INDUSTRIEARMATUREN

Sight glass plates

made of synthetic quartz glass

for sight glass fittings, round/ longitudinal/ angular/ tube

INFO QGS

APPLICATION:

Flame fused synthetic quartz glass sight glasses are required wherever the visual inspection of processes in containers must be ensured under extreme pressure, at very high thermal and chemical loads.
Synthetic quartz glass consists of ≥99,9995% SiO2 and is therefore ideal for **precision optics, lasers, lithography** and **electronics**. It has above average chemical resistance and is ideal for **high temperature applications**.

OPERATING CONDITIONS:

The production and quality tests during the process guarantee the quality values of the glass and the tight dimensional tolerances. With these outstanding properties, these sight glasses are suitable for extreme conditions.

DELIVERY FORMS AND DIMENSIONS:

We supply natural quartz glass sight glasses in round, longitudinal, square, tubular or special shapes. Dimensions on request.

Please specify application, medium, temperature and pressure for your inquiry.

Operating conditions:	
Temperature:	950 °C long term 1200 °C short term
Pressure:	depending on dimensions and thickness

Chemical resistance:	
Water resistance acc. to DIN ISO 719/720	Hydrolysis class 1
Acid resistance acc. to DIN 12116	Acid class 1
Alkali resistance acc. to DIN 52332	Alkali class 1

Technical Information QZS1:	
Coefficient of expansion at 25 °C/300 °C	5,9 x $10^{-7}K^{-1}$
modulus of elasticity	7,1 x 10^4 N/mm²
Thermal conductivity at 20 °C	1,4 W/(m·°K)
thermal shock resistance	220 °C

Technical Information QZS2:	
Coefficient of expansion at 25 °C/300 °C	5,2 x $10^{-7}K^{-1}$
modulus of elasticity	7,2 x 10^4 N/mm²
Thermal conductivity at 20 °C	1,38 W/(m·°K)
thermal shock resistance	220 °C

Technical Information QZS3:	
Coefficient of expansion at 25 °C/300 °C	5,3 x $10^{-7}K^{-1}$
modulus of elasticity	7,0 x 10^4 N/mm²
Thermal conductivity at 20 °C	1,38 W/(m·°K)
thermal shock resistance	220 °C

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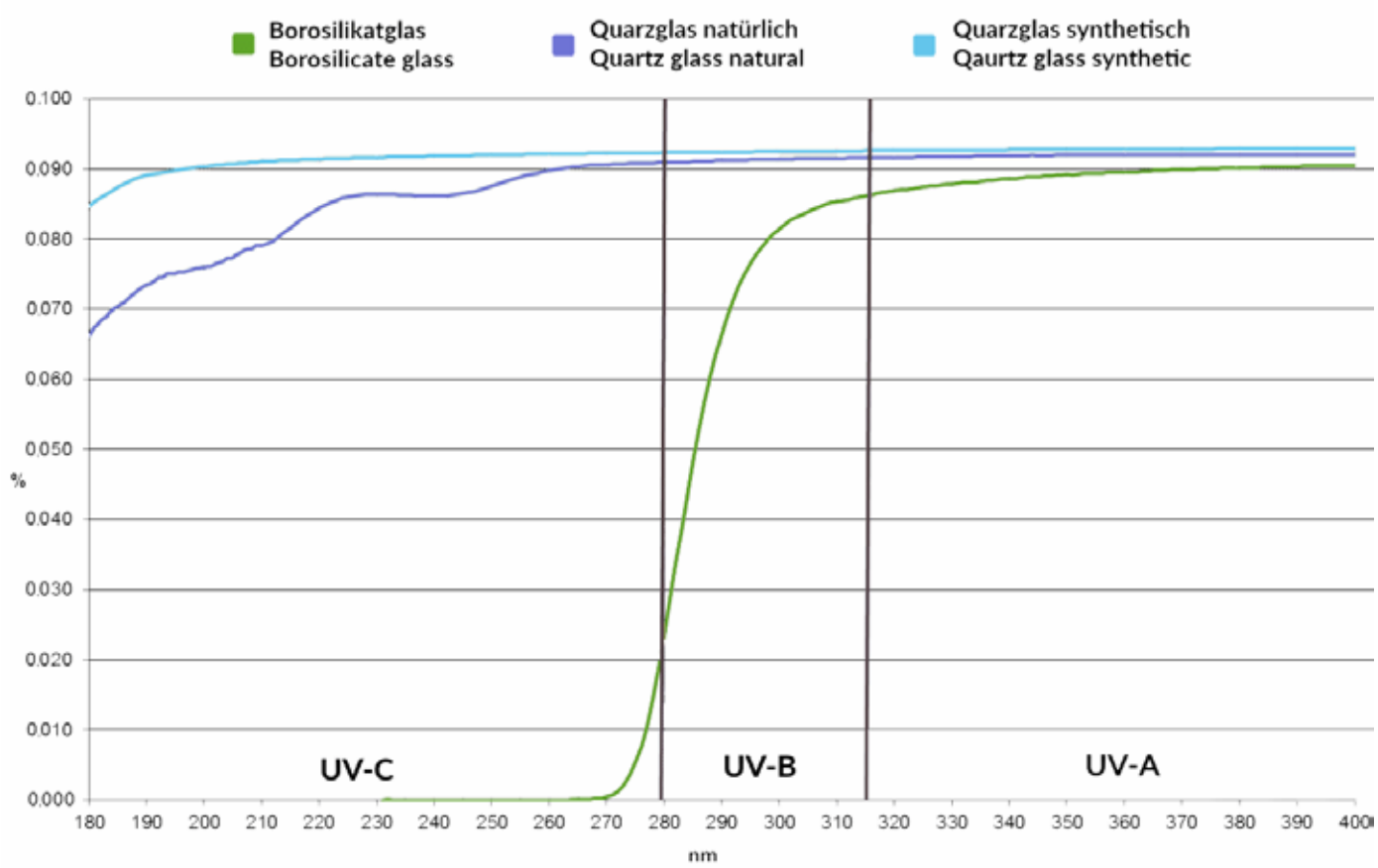
INFORMATION ABOUT SYNTHETIC QUARTZ GLASS:
The content of foreign substances is decisive for the application of synthetic quartz glass. These affect the properties such as light transmission in the UV and IR range.

SYNTHETIC QUARTZ GLASS IN THE UV RANGE:
In comparison to e.g. borosilicate glass, quartz glass has a high light transmission, especially in the UV range, due to the standard low basic contamination of foreign substances.
The following figure shows typical exemplary transmission curves in the UV range of borosilicate glass, natural quartz glass and synthetic quartz glass.



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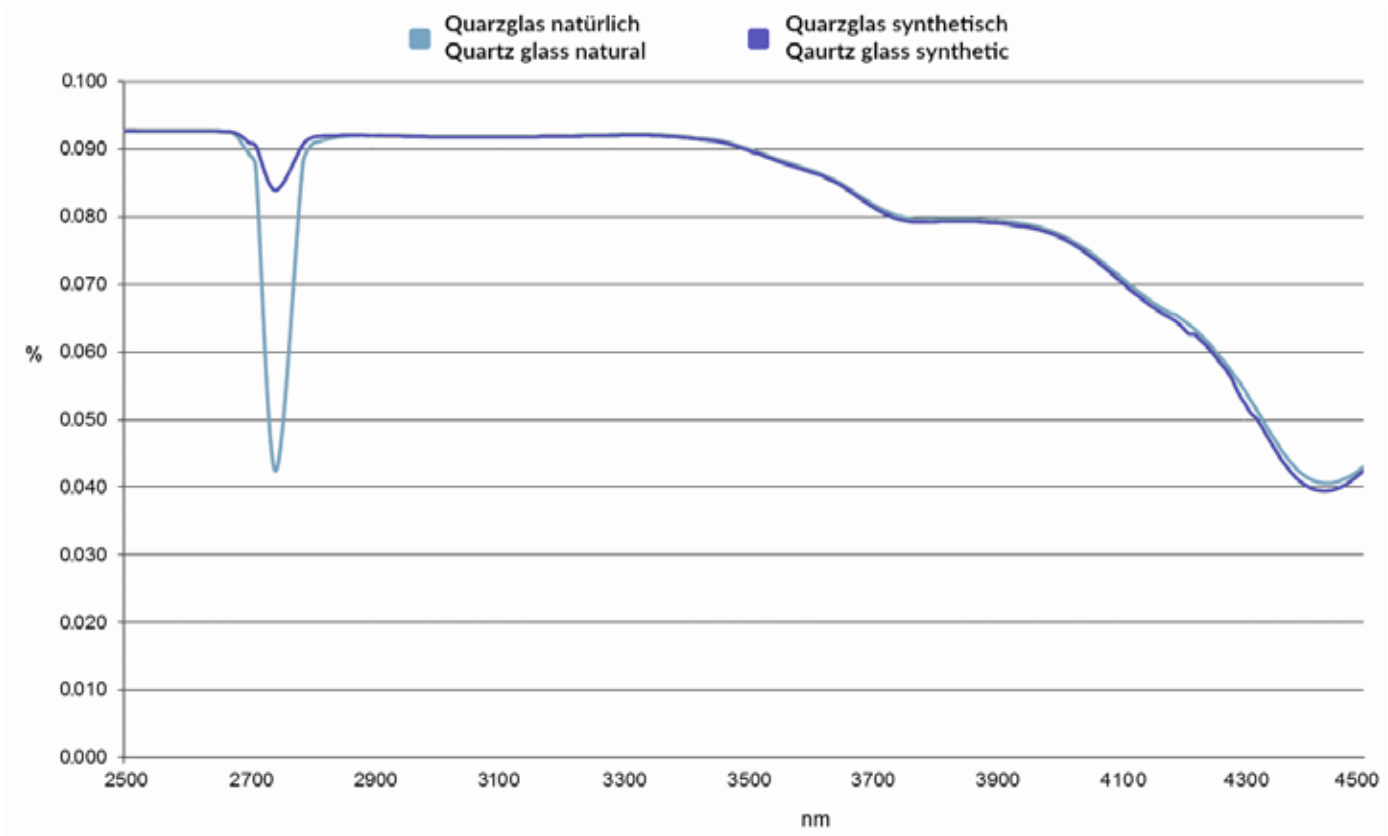
SYNTHETIC QUARTZ GLASS IN THE IR RANGE:

Due to the hydroxy groups (OH groups) contained in the quartz glass, light transmission falls in the infrared range at approx. 2500 to 3000 nm. The peak point is normally at 2730 nm and is used in quartz glass to determine the OH-group content. Therefore the following conclusion can be drawn for synthetic fused silica: The lower the OH group content, the lower the opacity in this wave range. The following figure shows typical exemplary transmission curves in the IR range of natural and synthetic fused quartz.



SYNTHETIC QUARTZ GLASS OH-GROUP CONTENT:

In the case of flame fused quartz glass, OH groups are introduced into the glass structure by water, gas-liquid inclusions in the raw material or by burner gases during the production process. Due to different manufacturing methods in the melting process, these OH groups behave in different ways. During the subsequent thermal treatment (e.g. vacuum annealing), the OH groups are formed in a specific way in the finished end product, which allows a wide range of applications.

After thermal treatment, the OH content in the ACI quartz glass plates remains stable and is firmly bound in the basic structure of the quartz glass. The maximum absorption value (measured at 2730 nm) is measured in the end product by means of an IR spectrometer. Additional samples are also taken in the range of 2500 to 3000 nm. The resulting transmission curve is a guide for the application of synthetic fused quartz in the IR range.

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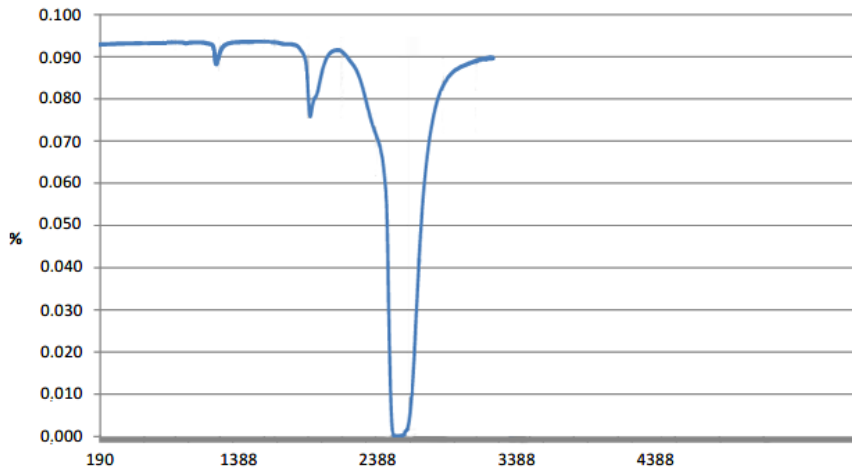
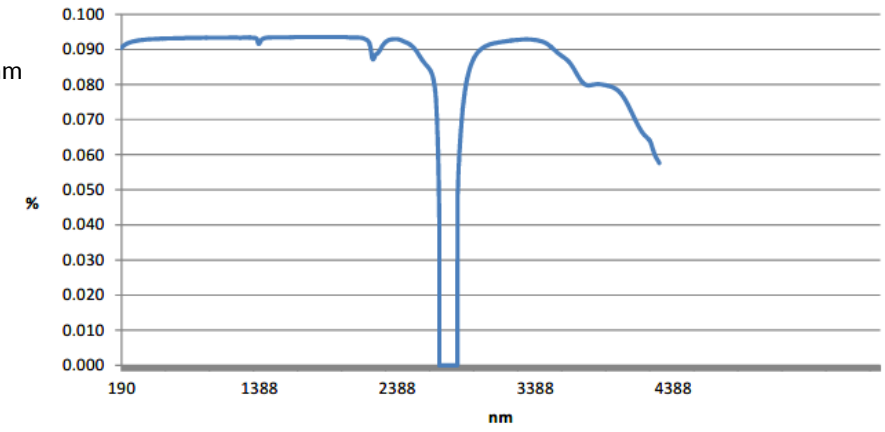
ACI SYNTHETIC QUARTZ GLASS QZS1 TRANSMISSION PROPERTIES:

QZS1 Spectral transmission from 190-4388nm at 1mm thickness



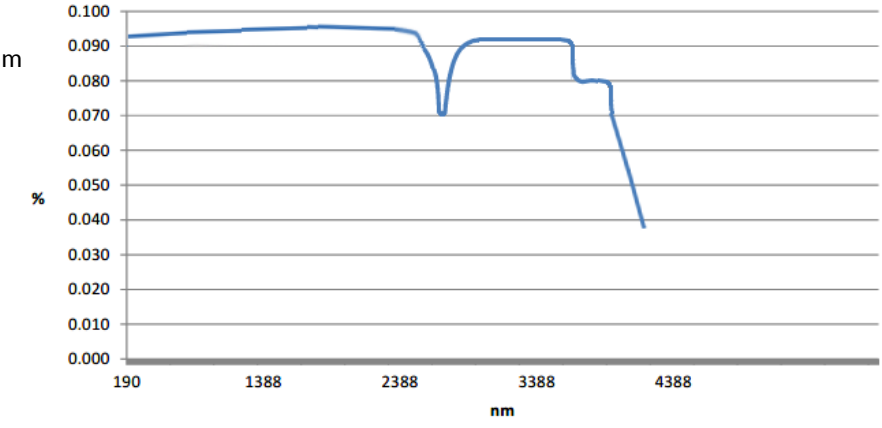
ACI SYNTHETIC QUARTZ GLASS QZS2 TRANSMISSION PROPERTIES:

QZS2 Spectral transmission from 190-4388nm at 1mm thickness



ACI SYNTHETIC QUARTZ GLASS QZS3 TRANSMISSION PROPERTIES:

QZS3 Spectral transmission from 190-4388nm at 1mm thickness



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CHEMICAL IMPURITIES:

The chart on the right is an example of the maximum impurity in synthetic fused silica and may vary slightly between QZS1, QZS2 and QZS3.

Chemical impurities (ppb):			
Al	<0,1	Mn	<0,1
As	<0,1	Mo	<0,1
B	<0,1	Na	<0,1
Ca	<0,1	Ni	<0,1
Cd	<0,1	P	<0,1
Co	<0,1	Pb	<0,1
Cr	<0,1	Sb	<0,1
Cu	<0,1	Sn	<0,1
Fe	<0,1	Ti	<0,1
Ge	<0,1	U	<0,1
K	<0,1	V	<0,1
Li	<0,1	Zn	<0,1
Mg	<0,1	Zr	<0,1
SiO_2	99,9995 %		

CLEANING INSTRUCTIONS FOR QUARTZ GLASS:

Regular and careful cleaning is necessary to maintain the required optical and technical properties of the synthetic quartz glass plates.

The following points must be observed to maintain the optical properties:

- Remove general impurities with alkaline agents
- Remove grease with cleaning alcohol
- Remove strong impurities with 5% hydrofluoric acid for a maximum of 3 minutes
- Clean rinsing only with distilled or deionized water
- Handling afterwards only with clean gloves
- Careful packing for storage

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