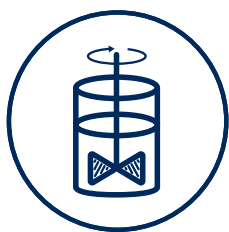


Sol-gel technology

Sol-gel process

To produce a sol-gel silica glass part, a method is applied, which allows to utilize a cold casting process and to lead to a solid quartz glass. For this purpose, a silicon-containing liquid called sol is mixed. It contains all the components for the chemical reaction which takes place after the casting. This so-called sol-gel process results in gelation of the liquid and the quartz glass components therein. The obtained gel already shows the final shape of the finished glass piece. In a subsequent multi-stage drying process, shrinkage occurs.

At the same time all the liquid components are extracted. In this stage you find the so-called xerogel, which is an open-pored silica skeleton. In the final sintering step, the part is thermally compacted into a solid amorphous quartz glass, still below the melting temperature. The original shape of the casting thereby is reduced down to 50 % in edge length with high dimensional accuracy. The properties of the resulting sol-gel silica glass are equal to those of quartz glass manufactured by classical methods.



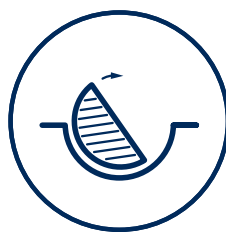
1 Mixing



2 Casting



3 Gelling



4 Demolding



5 Drying and
sintering

Thermal properties

Quartz glass is, based on its thermal stability, steady in its properties and shape even at high working temperatures (temporary up to 1300 °C).

It has a low thermal expansion coefficient and thus withstands high thermal stress.

Optical properties

Due to its good transmittance of ultraviolet, visible and infrared radiation, quartz glass is one of the most important materials in the optical field.

Chemical properties

Quartz glass shows a strong chemical resistance against acids, salt solutions and water as well as against all organic solvents.

Merely hydrofluoric acid and hot phosphoric acid can damage the material surface. With most other chemicals such as oxide-free metals quartz glass does not interact.

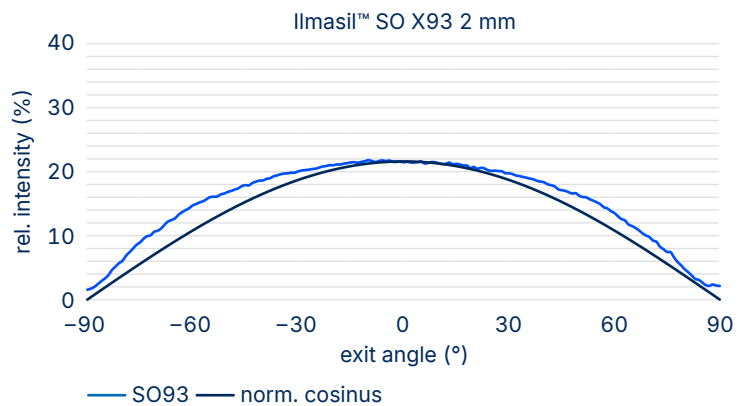
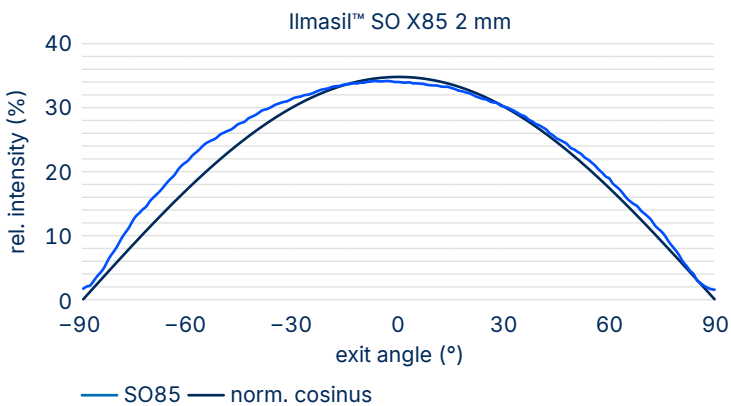
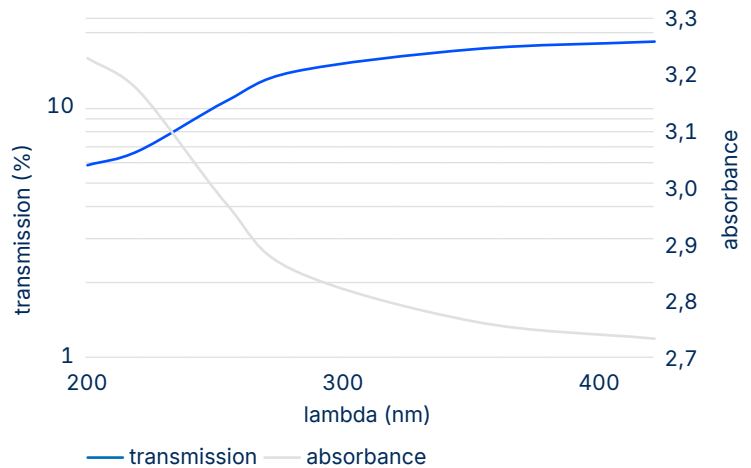
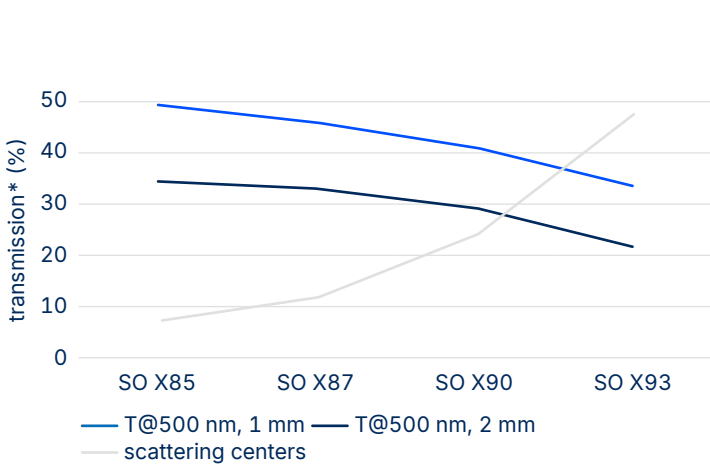
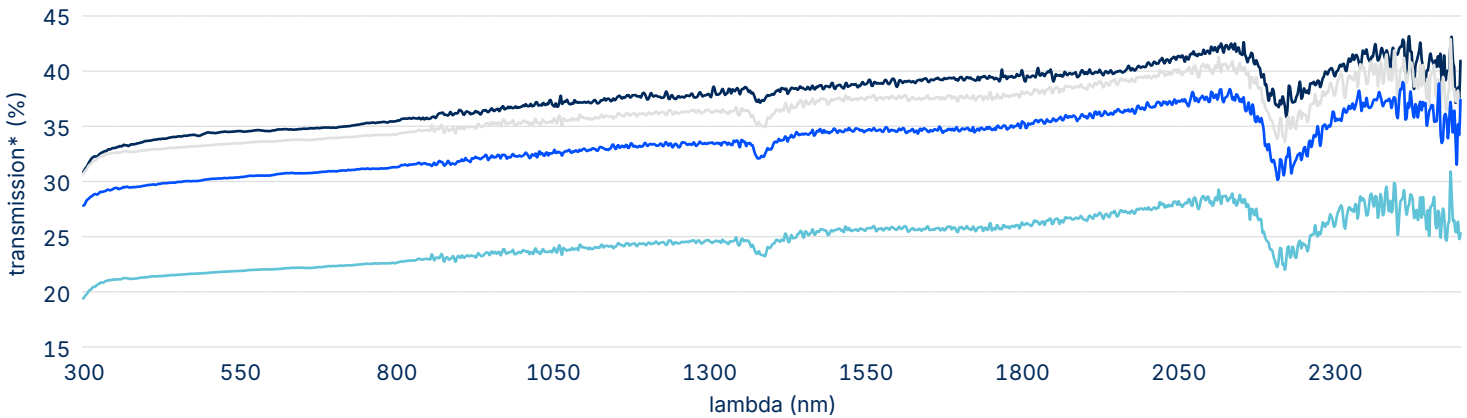
Volume diffusors

Ilmasil™ SO X – opaque, synthetic quartz glass.

An extremely homogeneous distribution of monodisperse scattering centers in the material and the resulting virtually ideal Lambert scattering make our material unique in the market of opaque quartz glasses.

An excellent transmittance ranging from deep UV up to IR-radiation open a wide spectrum of applications.

Special radiation damping can be modified by material thickness or number of scattering centers.



* measured with photo-spectrometer with integrating sphere (Perkin Elmer)

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