



## ROBAX®

### General Description

ROBAX® is a highly transparent glass-ceramic having virtually zero thermal expansion and sufficient mechanical resistance required for all standard applications. It is produced in flat, rolled sheets.

As a result of its extremely low thermal expansion, ROBAX® can be subjected to extreme temperature differences. Even when used in high temperature conditions, ROBAX® maintains excellent stability of form. ROBAX® can be further processed mechanically using all of the normal methods of glass processing.

### Applications

ROBAX® possesses a high degree of resistance against thermal stresses and chemical surface attacks. Its diverse range of applications include: chemical process sight glass, high temperature vision windows, heat insulators, commercial ovens/broilers, architectural and outdoor lighting, electronics and UV lightwave blocking applications.

All of the following data are reference values (as per DIN 55 350 Part 12, March 1989).

### Dimensions

Flat Panels/Stock Size Sheets

Thickness mm (in)	Sheet Size Minimum usable area mm x mm ± 20 mm (in x in)
3.0 ± 0.2 (0.118 ± 0.008)	790 x 590 (31.1 x 23.2)
4.0 ± 0.2 (0.157 ± 0.008)	1580 x 800 (62.2 x 31.5)
5.0 ± 0.2 (0.197 ± 0.008)	1580 x 800 (62.2 x 31.5)

### Flatness

#### Testing Procedure:

A beveled straight edge is laid diagonally across the horizontal panel and the deviation read by means of a gauge.

Tolerance: ± 0.3% of edge length

### Thermal Data

Linear Thermal Coefficient of Expansion  
 $\alpha$  (20 - 700°C) =  $(0.0 \pm 0.3) \times 10^{-6} \text{K}^{-1}$

Thermal Conductivity at 90°C (194°F)  
1.6 W/(m°K)

### Resistance to Thermal Gradients (RTG)

The resistance to thermal gradients (RTG) characterizes the ability of a panel to withstand the temperature difference between the hot center of the panel (hot side) and the cold panel edge (room temperature). The RTG is determined by a standard method.

The unit of measure used for the RTG is expressed as the difference in °K (or °R) between the maximum temperature of the hot panel surface in the middle of the panel and the temperature of the cold edge of the pane (room temperature) which, when exceeded, could lead to a breakage as a result of thermal stress.

Recommended values for the RTG are limited to applications where the risk of breakage is not a safety concern (surface in normal practical use conditions):

Short Term usage:

< 100 h: RTG =  $\Delta T$  700°K (1260°R)

Long Term usage:

≥ 100 h: RTG =  $\Delta T$  650°K (1170°R)

### Bending Strength/Mechanical

Recommended value for use with surfaces in practical use conditions (according to DIN 52 292, Part 1):

For Normal Conditions 30 MPa (4300 psi)  
For Safety Conditions 6 MPa (870 psi)

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## Temperature Shock Resistance (TSR)

The temperature shock resistance (TSR) of glass-ceramic characterizes the ability of a panel to withstand a temperature shock in which cold water is poured on to a hot panel.

As a result of the fact that the thermal linear expansion of ROBAX<sup>®</sup> is practically zero, the temperature shock caused by sudden cooling with cold water leads to only minor stresses. The shock resistance of ROBAX<sup>®</sup> is, therefore, normally only limited by the maximum operation temperature.

## Maximum Operation Temperatures

Short-term usage:  
(total <100 h)  $T_{\max} = 760^{\circ}\text{C}/1400^{\circ}\text{F}$

Long-term usage:  
(total 100 h - 10,000 h)  $T_{\max} = 680^{\circ}\text{C}/1256^{\circ}\text{F}$

The maximum application temperatures stated are only valid in conjunction with the RTG values specified.

## Mechanical Data

Density at 25°C = 2.56 g/cm<sup>3</sup>

Young's Modulus = 92 GPa/13.3 Msi

Poisson's Ratio = 0.25

## Chemical Data

Hydrolytic resistance: ISO 719-HGB Class 1  
ISO 720-HGA Class 1

Acid resistance: ISO 1776 Class 2

Alkali resistance: ISO 695-A Class 2

## Installation Instructions

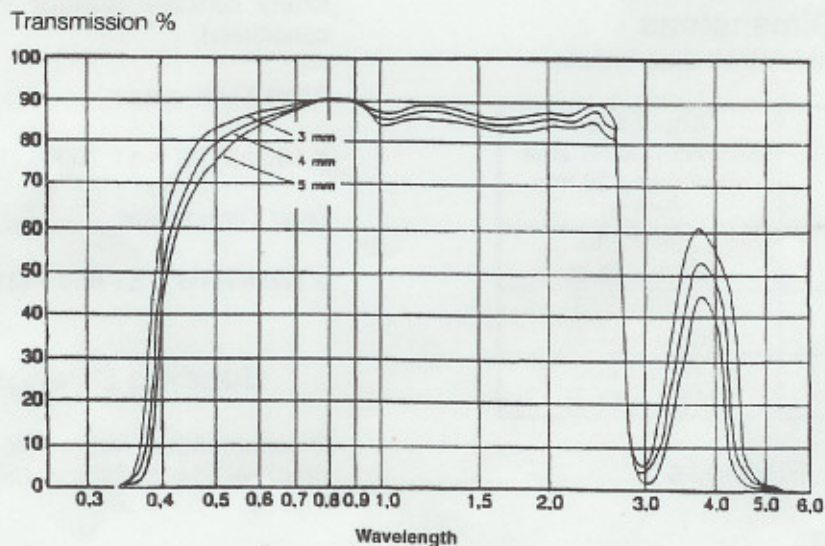
The basic guidelines for glass or glass-ceramic products apply also for the installation and handling of ROBAX<sup>®</sup>.

The differing thermal expansions and possible production tolerances of ROBAX<sup>®</sup> and the various frame materials must also be taken into consideration when determining the dimensions of the frames and the panels.

Installation should be made in a distortion-free frame.

Direct contact between the glass-ceramic and metal must be avoided. It is highly recommended to use a permanently flexible, heat resistant material as an intermediate layer.

## Optical Data



ROBAX<sup>®</sup> is a registered trademark of Schott Glaswerke, Mainz, Germany