

# STL-100 and STL-150D

## ALUMINUM NITRIDE LOSSY DIELECTRICS

Aluminum nitride (AlN) based lossy dielectrics are vacuum compatible ceramic microwave absorbers that are developed as drop-in replacements for beryllia-silicon carbide (BeO-SiC) composites at a more economical cost and without BeO's toxicity concerns for high power microwave applications.

Sienna's AlN-based lossy dielectrics can be designed to meet specific microwave energy absorption and frequency requirements by varying their dielectric properties (dielectric constant, loss tangent) through compositional adjustments.

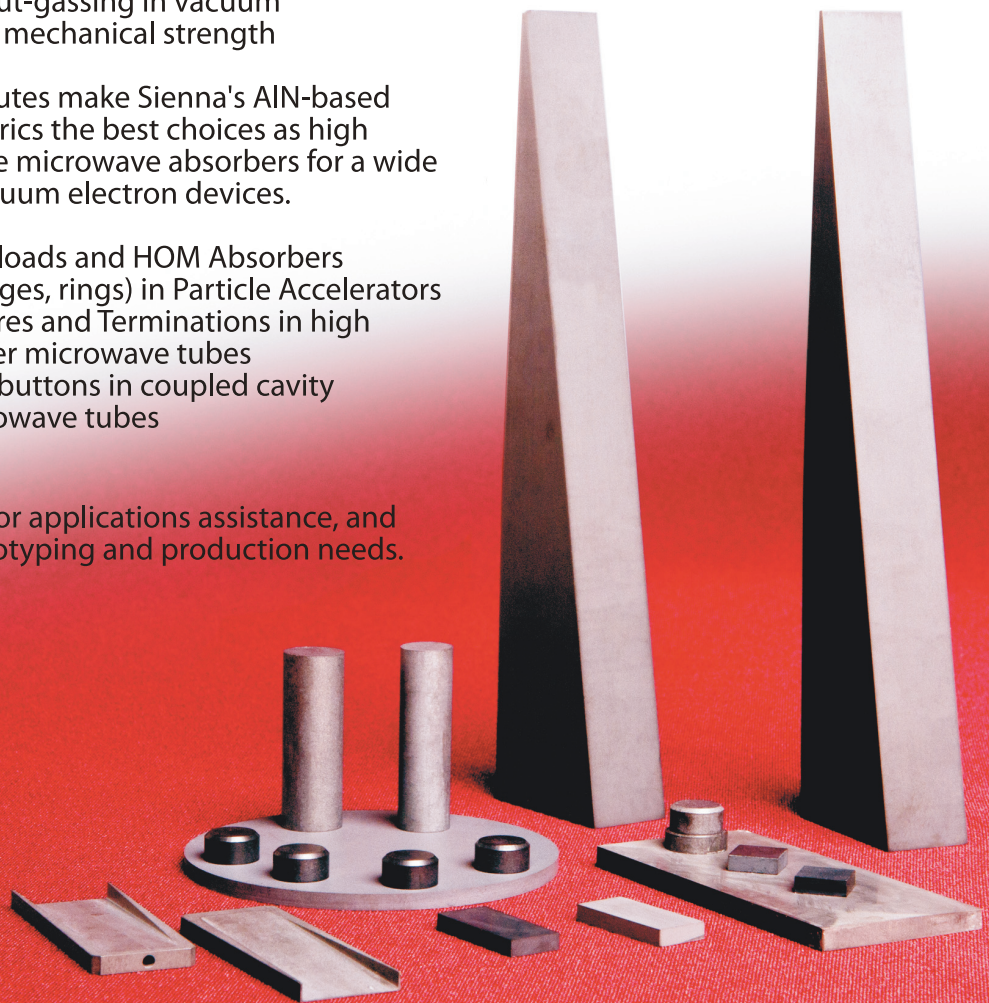
Sienna's AlN-based lossy dielectrics offer:

- Customizable dielectric properties to meet specific absorption and frequency requirements
- Temperature independent loss characteristics
- Microwave absorption down to 2K
- Thermal conductivity that is comparable to or better than BeO-SiC composites
- No out-gassing in vacuum
- High mechanical strength

These attributes make Sienna's AlN-based lossy dielectrics the best choices as high performance microwave absorbers for a wide range of vacuum electron devices.

- Loss loads and HOM Absorbers (wedges, rings) in Particle Accelerators
- Severs and Terminations in high power microwave tubes
- Loss buttons in coupled cavity microwave tubes

Contact us for applications assistance, and for fast prototyping and production needs.



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 **SIENNA**  
TECHNOLOGIES Inc.®  
providing solutions through advanced materials

# STL-100 and STL-150D

## AlN LOSSY DIELECTRIC PROPERTIES

	STL-100HTC	STL-100F	STL-150D
<b>Composition</b>	AlN - SiC (Composite)	AlN - SiC (Composite)	AlN (Doped)
<b>Density, g/cm<sup>3</sup></b>	3.24	3.24	3.27
<b>Outgassing</b>	No	No	No
<b>Thermal Conductivity, W/m·K</b>	120±10	55±5	135±10
<b>Thermal Expansion Coefficient, X10<sup>-6</sup>/°C</b>	4.5	4.5	4.0
<b>Dielectric Constant</b> 2 GHz 6 GHz 10 GHz	24.5	32 25.0 23.0	23 20 19
<b>Loss Tangent</b> 2 GHz 6 GHz 10 GHz	0.21	0.32 0.32 0.32	0.41 0.39 0.40
<b>Flexural Strength, MPa</b>	410	650	300
<b>Elastic Modulus, GPa</b>	360	360	320
<b>Hardness, GPa</b>	16	16	12
<b>Application</b>	Lossy Dielectric, Replacement for BeO-SiC composites in high power applications, Severs, Terminations, Loss loads	Lossy Dielectric, Replacement for BeO-SiC composites, Loss buttons	Lossy Dielectric, HOM Absorbers, Severs, Terminations, Loss loads
<b>Additional Attributes</b>	<ul style="list-style-type: none"> <li>• Properties can be tailored by changing composition.</li> <li>• High thermal conductivity</li> </ul>	<ul style="list-style-type: none"> <li>• Properties can be tailored by changing composition</li> </ul>	<ul style="list-style-type: none"> <li>• Properties can be tailored by changing composition.</li> <li>• Lower dielectric constant than STL-100F</li> <li>• Maintains loss characteristics at cryogenic temperatures to 2K</li> </ul>

The information given herein is a representation of typical properties and is not specifications.  
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