Technical Data Sheet

Carbon Clad™

Elect Nano Carbon Clad™ is an ultra-matte black discrete carbon nanotube coating engineered to deliver CVD-like low reflectance in a practical, water-based paint format. Designed for metals, plastics, ceramics, and composite surfaces, Carbon Clad™ forms a deep black, highly light-absorbing finish for optical control, stray-light suppression in sensor housings, baffles, scientific instruments, and advanced aerospace hardware. The water-based formulation supports safer handling, straightforward spray or brush application, and faster integration into production workflows compared with vacuum-deposited ultra-black surfaces. Carbon Clad™ is silicone-free and PFAS-free, making it well suited for clean manufacturing environments, optical assemblies, electronics hardware, terrestrial instruments, and space applications where atomic oxygen exposure is not a primary design constraint.

	Test Method	Unit	Values
Physical Properties			
Density (dry)	ASTM D792	g/cm³	0.389
Weight Percent Solids Content	ASTM D2369	%	12.6
Zahn Cup Viscosity	ASTM D4212		TBD
Rotational Viscosity	ASTM D2196	cP	4.3
Optical Properties			
Specular Gloss	ASTM D523		TBD
Hemispherical Reflectance	ASTM E1331	%	2.3
BRDF	ASTM E2387		TBD
Mechanical Properties			
Pencil Hardness Gouge	ASTM D3363		5H
Pencil Hardness Scratch	ASTM D3363		H
Crosscut Adhesion	ASTM D3359		4B
Impact Resistance	ASTM D2794		TBD
Flexibility Conical Mandrel Bend	ASTM D522		TBD
Thermal			
Degradation Temperature	ASTM E1131	˚C	>200
Electrical			
Surface Resistance	ANSI STM11.11	Ohm	>1E12

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Processing Guidelines

Before coating, thoroughly clean substrates with a mild detergent or solvent (IPA or ethanol) and dry completely; for polished metals, optional light abrasion enhances adhesion, followed by an oil-free air blast. Shake Carbon Clad™ for at least two minutes, then strain through a 190-mesh filter. If needed, thin up to 20% with deionized water or alcohol to reach a Zahn #2 viscosity of 18 – 22 s. Use an HVLP gun fitted with a 1.2 – 1.4 mm tip, setting supply air to 30 – 40 psi and maintaining ≤10 psi at the cap (fluid pressure 1.5 – 3 psi), with a medium fan pattern. Hold the gun 8 – 12 inches from the part and apply two to three light coats in a cross-hatch pattern with 50% overlap, starting and ending each pass beyond the edges to avoid buildup. Allow parts to flash at room temperature until tacky (10 – 30 min), then cure either at 60 °C for one hour in a forced-air oven (ramping ~10 °C/min) or by ambient drying for 24 hours. After cure, verify hardness (ASTM D3363 ≥ H). Clean equipment immediately with warm water or solvent, and store unused paint in sealed containers below 25 °C, away from direct sunlight.

	Unit	Recommended	Range
Coating Properties			
Wet film thickness	µm	320	150 – 400
Dry coating thickness	µm	40	20 – 60
Theoretical coverage @ rec. thickness	m²/L	3.15	2 – 4
Coating application ambient temperature	˚C	23	15 – 30
Coating application ambient humidity	%RH	50	30 – 70
Processing Parameters			
Strainer size	mesh	190	150 – 200
HVLP gun tip size	mm	1.2	1.2 – 1.4
HVLP gun supply pressure	psi	35	30 – 40
Curing Conditions			
Solvent flash	min	15	10 – 30
Oven cure time (optional)	min	60	45 – 90
Oven cure temperature	˚C	60	50 – 120
Ambient cure time	hrs	24	18 – 48

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