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	Graphene Gear Oil Additive
Product codes (SKUs)	GI-GOA-32OZ, GI-GOA-1GAL, GI-GOA-5GAL
Product form	Ready-to-use liquid: graphene (1–7 wt%) pre-mixed in tall oil fatty acid (TOFA) carrier. Ready to use; do not dilute.
Recommended use	Ready-to-use graphene gear oil product, graphene 1–7 wt%. Use as supplied; do not dilute or let down.
Restrictions on use	Industrial/professional use only. Not for food, drug or cosmetic use. Not for direct consumer use. Do not dilute.
Supplier / manufacturer	Graphene Integrations, LLC, 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	Not classified. Carrier tall oil fatty acids (61790-12-3): physical hazards, health hazards and OSHA defined hazards not classified; not a hazardous chemical under 29 CFR 1910.1200 (carrier supplier SDS for tall oil fatty acids). Graphene: no harmonized GHS classification. Reported on lot Certificate of Analysis
Signal word	None
Hazard statements	None (does not meet the criteria for classification)
Pictograms	None
Precautionary statements	Prevention: Observe good industrial hygiene practices. Response: Wash hands after handling. Storage: Store away from incompatible materials. Disposal: Dispose of waste and residues in accordance with local authority requirements.
Hazards not otherwise classified	After prolonged contact with highly porous materials (rags, paper, insulation, organic clay), this product may spontaneously combust. Spills make floors slippery. Stains black.

Ingredient(s) of unknown acute toxicity	Graphene content is of unknown acute toxicity. Graphene is 1–7 wt%; the exact percentage is withheld as a trade secret (29 CFR 1910.1200(i)) and reported on the lot Certificate of Analysis.

3. COMPOSITION / INFORMATION ON INGREDIENTS

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

Component	CAS number	Concentration (% by weight)
Graphene	1034343-98-0	1–7
Tall oil fatty acids (basic grade)	61790-12-3	Balance (about 93–99)

4. FIRST-AID MEASURES

Inhalation	Move to fresh air. Call a physician if symptoms develop or persist.
Skin contact	Wash off with soap and water. Get medical attention if irritation develops and persists.
Eye contact	Rinse with water. Get medical attention if irritation develops and persists.
Ingestion	Rinse mouth. Get medical attention if symptoms occur.
Most important symptoms and effects	Direct contact with eyes may cause temporary irritation.
Immediate medical attention / special treatment	Treat symptomatically. Ensure medical personnel are aware of the material involved.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media	Water fog, foam, dry chemical powder, carbon dioxide (CO2).
Unsuitable extinguishing media	Do not use a water jet; it will spread the fire.
Specific hazards	During fire, gases hazardous to health may be formed: carbon monoxide, carbon dioxide and/or low-molecular-weight hydrocarbons. Porous material wetted with this product may spontaneously combust.
Firefighter protection	Self-contained breathing apparatus and full protective clothing. Move containers from the fire area if safe to do so.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions	Keep unnecessary personnel away. Spills are slippery; wear gloves and eye protection.
Environmental precautions	Avoid discharge into drains, water courses or onto the ground.

Containment and clean-up	Large spills: stop the flow if safe, dike, cover with plastic sheet, soak up with non-combustible material (vermiculite, sand, earth) and place in a container for disposal; flush area with water after recovery. Small spills: clean surface thoroughly. Never return spills to original containers. Do not leave soaked absorbent or rags in open piles (self-heating).

7. HANDLING AND STORAGE

Precautions for safe handling	Porous material such as rags, paper, insulation or organic clay may spontaneously combust when wetted with this material; it may auto-oxidize and ignite if spread as a thin film or absorbed on porous or fibrous material. Put contaminated rags and cloths in fireproof containers. Avoid prolonged exposure. Ready to use; do not dilute. Mix before use (graphene may settle). Observe good industrial hygiene.
Conditions for safe storage	Do not store in direct sunlight. Store in original tightly closed container; keep closed when not in use. Store at ambient temperature and pressure, away from strong oxidizing agents.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Occupational exposure limits	Tall oil fatty acids (61790-12-3), oil mist, respirable: OSHA TWA 5 mg/m3; ACGIH TWA 5 mg/m3, STEL 10 mg/m3. Graphene: none established.
Engineering controls	Good general ventilation (typically 10 air changes per hour); local exhaust or enclosures to keep airborne levels below limits.
Eye / face protection	Safety glasses with side shields (or goggles).
Skin / hand protection	Chemical-resistant gloves; suitable protective clothing. Thermal protection when handling hot material.
Respiratory protection	In case of insufficient ventilation, wear suitable respiratory equipment.
General hygiene	Eye wash and emergency showers recommended. Wash after handling and before eating, drinking or smoking.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state / form	Liquid
Color	Black (graphene); carrier is yellow
Odor	Mild (carrier)
Odor threshold / pH	Not available
Melting / freezing point	Carrier: not available; pour point -8 °C (carrier supplier SDS)
Boiling point	Carrier: >200 °C
Flash point	Carrier: 200 °C Cleveland open cup; finished: Reported on lot Certificate of Analysis

Evaporation rate	0 (n-BuAc = 1), estimated
Flammability / explosive limits	Not available; carrier flammability class Combustible IIIB (estimated)
Vapor pressure	Carrier: 2.25 mm Hg at 150 °C
Vapor density	Not available
Relative density	Carrier: 0.9 at 25 °C (905 kg/m3 at 20 °C); finished: Reported on lot Certificate of Analysis
Solubility in water	Carrier: 12.6 mg/L at 20 °C
Partition coefficient (log Kow)	Carrier: 4.9 - 6 at 30 °C
Auto-ignition temperature	Carrier: 257 °C (similar-product data)
Decomposition temperature	Not available
Viscosity	Carrier: 25 cP at 20 °C; finished: Reported on lot Certificate of Analysis
Graphene content	Reported on lot Certificate of Analysis Graphene is 1–7 wt%; the exact percentage is withheld as a trade secret (29 CFR 1910.1200(i)) and reported on the lot Certificate of Analysis.

10. STABILITY AND REACTIVITY

Reactivity	Stable and non-reactive under normal conditions of use, storage and transport.
Chemical stability	Stable under normal conditions.
Possibility of hazardous reactions	None known under normal use.
Conditions to avoid	Temperatures above the flash point; contact with strong oxidizers; porous materials wetted with product (spontaneous combustion).
Incompatible materials	Strong oxidizing agents.
Hazardous decomposition products	Acrid dense smoke with carbon dioxide, carbon monoxide, water and other combustion products.

11. TOXICOLOGICAL INFORMATION

Likely routes of exposure	Skin and eye contact; inhalation of mist. Prolonged inhalation may be harmful (carrier).
Acute toxicity	Carrier: oral LD50 >10,000 mg/kg (rat); dermal LD50 >2,000 mg/kg (rabbit); classification criteria not met. 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	Prolonged skin contact may cause temporary irritation (carrier).

Serious eye damage / irritation	Direct contact may cause temporary irritation; carrier Draize test negative (rabbit).
Respiratory or skin sensitization	Carrier: not a skin sensitizer (Buehler and Magnusson-Kligman, OECD 406, guinea pig, negative). Respiratory: not available.
Germ cell mutagenicity	Carrier: Ames (OECD 471) negative.
Carcinogenicity (NTP, IARC, OSHA)	Carrier not listed by IARC, ACGIH, NTP or OSHA. Graphene not listed. Contains no carbon black.
Reproductive toxicity / STOT	Carrier: not expected to cause reproductive effects; STOT single and repeated exposure not classified.
Aspiration hazard	Not available.

12. ECOLOGICAL INFORMATION

Ecotoxicity	Carrier not classified as environmentally hazardous: bacteria EC50 >10,000 mg/L; algae EL50 >1,000 mg/L (72 h); Daphnia EL50 >1,000 mg/L (48 h); fish LL50 >10,000 mg/L (96 h). Graphene: limited data.
Persistence and degradability	Carrier readily biodegradable (88-100%, OECD 301B, 28 d). Graphene: not biodegradable; persistent.
Bioaccumulative potential	Carrier log Kow 4.9 - 6.
Mobility in soil	Carrier: no data. Graphene expected to bind to soil and sediment.

13. DISPOSAL CONSIDERATIONS

Disposal methods	Collect and reclaim or dispose of in sealed containers at a licensed waste disposal site, per all applicable regulations. Waste code to be assigned by user, producer and disposal company.
Contaminated packaging	Empty containers may retain residue; follow label warnings; send to an approved site for recycling or disposal.

14. TRANSPORT INFORMATION

DOT / IATA / IMDG	Carrier: not regulated as dangerous goods.
Transport in bulk (MARPOL/IBC)	Not available.
Special precautions	Keep containers upright and closed.

15. REGULATORY INFORMATION

OSHA HCS	Carrier not known to be a hazardous chemical (29 CFR 1910.1200).

TSCA inventory status	Tall oil fatty acids (61790-12-3): listed, active. 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 302 / 311/312 / 313	Carrier: not listed / No / not regulated.
CERCLA	Carrier not listed.
Clean Air Act HAPs / 112(r); SDWA	Carrier not regulated.
California Proposition 65	Tall oil fatty acids are not on the Prop 65 list and the carrier SDS reports no listing. Contains no carbon black.

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 1.2 (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. Carrier selection: tall oil fatty acid (TOFA) was chosen based on independent lab testing of three carriers (oleic acid, tall oil fatty acid and monomer acid) with 1% and 5% graphene: tall oil fatty acid gave the smallest single four-ball wear scar (0.57 mm, ASTM D4172), was the only carrier with lower tapping torque (ASTM D8288; estimate read from report curves) and gave the same 126 kgf weld load as the others (ASTM D2783, from 100 kgf). Grade: basic tall oil fatty acid grade. Composition: graphene 1–7 wt% in tall oil fatty acid (balance), less any dispersant; exact percentage withheld as a trade secret (29 CFR 1910.1200(i)). Reported on lot Certificate of Analysis Carrier data: carrier supplier SDS for tall oil fatty acids.
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.