

The Corning logo is a solid blue square with the word "CORNING" in white, uppercase, sans-serif font.

CORNING

Semiconductor Glass Products

Corning® Semiconductor Glass Wafers

The background of the entire page is a close-up, high-angle photograph of a semiconductor glass wafer. The wafer is a light tan or off-white color and is covered with intricate, golden-brown circuitry. This circuitry includes various rectangular pads of different sizes, some of which are larger and more prominent than others. There are also numerous small, circular features and fine lines that form a complex network across the surface. The lighting is soft and even, highlighting the metallic sheen of the circuitry against the matte background of the glass.

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	3.2 ppm/°C, 7.6 ppm/°C, 8.0 ppm/°C, 8.5 ppm/°C
Diameters	100 mm - 450 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	≤ 30 µm	-	≤ 100 µm

The attributes above are general guidelines. Corning Incorporated can provide glass wafers 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 semiglass@corning.com for additional information, specifications, or requirements.

Mechanical Properties

Density (g/cm³)
Young's Modulus (GPa)
Vickers Hardness (kgf/mm²)

SGW ₃	SGW _{7.6}	SGW ₈	SGW _{8.5}
2.38	2.39	2.42	2.44
73.6	69.3	71.5	71.7
640	534	534	534

Thermal Properties

Thermal Conductivity (23°C)
Strain Point (poises)
Average CTE (0°C-300°C)

SGW ₃	SGW _{7.6}	SGW ₈	SGW _{8.5}
0.0104 W/(cm·K)	0.0114 W/(cm·K)	0.0117 W/(cm·K)	0.0107 W/(cm·K)
669 °C (10 ^{14.5})	574 °C (10 ^{14.7})	599 °C (10 ^{14.7})	563 °C (10 ^{14.7})
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)
HCl-5%	24hrs.	95
NH ₄ :HF-10%	20min.	20
HF-10%	20min.	20
NaOH-5%	6hrs.	95

SGW ₃	SGW _{7.6}	SGW ₈	SGW _{8.5}
Typical Plate Durability, Weight Loss In (mg/cm ²)			
0.79	0.6	0.12	0.04
0.84	2.1	2.64	3.14
5.18	12.3	11.88	11.96
1.83	1.9	1.42	1.10

Electrical Properties

Dielectric Strength (0.5 mm)
Breakdown Voltage (0.5 mm)

SGW ₃	SGW _{8.5}
217 kV/mm	41 kV/mm
107 kV	22 kV

Volume Resistivity
 $\log(\rho)(\Omega \cdot \text{cm})$

Temp. (°C)

SGW ₃	SGW _{7.6}	SGW ₈	SGW _{8.5}
0.5 mm	1.0 mm	0.55 mm	0.7 mm
22.92	9.24	9.1	10.67
12.98	4.64	4.52	5.30
10.87	3.67	3.55	4.16
8.72	2.68	2.56	3.0

Dielectric Constant/ Loss Tangent

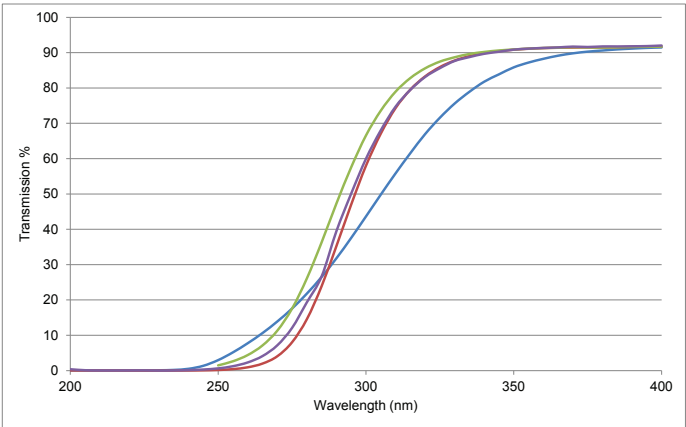
Frequency

SGW ₃		SGW _{8.5}	
Dielectric Constant	Loss Tangent	Dielectric Constant	Loss Tangent
5.2	0.005	7.2	0.025
5.1	0.0057	-	-
5.0	0.007	6.9	0.023
5.0	0.007	6.9	0.023

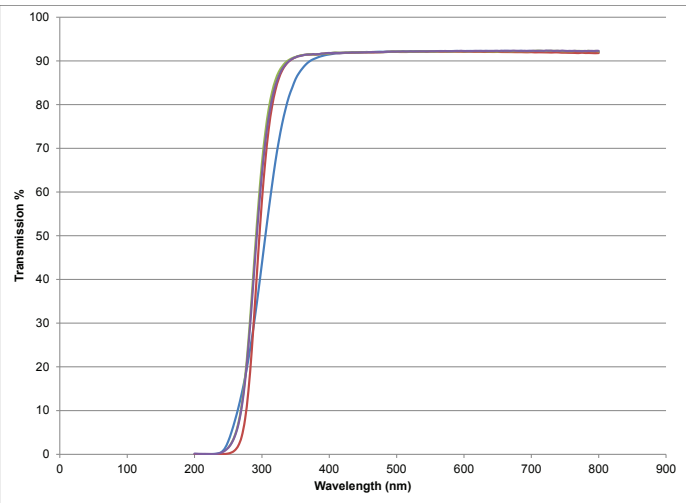
Optical Properties

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

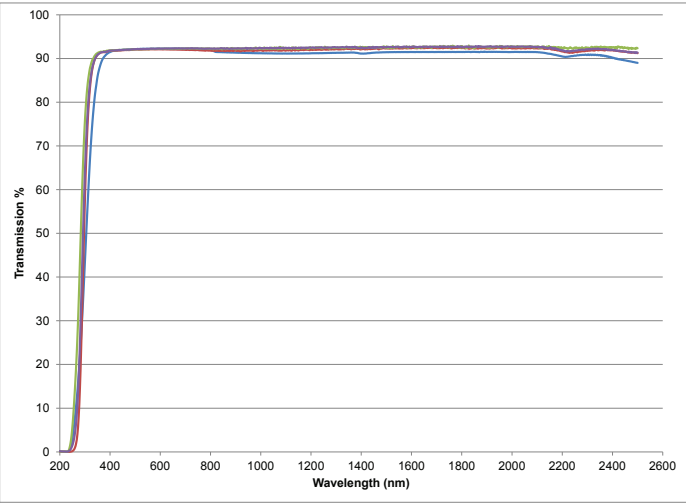
- UV Transmission
- SGW3 (0.7 mm thick)
 - SGW7.6 (0.7 mm thick)
 - SGW8 (0.7 mm thick)
 - SGW8.5 (1.0 mm thick)



- 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.