

## Info-sheet Tempered glass 4mm

*Tempered or toughened glass is a type of safety glass processed by controlled thermal or chemical treatments to increase its strength compared with normal glass. Tempering puts the outer surfaces into compression and the interior into tension. Such stresses cause the glass, when broken, to crumble into small granular chunks instead of splintering into jagged shards as plate glass (a.k.a. annealed glass) does. The granular chunks are less likely to cause injury.*

Tempered or toughened glass is also as much as 6 times stronger than untreated glass as well as being resistant to impacts. The safety glass credentials come in when tempered/toughened glass is broken into smaller, rounder edged pieces. Whereas normal annealed glass shatters into sharper edged pieces that are much more likely cut the skin on contact. The tempered glass JANSSENS supplies always has broken or polished edges to reduce injury and take away tension.

### How do you know if glass is toughened or tempered?

You can rest assured that all greenhouses by JANSSENS are supplied with toughened/tempered glass. On any glass product, you should be able to identify toughened ESG glass by its mark of the European standard **EN 12150 ESG** etched into the glass. (The exact markings will depend on the toughened glass' country of origin) Beside that, the only way to find out is to break the glass...

### Can toughened glass be cut?

No, you cannot cut the toughened glass for your greenhouse yourself! Glass can be cut to any shape and size BEFORE the toughening process in the factory.

### INGREDIENT AND PHYSICAL MECHANICAL PROPERTIES

PERFORMANCE	
Color	Clear
Thickness	4mm
Weight	10 Kg/m <sup>2</sup>
Ug	5,8 W/m <sup>2</sup> K
TVIS (Visible Light Transmittance) - LTA	90%
LR (Light Reflection)	8%
TUV (Ultra Violet Transmittance)	71,09%
TSOL (Direct Solar Transmittance)	87%
Solar Energy Absorption	5%
ZTA (Solar Light factor)	88%
ZR (Sunreflection)	8%
Compression Strength	638,49Mpa
Thermal Conductivity	0,1w/m*k)
Reflective index	1,519
Softening point	725°C

INGREDIENTS		
SiO <sub>2</sub>	72,47%	724700ppm
Al <sub>2</sub> O <sub>3</sub>	0,84%	8400ppm
CaO	8,38%	83800ppm
MgO	3,89%	38900ppm
K <sub>2</sub> O	0,29%	2900ppm
Na <sub>2</sub> O	13,79%	137900ppm
SO <sub>3</sub>	0,23%	2300ppm
TiO <sub>2</sub>	0,041%	410ppm
Fe <sub>2</sub> O <sub>3</sub>	0,074%	740ppm