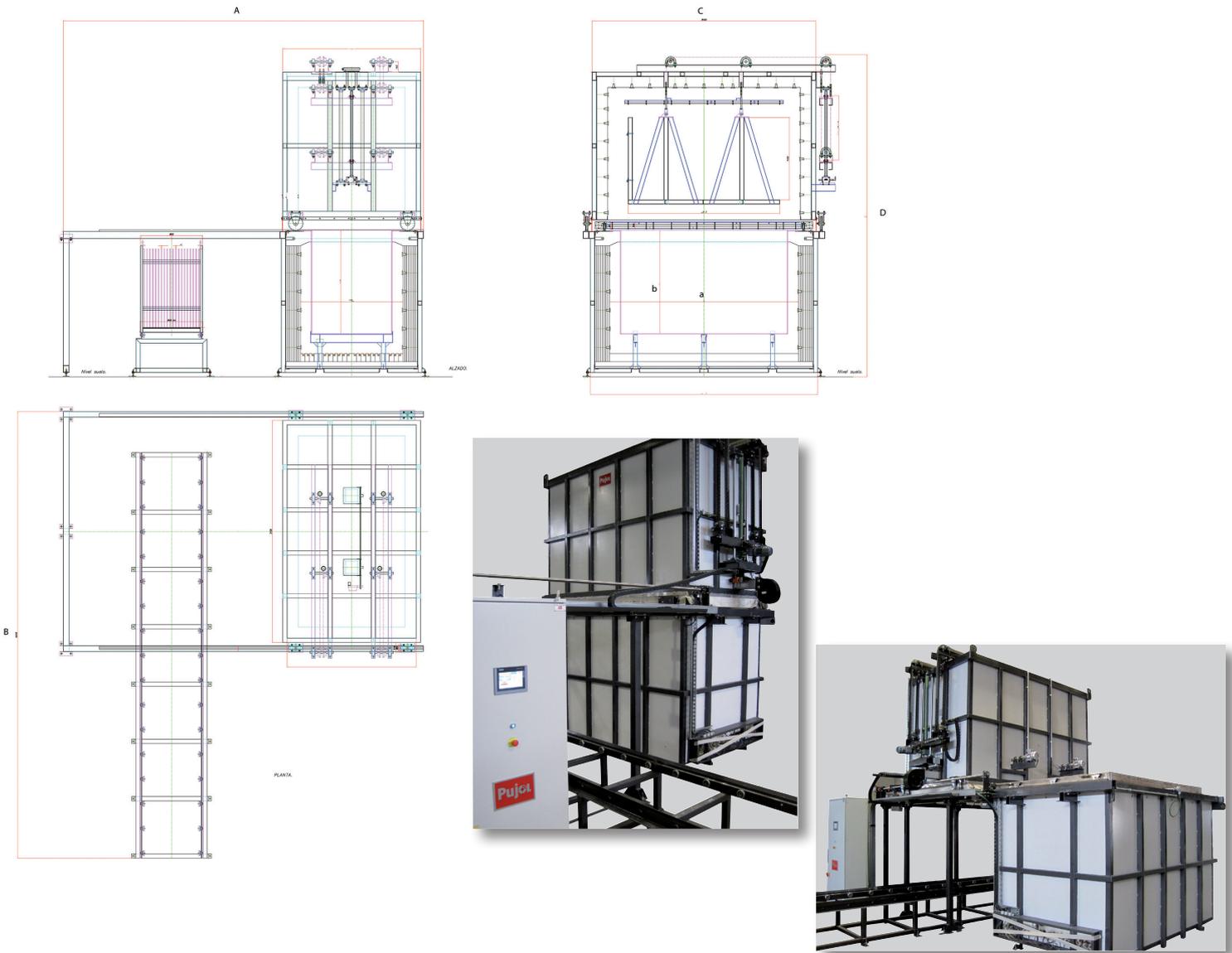


Chemical Tempering Systems

TQ – Lines by PUJOL



	MODEL	A	B	C	D	a	b	KW
TQ	21 X 12	4990	6235	3100	4700	2300	1540	110
	25 X 20	4990	6635	3500	6300	2700	2340	190
	30 X 15	4990	7135	4000	5300	3200	1840	170

Pujol

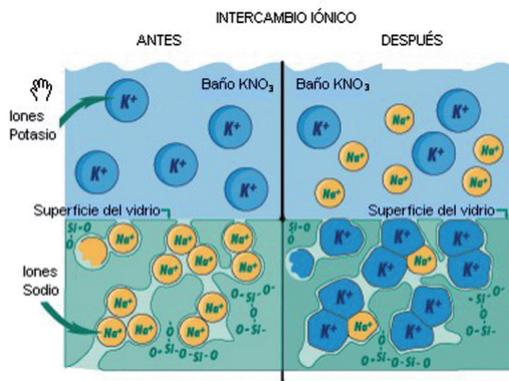
C. del Pla, nº 108-110 / Pol. Ind. El Pla - 08980 Sant Feliu de Llobregat / Barcelona - España (Spain)
 Tel. +34 93 685 56 72 / Fax +34 93 685 53 92 / hipujol@hornospujol.com / www.hornospujol.com

System description and performances

The **PUJOL-TQ SYSTEM** has been developed & designed to perform customer to work any kind of thickness and shape of almost any kind of glass.

The Chemical Tempering is a surface treatment developed under the limit temperature where glass have it's change to vitreous phase.

The glass is soaked in an special salt solution of KNO_3 at a temperature over $380^{\circ}C$ where salts are fused, producing as a consequence of the different electrochemical potential gradient of each element, an ionic exchange between de Sodium (Na) ions of the glass surface and the Potassium (K) ions suspended in the Salt composition.



The insertion of Potassium ions with bigger dimension than the Sodium ions over the glass surface brings as consequence, a high compression tension over the glass surface combined and balance with another internal tension on the glass thickness of traction tension. Which promotes as a result a tempered glass with a mechanical resistance 20 times bigger than a normal annealed float glass.

As main **Highlights** of the System, you can consider:

- Is possible to temper all glass thickness, even 2,5 mm. (which are impossible to temper thermally).
- Perfect Optical of final result, no deformation of edges or roller waves effects typical in thermal tempered glasses. Exceptional for Automotive, Train & Aerospace application for perfect vision of commanders.
- Perfect planimetry after tempering, allows ofr laminated glasses the use of small thickness of EVA or PVB film, reducing final cost of Total composition = Less glass thickness + Less Laminated film = Less Cost + MAXIMUM RESITANCE.
- Possibility of tempering any glass shape, even the most difficult bended glasses.
- A Mechanical strength 20 times bigger than normal annealed glass and 5 to 10 times stronger than thermal temper. So is suitable to use even in Aerospace applications.
- To his exceptional strength combined with Laminated glass gives a result of anti-burglar & bullet-proof high performance glasses.

Glass Type	Annealed Float.	Thermal Strength	Tempered / Toughened	Chemical Tempered
Thickness (mm)	2,3 ÷ 19	2,3 ÷ 8	3,2 ÷ 19	0,7 ÷ 19
Surface Compression (N/m ²)	0	30÷70	30÷70	300÷400
Compression Thickness	0	20% of Total Glass thickness	20% of Total Glass thickness	Up to 100÷120 micron
Flexion Resistance (N/m ²)	30÷40	50÷100	120 ÷200	250 ÷600
Heat Resistance (°C)	30	40÷100	110÷180	< 200
Fragmentation	Big Pieces in sharp edges	Middle Pieces in sharp edges	Small pieces NON sharp edges	Big Pieces in sharp edges
Mechanical strength after lamination breakage	Excellent	Excellent	Poor	Excellent