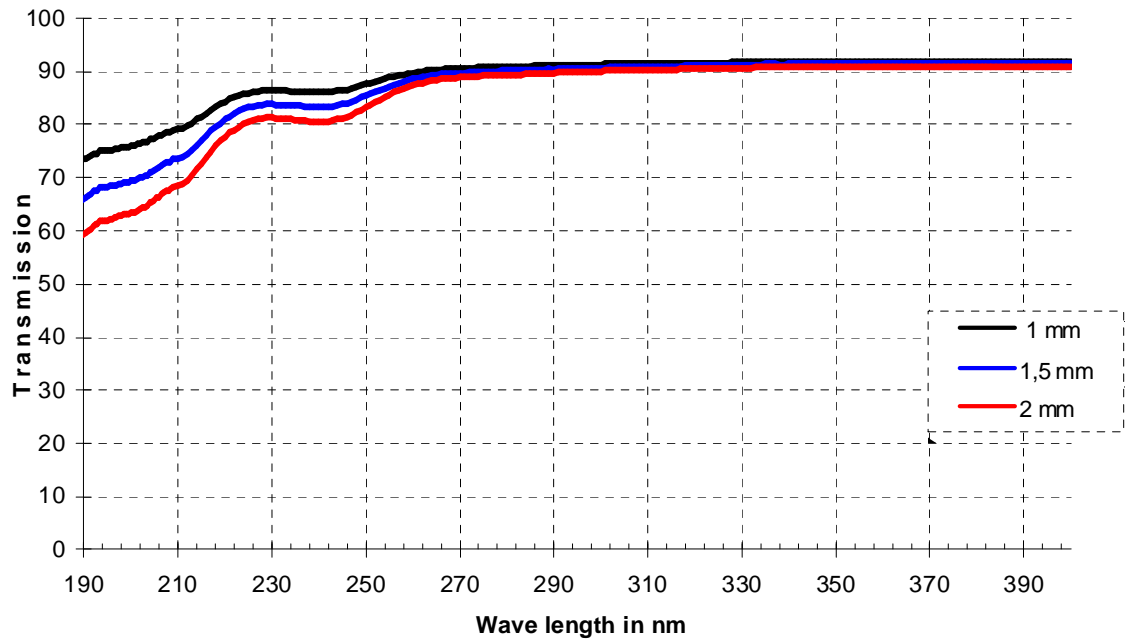


Application: **ilmasil® PN** is a clear fused quartz (quartz glass). This specification is applicable to all products produced with **ilmasil® PN**

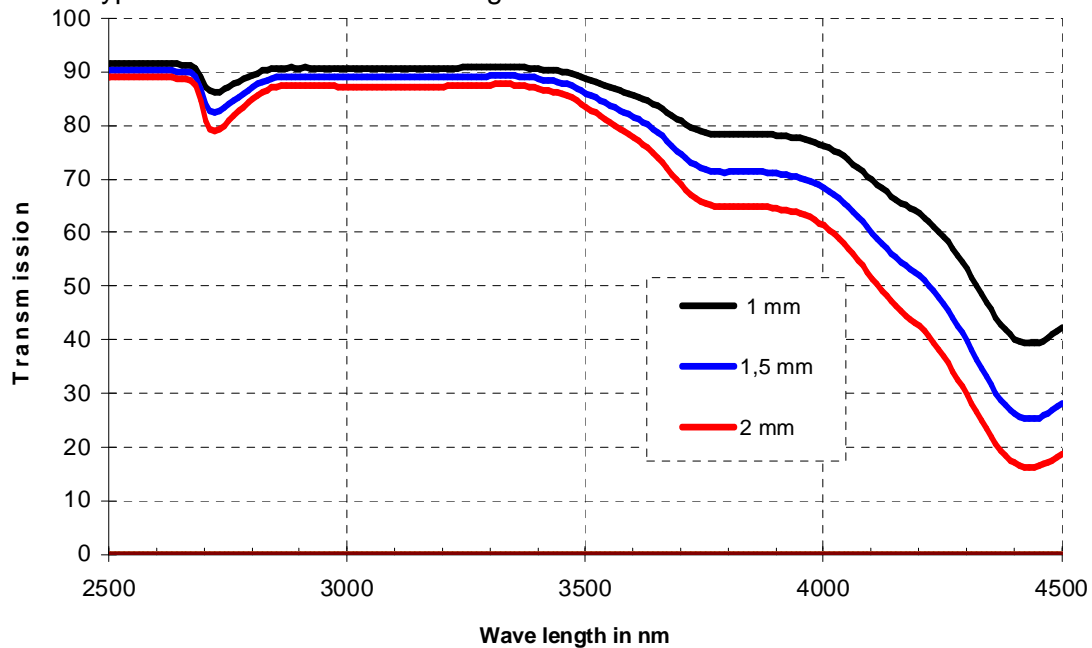
1 Optical Properties

1.1 Transmission

1.1.2 Typical Transmission in UV-range



1.1.3 Typical Transmission in IR-range



Remark: transmission measured on a plane surface

2 Chemical Properties

2.1 Typical Trace Elements

Element	Typical content in ppm	Maximum content in ppm
Al	15	20
Ca	0,8	1,5
Cr	<0,05	0,05
Cu	<0,03	0,05
Fe	0,3	1,0
K	0,7	1,5
Li	0,5	1,5
Mn	0,05	0,1
Na	1,0	1,5
Ni	<0,02	0,02
Ti	1,5	2,0
Zr	1,5	2,7
OH-content*	30	45

2.2 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

2.3 chemical resistances

Hydrolytic resistance per DIN 12111: 1st. class

Acid resistance per DIN 12116: 1st.class

Alkaline resistance per DIN 52322: 1st.class



Material Specification Clear Fused Quartz **ilmasil® PN**

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3 Thermal Properties

Softening Point ($\lg \eta$ (in dPas) = 7.6)	ca. 1730 °C
Annealing Point ($\lg \eta$ (in dPas) = 13.0)	1204 °C
Strain Point ($\lg \eta$ (in dPas) = 14.5)	1054 °C
Processing Range $\lg \eta$ (in dPa s) = 5 – 8	1700 – 2100°C
Max. usable temperature	
Long term	1100 °C
Short term	1300 °C
Coefficient of Thermal Expansion	
20 ... 300 °C	$5.5 \times 10^{-7} \text{ } ^\circ\text{K}^{-1}$

4 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.

5 Electrical Properties

Specific electrical resistance	
20 °C	$10^{18} \Omega \times \text{m}$
400 °C	$10^{10} \Omega \times \text{m}$
800 °C	$6.3 \times 10^6 \Omega \times \text{m}$
1200 °C	$1.3 \times 10^5 \Omega \times \text{m}$
Dielectric strength	
20 °C	25 ... 40 KV/mm
500 °C	4 ... 5 KV/mm
Dielectric loss factor	
at 7,5 kHz	$\text{tg } \delta \approx 5.0 \times 10^{-4}$
Dielectric constant	
at 20 °C and 7,5 GHz	$\epsilon \approx 3.7$