

## GENERAL INFORMATION

### TOUGHENED SAFETY GLASS

As producers of TSG, we are obliged according to DIN EN 12150 to label all outgoing panes. This happens using a round branding film (stamp) which is permanently burnt into the glass.

Unless otherwise stated, we always mark the plane side, or, on curved panes, within the hollow side as a mirror image (readable from the convex side).

If labelling (stamp) is not desired, especially on UV-bonded parts, we will try to comply with this request; however, if, contrary to expectation, a stamp has been applied, this does not give cause for complaint. In individual cases, toughened safety glass has a tendency to break spontaneously because of nickel sulfide inclusions, even after years, due to the material. Therefore, lawmakers have decided that a heat soak test must be done for safety-relevant applications. Nevertheless, even after a heat soak test has been done, a statistical residual risk remains of one break on 400 tons of glass. This corresponds to approx. 20,000 m<sup>2</sup> with a glass thickness of 8 mm. A heat soak test will cause additional costs.

### LSG (LAMINATED SAFETY GLASS)

Due to production, a slight misalignment along the edges cannot be ruled. Regrinding of the LSG unit is not allowed according to DIN EN ISO 12543-5, and we will not carry out this work after installation (applies to LSG of TSG/STG [Semi Tempered Glass]). Bubbles and misalignment in the field of boreholes / cutouts are production related and do not give cause for complaint.

### ANTIREFLECTIVE GLASS

Antireflective glass is basically to be treated as uncoated glass. However, it is advisable to exercise particular care when handling.

It is impossible to refurbish scratches. Therefore, during installation the glass must be protected against dirt and other influences.

The glass is cleaned in the usual way with a lot of water, a sponge or wash leather. The use of abrasive cleaners is not allowed. Silicone residues from gluing panes have to be removed immediately.

### MIRRORS / CARE

To remove spots which develop in daily use – splashes, drops, etc. – mirrors / glass are to be rubbed only with a soft, dry cloth. Persistent spots – such as fat, traces of makeup, fly droppings, etc. – can be removed by rubbing with wash leather soaked in hot, clear water and wrung out.

*Do not use chemicals or cleaning agents under any circumstances!*

If a mirror is rubbed with a damp cloth, pay attention that no residual drops remain at the bottom edge. It needs to be dried there too.

## IMPRINTS

Due to the process of thermal toughening, it is possible for chemical or mechanical changes in the surface condition to occur in toughened safety glass. Therefore, dot and reel marks may form, for instance, as well as edge marks along the height edges.

## STATICS

We cannot take responsibility for the statics of the glass as we do not know the construction details or the local conditions of the building. Approval by the responsible building authority is required here in individual cases.

All necessary individual evidence, any necessary approval in individual cases, or static calculations may have to be provided by customer. Therefore, our offer is subject to static correctness.

## STG Mono / LSG of STG

We kindly ask you to respect that, in individual cases, these panes require approval of the senior building authorities in Germany. Commissioning an approval in individual cases is part of the scope of responsibility of the client.

## TOLERANCES Curved Glass

Dimensional tolerances (glass thickness of up to 12 mm) =  $\pm 2$  mm [girth x height < 2000 mm]

Dimensional tolerances (glass thickness > 12 mm) =  $\pm 3$  mm [girth x height < 2000 mm]

Dimensional tolerances (glass thickness of up to 12 mm) =  $\pm 3$  mm [girth x height > 2000 mm]

Dimensional tolerances (glass thickness > 12 mm) =  $\pm 4$  mm [girth x height > 2000 mm]

Contour accuracy (max. dimension 4000 mm) =  $\pm 3$  mm

Torsion =  $\pm 3$  mm

Straightness of the height edges (glass thickness of up to 12 mm) =  $\pm 2$  mm per running meter

Straightness of the height edges (glass thickness > 12 mm) =  $\pm 3$  mm per running meter

Misalignment of edges and boreholes with LSG units =  $\pm 2$  mm

In case of curved glass tangential extensions always have to be expected.

Bulges in the field of the girth edges are possible.

In case of curved panes all dimensions indicated refer to the convex side (outside of the curve).

The view page of drawings is always the convex side (outside of the curve).

Please also note the technical guidelines for TSG, which we will provide upon request (dimensional tolerances, aspect ratios, borehole placement, deviations from the plane, etc.)

In this respect it should, however, be kept in mind that the distance of a bore to the edge of the glass must be at least 2 x the thickness of the glass to the beginning of the bore. If this distance falls short, we can split the bore to the side at our discretion without consulting with the customer!

## **ANISOTROPIES**

Anisotropies arise with glass that was subject to a process of thermal toughening. Due to the different zones of tension, a double refraction of rays develops. Only the polarizing parts of daylight make these occurrences visible by rings in spectral colors, cloud formations and the like.

These occurrences are production related and do not give cause for complaint.

The arrangement of the anisotropy fields may fall differently with subsequent deliveries as well as within one production charge.

## **EVENNESS OF COLOR**

Based on the confusing situation regarding raw glass, we are forced to extend our sources of supply for float glass. Therefore, considerable deviations in color may occur and that thick glass can be 16 or 20 mm thick instead of 15 or 19 mm.

This has a particular significance for Satinato glasses as we cannot guarantee here that each charge is produced of the same basic material (float glass), and that the etching shade is always the same. Only by using another basic glass can the color effect be completely different; unfortunately, we have no influence over it.

## **SCREEN PRINTING**

If screen-printed glass is installed in front of a light background, or if it is illuminated from the side turned away from the viewer, the impression of a starry sky or striation may occur due to production. The cause is that the enamel layer is not entirely opaque. To avoid this effect, this glass should be installed only in front of a dark background.

The enamel side of this screen-printed glass is not suitable for viewing as structures from manufacturing are visible which are not visible when viewed from the glass side.

For production-related reasons, it is not always possible to achieve an absolute evenness in color. This applies especially to follow-up orders.

## **SATINATO**

Cloud formation may occur on etched glasses, caused by the etching process. This is production related and thus does not give cause for complaint.

Etched glass must by all means be stored in a dry area. In case of moisture, it must be eliminated immediately.

We cannot guarantee that each charge of Satinato glass will be produced by the same basic material (float glass) and that the etching shade will always be the same. Only by using another basic glass can the color effect be completely different; unfortunately, we have no influence over it.

## **BONDING**

Due to the process of thermal toughening, it is possible for chemical or mechanical changes in the surface condition to occur in toughened safety glass. Therefore, dot and reel marks may form, for instance, as well as edge marks along the height edges.

These thermal qualities influence on the durability of glass bonding; therefore, we cannot furnish a guarantee for durability. Due to the surface condition of TSG, bubble-free bonding cannot be guaranteed. Bonded glass must be protected against shock, distortion, vibrations, blows, moisture and great changes in temperature. This applies in particular to the transportation of bonded glass. If one of the aforementioned causes should lead to a defect in the glass, this does not give cause for complaint or warranty claims.

## **COPYRIGHT / DESIGN PROTECTION**

For time and cost reasons, we cannot check if glass processing according to our customers' specifications is subject to design protection or the like. We deny any liability hereto (pattern, brand, copyright or rights on the basis of the competition law). Verification is up to the client and lies in his field of responsibility.

## **SURFACE COATINGS / SEALINGS**

Surface coatings / sealings must be cleaned basically with warm water, a sponge or soft cloth. Then wipe the glass with a wrung-out sponge and wipe dry with a microfiber cloth. Do not use abrasive, corrosive, acidic or basic cleaning agents. They can destroy the coating. The same applies to strong manual influences, such as scraping using a window scraper.

## **TECHNICAL DATA**

Technical data / values refer to the information from the producers of basic glass or have been determined according to applicable standards within the framework of an inspection by an independent testing institute. Functional values refer to test pieces of the dimensions being tested. A continuing warranty for technical values will not be accepted, especially if inspections are done on differing installation situations. Statics and impact load are not tested.

All values mentioned are standard nominal values and are subject to corresponding product tolerances according to EN standards, Building Rules List (BRL) and the basic glasses used.

## **FROST FLOWER WINDOWS**

On the pane of frost flower windows, isolated residues of bone glue may remain that cannot be removed. Due to the production process, unevennesses and scratches may occur within the facets. This is production related and does not give cause for complaint.

## **GLASS BREAKAGE**

When producing high-quality glass, breakdowns can occur occasionally due to glass breakage or defects in the glass. It may therefore result in delays in delivery as the new production of the units has to be arranged. We refuse any consequential costs resulting from this.

## **INSULATING GLASS**

When calculating, please bear in mind that curved insulating glass behaves differently than plane glass. Pressure glazing is generally not permitted with insulating glasses!

We cannot furnish a guarantee for triple glazed insulating glass with curved glasses, as they are untested superstructures. Transparency is influenced by the glass's curve. Depending on the glass thickness and geometry so-called burn marks may appear. Due to optical laws the reflection of curved glass is always different from the reflection of planar glass. Transparency and color impression of the curved pane may deviates towards the ones of plane glass. The reflection behaviour is impaired by, for instance: close bending radii; strong self-reflection of the basic glass (sun protection glass or other coatings); increasing glass thickness; large bending angles (e.g. more than 90°) or tangential extensions.

Increasing burn marks, coating errors and surface imprints are admissible unless they are still visible from a distance of 3 m, diffuse daylight and perspective.

The same applies to damages with regard to color, reflection and light transmission.