



SAFETY DATA SHEET

GHS / OSHA HazCom 2012 Compliant

Minuteman Peptides, LLC

BPC-157/TB-500 Blend

CAS: n/a (blend) Formula: Blend

Document ID: 521092fd

Revision Date: 2026-07-19

Version: 1.0

Section 1 — Product and Company Identification

Product Name	BPC-157/TB-500 Blend
Synonyms	Wolverine Blend
CAS Number	Blend of : 77591-33-4, 137525-51-0
Molecular Formula	BLEND
IUPAC Name	BLEND (see individual Safety Data Sheets for individual IUPAC names of each included compound in the blend.
Identified Uses	Research laboratory chemical for in vitro scientific research and development use only.
Restriction on Use	Not for human or veterinary use. Not for food, drug, cosmetic, household, agricultural, clinical, therapeutic, or diagnostic applications.

Supplier:

Company	Minuteman Peptides, LLC
Address	53 Knox Trail, Suite 200, Acton, MA 01720, US
Phone	978-596-1533
Website	https://minutemanpeptides.com/
Emergency Contact	CHEMTREC
Emergency Phone	800-424-9300 CHEMTREC (USA) +1-703-527-3887 CHEMTREC (International) 24 Hours/day; 7 Days/ week

Section 2 — Hazard Identification

Classification of the substance

Not classified based on currently available data; however, data is limited and hazards cannot be fully characterized. The absence of classification should not be interpreted as a determination of the absence of hazard.

Classification has been conducted in accordance with 29 CFR 1910.1200 (OSHA HazCom 2012) and GHS Rev.8 using all available data and scientifically valid weight-of-evidence approaches (GHS Rev.8 Chapter 1.3.2.4), including read-across from chemical class and structural considerations where substance-specific study data is not available.

Signal Word: None

GHS Pictograms:

None required based on classification.

Hazard Statements

None. This substance is not classified for any GHS hazard class based on available data.

Precautionary Statements

- P261: Avoid breathing dust, fume, gas, mist, vapors, or spray.
- P264: Wash hands and exposed skin thoroughly after handling.
- P280: Wear protective gloves, protective clothing, and eye/face protection.
- P501: Dispose of contents and container in accordance with local, regional, national, and international regulations.

Precautionary statements are provided as best practice for handling substances with limited toxicological data, and are not a declaration of GHS classification.

Hazards Not Otherwise Classified (HNOC)

None known based on available data and weight-of-evidence assessment. The toxicological properties of this substance have not been fully characterized; handle as a potentially bioactive substance of unknown toxicity.

Section 3 — Composition / Information on Ingredients

Single-substance product. Chemical identity:

Ingredient	CAS Number	Mol. Formula	Mol. Weight	Concentration
Blend (see above)	See individual SDS	See individual SDS	See individual SDS	>98% (research grade)

Impurities

No hazardous impurities known to be present above the GHS classification thresholds specified in 29 CFR 1910.1200 Appendix A. Residual synthesis reagents, solvents, and counter-ions may be present at levels consistent with research-grade (>98% purity) material. Balance: non-hazardous impurities. Refer to the accompanying Certificate of Analysis (CoA) for the lot-specific impurity profile.

Section 4 — First Aid Measures

Eye Contact

Rinse cautiously with water for several minutes. If irritation persists, seek medical advice.

Skin Contact

Wash with soap and water. Remove contaminated clothing and wash before reuse. If irritation persists, seek medical advice.

Inhalation

Move affected person to fresh air. If symptoms develop, seek medical advice.

Ingestion

Rinse mouth thoroughly with water. If large amounts are swallowed or if symptoms develop, seek medical advice. Do not induce vomiting unless directed by medical personnel.

Note to Physician

Treat symptomatically. No specific antidote known.

Section 5 — Fire Fighting Measures

Flash Point: *Not determined*

Suitable Extinguishing Media

Use extinguishing media appropriate to the surrounding fire conditions. Carbon dioxide (CO₂), dry chemical powder, foam, or water spray.

Special Hazards

May produce toxic gases upon combustion. Carbon monoxide and other combustion products may be generated.

Protective Equipment for Firefighters

Wear self-contained breathing apparatus (SCBA) and full protective gear. Do not enter fire area without proper protective equipment.

Section 6 — Accidental Release Measures

Personal Precautions

Avoid dust formation. Avoid breathing vapors, mist, or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Use personal protective equipment as described in Section 8.

Environmental Precautions

Prevent further leakage or spillage if safe to do so. Do not allow the product to enter drains, sewers, or waterways.

Containment and Cleanup

Sweep up and shovel. Keep in suitable, closed containers for disposal. Avoid raising dust. Clean contaminated surface thoroughly. Dispose of waste in accordance with local regulations (see Section 13).

Section 7 — Handling and Storage

Handling Precautions

Handle in accordance with good laboratory practice (GLP) and OSHA Hazard Communication Standard (29 CFR 1910.1200). Because comprehensive toxicological data for GHK-Cu (CAS 300801-03-0) are not established, treat as a potentially bioactive substance of unknown toxicity and minimize all routes of exposure (inhalation, ingestion, skin/eye contact). Weigh and manipulate the dry powder in a ventilated enclosure (fume hood, powder-handling hood, or Class I/II biosafety cabinet) to control airborne particulates, consistent with the OSHA Laboratory Standard (29 CFR 1910.1450) and the NIOSH hierarchy of controls. Wear chemical-resistant nitrile gloves, a buttoned lab coat, and ANSI Z87.1-compliant safety eyewear; use a NIOSH-approved N95 or P100 filtering facepiece respirator when engineering controls do not eliminate the potential for dust generation. Avoid formation and inhalation of dust or aerosols. Do not eat, drink, smoke, or apply cosmetics in work areas. Wash hands and exposed skin thoroughly with soap and water after handling and before breaks. Use only non-sparking tools and clean equipment free of oxidizing residues. Keep containers tightly closed when not in use and re-seal promptly under an inert atmosphere (nitrogen or argon) if repeated openings are anticipated, since the Cu(II)-peptide complex is subject to redox/oxidative degradation on exposure to air and moisture. Decontaminate work surfaces and equipment after use; collect residues for disposal in accordance with 40 CFR 261 and applicable state/local requirements.

Storage Conditions

Store the sealed container tightly closed in a cool, dry, well-ventilated area, protected from light, moisture, heat, and incompatible materials, in accordance with general laboratory chemical storage guidance (OSHA 29 CFR 1910.1450; NFPA 45). Because the compound is a hygroscopic copper(II) coordination complex susceptible to hydrolysis and oxidation, storage of the solid at refrigerated (2-8 degC) or freezer (-20 degC) temperatures under desiccation and inert gas (nitrogen or argon) headspace is commonly recommended for peptide-copper complexes to preserve integrity; consult the certificate of analysis and manufacturer recommendations for the specific lot, as no authoritative regulatory shelf-life value has been established. Protect from direct sunlight and UV exposure using amber glass or opaque secondary containers. Avoid contact of the container contents with bare reactive metal surfaces (e.g., metal cap liners without inert gaskets), which can promote redox degradation of the Cu(II) center. Reconstituted aqueous solutions are less stable than the dry solid and should be prepared fresh, kept near neutral pH, refrigerated, and protected from light; aliquot to minimize freeze-thaw cycles. Segregate from strong acids, strong bases, strong oxidizers, and reducing agents. Store separately from foodstuffs and out of reach of unauthorized personnel. Label containers per OSHA HazCom 2012 (29 CFR 1910.1200(f)).

Incompatibilities

Avoid contact with strong oxidizing agents (e.g., peroxides, hypochlorites, permanganates, nitric acid, chromates) and strong reducing agents, which can degrade the peptide backbone and disrupt the Cu(II) coordination sphere. Avoid strong acids and strong bases, as extremes of pH promote hydrolysis of amide bonds and dissociation/precipitation of the copper complex; the Cu(II)-tripeptide complex is most stable in near-neutral to slightly alkaline conditions and is destabilized under acidic conditions. Incompatible with chelating agents (e.g., EDTA, DTPA) and thiol-containing compounds (e.g., cysteine, glutathione, mercaptoethanol, dithiothreitol), which can sequester or reduce the copper center. Avoid contact with bare reactive/transition metal surfaces and metal ions that may participate in transmetalation or redox reactions. Protect from moisture (hygroscopic), prolonged exposure to air/oxygen, elevated temperatures, and ultraviolet light, all of which accelerate oxidative degradation. Hazardous decomposition products may include carbon oxides (CO, CO₂), nitrogen oxides (NO_x), and copper-containing fumes or oxides upon thermal decomposition or combustion.

Section 8 — Exposure Controls / Personal Protection

Exposure Limits

No regulatory occupational exposure limits (OEL) have been established specifically for GHK-Cu (CAS 300801-03-0) by OSHA, ACGIH, NIOSH, or equivalent bodies. No biological exposure indices (BEIs) have been established for this substance. As a reference for the copper component only, the following limits apply to inorganic copper dusts and mists (as Cu) and may be used for informational purposes when handling dry powder: OSHA PEL (29 CFR 1910.1000, Table Z-1) 1 mg/m³ TWA (as Cu, dusts and mists); NIOSH REL 1 mg/m³ TWA (as Cu, dusts and mists) with an IDLH of 100 mg Cu/m³ (NIOSH Pocket Guide, CAS 7440-50-8); ACGIH TLV-TWA 1 mg/m³ (as Cu, dusts and mists). These inorganic-copper limits do not account for the peptide portion of the molecule. Handle GHK-Cu as a potentially bioactive substance of unknown toxicity and control exposure to the lowest level reasonably achievable (ALARA) using the engineering controls and PPE specified below.

Engineering Controls

Handle only in a well-ventilated area. Use in a certified chemical fume hood, ventilated balance enclosure, or Class I/II biosafety cabinet when weighing, opening containers, or otherwise generating dust, aerosols, or mists of the solid or its solutions. Where local exhaust ventilation is not feasible, use a HEPA-filtered powder-containment glove box or isolator. General dilution ventilation alone is not sufficient for open handling of the neat powder. Provide readily accessible emergency eyewash and safety shower stations in the immediate work area in accordance with ANSI Z358.1. Keep containers tightly closed when not in use. Follow good laboratory practice (GLP) and prudent-practices guidance for handling substances of unknown toxicity (NRC, Prudent Practices in the Laboratory, 2011). Prohibit eating,

drinking, smoking, and application of cosmetics in areas where the substance is handled; wash hands and exposed skin thoroughly after handling and before breaks.

Personal Protective Equipment

Respiratory Protection: Under normal laboratory use within a properly functioning fume hood or containment device, no respirator is typically required. If dusts, mists, or aerosols can be generated outside of containment, or if airborne concentrations are unknown or may exceed the OSHA PEL for copper dusts and mists (1 mg/m³ as Cu), use a NIOSH-approved air-purifying respirator with an N95, R95, or P95 particulate filter, selected in accordance with the NIOSH Pocket Guide entry for copper (dusts and mists, as Cu). For higher concentrations or unknown exposures, use a full-facepiece respirator with P100 filters or a powered/supplied-air respirator. All respirator use must be part of a complete written respiratory protection program that complies with OSHA 29 CFR 1910.134, including medical clearance, fit-testing, and training.

Hand Protection: Wear chemically resistant, impervious laboratory gloves compliant with EN ISO 374 / ASTM F739. Nitrile rubber gloves of at least 0.11 mm thickness are generally suitable for handling solid peptide and its aqueous solutions; double-gloving is recommended when handling the neat powder or concentrated solutions. Inspect gloves before use for pinholes or tears, and replace immediately if contamination, degradation, or breakthrough is suspected. Wash hands with soap and water after removing gloves. Glove selection should be verified with the glove manufacturer for the specific solvent system in use (e.g., DMSO, ethanol), as some solvents used with peptides can rapidly permeate nitrile.

Eye / Face Protection: Wear tight-fitting chemical safety goggles meeting ANSI/ISEA Z87.1 (or EN 166) whenever handling the solid, solutions, or performing operations that could generate splashes, dusts, or aerosols. A face shield worn over goggles is recommended for operations with a significant splash or aerosol potential (e.g., pouring, sonication, or opening pressurized vials). Contact lenses should not be worn as a substitute for eye protection. Ensure an ANSI Z358.1-compliant emergency eyewash is available within 10 seconds of the work area.

Skin Protection: Wear a fastened laboratory coat with long sleeves and full-length trousers, together with closed-toe, non-absorbent footwear. For handling larger quantities, or where splash or dust exposure is possible, use a chemically resistant apron or a disposable, low-linting chemical-protective coverall (e.g., Type 5/6 per EN 13034/13982). Remove contaminated clothing promptly and launder before reuse; discard heavily contaminated disposable garments as chemical waste. Keep the substance off skin and hair; wash any exposed skin thoroughly with soap and water after handling and before leaving the work area.

Section 9 — Physical and Chemical Properties

Physical State	Solid (research-grade lyophilised powder or crystalline solid)
Appearance	Blue to dark blue powder
Odor	Odorless
Odor Threshold	Not available.
Boiling Point	<i>Not determined</i>
Melting Point	<i>Not determined</i>
Flash Point	<i>Not determined</i>
Auto-ignition Temperature	No data available.
Decomposition Temperature	No experimental data available.
Vapor Pressure	<i>Not determined</i>
Vapor Density	<i>Not determined</i>
Specific Gravity	<i>Not determined</i>

Partition Coefficient (log K_{ow})	No experimental data available.
Solubility	Soluble in water
Stability in Solution	Subject to hydrolytic and oxidative degradation typical of the chemical class; store reconstituted solutions refrigerated or frozen, protect from light, and use within the stability window indicated on the Certificate of Analysis.
pH	<i>Not determined</i>
Molecular Weight	744.3 g/mol
Molecular Formula	C ₂₈ H ₄₈ CuN ₁₂ O ₈

Section 10 — Stability and Reactivity

Chemical Stability: Stable under normal conditions of use, storage, and transport.

Conditions to Avoid: Excessive heat, open flames, sparks, incompatible materials.

Incompatible Materials: Avoid contact with strong oxidizing agents (e.g., peroxides, hypochlorites, permanganates, nitric acid, chromates) and strong reducing agents, which can degrade the peptide backbone and disrupt the Cu(II) coordination sphere. Avoid strong acids and strong bases, as extremes of pH promote hydrolysis of amide bonds and dissociation/precipitation of the copper complex; the Cu(II)-tripeptide complex is most stable in near-neutral to slightly alkaline conditions and is destabilized under acidic conditions. Incompatible with chelating agents (e.g., EDTA, DTPA) and thiol-containing compounds (e.g., cysteine, glutathione, mercaptoethanol, dithiothreitol), which can sequester or reduce the copper center. Avoid contact with bare reactive/transition metal surfaces and metal ions that may participate in transmetalation or redox reactions. Protect from moisture (hygroscopic), prolonged exposure to air/oxygen, elevated temperatures, and ultraviolet light, all of which accelerate oxidative degradation. Hazardous decomposition products may include carbon oxides (CO, CO₂), nitrogen oxides (NO_x), and copper-containing fumes or oxides upon thermal decomposition or combustion.

Hazardous Decomposition Products: Upon combustion or decomposition may produce: carbon monoxide (CO), carbon dioxide (CO₂), nitrogen oxides (NO_x).

Hazardous Polymerization: Will not occur.

Section 11 — Toxicological Information

The toxicological properties of this substance have not been fully characterized. Where no authoritative study data was identified, endpoint classifications are based on a weight-of-evidence approach using read-across from the compound's chemical class and structural features, per GHS Rev.8 Chapter 1.3.2.4. "Not classified" entries below mean "not classified based on currently available data" — hazards cannot be excluded.

Acute Toxicity: The acute toxicity of GHK-Cu (CAS 300801-03-0) is not fully characterized. No quantitative acute toxicity values (oral, dermal, or inhalation LD₅₀/LC₅₀) for this specific copper-tripeptide complex are available from authoritative regulatory sources (ECHA, NIOSH, NTP, or peer-reviewed literature indexed in PubChem CID 133697840). Not classified based on currently available data; hazards cannot be excluded, and the substance should be handled as potentially harmful by all routes of exposure. Note that the substance contains coordinated copper(II); systemic exposure to soluble copper species can produce gastrointestinal irritation and, at sufficient dose, effects on the liver and kidney, so ingestion and inhalation of dusts/aerosols should be avoided as a precautionary measure.

Skin Corrosion / Irritation: No experimental skin corrosion/irritation study conducted according to OECD Test Guideline 404 or 439 has been located for GHK-Cu in authoritative databases (ECHA, PubChem). Not classified based on currently available data; hazards cannot be excluded. Prolonged or repeated contact with the solid or with concentrated solutions may cause mechanical or mild chemical irritation. Handle with impervious gloves as specified in Section 8.

Serious Eye Damage / Irritation: No experimental serious eye damage/eye irritation study conducted according to OECD Test Guideline 405, 437, 438, 460, 491, or 492 has been located for GHK-Cu in authoritative databases. Not classified based on currently available data; hazards cannot be excluded. Dust or solutions may cause mechanical irritation and transient conjunctival redness upon direct ocular contact. Protective eyewear is recommended (see Section 8).

Skin / Respiratory Sensitization: No experimental respiratory or skin sensitization study (OECD TG 406, 429, 442A/B/C/D/E) has been located for GHK-Cu in authoritative regulatory sources. Not classified based on currently available data; hazards cannot be excluded. Because the substance contains coordinated copper(II), and copper salts have been reported in the peer-reviewed dermatological literature to elicit contact sensitization in a small subset of exposed individuals, a sensitization hazard cannot be ruled out on a weight-of-evidence basis (GHS Rev.8 S1.3.2.4).

Germ Cell Mutagenicity / Genotoxicity: Not classified based on currently available data; hazards cannot be excluded. Weight-of-evidence assessment applied using read-across from chemical class and structural considerations (GHS Rev.8 Chapter 1.3.2.4); no authoritative substance-specific study data identified.

Carcinogenicity: GHK-Cu (CAS 300801-03-0) is not listed as a carcinogen by IARC, the U.S. National Toxicology Program (NTP 15th Report on Carcinogens), OSHA (29 CFR 1910.1200 Subpart Z), or the ACGIH TLV carcinogen classification. No long-term carcinogenicity bioassays for this substance have been identified in authoritative sources. Not classified based on currently available data; hazards cannot be excluded due to absence of long-term studies.

Reproductive Toxicity: No OECD-compliant reproductive or developmental toxicity studies (e.g., TG 414, 416, 421, 422, 443) for GHK-Cu have been located in authoritative regulatory databases (ECHA, NTP, EPA). Not classified based on currently available data; hazards cannot be excluded. As a precaution, exposure of pregnant or nursing workers should be minimized.

Specific Target Organ Toxicity (STOT): Specific target organ toxicity - single exposure (STOT-SE) and repeated exposure (STOT-RE): No subacute, subchronic, or chronic repeat-dose toxicity studies conducted according to OECD Test Guidelines 407, 408, 410, 411, or 413 have been identified for GHK-Cu in authoritative sources (ECHA, NTP, PubChem CID 133697840). Not classified for STOT-SE or STOT-RE based on currently available data; hazards cannot be excluded. Because the molecule delivers coordinated copper(II), the liver, kidney, and gastrointestinal tract are the organ systems of theoretical concern based on the known toxicology of soluble copper compounds documented by ATSDR (Toxicological Profile for Copper) and should be considered potential target organs pending compound-specific data.

Aspiration Hazard: Not classified based on currently available data; hazards cannot be excluded. Weight-of-evidence assessment applied using read-across from chemical class and structural considerations (GHS Rev.8 Chapter 1.3.2.4); no authoritative substance-specific study data identified.

Derived No-Effect Level (DNEL): No data available — no substance-specific DNEL has been derived.

Predicted No-Effect Concentration (PNEC): No data available — no substance-specific PNEC has been derived.

Section 12 — Ecological Information

No authoritative substance-specific ecotoxicity study data was identified. In the absence of experimental data, adverse environmental effects cannot be fully excluded.

Ecotoxicity: No substance-specific experimental aquatic toxicity data (e.g., fish LC50, Daphnia EC50, algae ErC50) have been identified for GHK-Cu (CAS 300801-03-0) in authoritative sources (ECHA, EPA, PubChem). GHK-Cu is a copper(II) coordination complex of the tripeptide glycyl-L-histidyl-L-lysine; upon dissociation or degradation, release of copper(II) ions may occur. Ionic copper is recognized by the U.S. EPA (Aquatic Life Criteria - Copper) and ECHA (Registration Dossier for copper) as toxic to aquatic organisms (fish, invertebrates, and algae), with toxicity strongly modulated by water chemistry parameters such as pH, hardness, dissolved organic carbon, and speciation. On a weight-of-evidence basis, releases of GHK-Cu to surface waters should therefore be avoided. The substance itself has not been assigned an official GHS aquatic hazard classification in the authoritative sources reviewed.

Persistence and Degradability: No substance-specific experimental biodegradation, hydrolysis, or photolysis data have been identified for GHK-Cu in authoritative sources. The molecule contains a copper(II) center coordinated to a tripeptide (glycyl-L-histidyl-L-lysine); the organic peptide portion may undergo biotic or abiotic degradation via peptide-bond hydrolysis and microbial metabolism, whereas the copper moiety is an element and cannot be degraded. Per ECHA's copper registration dossier, copper released to the environment partitions between water, sediment, and soil and is considered persistent as an element, although its bioavailability depends on speciation and environmental conditions.

Bioaccumulative Potential: No experimental bioconcentration factor (BCF) or log Kow value specific to GHK-Cu has been identified in authoritative sources (ECHA, EPA, PubChem). The compound is a polar, charged copper-peptide complex with multiple ionizable groups, which is not expected to favor partitioning into lipid tissues. ECHA's copper registration dossier notes that BCF-based bioaccumulation criteria are not directly applicable to essential metals such as copper and that copper is not biomagnified in aquatic or terrestrial food webs, although accumulation in target tissues (e.g., fish gills) can occur under exposure. A definitive bioaccumulation classification for GHK-Cu cannot be assigned from the available authoritative data.

Mobility in Soil: No substance-specific experimental data identified.

Other Adverse Effects: No other adverse environmental effects identified. The substance is not included on the Montreal Protocol list of ozone-depleting substances.

Section 13 — Disposal Considerations

Dispose of contents and container in accordance with all local, state, and federal regulations. Do not dispose of this material into sewers or waterways. Contact a licensed waste disposal company for disposal guidance.

US: Dispose in accordance with 40 CFR Parts 261-270 (RCRA). **EU:** Dispose according to Directive 2008/98/EC (Waste Framework Directive).

Section 14 — Transport Information

DOT (US)	Not regulated as dangerous goods under DOT (49 CFR) based on current classification.
IATA	Not regulated as dangerous goods under IATA Dangerous Goods Regulations based on current classification.
IMDG	Not regulated as dangerous goods or as a marine pollutant under the IMDG Code based on current classification.
UN Number	Not applicable.

Transport classifications above are based on the substance's intrinsic hazard classification; the shipper must independently verify the classification, packaging, labelling, and documentation requirements for their specific shipment configuration, quantity, and carrier (including airline policies) prior to dispatch.

Section 15 — Regulatory Information

United States

TSCA (Toxic Substances Control Act): May be eligible for exemption from TSCA inventory listing requirements under the R&D provisions of 40 CFR 720.36, depending on actual conditions of use. This substance is supplied solely for use in scientific research and development in small quantities; it is not intended for, and shall not be used for, any commercial

manufacturing, processing, or distribution in commerce. The importer/end user is responsible for confirming that the R&D exemption criteria are met for their specific use. **OSHA HazCom 2012:** This SDS was prepared in accordance with 29 CFR 1910.1200 (HazCom 2012), aligned with the Globally Harmonized System (GHS) Rev. 8. **CERCLA / SARA Title III:** Not listed as a CERCLA Hazardous Substance (40 CFR 302.4); not subject to SARA 313 reporting based on available classification data. Users must independently verify applicability for their facility.

European Union

REACH (EC 1907/2006): Supplied solely for Scientific Research and Development (SR&D) use in quantities below 1 tonne per year per legal entity. Where applicable, this use may be exempt from REACH registration obligations under the scientific research and development provisions of REACH Article 3(23) and the conditions of Article 26(3); importers/users should independently verify the applicable exemption pathway for their specific use. If the substance is used as part of a formally notified Product and Process Oriented Research and Development (PPORD) programme, the separate notification procedure under REACH Article 9 (with a 5-year exemption renewable once) may apply instead. **CLP (EC 1272/2008):** Not classified under CLP based on available data; no harmonized classification entry identified in Annex VI of CLP or the ECHA Classification and Labelling (C&L) Inventory.

Canada

WHMIS 2015 / HPR: Not classified as a hazardous product under the Hazardous Products Act and Hazardous Products Regulations (SOR/2015-17) based on available data and weight-of-evidence assessment. Supplied for laboratory research use only. **DSL/NDSL:** Research-use exemption applies; substance is not intended for commercial import or manufacture in Canada.

Note: The regulatory statements above reflect the intended use of this substance for scientific research and development only and do not constitute a legal determination of regulatory status. If the substance is used outside the R&D exemption scope, users are solely responsible for independently verifying applicable regulatory obligations (TSCA, REACH, WHMIS, state, and local) for their specific use and jurisdiction prior to any such use.

Section 16 — Other Information

Document ID	521091ed-9052-4d44-b509-5265b3319f28
Revision Date	2026-07-19
Version	1.0
Prepared By	Prepared in accordance with GHS Rev.8 and OSHA HazCom 2012 (29 CFR 1910.1200). Independent review by a qualified chemical safety professional is recommended prior to use.

Revision History

Revision date: 2026-07-19

Version: 1.0

Change description: Initial issue. Document prepared in 16-section GHS Rev.8 / OSHA HazCom 2012 format.

Sources Used

- PubChem (U.S. National Library of Medicine / NCBI) — <https://pubchem.ncbi.nlm.nih.gov>
- Peer-reviewed chemistry and toxicology literature (class-based read-across and weight-of-evidence assessment per GHS Rev.8 Chapter 1.3.2.4)
- OSHA HazCom 2012 / 29 CFR 1910.1200 Appendix A–C; GHS Rev.8; OECD Test Guidelines

Key to Abbreviations

CAS = Chemical Abstracts Service; GHS = Globally Harmonized System of Classification and Labelling of Chemicals; OSHA = U.S. Occupational Safety and Health Administration; HazCom = Hazard Communication Standard; REACH = Registration, Evaluation, Authorisation and Restriction of Chemicals; CLP = Classification, Labelling and Packaging Regulation; TSCA = Toxic Substances Control Act; WHMIS = Workplace Hazardous Materials Information System; OEL = Occupational Exposure Limit; PEL = Permissible Exposure Limit; TLV = Threshold Limit Value; REL = Recommended Exposure Limit; STOT = Specific Target Organ Toxicity; LD50 = Median Lethal Dose; LC50 = Median Lethal Concentration; PPE = Personal Protective Equipment; SCBA = Self-Contained Breathing Apparatus; R&D = Research and Development.

Disclaimer

DISCLAIMER: The information in this Safety Data Sheet is compiled from the authoritative sources cited above, supplemented by weight-of-evidence assessment based on the compound's chemical class and published literature. It is believed to be accurate as of the revision date but is provided "as is" without warranty of any kind, express or implied, including fitness for a particular purpose. The preparer of this document has not independently tested the substance described herein. Users bear sole responsibility for verifying all information, ensuring safe handling, and compliance with all applicable federal, state, provincial, and local regulations. This SDS is not a substitute for independent chemical safety assessment by a qualified professional. This product is intended for scientific research and development use only and is not for human consumption, drug, food, cosmetic, agricultural, or household use.

This SDS complies with GHS Revision 8 / UN GHS Rev.8 and OSHA HazCom 2012 (29 CFR 1910.1200).