

# Safety Glass

## Thermal Tempering Process



Safety glass (ESG) is produced in a thermal process. After being mechanically processed the glass is heated up to more than 600° C with a rapid cooling afterwards. Compressive stress on the glass surface and tensile stress within the glass ensure an increased impact strength and shock resistance. In case of breakage there are just small crumbs which reduces danger of injury.

### Technical Data

Glass thickness: 2,85 - 12 mm / glass thickness < 2.85 mm: use chemical tempering or semi-tempering  
 Min. glass width: 50 mm  
 Min. glass length: 250 mm  
 Max. size: 1.800 x 1.300 mm  
 Glass types: float glass, even coloured or etched, antireflective glass or conductive glass

	thermal tempered glass	untreated glass
compressive stress	800 - 1000 N/mm <sup>2</sup>	800 - 1000 N/mm <sup>2</sup>
bending stress (glass thickness 3-5 mm)	120 N/mm <sup>2</sup>	40 - 60 N/mm <sup>2</sup>
thermal shock resistance (glass thickness 3-5 mm)	150 K	40 K
operating temperature	> 600° C	max. 450° C
Tempering according to: DIN EN 12150-1		

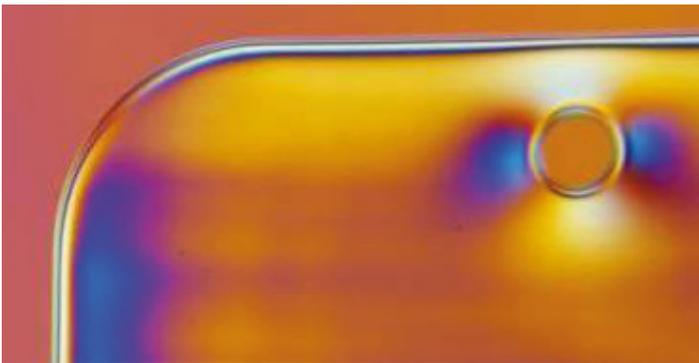
## Advantages

- very high strength compared to untreated glass
- a lot of optical coatings can be thermally tempered
- constant optical properties for visible spectrum
- reduced risk of injury in case of breaking glass
- printing is possible before\* and after the thermal tempering process

## Typical Applications

- automotive industry
- all kinds of display covers
- information screens
- safety applications

## Visible stresses in safety glass (ESG) under polarized light



## Semi-tempered glass

Semi-tempered glass (TVG) passes similar production processes like thermal tempered safety glass (ESG) except for the slower cooling process, which results in lower strength of the glass. Bending strength of semi-tempered glass is between strength values of untreated glass and thermal tempered safety glass (ESG). Semi-tempered glass does not break into small crumbs but into large cracks.

\* only by using ceramic colours

Do you have any questions or do you need an advice concerning the varied possible applications of technical glass?  
Please do not hesitate to contact us!



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