

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.

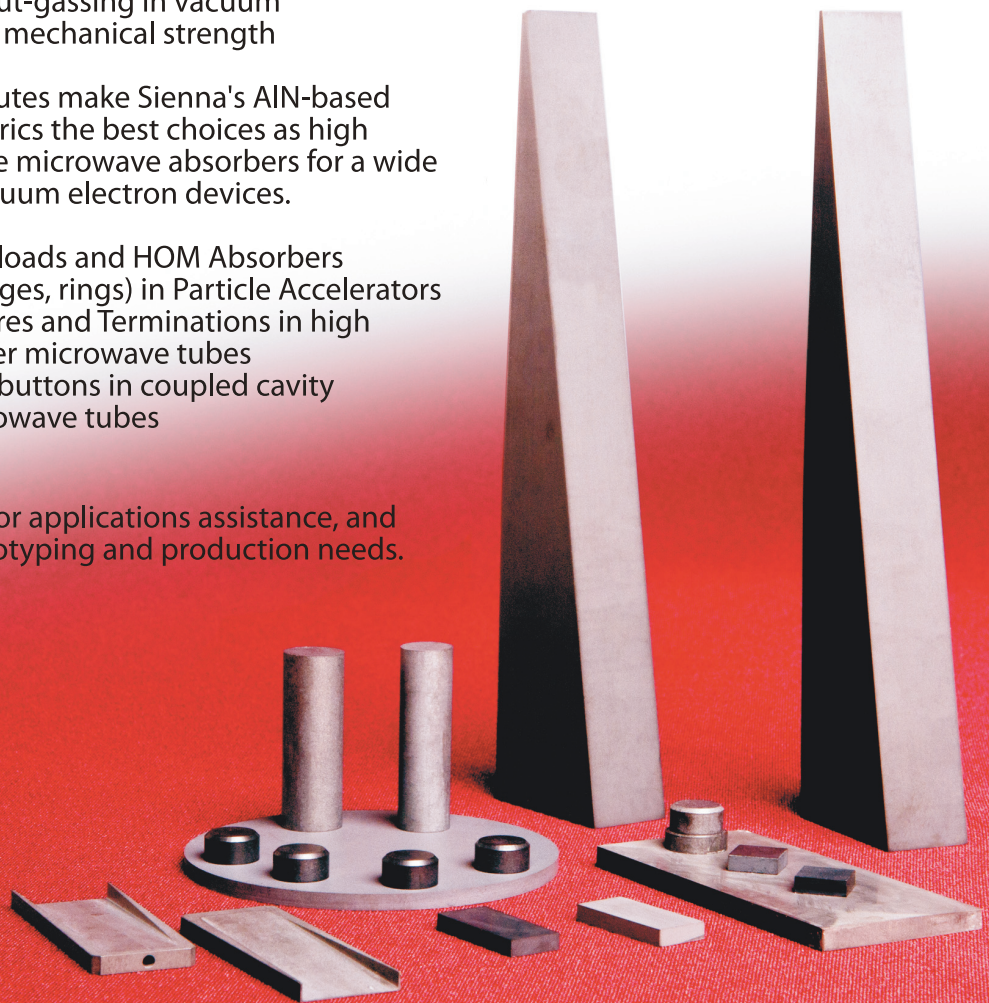
Sienna's AlN-based lossy dielectrics offer:

- 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-150D11
Composition	AlN - SiC (Composite)	AlN - SiC (Composite)	AlN (Doped)
Density, g/cm³	3.24	3.24	3.27
Outgassing	No	No	No
Thermal Conductivity, W/m·K	120±10	55±5	135±10
Thermal Expansion Coefficient, X10⁻⁶/°C	4.5	4.5	4.0
Dielectric Constant 2 GHz 6 GHz 10 GHz	24.5	32 25.0 23.0	23 20 19
Loss Tangent 2 GHz 6 GHz 10 GHz	0.21	0.32 0.32 0.32	0.41 0.39 0.40
Flexural Strength, MPa	410	650	300
Elastic Modulus, GPa	360	360	320
Hardness, GPa	16	16	12
Application	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
Additional Attributes	<ul style="list-style-type: none"> • Properties can be tailored by changing composition. • High thermal conductivity 	<ul style="list-style-type: none"> • Properties can be tailored by changing composition 	<ul style="list-style-type: none"> • Properties can be tailored by changing composition. • Lower dielectric constant than STL-100F • Maintains loss characteristics at cryogenic temperatures to 2K

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