# 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

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| **Product identifier** | Graphene Battery Additive |
| **Product codes (SKUs)** | GI-BAT-32OZ, GI-BAT-1GAL |
| **Product form** | Liquid dispersion: graphene in N-methyl-2-pyrrolidone (NMP) |
| **Recommended use** | Add during electrode slurry mixing. |
| **Restrictions on use** | Industrial/professional use only. Not for food, drug or cosmetic use. Not for direct consumer use. |
| **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

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| **GHS / OSHA HazCom 2012 classification** | Flammable liquid Category 4 (combustible liquid); Skin Irritation 2; Eye Irritation 2A; STOT Single Exposure 3 (respiratory irritation); Reproductive Toxicity Category 1B. Based on NMP at > 0.3% (reproductive cut-off); source: carrier supplier SDSs for N-methyl-2-pyrrolidone (NMP). |
| **Signal word** | Danger |
| **Hazard statements** | H227 Combustible liquid. H315 Causes skin irritation. H319 Causes serious eye irritation. H335 May cause respiratory irritation. H360D May damage the unborn child. |
| **Pictograms** | GHS08 (health hazard); GHS07 (exclamation mark) |

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| **Precautionary statements** | P201 Obtain special instructions before use. P202 Do not handle until all safety precautions have been read and understood. P210 Keep away from heat, sparks, open flames, hot surfaces. No smoking. P261 Avoid breathing vapors. P271 Use only outdoors or in a well-ventilated area. P280 Wear protective gloves/protective clothing/eye protection/face protection. P302+P352 IF ON SKIN: wash with plenty of water. P304+P340 IF INHALED: remove person to fresh air. P305+P351+P338 IF IN EYES: rinse cautiously with water for several minutes; remove contact lenses if easy; continue rinsing. P308+P313 IF exposed or concerned: get medical advice. P403+P233 Store in a well-ventilated place; keep container tightly closed. P405 Store locked up. P501 Dispose of contents/container per regulations. |
| **Hazards not otherwise classified** | NMP is readily absorbed through skin. Stains black. |
| **Ingredient(s) of unknown acute toxicity** | Graphene is of unknown acute toxicity. |

## 3. COMPOSITION / INFORMATION ON INGREDIENTS

Mixture: graphene pre-dispersed in the liquid carrier below. Never supplied as a dry powder. Contains no carbon black.

| Component | CAS number | Concentration (% by weight) |
|---|---|---|
| Graphene | 1034343-98-0 | Reported on lot Certificate of Analysis |
| N-Methyl-2-pyrrolidone | 872-50-4 | Balance |
| Dispersant (proprietary) | Not disclosed (trade secret) | About 5 |

## 4. FIRST-AID MEASURES

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| **Eye contact** | Rinse immediately with plenty of water for at least 15 minutes, also under the eyelids. Get medical attention. |
| **Skin contact** | Remove contaminated clothing immediately. Wash with plenty of water. Get medical attention if irritation persists. |
| **Inhalation** | Move to fresh air. If breathing is difficult, get medical attention. |
| **Ingestion** | Rinse mouth. Do not induce vomiting. Get medical attention. |
| **Most important symptoms and effects** | Eye, skin and respiratory tract irritation; headache. May damage the unborn child. |
| **Immediate medical attention / special treatment** | Treat symptomatically. Pregnant workers should be advised of the reproductive hazard. |

## 5. FIRE-FIGHTING MEASURES

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| **Suitable extinguishing media** | Water spray, alcohol-resistant foam, dry chemical, carbon dioxide. |
| **Unsuitable extinguishing media** | Do not use a solid water jet. |
| **Specific hazards** | Combustible liquid; vapors heavier than air; containers may rupture when heated. Combustion produces carbon oxides and nitrogen oxides (NOx). |

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| **Firefighter protection** | Self-contained breathing apparatus and full protective gear; cool containers with water spray. |

## 6. ACCIDENTAL RELEASE MEASURES

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| **Personal precautions** | Ventilate; remove ignition sources; wear chemical-resistant gloves, goggles and respirator as needed. Keep pregnant persons away. |
| **Environmental precautions** | Prevent entry into drains and waterways. |
| **Containment and clean-up** | Absorb with inert material (sand, diatomaceous earth); collect in closed labeled containers with non-sparking tools. |

## 7. HANDLING AND STORAGE

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| **Precautions for safe handling** | Obtain special instructions before use. Avoid contact with skin and eyes and breathing vapors. Use local exhaust; keep away from ignition sources. Mix before use. |
| **Conditions for safe storage** | Keep tightly closed in a dry, cool, well-ventilated place; store locked up; NMP is hygroscopic. Away from strong oxidizers, acids and bases. |

## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

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| **Occupational exposure limits** | NMP: no OSHA PEL; source SDS lists EU/UK WEL 40 mg/m³ (8 h) and 80 mg/m³ (15 min) with skin notation. Graphene: none established. |
| **Engineering controls** | Local exhaust ventilation; closed systems where practical. |
| **Eye / face protection** | Chemical goggles; face shield for splashing. |
| **Skin / hand protection** | Butyl rubber gloves (NMP penetrates nitrile quickly); protective clothing. |
| **Respiratory protection** | NIOSH-approved organic vapor respirator if ventilation is inadequate. |

## 9. PHYSICAL AND CHEMICAL PROPERTIES

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| **Physical state** | Liquid |
| **Appearance / color** | Black (graphene in colorless solvent) |
| **Odor** | Amine-like (carrier) |
| **pH** | Not applicable (non-aqueous; based on NMP carrier) |
| **Melting point** | -24 °C (carrier, typical) |
| **Boiling point** | 204 °C (carrier, typical) |
| **Flash point** | 91 °C (carrier, typical); finished: Reported on lot Certificate of Analysis |
| **Flammability limits** | LEL 1.3% / UEL 9.5% (v/v) (carrier, typical) |
| **Vapor pressure** | 0.32 hPa (carrier, typical) |

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| **Density** | 1.028 g/cm³ (carrier, typical); finished: Reported on lot Certificate of Analysis |
| **Solubility in water** | Miscible (carrier) |
| **Viscosity** | Reported on lot Certificate of Analysis |
| **VOC content** | Carrier is a VOC Reported on lot Certificate of Analysis |
| **Graphene content** | Reported on lot Certificate of Analysis |

## 10. STABILITY AND REACTIVITY

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| **Reactivity** | Not reactive under normal conditions. |
| **Chemical stability** | Stable; hygroscopic. |
| **Possibility of hazardous reactions** | Vigorous reaction with strong oxidizers. |
| **Conditions to avoid** | Heat, flames, sparks, moisture. |
| **Incompatible materials** | Strong oxidizers, strong acids, strong bases, reducing agents. |
| **Hazardous decomposition products** | Carbon monoxide, carbon dioxide, nitrogen oxides. |

## 11. TOXICOLOGICAL INFORMATION

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| **Likely routes of exposure** | Skin absorption, inhalation, eye contact. |
| **Acute toxicity** | Carrier: low acute toxicity per source SDS. 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 / eye** | Causes skin and serious eye irritation (carrier). |
| **STOT single exposure** | May cause respiratory irritation (carrier). |
| **Reproductive toxicity** | May damage the unborn child (Category 1B, carrier). |
| **Carcinogenicity** | Not listed by NTP, IARC or OSHA. Graphene not listed. No carbon black. |
| **Aspiration hazard** | Not classified. |

## 12. ECOLOGICAL INFORMATION

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| **Ecotoxicity** | Carrier: low aquatic toxicity per source SDS. Graphene: limited data (Fadeel et al., ACS Nano 2018, Safety Assessment of Graphene-Based Materials: https://pubmed.ncbi.nlm.nih.gov/30387986/). |
| **Persistence** | NMP readily biodegradable; graphene persistent. |
| **Bioaccumulative potential** | Low (carrier). |
| **Mobility in soil** | NMP mobile (water-miscible). |

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| **Other** | None known. |

## 13. DISPOSAL CONSIDERATIONS

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| **Waste treatment / disposal methods** | Dispose of as chemical waste via licensed handler; do not discharge to drains. RCRA status:. |
| **Contaminated packaging** | Empty completely, then recycle or dispose of per local regulations. |

## 14. TRANSPORT INFORMATION

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| **UN number / shipping** | Non-bulk: not regulated by US DOT (combustible liquid, flash point 91 °C); bulk may be regulated as combustible liquid. IMDG/IATA: not regulated as dangerous goods |
| **Marine pollutant** | No |
| **Special precautions** | Keep closed and upright. |

## 15. REGULATORY INFORMATION

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| **TSCA** | NMP (872-50-4): listed; subject to TSCA section 6 risk management rule for NMP. Graphene: 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** | Flammable (combustible), skin/eye irritation, STOT, reproductive toxicity |
| **SARA 313** | N-Methyl-2-pyrrolidone is a listed toxic chemical (de minimis 1%). |
| **California Proposition 65** | WARNING: N-Methylpyrrolidone is known to the State of California to cause birth defects or other reproductive harm (developmental toxicity). |

## 16. OTHER INFORMATION

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| **Prepared by** | Graphene Integrations, LLC, 8101 Beatty Rd, Sherrills Ford, NC 28673, USA • sales@grapheneintegrations.com |
| **Revision date** | 2026-11-19 |
| **Revision** | Version 1.1 (revised 2026-11-19) |

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| **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 data source (cited, typical values): carrier supplier SDSs for N-methyl-2-pyrrolidone (NMP). Graphene notes: Fadeel et al., ACS Nano 2018, Safety Assessment of Graphene-Based Materials: https://pubmed.ncbi.nlm.nih.gov/30387986/. |
| **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. |