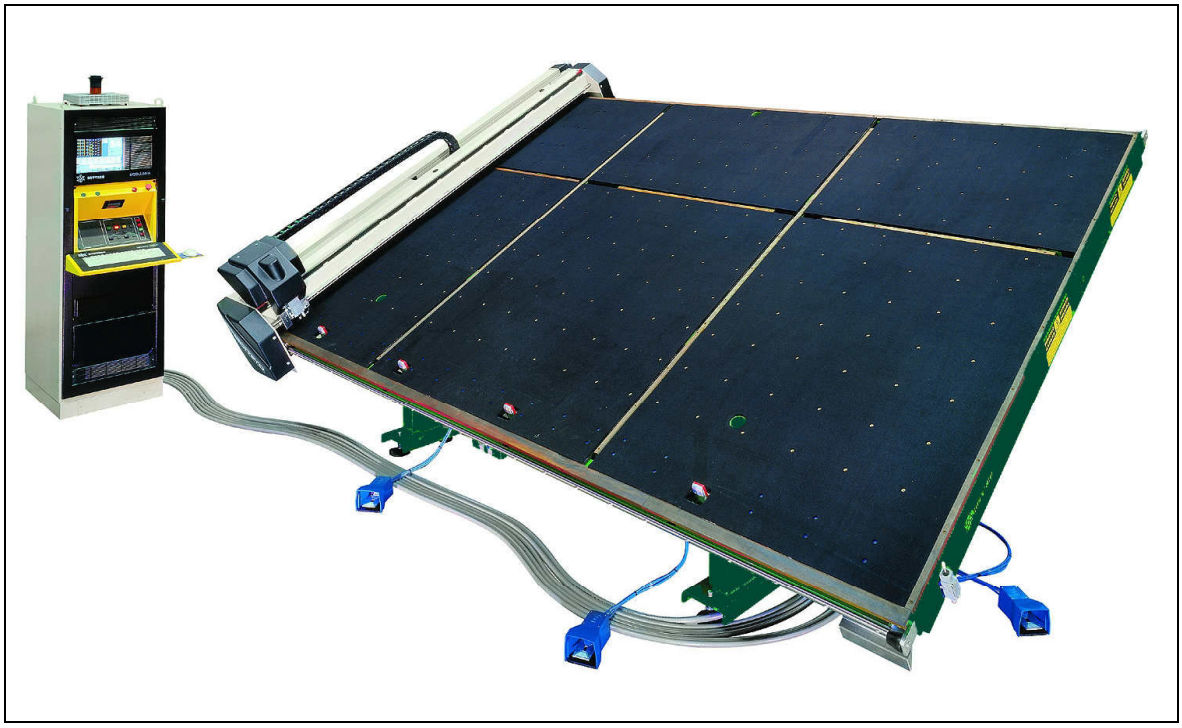
Bottero
Glass Technologies

352 BCS^{classic}

Numeric control cutting machine

for flat glass



352BCS^{classic}: MAIN FEATURES

Machine for the cutting, handling, breakout and loading of flat glass sheets.

Structure made up of electro-welded steel tubular pipes, protected by two layers of paint: rust-prevention and coloured enamel.

Accurately flat and wool felt padded wooden table surface to ensure maximum air cushion performance.

Powerful air cushion system with two fans in order to create the “air cushion” between the table and the glass. As a consequence, the friction is drastically reduced and all glass handling operations can be easily carried out.

Tilting working table controlled by two hydraulic cylinders that enable the sub-vertical position (80°) in order to ease the glass manual loading.

Possibility of implementing any complex cutting scheme including straight cuts and shape cuts with LOW-E grinding option.

Cutting bridge made of steel and placed transversally to the machine equipped with state-of-the-art motor.

Glass squaring electronic search:
the glass is no longer squared on the loading lugs, thus avoiding consequences on the cutting precision when the lugs are worn.

It is possible to adjust the cutting parameters directly from the keyboard and memorise the parameters by linking them to the type of glass. This makes the approach to the machine simple and intuitive.

The electronic control of all parameters (pressure, speed, cutting acceleration, oil quantity on cut, head descent time, beginning of cut head pressure delta) is constantly ensured by the machine control program. In this way the cutting quality is excellent and constant, which also means a good glass breakout quality.

Special solenoid valve for lubrication control, located close to the cutting wheel, suitable for high evaporating oils used in LOW-E glass processing.

Cutting head safety devices:

1. Linear encoder for glass detection.
2. Collapsible cutting head element, easily replaceable. In case of accidental impact it avoids the stress on the carriage and the bridge.

Control panel with machine computer (Personal Computer and C.P.U. with remote machine control cards on BUS-ETN) power logic, drivers and safety logic.

Besides, the tilting version is equipped with pneumatically activated glass sheet loading lugs with “dead centre” cam wheels and a pneumatic solenoid valve with bistable logic (without consent the valve does not move).

The working table edges are made of solid wood to enable the glass manual breakout.

Series of pneumatically activated breakout bars positioned in the working table with pedal commands located close to the relevant bar.

Bridge driven by motor gripping on pinions with rack facing downwards to prevent the deposit of impurities between the teeth.

Head holder carriage activated by direct drive motor on precision rack.

Simple and intuitive man-machine dialogue thanks to a software interface which takes into account all the glassmaker's requirements.

In the data input phase as well as in all machine operative functions the operator is guided step-by-step by the software, which helps him to detect any possible error.

Among the standard functions: "Shape Scanner", "ScanCad", On Board optimisation software.

TECHNICAL SUMMARY	352BCS-J	352BCS-R	352BCS-TS
Maximum glass size	6100x3300 mm	3650x2750 mm	3710x3355 mm
Glass Thickness	2 ÷ 25 mm		
Working table tilting	Hydraulic with 2 cylinders (optional)		
Maximum tilting Weight (up/down)	1260 / 1000 Kg		
Operator Interface	Bottero Numeric Control on P.C.; management of interpolated axes. Learning and use facilitated by drop down menus and soft function keys. It is possible to personalize the display.		
Data Entry	Alphanumerical keyboard in the control panel. Production data on Hard Disk or USB or through office Ethernet connection.		
Air cushion device + Quick fan shut off	Powerful air cushion system with two fans to create "air cushion" between the table and the glass. Fan-integrated system to quickly decrease the power of the air cushion.		
Working table	Carpet covered working table, accurate in flatness and free from obstacles for glass handling.		
Breakout bar	3+1	2+1	2+1
Glass squaring	Electronic		
Cut	Cutting bridge made of light aluminium alloy with dual brushless motoring according to the pinion – rack scheme, down-turned teeth rack. Light aluminium alloy cutting head carriage activated by direct drive motor on precision racks. Cutting head with glass detection device, automatic lubrication of the cutting wheel, management of cutting pressure.		
Surface grinding with wheel Easy Deletion (option)	Vertical axis wheel for Low-E removal. Grinding residue aspiration by Venturi meter.		
Grinding wheel rectification (option)	Automatic with dedicated cycle		
Noise L_{eq}(A)	77 ± 2 dB(A)		

GENERAL PERFORMANCES		352BCS-J	352BCS-R	352BCS-TS
Cutting bridge	**Maximum speed and acceleration**	120 m/min 1.8 m/s²		
	Speed and acceleration (during LOW-E removal with easy deletion)	20 m/min 1.8 m/s²		
Head holder carriage	**Maximum speed and acceleration**	120 m/min 1.8 m/s²		
	Speed and acceleration (during LOW-E removal with easy deletion)	20 m/min 1.8 m/s²		
Easy Deletion (option)	**Grinding wheel rotation speed**	30000 giri/1'		
	Grinding wheel size	D. 20 mm, H.=10 mm		
	Glass Thickness	3 ÷ 25 mm		
Air cushion power		200 mm minimum of water column		
Tilting motion operating time (up + down)		45 s		
"Shape Scanner"		Electronic Outline detection system. It replaces the traditional "mechanical drafting" digitalisation systems.		
Glass Thickness Sensor		Automatic glass thickness detection device, enables the automatic adjustment of the cutting pressures.		

CUTTING BRIDGE PRECISIONS	352BCS-J	352BCS-R	352BCS-TS
Operating head positioning precision Straight working	+/- 0.15 mm		
Maximum length difference between two diagonals. (Area rectangle < 2 sqm)	1 mm		
Maximum length difference between two diagonals. (Area rectangle > 2 sqm)	2 mm		
Straightness tolerance (cut)	0.5 mm		

All tolerances are to be considered as measured on 2 mm thick glass.

SAFETY FEATURES	352BCS-J	352BCS-R	352BCS-TS
Photocell barriers (where foreseen)	2 rays integrated system that guarantees maximum protection to the operator while the cutting bridge is working.		
Hydraulic tilting	Flexible pipes protected by cut-prevention steel plait. Safety valves (parachute) on the cylinder breeches		
Electromechanical safety	Hardware security systems through special safety modules.		
Moving parts management	Electromechanical hardware braking block (with mechanical switch sensor).		

INSTALLATION AND CONDITIONS OF USE	352BCS-J	352BCS-R	352BCS-TS
Overall dimensions	7000 x 4030 mm	4600 x 3430 mm	4750 x 4030 mm
Weight max (complete configuration)	2250 Kg	1800 Kg	2250 Kg
Work surface height	900 mm +/- 20 mm		
Installed Power	16 KVA	13.4 KVA	16 KVA
Additional power (easy deletion)	0.8 KVA (optional)		
(Max) **Air consumption**	70 NL/min 500 NL/min (with group easy deletion)		
Air characteristic	Filtering : 5 micron Dew point : + 10°C of ambient temperature		
Power supply	Voltage: 400V-415V (+/- 10%), Frequency 50-60 Hz without tension converter. Or Voltage: 200V-240V (+/- 10%), Frequency 50-60 Hz with tension converter. Or Voltage: 440V-600V (+/- 10%), Frequency 50-60 Hz without tension converter. Compressed Air: Minimum pressure 7 Bar Dew point < 5°		
Stocking: temperature and moisture	From - 25 °to + 75°, Reference pressure 1 Bar 90% of relative moisture at 20 °(w/o condensation) 50% of relative moisture at 40 °(w/o condensation)		
Use: temperature and moisture	From + 5 °to + 40 °, Reference pressure 1Bar 90% of relative moisture at 20°(w/o condensation) 50% of relative moisture at 40°(w/o condensation)		

AVAILABLE OPTIONS	352BCS-J	352BCS-R	352BCS-TS
Lean-to device	Couple of pneumatic cylinders that ease the loading of the glass with the aid of the Bottero tong.		
Second pneumatic control for breakout bar	Second pneumatic control through convenient floor pedal.		
Glass transport	Series of lugs for the plate transport with the bridge from the cutting table to the breakout table.		
	Plate max size		
	6000x3300x19 mm	3650x2750x19 mm	3610x3355x19 mm
	transport glasses of max size with optional easy deletion		
	5900x3300x19mm	3550x2750 x19mm	3510x2750 x19mm
	Plate min size		
	1000x2200x3mm	1000x1800x3mm	1000x2200x3mm
Easy Deletion	Vertical axis wheel for Low-E removal (see technical specifications)		
Plastic cut	Incision system of the plastic layer placed on the glass before the sandblasting.		
Second oil tank	The second tank can be selected on the PC by the operator (Standard with Easy Deletion option)		
Air conditioner	Air conditioner against stuffy environments		

PROJECT AND PRODUCTION STANDARDS	Adopted Standards
The machine is designed, built and installed in consideration of the safety standards in force. Importance is placed upon the following aspects: Easy approach. Ergonomics at work. Easy access to parts requiring maintenance. Reliability of the machine and its components. Reduced noise levels. Power savings.	**The following versions are available:** **Equipment in compliance with the European Standard, CE marking.** **IEC 204/1, CELENEC EN 60204-1, CEI 44-5,** **Guideline 2006/95/CE** **Guideline 98/37/CE** **Guideline 2004/108/CE** **Equipment in compliance with the American Standards, UL-CSA marking (OPTIONAL).** **Equipment in compliance with the regulations and standard planning suggested by APAVE France.**