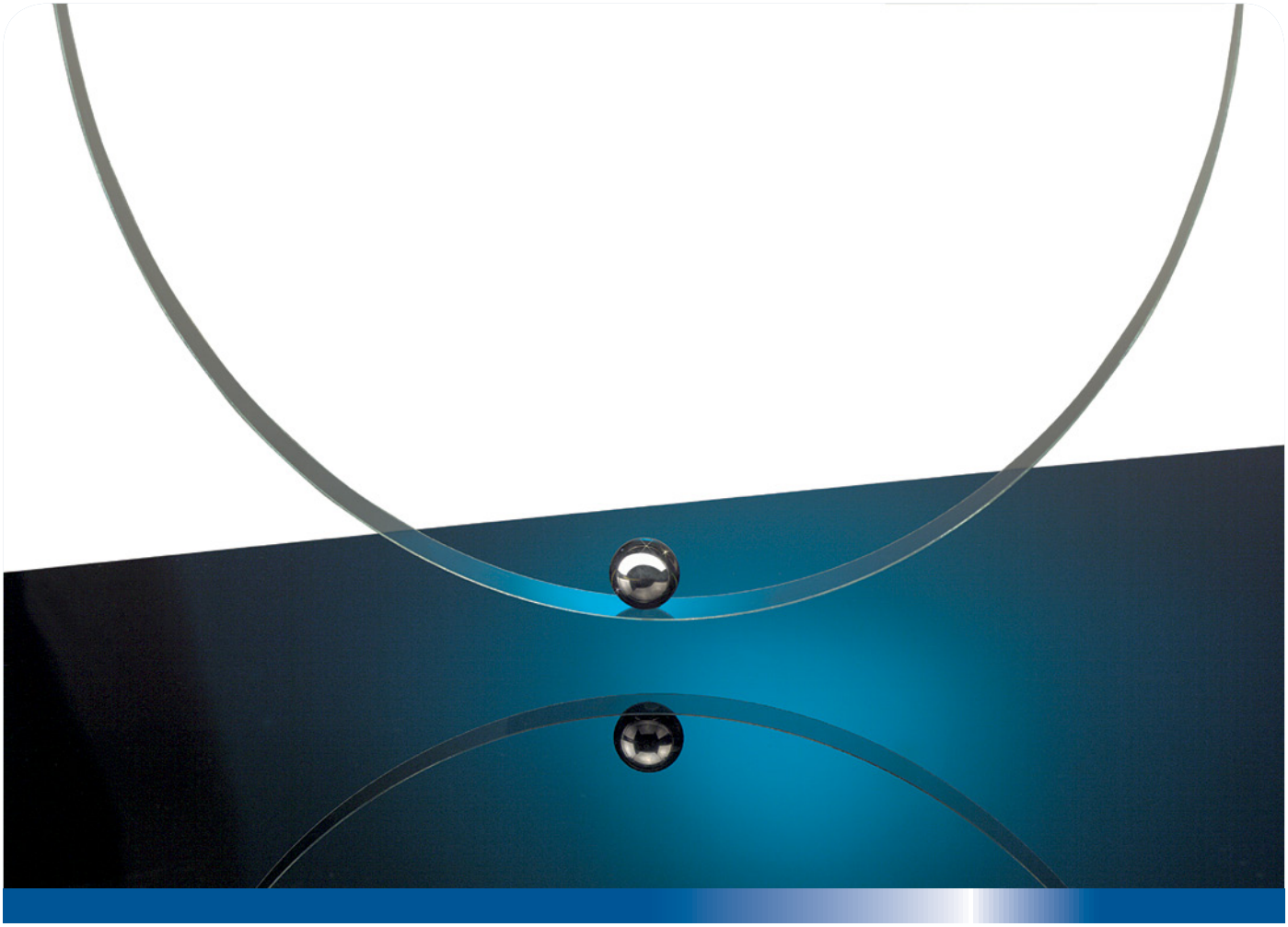

Chemical Strengthening.

High Impact, Bending and Scratch Resistance.

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 (< 3 mm), as flatness is difficult to control if thermally toughened. Moreover, surface flatness is maintained during the chemical strengthening process. Manufacturers of touch-enabled display modules, mobile or stationary control and operating units or companies from the fields of laboratory and medical technology, measurement and sensor technology, building and lighting technology, aerospace, naval and vehicle technology, digital signage and entertainment electronics as well as those of many other flat glass applications take advantage of this possibility to use highly resistant glass in their products.

Chemically prestressed glass has the following advantages:

- improved impact resistance
- improved flexibility strength
- improved scratch resistance
- improved resistance to temperature changes

The following advantages are the result of using thinner but strengthened glass:

- improved transmission
- reduced weight
- reduced mechanical processing costs
- reduced frame and bracket costs

Chemical Strengthening.

Material

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

Flat glass
- soda-lime glass (e. g. float glass)
- aluminosilicate glass (e. g. Gorilla®, Dinorex™, Xensation®)
- borosilicate glass (e. g. Borofloat®)
- grey glass
- B 270
- various colored glasses

Other glass
- diffusers
- cast glass
- pressed glass parts

Other glass on request.

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

Specification

Overall dimensions	up to approx. 1,000 x 1,600 mm or Ø 1,000 mm
Thickness	0.3–19 mm
Surface stress	σ > 300 N/mm² for float glass σ > 700 N/mm² for aluminosilicate glass σ > 100 N/mm² for borosilicate glass (1 N/mm² = 1 MPa)
Penetration layer thickness	d > 13 µm

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 strengthened glass complies with the recommendation in DIN EN 12337-1.

Notes

The edges of all chemically strengthened glass must be chamfered. After chemical strengthening 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 strengthened glass can subsequently be printed or coated and is particularly suitable for a laminate solution, for example laminated safety glass.

Comparison of properties of chemically strengthened and of untreated glass

	Chemically 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 Nm)
Flexibility strength	150 N/mm²	50 N/mm²
Resistance to temperature (according to DIN 52313)	350 K for 1 mm glass 300 K for 2 mm glass 270 K for 3 mm glass 250 K for 4 mm glass	170 K for 1 mm glass 130 K for 2 mm glass 120 K for 3 mm glass 100 K for 4 mm glass
Max. application temperature	300° C (above 300° C the chemical strengthening can be reduced or lost)	450° C
Vicker hardness	626 HV 0.2/15	550 HV 0.2/15
Fracture behavior	Chemically strengthened glass usually has the same fracture pattern as untreated glass. The splitter quantity can be kept small by means of an additional protection film or a laminate solution, for example a laminated safety glass.	

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