

# **Manual of Vertical Glass Drilling and Milling machine**

**Fujian Baineng CNC Equipment co.,ltd.**

**Add:No.3 Sanmenkou Industry zone,Tongcheng street Fuding city Fujian province**

**Tel:0086-593-7869881**

**Fax:0086-593-7869882**

**Website:www.bncnc.net**

**mail:bnsale@bncnc.net**

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## I .Brief Introduction

### 1.Introduction of Machine

Baineng CNC Vertical Glass Drilling and Milling machine is a new generation machine which is professional for glass deep processing.We adopt the TAIWAN SYNTEC CNC system combined with BAINENG software.It is fully auto-complete from pattern design to product processing. It can be used for cutting,drilling,milling,shaped notching,edge grinding and polishing on glass.First of all,make the drawing with CAD software,then transfer the CAD drawing to Baineng software(CAM) and set parameters.The code is generated.Last the machine can work according to TAIWAN SYNTEC CNC system's instructions.So it's a good choice for mass production for building glass,furniture glass,decoration glass and bathroom glass.

Operation process :

drawing→transfer the drawing to software→lead the code into the system→the machine working

### 2.Introduction of Software

Baineng software is easy to learn and operate.You just need to transfer CAD2000.dxf to Baineng software ,then it can automatically generate the codes.

Operation process:

File import→select the lines→set the parameters→update the parameters→generate the codes

## II .Installation

### 1.Machine Installation

#### 1) Machine Balance

- 1) Prepare 4pcs steel plates in size300\*300\*10mm.Put the plates to the bearing feet

of machine. Increase the stressed area to prevent floor subsidence resulting in equipment tilt.

- a. First use 4pcs adjustable shock pads to adjust the level of main body, then use 4 adjustable footing cushion to adjust the level of the feeding and discharging parts which connected with the main body to ensure all in line.

## 2) Lines Installation

Machine main power connection: select 4 (3) core 6mm<sup>2</sup> copper core cable to connect to the output side of 4-way 60A circuit breaker with external independent control.

The signal and code line of each axis driver must be connected and installed according to the corresponding identification. Other lines have the corresponding socket to connect the aviation plug

Note: All above installations had better be carried out by professional personnel

## 2. Software Installation

Software will be installed through remote by our technician.

## III. Control System

### 1. Starting Up

Turn on the power switch connected to the device until all electrical components are fully displayed.

### 2. Zero-return

- 1) Select the zero return mode
- 2) Press 『X+, X-, Y+, Y-, Z+, Z-, C+, C-』 according to direction of machine motion.
- 3) Machine starts return to zero (As below picture)

G54	N0 L1	Coord.	2018/1/11	10:10:00	Admin
<b>Machine</b>			<b>Relative</b>		
X	0.000		X	0.000	
Y	0.000		Y	0.000	
Z	0.000		Z	0.000	
C	0.000		C	0.000	
<b>F</b> 1000.000 mm/mir 100% 0.0 mm/mir(Actual)			<b>S</b> 1000 RPM 100% 1000 RPM Actual		
Run Time 0 : 0 : 0			PartCo 0 T 0		
			•Ready Auto		Alarm
Coord.	Program	Offset/Setting	Monitor	Maintain	

### 3.Set the Working Coordinates

1)Open "set the offset" as below:

G54	N0 L1	Coord.	2018/1/11	10:10:51	Admin
<b>External Shift</b>			<b>Machine</b>		
<b>G54P1(G54)</b>			X 0.000		
X	0.000	X 0.000	Y	0.000	
Y	0.000	Y 0.000	Z	0.000	
Z	0.000	Z 0.000	C	0.000	
C	0.000	C 0.000	<b>Relative</b>		
<b>MPG Shift</b>			X 0.000		
<b>G54P3(G56)</b>			Y 0.000		
X	0.000	X 0.000	Z	0.000	
Y	0.000	Y 0.000	C	0.000	
Z	0.000	Z 0.000	<b>Aux. Coord</b>		
C	0.000	C 0.000	X	0.000	
			Y	0.000	
			Z	0.000	
			•Ready Auto		Alarm
WorkPiece Coord.	Tool Set	Tool Tip Measure	User Param. Setting		

2)Fill the X.Y.Z.axis coordinates in corresponding parts(It needs to add radius of the diamond wheel to Z axis coordinate)

3)Press F2 Tool Setting:Fill tool radius into left side of following picture(tool radius D),fill tool length into right side of following picture(Tool Length).



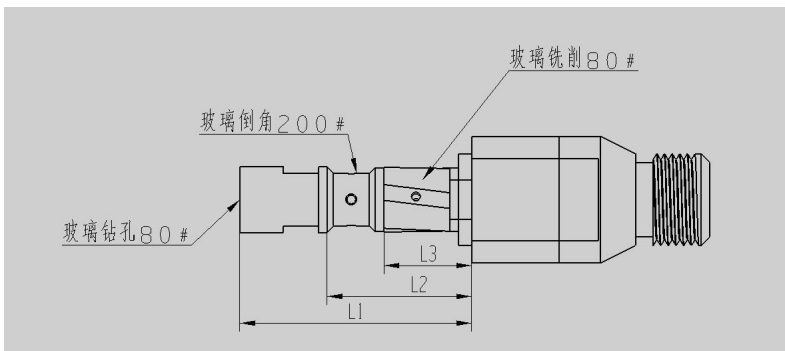
#### 4)Measure method of Tool Length:

For example:Drill measurement,put the tool to spindle and fix it,set the glass to processing area and tight it,slowly move or use hand remote move the tool until touch the Z axis coordinates,the data is drill length.



## 5) Multifunctional Tools Length Measurement

Measure the size for each processing part L1.L2.L2(see below picture)



## 4.Processing Monitoring

### 1) Open Processing Monitoring(As below picture)

Processing monitoring is the interface for executing the program, You can see processing code, processing time and simulated pattern here.





## 5.Placement of glass

- 1) Check all axis under normal working,move the clamp on A axis till the glass can load on it.
- 2) Put the glass on the feeding rack,move the glass to processing area by hand or hand remote,then set the Working Coordinates(Like above point 3)

## 6.Copy the Program

- 1)Copy the .nc file to u-disk and insert to the USB connector
- 2)Open"Program Editor"F2(see below picture 1),then open F4 Archives administration—F4 File transfer—F1 File input(see below picture 2)
- 3)Press F1 select the file need to be processed then F2 copy



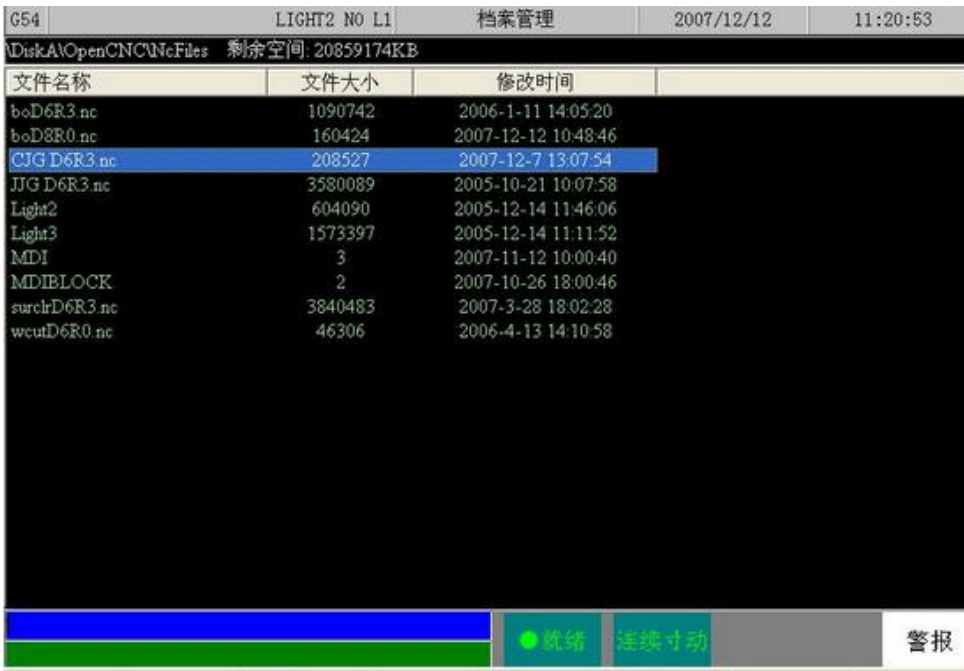


图 1 Picture 1



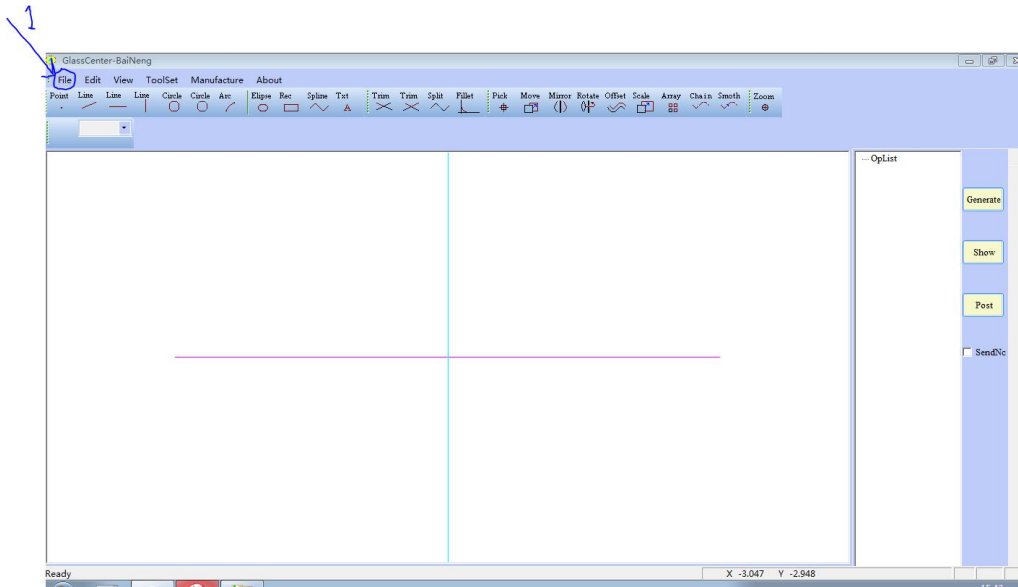
图 2 Picture 2

## 7. Loading Program

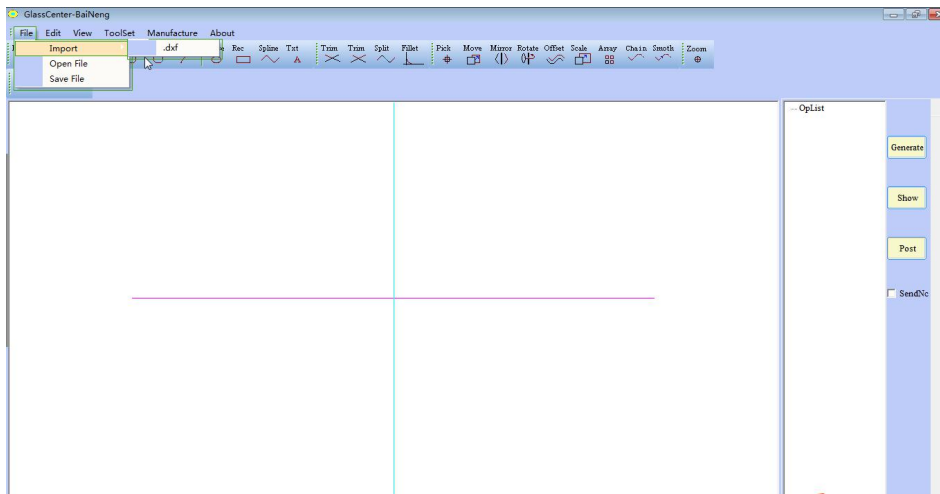
Back to "Program Editor" as Picture 1, Move the cursor to the copied file and click F5 to load it start processing.

## IV.软件使用教程 Software Operation

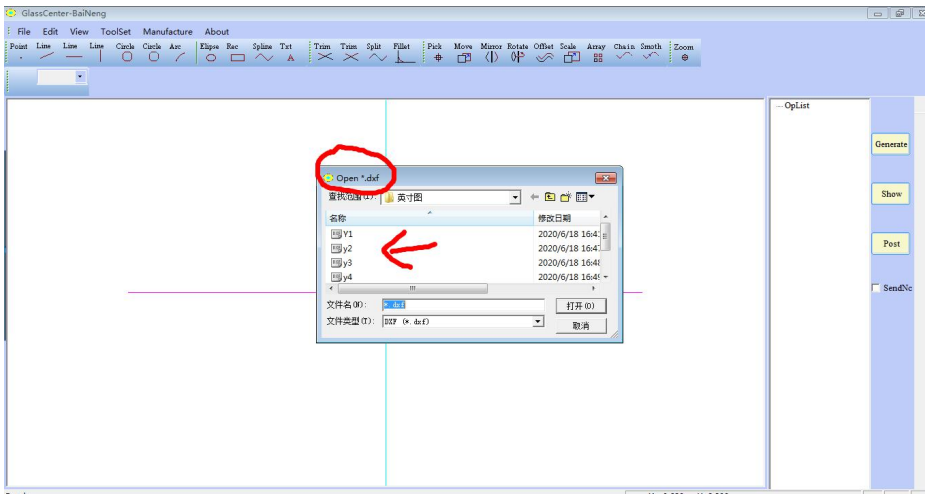
### 1. Open BAINENG software



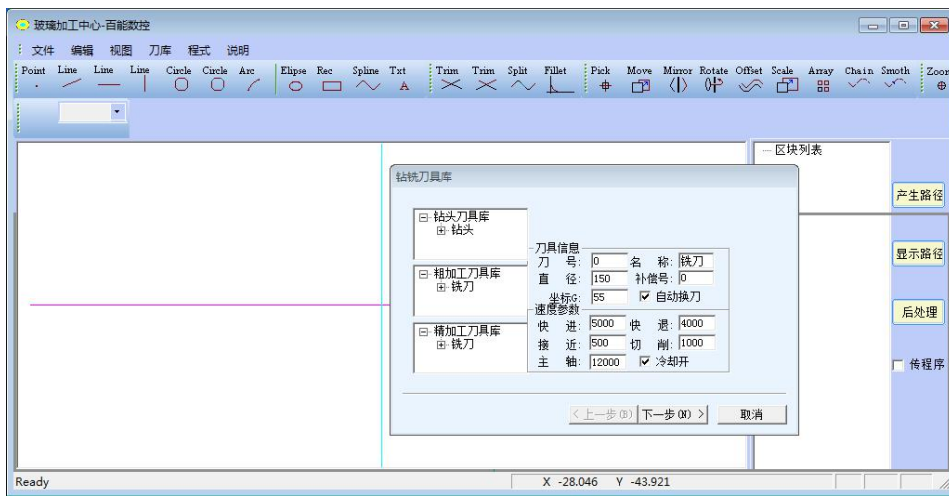
### 2. Click Menu-File



### 3. Select the processing file(DXF file)

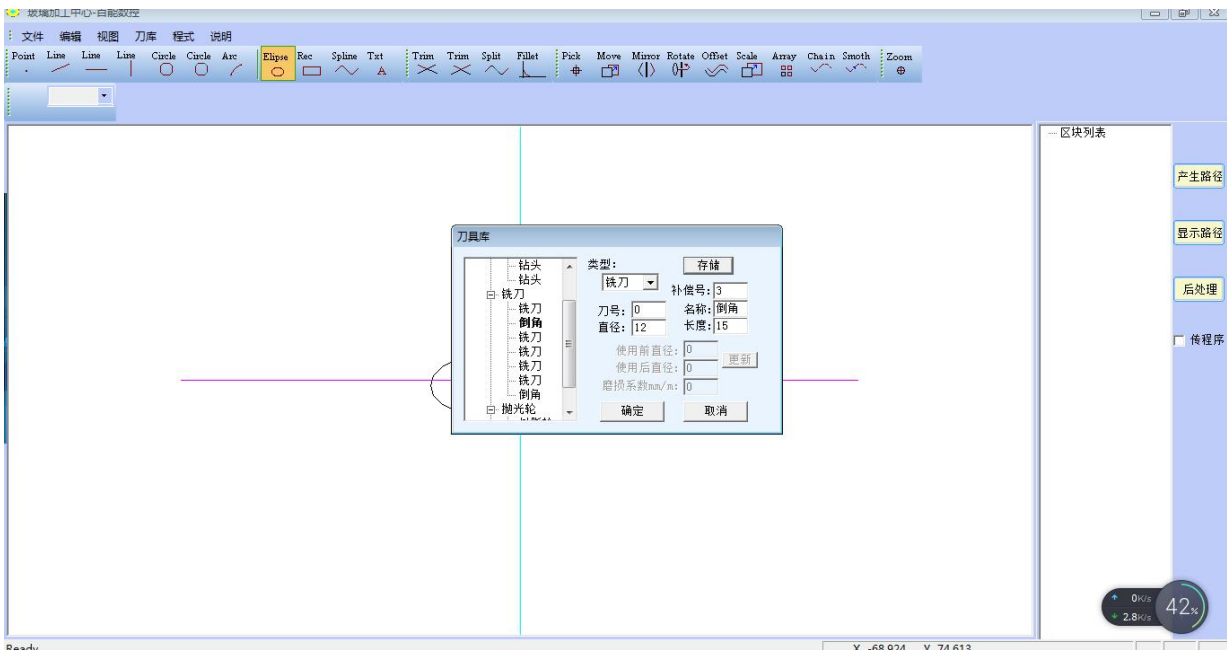


#### 4. Set parameter for tool



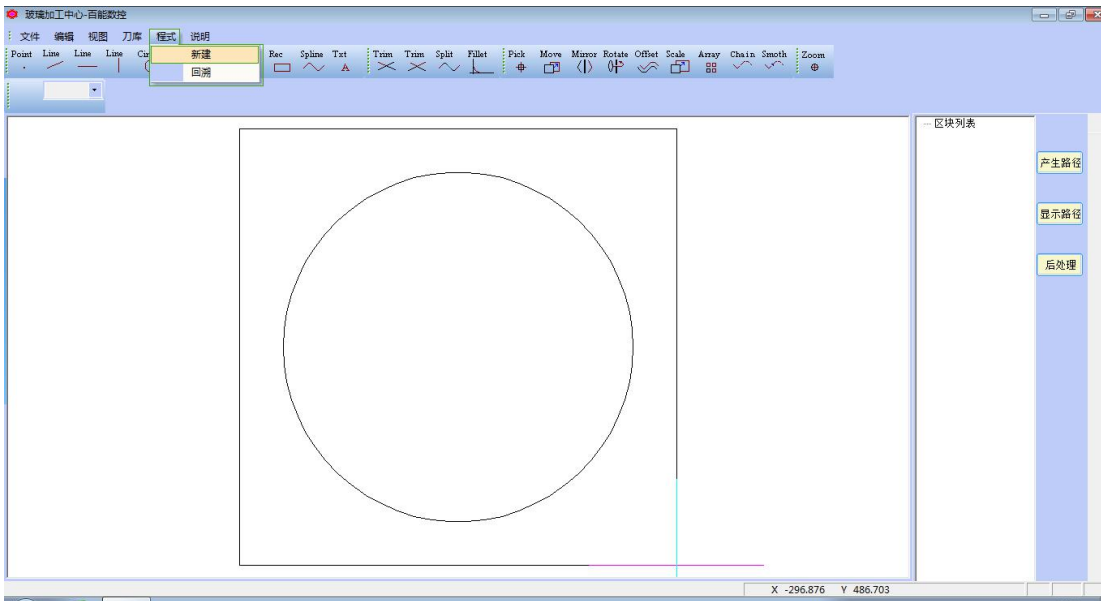
#### 5. Select the tool parameter you will processing:

Such as: Radius, Tool No., Compensate No....

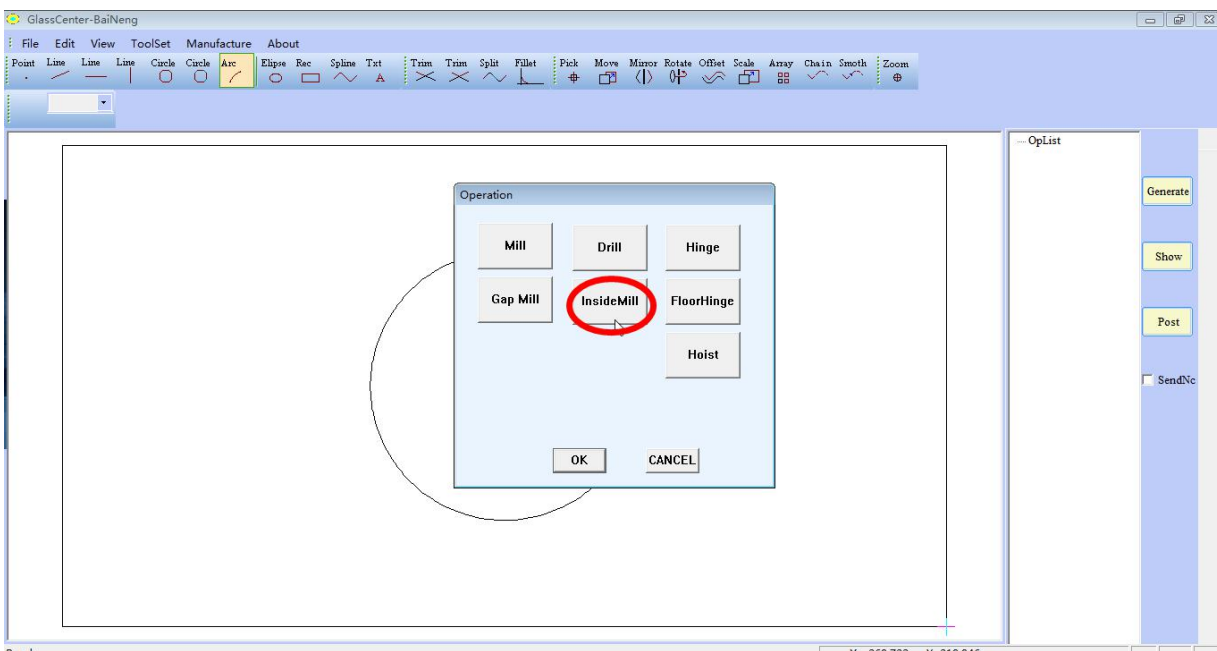


6.After setting,click save it ---confirm---tool library---save

7.Click Menu---Form---New

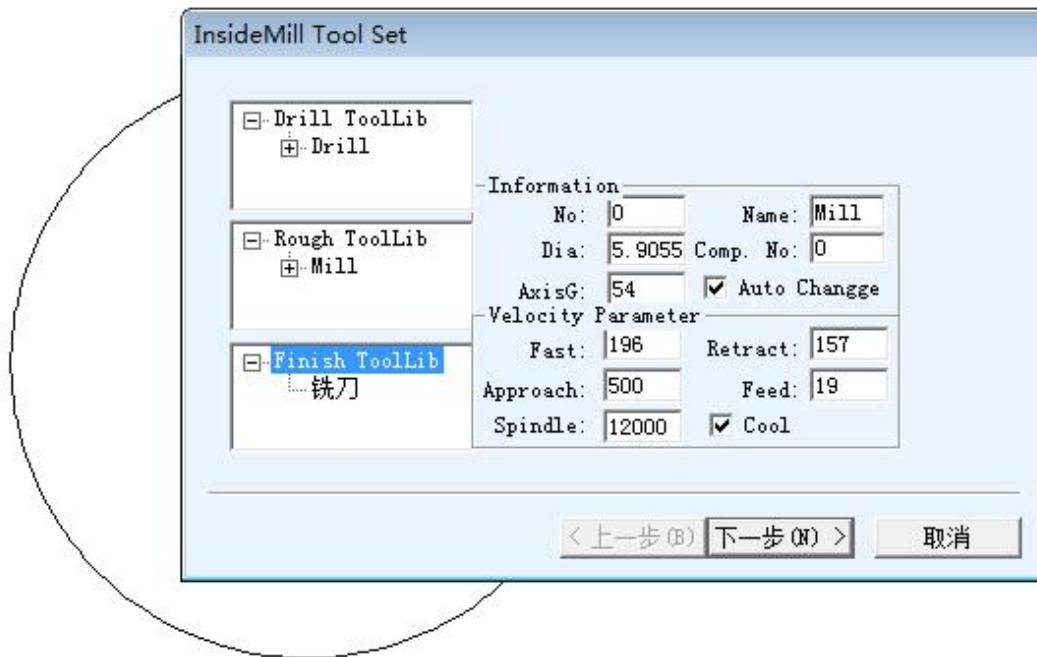


8.Select processing type



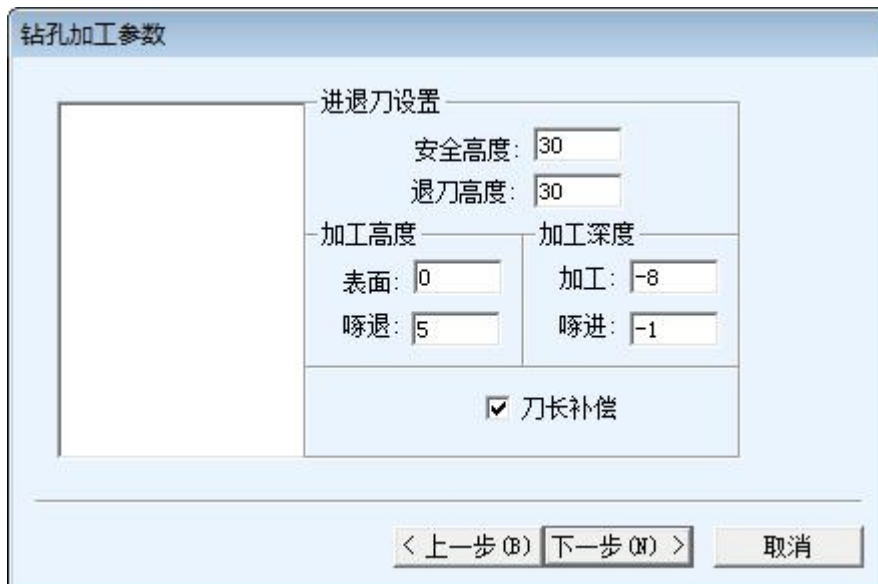
Such as inner Milling

A.Select tool:Drill,Rough processing Miller,Precision Processing Miller(After set the tool parameter should right click to update it.)



### B.Setting tool(drill) parameter

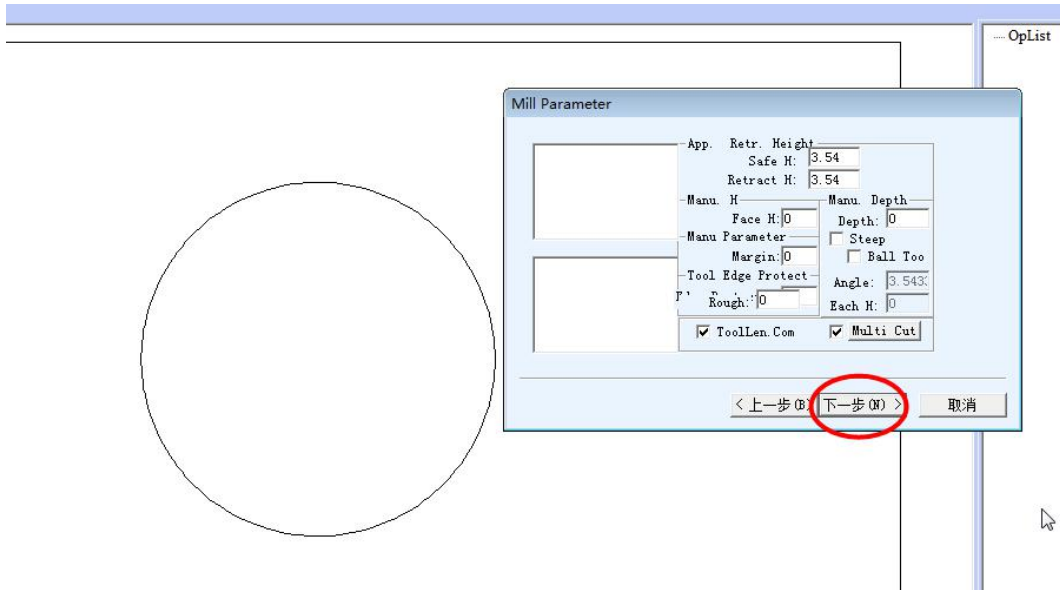
Remark:Put the glass thickness on processing depth(For example:If the glass thickness is 8mm,should be fill -8)



### C.Setting Tool (miller)Parameter

Progressive cutting depth in blade protection shall be equal to the length of the cutting edge of the milling cutter minus the glass thickness

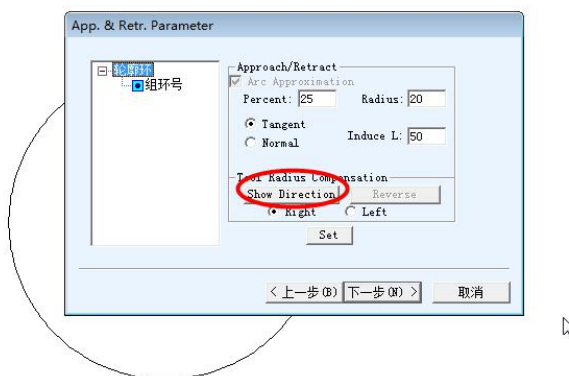
The multiple layers of cutting should be ticked when roughing and finishing are selected at the same time,and fill 1 to the quantity of rough processing.



#### D. Set tool route parameter

When setting the group ring number parameter, select the group ring to be set, The tool feeding position can be adjusted by amplitude and radius. Tool radius and tool path are selected by tool complement setting.

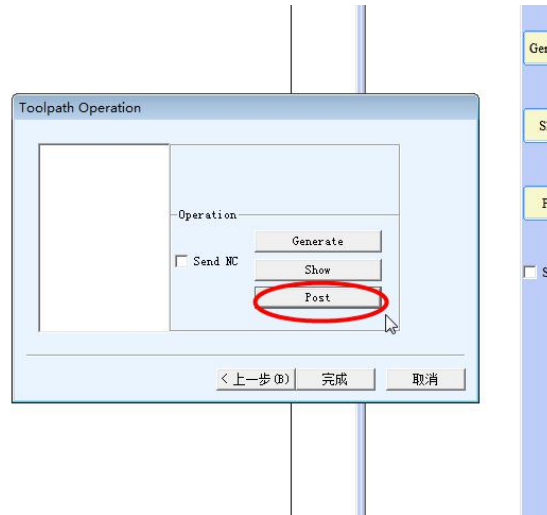
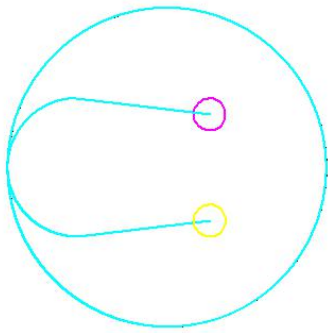
Please click set after setting all data, then next step.



#### B. Check the tool path

Click path button → Toolpath Appear

Check the processing effect same design or not.



### C. Generate processing code

When only have one file to process,click generate to save the file.If have some files need to process, click finish button to generate the file number and merge it with other files to save together.

### V.Common System Alarm

System Alarm	Alarm reason	Solve way
Home Alarm	While turn on the machine,all axes not return to home.	Move X.Y.Z.C axis and make machinery coordinates to negative.Then click"HOME"--"START"
Tool Library Alarm	Due to some errors cause push out tool library not successful.	A,Check if the air pressure too low. B,Check if tool library device is fully lubricated. C,Check if all switches and lines are damage or not. D,After solve all above problems,Press "restart"or "power off and restart"to clear alarm.



<p>Tool Change Alarm</p>	<p>Tool change not finish while automatically change tools.</p>	<p>According to system remind,press"home"till alarm clear.</p>
<p>Actuator Alarm</p>	<p>The alarm happen due to operation fault cause all axes crash or actuator and servo motor occurred.</p>	<p>A,Check the alarm code and failure reason,solve the problem accordingly. B,The machine totally power off,move the problem axes to safety position by "JOG".</p>
<p>Spindle frequency converter alarm</p>	<p>A,Alarm happen while input voltage fault or output lines and machine failure. B,Human reason(The tool crash to the worktable due to the error of coordinate for Z axis)</p>	<p>A,Check the alarm code of frequency converter and read the manual to check failure reason,solve it accordingly. B,Cut off the control power of frequency converter to solve the problem. C,After confirm the problem solved,totally power off the machine,restart after 10mins,move up Z axis to safety position by"JOG".</p>
<p>Over-trip Alarm</p>	<p>Each axis moves over stroke limited.</p>	<p>Move the alarm axes to the opposite direction by"JOG"until the alarm clear.If still not solve,should be check if trip switches and lines damage.</p>
<p>Following Error Alarm</p>	<p>A,Due to wrong operation cause each axis move slightly,the alarm is issued. B,If following error value double over MAX error</p>	<p>A,Check if all control lines and actuators of axes are alarm. B,If alarm issued by actuators,solve the</p>

	value,the alarm is issued.	<p>problem according to above step(Actuator Alarm)</p> <p>C,Check if electrical components and lines both burn-in,and if there have too much dust in actuator make temperature too high cause following speed slowly.</p>
Miss Command Alarm	<p>A,Due to long time without lubrication for each axis cause resistance to move.</p> <p>B,Momently Check if the tolerance of feedback and output command value is within the predetermined error range after the controller stop output the commands to an axis ,if not within the error range,the alarm is issued.</p>	<p>A, Check if the automatically lubrication device can add oil normally.</p> <p>B,Enter into “Parameter setting”,find the missing place,adjust the error value range greater than the actual value.(Remark:Increase this parameter value,the error value should be increase also)</p>

## VI.Maintenance

### 1.Ball screw and Linear

- 1)The ball screw and linear of each axis is transmission part,it's lubrication automatically by system.It should set the control time of the lubrication system according to the workload and keep lubrication oil in lubrication pump.
- 2)While add lubricating oil,do not add used lubricants and oils.
- 3)Clean the dirt and moisture on ball screw and linear in time,especially for Z axis.

4) Do not use corrosive liquid or sandpaper (cloth) to wipe the ball screw and linear.

## 2. Electric box

1) There are many main electronic component in the electric box. It should be dust-proof and wet-proof

2) Don't move the control box after installation to avoid any damage on lines.

3) Regularly clean the dust in the control box and electric box. Please use dry and clean brush or high-pressure air cooler to clean.

## 3. Water pump

The water tank should be cleaned in time for the water supply and the maintenance of the water pump. Due to long-term processing and recycled water, there is much glass dust and powder which makes water block and water pump broken.

## VII. Notes

### 1. Safety Procedures

Safety Procedures issued to ensure operator and machine can avoid accidents by improper operation, so all reference person must read this chapter carefully and take preventive accordingly.

### 2. Safety checking

A. While Maintenance must cutoff power.

B. Please wear safety protection measures at work, like safety shoes, safety helmet, safety goggles, etc

C. Pls don't wear wet gloves while operate the machine

D. Do not remove mechanical safety device or metal sheet cover.

- E. The environment around the machine needs to be clean and bright. Don't stack other stuff. Do not clean around side of the machine with air gun. (Avoid dust rise)
- F. While there are people working in the worktable, it is strictly forbidden to operate machine.
- G. Any electronic control problem should be handled by the professional people.
- H. Check that all parts which need the oil should be lubricated.
- I. Check that the door and panel of the electrical cabinet are closed and locked.
- J. Make sure all the buttons are in good condition
- K. Make sure that all wires are not broken
- L. Please check whether the three-phase voltage is normal before power supply.
- M. Please fully understand the operation instructions before use
- N. The machine must be grounded. Connect the copper to 1 meter underground.