Optic Clear Solutions	**KleHeet™** **Functionalized Graphene Thermal-Management Coating**	Catalog Listing KleHeet™
Drawn by: ST	**Revision:** F **Date:** 28 Sept 26	**Scale:** None
Tolerances: See Figure	**Approvals:**	**Sheet** 1 **of** 3
Optic Clear Solutions Coatings Division Weiser, Idaho 83672		

Product Overview

Product Name: *KleHeet™*
Type: Multi-functional Thermal-Management Coating
Functionality: Thermal Management and Protective Surface
Key Component: Functionalized Graphene Nanoparticles

Product Description

KLeHeet™ is a one-part, solvent-based functional coating formulated with uniformly dispersed, functionalized graphene particles. The coating is engineered to provide a controlled thermal-transport path across coated surfaces while maintaining coating integrity and protective surface performance.

Current testing has demonstrated preliminary thermal conductivity in the 2-3 W/m·K range at ≥200 µm dry-film thickness. The defined KLeHeet target specification is 5-8 W/m·K; formulation improvement and independent validation are in progress before this range is released as final product performance.

Final performance depends on substrate, surface preparation, dry-film thickness, coating continuity, curing, interface condition, geometry, temperature and application method. Items shown as TBD, In Progress, Preliminary, or Verify are not final acceptance limits.

Preliminary

Key Benefits & Features — KleHeet™

Feature	Description
Thermal Management	Functionalized graphene provides the thermal-transport network used to manage heat across the coating. Target thermal conductivity is 5-8 W/m·K; validation and product improvement are in progress. Thermal diffusivity and system heat-transfer performance remain TBD / In Progress.
Heat Spreading / Temperature Uniformity	Designed to distribute heat across coated surfaces and reduce localized thermal gradients. Quantified performance: TBD / In Progress.
Uniform Graphene Dispersion	Engineered dispersion promotes consistent graphene distribution throughout the one-part coating to support repeatable thermal, electrical and surface performance.
Durable Protective Barrier	Forms a continuous coating layer intended to protect the substrate while maintaining functional thermal performance. Final KLeHeet corrosion/mechanical values: Verify / In Progress.
Thermal & Chemical Stability	Designed for elevated-temperature and chemical exposure. Final operating-temperature and resistance limits: TBD / In Progress.
Surface Compatibility	Intended for properly prepared metals, composites, polymers and other approved substrates. Compatibility must be confirmed for each substrate/primer system.
One-Part Formulation	Single-component coating intended to simplify preparation and application.
Flexible / Conformal Application	Intended primarily for spray application on complex geometries. Development dry-film thickness: ≥200 µm.

Preliminary

Applications

- Power electronics, inverters, converters and power supplies
- Electronic/electrical enclosures and control cabinets
- Heat-spreader and heat-sink surfaces
- Motors, generators, pumps and industrial equipment housings
- Battery and EV thermal-management surfaces
- Aerospace, defense and marine electronics
- Data-center, server, rack and telecom equipment
- Sensors, LED assemblies and instrumentation

Specification note: KLeHeet™ is in product-improvement and validation phase. Final performance characteristics will be released only after the applicable test method, specimen construction, DFT, process controls and acceptance criteria are established.

Technical Specifications

Property	Value / Range	Test Method / Status
Appearance	Brown / Verify	Final cured coating
Graphene Content	8.34 wt.% / Verify	Internal method
Dry-Film Thickness	≥200 µm	Process measurement
Through-Plane Thermal Conductivity	5-8 W/m·K	Target Specification - Validation In Progress
Thermal Diffusivity	~4–7 mm²/s	Calculated Engineering Prediction — Validation Required
Specific Heat Capacity	~800–1,200 J/kg·K	Engineering Prediction — Validation Required
Heat Spreading / Thermal Transfer	Reduction in surface ΔT vs. control	Target — Quantification In Progress
Operating Temperature Range	TBD	In Progress
Thermal Cycling	TBD - In Progress	Qualification method TBD
Corrosion Resistance	Verify	Based on KLeGuard® / KLeProtect® platform performance; KLeHeet validation in progress
Bond / Adhesion	Verify / In Progress	Final qualification method TBD
Impact Resistance	Verify	Based on KLeGuard® / KLeProtect® platform performance; KLeHeet validation in progress
Flash Point	34°C / Verify	ASTM D93 / EPA 1010
VOC Content	352 g/L / Verify	ASTM D2369
Shelf Life	TBD - In Progress	Stability validation
Areal Thermal Resistance	~0.025–0.040 cm²·K/W @ 200 µm	Calculated from Target k
In-Plane Thermal Conductivity	TBD	Characterization In Progress

Notes:
Thermal Conductivity Directionality: KLeHeet thermal performance will be characterized in both through-plane and in-plane directions. Through-plane conductivity represents heat transport across the coating thickness and is assigned the 5-8 W/m·K target range. In-plane conductivity represents lateral heat-spreading capability and remains under characterization.
Engineering Calculation Note: Predicted thermal diffusivity uses $\alpha = k/(\rho Cp)$ with target $k = 5–8$ W/m·K, nominal $\rho \approx 1{,}200$ kg/m³ and nominal $Cp \approx 1{,}000$ J/kg·K. Areal thermal resistance at 200 µm uses $R'' = L/k$. Calculated/predicted values are not independently measured product specifications and require validation.

Preliminary

Instructions for Use

- Surface Preparation: Surface must be clean, dry, and free from contaminants. Final substrate-specific preparation requirements: TBD / Verify.
- Application: Spray application is the primary KLeHeet development method. Final equipment, pass thickness and process window: In Progress.
- Dry-Film Thickness: ≥200 µm development baseline. Final production tolerance: TBD.
- Cure: Current OCS platform cure information is under KLeHeet verification. Final cure schedule: TBD / In Progress.

Storage & Handling

- Final KLeHeet storage temperature and shelf-life limits: TBD / In Progress.
- Refer to the applicable KLeHeet SDS for safety and handling requirements when released.

Preliminary