IN FRONT

Glass-ceramic for fireplaces and stoves
SCHOTT is a leading international technology group in the areas of specialty glass and glass-ceramics. With more than 130 years of outstanding development, materials and technology expertise we offer a broad portfolio of high-quality products and intelligent solutions that contribute to our customers’ success.

SCHOTT ROBAX® is another SCHOTT brand that is on the road to success. Over 100 million ROBAX® fire viewing panels have been sold in 40 years and have made SCHOTT a leading manufacturer of heat-resistant, transparent materials. With our remarkable variety of products and services, we team up with fireplace manufacturers to take advantage of market opportunities. As a joint source of inspiration for product, market, sales and distribution ideas, SCHOTT fulfills end customer wishes before they have even been expressed.
“Beneficent is fire’s strong might, when man subdues and watches it.”

Friedrich von Schiller
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6 SCHOTT ROBAX® IN FRONT
8 Function | Flat ROBAX® panels
10 Coziness | ROBAX® 3D panels
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A blazing and crackling fire warms our hearts.

Indeed, a flickering campfire in the wild is especially appealing. But when it comes to our own four walls, safety, visual and heating considerations stand front and center. The options for transparent glass-ceramics from SCHOTT are as varied as the ideas of fireplace manufacturers.

ROBAX® fire viewing panels “engineered in Germany” ensure real enjoyment while providing full protection. They enable a close-up view and feel of the fire, with no danger from flying sparks.

ROBAX® glass-ceramic is extremely heat resistant, sturdy, and displays very low thermal expansion. For a short time the panels even withstand extreme temperatures of up to 760 °C (1,400 °F), as well as considerable shifts in temperature and thermal shocks. Precisely such features as temperature stability, transparency, heat transmission and long lifespan are what allows ROBAX® – especially in comparison to conventional flat glass – to guarantee perfect protection from fire hazards.

With our comprehensive knowledge of products, markets and consumers worldwide, we can provide you complete product development opportunities from concept ideation to development, to consumer launch, backed by exceptional customer service.

We see ourselves and our expertise in specialty glass as a joint source of inspiration for your product, market, sales and distribution ideas. We team up with you to develop product features and components even before they are needed by end customers.
Function

ROBAX® flat panels

Fireplaces that feature SCHOTT ROBAX® allow for the heat radiation created in the combustion chamber to pass through so that it gradually fills the entire room with pleasant warmth.

SCHOTT ROBAX® IN FRONT

- Flat panels for increased functionality
- In sizes up to 1,954 x 1,100 mm
- Thicknesses of 4 and 5 mm
- In many different formats
- ROBAX® IR Max for pleasant warmth in the living room, no overheating
Coziness
ROBAX® 3D panels

Curved or angular bent. One or two angles: The various designs that ROBAX® 3D-panels come in offer completely new views of a fire inside a closed fireplace.

SCHOTT ROBAX® IN FRONT

- Round or angled shapes
- Singular or various bends
- Many different bending angles, radii and opening angles possible
- Good views of the fire from all sides
Design
ROBAX® decorative panels

All flat and 3D panels are available in a variety of decorative designs according to your preference, either in black or one of many other colors.

SCHOTT ROBAX® IN FRONT

• Various decoration colors for pattern designs and logos
• ROBAX® Mirror: panels with reflective coating
• ROBAX® TrueView: panels with anti-reflective coating
• ROBAX® Magic: interior glass-ceramic panels for gas fireplaces and stoves
• ROBAX® Ambience: exterior glass-ceramic panels for fireplaces and stoves
Luxury
ROBAX® exclusive panels

The luxury segment of SCHOTT ROBAX® helps make customized dreams come true.

SCHOTT ROBAX® IN FRONT

- Largest producible curved panel ROBAX® Giant
- Largest producible angular bent ROBAX® panel
- Angular bent ROBAX® panels with big bending radii
- More than two bending edges (on request)
- ROBAX® Dome
- Wave shape
SCHOTT ROBAX® Service Experience: One of a kind.

Teaming up with SCHOTT ROBAX® makes for a very special service experience. With us, smooth collaboration is not just a desire, but lived out on a daily basis.

**Research and development |** Innovations are the impetus of our tech company. With trend-setting development partnerships, we ensure not only high-level technological progress in all areas, we also guarantee that you will soon look forward to the latest innovations from SCHOTT ROBAX®.

**Quality |** Steady series production since 1979 has yielded an impressive result: 100 million glass-ceramic panels sold. They are not only TÜV and UL certified, but undergo thorough quality control.

**Worldwide distribution |** We hear our customers’ requests – regardless of the language. In 36 countries, they benefit from sales staff who speaks their language and promptly and flexibly respond to every customer request. This major service advantage provides you with a permanent and dedicated contact person who has a direct line to the headquarter.

**Logistics |** Experience excellent delivery performance. SCHOTT ROBAX® boasts short delivery times and custom-tailored logistics concepts.

**Application service |** We deliver more than glass-ceramic. Our service package always includes 40 years of experience. As a competent partner with an applications lab and supporting tests, we help you save development costs and time.

**Marketing Service |** Our comprehensive knowledge of end users and key markets around the world help you tap into new sales territories and further your success.
ROBAX® flat panels

**Appearance**

ROBAX® glass-ceramic is transparent and has very little natural coloring with respect to the material itself as a result of the manufacturing process. The smooth surface on both sides has a high-quality, silky matt appearance.

**Quality**

The externally certified management system introduced in accordance with DIN EN ISO 9001 (for quality management) and DIN EN ISO 14001 (for environmental management) represents a high standard for quality. It also ensures compliance with customer demands, as well as official regulations and guidelines. The whole production and product testing process are TÜV certified (TÜV PROFICERT).

**Available shapes | Random sizes**

Random sheets (jumbo formats) are large-format glass-ceramic sheets that have not yet been processed, especially with respect to the edges. These serve as the base material for cut-to-size panels.

**Jumbo formats are available in the following sizes:**

<table>
<thead>
<tr>
<th>Edge length</th>
<th>Thickness*</th>
<th>Packaging</th>
<th>Number per packaging unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,954 x 1,100 mm</td>
<td>4.0 mm</td>
<td>Wooden crate</td>
<td>45 sheets</td>
</tr>
<tr>
<td>1,954 x 1,100 mm</td>
<td>5.0 mm</td>
<td>Wooden crate</td>
<td>35 sheets</td>
</tr>
</tbody>
</table>

*Other thicknesses upon request
Flatness | Random sizes

Flatness (f) describes the maximum deviation from flatness for stock sizes. This is tested using a straightedge and a feeler gauge. The following applies to random sizes: Flatness ≤ 0.3 % x measured length | Measured length at least 500 mm

ROBAX® can be cut-to-size within the standard dimensions to meet your specific demands. We would be happy to supply you with the minimum dimensions of cut-to-size panels upon request. The maximum dimensions of cut-to-size panels are equivalent to the edge lengths area of the respective panel.

Standard length tolerance cut-to-size panels, standard shape cut-to-size panels

<table>
<thead>
<tr>
<th>Edge length ℓ₁, ℓ₂</th>
<th>Tolerance</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤ 500 mm</td>
<td>± 1.0 mm</td>
</tr>
<tr>
<td>&gt; 500 mm</td>
<td>± 1.5 mm</td>
</tr>
</tbody>
</table>

Flatness | Flat cut-to-size panels

Flatness (f) describes the maximum deviation from flatness and is tested using a straightedge and a feeler gauge. Maximum deflection for cut-to-size panels: Flatness ≤ 0.3 % x diagonal of the cut-to-size panel

Rectangularity

The limits shown in the sketch on the right apply to the rectangularity of the panels:

The tolerance range a is the range within which the actual dimensions of the panel may vary.

Rectangularity tolerance

<table>
<thead>
<tr>
<th>Edge length</th>
<th>Tolerance</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤ 500 mm</td>
<td>a ≤ 1.0 mm</td>
</tr>
<tr>
<td>&gt; 500 mm</td>
<td>a ≤ 1.5 mm</td>
</tr>
</tbody>
</table>
ROBAX® 3D panels

ROBAX® curved and angular bent panels are available in various versions in thicknesses of 3, 4 and 5 mm.

If you require a custom-tailored solution, please inquire early about our available models and shapes. This helps us reduce delivery times and costs. For curved panels, we recommend selecting panels from the standard product line.

All geometric tolerances are tested using a two-dimensional slot gauge. This is a plastic gauge with a defined slot. The glass-ceramic panel must fit easily into the gauge.

Appealance

SCHOTT ROBAX® Fire View Index by Dudek

Do you already know our SCHOTT ROBAX® Fire View Index by Dudek? With this tool, we can now calculate the view of the fire.

Shaped glass-ceramic panels enlarge the view of the fire. With the Fire View Index by Dudek (FVI), SCHOTT ROBAX® is now able to show how much more of the fire is viewable through a shaped panel compared to a flat one.
Curved

Curved ROBAX® glass-ceramic panels are available in a number of different versions. Geometries outside the product range mentioned below upon request.

<table>
<thead>
<tr>
<th>Product range</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>h panel height</td>
<td>100 – 800</td>
</tr>
<tr>
<td>$\ell_a$ arc length</td>
<td>210 – 1,100</td>
</tr>
<tr>
<td>r bending radius</td>
<td>225 – $\infty$</td>
</tr>
</tbody>
</table>

All dimensions in mm | All dimensions are exterior dimensions
Tolerances according to technical delivery specifications
**Angular bent, 1 angle**

Geometries outside the product range mentioned below upon request.

<table>
<thead>
<tr>
<th>Product range</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>h panel height</td>
<td>230 – 815</td>
</tr>
<tr>
<td>$\ell_1$ long side section</td>
<td>220 – 1,100</td>
</tr>
<tr>
<td>$\ell_2$ short side section</td>
<td>60 – 590</td>
</tr>
<tr>
<td>$\alpha$ bending angle</td>
<td>90° – 160°</td>
</tr>
</tbody>
</table>

All dimensions in mm | All dimensions are exterior dimensions
Tolerances according to technical delivery specifications
Angular bent, 2 angles

Geometries outside the product range mentioned below upon request.

<table>
<thead>
<tr>
<th>Product range</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>h panel height</td>
<td>230 – 815</td>
</tr>
<tr>
<td>( \ell_2 ) center section length</td>
<td>170 – 900</td>
</tr>
<tr>
<td>( \ell_1 ) side section length</td>
<td>60 – 420</td>
</tr>
<tr>
<td>( \alpha ) bending angle</td>
<td>90° – 160°</td>
</tr>
</tbody>
</table>

All dimensions in mm | All dimensions are exterior dimensions
Tolerances according to technical delivery specifications

Perhaps you have something special in mind? Upon request, we are able to develop additional, complex and innovative shapes in cooperation with you. You’ll find examples on page 15.
Decoration

Flat and shaped ROBAX® panels with decoration are available upon request. The decoration can serve a functional as well as decorative purpose. The colors below are available. "Amber gold" and "satin silver" are very transparent colors with a glitter effect, the other colors are opaque.

For area coverage larger than 70 %, the glass-ceramic requires a thickness of 5 mm.

The depicted color impressions are not authoritative. We will be glad to send you an original color sample upon request.
In addition the matte color combinations “matte stone grey and mystic black” and “matte stone grey and opaque black” can be delivered. They are suitable for frame decorations and logos.

On request we can supply a glass-ceramic panel with a personalised logo.

**METALLIC Design Effects**

Individual decorations with finely crafted floral elements and puristic linear forms with METALLIC effect create a unique atmosphere. The decorative effect of a 3D-panel is now upgraded by the color and design options and flat panels get a perspective elegance.

Following METALLIC Design Effects are available:

- METALLIC anthracite and mystic black
- METALLIC ochre and mystic black
- METALLIC red and mystic black

In addition the matte color combinations “matte stone grey and mystic black” and “matte stone grey and opaque black” can be delivered. They are suitable for frame decorations and logos.
Coatings | ROBAX® IR Max

At a glance

The power package for your fireplace: ROBAX® IR Max is a first glass-ceramic fire viewing panel with a heat reflecting coating. The advantage is an energy-friendly fireplace: While visible light can easily pass through the panel, some of the heat radiation is reflected back into the combustion chamber. This can result in a noticeable gain in stored energy.

Further product benefits

- The coated panel reflects up to seven times more infrared light (integral value of the reflection spectrum in the wavelength range 800 nm to 8 μm, see graphic on page 27) as an uncoated panel. The result: the energy radiation passing through the panel is reduced and the temperature in the combustion chamber is significantly increased. The extra energy gained can for example be used for more efficient heating water conduits or as additional stored energy. Its advantage: more optimal use of the heat energy and the wood reduces heating costs.

- With the highest esteem for the environment: Depending on the fireplace design, the higher combustion chamber temperature can improve the combustion process and thus lead to lower emission values.
• Even when the heat runs high, ROBAX® IR Max is resistant to high temperatures. The temperature resistance is approximately 650 °C (1,202 °F). The efficiency of the coating is therefore maintained over time.

• ROBAX® IR Max inspires confidence with a homogeneous and slight bluish shimmering look, which integrates it perfectly into any home design.

• The coating can result in less soiling on the panel, in particular due to soot, which makes cleaning the glass-ceramic distinctly easier.

• ROBAX® IR Max makes heating with fire safer. The reason for this: the reduced radiation means that the installation area is heated more pleasantly and evenly. Also, the floor temperature in front of the heating appliance remains lower. This means that furniture can be placed closer to the visible area of the appliance, thus offering increased enjoyment of the fire experience.

• The SCHOTT application technology laboratory guarantees comprehensive application servicing.

<table>
<thead>
<tr>
<th>Temperature/time load capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>600 °C/1,112 °F</td>
</tr>
<tr>
<td>650 °C/1,202 °F</td>
</tr>
</tbody>
</table>

Cumulative reflection of heat radiation for a wavelength range of 800 to 8,000 nm

<table>
<thead>
<tr>
<th>Technical data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glass thickness</td>
</tr>
<tr>
<td>Max. usable area</td>
</tr>
<tr>
<td>Versions</td>
</tr>
<tr>
<td>Temperature resistance</td>
</tr>
<tr>
<td>Effect of the coating</td>
</tr>
</tbody>
</table>
Coatings | ROBAX® Mirror

This reflective coating is only offered for flat ROBAX® fire viewing panels. When no fire is burning, the reflective pane prevents the inside of the fireplace from being viewed to a large extent. When a fire is burning, however, viewing is excellent. The reflective coating is found on the side that faces away from the fire. The uncoated side is indicated for purposes of installation.

<table>
<thead>
<tr>
<th>Technical data</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Glass thickness</td>
<td>4 and 5 mm</td>
</tr>
<tr>
<td>Max. usable area</td>
<td>1,770 x 1,070 mm</td>
</tr>
<tr>
<td>Long-term temperature resistance</td>
<td>up to 600 °C (1,112 °F)</td>
</tr>
<tr>
<td>Mean visual reflection</td>
<td>approx. 50 %</td>
</tr>
</tbody>
</table>
Coatings | ROBAX® TrueView

The anti-reflective coating applied on both sides of the glass-ceramic is available for flat ROBAX® fire viewing panels. It helps to avoid reflections from the area surrounding the fireplace and, thus, facilitates the best possible view of the heart of the fireplace. We recommend using ROBAX® TrueView only in gas fireplaces.

Technical data

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Glass thickness</td>
<td>4 and 5 mm</td>
</tr>
<tr>
<td>Max. usable area</td>
<td>1,770 x 1,070 mm</td>
</tr>
<tr>
<td>Long-term temperature resistance</td>
<td>up to 600 °C (1,112 °F)</td>
</tr>
<tr>
<td>Reflection (at a wavelength of 550 nm)</td>
<td>approx. 1 %</td>
</tr>
</tbody>
</table>
Colored panels | ROBAX® Magic

Smooth, dimpled or grooved Robax® Magic glass-ceramic panels, available in different colors, are suitable for use as interior glass-ceramic panels for gas fire-places and stoves for domestic heating. The impression of additional reflections created by the dancing flames and the ease of cleaning make Magic a real alternative to the conventional materials used inside the combustion chamber.

Temperature/time loading

The heat resistance and endurance ratings for inner-lining panels in gas stoves and fireplaces establish the threshold temperatures on the left which no thermally induced temperature-stress breakage occurs at a given period of exposure. The values listed in the table to the left are relevant for the practical use of glass-ceramic as interior for gas fireplaces and stoves.

<table>
<thead>
<tr>
<th>Temperature/time load capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>400 to 610 °C / 752 to 1,130 °F</td>
</tr>
<tr>
<td>425 to 660 °C / 797 to 1,220 °F</td>
</tr>
</tbody>
</table>

Technical data

| Glass thickness | 4 mm |
| Shapes | flat | boreholes possible |
| Minimum size | 100 x 100 mm |
| Maximum size | 1,180 x 590 mm |
| Edge processing | U-profile edge |
| Shape | Square with corner radius |

More sizes, gauges, special shapes and edging available upon request
Colored panels | ROBAX® Ambience

Thanks to their thermal, physical and chemical characteristics, ROBAX® Ambience glass-ceramic panels are intended as durable exterior glass-ceramic panels for fireplaces and stoves in private homes. ROBAX® Ambience opens new and large-area design options for enhancing and beautifying room heating devices that may require low thermal expansion and high temperature resistance.

ROBAX® Ambience can be custom-decorated with a large selection of ceramic colors. The material colors of ROBAX® Ambience are black, grey, translucent bluegrey, white, translucent and transparent. The surfaces of ROBAX® Ambience are smooth on one side and smooth or dimpled on the other side.

Temperature/time load capacity

<table>
<thead>
<tr>
<th>Temperature/time load capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>400 to 610 °C / 752 to 1,130 °F</td>
</tr>
<tr>
<td>425 to 660 °C / 797 to 1,220 °F</td>
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</tbody>
</table>

Technical data

<table>
<thead>
<tr>
<th>Technical data</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Glass thickness</td>
<td>4 mm</td>
</tr>
<tr>
<td>Shapes</td>
<td>Flat, curved and angular bent boreholes possible</td>
</tr>
<tr>
<td>Minimum size</td>
<td>100 x 100 mm</td>
</tr>
<tr>
<td>Maximum size</td>
<td>1,180 x 590 mm</td>
</tr>
<tr>
<td>Edge processing</td>
<td>U-profile edge</td>
</tr>
<tr>
<td>Decoration</td>
<td>Several colors available for decoration</td>
</tr>
</tbody>
</table>

More sizes, gauges, special shapes and edging available upon request
General information

In addition to its attractive appearance, SCHOTT ROBAX® is mainly known for its “intrinsic” values. Regardless of whether one refers to its mechanical, thermal, chemical, or optical properties, the transparent glass-ceramic meets even the highest requirements with poise. The following technical information applies to ROBAX® in general. Unless otherwise indicated, the data provided is intended as a point of reference. Values for which no generally applicable measurement method exists or, alternatively, are not defined in a generally applicable manner (for instance by a standard), are specified and explained.

Technical properties

Panel thicknesses

ROBAX® is available in the following standard thicknesses with corresponding admissible tolerances:

<table>
<thead>
<tr>
<th>Thickness</th>
<th>Tolerance</th>
</tr>
</thead>
<tbody>
<tr>
<td>4,0 mm</td>
<td>± 0.2 mm</td>
</tr>
<tr>
<td>5,0 mm</td>
<td>± 0.2 mm</td>
</tr>
</tbody>
</table>

Other thicknesses upon request

Fine grinding for that perfect effect

Regardless of whether attractive appearance or top functionality is what interests you most, a variety of different types of processing and finishes give ROBAX® the finishing touch. You’ll receive a perfect product that meets your needs.
Edge and corner finishing

The standard edge finish for glass-ceramic panels is based on DIN 1249. Standard grinding is used for flat and curved ROBAX® panels as in the sketch above.

Boreholes

Upon request, ROBAX® is available with holes bored into it.

These holes are available with diameters of 7 mm or more. The position of the holes is subject to certain limitations with respect to the edges and corners of the panel, as well as the position of these holes in relationship to each other.

This limitation generally depends on:

- nominal thickness of the glass-ceramic
- panel dimensions
- diameter of the hole
- shape of the panel

Further details available upon request.
Mechanical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density ( \rho )</td>
<td>approx. 2.6 g/cm³ (at 25 °C / 77 °F)</td>
</tr>
<tr>
<td>Bending strength ( \sigma_{bb} )</td>
<td>approx. 35MPa*</td>
</tr>
</tbody>
</table>

* 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.

Impact resistance

Comments can only be made on impact resistance when more is known about the actual application. Of particular importance here are application-specific standards that must be met with respect to strength requirements.

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 (≥ 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.

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, e.g. hydrofluoric acid)
- the area subject to load, as well as the thickness of the panel
- how the panel is installed

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

Coefficient of mean linear thermal expansion $\alpha_{(20-700^\circ\text{C}/68-1,292^\circ\text{F})} (0 \pm 0.5) \times 10^{-6}/\text{K}$

Resistance to thermal gradients (RTG)

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

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 $T_{\text{max}} \leq 700^\circ\text{C} (1,292^\circ\text{F})$.

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 (please see table on the right).

<table>
<thead>
<tr>
<th>Temperature/time load capacity</th>
<th>610 °C/1,130 °F</th>
<th>1,000 hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>660 °C/1,220 °F</td>
<td>100 hours</td>
<td></td>
</tr>
</tbody>
</table>
Chemical properties

Chemical composition

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

Water resistance

Hydrolytic resistance to
ISO 719 Grain class: **HGB 1**

Alkali resistance

In line with ISO 695: min. Class A2

Acid resistance

DIN 12116: min. Class S2

Surface modifications caused by use

ROBAX® has a high degree of resistance to surface attacks. In individual cases, however, surfaces can experience changes under critical conditions, e.g. corrosive combustion gases (formation of acid at high temperatures). In such cases, practical tests should be conducted before using ROBAX®.
Optical properties

Transmission ROBAX® | 4 and 5 mm thickness

These are typical transmission curves for the material thicknesses mentioned that are based on individual measurements.
**General information**

1. Even under thermal load, ROBAX® glass-ceramic panels show near-zero thermal expansion. For this reason the different thermal expansion of the various framing materials in proportion to the ROBAX® panel must be taken into account in the design of the entire heating device.

2. Additionally, the limitations of manufacturing tolerances of the frame and glass-ceramic panel should be considered.

3. Contact pressure that leads to bending stress on the panel must be eliminated. This can be achieved, for example, by limiting torque, or with an arrester which limits screw-in depth.

4. If the frame is required to touch the glass-ceramic panel due to design reasons, then the contact pressure must be evenly distributed (never at single points) over the circumference of the panel.

5. The panel must not come into direct contact with metal frame parts. It is recommended to use a thermally stable, permanently elastic seal.

6. Seal manufacturer instructions must also be followed, in particular with regard to contact pressure of materials.

7. During installation, it is essential to protect the glass-ceramic panel, specifically the edges from potential damage (blows, bumps and scratches).

8. If a high-temperature-resistant silicone is applied to the circumference of the panel, the elastic limit of the silicone must be considered. Due to the excellent bonding properties of glass-silicone, exceeding the limit can lead to cracked or broken windows.
Frameless installation

The main hazards that could arise when installing ROBAX® glass-ceramic doors without a frame are mechanical stresses (bending stress, blows, bumps, etc.). A concealed substructure features a frameless design onto which the ROBAX® glass-ceramic panel is mounted, while also covering the front side. Therefore, the panel edges are not surrounded by a protective frame and may be exposed to additional mechanical stress. Other essential general instructions that remain applicable and must be taken into account in the design of a frameless door can be found on the “General information” section.

1. The weight of the panel should be supported by a surrounding and sufficiently dimensioned frame. The pressing forces transmitted from the frame to the glass-ceramic must be absorbed by a suitable and temperature-stable material that is also flexible (e.g. glass-fiber cord between hinge/handle and window).

2. Pressure points, caused for example by the weight of the window “resting” on the screws/lead-throughs, should be kept to a minimum, e.g. with threaded sleeves which at the same time prevent unacceptable glass-metal contact.

3. Borehole diameter in the ROBAX® panel must allow for thermally-induced expansion of metal components (lead-throughs, mounting rails, etc.). Additionally, borehole edges must be of sufficient quality and be beveled on both sides. Panel edges should be ground.

3.a Minimum distance between borehole edge and outer edge of the panel should be at least twice the thickness (x) of the panel.

4. Closing the door must not generate any additional forces (lever) on the hinged side.

5. Hinges must not jam when closing, since the resisting force produced by closing or opening the door could transmit excessively high stress to the glass-ceramic.

6. Bending forces, which are exerted when the panel is latched, depend largely on the position of the boreholes for the latching mechanism and the pressing-on force needed for latching, and which is exerted by the user. Rigidity is not an issue, provided that the required pressing-on force exerted on the panel does not exceed 40 N.

7. Instructions for the location of boreholes can only be provided when the specific panel and design are known.
Installation of angular bent fire viewing panels

1. With regard to the installation of an angular bent fire viewing panel, an optimal frame construction, especially in the corner area, is characterized by the following criteria (see figure 1):
   • No frame profile in the edge area of the viewing panel (1)
   • Split frame profile strips (2)
   • Slotted frame profile for an appropriate mounting of the panel (3)
   • Long holes in the frame profile (4)
   • Rounded door frame corner (5)
   • Circumferential mounting of a suitable sealing between the door frame and the inside of the window respectively between the frame profile and the outside panel surface

2. It is important to ensure that the vertical edge of the panel is also supported by a frame strip (see red areas in figure 2).

3. If, on the other hand, the vertical panel edge remains free, there may be a mechanical overloading acting on the panel in the event of a dynamic load (for example when the stove door is slammed). That would result in the following scenario (figure 3 shows an top view of the installed fire viewing panel):
   • Closing movement of the hinged door in the stated direction of rotation (1)
   • When the frame is engaged or stopped, the panel receives a pulse in the indicated direction (2).
   • The long glass leg of the panel is held back by the door frame (3), but the short glass leg can, in principle, move in the direction of movement if the vertical panel edge does not have a frame strip as a counter bearing.
   • Consequence: Increased fracture risk due to occurring tensile stresses at position (4)
Cleaning

Remove any minor soil, dirt or grime on SCHOTT ROBAX® fire viewing panels by using conventional glass-cleaning products according to the instructions and ensuring the glass-ceramic surface is cold. Remove any remaining cleaning residue to avoid a chemical reaction when ROBAX® panels are exposed to heat. Clean the coated products ROBAX® Mirror, ROBAX® TrueView and ROBAX® IR Max with a soft cloth. Note: Do NOT use scouring pads, abrasive cleaners or scouring agents as they may damage the glass-ceramic surface. SCHOTT highly recommends the SCHOTT ROBAX® Dry Wiper to wipe uncoated fire viewing panel surfaces. Note: For cleaning of the uncoated side (fireside) of ROBAX® Mirror and ROBAX® IR Max, the Dry Wiper may be used.

Find out more at: www.schott.com/robax

Application of the SCHOTT ROBAX® Dry Wiper:

1 Please wear household gloves, wear protection against any dust produced during cleaning and make sure the area is well ventilated during cleaning.

2 Only use the Dry Wiper dry – do not moisten!

3 Clean the cold SCHOTT ROBAX® fire viewing window with the Dry Wiper before or after lighting every fire. To do this, rub the grey active side of the Dry Wiper over the cold dirty window.

4 After cleaning, beat the Dry Wiper and return to the packaging. All done!
Delivery times

Delivery times, after samples have been released by the customer, depend on demand and capacity. They are understood as after receipt of series order and ex works. Individual logistics agreements are available upon request.

<table>
<thead>
<tr>
<th>Panel Type</th>
<th>Delivery Time</th>
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</thead>
<tbody>
<tr>
<td>Flat ROBAX® panels</td>
<td>approx. 2 weeks</td>
</tr>
<tr>
<td>ROBAX® 3D panels</td>
<td>approx. 4 - 6 weeks</td>
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</tbody>
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Disposal

Should you need to replace a SCHOTT ROBAX® fire viewing panel, it should be disposed of as normal domestic waste – not in the glass recycling bin.

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