CORNING

Alumina Ribbon Ceramic

Thin, flexible ceramic technology for electronic substrates and packaging.

Alumina Ribbon Ceramic

Corning has invented a new way to manufacture high performance, fully dense alumina ceramic ribbon in roll-to-roll (R2R) format, which is a revolution in the processing of ceramic materials. This new manufacturing process enables us to make high performance alumina wafers and panels with unique form factors for electronic substrates and packaging, among other applications.

Properties

- Thin, flexible, and available in multiple sizes
- Smooth surface, clean edges, and supporting small vias formation
- High heat dissipation and thermal shock resistance
- Low dielectric loss tangent

Physical Properties

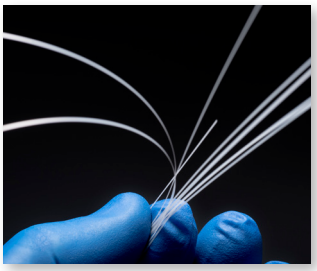
Physical	
Purity	>99.9%
Surface Roughness (R_a)	40/60 nm
Grain Size	1.5 µm
Porosity	<0.5%
Mechanical	
Bend Strength	630 MPa
Thermal	
Thermal Conductivity	36 W/m-K
Dielectric	
Dielectric Strength (ASTM D149, 40 µmt)	124 kV/mm
Dielectric Constant (Dk) (10-50 GHz)	10
Dielectric Loss Tangent (10-50 GHz)	0.0001
Other	
Transmittance (40 µmt, 550 nm)	>75%
Outgassing	0%

*Properties of this table are measured from developmental samples and are expected but not guaranteed.

Unique Form Factor

For the first time, alumina ceramic substrates are available at thicknesses down to 40 µm and at widths up to 100 mm (down to 0.5 mm) and meter scale lengths. This unique format allows the ribbon to flex and be laminated to curved surfaces.

100 mm wide, 40 µm thick



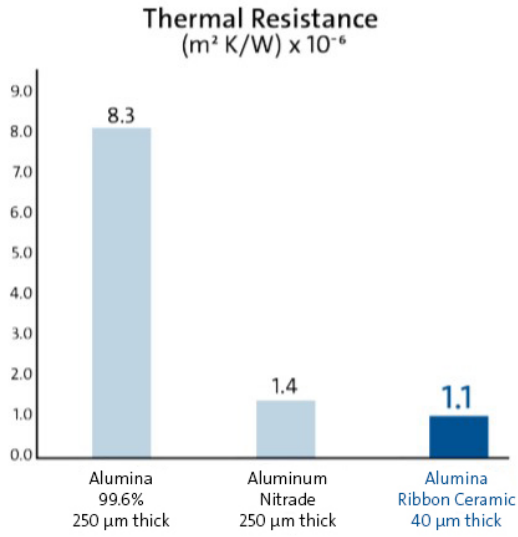
0.5 mm wide, 40 µm thick

Potential Applications

- 5G/mmWave, automotive sensors and other high frequency components that require conformable, small form factor substrates along with low loss and heat dissipation
- Potentially ideal material for THz device substrates and THz dielectric waveguides
- Lightweight, long length sensors for high temperature or harsh environments
- High temperature, flexible power electronic modules
- Hermetic and compact packaging designs

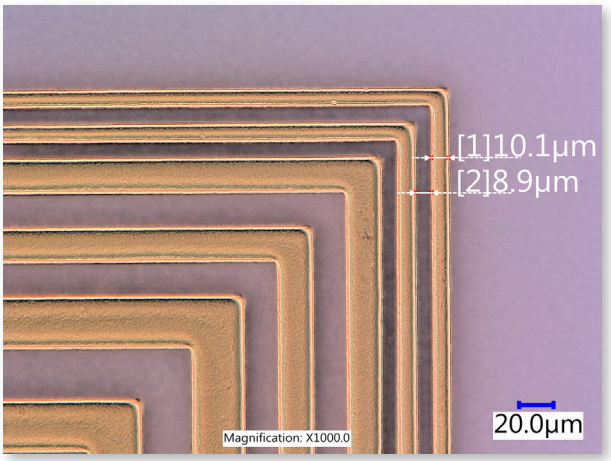
High Heat Dissipation & Thermal Shock Resistance

Due to its high thermal conductivity and thinness, Alumina Ribbon Ceramic has a low thermal resistance and dissipates heat similar to 250 µm thick aluminum nitride.



Metallization

Alumina Ribbon Ceramic can be metallized and patterned through a variety of conventional metallization processes.



Availability

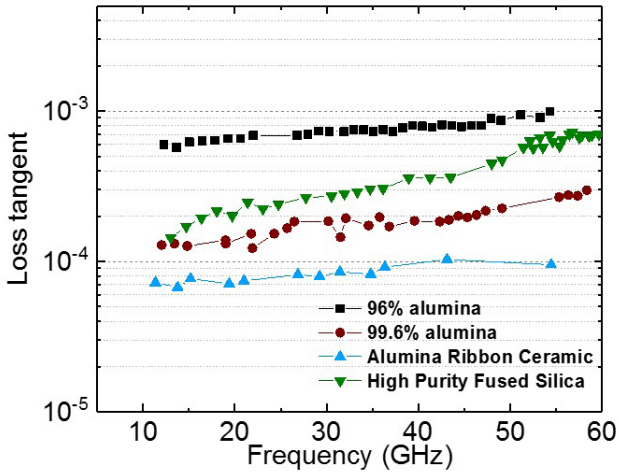
Available at thicknesses of 40 µm, 80 µm, and 120 µm in the following sample sizes:

- 4” wafers and squares
- Custom dimensions

Ribbon format for R2R processing may be discussed on a project basis.

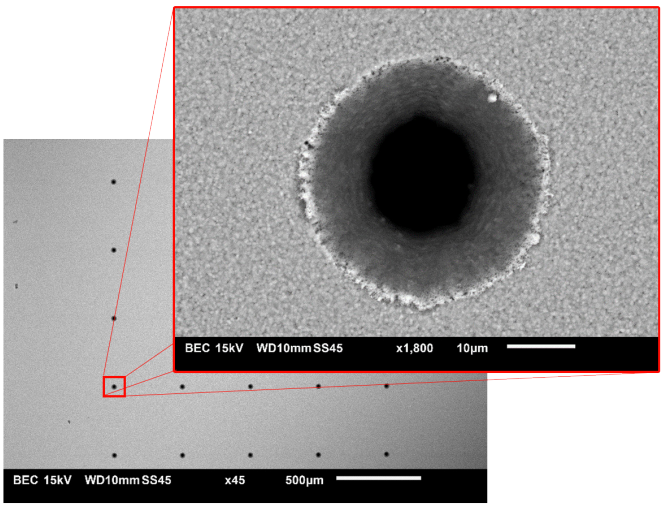
Low and Stable Dielectric Loss up to High Frequency

Alumina Ribbon Ceramic has an extremely low loss tangent. Coupled with its high Dk, this enables compact designs for RF passive components.



Smooth Surface, Clean Edges and Small Vias

Our smooth surface, fine grain structure, and thin substrate enables high quality and small diameter vias (down to 20 µm) with an aspect ratio favorable for via filling.



Contact Us

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