

# 301 - C

## **SEMI-AUTOMATIC CUTTING-BREAKING-SEPARATING MACHINE FOR LAMINATED GLASS.**

MAX. CUTTING LENGTH L=3400 mm

Machine to score, break and separate laminated glass.

The machine is formed by:

SCORING-BREAKING-SEPARATION MODULE

ABUTMENT AND WORKING TABLE

Structure made of electro-welded steel pipes, protected with two paint coats: anti-rust and coloured paint

The working tabletop is made of wood with flatness accuracy and covered with woollen felt, to assure the air cushion of maximum efficiency.

Table edges made of hard wood to allow the manual glass breaking.

Powerful system of forced air, produced with a fan to create the "air cushion" between the table and the glass surface.

This allows to reduce the friction consistently and make the glass movement operations easy.

The noise level of the air forced system is included into the established limits according to the standards.

CUTTING-BREAKING-SEPARATION MODULE :

A couple of bridges with an automatic clamping system to permit the glass cutting, breaking and PVB separation, to produce a right-angle glass edge without splinters, PATENTED BY BOTTERO.

Cutting head carriages moved by a transmission system formed by motorreductor, pulleys and toothed belts.

Cutting, breaking and PVB separation system PATENTED BY BOTTERO, equipped with a heating element at disappearance, pneumatically controlled.

Cutting length determined by a double photocell according to the glass sheet dimension.

Lubrication system with the flow concentrated on the score.

Manual working cycle. Carrying out every single function: locking, scoring, sheet breakout, heating and PVB separation.

Possibility of excluding the lower cutting head to score monolithic glass up to 19mm thickness.

Possibility of performing the monolithic glass breakout up to 10-mm thickness.

Possibility of excluding the lubrication flow during the score.

#### ABUTMENT AND WORKING TABLE:

Pneumatic tilting arms used to load or unload glass sheets, case sizes or sub-plates.

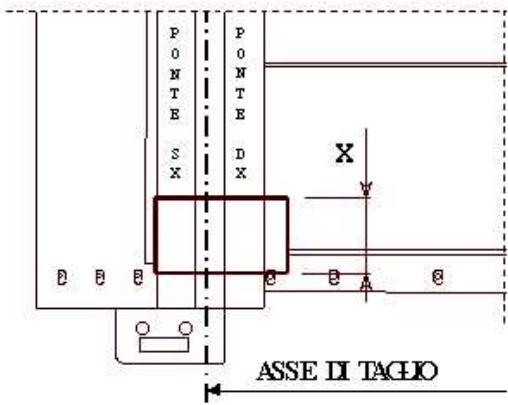
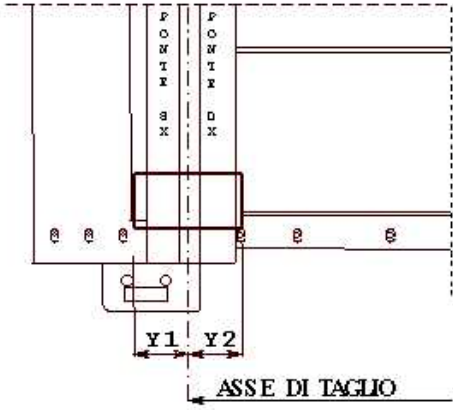
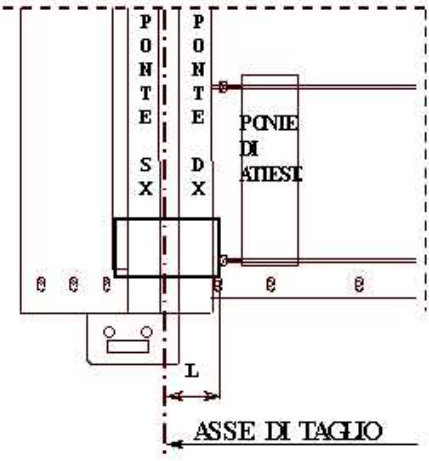
Retractable lateral squaring lug of reference.

Sheet abutment arm, that slides above the table by a mechanically connected guide shaft and a manual tilting system which lets the working tabletop free.

**TECHNICAL SYNTHESIS**

<b>Machine control</b>	Electromechanical instrumentation with manual setting of the pressures and sheet dimension determined by means of a photocell.
<b>Arms tilting</b>	Pneumatically with 1 cylinder (Max 280 Kg).
<b>Air cushion device</b>	Air cushion device to sustain the glass sheet pneumatically.
<b>Working Table surface</b>	Working tabletop covered with woollen felt, accurate flatness and without any obstacles on the sheet movement area.
<b>Sheet squaring</b>	Manually performed against the mechanical reference lugs
<b>Cutting</b>	<p>Cutting head carriage made of aluminium light alloy motorised by a pulley-toothed belt transmission.</p> <p>Cutting head with automatic lubrication for the scoring wheel, cutting pressure setting, performed by a pressure regulator placed on the control console side.</p>
<b>Lower breaking</b>	Breaking head with manual pressure setting according to the glass thickness performed by a pressure regulator.
<b>Upper breaking</b>	Upper breaking cycle given by simultaneous movements of the left lower and upper bridges. PATENTED BY BOTTERO
<b>Heating</b>	Electric heating element that approaches the glass surface by a pinion-rack transmission system and heats the PVB layer for some seconds (according to the thickness).
<b>Separation</b>	Clamping system performed by bridges and a rotation shaft, so called detachment, which permits the sheet traction and separates the PVB layer already melted. PATENTED BY BOTTERO.

**PERFORMANCES**

<p><b>Maximum cutting length</b>  <math>X=3400</math> mm</p> <p><b>Minimum cutting length</b>  <math>X=250</math> mm</p>	
<p><b>Minimum breaking in automatic mode</b></p> <p><math>Y1=175</math> mm</p> <p><math>Y2=175</math> mm</p>	
<p><b>Minimum abutment for cutting</b>  <math>L=250</math> mm</p> <p><b>Maximum abutment for cutting</b>  <math>L=2200</math> mm</p>	

<b>Maximum sheet to process</b>	Sheet 3200 x 2400 mm		
<b>Air cushion power</b>	Minimum 200 mm water column.		
<b>Thickness range to process</b>	Monolithic: 3 - 10 mm Laminated: 3 + 0,38 + 3 (33-1) minimum 6 + 3,04 + 6 (66-8) maximum		
<b>Maximum sheet to process with a Jumbo-tilting table combined.</b>	Sheet 6100 x 3300 mm		
<b>Maximum carriages speed</b>	40 m/min		
<b>Arms tilting time (rising + lowering)</b>	30 s		
<b>Cycle times for L=3400 mm (cutting, breaking, separation)</b>	Times in seconds (environmental temperature equal to 18° Centigrade)		
GLASS	P.V.B.	HP/STANDARD	HP/LOW-E
3+3	0,38	45	41
4+4 / 3+5	0,38	49	44
5+5	0,38	53	48
6+6	0,38	57	51
3+3	0,76	55	50
4+4	0,76	59	53
5+5	0,76	63	57
6+6	0,76	67	61
3+3	1,52	85	76
4+4	1,52	91	82
5+5 / 4+6	1,52	95	86
6+6	1,52	99	89

**CUTTING PRECISION**

<b>Max. cutting sizes tolerance</b>	+/- 0,5 mm
<b>Max. straightness tolerance</b>	0,5 mm
<b>Max. parallelism tolerance</b>	1 mm

It is understood that the tolerance has been checked on 2-mm thick glass.

**SAFETY EQUIPMENT**

<b>Electromechanical safety</b>	Hardware circuits done by means of using special safety modules
<b>Control of the moving units.</b>	Electromechanical hardware locking brake (guaranteed by a mechanical limit switch intervention)

**INSTALLATION AND USE CONDITIONS**

<b>Overall dimensions</b>	3350 x 4790 mm
<b>Weight</b>	2800 Kg
<b>Working table height</b>	Adjustable from 880 up to 920 mm
<b>Installed Power</b>	12 KVA
<b>Compressed air max. consumption</b>	500 NL/Min.
<b>Storage, temperature and humidity tolerances</b>	From - 25 °C up to + 75 °C, reference pressure 1 Bar 90% relative humidity at 20 °C (without condensation) 50% relative humidity at 40 °C (without condensation)
<b>Working, temperature and humidity</b>	From 5 °C up to 40 °C, reference pressure 1 Bar 90% relative humidity at 20 °C (without condensation) 50% relative humidity at 40 °C (without condensation)
<b>Powers Supplied</b>	Voltage: 400 V (+/- 10%), Frequency 50 Hz Compressed air: Minimum pressure 7 Bar Dew point: < 5 °

**DESIGN AND PRODUCTION STANDARDS**

	<b>Standards Adopted</b>
<p>The machine has been designed, produced and installed according to the Safety regulations in force.</p> <p>Great importance has been given to the following aspects:</p> <p>Easy use. Ergonomics working place. Easy access to the parts subject to maintenance. Machine and its components reliability. Noise limits maintained in the allowed tolerances. Energy saving.</p>	<p><b>IEC 204/1, CELENEC EN 60204-1, CEI 44- 5, Low Voltage Norms 73/23/CEE, Norm 93/68/CEE.</b></p> <p><b>The following versions are provided for:</b></p> <p><b>Equipment corresponding to the European Standards, C.E. sealed.</b></p> <p><b>Equipment corresponding to the American Standards, UL - CSA sealed (OPTIONAL).</b></p>

**OPTIONAL AVAILABLE**

<b>Telescopic arms</b>	Telescopic arms equipped with pivoting wheels to support the sheet.
<b>HP</b>	HP infrared-ray electrical resistance. This type of resistance heats the P.V.B., so the glass is not overheated.
<b>LOW-E</b>	Model with detachment rollers with a special rubber coating that allow working LOW-E glass.
<b>HP/LOW-E</b>	Increase of general performance levels of the machine.