

Flat ROBAX® panels

Clear views of a real fire are the trademark feature of ROBAX® panels, and the flat model is no exception. This glass-ceramic is supremely transparent, with very little residual natural coloring thanks to SCHOTT's precise production process.

Thermal characteristics

ROBAX® glass-ceramic panels show a near-zero thermal expansion even under thermal load.

Coefficient of mean linear thermal expansion

$$\alpha_{(20-700^{\circ}\text{C} / 68-1292^{\circ}\text{F})} (0 \pm 0.5) \times 10^{-6}/\text{K}$$

Resistance to temperature differences (RTD)

The RTD value measures how well a material can resist temperature differences within a defined area. For example, the temperature difference between the hot area in the center of a panel and the cold edge or frame area (room temperature). No breakage caused by thermal stress occurs at a maximum temperature of $T_{\text{max}} \leq 700^{\circ}\text{C}$ (1,292 °F).

Resistance to thermal shock (RTS)

The RTS value measures a hot panel's ability to withstand a sudden thermal shock by cold water (15 °C/ 59 °F). No breakage caused by thermal stress occurs at a maximum temperature of $T_{\text{max}} \leq 700^{\circ}\text{C}$ (1,292 °F).

Temperature/time loading

The temperature/time loading limits determine the permissible temperature for set usage times at which no breakage caused by thermal stress occurs. The temperature values refer to the hottest points on the outside of the panel.

One must make sure that these temperature/time loading limits are not exceeded. Taking resistance to thermal gradients and thermal shock into account, the following applies:

590 °C (1,094 °F) 1,600 hours

Valid for inhomogeneous heating.

Mechanical characteristics

Density

ρ approx. 2.6 g/cm³ (at 25°C/77°F)

Impact and flexural strength

σ_{bB} approx. 35 MPa*

* The test is carried out in accordance with DIN EN 1288 part 5, with the surface in its normal condition of use as encouraged in practice.

The impact resistance of ROBAX® depends on the kind of installation, the size and thickness of the panel, the kind of impact, the geometry of the panel, and especially on the drilled holes and their position on the ROBAX® panel.

Therefore, information on impact resistance must always be evaluated individually according to the installation situation.

The flexural strength is tested in accordance with DIN EN 1288 Part 5, with the surface in the normal state of use.

Comments on mechanical properties

Values presented regarding the strength of glass and glass-ceramic must also take into account the special properties of these materials.

In the technical sense, glass and glass-ceramic are 'ideally elastic', yet brittle materials in which there are no flow patterns. When they come into contact with materials of the same hardness, this causes surface damage in the form of fine nicks and cracks. When glass and glass-ceramic are subjected to a mechanical load, the build-up of critical stress at the points of such nicks and cracks cannot be relieved by plastic flow, as is possible with materials like metals.

The consequence of this behavior is that the structurally based high strength of glass and glass-ceramic ($\geq 10,000$ N/mm²) is practically irrelevant. It is reduced by the effect of unavoidable surface defects (in the case of unprotected surfaces) to a practical value of approx. 20 to 200 N/mm² bending strength, depending on the surface state and test conditions. This must be taken into account accordingly during installation and handling.

The strength of glass and glass-ceramic is therefore not a material constant (as its density, for example), but is dependent on the following criteria:

- Processing condition of the panel (incl. edge finish, boreholes, etc.)
- Usage condition (type and distribution of surface defects)

- Time-related conditions or alternatively the duration of the effective load
- Surrounding conditions (corrosive substances, such as hydrofluoric acid)
- The area subject to load, as well as the thickness of the panel
- The installation method of the panel

Its strength is also subject to a statistical distribution in accordance with the type and distribution of the surface defects.

Chemical characteristics

The chemical composition of ROBAX® complies with the requirements for a glass-ceramic in accordance with EN 1748 part 2. The special glass is produced of mainly natural raw materials and can therefore be used as raw material for the glass-ceramic production.

Chemical resistance

In addition ROBAX® is tested for chemical resistance as follows:

- Water resistance (hydrolytic resistance to ISO 719 grain class): HBG 1
- Acid resistance (DIN 12116): Min. class S2
- Alkali resistance (in line with ISO 695): Min. class A1