BERLINER GLAS

BERLINER GLAS GROUP

Chemical Strengthening

Product

If glass is subjected to a defined salt bath treatment, ion exchange will produce strong compressive stress in a thin surface layer which significantly improves the glass toughness and strength.

Chemical strengthening is mainly used to strengthen thin glass up to 3 mm thick, as flatness is difficult to control if thermally toughened. Moreover, surface flatness is maintained during the chemical strengthening process. The manufacturers of photocopiers, solar modules, microwave ovens, measuring apparatus, lighting, and automobiles as well as those of many other flat glass applications take advantage of this possibility to use highly resistant glasses in their products.

Chemically prestressed glass has the following advantages:
- Improved impact resistance
- Improved flexibility strength
- Improved scratching resistance
- Improved resistance to temperature changes

The following advantages are the result of using thinner but strengthened glass
- Improved transmission
- Reduced weight
- Reduced mounting costs

Material

Almost all glass with high sodium oxide content can be toughened by ion exchange techniques.

Flat glass
- Grey glass
- Bronze glass
- Machine-drawn Soda-lime glass
- Borosilicate glass
- B 270
- and different colored glasses

Optical glass
- BK 7
- ZKN 7
- and others

Other glass
- Diffusers
- Cast glass
- Pressed glass parts

The glass may be finished, bent, ground, frosted or etched in any way.

Specifications for chemically strengthened float glass

- **External dimensions:** up to app. 2000 x 1000 mm or 1000 mm Ø at BG/Berlin
- **Thicknesses:** 0.3 mm - 19 mm
- **Surface stress:** σ >300 N/mm²; σ >100 N/mm² for borofloat
- **Penetration layer thickness:** D 15 -25 µm

Other penetration layers on your request.

Berliner Glas KGaA Herbert Kubatz GmbH & Co • Waldkraiburger Str. 5 • D-12347 Berlin
techglas@berlinerglas.de • Phone: +49 30 60905-0 • Fax: +49 30 60905-100
www.berlinerglas.com

Comparison of properties of chemically strengthened and of untreated glass

	Chem. strengthened glass	Untreated glass
Impact resistance (with ball drop test, 150,7 g/ height 1 m)	4 - 10 Joule (depending on conditions of test)	1 - 2 Joule (1 Joule = 1 N*m)
Flexibility strength σ bB: (similar to pr EN 12337)	150 N/mm²	50 N/mm²
Resistance to temperature (according to DIN 52313)	350℃ for 1 mm glass 300℃ for 2 mm glass 270℃ for 3 mm glass 250℃ for 4 mm glass	170℃ for 1 mm glass 130℃ for 2 mm glass 120℃ for 3 mm glass 100℃ for 4 mm glass
Vicker hardness	626 HV0,2/15	550 HV 0,2/15
Max. application temperature	300℃ (above 300℃ the chemical hardening can be reduced or lost)	450℃

The above data are merely guidelines. In exceptional cases we recommend tests under the relevant operating conditions. All other physical and chemical properties of the glass are minimally affected.

Quality Assurance

Maintenance of the process parameters, temperature and duration of toughening is electronically controlled, monitored and documented by records. Regular analysis of the salt bath guarantees the quality of the hardening. Each lot is tested for the degree of penetration and surface stress. Our chemically toughened glass is reduced according to pr EN 12337.

Notes

The edges of all chemically toughened glass should be chamfered. After chemical hardening no further edge treatment is possible. Later cutting will be possible with a reduction of the edge resistance stability. On request we mark the glass “BG▽ CG” for “chemically toughened”. Chemically toughened glass can subsequently be printed or coated.

Measuring instruments for quality assurance

Gloss	BYK Gardner Glossmaster, Haze-Guard Plus
Roughness	Perthometer, White light Interferometer
Transmission and reflection	Spectrometer
Outlines	Smartscope, optical 3D- measurement
Layer Resistance	Climatic chamber, abrasion test
Cleanliness	Dark field illuminator
Flatness	Interferometer
Surface defects/inclusions/edge chips	Profile projector, digital microscope

Berliner Glas KGaA Herbert Kubatz GmbH & Co • Waldkraiburger Str. 5 • D-12347 Berlin
techglas@berlinerglas.de • Phone: +49 30 60905-0 • Fax: +49 30 60905-100
www.berlinerglas.com