

CORNING Gorilla® Glass



Antimicrobial Corning® Gorilla® Glass

Product Information

Antimicrobial Corning® Gorilla® Glass is the world's first antimicrobial cover glass with EPA registration as a treated article. It combines the renowned benefits of Corning® Gorilla® Glass technology, including durability, scratch resistance and toughness. Antimicrobial Corning® Gorilla® Glass is an alkali-aluminosilicate thin sheet glass formulated with an antimicrobial agent to help keep the glass surface clean of stain and odor-causing bacteria.

Antimicrobial Efficacy

Antimicrobial Corning® Gorilla® Glass is produced by incorporating silver ions (Ag⁺) as the antimicrobial agent into Corning® Gorilla® Glass 3. Trace amounts of silver ions leach to the glass surface to eliminate the surface bacteria in multiple modes. Antimicrobial Corning® Gorilla® Glass has proven to show a consistent [3 log (>99.9%)] microbial reduction rate against a broad range of bacteria under the JIS Z 2801 test protocol.

The JIS Z 2801* is an internationally recognized industrial standard test protocol for measuring antibacterial efficacy. This standard is accepted by many laboratories in the U.S., Japan, Germany, and Korea. Per this method, antibacterial efficacy is measured by quantifying the survival of bacterial cells that have been held in intimate contact with the surface containing the antibacterial agent for 24 hours at 37°C/ saturated humidity. The efficiency is measured by comparing the survival of bacteria on a treated sample with that achieved on an untreated (control) sample.

*The most current version of this standard can be purchased for a small fee using this link:
<http://www.webstore.jsa.or.jp/webstore/Com/FlowControl.jsp?lang=en&bunsyoid=JIS+Z+2801%3A2010&dantaiCd=JIS&status=1&pageNo=0>

Benefits

- Delivers intrinsic and long-lasting antimicrobial efficacy, with EPA registration and compatibility with an Easy-to-Clean Technology
- Maintains the durability and scratch resistance of Corning® Gorilla® Glass 3
- Maintains the exceptional surface quality and optical clarity of Corning® Gorilla® Glass 3

Applications

- Ideal protective screen cover glass for:
 - Mobile devices, such as smartphones and tablets
 - Laptop computers
 - Medical displays
 - Point-of-sale kiosks
 - Touchscreen monitors and trackpads
- Door, window, and wall surfaces in healthcare settings
- Furniture surface tops where reduced microbe load is highly desirable

Dimensions

Available Thickness: 0.4mm - 2.0mm

Physical and Thermal Properties

Viscosity

Softening Point (10 poises)	900 °C
Annealing Point (10 poises)	628 °C
Strain Point (10 poises)	574 °C

Physical Properties

Density	2.39 g/cm ³
Young's Modulus	69.3 GPa
Shear Modulus	28.5 GPa
Poisson's Ratio	0.22
Vickers Hardness (200 g load)	
Un-strengthened	534 kgf/mm ²
Strengthened	649 kgf/mm ²
Fracture Toughness	0.66 MPa m ^{0.5}
Coefficient of Expansion (0 °C - 300 °C)	75.8 x 10 ⁻⁷ /°C

Chemical Strengthening

Compressive stress	> 750 MPa
Depth of Layer	> 35 µm

Chemical Durability

Reagent	Time	Temperature (C)	Weight Loss (mg/cm ²)
HCl - 5%	24 hrs	95	0.78
NH ₄ F:HF - 10%	20 min	20	2.2
HF - 10%	20 min	20	14.2
NaOH - 5%	6 hrs	95	2.4

Dielectric Properties

Frequency (MHz)	Dielectric Constant		Loss Tangent	
	Corning® Gorilla® Glass	Antimicrobial Corning® Gorilla® Glass	Corning® Gorilla® Glass	Antimicrobial Corning® Gorilla® Glass
54	7.20	7.18	0.0199	0.0198
163	7.12	7.10	0.0189	0.0189
272	7.08	7.06	0.0166	0.0163
381	7.05	7.03	0.0166	0.0165
490	7.04	7.02	0.0177	0.0178
599	7.04	7.02	0.0169	0.0168
708	7.04	7.02	0.0172	0.0173
817	7.05	7.03	0.0175	0.0177
926	7.07	7.05	0.0177	0.0180

The dielectric constant and loss tangent values of Antimicrobial Corning® Gorilla® Glass are indistinguishable from Corning® Gorilla® Glass.

Terminated coaxial line similar to that outlined in NIST Technical Notes 1520 and 1355-R.

Optical Properties

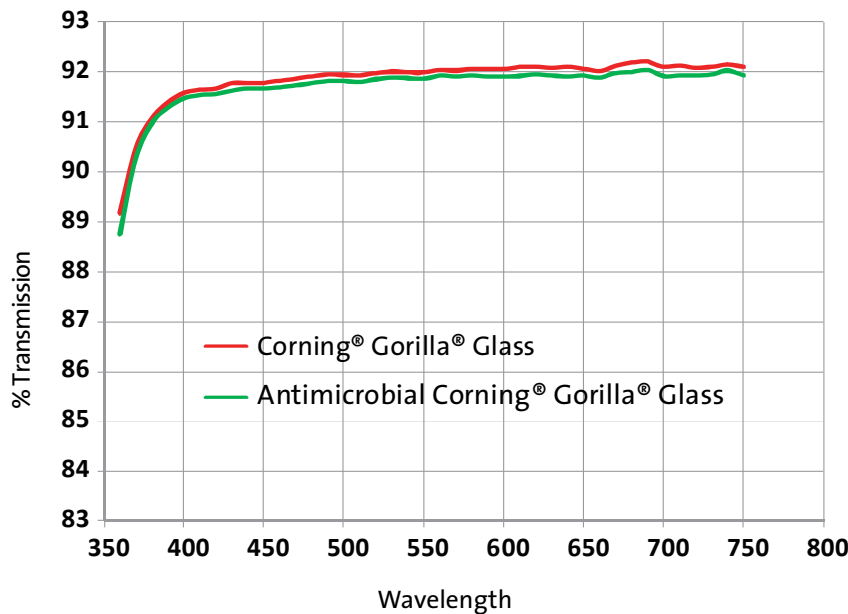
Refractive Index (590 nm)

Core glass* 1.50
Compression layer 1.52

Photo-Elastic constant** 31.9 nm/cm/MPa

* Core index is used for FSM-based measurements since it is unaffected by ion-exchange conditions.

** PEC is measured before IOX

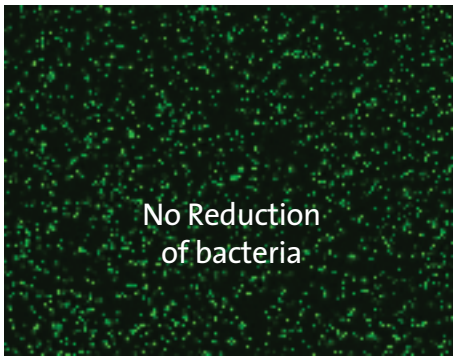


Antimicrobial Corning® Gorilla® Glass exhibits high transmission of visible and infrared light.

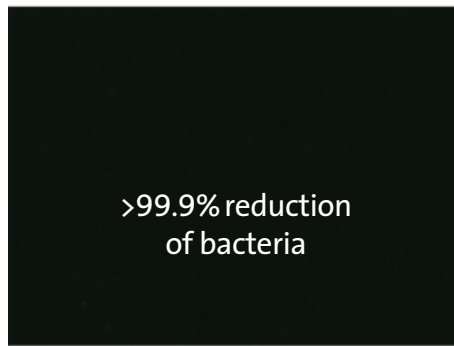
	Aging Condition(s)	L*	a*	b*	ΔE
Corning® Gorilla® Glass	No exposure	96.93	-0.01	0.13	
Antimicrobial Corning® Gorilla® Glass	No exposure	96.85	0.00	0.15	0.08
	85°C/85%RH/72hr	96.66	0.01	0.32	0.19
	-40°C to 85°C (100 cycles)	96.81	0.00	0.16	0.03

The CIELAB color coordinate measurement confirms that the color changes resulting from the infusion of silver ions (Ag⁺) is imperceptible by the human eye. (Color difference, ΔE <<1)

Standard Cover Glass

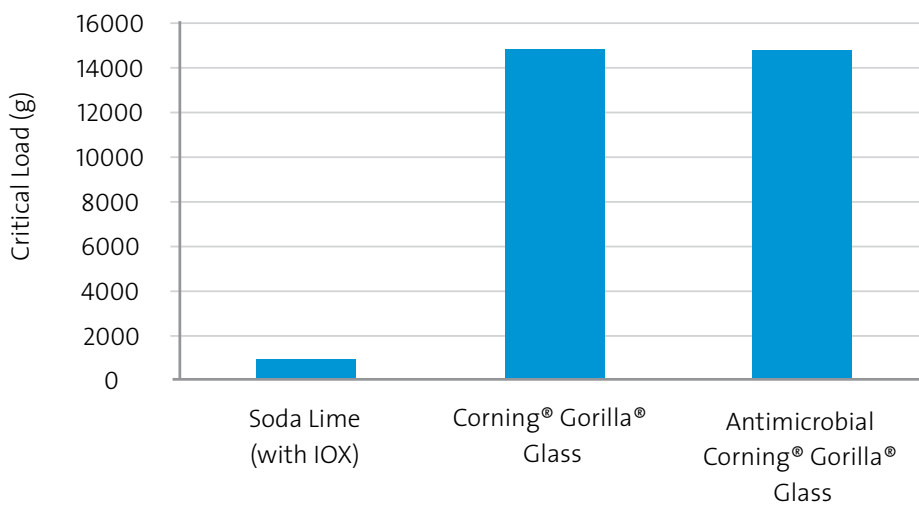


Antimicrobial Corning® Gorilla® Glass



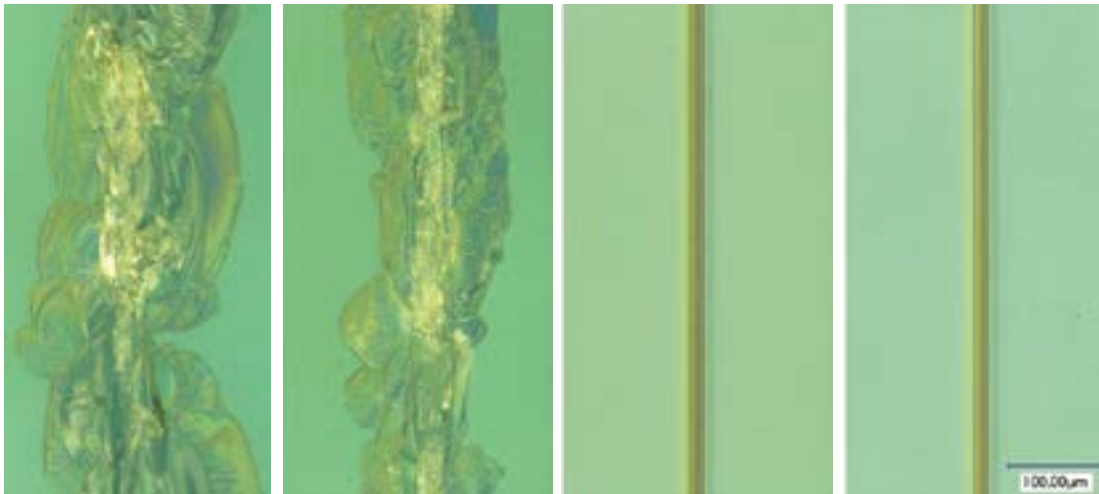
Silver ions (Ag⁺) migrate to the glass surface to eliminate the surface bacteria in multiple modes. Antimicrobial Corning® Gorilla® Glass has proven to show a consistent [3 log (>99.9%)] microbial reduction rate against a broad range of bacteria under the JIS Z 2801 test protocol.

Putting Antimicrobial Corning® Gorilla® Glass with Native Damage Resistance™ to the Test



The NDR™ of Antimicrobial Corning® Gorilla® Glass enables its high fracture threshold.

Knoop Visual Scratch Test



Soda Lime Silicate
2N Force

Other alkali-aluminosilicate
7N Force

Antimicrobial
Corning® Gorilla® Glass
7N Force

Corning® Gorilla® Glass
7N Force

Antimicrobial Corning® Gorilla® Glass exhibits scratch threshold properties identical to Corning® Gorilla® Glass.

Antimicrobial Corning® Gorilla® Glass is formulated with antimicrobial properties to help protect touch surfaces from stain and odor-causing bacteria. Corning makes no direct or implied claims to protecting users or providing other health benefits.

CORNING

For more information:
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