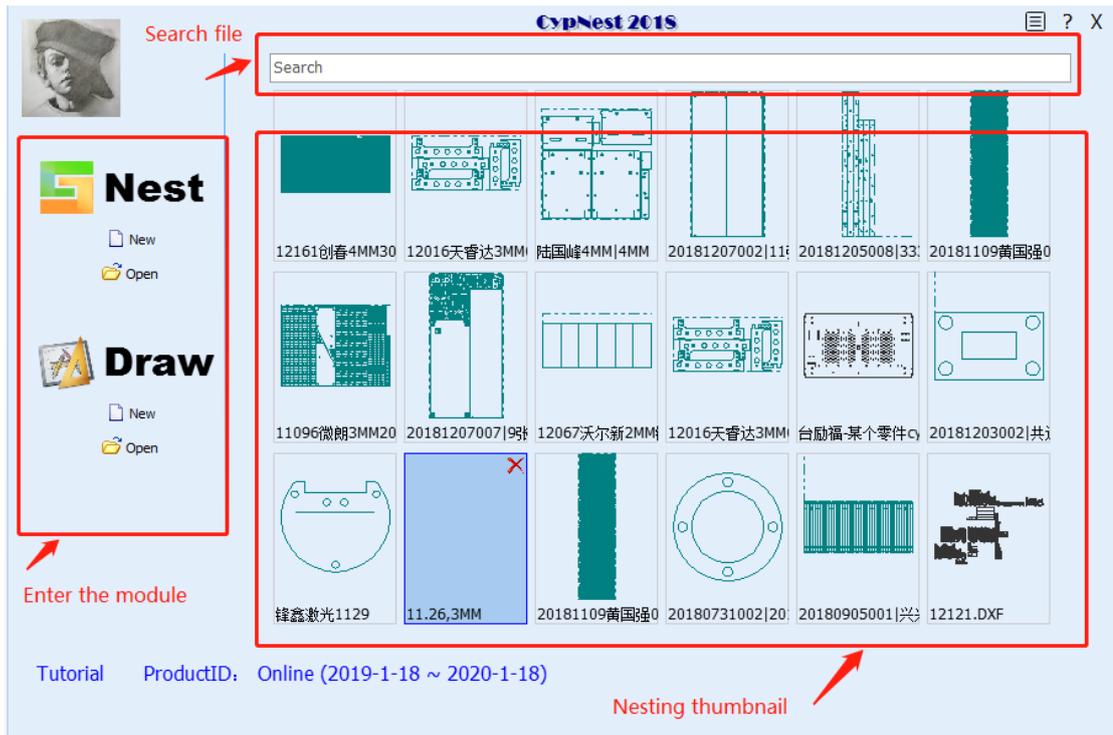
## 1.1 Dongle registration

Dongle users only need to insert dongle to computer then open the software without registration.



## Chapter 2 Nesting task

Open the software enter in welcome page. There are drawing module and nesting module in CypNest for parts drawing and nesting. Click to enter in the different function module in welcome page.



In welcome page displays the latest nest thumbnails. You can click the thumbnail to quick enter in nest task.



## 2.1 Create a task

Nest Task

TaskName: 20190119002

Material: SPCC Thickness: 1.00 mm

Plates Layer

+ Added + Import - Delete Up Down

Priority	name	Length(X)	Width(Y)	Gaps	Amo...
1	StandardPI 1200	2400	2.00	20	

Y X MCS

OK Cancel

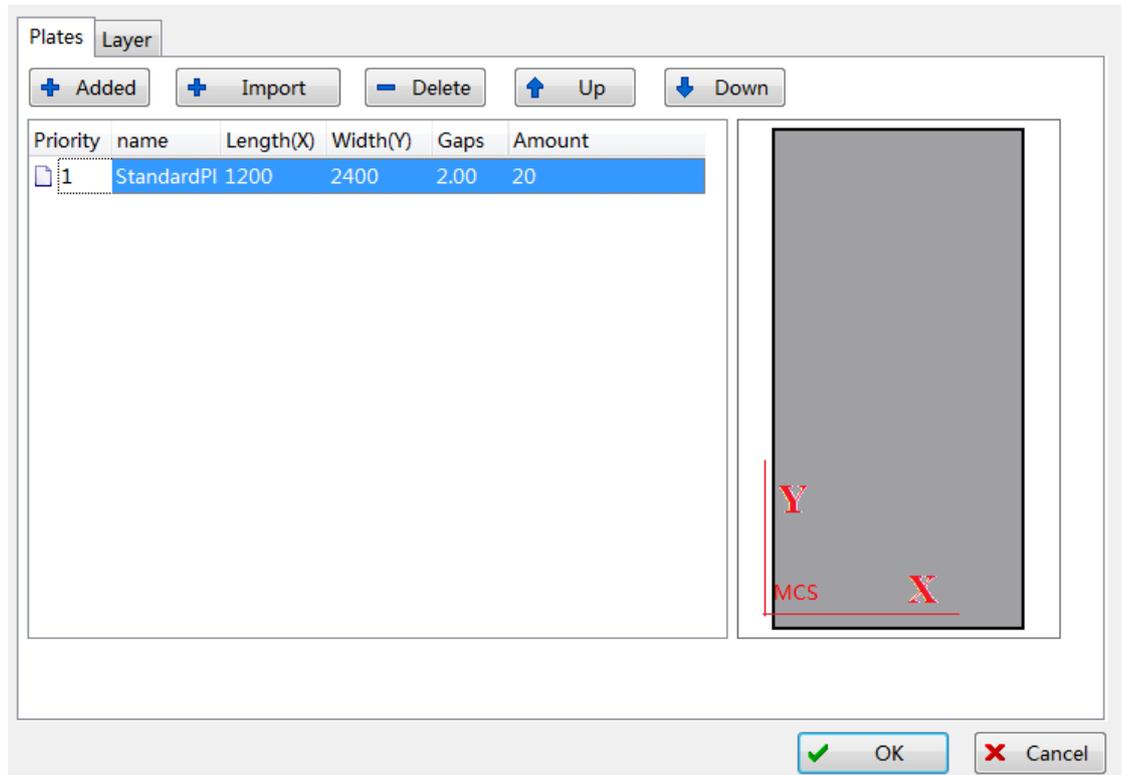
Create a new task will pop out the Nest Task Page. You can input basic information of the nesting task on this page includes: task name, material, thickness and dimension of the sheet. And select automatic process add to parts graph and set unit price for quoting.

- **Task name:** The name of the nesting task.
- **Sheet material:** Material type of the task sheet. This parameter will display in the nesting report. Click the button  to delete the current sheet. Click "Add New Materials" in the drop-down menu to add new material.
- **Sheet thickness:** Thickness of the task sheet. This parameter will be displayed in the nesting report.



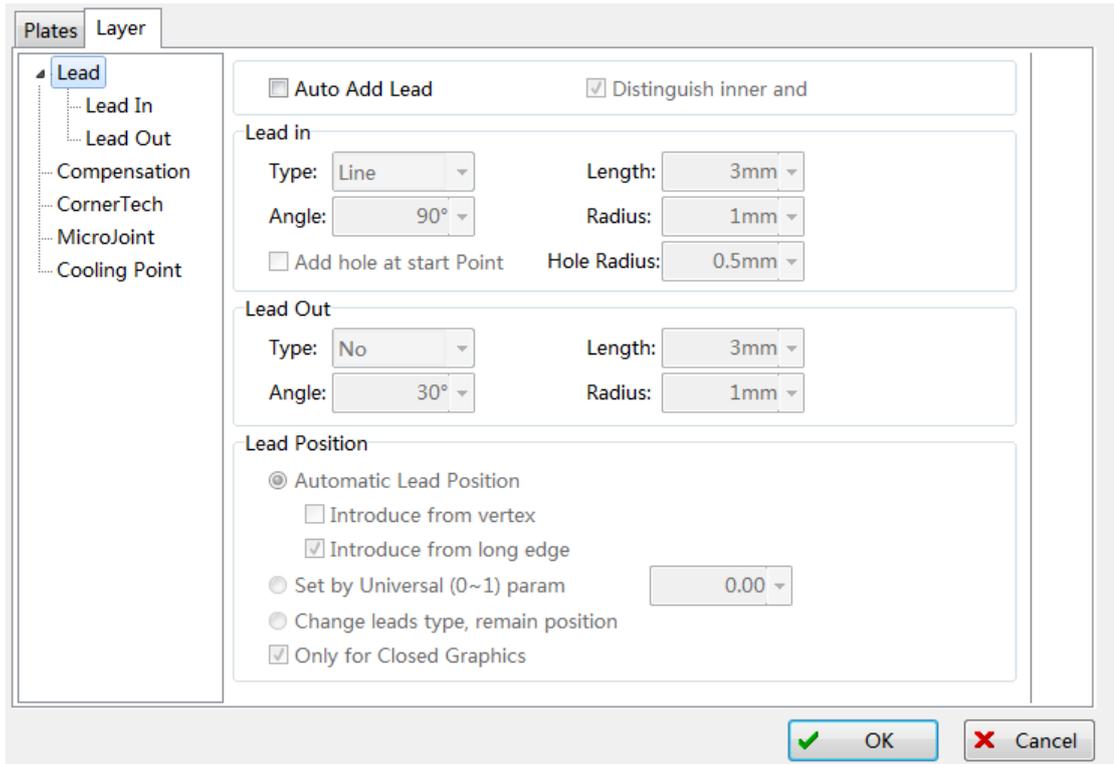
## Sheet tab

- **Add:** Add a new sheet for the current task.
- **Delete:** Delete the selected sheet.
- **Up/down:** Modify the usage priority of the sheet.

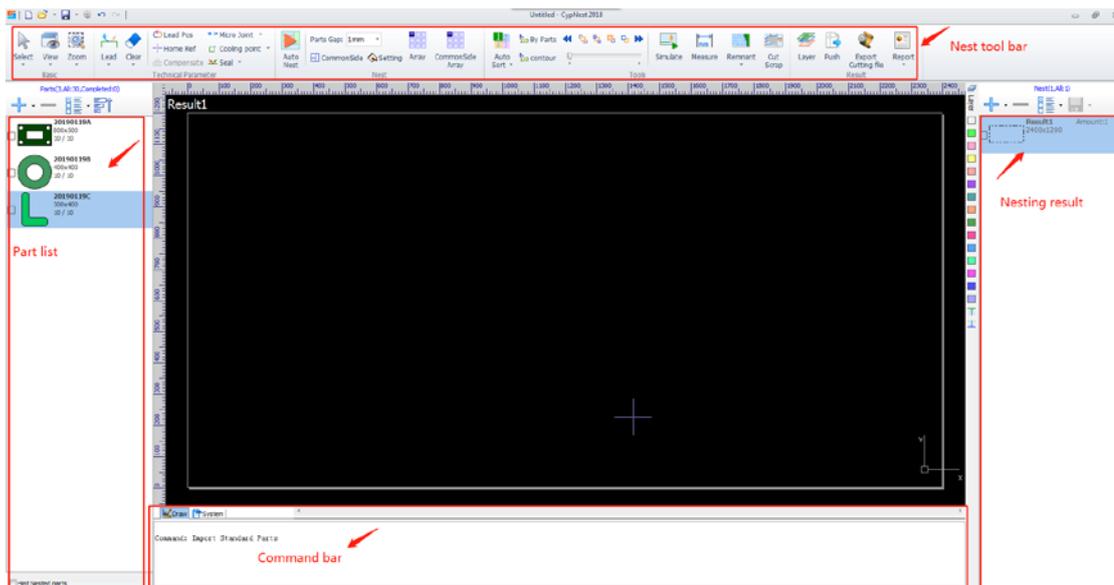


## Automatic-added technique tab

Setting up the automatic-added technique on this tab. The cutting technique parameter rule is same with the CypCut. The enabled function will be add to the parts automatically after import in the standard file. CypNest now supports automatically add compensation, lead line, fillet, micro-joint and cooling point. You can also add different lead line for inner contour and outer contour separately.



Confirm the parameters and enter in the main page. Top of the main page is toolbar for all nesting operation. Left bar is parts list showing the thumbnail, parts name, nested parts and un-nested parts. Right bar displays the nested sheets. Down the bottom is the command bar recording all the execute operations.





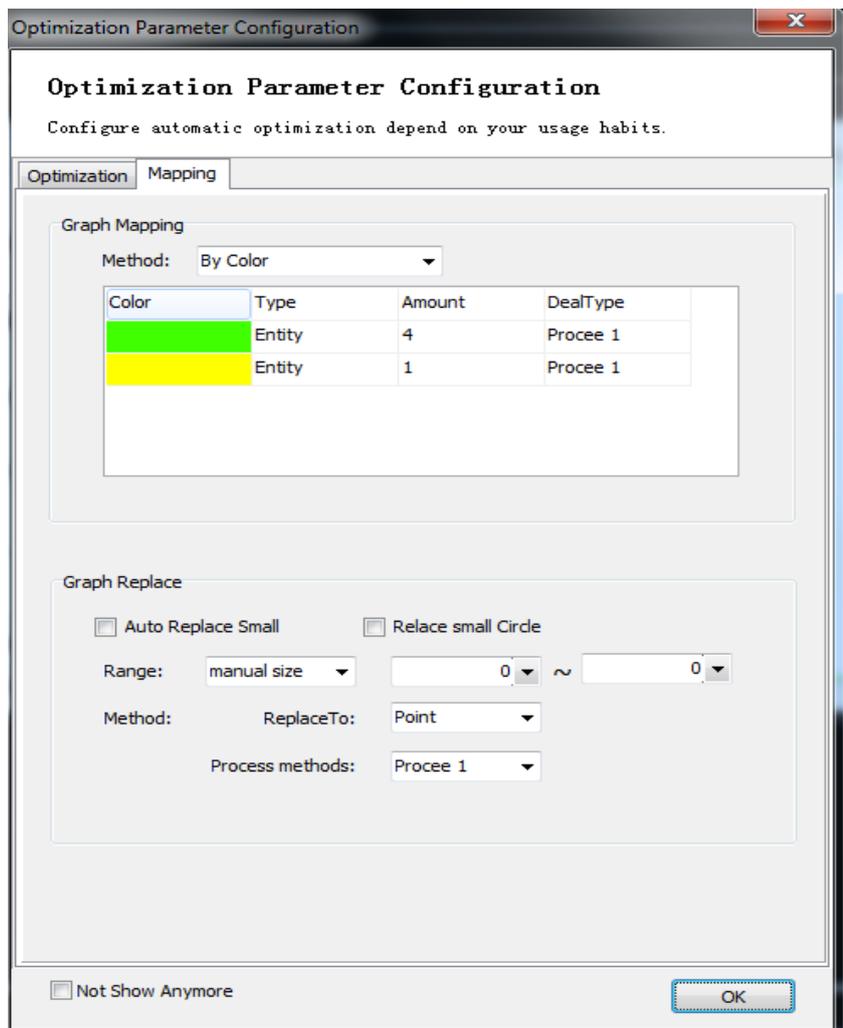
## 2.2 Add parts

### 2.2.1 Add from file and edit

Select and click open the file will pop out the optimization parameter page. In the "Mapping" tab, you can choose automatic map the DXF file by color or layer, and replace the minimal graph to the marking point or cross.

#### Drawing processing

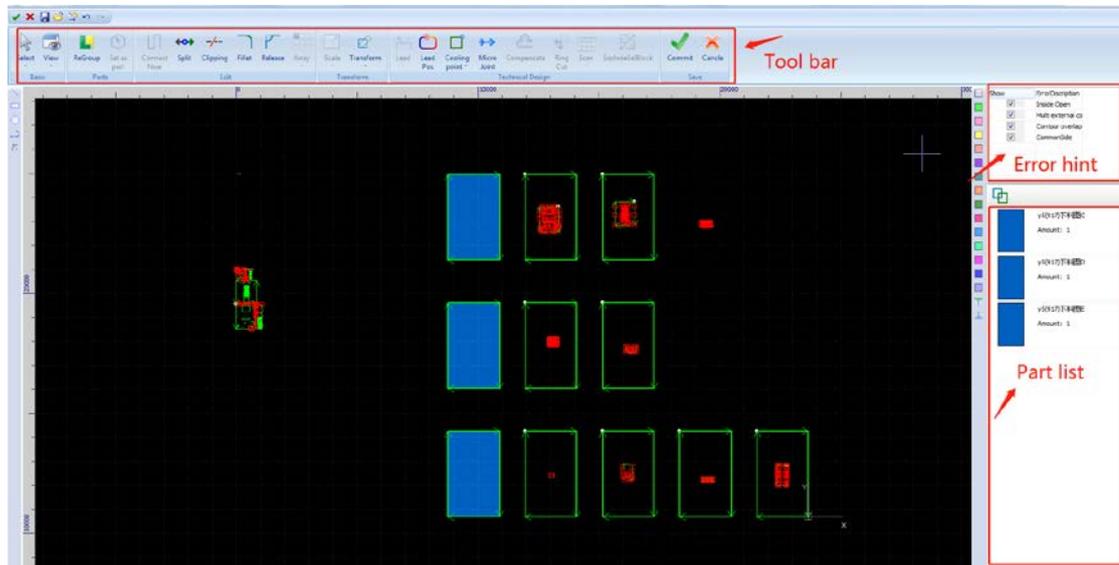
- **DXF mapping:** Software will identify the layer/color of the file, you can set entity of different color with process of cutting, marking or delete.
- **Automatic replace the small circle:** Automatically replace the graph smaller than the specified size as marking or piercing point.





Click Ok to save the setting and enter into drawing edit window.

Legal graphics are automatically identified as parts and filled in blue. The problem drawings are marked with red highlights and red boxes.



On the top right area shows the error hint. You can check or uncheck each option to show or hide related error area. All types of errors are highlighted in red.

When the drawing is set as a part, it will be displayed in the part list on the right side. Click each part and input number to modify the part quantity. You can modify the part name in this part list.

The ribbon toolbar provides tools for modifying and editing error drawings.

### Edit toolbar:

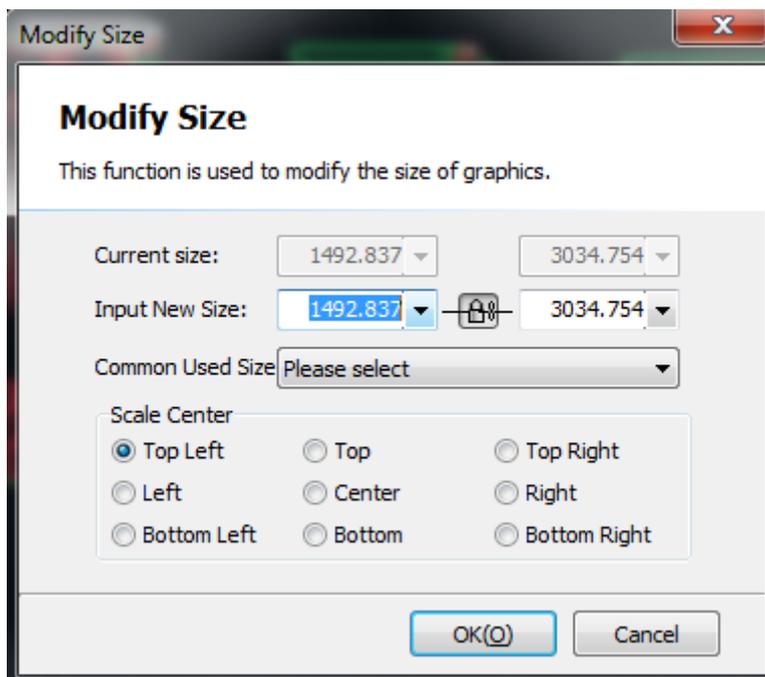
- Connect Near: Select the edges to connect and input max distance(unclosed lines within this distance will snap as one)
- Split: Click the split point will divide the closed curve to 2 curves. The split function will be activated until press ESC to disable the function or switch to other command.
- Clipping: The selected entity will be clipped from the near entity.



- **Fillet:** Add fillet corner to the graph entity.
- **Release:** Add a release corner to the specified position.
- **Array:** Array the selected graphic entities.

### Transform toolbar:

- **Scale:** Select graph entity and click scale will prompt modify size dialog box. If the lock icon in this state , the scale of length and width is coupled, if you want to modify the length and width separately click the icon  turn to state . "Scale center" specify the position between new graph and the original one. For example, "Top left" indicate the graph in new scale at the top left of the original one. Click the small triangle on the scale button will open a drop-down menu you can modify the graph scale as fixed ratio.



- **Transform:** Transform the graph entity as specified rules. Transform the graph entity by rotate. Click mouse to create a rotate base line to modify the graph entity.

### Parts toolbar:



- **Regroup:** Automatically analyze the drawings, graphic entities without errors are automatically set as parts.
- **Set as parts:** Set the selected graphic entity as a part, the wrong graphic entity cannot be set as a part

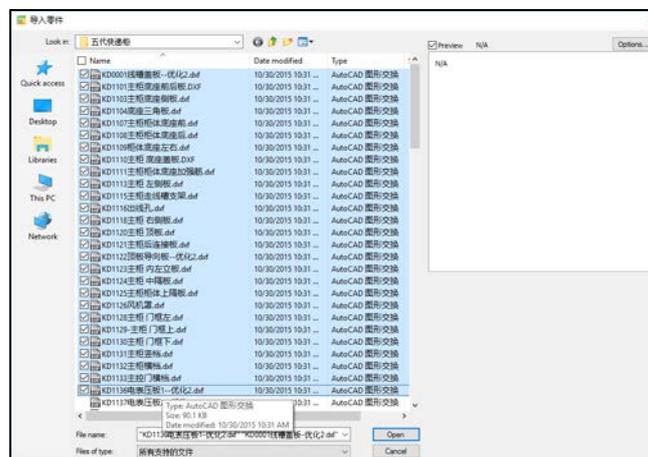
### Drawing toolbar on the left

- **Line:** Click and drag to draw a straight line.
- **Rectangle:** Drag a diagonal line to draw a rectangle.
- **Circle:** Drag the mouse to draw a circle.
- **Polyline:** Click mouse to create the control point of polyline, meanwhile you can right click the mouse to switch the polyline type.
- **Node mode:** Activate the node mode will display the nodes of selected graphic entity. Drag the node to modify the node position.

Click Ok to save the setting, all the parts in list will be imported into nesting page. All the graphical technique data will be saved with the parts.

### 2.2.2 Import from file

Add dxf file. If there is more than one part in the drawing, the software will identify the part by inner and outer contour of the graphic. You can import bath files



in one time. The part name same with the file name. You can also input the new part



name.

If software detected there is unclosed graph entity will prompt warning to show the file name and won't add any process to the file.

### 2.3 Add sheet and sheet setting

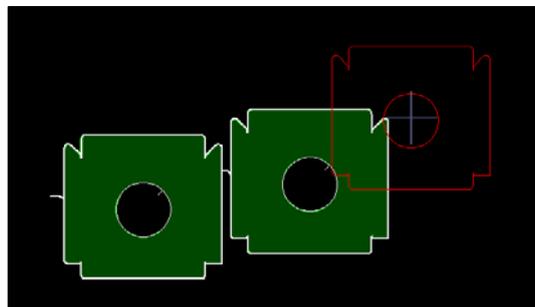
In sheet list on the right side will display all the plan sheet and quantity. Click



to add sheet in the nesting list, select the sheet you can also manually nest the parts on it.

### 2.4 Manual nesting

Drag the part into the nesting area meanwhile the part is snapped on the mouse. Click the left mouse to drop the part. The graph entity in red color indicates the



overlap with the other graph cannot drop in current position.

The part nested on the sheet can still be dragged and snapped. Multiple parts selected at the same time will be nested as a whole entity. Meanwhile the bump detection still works, the whole entity cannot be put in overlap area. The whole entity can be copy and nested manually. When the remnant quantity of the part not enough the part cannot be copy.

When the part is snapped on the mouse, press shortcut key can rotate the part.

The functions are shown in Table 1.

You can press arrow key to move the part lean to the nearest part or sheet border.



Select a part and press array will open the array window. By "Dynamic Array" you can drag the border box around the part to array the part. By "Array" you set the parameter and create the array.

Also you can press shortcut key to finish the dynamic array and parameter array.

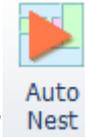
**Table 1: Rotate shortcut key1**

Part status	Function	Key
Parts snapped on the mouse	W	Rotate 90° clockwise
	S	Rotate 90° counter-clockwise
	D	Clockwise rotate (you can set rotate angle by click right mouse in nesting parameter-rotate angle)
	A	Counterclockwise rotate (you can set rotate angle by click right mouse in nesting parameter-rotate angle)
	Ctrl	Close snap and bump
	1 (not in keypad)	Rotate 1° counter-clockwise
	4 (not in keyboard)	Rotate 45° counter-clockwise
	0 (not in keypad)	Reset to initial position
	M	Vertical mirror
	G	Press G enable common line function, loose G to disable the function
Nested parts selected	Dynamic array	Ctrl+ D
	To the left	←
	To the right	→
	To the top	↑
	To the bottom	↓



By "Parts gap" **Parts Gap:** 1mm in nest toolbar define the spacing between the parts. This parameter can be modified anytime in nesting process.

## 2.5 Auto nest



Click "Auto nest" in nest toolbar will prompt the Auto nest parameter page.

### Basic parameters

**Auto Nest**

**Nest**

Please enter the board size and then click OK, the graphics will be automatically nest.

**Nest Params**

**Nest Range**

Current plate  All plates

**Nest strategy**

Speed  Utilization

**Nest Direction** Portrait

**Nest Settings**

**Pre-Group**  Open  Close

**Rotate:** 90

Enable Auto CommonSide

**CommonSide Style**  All CommonSide  Part CommonSide

CommonSide SimilarSide

**Min CommonSide Length:** 20mm

**Max CommonSide Num:** 2

Continue Rearrange Cancel

- **Nest range:** Select current plate the nesting only use the current plate, won't affect the nested plate and other plate in plate library. When select all plate the nesting will use all the plate in nesting list and plate library.
- **Nest strategy:** The slider closer to speed, the program will reduce the calculation times and save the time which suitable for regular shape parts. The slider closer to utilization, the program will increase the calculation and



use the optimal solution, which suitable for the irregular shape parts.

- **Nest direction:** The software will nest the parts in the selected direction.
- **Nest settings:**
  - **Pre group:** Enable the function the program will nest the parts into rectangular shape to improve the utilization. It's not suitable for parts of arc shape.
  - **Rotate:** The parts will be rotated by the integral multiple of the degree.

### Common line

Activate the function the program will snap the edges of the parts according to the setting.

- **Common line type:** Select "**All common line**", as long as the snap edges reach to the **min common line length** will be merged as common line. It's not recommended to use all common line, it might sacrifice the cutting quality. Select **part common line**, the common line part cannot exceed the **max common line number**. Select **common line similar side**, only similar parts edges will be merged as common line.

Click continue will resume nesting and keep the current nest result. Select "**rearrange**" the program will clear nest result and restart nesting. If the parts not nested yet just click **start nest**.



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## Chapter 3 Common line tool path

The program designed common line array for the regular rectangle shape part. After array the parts the program will create the tool path automatically. The parts nested manually in common line will have to sort the sequence then create the tool path.

### 3.1 Common line array

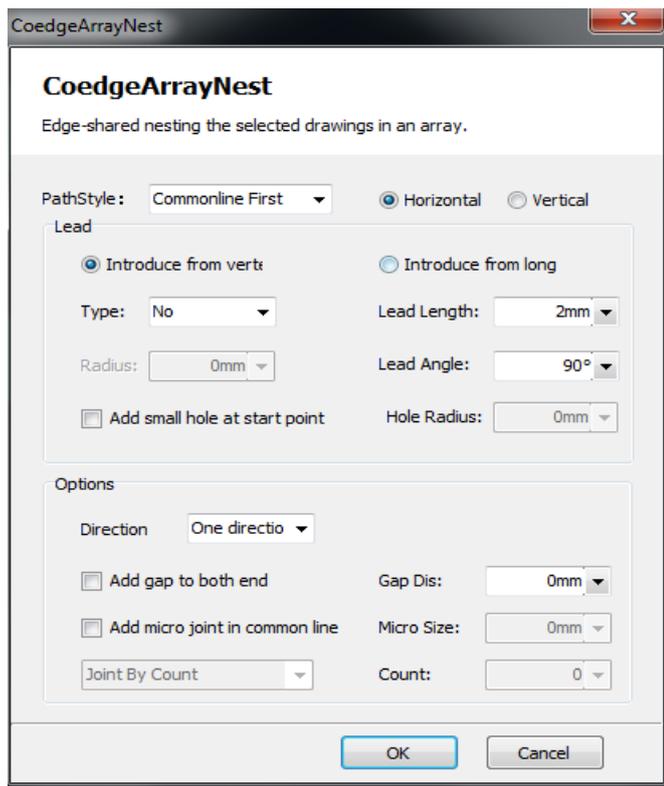
You can nest the part by common line array and no need to create tool path. This is efficient for the regular rectangle parts nesting.

There are three ways to generate tool path of common line array.

#### 3.1.1 Common line first

The tool path is designed for “目”shape array, all the common line are parallel in same length.

The tool path of this pattern is cutting common line first then the outer frame. Add joint at the cross section between common line and outer frame to prevent tip-up crash.



**Lead line:** Lead line parameters define the features of lead line at outer frame.

- **Introduce from vertex:** The lead in line is always from start point of common line.
- **Lead length:** The length of the lead in line
- **Lead angle:** The angle between lead line and part edge.
- **Add small hole at start point:** Add a small circle at the start point of the lead line.
- **Hole Radius:** The radius of the small circle.

**Options:** The option define the pattern of common line tool path.

- **Gap distance:** The gap between common line and outer frame.
- **Direction:** One direction means cutting all common line in same direction. Zigzag means cutting adjacent common line in opposite direction.
- **Add micro joint in common line:** Add micro joint in common line.
- **Micro distance:** The distance from micro joint to the ends of the common



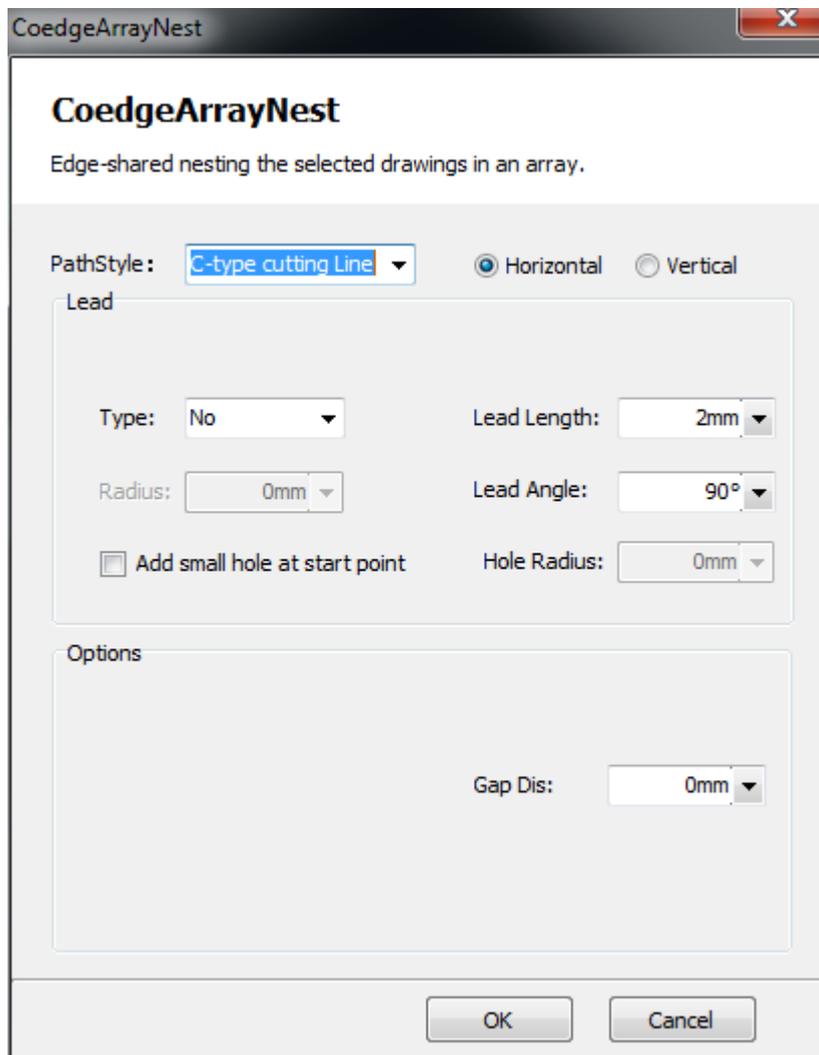
line.

- **Micro size:** The length of the micro joint.

### 3.1.2 C-type cutting line

The tool path is designed for “目”shape array, all the common line are parallel in same length.

The basic tool path is cutting the "[" or "C" shape one by one. This tool path can avoid tip-up crash.



C type common line suitable for the rectangle parts.

**Lead:** The parameter define the lead line feature.

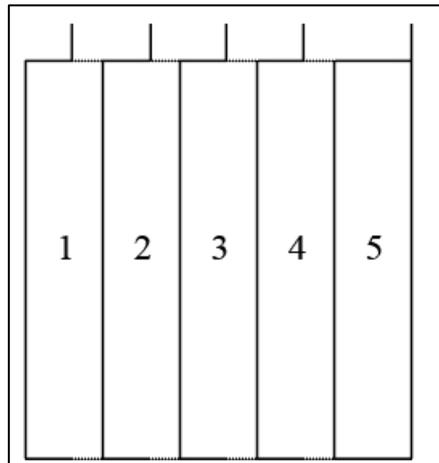
- **Lead length:** The length of the lead line.



- **Lead angle:** Angle between lead line and part edge.
- **Add small hole at start point:** Add a small circle at the start point of the lead line.
- **Hole Radius:** The radius of the small circle.

**Options:** The option define the pattern of common line tool path.

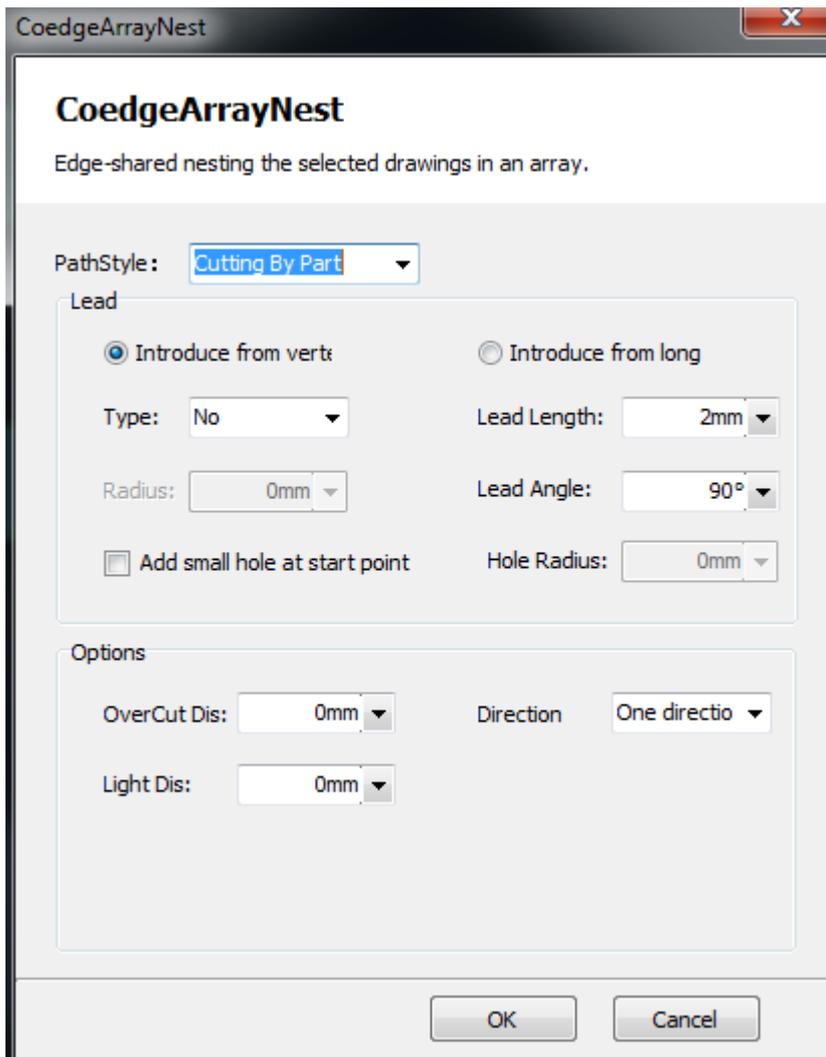
- **Gap distance:** The joint on a graphic entity at start point.



### 3.1.3 Cutting by part

This tool path is designed for the "田" shape common line pattern.

The tool path is cutting C shape one by one. There will be overcut at the intersection of common line, each cut path start from the gap no need piercing.



**Lead:** The lead line will be at the first part. Lead line parameters define the features.

- **Introduce from vertex:** The lead in line is always from start point of common line.
- **Lead length:** The length of the lead in line
- **Lead angle:** The angle between lead line and part edge.
- **Add small hole at start point:** Add a small circle at the start point of the lead line.
- **Hole Radius:** The radius of the small circle.

**Options:** The option define the pattern of common line tool path.



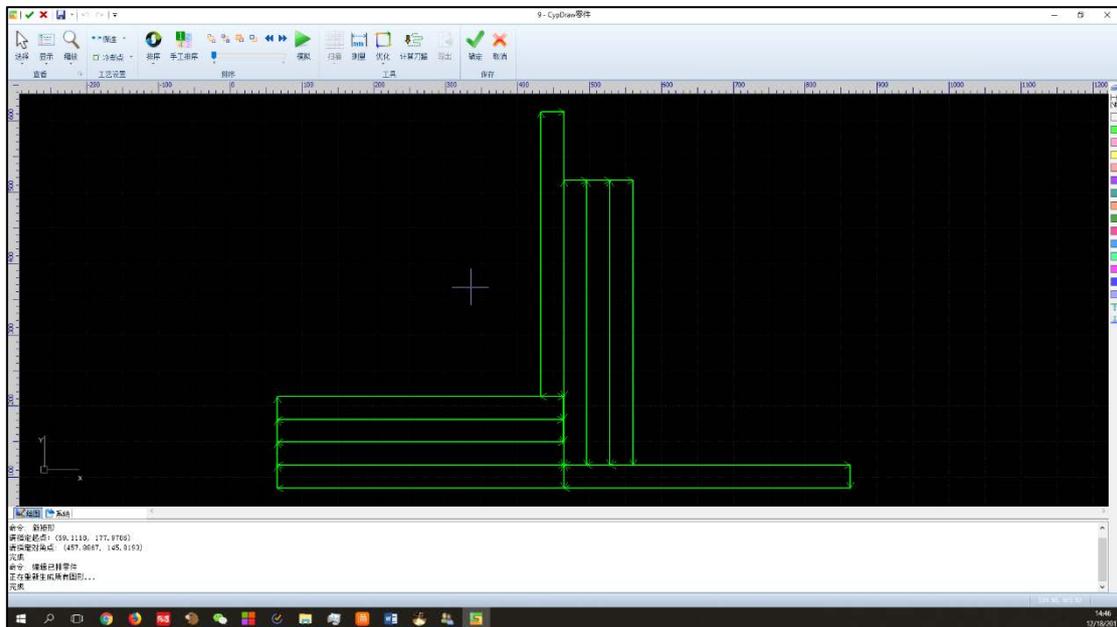
- **Overcut distance:** The overcut distance from the vertex of the common line to the next part.
- **Direction:** Cutting sequence of array parts. Zigzag means cutting path is S shape, one direction means same cutting direction to all parts.
- **Light distance:** The distance from laser fires to the overcut point.

### 3.2 Custom common line

Common line create by auto nesting and manual nest required to reset tool path.

The tool path setting is same with the "cutting by part" in common side array.

Double click the common side graphic entity enter into the tool path setting page. Reset the sequence of the part and click "create tool path" open the tool path parameter page. The definition of the parameter same with the "cutting by part" pattern. After create the tool path you can set micro-joint and cooling point. After setting up, click OK to return into nesting page.





## Chapter 4 Processing settings

### 4.1 Graphic technique settings

After nested the parts you can modify the nesting result by technical parameter tool bar. The operation is same with that of CypCut software.

### 4.2 Batch modification

The technique of same part can be batch modified. Including start point, micro joint and cooling point.

Click each technique option the modify range will show in the left bar.

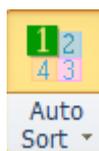
**Current part:** The modification only take effect on the current selected parts.

**All parts:** For example, the modification of Part A will take effect to all part A.

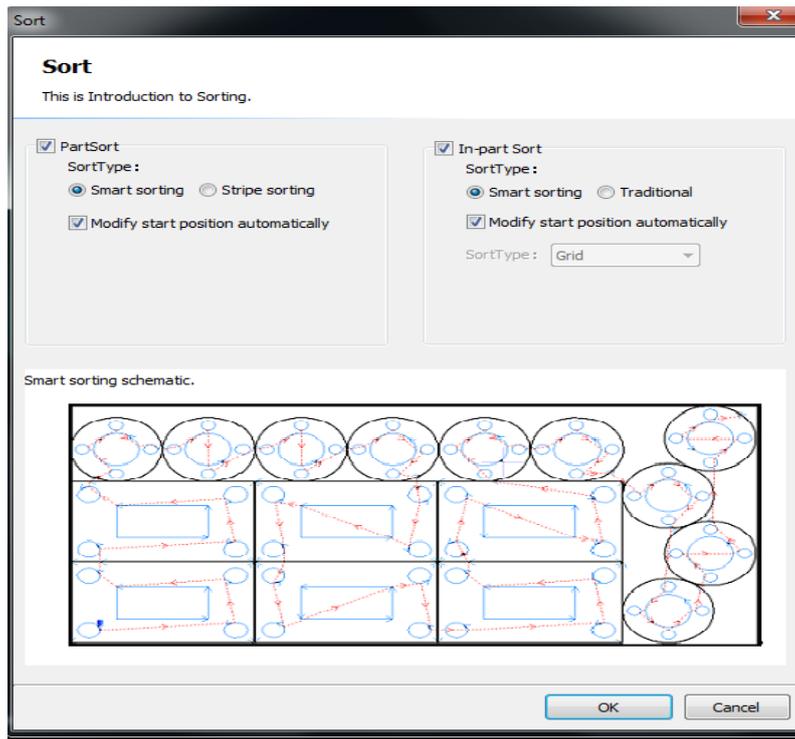
**Same rotating:** The modification of part A will take effect to all the parts A same angle with current selected one.

**Select manually:** Frame select the parts. The modification of part A will take effect to all the part A selected.

### 4.3 Auto sort



Click sort button will prompt auto sort page.



Auto sort includes sort part and sort in part.

#### 4.3.1 Part sort

**Smart sorting:** Select the function, the program will calculate the optimized tool path by the "home ref" and layout of the part.

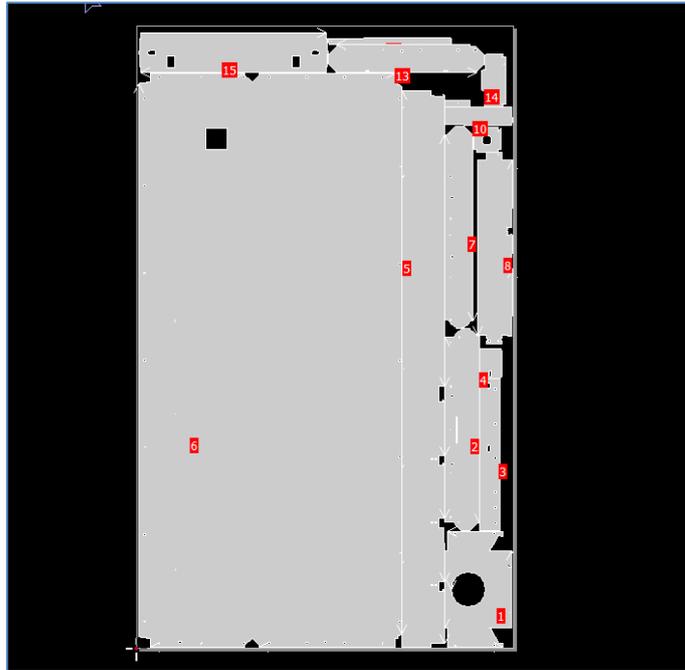
**Modify start position automatically:** Program will calculate the optimum start point to avoid laser head pass the tilted part and crash to the part.



## 4.4 Manual sort:

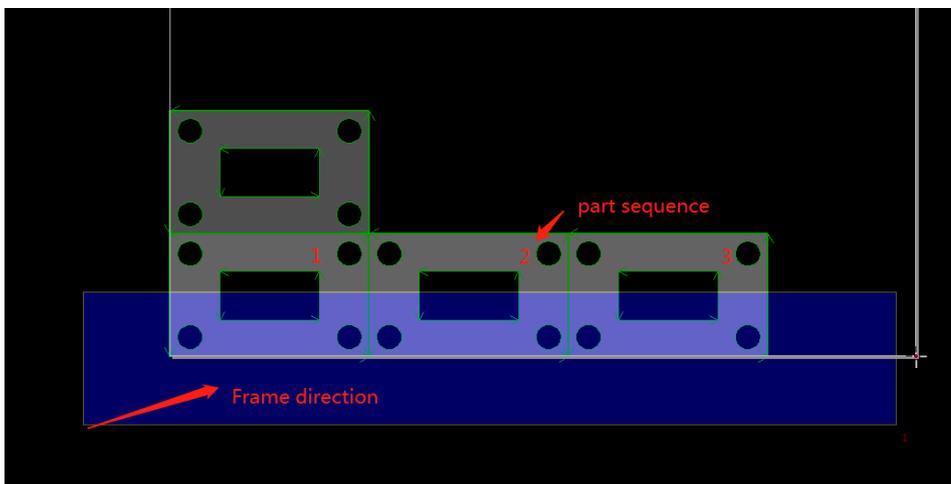
### 4.4.1 Part sort

Click  will enter into manual sort state, all parts will highlighted in grey color. The number on the each part shows the cutting sequence.



By click each part to modify the cutting sequence. The part sorted in new sequence will return the original fill color.

In addition, you can drag the frame box to set the part sequence. The part sequence same with the direction drag the frame box.

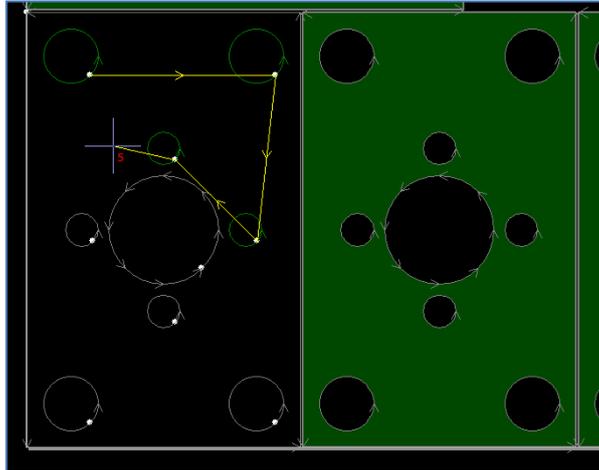




#### 4.4.2 In-part sort

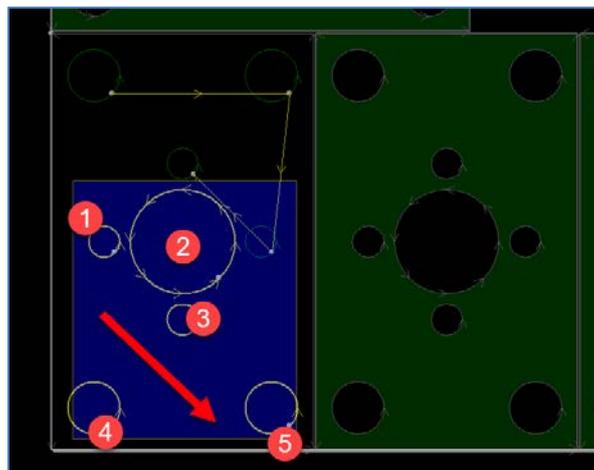
Click the button  activate the function. The selected part will be highlighted in grey.

Click each graphic in sequence to modify the cutting order. Sorted graphic will



turns green.

In addition, you can drag the frame box to set the part sequence. The part sequence same with the direction drag the frame box.



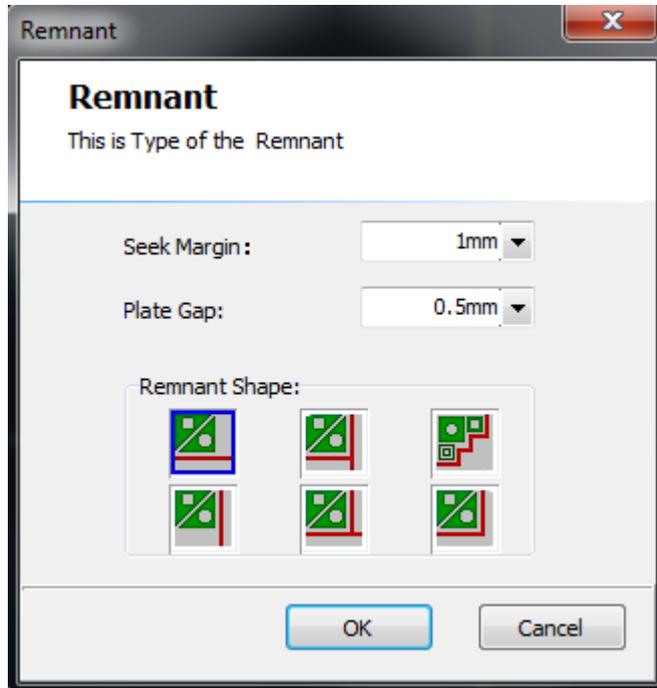
#### 4.5 Remnant

Click the remnant will prompt a cross dotting line in the page. Move the cross line to snap on the nested area click mouse will prompt the parameter page.

- **Seek margin:** Spacing between remnant line and nested area.
- **Plate gap:** The spacing between remnant line with the sheet outline.



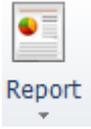
- **Remnant shape:** The type of the remnant line. There are horizontal-vertical shape, horizontal-vertical T-shape, polygonal and L-shape etc., 6 types in total.

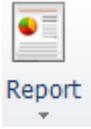




## Chapter 5 Export cutting file

### 5.1 Report



Click  will prompt the parameter page. CypNest generates PDF and Excel format nesting report.

**Report name:** File name of the report

**Report type:** Report format.

**Content:** To select the content generated in report. When PDF format is selected, the price report will be generated separately.

**Content options:**

**Show part list:** Display the parts list in the report.

**Plate size:** Select "Plate" the plate dimension in report calculated by the pre-set dimension;

**Contour:** Select "Contour" the plate dimension in report calculated by the peripheral contour of the nesting area on the sheet.

**Price parameters:** It is used to calculate the material weight and cost in the price report.

**Save path:** The save path of the report file.

The nesting report contains 3 part including task info, part list and work report. Make sure the motion parameter is same with the actual cutting parameter, otherwise the time count will be wrong.

Task information includes sheet metal overview and price information. The sheet overview shows the sheet dimension, the utilization of the sheet, the processing time and the unit price. And the price information shows the price estimator of the whole processing task.

The part list shows the number, sequence and process quantity of each part.



The processing report shows the nesting thumbnails and each part with number on it for picking out the part easily. In addition, the production price for a single sheet, production parameter and part list contained in the work report.

## 5.2 Export cutting file

CypNest software can generate files of 2 format- nrp file of nesting sheet package and lxd.

Click the "export cutting file"  will generate one nrp file contains all the nesting sheet and can be read in CypCut as whole. Now only Cypcut 6.3.712.6 and later support the function.

Select single nesting sheet can be saved as lxd file. Select a folder and all the selected nesting sheet will be saved in the folder as lxd for importing in CypCut for processing.

All the cutting parameters set in CypNest will be saved on the file and read by CypCut.