

CORNING

Zirconia
Ribbon Ceramics

Overview

Leveraging its unparalleled expertise in ceramic science, Corning® has invented a new way to manufacture high performance, fully dense 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 wafers, panels, and long length ribbons with unique form factors for hydrogen production, sensors, and other applications.

Properties

- Thin, flexible, and available in multiple sizes
- Smooth surface, clean edges, and supporting small via formation
- Thermal shock resistance with no outgassing
- Lightweight and wear resistant
- Corrosion resistant



Key Features

Unique Form Factor | Roll to Roll

For the first time, zirconia ceramic substrates are available as thin as 20µm at widths up to 200mm and meter scale lengths. This unique form factor allows the ribbon to flex and be laminated to curved surfaces. In addition, post processing of long length formats enables faster production and new application technologies.

Roll to Roll (R2R) Metalization

Zirconia Ribbon Ceramic can be metallized on a variety of roll-to-roll process such as vacuum sputtering, screen printing, slot die coating, or electrode plating. The image below shows a section of zirconia ribbon ceramic sputter coated with copper from a roll-to-roll process.

Durable, Flexible, and Robust

Zirconia Ribbon Ceramic is thin, flexible, and mechanically durable with a smooth, low-defect surface.

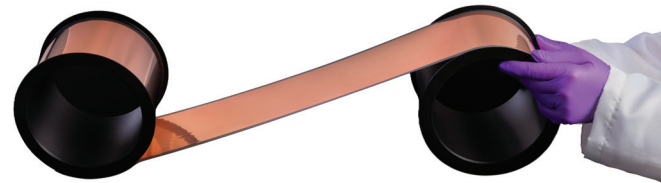
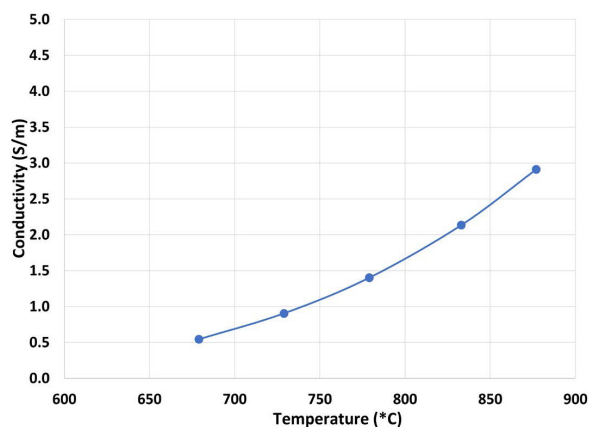
Physical Properties

Physical	
Material	3YSZ
Surface Roughness (R_a)	~20/50 nm
Grain Size	0.45 μm
Porosity	< 0.5%
Outgassing	0%
Mechanical	
Bend Strength	1GPa
Bulk Strength (BoCR)	1.8GPa
Thermal	
Operating Temperature	$\leq 1000^\circ\text{C}$
Thermal Conductivity	~2.7 W/mK
Electrical	
DC Dielectric Strength (kV/mm)(40 μm)	200
Dielectric Constant (Dk)(2.6 GHz)	~28

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

Ionic Properties

Zirconia Ribbon Ceramic exhibits high ionic conductivity at elevated temperature.



Usage



Potential Applications

- Ionic conducting processes including hydrogen (H₂) production (SOEC & SOFC)
- Thin film solid state battery substrate
- Hybrid flexible electronic sensors
- Harsh environment sensor



Availability

- Developmental ribbon formats and sample sizes available on a project basis
- Available at thicknesses of 20 μm and 40 μm in the following sample sizes: 4" wafers or Custom dimensions

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

Contact Us

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Visit our website to learn more about Corning Ribbon Ceramics

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