

# CORNING Gorilla® Glass

Corning® Gorilla® Glass 4 – Corning’s latest composition was formulated to address breakage – the #1 consumer complaint, according to Corning’s research. The new glass is just as thin and light as previous versions, but has been formulated to deliver dramatically improved damage resistance allowing improved in-field performance. Corning® Gorilla® Glass 4 has been tested for performance when subjected to sharp contact damage, such as asphalt and other real-world surfaces.

## Product Information

### Benefits

- Enhanced retained strength after use
- High resistance to scratch and sharp contact damage
- Improved drop performance
- Superior surface quality

### Applications

- Ideal protective cover for electronic displays in:
  - Smartphones
  - Laptop and tablet computer screens
  - Mobile devices
- Touchscreen devices
- Optical components
- High strength glass articles

### Dimensions

Thickness: 0.4 mm - 1.0 mm

Additional thicknesses available upon request.

### Viscosity

Softening Point (10 <sup>7.6</sup> poises)	912 °C
Annealing Point (10 <sup>13.2</sup> poises)	646 °C
Strain Point (10 <sup>14.7</sup> poises)	596 °C

### Properties

Density	2.42 g/cm <sup>3</sup>
Young’s Modulus	65.8 GPa
Poisson’s Ratio	0.22
Shear Modulus	26.0 GPa
Vickers Hardness (200 g load)	
Un-strengthened	489 kgf/mm <sup>2</sup>
Strengthened	596 kgf/mm <sup>2</sup>
Fracture Toughness	0.67 MPa m <sup>0.5</sup>
Coefficient of Expansion (0 °C - 300 °C)	86.9 x 10 <sup>-7</sup> /°C

### Chemical Strengthening

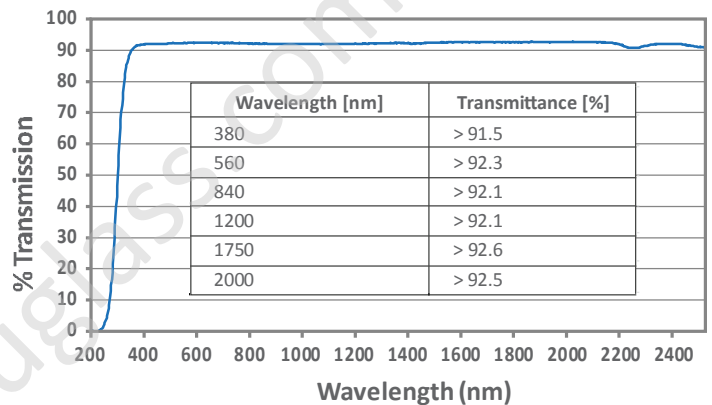
Capability of >850MPa CS, and >50 µmDOL

### Optical

Refractive Index (590 nm)

Core glass**	1.49
Compression layer	1.51
Photo-elastic constant	30.3 nm/cm/MPa

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



### Chemical Durability

Durability is measured via weight loss per surface area after immersion in the solvents shown below. Values are highly dependent upon actual testing conditions. Data reported is for Corning® Gorilla® Glass 4.

Reagent	Time	Temperature (°C)	Weight Loss (mg/cm <sup>2</sup> )
HCl - 5%	24 hrs	95	34.7
NH <sub>4</sub> F:HF - 10%	20 min	20	3.3
HF - 10%	20 min	20	39.4
NaOH - 5%	6 hrs	95	5.9

### Electrical

Frequency (MHz)	Dielectric Constant	Loss Tangent
54	7.89	0.026
163	7.77	0.024
272	7.70	0.024
381	7.66	0.024
490	7.63	0.023
599	7.60	0.024
912	7.43	0.024
1499	7.39	0.025
1977	7.37	0.025
2466	7.34	0.026
2986	7.33	0.027

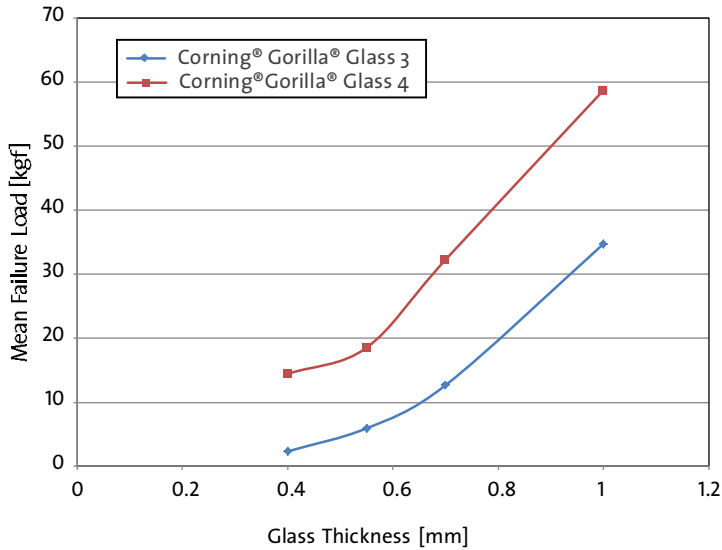
Terminated coaxial line similar to that outlined in NIST Technical Notes 1520 and 1355-R.

\* Specifications subject to change

# Putting Corning® Gorilla® Glass 4 to the test.

## Greater damage resistance with deep abrasion.

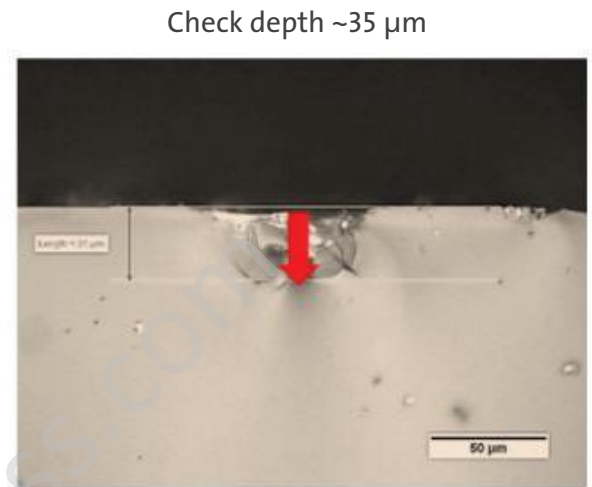
(15 psi abrasion pressure)



## Improved Damage Resistance

Shallower check depth with higher abrasions levels

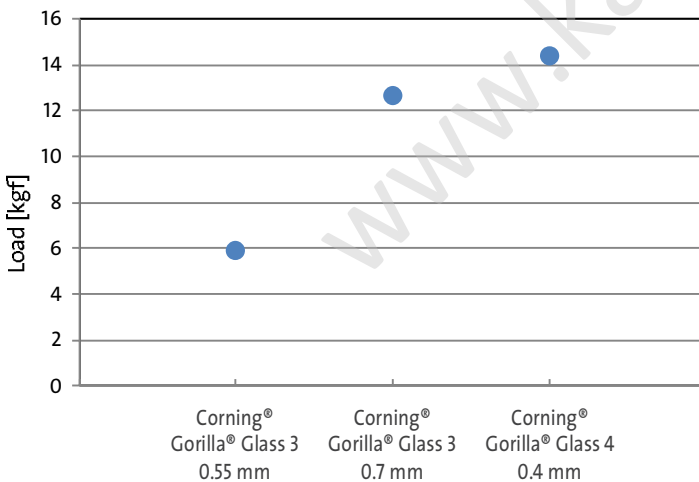
(15 psi abrasion pressure)



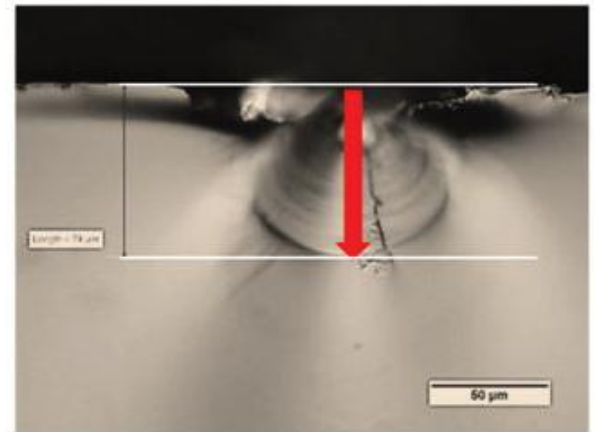
Corning® Gorilla® Glass 4

## Enables thickness reduction

(15 psi abrasion pressure)



Check depth ~75 μm



Corning® Gorilla® Glass 3

# CORNING

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