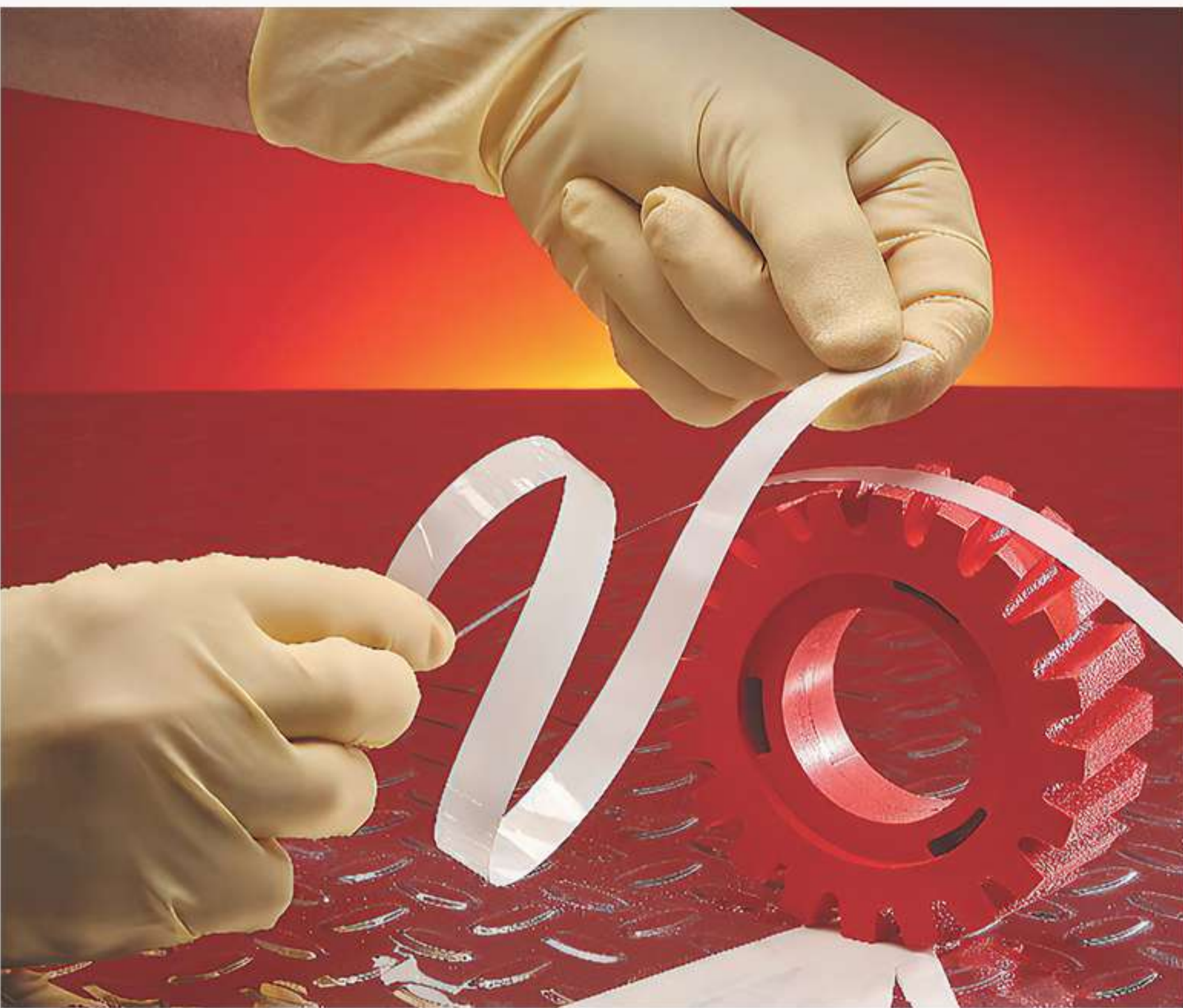


OASIS MATERIALS . COM

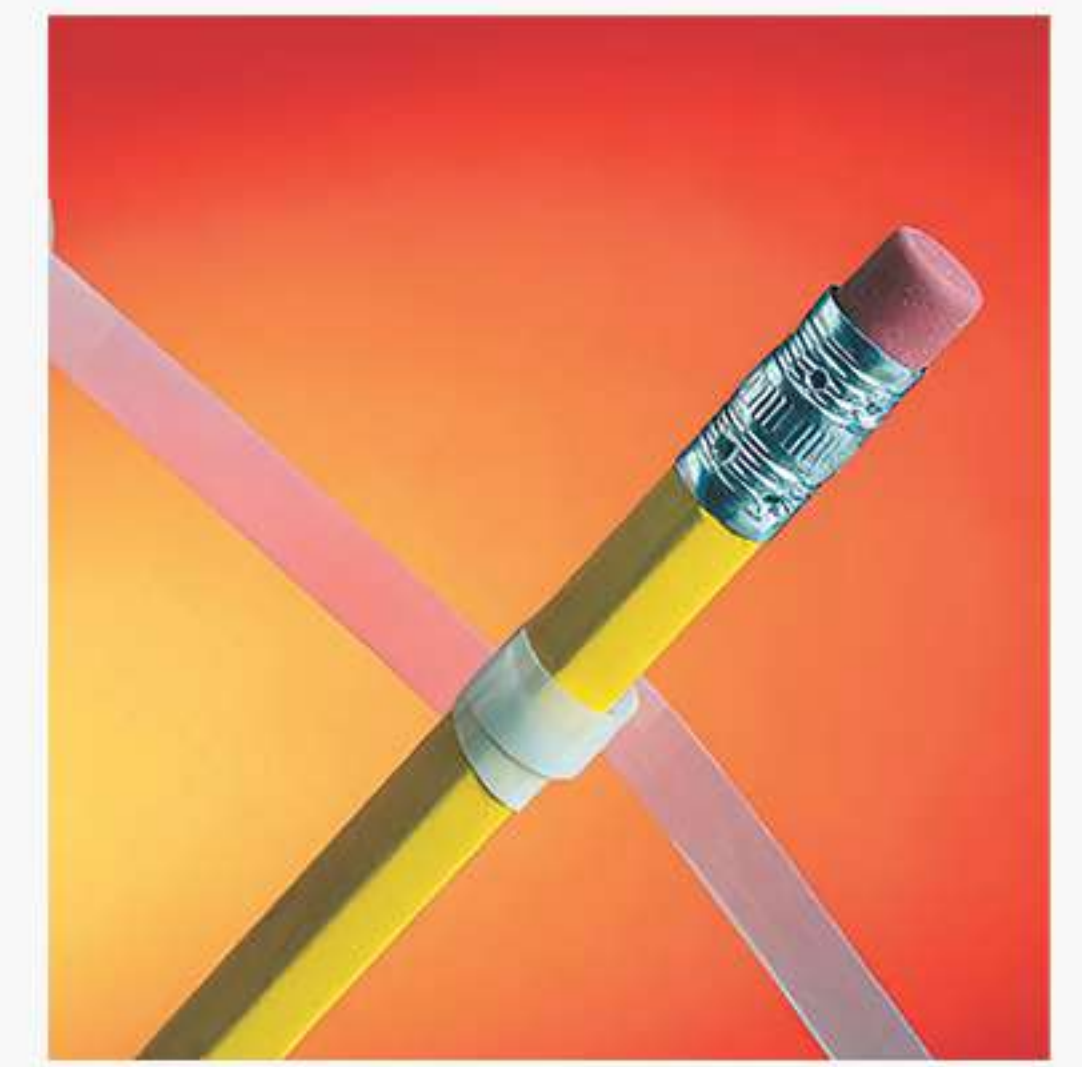
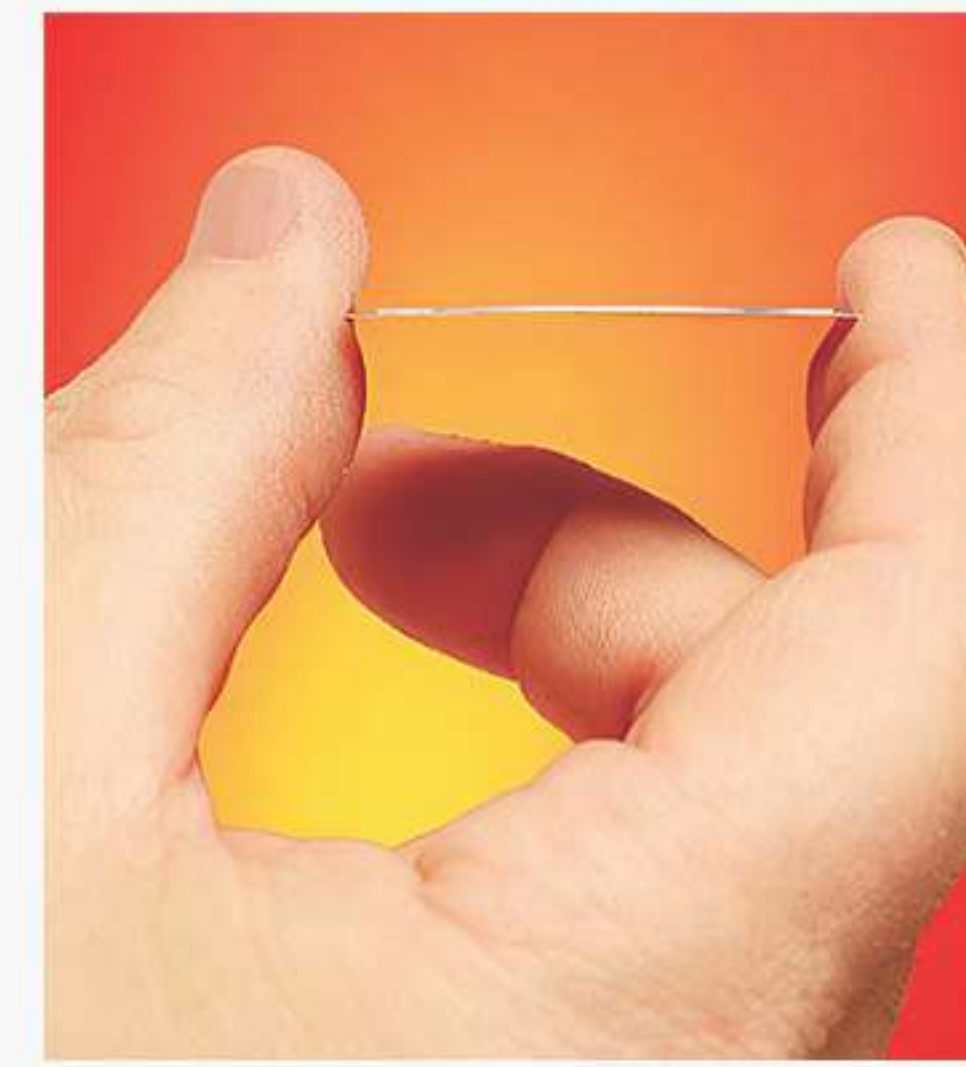
# OASIS MATERIALS

HIGH SPEED TEMPERATURE TRANSITION

## ULTRA-THIN, FLEXIBLE ZIRCONIA CERAMIC



Thin E-Strate® as support and seal in Flexible Solid State Lithium Batteries and OLEDs.



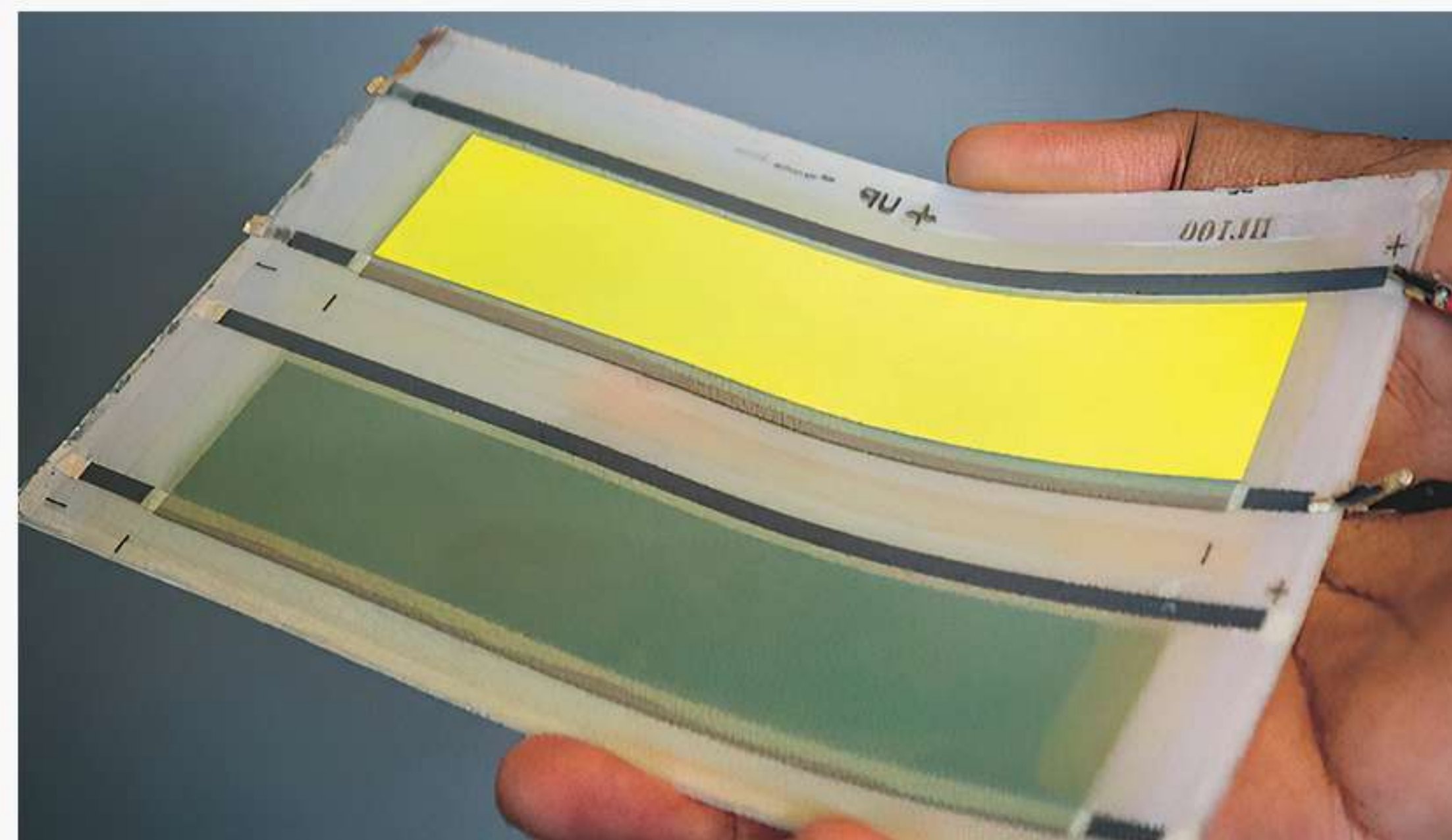
20µm thick ceramic

### SOLID STATE & THIN FILM DEVICES, FLEXIBLE HYBRID ELECTRONICS OR SENSORS:

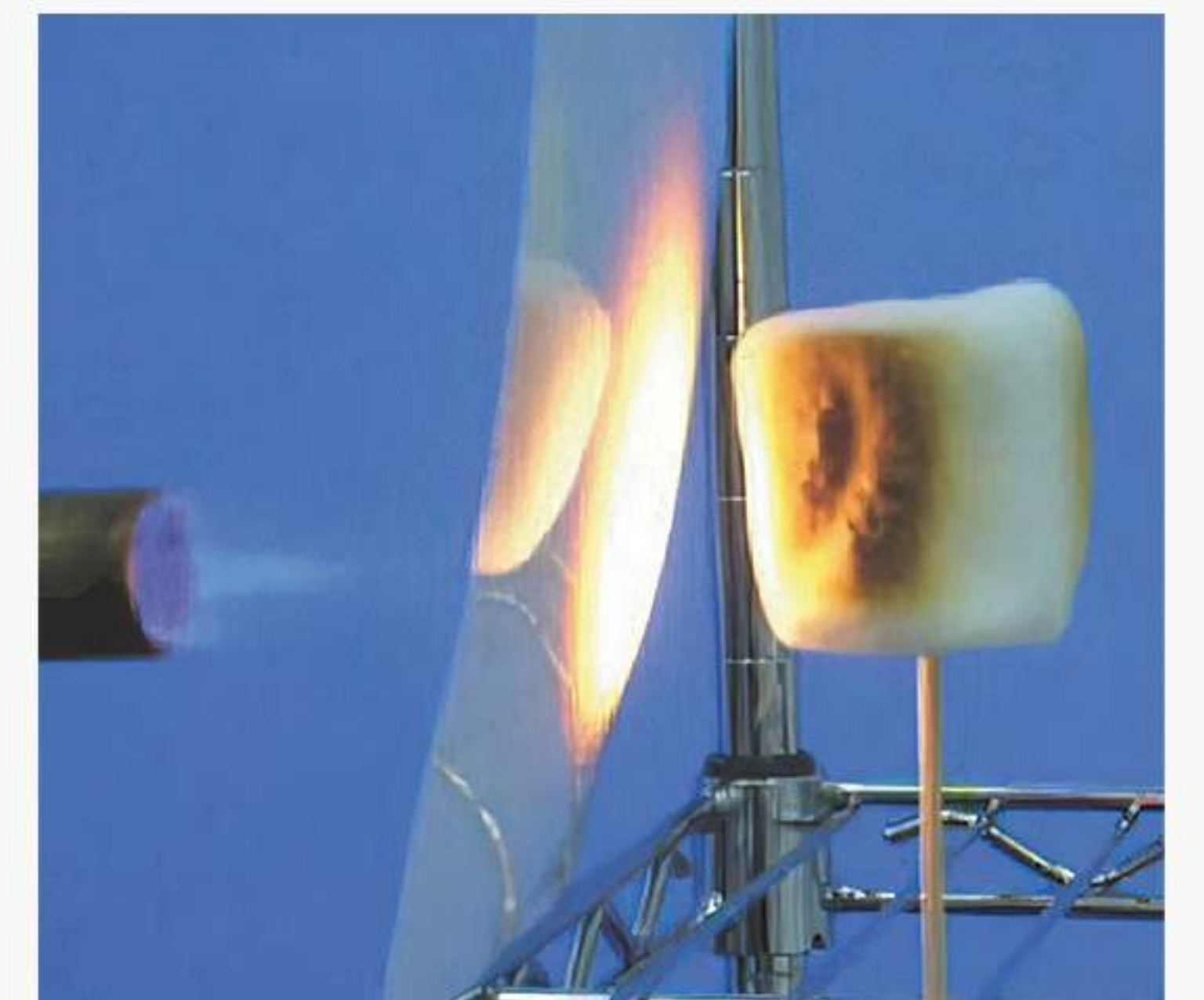
- ULTRA BARRIER
- WEAR RESISTANT
- DURABLE
- CORROSION RESISTANT
- LIGHTWEIGHT
- BIOCOMPATIBLE
- TRANSLUCENT

### PROCESSING ADVANTAGES:

- HIGH TEMPERATURE CAPABLE
- NO OUTGASSING
- HIGH PURITY CERAMIC
- THERMAL SHOCK TOLERANT
- DIMENSIONALLY STABLE
- PATTERNED BY STD. TECHNIQUES



OLED Photo Courtesy of Holst Centre



Low Thermal Mass:  
Charred Marshmallow Demo

### PAPERS:

Thermal and Electrical Characterizations of Ultra-Thin Flexible 3YSZ Ceramic for Electronic Packaging Applications, Xin Zhao et al.

International Symposium on Microelectronics: Fall 2016, Vol. 2016, No. 1, pp. 000391-000396

<https://doi.org/10.4071/isom-2016-THA13>

Visible Flip-Chip Light-Emitting Diodes on Flexible Ceramic Substrate With Improved Thermal Management, Seung Hwan Kim et al.

IEEE Electron Device Letters, Volume: 37, Issue: 5, May 2016 10.1109/LED.2016.2547877

Ultrathin Yttria-Stabilized Zirconia as a Flexible and Stable Substrate for Infrared Nano-Optics, Kavitha K. Gopalan et al.

Advanced Optical Materials, December 2018 <https://doi.org/10.1002/adom.201800966>



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# OASIS MATERIALS

HIGH SPEED TEMPERATURE TRANSITION

## APPLICATIONS:

Thin film devices, portable electronics, solid state batteries, lightweight thin solar PV, durable labels, display backplanes, harsh environment sensors, heaters and bio-compatible devices.

### PROPERTY

### MEASUREMENT

#### PHYSICAL:

Material	3mol% Ytria-Stabilized Zirconia (3YSZ)
Surface Roughness	20-25 nm
Density	6.04 g/cm <sup>3</sup> , 99% dense
WVTR	1.5 ± 0.9x10 <sup>-6</sup> g/m <sup>2</sup> /day (45°C/85%RH)

#### MECHANICAL:

Bend Strength	1.2 GPa, measured on 2 cm strip, 20 microns
Tensile Strength	248 MPa @RT

#### THERMAL:

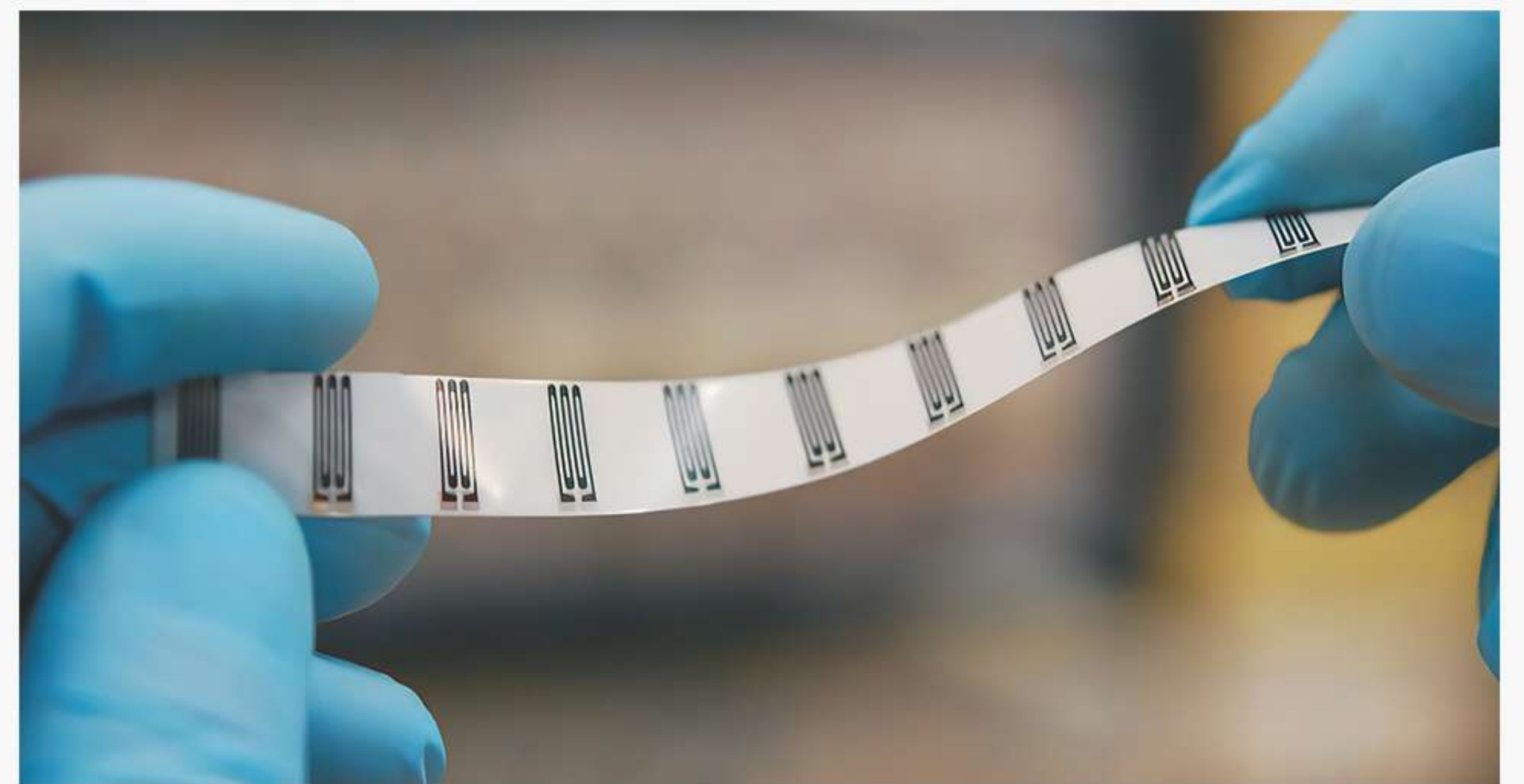
Processing Temperature	≤ 1200°C up to 2 hrs.
Operating Temperature	Up to 1000°C
Bulk Thermal Conductivity	2.7 W/mK

#### ELECTRICAL:

Dielectric Constant	28 @ 2.6 GHz
Dielectric Strength	3200 VDC @ 40µm, 2500 VDC @ 20µm (R.T.)

#### OPTICAL:

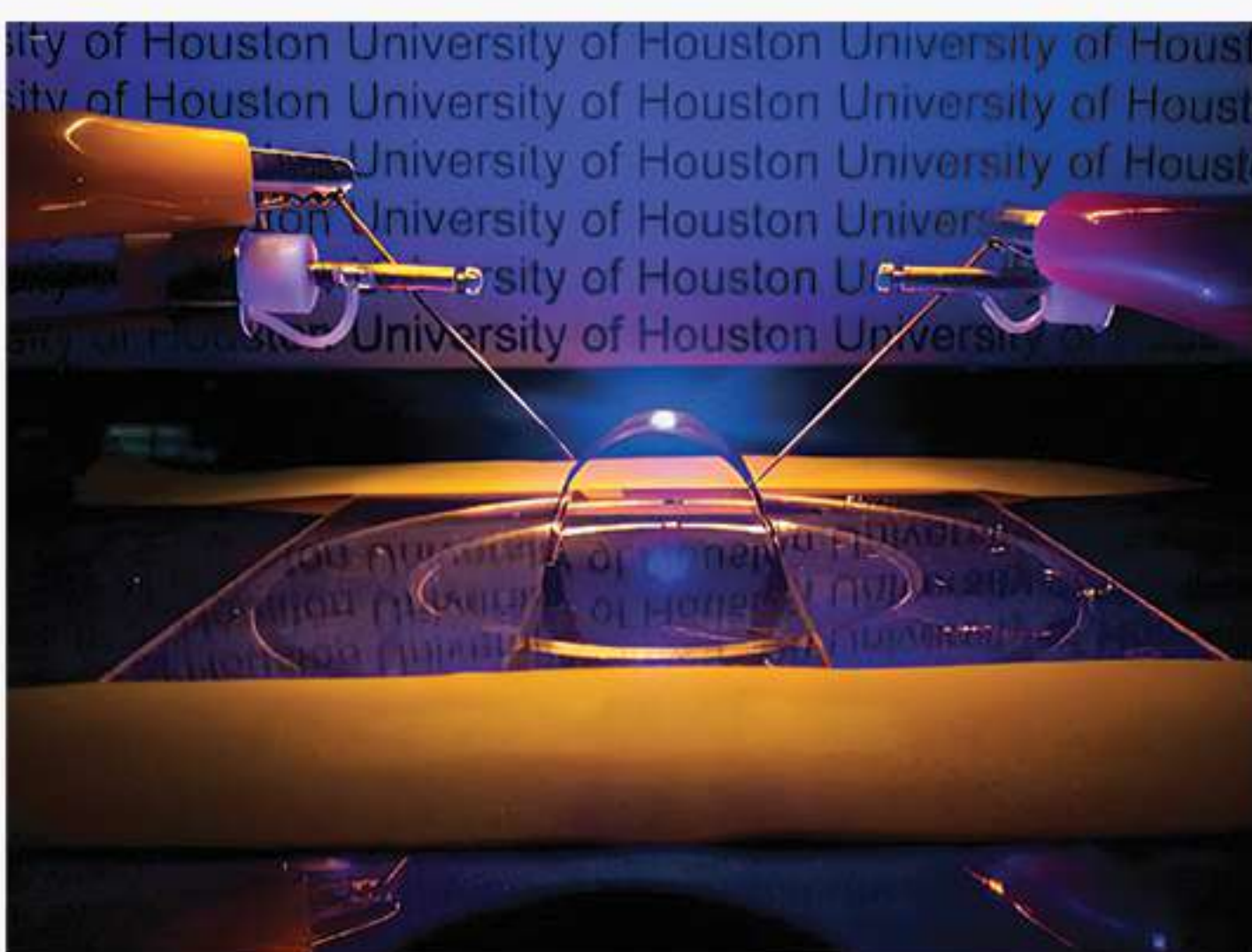
Refractive Index	
Transluceny	2.2
IR Transparency	15% dispersive @ 40 microns 80% between 2-7 nm



Thin film strain gages on zirconia ribbon



Laser cut features in Thin E-Strate®



GaN flip-chipped LED operating more efficiently and cooler on a flexed Thin E-Strate® substrate  
*Photo Courtesy of University of Houston*



Printed silver folded-dipole antenna



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