Technical Data Sheet

LCP Spectrum Silence™

Elect Nano LCP Spectrum Silence™ is a space-engineered, broadband electromagnetic interference (EMI) shielding nanocomposite injection-molding compound based on a liquid crystal polymer (LCP) matrix. The formulation integrates Elect Nano's patented discrete carbon nanotube (dCNT) technology with proprietary shielding fillers to achieve greater than 30 dB/mm shielding effectiveness from 30 MHz to 110 GHz. The filler system delivers strong EMI attenuation while maintaining low magnetic remanence, ensuring compatibility with sensitive magnetometers and spacecraft sensing systems. Spectrum Silence™ is engineered to be fully demisable upon atmospheric reentry, supporting responsible end-of-life disposal. Additional advantages include high-temperature stability, low outgassing, and resistance to atomic oxygen.

	Test Method	Unit	Values
Physical Properties			
Density	ASTM D792	g/cm³	2.41
Mold Shrinkage (FD* – 6" X 6" plaque)	Internal	%	0.15
Mold Shrinkage (TD* – 6" X 6" plaque)	Internal	%	0.26
Mechanical Properties			
Tensile Strength	ISO 527-1,2	MPa	TBD
Tensile Modulus	ISO 527-1,2	GPa	TBD
Tensile Elongation at Break	ISO 527-1,2	%	TBD
Flexural Strength	ASTM D790	MPa	TBD
Flexural Modulus	ASTM D790	GPa	TBD
Notched Izod Impact Strength	ASTM D256	J/m	TBD
Thermal			
Specific Heat Capacity	ASTM E1269	J/(kg·K)	TBD
Thermal Effusivity	ASTM D7984	W·√s/(m²·K)	TBD
Thermal Conductivity	ASTM D7984	W/(m·K)	0.71
Heat Deflection Temperature (1.82 MPa)	ASTM D648	˚C	TBD
Coefficient of Thermal Expansion (FD*)	ASTM E831	µm/(m·˚C)	TBD
Coefficient of Thermal Expansion (ND*)	ASTM E831	µm/(m·˚C)	TBD
Electrical			
Shielding Effectiveness (30 MHz – 110 GHz)	Internal	dB/mm	>30
Surface Resistance	ANSI STM11.11	Ohm	<1E+03

* FD = Flow Direction, TD = Transverse (Cross Flow) Direction, ND = Normal (Thickness) Direction

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Processing Guidelines

Elect Nano LCP Spectrum Silence™ is generally noted to have low moisture absorption at equilibrium, but properly drying material prior to injection molding is critical in achieving high quality molded parts. Drying should be carried out in a desiccant or membrane dryer that can maintain a dew point of < -40˚C. Proper mold cavity design is critical for achieving high strength, defect-free parts. Ensure cavities have uniform wall thickness where possible and smooth transitions in areas with varying wall thickness to avoid jetting and backfilling which can entrap air. Maximize the injection speed until flow instabilities or surface defects are observed. Increase venting at the end of flow patterns and weld lines until flash appears.

	Unit	Recommended	Range
Drying Conditions			
Max Moisture Content	ppm	<100	0 – 300
Drying Time	hrs	6	4 – 8
Drying Temperature	˚C	140	130 – 150
Processing Parameters			
Injection Pressure	MPa	100	80 – 160
Injection Holding Pressure	MPa	60	40 – 100
Back Pressure	MPa	3	1 – 4
Holding Time	s	2	0.5 – 4
Injection Rate	cc/s	120	40 – 160
Injection Speed†	mm/s	60	20 – 80
Suck Back (Decompression)	mm	1	0 – 4
Melt Cushion	mm	4	3 – 5
Feed Zone Temperature	˚C	305	270 – 310
Compression Zone Temperature	˚C	300	280 – 300
Metering Zone Temperature	˚C	290	280 – 295
Nozzle Temperature	˚C	300	290 – 310
Melt Temperature	˚C	290	280 – 315
Mold Temperature	˚C	100	90 – 120
Screw Tangential Speed	mm/s	190	180 – 200
Screw Rotational Rate†	RPM	75	60 – 250

†*Note: Linear injection speed (mm/s) and screw rotational rate (RPM) values depend on screw diameter. Values shown are calculated from the injection rates and screw tangential speed ranges for a 50mm diameter screw.*

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