# Manual of Glass Working center machine

# Ⅰ.Brief Introduction

## 1.Introduction of Machine

Baineng CNC Glass Working Center 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
a,Prepare 4 pcs steel plates in size 30x30x0.5cm.Put the plates under the feet of the machine.
b,Put the linears on the straight lines for X,Y axis with precision level.Adjust X,Y axis in a horizontal level with adjustable cushion
2)Lines Installation
The signal and coding lines of axis drivers need to be installed in the corresponding socket of the system.Select 4 core 20A cable connected to main power source of the machine

## 2.Software Download

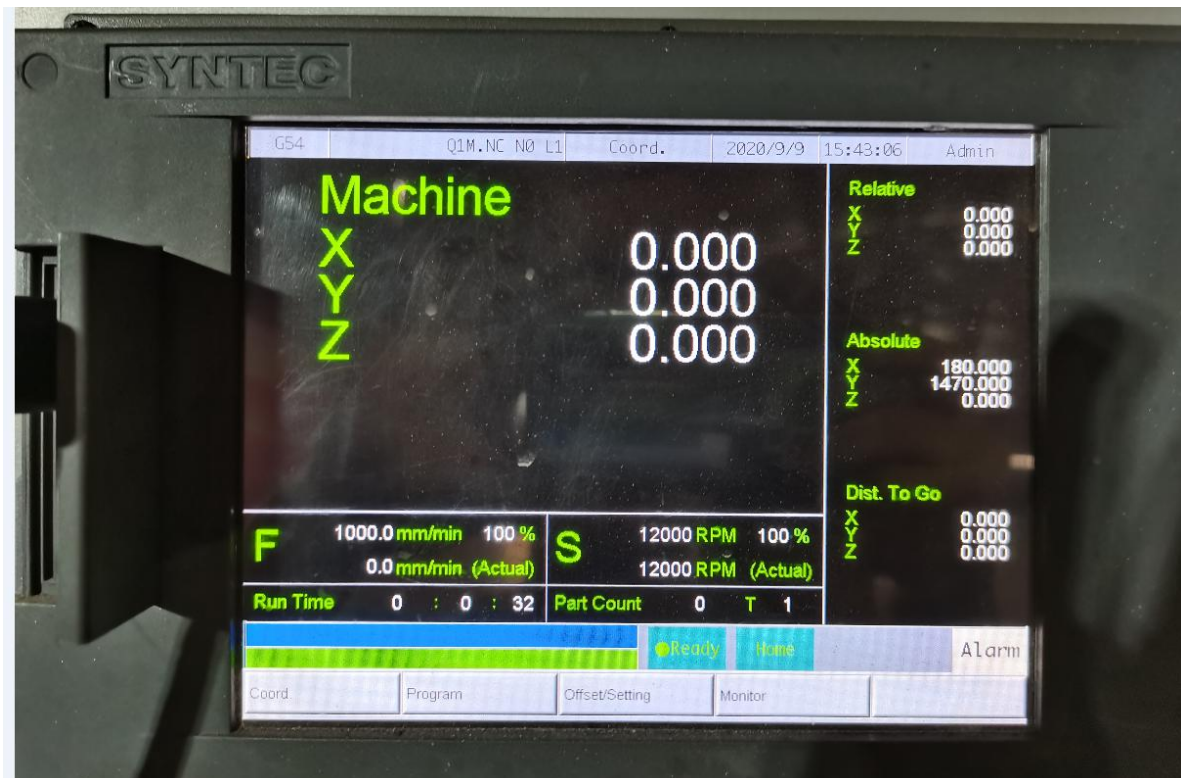Software will be download through remote control by our technician

# Ⅲ.Control System

## 1.Starting Up

Turn on all the power switches,until all appliances 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)CNC Machine starts return to zero

## 3.Set the Working Coordinates

1)Open "set the offset"



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

## 4.Set Tools Library Coordinates

1)Manually measure the corresponding X.Y.Z axis coordinates for tools 1-10 and make a record
2)Open"Goto parameters"(see below picture),search the axis parameters for tools(3426-3456)

| Index | Item | Value |
|---|---|---|
| 3417 | Knife speed F(R97) | 2000 |
| 3418 | Slack time (0.1S)(R98) | 20 |
| 3419 | Clip pause time (0.1S)(R99) | 20 |
| 3420 | Left tool library,X,exit point coordinates(R100) | 300000 |
| 3421 | Right tool library,X,exit point coordinates(R801) | -2450000 |
| 3422 | Left tool library, X, safe point, coordinates(R802) | 300000 |
| 3423 | Right tool library, X, safety point, coordinates(R803) | -2450000 |
| 3424 | Total number of knives(R804) | 10 |
| 3425 | Safety coordinate for tool change of Z shaft(805) | 35000 |
| 3426 | No.1 knifeY position, mechanical coordinates(R806) | -1609078 |
| 3427 | No. 2 knifeY position, mechanical coordinates | -1300000 |
| 3428 | No. 3 knifeY position, mechanical coordinates | -989775 |
| 3429 | Extension Parameter(R809) | -678775 |
| 3430 | No. 5 knifeY position, mechanical coordinates | -367325 |
| 3431 | No. 6 knifeY position, mechanical coordinates | -1605350 |
| 3432 | No. 7 knifeY position, mechanical coordinates | -1298367 |

G54        Q1M.NC N0 L1    Parameter    2020/9/9   15:44:15    Admin
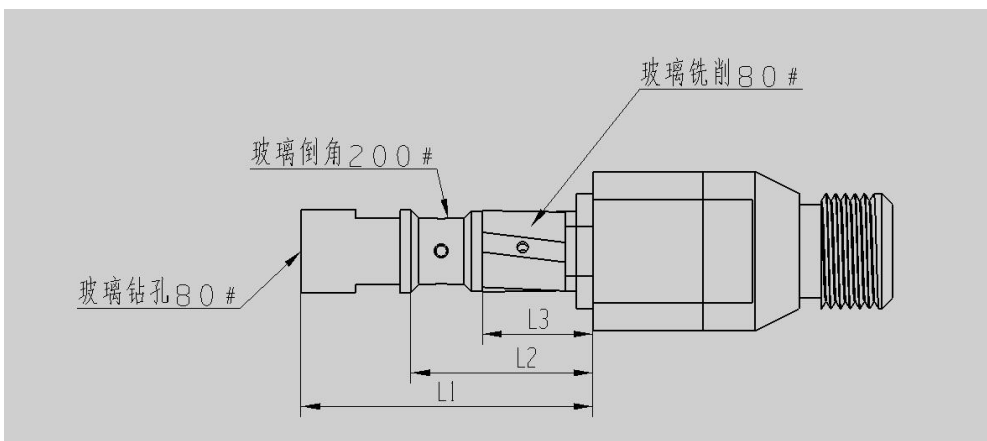
(-999999999~999999999)        ●Ready    Home        Alarm

All Param.    Service Param.    Maker Param.    Comp. Param.    Goto Param.

3)Fill the coordinates in the parameters(input:need to fill "-"and 0,no need to fill decimal point)

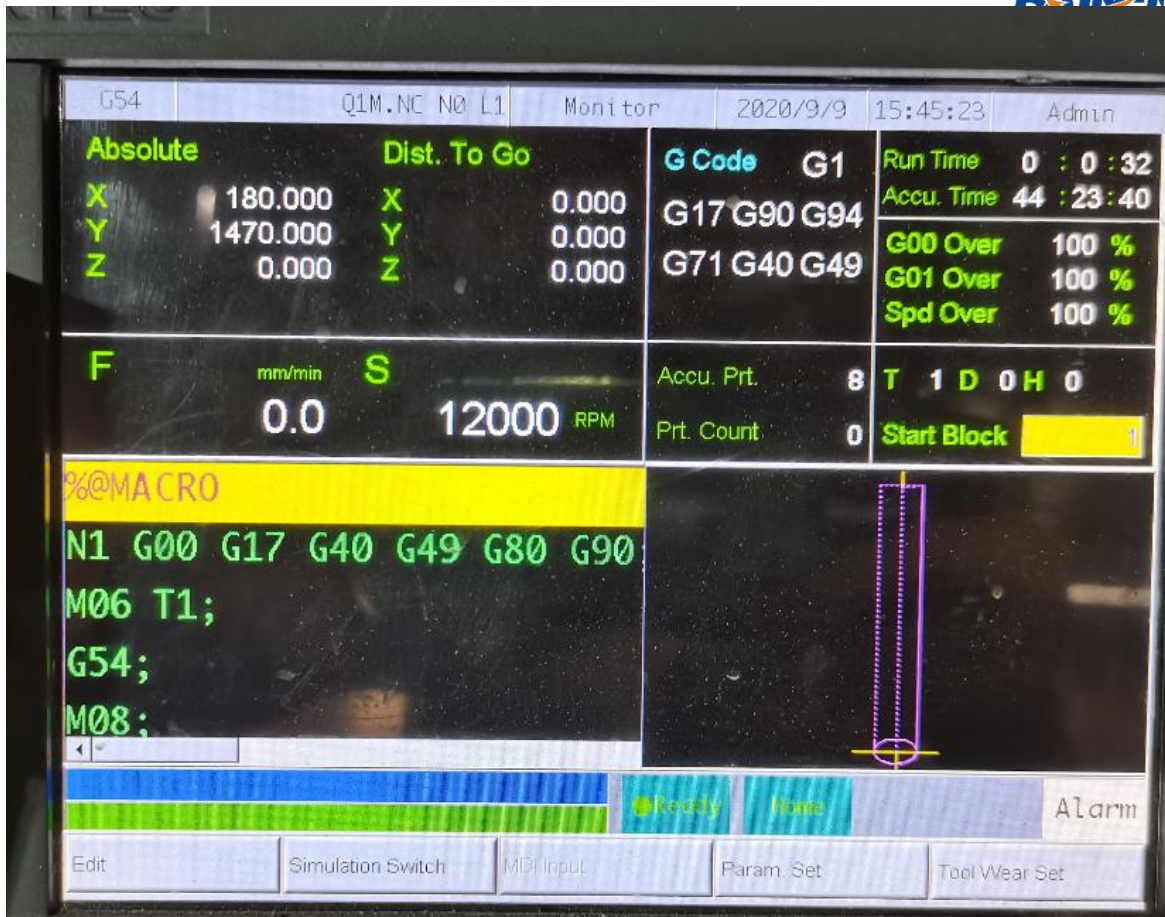## 5.Multifunctional Tools Length Measurement

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



## 6.Processing Monitoring

1) Open Processing Monitoring
You can see processing code,processing time and simulated pattern here

## 7.Loading Glass

1) Washing the table and holes of the suction cup,then loading the glass based on settled coordinates
2) For irregular shape glass,you can use self-positioning function to locate the glass

1. Operation of Vacuum Suction

1) Open the air button on the control panel
2) Open the corresponding suction button in the machine and check if the glass has been sucked well

## 8.Copy the Program

1) Copy the .nc file to u-disk and insert to the USD 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)
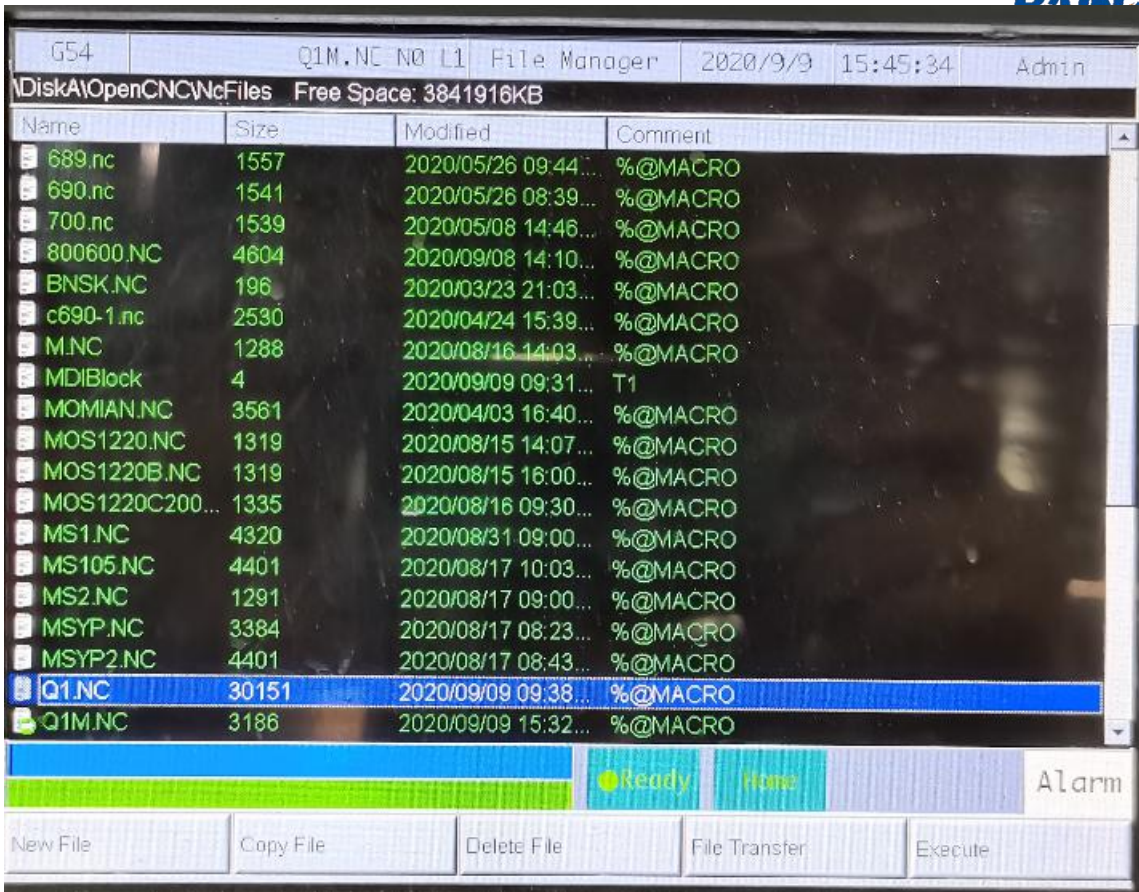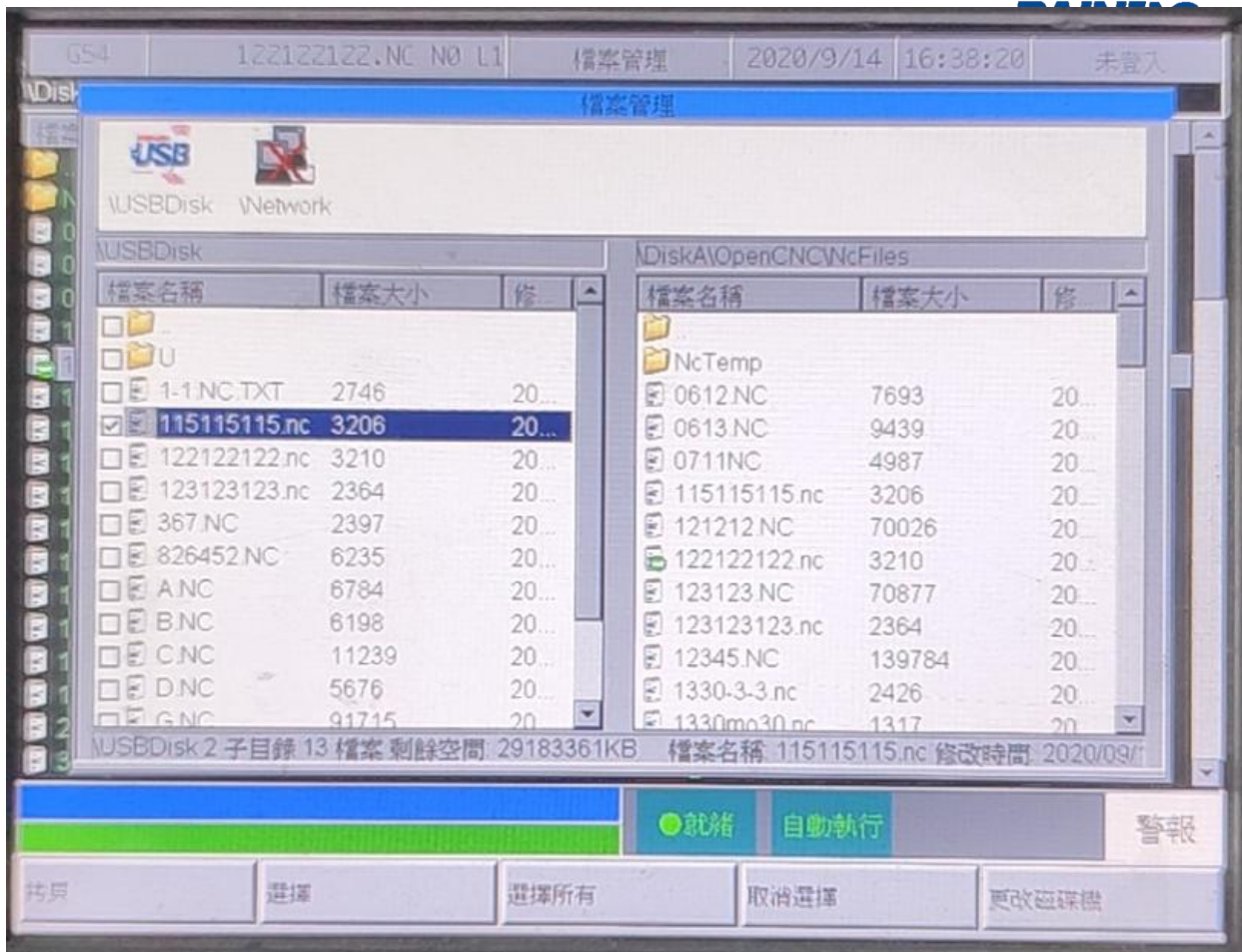3)Press F1 select the file need to be processed then F2 copy
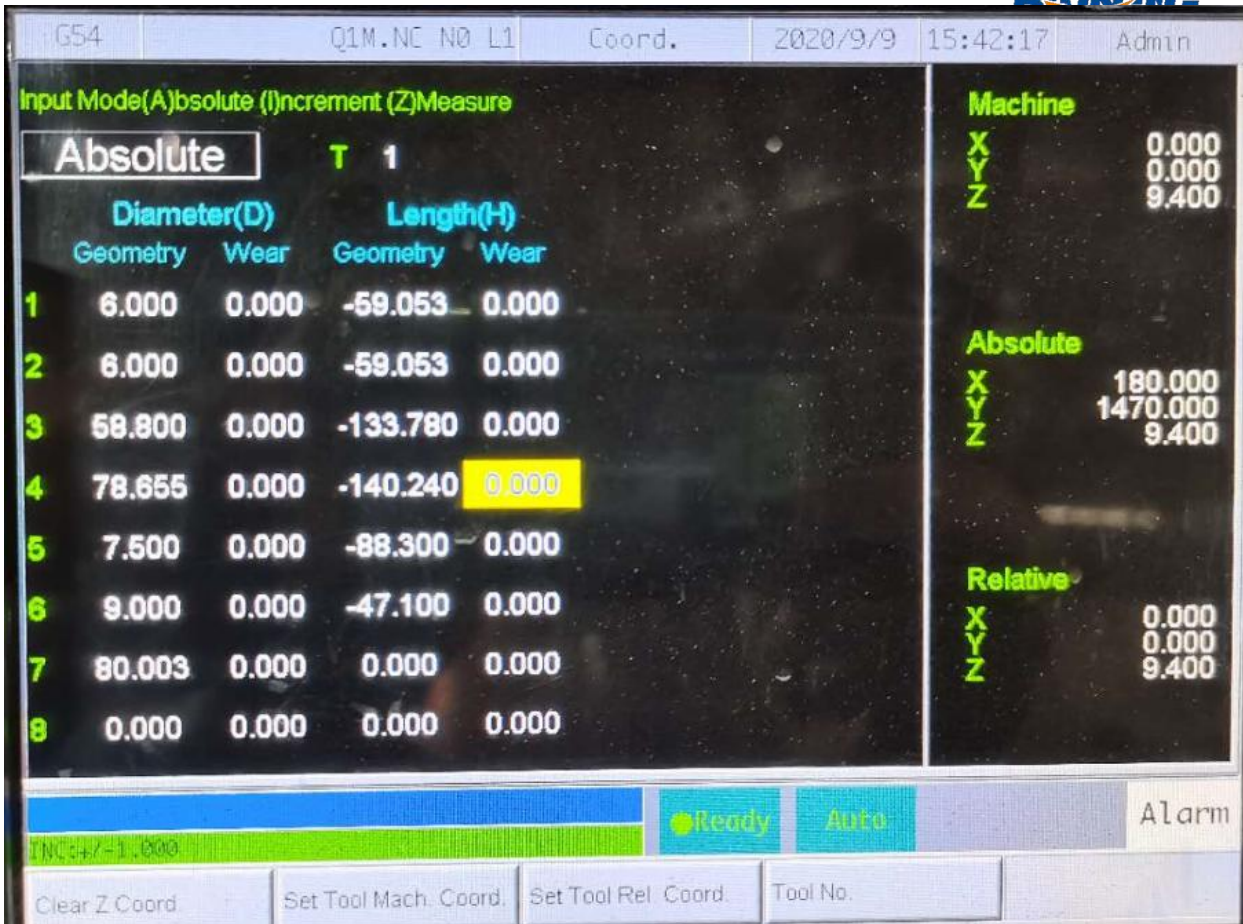
图 1　Picture 1

图 2 Picture 2

## 9.Loading Program

Back to the"Program Editor" (see picture 1),press F5 for loading to the file

## Ⅳ.Polishing Compensation

### 1.New Polishing Wheel Parameters Setting

1) Measure radius of the polishing wheels,then input the radius to"wheel radius compensation"

Notes:While input the radius of new polishing wheel,it should add 0.5-1 for radius(For example,if the radius is 82.5,then you need to input 83)

## 2.Polishing Wheel Compensation Setting

1)It is set in Baineng software for wear coefficient of polishing wheel.
2)Input wear coefficient value of polishing wheel on the corresponding tool number.The value of wear coefficient between0.03-0.09.(The value should be small for harder polishing wheel relatively,and large for softer polishing wheel.Details must subject to Practice.)

## Ⅴ.Common System Warning

| 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. |
|---|---|---|
| Tool Change Alarm | Tool change not finish while automatically change tools. | According to system remind,press"home"till alarm clear. |
| Actuator Alarm | The alarm happen due to operation fault cause all axes crash or actuator and servo motor occurred. | 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". |
| Spindle frequency converter alarm | 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) | 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". |
| Over-trip Alarm | Each axis moves over | Move the alarm axes to the opposite direction |

| | | |
|---|---|---|
| | stroke limited. | by"JOG"until the alarm clear.If still not solve,should be check if trip switches and lines damage. |
| Following Error Alarm | A,Due to wrong operation cause each axis move slightly,the alarm is issued.<br><br>B,If following error value double over MAX error value,the alarm is issued. | A,Check if all control lines and actuators of axes are alarm.<br><br>B,If alarm issued by actuators,solve the problem according to above step(Actuator Alarm)<br><br>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. |
| Miss Command Alarm | A,Due to long time without lubrication for each axis cause resistance to move.<br><br>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. | A，Check if the automatically lubrication device can add oil normally.<br><br>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) |

# Ⅵ，Maintenance

Purpose:Keep machine clean and new,reduce failure rate,improve productivity,extended service life.

1.Gear box of C axis

1） Periodical cleaning the dust in the surface so that it can be heat dissipation while processing

2） The gearbox is a high density area.Lubrication is the most important.It should be pay more attention to whether the oil level in the oil box is in normal position(Reamark:eft and right oil Windows and oil holes are independent)

3） Develop a good habit for oil change.Changing the oil in the gearbox regularly can improve the service life of the gearbox.
(It should be change gear oil after 200hours or one month for new machine,then 3 month is ok.Normally keep the oil running in the horizontal center line of the oil window)

4） Do not knock the gear box.

Suggestion:Use medium load industrial closed gear oil(L-CKC150)

2.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.
Remark:Check ball screw and linear of X-axis if with oil regularly,if without oil,must add it,linear can smear the oil,screw must use oil gun to add oil.

### 3.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. Prohibited to use compressed air with water and other compressed gases.

4)After running 1 month,check electrical parts thoroughly and tight the screw.

5)All above inspection and operation must by professional electrical person.

### 4.Worktable

1)Cleaning the powder and dust in the worktable,like glass and polishing wheel dust.It should use high pressure water gun to wash the worktable.

2)The suction hole on the worktable should be unblocked at all times.Turn off the vacuum switch and turn on vent switch so that the dust can be out.

### 5.Vacuum pump and water pump

1)Before turn on the vacuum pump,please pour the water from the inlet into the vacuum pump that has been opened.If there is no water to run for a long time, it will cause no gas or can not absorb the workpiece,and make vacuum pump burn out.

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

Suggestion:Clean water tank everyday.

### 6.Oil in oil-water separation cup is supply lubrication of Electromagnetic valve and air cylinder(Oil cup must keep oil)

## 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

1)While Maintenance must cutoff power.

2)Please    wear    safety    protection    measures    at    work,like    safety

shoes,safety helmet,safety goggles.etc

3)Please don't wear wet gloves while operate the machine

4)Do not remove mechanical safety device or metal sheet cover.

5)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)

6)While there are people working in the worktable, it is strictly forbidden to operate machine.

7)Any electronic control problem should be handled by the professional people.

8)Check that all parts which need the oil should be lubricated.

9)Check that the door and panel of the electrical cabinet are closed and locked.

10)Make sure all the buttons are in good condition

11)Make sure that all wires are not broken

12)Please check whether the three-phase voltage is normal before power supply.

13)Please fully understand the operation instructions before use.
14)The machine must be grounded.Connect the copper to 1 meter underground.(Grounding resistance shall not be greater than 4 ohms )

## Ⅷ.About Software

### 1.Open Baineng Software
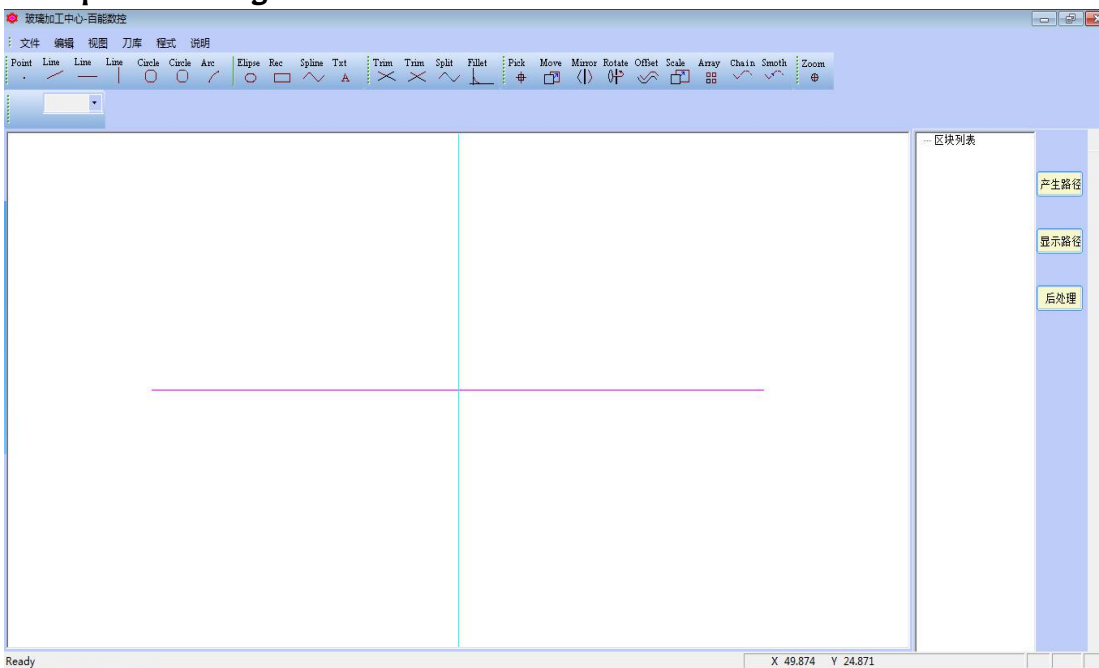


### 2. Click Menu---File
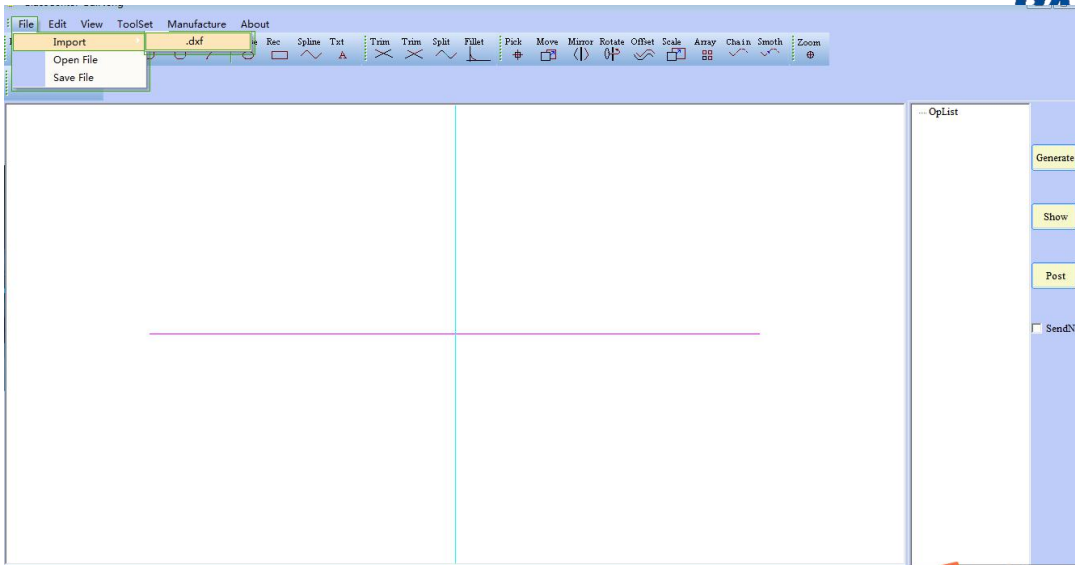
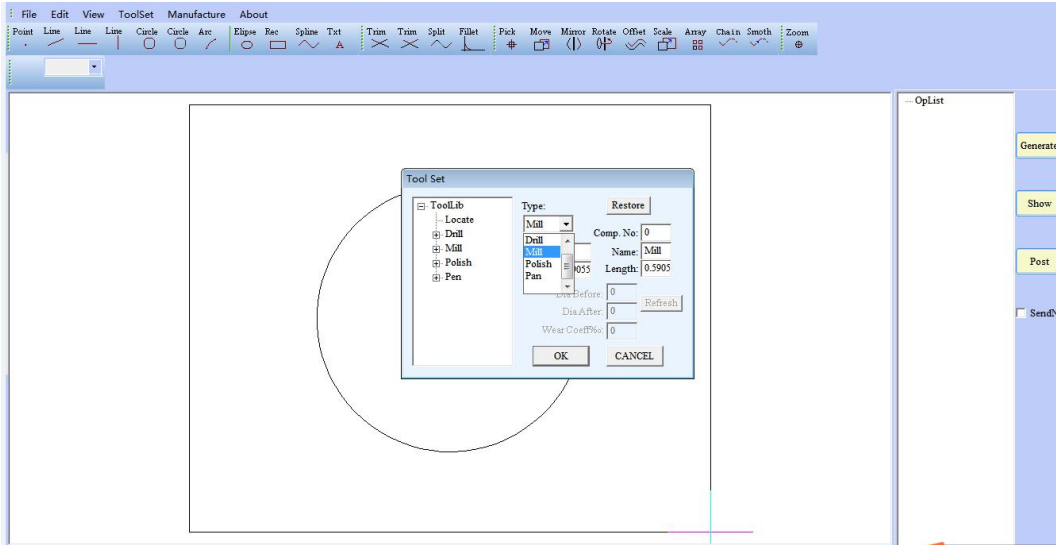## 3.Select the processing file(DXF file)
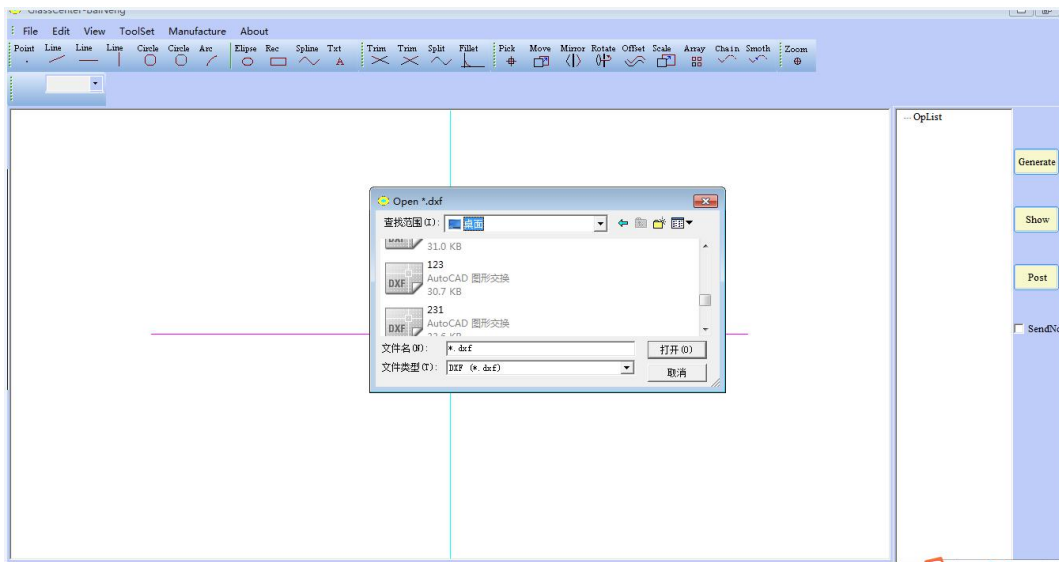


## 4.Set parameter for tool
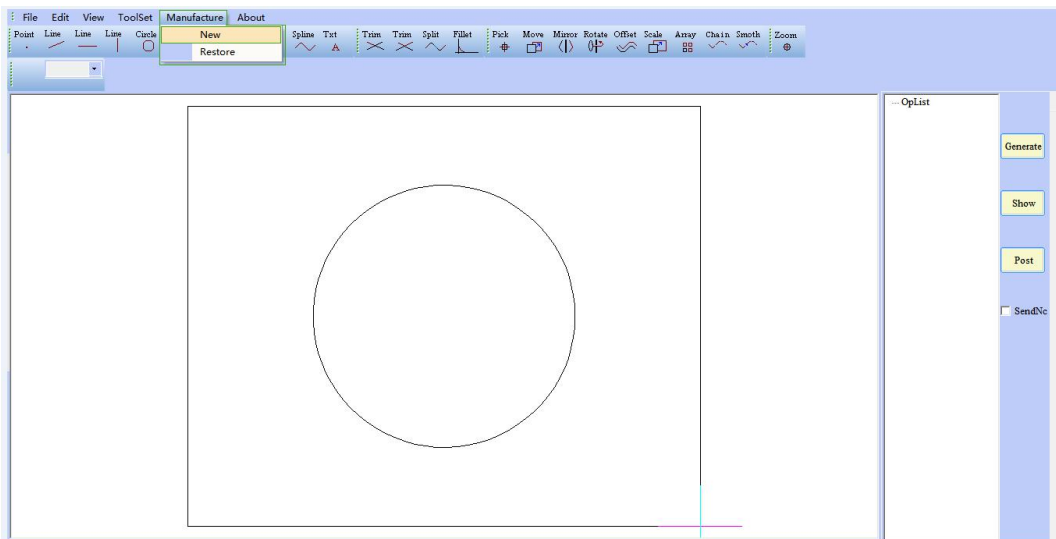### Tool Library---Design
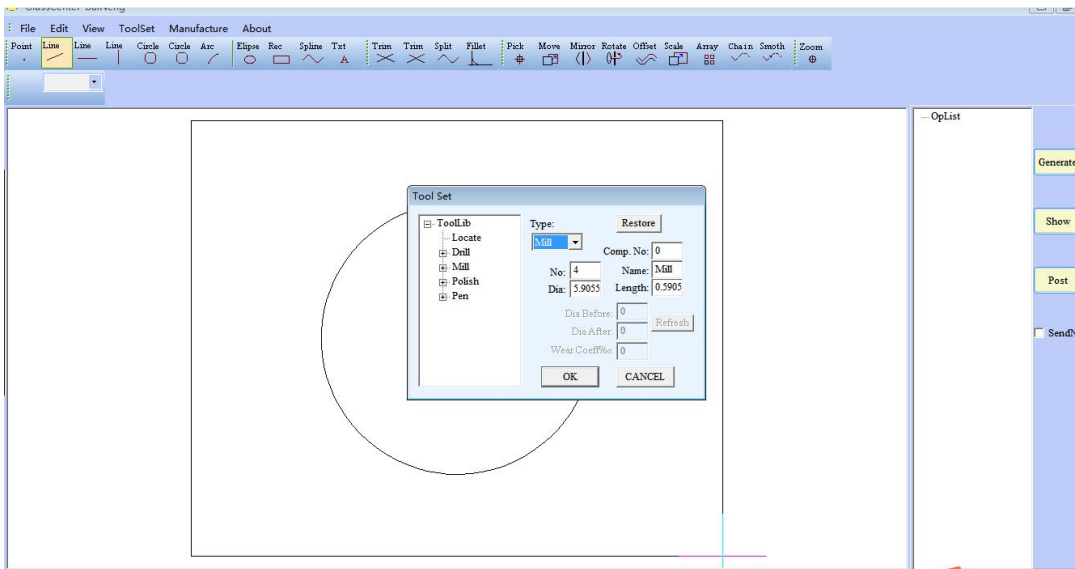


## 5.Select the tool parameter you will processing:
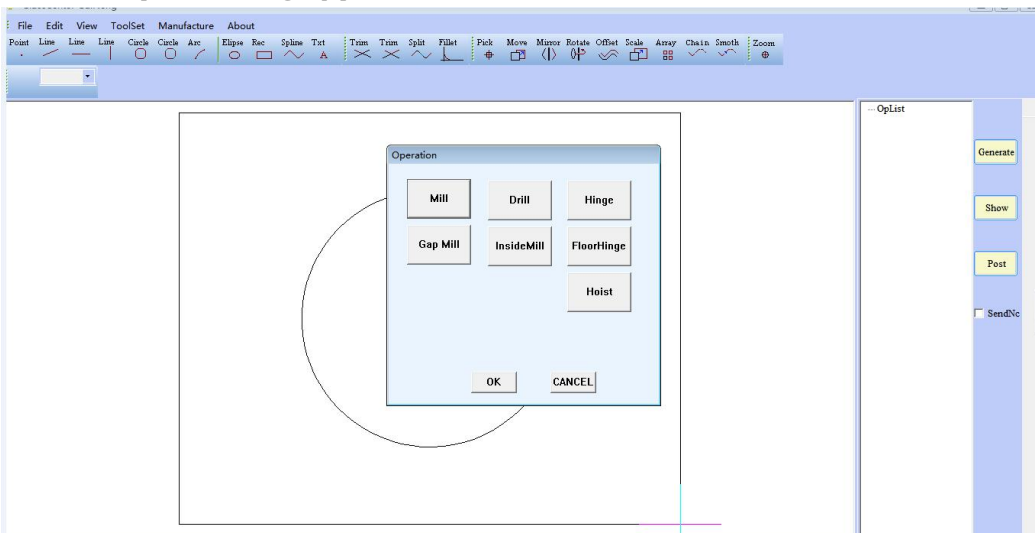
# Such as:Radius,Tool No.,Compensate No.



## 6. After setting,click save it ---confirm---tool library---save
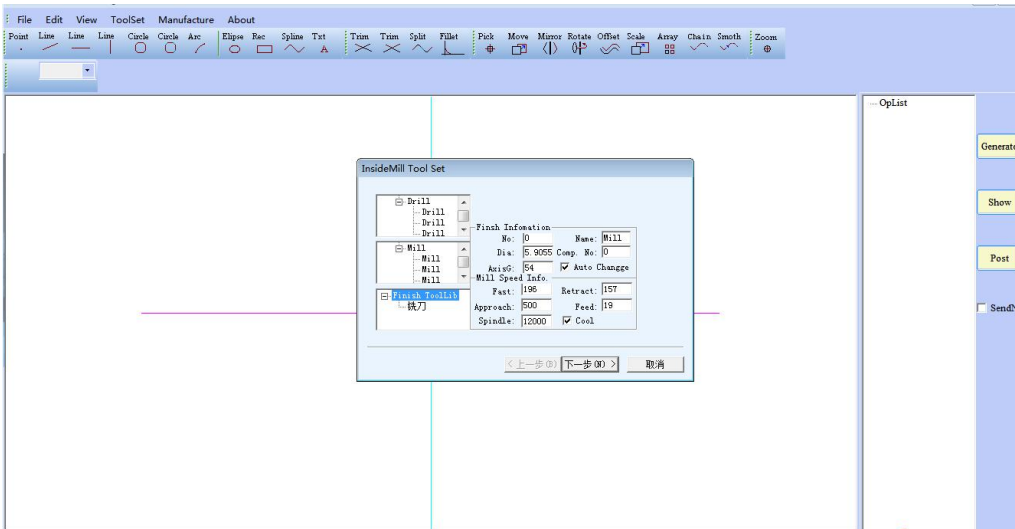
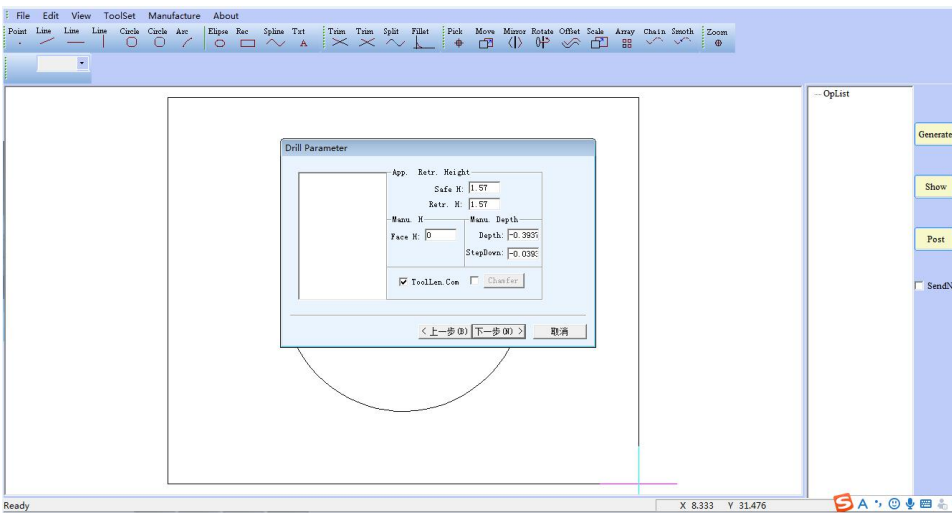## 7 .Click Menu---Form-New



## 8 .Select processing type
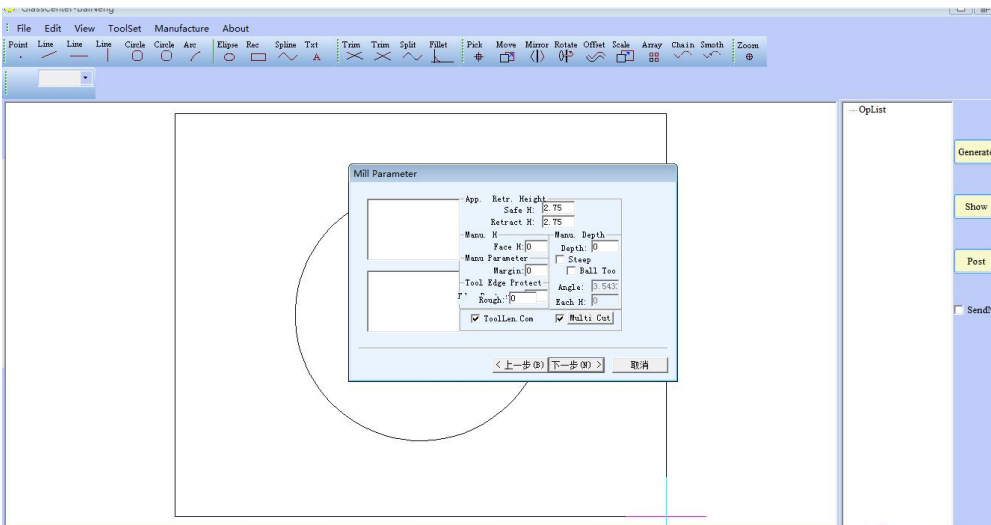
# Such as inner Milling

## A.Select tool:Drill,Rough processing Miller,Precision Processing Miller
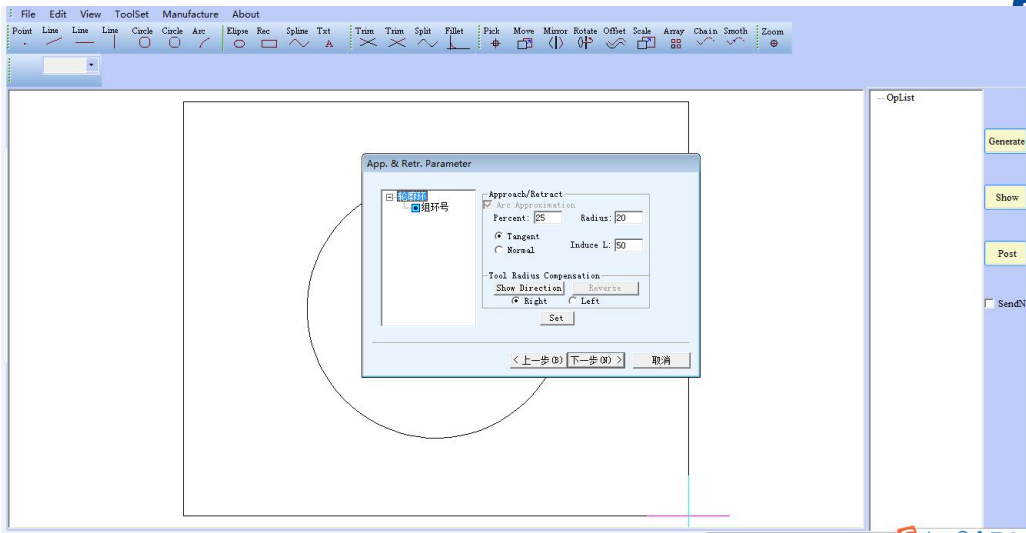


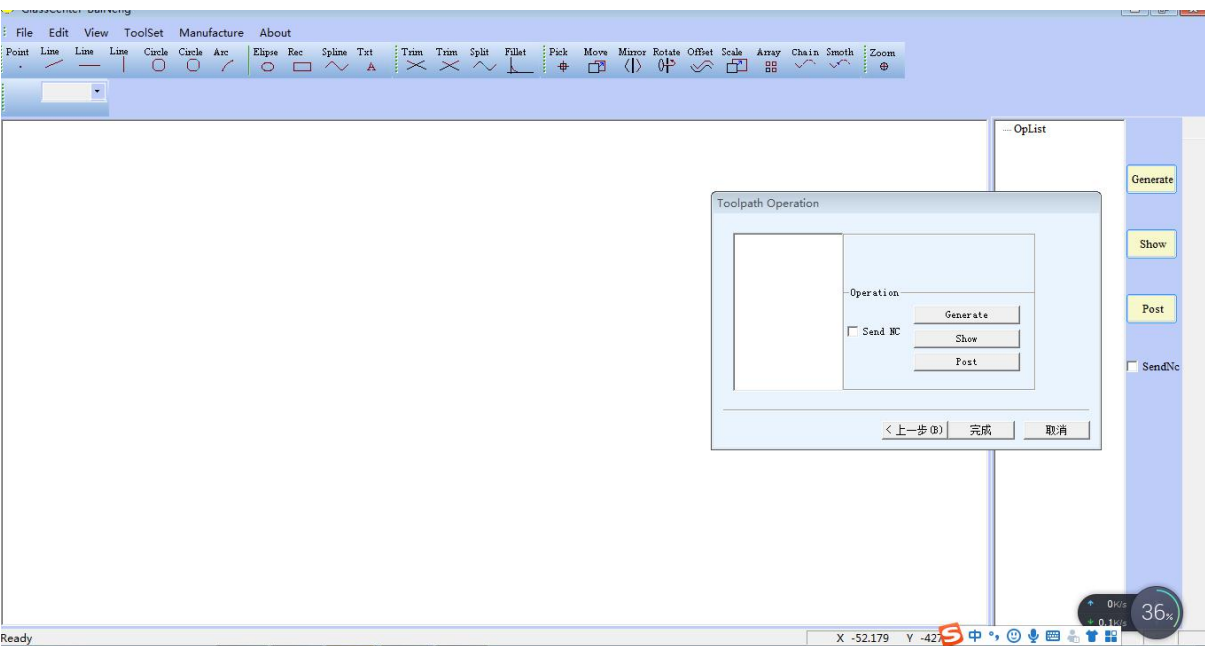## B.Set tool(drill) parameter



## C.Set tool(miller)parameter



## D.Set tool route parameter

Remark:The tool feeding position can be adjusted by amplitude and radius.Tool radius and tool path are selected by tool complement setting.

# E.Check the tool route



# F.Generate Processing code