SAFETY DATA SHEET

ThermaGraph-D™ Immersion Cooling Fluid

SKUs: GI-TGD-5GAL, GI-TGD-55GAL, GI-TGD-275GAL

Safety Data Sheet

Prepared in OSHA Hazard Communication Standard (29 CFR 1910.1200, HazCom 2012) / GHS 16-section format. Revision date 2026-11-19. No measured value has been invented: finished-product values are “Reported on lot Certificate of Analysis” or “Not determined”; values labeled “typical, base fluid” are published carrier data.

1. IDENTIFICATION

Product identifier	ThermaGraph-D™ Immersion Cooling Fluid
Product codes (SKUs)	GI-TGD-5GAL, GI-TGD-55GAL, GI-TGD-275GAL
Product description	Formulated as a low-conductivity dielectric with enhanced thermal conductivity; measured values on lot CoA.
Recommended use	Dielectric heat-transfer fluid for single-phase immersion cooling of data center electronics.
Restrictions on use	Single-phase immersion only. Not for two-phase systems, water or glycol loops, or HVAC. Do not energize immersed equipment until this lot’s breakdown voltage and conductivity appear on its COA.
Supplier / manufacturer	Graphene Integrations, LLC (manufacturer of the graphene and of this product), 8101 Beatty Rd, Sherrills Ford, NC 28673, USA
Email	sales@grapheneintegrations.com
Website	grapheneintegrations.com
Phone	+1 (704) 659-3682
Emergency phone number	+1 (704) 659-3682 (24-hour emergency number)

2. HAZARD(S) IDENTIFICATION

GHS / OSHA HazCom 2012 classification	Aspiration hazard, Category 1. Classified conservatively from the carrier: white mineral oil grades with a kinematic viscosity of 20.5 mm^2/s (cSt) or less at 40 °C are Aspiration Category 1 (base-fluid supplier SDS, low-viscosity white mineral oil grade). The white mineral oil grade is selected per order and shown on the COA. Grades above 20.5 cSt are not classified, but this SDS applies the stricter classification to every grade.
Signal word	Danger
Hazard statements	H304: May be fatal if swallowed and enters airways.
Pictograms	GHS08 (health hazard)
Precautionary statements	P301+P310: IF SWALLOWED: Immediately call a POISON CENTER or doctor. P331: Do NOT induce vomiting. P405: Store locked up. P501: Dispose of contents/container in accordance with local, state and federal regulations.

Hazards not otherwise classified	Spills make floors very slippery. Not classified as flammable (flash point above 93 °C, typical, base fluid).
Ingredient(s) of unknown acute toxicity	Up to 0.20% of the mixture consists of graphene of unknown acute toxicity.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Mixture: graphene pre-mixed in a liquid carrier, never supplied as a dry powder. Contains no glycol, no other additives and no carbon black.

Component	CAS number	Concentration (% by weight)
Graphene	1034343-98-0	0.05–0.20
White mineral oil (petroleum), grade per order	8042-47-5	≥99.8

Trade secret claim	None claimed.

4. FIRST-AID MEASURES

Ingestion	Do NOT induce vomiting. Immediately call a poison center or doctor. Aspiration into the lungs can cause chemical pneumonitis. Never give anything by mouth to an unconscious person.
Eye contact	Rinse with plenty of water for at least 10 minutes, removing contact lenses if easy to do. Get medical attention if irritation persists.
Skin contact	Wash with soap and water. Remove contaminated clothing.
Inhalation	Not expected under normal use (low vapor pressure). If mist is inhaled, move to fresh air.
Most important symptoms and effects	If aspirated: coughing, choking, chemical pneumonitis. Prolonged skin contact may cause dryness.
Immediate medical attention / special treatment	Treat symptomatically. If ingested, consider the aspiration risk.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media	Foam, dry chemical, CO_2 or water spray.
Unsuitable extinguishing media	Do not use a direct water jet, which can spread burning oil.
Specific hazards	Combustion may produce carbon monoxide, carbon dioxide and smoke.
Firefighter protection	Self-contained breathing apparatus and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment, emergency procedures	1) Isolate electrical power to the affected racks or equipment according to site lockout/tagout procedures before cleanup. 2) Stop the leak at the source if it is safe to do so (isolate the loop or tank valves). 3) Wear nitrile gloves and safety glasses. 4) Spilled fluid is slippery, so mark the area and keep people out.
Environmental precautions	Keep out of drains, sewers and waterways.

Methods and materials for containment and clean-up	Contain with oil-absorbent socks or pads. Collect into a labeled container. Degrease the surfaces, then dry them. Inspect the equipment and check that it is dry and clean before re-energizing it.

7. HANDLING AND STORAGE

Precautions for safe handling	Mix or roll the container before use. Avoid contact with eyes. Wash hands after handling. Do not eat, drink or smoke in work areas. Keep out of reach of children.
Conditions for safe storage	Store in tightly closed containers, indoors, away from strong oxidizers and heat. See the lot COA for shelf life or contact GI.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Occupational exposure limits	Mineral oil mist: OSHA PEL TWA 5 mg/m^3; ACGIH TLV TWA 5 mg/m^3 (inhalable fraction, highly refined oil) (base-fluid supplier SDS, low-viscosity white mineral oil grade). Graphene: no OSHA PEL or ACGIH TLV has been established.
Engineering controls	General ventilation is adequate. Avoid generating mist.
Eye / face protection	Safety glasses with side shields.
Skin / hand protection	Nitrile gloves.
Respiratory protection	Not normally required. If mist is generated above the exposure limits, use a NIOSH-approved respirator.

9. PHYSICAL AND CHEMICAL PROPERTIES

Conductivity (electrical / thermal)	Formulated as a low-conductivity dielectric with enhanced thermal conductivity; measured values on lot CoA.
Physical state	Liquid
Appearance / color	Dark grey to black liquid (graphene dispersed in white mineral oil). Mix before use; graphene may settle.
Odor	Odorless to slight (typical, base fluid)
pH	Not applicable (non-aqueous)
Pour point	−26 °C (low-viscosity grade, typical, base fluid; base-fluid supplier SDS, low-viscosity white mineral oil grade)
Initial boiling point and range	299–520 °C (typical, base fluid; low-viscosity grade)
Flash point (method)	Above 112 °C, closed cup (low-viscosity grade) to above 187.8 °C, ASTM D92 COC (USP grades) (typical, base fluid; base-fluid supplier SDS, USP-grade white mineral oil)
Auto-ignition temperature	325–355 °C (typical, base fluid; low-viscosity grade)
Vapor pressure	Negligible (typical, base fluid)
Vapor density (air = 1)	>1 (typical, base fluid)

Relative density	0.85 (low-viscosity grade) to 0.86–0.88 (USP grades) (typical, base fluid)
Solubility	Insoluble in water
Viscosity	12 cSt at 40 °C for a low-viscosity grade (typical, base fluid). The grade varies by order. Reported on the lot Certificate of Analysis (COA).
Electrical conductivity / volume resistivity	Reported on the lot Certificate of Analysis (COA). Method: IEC 60247 or ASTM D1169.
Dielectric breakdown voltage	Reported on the lot Certificate of Analysis (COA). Method: ASTM D877 or ASTM D1816.
Water content	Reported on the lot Certificate of Analysis (COA). Method: ASTM D6304.
Graphene content	0.05–0.20 wt%. Reported on the lot Certificate of Analysis (COA).

10. STABILITY AND REACTIVITY

Reactivity	Not reactive under normal conditions.
Chemical stability	Stable. Graphene may settle over time, so mix before use.
Possibility of hazardous reactions	None known.
Conditions to avoid	Heat, open flames, strong oxidizers. Water contamination, which lowers breakdown voltage.
Incompatible materials	Strong oxidizers.
Hazardous decomposition products	Carbon oxides in a fire.

11. TOXICOLOGICAL INFORMATION

Likely routes of exposure	Skin and eye contact. Ingestion is unlikely. Inhalation only if mist forms.
Acute toxicity estimates	Base fluid (white mineral oil): oral LD50 (rat) >5,000 mg/kg; dermal LD50 (rabbit) >2,000 mg/kg (base-fluid supplier SDS, low-viscosity white mineral oil grade). Graphene: Graphene was assigned no harmonized GHS classification. Published reviews (Fadeel et al., ACS Nano 2018, Safety Assessment of Graphene-Based Materials: https://pubmed.ncbi.nlm.nih.gov/30387986/) report that the main concern is inhaling dry, airborne particles. This product contains graphene only as a dispersion in a liquid, not as a powder. Toxicity data for this graphene grade in this form are not available.
Skin corrosion / irritation	Not classified (base fluid). Prolonged contact may defat skin.
Serious eye damage / irritation	Not classified. May cause mild, temporary discomfort.
Respiratory or skin sensitization	Not classified.
Germ cell mutagenicity	Not classified.
Carcinogenicity (NTP, IARC, OSHA)	Highly refined white mineral oils are not listed by NTP, IARC or OSHA as carcinogens. Graphene is not listed.

Reproductive toxicity	Not classified.
STOT single / repeated exposure	Not classified.
Aspiration hazard	Category 1 (see Section 2).
Food-grade status of base fluid	White mineral oil is permitted for certain food uses under 21 CFR 172.878: https://www.ecfr.gov/current/title-21/chapter-I/subchapter-B/part-172/subpart-I/section-172.878. This product is NOT for food use.

12. ECOLOGICAL INFORMATION

Ecotoxicity	Base fluid: low aquatic toxicity, but oil films can harm aquatic life. Graphene: limited data, and effects in aquatic systems are still being studied (Fadeel et al., ACS Nano 2018, Safety Assessment of Graphene-Based Materials: https://pubmed.ncbi.nlm.nih.gov/30387986/).
Persistence and degradability	Base oil: inherently biodegradable, slowly. Graphene: not biodegradable; persistent.
Bioaccumulative potential	No data.
Mobility in soil	Low (oil adsorbs to soil).
Other adverse effects	None known.

13. DISPOSAL CONSIDERATIONS

Waste treatment / disposal methods	Recycle or dispose of as used oil through a licensed handler. Follow local, state and federal regulations.
Contaminated packaging	Empty the container completely, then recycle or dispose of it according to local regulations.

14. TRANSPORT INFORMATION

UN number	Not regulated
UN proper shipping name	Not regulated
Transport hazard class(es)	Not regulated (US DOT, IATA, IMDG)
Packing group	Not applicable
Environmental hazards (marine pollutant)	No
Special precautions	Keep containers upright and closed.

15. REGULATORY INFORMATION

TSCA inventory status	White mineral oil (8042-47-5): listed. Graphene (1034343-98-0): Not identified on the public TSCA Chemical Substance Inventory. EPA has handled graphene and graphene nanoplatelets as new chemical substances (premanufacture notices with significant new use rules, e.g. 40 CFR 721.10844 and 721.11917). Some suppliers report graphene nanoplatelets under graphite (7782-42-5, TSCA active); that listing has not been applied to this product. Contact Graphene Integrations for the current TSCA status of the graphene in this product.
SARA 311/312	Aspiration hazard
SARA 313	No listed chemicals
CERCLA reportable quantity	None
California Proposition 65	Highly refined white mineral oil is not a Proposition 65 listed substance. Contains no carbon black. Contact GI for Proposition 65 questions.

16. OTHER INFORMATION

Prepared by	Graphene Integrations, LLC, 8101 Beatty Rd, Sherrills Ford, NC 28673, USA • sales@grapheneintegrations.com
Revision date	2026-11-19
Revision	Version 4.1 (revised 2026-11-19)
Notes	Graphene is supplied only pre-mixed in a liquid carrier, never as a dry powder. Finished-product values are reported on each lot's Certificate of Analysis. Aligned with ThermaGraph SDS v3 (2026-10-29).
Disclaimer	The information in this SDS is believed to be accurate as of the revision date. It does not constitute a warranty. Users should determine the suitability of this product for their own use.