

# Thin synthetic quartz wafers

## VIOSIL-SQ, SX, LSX

In recent years, thin and/or high-flat synthetic quartz substrates are required in the field of semiconductors, green materials, thin-film solar cells, optical components, biology, chemistry and so on. Shin-Etsu supplies thin and/or high-flat synthetic quartz wafers by applying synthetic quartz technologies and excellent polishing technologies that have been developed until now.

Shin-Etsu's synthetic quartz glass (VIOSIL) has three material grades, VIOSIL-SQ, -SX and -LSX, as different OH concentrations. VIOSIL-SQ concludes 300~1000 ppm OH, VIOSIL-SX concludes under 100 ppm OH, while VIOSIL-LSX concludes under 15 ppm OH. Generally, the lower OH concentration it has, the higher heat resistance. Attention that it has OH-derived absorption at specific wavelengths (Figure 3).

Please choose a material according to application.

## Features

- Transmissivity : High transmissivity on the range from near infrared to far UV.
- UV-resistance : UV-resistance has been established from extensive use in photomask substrates.
- Low thermal Expansion : Synthetic Quartz offers high stability when exposed to temperature variations.
- Dimensional accuracy : Shin-Etsu synthetic quartz is manufactured to meet the strictest dimensional requirements.
- Flatness : Flatness specification are in sub-micron ranges at thin wafer substrate.
- Surface : Technologies used in photomask substrates insures no defects and low surface roughness averages.

## Examples of lineups

### ◎Thin synthetic quartz wafers

Shin-Etsu can offer thinner wafers than those listed below. Feel free to contact us with any requests.

Thin wafer	φ3 inches	φ4 inches	φ5 inches	φ6 inches	φ8 inches	φ12 inches
Thickness (mm)	0.150, 0.200	0.150, 0.200	0.200, 0.300	0.200, 0.300,	0.300, 0.400	0.500
Tolerance	±0.02	±0.02	±0.02	±0.02	±0.02	±0.02
Surface grade (see figure 2)	P, W, S	P, W, S	P, W, S	P, W, S	P, W, S	P, W, S
TTV (μm)	<1, <2, <5, <10	<1, <2, <5, <10	<2, <3, <5, <10	<2, <3, <5, <10	<2, <3, <5, <10	<2, <3, <5, <10

TTV : Total Thickness Variation

SORI : The total of the distance from a least square plane of the highest point and the lowest point in the wafer surface

©Examples of standard synthetic quartz wafers for reference. (Not always available in a stock)

Standard wafer	φ3 inches	φ4 inches	φ5 inches	φ6 inches	φ8 inches	φ12 inches
Thickness (mm)	0.525, 1.000	0.525, 1.000	0.550, 0.625	0.525, 0.725, 0.800	0.725, 0.800, 1.200	0.775, 1.100, 1.200
Tolerance	±0.02	±0.02	±0.02	±0.02	±0.02	±0.02
Surface grade (see figure 2)	P, W, S	P, W, S	P, W, S	P, W, S	P, W, S	P, W, S
TTV (μm)	<1, <2, <5, <10	<1, <2, <5, <10	<2, <3, <5, <10	<2, <3, <5, <10	<2, <3, <5, <10	<2, <3, <5, <10
SORI(μm)	<10 No regulation	<10 No regulation	<10, <20 No regulation	<10, <20 No regulation	<10, <20 No regulation	<20 No regulation

## Flatness

Shin-Etsu has excellent polishing technology of making up high-flat wafers.

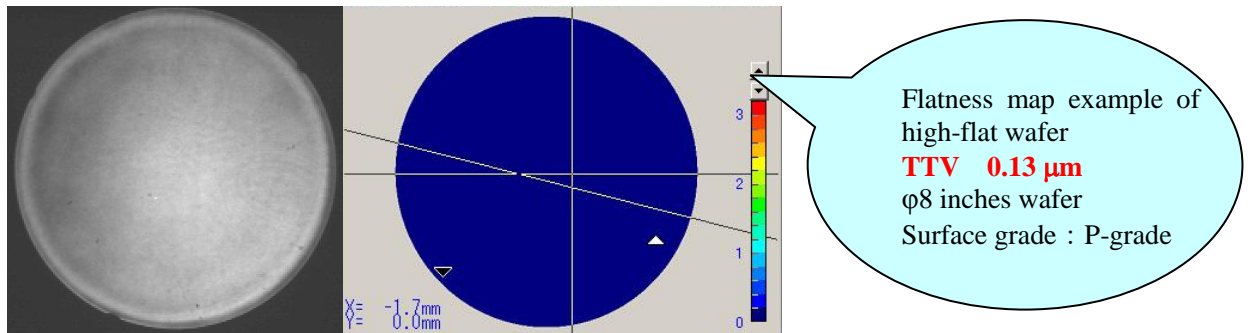


Figure 1 Flatness map of high-flat wafer

## Surface roughness of wafer

Shin-Etsu can offer surface grades listed below to meet your requirement.

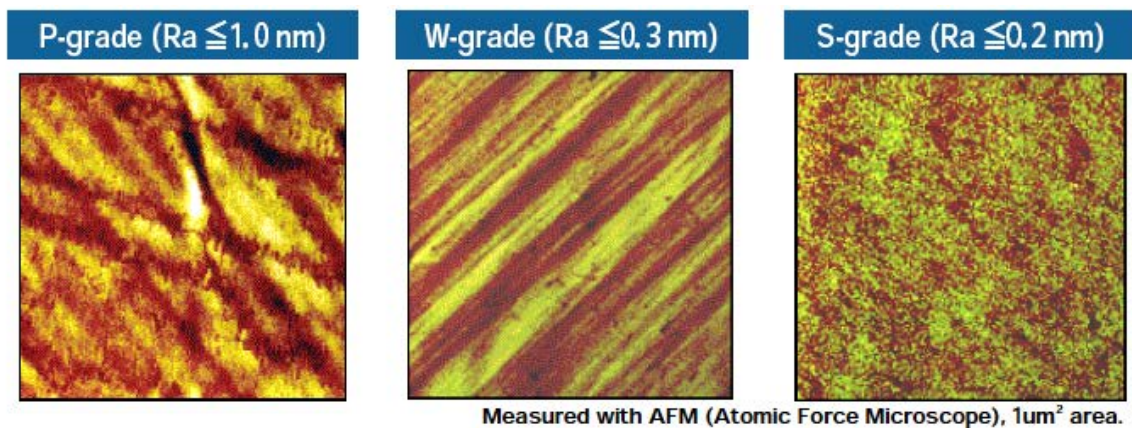


Figure 2 AFM images of polished surfaces of each grade

## Transmission Curve

Shin-Etsu can offer grades of materials listed below to meet your requirement.

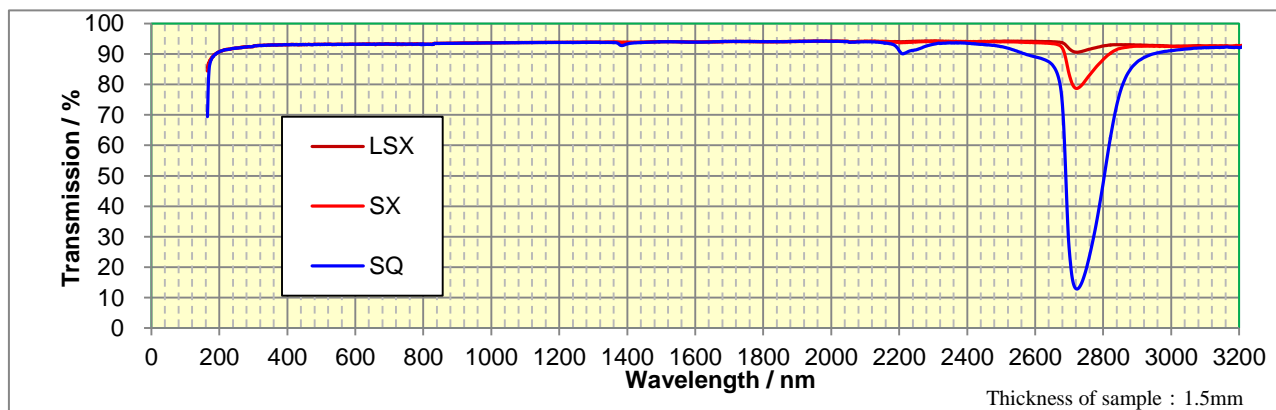


Figure 3 Transmission curve of each material

Shin-Etsu Chemical Co., Ltd. Advanced Material Division

6-1 Ohtemachi 2-chome, Chiyoda-ku, Tokyo, Japan

TEL. +81-(0)3-3246-5222 FAX. +81-(0)3-3246-6839 E-mail: hp-sekiei@shinetsu.jp