



CORNING

Semiconductor Glass Products

Corning® Semiconductor Glass Wafers

Product Information Sheet

Corning® Semiconductor Glass Wafers

The unique glass composition of Corning Semiconductor Glass Wafers, manufactured using Alkaline Earth Boro-Aluminosilicate materials, along with Corning's proprietary fusion process offers an exceptionally low total thickness variation (TTV), a pristine surface, and outstanding mechanical strength. This, combined with optimized thermal properties such as Coefficient of Thermal Expansion (CTE), makes Corning Semiconductor Glass Wafers ideal for advanced semiconductor packaging.

Benefits

- Very low TTV and warp
- Adjustable CTE offerings to meet various process requirements
- Profoundly flat
- Scalable with an ability to provide a wide variety of sizes and offerings: 100 mm to 450 mm
- As-formed surface
- Optical and transparency properties enabling visible inspection and other light-based processing techniques
- Excellent chemical durability
- Reusable

Applications

- Wafer carrier in temporary bonding applications for semiconductor processing
- Interposer substrate for 3D IC interposers and RF components
- Substrate for IPDs (integrated passive devices)
- Cover glass component within CMOS image sensors
- Optical sensors and detectors
- Microelectro-mechanical systems (MEMS)
- Aerospace & Defense
- Avionics

Standard Options and Features

CTE Offerings	2.7 ppm/°C – 12.4 ppm/°C
Form Factor	Wafers: 100 mm – 450 mm, Panels: >500 x 500 mm
Edge Chamfer	Radius (R) Type and Chamfer (C)
Surface Roughness	< 1.0 nanometers
Thicknesses	0.4 mm - 1.1 mm
Wafer ID Marking	SEMI MF standard specifications
Wafer Features	Semi MF notch or flat

Attributes

Diameter Tolerance	± 0.1 mm – ± 0.3 mm
Surface Quality Inspection Level	1.5 klux – 10 klux
Scratch/Dig (per ANSI oP1.002-2009)	20/10 – 60/40
Thickness Tolerance	± 1% – ± 5%
TTV	≤ 2 µm – ≤ 5.0 µm
Warp	≤ 20 µm – ≤ 100 µm

The attributes above are general guidelines. Corning Incorporated can provide glass wafers or panels to meet technical standards published in *SEMI 3D2-0013 Specifications for Glass Carrier Wafers for 3DS-IC Applications* and customer or process requirements. Please contact semiclass@corning.com for additional information, specifications, or requirements.

Mechanical Properties

	SGW3	SGW7.6	SGW8	SGW8.5
Density (g/cm ³)	2.38	2.39	2.42	2.44
Young's Modulus (GPa)	73.6	69.3	71.5	71.7
Vickers Hardness (kgf/mm ²)	640	534	534	534

Thermal Properties

	SGW3	SGW7.6	SGW8	SGW8.5
Thermal Conductivity (23°C)	0.0104 W/(cm·K)	0.0114W/(cm-K)	0.0117W/(cm-K)	0.0107 W/(cm-K)
Strain Point (poises)	669 °C (10 ^{14.5})	574 °C (10 ^{14.7})	599 °C (10 ^{14.7})	563 °C (10 ^{14.7})
Average CTE (0°C-300°C)	31.7 x 10 ⁻⁷ /°C	75.8 x 10 ⁻⁷ /°C	81.4 x 10 ⁻⁷ /°C	84.5 x 10 ⁻⁷ /°C

Chemical Durability

Reagent	Time	Temp. (°C)	SGW3	SGW7.6	SGW8	SGW8.5
<i>Typical Plate Durability, Weight Loss In (mg/cm²)</i>						
HCl-5%	24hrs.	95	0.79	0.6	0.12	0.04
NH ₄ :HF-10%	20min.	20	0.84	2.1	2.64	3.14
HF-10%	20min.	20	5.18	12.3	11.88	11.96
NaOH-5%	6hrs.	95	1.83	1.9	1.42	1.10

Electrical Properties

	SGW3	SGW8.5
Dielectric Strength (0.5 mm)	217 kV/mm	41 kV/mm
Breakdown Voltage (0.5 mm)	107 kV	22 kV

Volume Resistivity <i>log (ρ)(Ω·cm)</i>	Temp. (°C)	SGW3	SGW7.6	SGW8	SGW8.5
		0.5 mm	1.0 mm	0.55 mm	0.7 mm
	25	22.92	9.24	9.1	10.67
	250	12.98	4.64	4.52	5.30
	350	10.87	3.67	3.55	4.16
	500	8.72	2.68	2.56	3.0

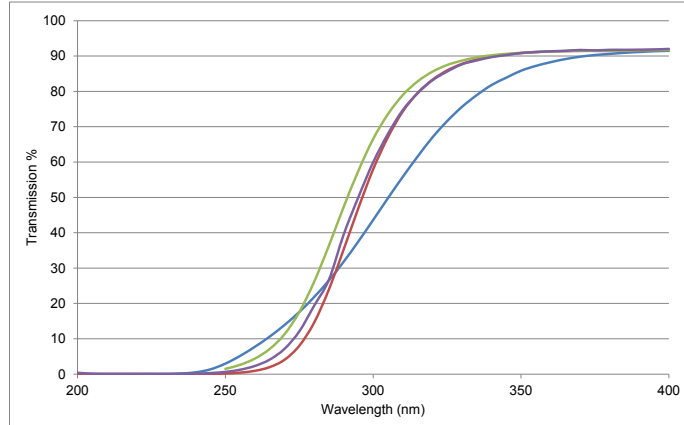
Dielectric Constant/ Loss Tangent	Frequency	SGW3		SGW8.5	
		Dielectric Constant	Loss Tangent	Dielectric Constant	Loss Tangent
	5 GHz	5.2	0.005	7.2	0.025
	10 GHz	5.1	0.0057	-	-
	15 GHz	5.0	0.007	6.9	0.023
	20 GHz	5.0	0.007	6.9	0.023

Corning provides a portfolio of semiconductor products with CTE offerings ranging from 2.7 ppm/°C – 12.4 ppm/°C. Four products from the portfolio are captured above.

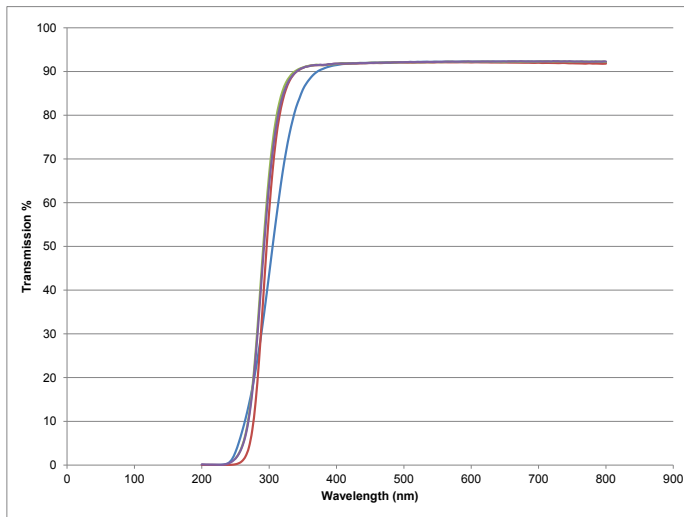
Optical Properties

		SGW3	SGW7.6	SGW8	SGW8.5
Refractive Index	(Wavelength 590 nm)	1.51	1.50	1.50	1.50

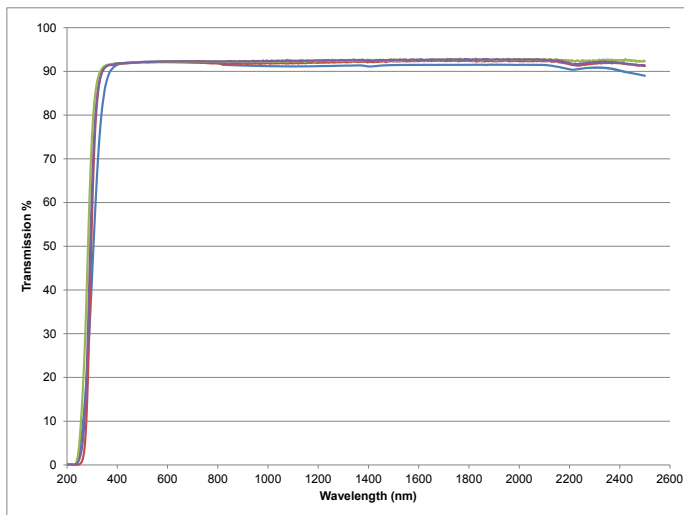
- UV Transmission
- SGW3 (0.7 mm thick)
 - SGW7.6 (0.7 mm thick)
 - SGW8 (0.7 mm thick)
 - SGW8.5 (1.0 mm thick)



- Visible Transmission
- SGW3 (0.7 mm thick)
 - SGW7.6 (0.7 mm thick)
 - SGW8 (0.7 mm thick)
 - SGW8.5 (1.0 mm thick)



- IR Transmission
- SGW3 (0.7 mm thick)
 - SGW7.6 (0.7 mm thick)
 - SGW8 (0.7 mm thick)
 - SGW8.5 (1.0 mm thick)



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To place an order, obtain additional technical information or specific requirements please contact semiglass@corning.com or one of our regional sales offices.

To learn more, visit us at www.corning.com/semiglass.