

USEFUL INFORMATION

TEMPERED GLASS

- Glass is a fragile material, therefore, tempered glass processes are used to increase its structural strength, transforming it into a safety glass.
- Before undergoing the tempering process, glass allows any mechanized work (notches, drilling holes, polishing the edges, etc,...) it also allows ceramic glazes (glass screen-printing or serigraphy). Once tempered, glass does not allow any mechanized work (notches, drilling holes, polishing the edges, etc,...) just sand or acid blasting.
- The tempering process consists in heating the glass evenly to a temperature above 650° C (softening point) and then cooling it rapidly blowing cold air under controlled stress on both sides.
- The quality of a tempered glass is determined by its fracture. It breaks into thousands of small fragments of rounded edges making it less likely to cause severe injury and deep lacerations. Tempered glass is considered to be of good quality, when the biggest fragment is five times smaller than the thick of the glass, or when the mass of the ten biggest fragments is lower than the mass of 6.500 mm² of the original pane (IRAM 12556).
- To be aware of the increase in strength acquired by a tempered glass, we must know that regular glass fracture module is from 350 to 550 Kg/cm² whereas tempered glass is from 1.850 to 2.100 Kg/cm².
- A tempering furnace consists basically of two parts:
 - A heating Section usually with electric resistors where the glass is laid until reaching the softening point (650° C)
 - The quenching section is composed of high-pressure blower, with air pressure control depending on the type of glass and the thickness of the glass to temper (the thicker the glass, the lesser the pressure)
- The softening of the glass may cause optic distortion and some grade of warp (arrow) in the final product. These defects are to a certain extent acceptable (according to the table below)

Tempering process	Warp	Distortion
Horizontal	2 mm x m.	0,5 mm
Vertical	7 mm x m.	0,7 mm

SPONTANEOUS BREAKAGE

- Spontaneous breakage could also happen in the case of tempered glass. This would consist in the shattering of the glass into thousands of small fragments for no apparent reason. This situation rarely occurs and is due to nickel sulphide stones which occasionally may cause stress, producing the aforementioned spontaneous breakage.

glass weight table						
thickness	3mm	4mm	5mm	6mm	8mm	10mm
vertical	7,5 Kg/m ²	10 Kg/m ²	12,5 Kg/m ²	15 Kg/m ²	20 Kg/m ²	25 Kg/m ²