

Ilmasil™ PQ

Clear fused quartz

Material specification

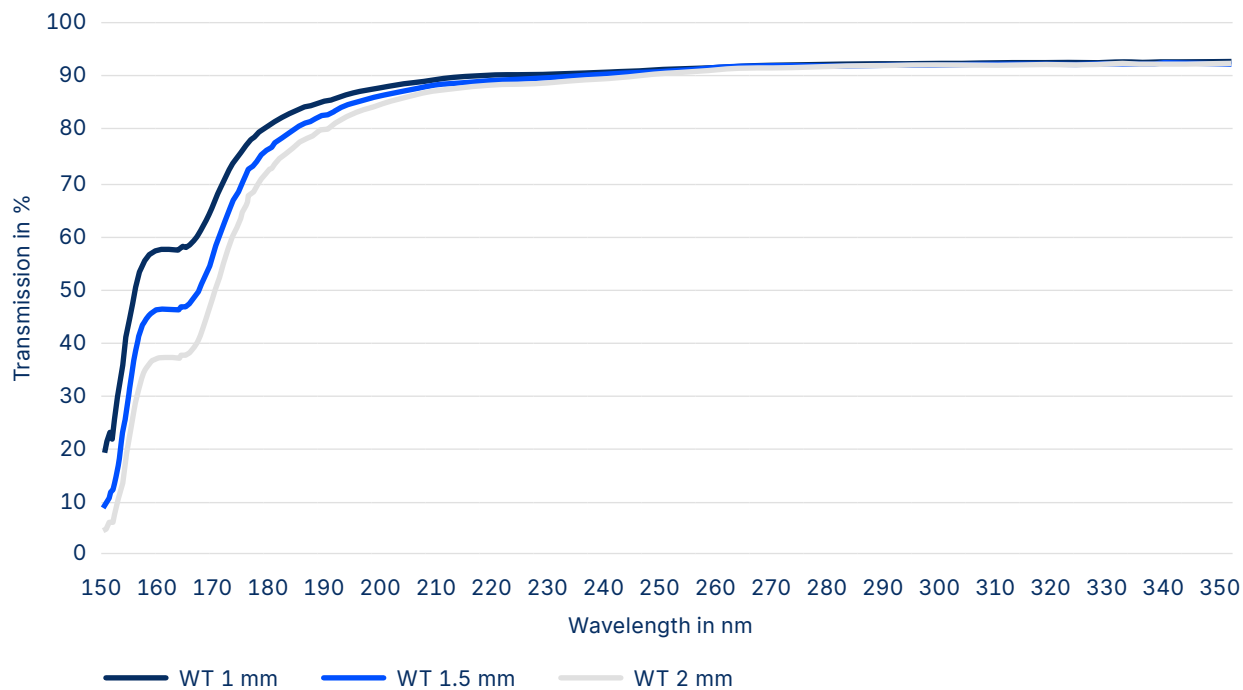
Ilmasil™ PQ is an electrically fused, clear quartz, manufactured from synthetic high purity quartz grain by hydrothermal growths technology, using SCHOTT Quartz Glass' proprietary plasma melting process.

Application

This specification is applicable to all products produced with Ilmasil™ PQ and Ilmasil™ PQ+.

Optical properties

Typical transmission for UV-range



Comment: transmission measured on a plane surface

Ilmasil™ PQ

Clear fused quartz

Chemical properties

Typical trace elements

Element	Typical content in ppm	Maximum content in ppm
Al	4	6
Ca	0.1	0.3
Cr	< 0.01	0.03
Cu	< 0.01	0.03
Fe	0.1	0.3
K	0.05	0.1
Li	0.5	0.8
Mn	< 0.01	0.03
Na	0.1	0.3
Ni	0.01	0.03
Ti	0.1	0.2
Zr	< 0.02	0.04
OH-content*	30	45

OH-content

Typical: 30 ppm*

Tolerance: max. 45 ppm*

Stability: after thermal treatment, a decrease of maximum 3 ppm is obtainable by tempering the material at 1000 °C under vacuum for a period of 30 hours.

* OH-content: values are applicable for non-flameworked material only

Chemical resistances

Hydrolytic resistance per DIN 12111 (1st class)

Acid resistance per DIN 12116 (1st class)

Alkaline resistance per DIN 52322 (1st class)

Ilmasil™ PQ

Clear fused quartz

Thermal properties

Softening point ($\lg \eta$ (in dPas) = 7.6)	1715 °C
Annealing point ($\lg \eta$ (in dPas) = 13.0)	1210 °C
Strain point ($\lg \eta$ (in dPas) = 14.5)	1100 °C
Processing range ($\lg \eta$ (in dPas) = 5 – 8)	1700 – 2100 °C
Max. usable temperature	
Long term	1100 °C
Short term	1300 °C
Coefficient of thermal expansion 20 ... 300 °C	$5.5 \times 10^{-7} \text{ °C}^{-1}$
Viscosity at 1280 °C	$\lg \eta \approx 11.8 \text{ dPas}$

Mechanical properties

(at 20 °C)

Density	2.2 g/cm ³
Mohs hardness	5.5 ... 6.5
Elasticity modulus	$7.5 \times 10^4 \text{ N/mm}^2$
Compressive strength	1150 N/mm ²
Tensile strength	50 N/mm ²
Bending strength	68 N/mm ²

Mechanical property measurements are dependent upon geometry, thermal gradient and the surface quality.

Electrical properties

Specific electrical resistance	
20 °C	$10^{18} \Omega \times \text{cm}$
400 °C	$10^{10} \Omega \times \text{cm}$
800 °C	$6.3 \times 10^6 \Omega \times \text{cm}$
1200 °C	$1.3 \times 10^5 \Omega \times \text{cm}$
Dielectric strength	
20 °C	25 ... 40 kV/mm
500 °C	4 ... 5 kV/mm
Dielectric loss factor at 7.5 GHz	$\text{tg } \delta \approx 5.0 \times 10^{-4}$
Dielectric constant at 20 °C and 7.5 GHz	$\epsilon \approx 3.7$