



### Green Vine Machinery Co.,Ltd

Address: Room C-408, Block A, Kingdee Software Park,

No. 3, Fuxing Fourth Street, Mapo, Shunyi District, Beijing, China/

No. 8, Shengkong Road, High-tech Industrial Development Zone, Zhangjiakou City, Hebei Province, China

Tel: 010-61403881/0313-7656115/13811582983

Email: [info@greenvine.com.cn](mailto:info@greenvine.com.cn)

Website: <http://en.greenvine.com.cn>

# 格恩 GREEN VINE

做中国玻璃机械行业的领跑者

GREEN SOUL. GREEN INNOVATION



# About us

Founded in 2017, Green Vine Machinery Co.,Ltd is the high-end automated and intelligent glass machines manufacturer. The Green Vine offer for glass includes: vertical glass CNC working center, vertical glass drilling and milling machine, horizontal CNC glass 3 axis working center, horizontal CNC glass 4 axis working center, horizontal CNC glass 5 axis working center and automatic bathroom processing line. Except for horizontal CNC glass 3 axis working center, for other products, we are the only manufacturer in China. Many pain points in the market are solved by our technology and machines.

Our company has a group of powerful R&D team: 3 senior mechanical engineers, 6 intermediate mechanical engineers, 2 senior software engineers, 2 senior precision assembly technicians, and 1 senior quality inspection technician, all of which are top talents in this industry.

Our company has been approved for 14 invention and utility model patents, and there are 11 patents in the approval stage. In the next three years, our company expects to declare up to 50 patents.

Our company adheres to the business philosophy of "Help others to achieve ourselves", and regards "keep learning ,keep innovation" as the core competitiveness of the company. While continuing to create value for domestic and foreign customers, employees, the company itself and the society, it also creates a dynamic moat for the company.



## GREEN AIR-L Automatic bathroom processing line



GREEN AIR-L is automatic processing line which is made up of horizontal drilling - milling machine and horizontal drilling machine. It is designed for drilling hole, doing notches, cut-outs, countersinking and grinding on shower screen and glass door. Thanks to the dual processing heads, horizontal drilling - milling machine can do the milling and grinding work at same time. This can greatly improve the processing speed of milling notches and cut-outs on glass doors. Full automatic control reduces the glass transfer during processing and avoids the repeated manual positioning. Horizontal drilling machine adopts multi-station simultaneous processing, which further improves the processing speed. Compared with traditional processing ways, the processing speed of Automatic bathroom processing line is more than doubled.

### GREEN AIR-L Automatic bathroom processing line

Glass size: ≤2500X1000mm  
 Glass thickness: 4-19mm  
 Max hole diameter: 70mm

Milling standard notch: around 50s (glass thickness:8mm)  
 Drilling speed: 10s/small hole, 15s/big hole (glass thickness:8mm)  
 Working table height: 1050mm



## GREEN SKY : Vertical CNC Glass Machines

### (1) GREEN SKY-B: Clamp-type vertical glass drilling and milling machine

The Green Sky-B is a five axes composite CNC vertical machine which is designed for drilling hole, doing notches, cut-outs and countersinking on glass sheets with the thickness of 4-19mm. High Processing efficiency and quality are ensured by self-developed high-power electro-spindle, efficient glass fixation by clamps which can protect the LOW-E glass from damaging, groups of pressing wheels and relying wheels in processing area which can improve the rigidity of glass during processing.

#### Advantages

1. thanks to the opposing heads, holes drilling work can be done at maximum speed and always ensures excellent quality and precision;
2. Large glass with internal graphics and some irregular glass can be processed;
3. processing+washing automatic connection line with vertical washing machine can be easily formed;
4. Only small floor area is occupied;
5. Thanks to the vertical structure, glass is easily upload and download, especially for large glass sheet;



Samples processed by vertical glass drilling and milling machine:



### GREEN SKY-B Clamp-type vertical glass drilling and milling machine

Items	Unit	SKY 2030.B	SKY 2530.B	SKY 2542.B
Max glass size	mm	2000x3000	2500x3000	2500x4200
Min glass size	mm	500x300	500x300	500x300
Glass thickness	mm	4~19	4~19	4~19
Max glass weight	Kg	310	390	540
X, Y (V), Z (W) Max axis speed	m/min	40, 35, 15	40, 35, 15	40, 35, 15
Electro-spindle power S1	kw	7.5+7.5	7.5+7.5	7.5+7.5
Max electro-spindle rotate speed	rpm	10000	10000	10000
Electro-spindle front bearings diameter	mm	50	50	50
Tool Holder Cone		BT30	BT30	BT30
Tool Magazine		7+7	7+7	7+7
Max tool diameter	mm	70	70	70
Straight line machining precision	mm/m	±0.15	±0.15	±0.15
Distance precision between two holes	mm/m	±0.15	±0.15	±0.15
Tool center cooling		YES	YES	YES
Constant temperature water chiller		YES	YES	YES
Total power	kw	26	26	26

## GREEN SKY-V Suction Cup-type vertical CNC glass working center

The Green Sky-V is a 13 axis composite CNC glass machine which is designed for drilling hole, doing notches, cut-outs, countersinking and also can carry out grinding and polishing operation on glass sheets in vertical direction. It can meet any customer's needs completely. Thanks to the self-developed big power electro-spindles of which front spindle head has C-axis rotation and auxiliary clamping mechanism and also smart water jacket on both front and rear electro-spindles, the glass sheet can be processed in extremely high efficiency and machining quality. The glass sheet is fixed and transferred by suction cups group. Each suction cup controls the glass sheet independently to avoid machining interference areas and will protect the LOW-E glass from damaging.

### Advantages:

1. Grinding and polishing on the edge and internal graphics of large glass sheet;
2. thanks to the opposing heads, holes drilling work can be done at maximum speed and always ensures excellent quality and precision;
3. Processing+washing automatic connection line with vertical washing machine can be easily formed;



## GREEN SKY-V Suction Cup-type vertical CNC glass working center

Items	unit	SKY 2235.V	SKY 2650.V	SKY 3360.V
Max glass size	mm	2200x3500	2600x5000	3300x6000
Min glass size	mm	500x300	500x300	500x300
Glass thickness	mm	4~25	4~25	4~25
Max glass weight	Kg	520	880	1340
X1(X2), Y(V), Z(W) axis max speed	m/min	40, 35, 15	40, 35, 15	40, 35, 15
Electro-spindle power S1	kw	11+11	11+11	11+11
Max electro-spindle rotate speed	rpm	10000	10000	10000
Electro-spindle front bearings diameter	mm	60	60	60
Tool holder cone		BT40	BT40	BT40
Max C axis rotate speed	rpm	25	25	25
C axis swing angle		±365°	±365°	±365°
Tool Magazine		2x10	2x10	2x10
Max tool diameter	mm	150	150	150
Straight line machining precision	mm/m	±0.15	±0.15	±0.15
Distance precision between two holes	mm/m	±0.15	±0.15	±0.15
Tool center cooling		YES	YES	YES
Constant temperature water chiller		YES	YES	YES
Total power	kw	42	42	42

### Samples processed by vertical CNC glass working center:

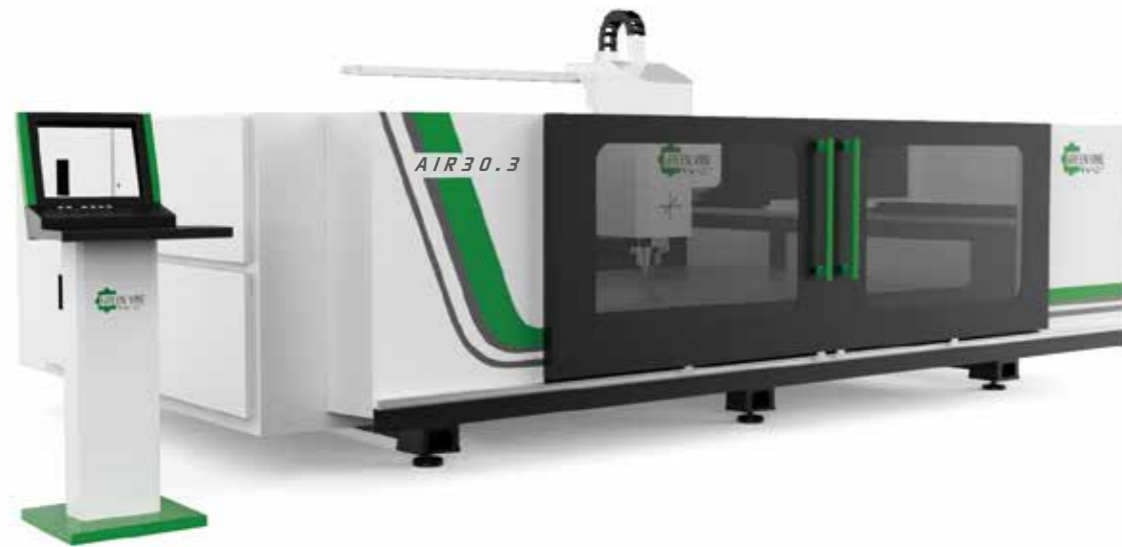


## GREEN AIR: Horizontal CNC Glass Working Center



### (一)、GREEN AIR\*\*.3 Horizontal CNC Glass 3 Axis Working Center

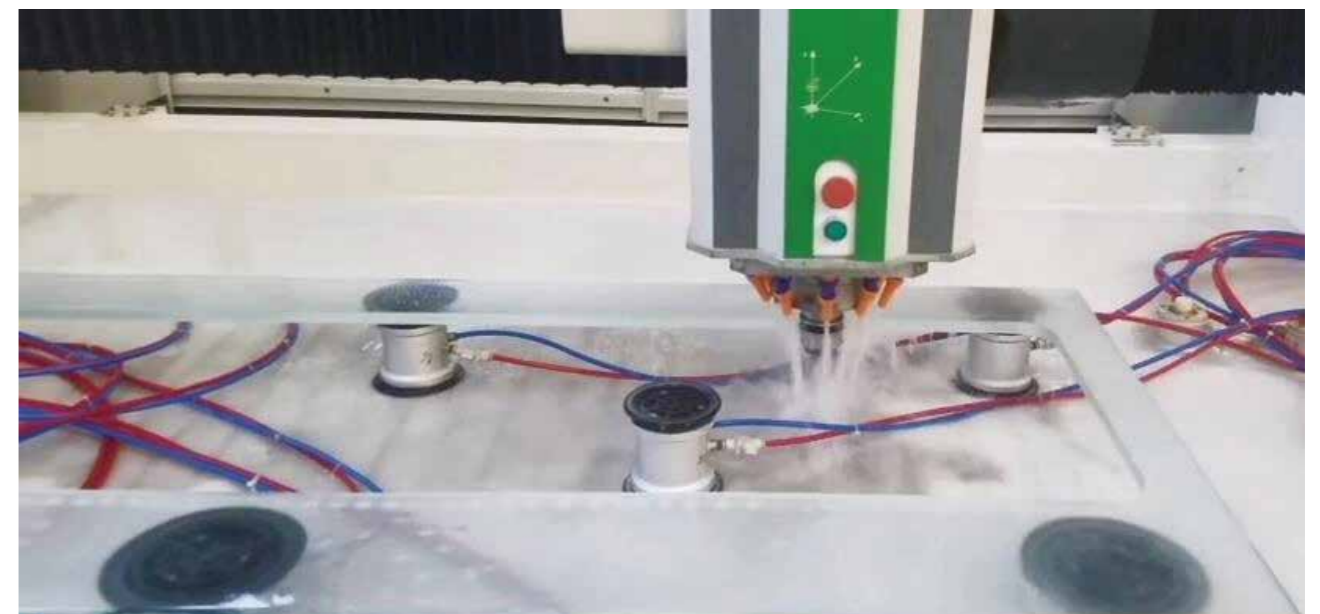
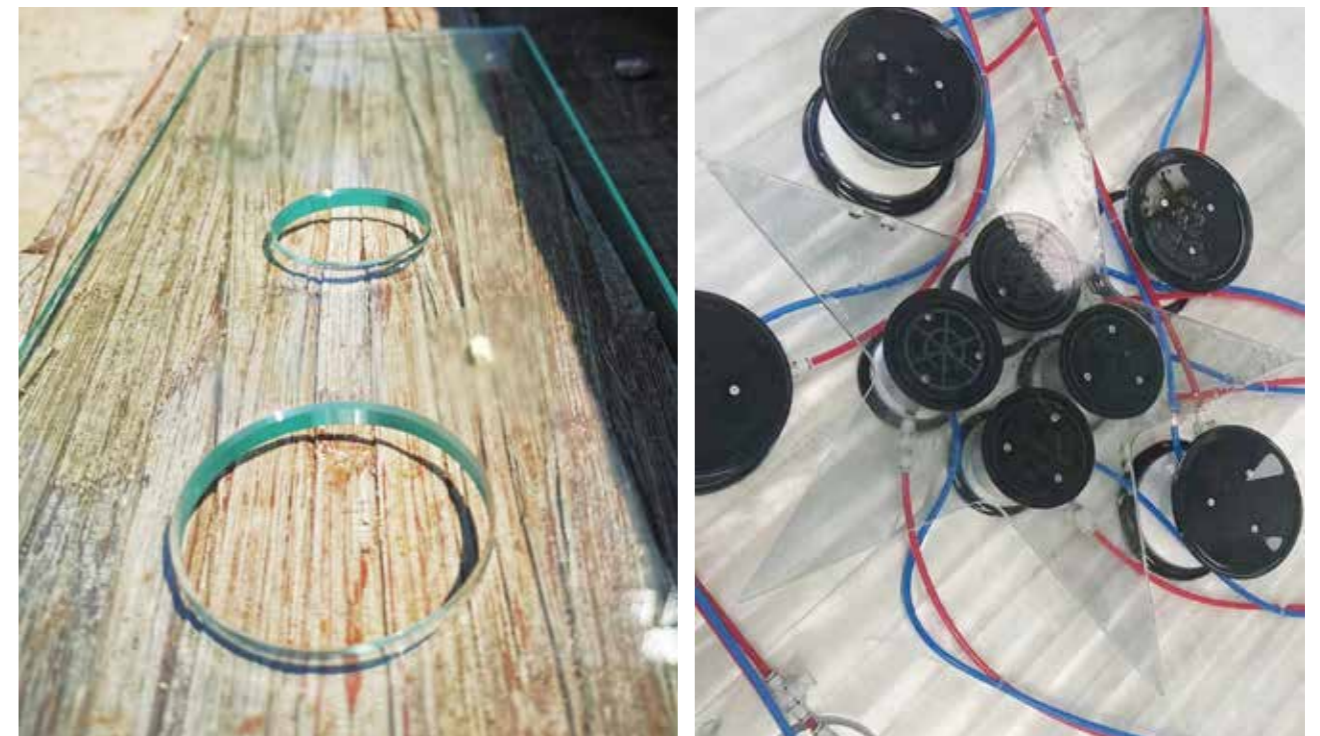
GreenAir\*\*.3 is a horizontal three axis working center machine used for drilling hole, milling, grinding and polishing on the edge and internal graphics of regular and irregular glass sheet. The glass sheet is fixed by suction cups after positioned by stopper. Then the processing begins as soon as the glass sheet is fixed. Thanks to the polishing real-time compensation in system, the polishing quality can be highly ensured.



### GREEN AIR\*\*.3 Horizontal CNC Glass 3 Axis Working Center

Items	Unit	AIR 30.3	AIR 38.3	AIR45.3
Max glass size	mm	3000x1600	3800x2000	4500x2500
Glass thickness	mm	4~25	4~25	4~25
X, Y, Z axis max speed	m/min	60, 50, 15	60, 50, 15	60, 50, 15
Electro-spindles power S1	kw	7.5	11	11
Max electro-spindle rotate speed	rpm	12000	12000	12000
Electro-spindle front bearings diameter	mm	60	60	60
Tool holder cone		BT40	BT40	BT40
Tool magazine		12	12	12
Max tool diameter	mm	150	150	150
Machining precision	mm	±0.1	±0.1	±0.1
Hand-held box		YES	YES	YES
Tool center cooling		YES	YES	YES
Constant temperature water chiller		YES	YES	YES
Total power	kw	20	23.5	23.5

### Samples processed by horizontal CNC glass 3 axis working center:



## GREEN AIR\*\*.4 Horizontal CNC Glass 4 Axis Working Center

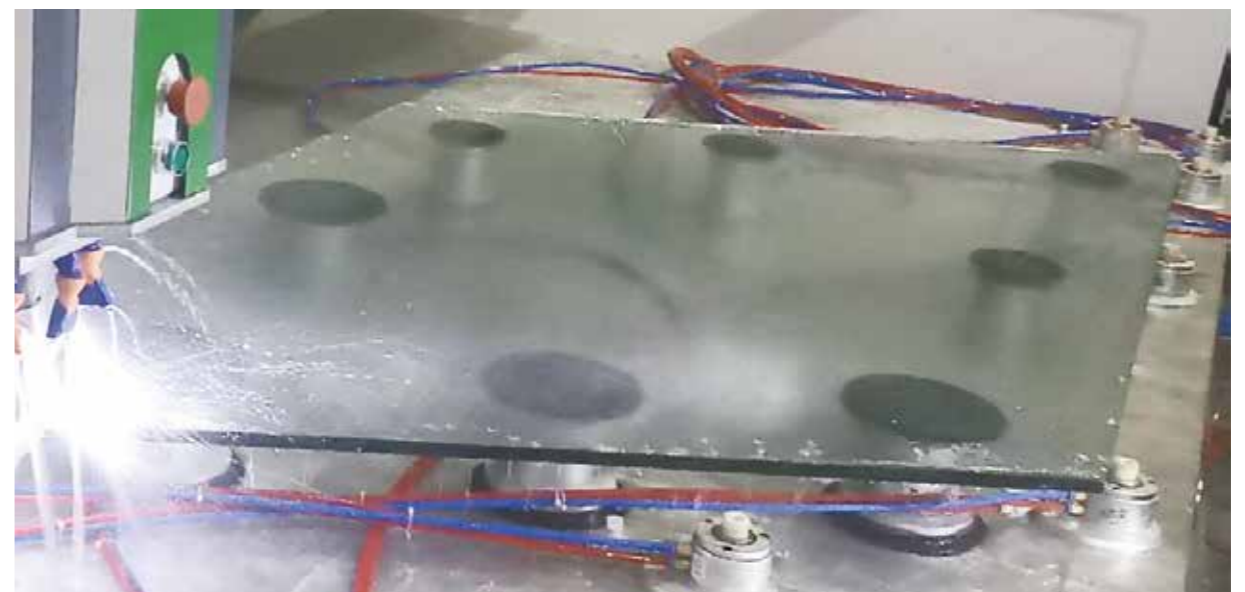
GREEN AIR\*\*.4 is a horizontal four axis working center machine which has additional C-axis rotation function and is equipped with a right-angle machining head on the basis of the horizontal three-axis working center. So that it can not only do the work of drilling, milling, grinding and polishing on the edge and internal graphics of regular and irregular glass sheet, it can also do the milling work on the edge of ultra-thick large glass sheet by using right-angle machining head connecting to the cup wheel. This processing speed is more than 3 times higher than using ordinary milling cutter.



### GREEN AIR\*\*.4 Horizontal CNC Glass 4 Axis Working Center

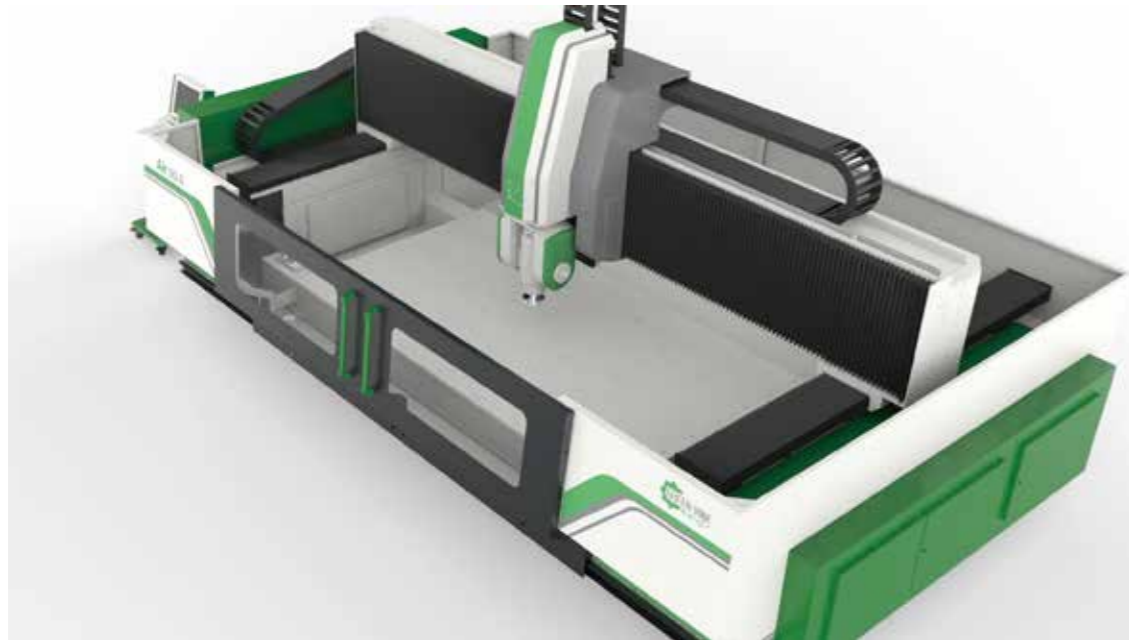
Items	Unit	AIR 30.4	AIR 38.4	AIR45.4
Max glass size	mm	3000x1600	3800x2000	4500x2500
Glass thickness	mm	4~25	4~25	4~25
X, Y, Z axis max speed	m/min	50, 50, 15	50, 50, 15	50, 50, 15
Electro-spindle power S1	kw	7.5	11	11
Max electro-spindle rotate speed	rpm	12000	12000	12000
Electro-spindle front bearings diameter	mm	60	60	60
Tool holder cone		BT40	BT40	BT40
Max C axis rotate speed	rpm	40	40	40
C axis swing angle		∞	∞	∞
Tool magazine		12	12	12
Max tool diameter	mm	150	150	150
Machining precision	mm	±0.15	±0.15	±0.15
Hand-held box		YES	YES	YES
Tool center cooling		YES	YES	YES
Constant temperature water chiller		YES	YES	YES
Total power	kw	21	24.5	24.5

### Samples processed by horizontal CNC glass 4 axis working center:



## GREEN AIR\*\* .5 Horizontal CNC Glass 5 Axis Working Center

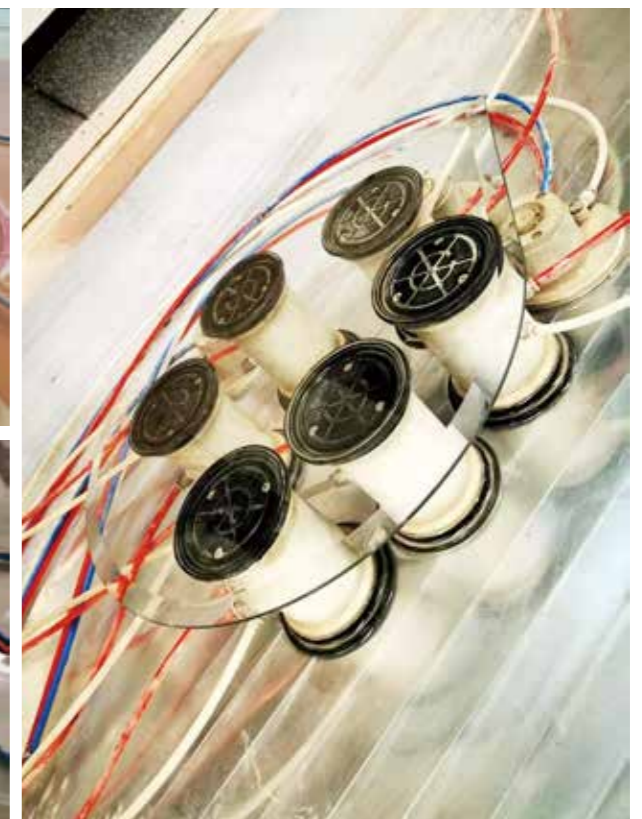
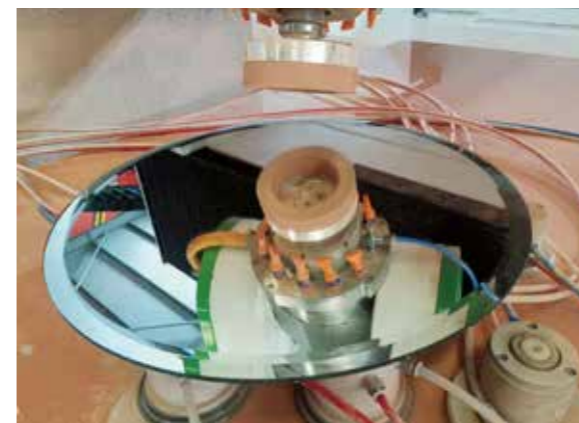
GREEN AIR\*\* .5 is a horizontal five axis working center machine which is equipped with a self-developed AC axis double swing angle electro-spindle, with X, Y, Z three linear motion axes and A, C rotary motion axes. It can realize any four-axis linkage. Besides all the functions of horizontal three axis and four axis working center, it also has special functions such as processing irregular bevels and engraving.



### GREEN AIR\*\* .5 Horizontal CNC Glass 5 Axis Working Center

Items	Unit	AIR 30.5	AIR 38.5	AIR45.5
Max glass size	mm	3000x1600	3800x2000	4500x2500
Glass thickness	mm	4~25	4~25	4~25
X, Y, Z axis max speed	m/min	50, 40, 15	50, 40, 15	50, 40, 15
Electro-spindle power S1	kw	7.5	11	11
Max electro-spindle rotate speed	rpm	12000	12000	12000
Electro-spindle front bearings diameter	mm	60	60	60
Tool holder cone		BT40	BT40	BT40
Max C axis rotate speed	rpm	30	30	30
C axis swing angle		∞	∞	∞
Max A axis rotate speed	rpm	25	25	25
A axis swing angle		±90°	±90°	±90°
Tool magazine		12	12	12
Max tool diameter	mm	150	150	150
Machining precision	mm	±0.15	±0.15	±0.15
Hand-held box		YES	YES	YES
Tool center cooling		YES	YES	YES
Constant temperature water chiller		YES	YES	YES
Total power	kw	22	25.5	25.5

### Samples processed by horizontal CNC glass 5 axis working center:



## Core Technology:



### CAM software

CAM software is an intelligent program generation software specially developed by our company for our machines. It can be installed in any Windows system. It has functions of automatic tool configuration, automatic creation of processing programs, automatic optimization of processing paths, visual simulation processing, and tool management. CAM software uses data library instead of CAD drawing. It realizes the graphics parameterization, greatly reduces the operation difficulty, and is easier to learn and use. The software also has the function of large graphics processing, providing more process options for processing large-area graphics. Automatic interference scope check function avoids the risk of tools hitting during machining.

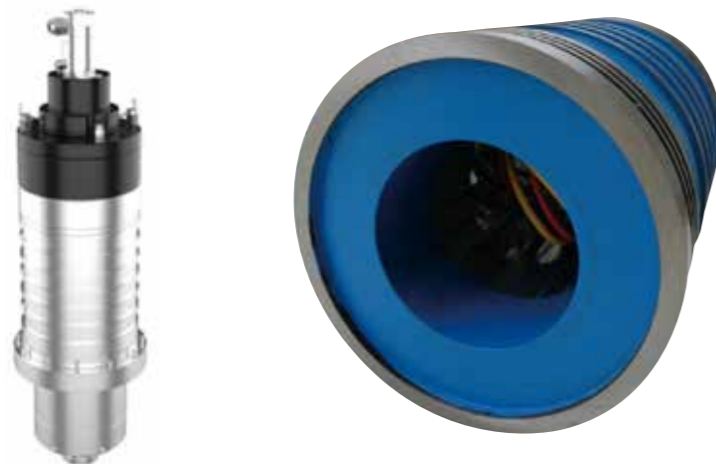


### Electro-spindle

Electro-spindles have always been a huge challenge for glass working center manufacturers, such as: stator and rotor waterproof issue, bearing, stator and rotor cooling issue, the spindle tool loose and pull issue, and the center internal cooling issue.

Thanks to the research, testing and applications we have done, the stator and rotor waterproof issue is solved by adopting glue filling method, constant temperature cooling is ensured by equipping with a constant temperature water chiller and a corresponding circulating water cooling structure, so that the electro-spindle will not be affected by the external environment and working conditions, malfunction can be avoided as glass powder influence on spindle tool loose-pull structure is greatly reduced thanks to the spindle tool loose-pull structure which is suitable for glass processing, glass processing quality and efficiency is improved and tool service life is extended by the spindle central water cooling structure. All above measures ensure our electro-spindles a long service life.

More important, the electro-spindle we design is easy to repair. Even when it has malfunction, the spindle can be repaired in customer's factory according to the video. This greatly reduces repair cost and time. So no need to worry about.



### A, C axis double swing angle electro-spindle

The self-developed A and C-axis double swing angle electro-spindle, the C axis can achieve  $\pm\infty$  rotation, and the A axis can achieve  $\pm 90^\circ$  rotation. It can realize any four axis linkage by cooperating with the X, Y, and Z three moving axis. The bevelling working can be done on any regular and irregular glass sheet and also three-dimensional workpiece can be processed.



### Multi-functional composite processing head

The multi-functional composite processing head is the core part of the suction Cup-type vertical CNC glass working center. When front and back spindles drill on glass, the smart water jackets will compress glass to increase the rigidity of processing area so that hole drilling quality will be improved. When spindles do the milling and grinding work, the multi-functional composite processing head can rotate around C axis to ensure the external cooling water is accurately sprayed to the processing area, so as to achieve ultra-high grinding and polishing processing quality. The clamping device of the multi-function head can clamp and guide the glass during the processing to keep accurate tool setting and minimized the vibration during grinding and polishing, so as to reduce the edge breakage and glass breakage.



### Ultra-high R&D and analysis capabilities

Thanks to the research and development ability and analysis capabilities of our R&D team, the transmission and feed mechanisms of the machines have been precisely calculated and have high reliability. Mechanical analysis and modal analysis are done on core parts on machine such as bed, beam, spindle, etc., by finite element analysis software. The best design solution is selected from a variety of design solutions after analysis. This ensures the machine in good rigidity and stability, and avoids vibration occurring during the process.

