SAFETY DATA SHEET

4817N MICROMAX™ CONDUCTOR PASTE

Version	Revision Date:	SDS Number:	Date of last issue: 04-12-2024
8.0	06-19-2025	300000000183	Date of first issue: 01-29-2024

SECTION 1. IDENTIFICATION

Product name : 4817N MICROMAX™ CONDUCTOR PASTE

Product code : 000000000027046852

Manufacturer or supplier's details

Company name of supplier : Celanese Ltd. Irving Texas
Address : 222 West Las Colinas Boulevard Suite 900N
Irving TX 75039
Telephone : '+1 972-443-4000
Emergency telephone number : DOMESTIC NORTH AMERICA: 800-424-9300
INTERNATIONAL, CALL +1 703-527-3887 (collect calls accepted)

Recommended use of the chemical and restrictions on use

Recommended use : For industrial use only.
Paste for electronic industry

SECTION 2. HAZARDS IDENTIFICATION

GHS classification in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200)

Specific target organ toxicity - single exposure : Category 3 (Central nervous system)

Flammable liquids : Category 3

Reproductive toxicity : Category 1B

Specific target organ toxicity - single exposure : Category 3 (Central nervous system)

Other hazards

None known.

GHS label elements

Hazard pictograms :

Signal word : Danger

Hazard statements : H226 Flammable liquid and vapour.
H336 May cause drowsiness or dizziness.
H360 May damage fertility or the unborn child.

Precautionary statements :

Prevention:

P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and understood.
P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P233 Keep container tightly closed.
P240 Ground and bond container and receiving equipment.
P241 Use explosion-proof electrical/ ventilating/ lighting equipment.
P242 Use non-sparking tools.
P243 Take action to prevent static discharges.
P261 Avoid breathing mist or vapours.
P271 Use only outdoors or in a well-ventilated area.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection/ hearing protection.
P280 Wear protective gloves, protective clothing, eye protection and face protection.

Response:

P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P304 + P340 + P312 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/ doctor if you feel unwell.
P308 + P313 IF exposed or concerned: Get medical advice/ attention.
P370 + P378 In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.

Storage:

P403 + P233 Store in a well-ventilated place. Keep container tightly closed.
P403 + P235 Store in a well-ventilated place. Keep cool.
P405 Store locked up.

Disposal:

P501 Dispose of contents/ container to an approved waste disposal plant.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Components

Chemical name	CAS-No.	Concentration (% w/w)
Silver Powder (particle diameter >100 nm <1mm)	7440-22-4	>= 40 - < 50
1-Methoxy-2-propyl acetate	108-65-6	>= 20 - < 30
n-Butyl acetate	123-86-4	>= 20 - < 30
Dibutyl phthalate	84-74-2	>= 1 - < 10
2-Methoxypropyl acetate	70657-70-4	>= 0.1 - < 1

The specific chemical identity and/or exact percentage (concentration) of composition has been withheld as a trade secret.

SECTION 4. FIRST AID MEASURES

If inhaled	:	If inhaled, remove to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Get medical attention.
In case of skin contact	:	Wash off with soap and water. Get medical attention if irritation develops and persists. Wash contaminated clothing before re-use.
In case of eye contact	:	Immediately flush eyes for at least 15 minutes. Get medical attention.
If swallowed	:	If swallowed Rinse mouth with water. Call a physician or poison control centre immediately. DO NOT induce vomiting unless directed to do so by a physician or poison control center.
Most important symptoms and effects, both acute and delayed	:	May cause drowsiness or dizziness. May damage fertility or the unborn child.

SECTION 5. FIREFIGHTING MEASURES

Suitable extinguishing media	:	Dry sand Dry chemical Alcohol-resistant foam
Specific hazards during firefighting	:	Hazardous decomposition products formed under fire conditions. (see also section 10) Avoid breathing decomposition products.
Further information	:	Evacuate personnel to safe areas. Stop spill/release if it can be done with minimal risk. Do not allow run-off from fire fighting to enter drains or water courses.
Special protective equipment for firefighters	:	Exposure to decomposition products may be a hazard to health. Wear self-contained breathing apparatus for firefighting if necessary.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	:	Avoid contact with skin, eyes and clothing. Ensure adequate ventilation. Wear suitable protective equipment. Dispose of in accordance with local regulations.
Environmental precautions	:	Prevent further leakage or spillage if safe to do so. Prevent product from entering drains. Clean contaminated floors and objects thoroughly while observing environmental regulations.

Methods and materials for containment and cleaning up	:	Contain spill. Soak up with inert absorbent material. Collect and contain contaminated absorbent and dike material for disposal. Keep in suitable, closed containers for disposal. Ventilate the area. Clean contaminated surface thoroughly.

SECTION 7. HANDLING AND STORAGE

Advice on protection against fire and explosion	:	Avoid formation of dust and aerosols. Keep away from heat and sources of ignition. Take measures to prevent the build up of electrostatic charge. Static charges can cause explosions in solvent and dust laden atmospheres.
Advice on safe handling	:	Avoid inhalation, ingestion and contact with skin and eyes. Do not use in areas without adequate ventilation. Keep container closed when not in use. Take care to avoid waste and spillage when weighing, loading and mixing the product.
Conditions for safe storage	:	Store in original container. Keep containers tightly closed in a dry, cool and well-ventilated place. Keep away from sources of ignition - No smoking. Do not store or consume food, drink or tobacco in areas where they may become contaminated with this material. Keep container closed when not in use. Do not reuse empty container.
Further information on storage stability	:	Stable under normal conditions.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
Silver Powder (particle diameter >100 nm <1mm)	7440-22-4	TWA (Dust and fume)	0.1 mg/m3	ACGIH
		TWA (Dust)	0.01 mg/m3	NIOSH REL
		TWA	0.01 mg/m3	OSHA P0
1-Methoxy-2-propyl acetate	108-65-6	TWA	50 ppm	US WEEL
n-Butyl acetate	123-86-4	TWA	150 ppm 710 mg/m3	NIOSH REL
		ST	200 ppm 950 mg/m3	NIOSH REL
		TWA	150 ppm 710 mg/m3	OSHA Z-1
		TWA	150 ppm 710 mg/m3	OSHA P0
		STEL	200 ppm	OSHA P0

			950 mg/m3	
		TWA	50 ppm	ACGIH
		STEL	150 ppm	ACGIH
Dibutyl phthalate	84-74-2	TWA	5 mg/m3	ACGIH
		TWA	5 mg/m3	NIOSH REL
		TWA	5 mg/m3	OSHA Z-1
		TWA	5 mg/m3	OSHA P0

Engineering measures : Local exhaust or a laboratory hood should be used when handling the materials.
Maintain air concentrations below occupational exposure standards.

Personal protective equipment

Respiratory protection : Provide adequate ventilation.
No personal respiratory protective equipment normally required.
Where there is potential for airborne exposures in excess of applicable limits, wear approved respiratory protection with dust/mist cartridge.
When workers are facing concentrations above the exposure limit they must use appropriate certified respirators.
Consult the respirator manufacturer to determine the appropriate type of equipment for a given application. Observe respirator use limitations specified by the manufacturer.
Persons performing maintenance or repairs on exhaust system equipment (e.g. ducts) may need to use respirators and protective clothing to prevent exposure to any accumulated residues.

Hand protection

Material : Impervious gloves

Remarks : Gloves must be inspected prior to use. Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough. The choice of an appropriate glove does not only depend on its material but also on other quality features and is different from one producer to the other. The exact break through time can be obtained from the protective glove producer and this has to be observed.
Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. Also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion, and the contact time.

Eye protection : Wear safety glasses with side shields.

Skin and body protection : Choose body protection in relation to its type, to the concentration and amount of dangerous substances, and to the specific work-place.
Lightweight protective clothing
Safety shoes

Hygiene measures : Handle in accordance with good industrial hygiene and safety practice.
Avoid contact with skin, eyes and clothing.
Contaminated work clothing should not be allowed out of the workplace.
Remove contaminated clothing and protective equipment

before entering eating areas.
Remove and wash contaminated clothing before re-use.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	viscous liquid
Colour	:	grey
Odour	:	fruity
Boiling point/boiling range	:	257 °F / 125 °C estimated
Flash point	:	90 °F / 32 °C Method: closed cup
Density	:	1.33 g/cm³ (68 °F / 20 °C)
Solubility(ies)		
Water solubility	:	slightly soluble (68 °F / 20 °C)
Viscosity		
Viscosity, dynamic	:	0.1 - 1.0 Pa.s (77 °F / 25 °C)
Viscosity, kinematic	:	> 20.5 mm2/s (104 °F / 40 °C) estimated

SECTION 10. STABILITY AND REACTIVITY

Possibility of hazardous reactions	:	Polymerization will not occur. Stable at normal temperatures and storage conditions.
Conditions to avoid	:	Heat, flames and sparks.
Incompatible materials	:	Acids
Hazardous decomposition products	:	No decomposition if stored and applied as directed. Under fire conditions: Carbon monoxide, carbon dioxide and unburned hydrocarbons (smoke). Metal oxides

SECTION 11. TOXICOLOGICAL INFORMATION

Acute toxicity

Not classified due to lack of data.

Components:

Silver Powder (particle diameter >100 nm <1mm):

Acute oral toxicity	:	LD50 (Rat): > 2,000 mg/kg Method: OECD Test Guideline 401 Assessment: The substance or mixture has no acute oral tox-

icity

Acute inhalation toxicity : LC50 (Rat): > 5.16 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Method: OECD Test Guideline 436
Assessment: The substance or mixture has no acute inhalation toxicity

Acute dermal toxicity : LD50 (Rat): > 2,000 mg/kg
Method: OECD Test Guideline 402
Assessment: The substance or mixture has no acute dermal toxicity

1-Methoxy-2-propyl acetate:

Acute oral toxicity : LD50 (Rat): 8,532 mg/kg
Method: US EPA Test Guideline OPP 81-1

Acute inhalation toxicity : LC50 (Rat): > 35.2 mg/l
Exposure time: 4 h
Test atmosphere: vapour
Method: OECD Test Guideline 403
Assessment: The substance or mixture has no acute inhalation toxicity

Acute dermal toxicity : LD50 (Rabbit): > 5,000 mg/kg
Method: OECD Test Guideline 402
Assessment: The substance or mixture has no acute dermal toxicity

n-Butyl acetate:

Acute oral toxicity : LD50 (Rat): 10,760 mg/kg
Assessment: The substance or mixture has no acute oral toxicity

Acute inhalation toxicity : LC50 (Rat): > 21 mg/l
Exposure time: 4 h
Test atmosphere: vapour
Method: OECD Test Guideline 403
Target Organs: Central nervous system
Assessment: The substance or mixture has no acute inhalation toxicity
Remarks: Anaesthetic effects

Acute dermal toxicity : LD50 (Rabbit): 14,112 mg/kg
Method: OECD Test Guideline 402
Assessment: The substance or mixture has no acute dermal toxicity

Dibutyl phthalate:

Acute oral toxicity : LD50 (Rat): > 7,500 mg/kg
Assessment: The substance or mixture has no acute oral toxicity

Acute inhalation toxicity	:	LC50 (Rat): 15.68 mg/l Exposure time: 4 h Test atmosphere: dust/mist Assessment: The substance or mixture has no acute inhalation toxicity
Acute dermal toxicity	:	LD50 (Rabbit): > 16,000 mg/kg Assessment: The substance or mixture has no acute dermal toxicity

2-Methoxypropyl acetate:

Acute oral toxicity	:	LD50 (Rat): > 10,000 mg/kg Method: US EPA Test Guideline OPP 81-1 Remarks: Information given is based on data obtained from similar substances.
Acute inhalation toxicity	:	Remarks: An LC50/inhalation/4h/rat could not be determined because no mortality of rats was observed at the maximum achievable concentration. Information given is based on data obtained from similar substances.
Acute dermal toxicity	:	LD50 (Rabbit): > 5,000 mg/kg Method: OECD Test Guideline 402 Assessment: The substance or mixture has no acute dermal toxicity Remarks: Information given is based on data obtained from similar substances.

Skin corrosion/irritation

Not classified due to lack of data.

Components:

Silver Powder (particle diameter >100 nm <1mm):

Species	:	Rabbit
Assessment	:	No skin irritation
Method	:	OECD Test Guideline 404
Result	:	Slight or no skin irritation
Remarks	:	Minimal effects that do not meet the threshold for classification.

1-Methoxy-2-propyl acetate:

Species	:	Rabbit
Assessment	:	Not classified as irritant
Method	:	OECD Test Guideline 404
Result	:	No skin irritation

n-Butyl acetate:

Species	:	Rabbit
Assessment	:	No skin irritation
Method	:	OECD Test Guideline 404
Result	:	No skin irritation

Dibutyl phthalate:

Species	:	Rabbit
Assessment	:	No skin irritation
Method	:	OECD Test Guideline 404
Result	:	Slight or no skin irritation
Remarks	:	Minimal effects that do not meet the threshold for classification.

2-Methoxypropyl acetate:

Species	:	Rabbit
Assessment	:	No skin irritation
Method	:	OECD Test Guideline 404
Result	:	No skin irritation
Remarks	:	Information given is based on data obtained from similar substances.

Serious eye damage/eye irritation

Not classified due to lack of data.

Components:

Silver Powder (particle diameter >100 nm <1mm):

Species	:	Rabbit
Result	:	No eye irritation
Assessment	:	No eye irritation
Method	:	OECD Test Guideline 405

1-Methoxy-2-propyl acetate:

Species	:	Rabbit
Result	:	No eye irritation
Assessment	:	Not classified as irritant
Method	:	OECD Test Guideline 405

n-Butyl acetate:

Species	:	Rabbit
Result	:	Slight or no eye irritation
Assessment	:	No eye irritation
Method	:	OECD Test Guideline 405
Remarks	:	Minimal effects that do not meet the threshold for classification.

Dibutyl phthalate:

Species	:	Rabbit
Result	:	Slight or no eye irritation
Assessment	:	No eye irritation
Method	:	OECD Test Guideline 405
Remarks	:	Minimal effects that do not meet the threshold for classification.

2-Methoxypropyl acetate:

Species	:	Rabbit
Result	:	No eye irritation
Assessment	:	No eye irritation
Method	:	OECD Test Guideline 405
Remarks	:	Information given is based on data obtained from similar substances.

Respiratory or skin sensitisation

Skin sensitisation

Not classified due to lack of data.

Respiratory sensitisation

Not classified due to lack of data.

Components:

Silver Powder (particle diameter >100 nm <1mm):

Species	:	Guinea pig
Assessment	:	Does not cause skin sensitisation.
Method	:	US EPA Test Guideline OPPTS 870.2600
Result	:	Does not cause skin sensitisation.
Remarks	:	Information given is based on data obtained from similar substances.

1-Methoxy-2-propyl acetate:

Species	:	Guinea pig
Assessment	:	Does not cause skin sensitisation.
Method	:	OECD Test Guideline 406
Result	:	Does not cause skin sensitisation.

n-Butyl acetate:

Species	:	Guinea pig
Assessment	:	Does not cause skin sensitisation.
Result	:	Does not cause skin sensitisation.

Dibutyl phthalate:

Species	:	Guinea pig
Assessment	:	Does not cause skin sensitisation.
Method	:	OECD Test Guideline 406
Result	:	Does not cause skin sensitisation.

2-Methoxypropyl acetate:

Species	:	Guinea pig
Assessment	:	Does not cause skin sensitisation.
Method	:	OECD Test Guideline 406
Result	:	Does not cause skin sensitisation.
Remarks	:	Information given is based on data obtained from similar substances.

Germ cell mutagenicity

Not classified due to lack of data.

Components:

1-Methoxy-2-propyl acetate:

Germ cell mutagenicity - Assessment	:	Tests on bacterial or mammalian cell cultures did not show mutagenic effects.

n-Butyl acetate:

Germ cell mutagenicity - Assessment	:	Animal testing did not show any mutagenic effects., Tests on bacterial or mammalian cell cultures did not show mutagenic effects., Information given is based on data obtained from similar substances.

Dibutyl phthalate:

Germ cell mutagenicity - Assessment	:	Animal testing did not show any mutagenic effects., Did not cause genetic damage in cultured bacterial cells.

2-Methoxypropyl acetate:

Germ cell mutagenicity - Assessment	:	Tests on bacterial or mammalian cell cultures did not show mutagenic effects., Evidence suggests this substance does not cause genetic damage in animals., Information given is based on data obtained from similar substances.

Carcinogenicity

Not classified due to lack of data.

Components:

1-Methoxy-2-propyl acetate:

Carcinogenicity - Assessment	:	Not classifiable as a human carcinogen., Animal testing did not show any carcinogenic effects., Information given is based on data obtained from similar substances.

2-Methoxypropyl acetate:

Carcinogenicity - Assessment	:	Not classifiable as a human carcinogen., Animal testing did not show any carcinogenic effects., Information given is based on data obtained from similar substances.

IARC No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

OSHA No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

NTP No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

Reproductive toxicity

May damage fertility or the unborn child.

Components:

1-Methoxy-2-propyl acetate:

Reproductive toxicity - Assessment : No toxicity to reproduction, Animal testing showed effects on reproduction at levels equal to or above those causing parental toxicity., Information given is based on data obtained from similar substances.
Evidence suggests the substance is not a developmental toxin in animals., Information given is based on data obtained from similar substances.

n-Butyl acetate:

Reproductive toxicity - Assessment : No toxicity to reproduction, Animal testing showed no reproductive toxicity., No effects on or via lactation
Animal testing showed effects on embryo-fetal development at levels equal to or above those causing maternal toxicity.

Dibutyl phthalate:

Reproductive toxicity - Assessment : Clear evidence of adverse effects on development, based on animal experiments., Animal testing showed effects on reproduction at levels below those causing parental toxicity that included:, Reduced fertility, Reduced embryo-foetal viability, Some evidence of adverse effects on sexual function and fertility, based on animal experiments.
Animal testing showed effects on embryo-foetal development including:, Delayed foetal development (variations)

2-Methoxypropyl acetate:

Reproductive toxicity - Assessment : Presumed human reproductive toxicant, Animal testing showed no reproductive toxicity.
Foetal malformations

STOT - single exposure

May cause drowsiness or dizziness.

Components:

1-Methoxy-2-propyl acetate:

Exposure routes : Oral
Target Organs : Central nervous system
Assessment : The substance or mixture is classified as specific target organ toxicant, single exposure, category 3 with narcotic effects.

n-Butyl acetate:

Target Organs : Central nervous system
Assessment : The substance or mixture is classified as specific target organ toxicant, single exposure, category 3 with narcotic effects.

Dibutyl phthalate:

Assessment : The substance or mixture is not classified as specific target organ toxicant, single exposure.

2-Methoxypropyl acetate:

Exposure routes	:	Inhalation
Target Organs	:	Respiratory system
Assessment	:	The substance or mixture is classified as specific target organ toxicant, single exposure, category 3 with respiratory tract irritation.

STOT - repeated exposure

Not classified due to lack of data.

Components:

1-Methoxy-2-propyl acetate:

Assessment	:	The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

n-Butyl acetate:

Assessment	:	The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

Dibutyl phthalate:

Assessment	:	The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

2-Methoxypropyl acetate:

Exposure routes	:	Inhalation
Assessment	:	The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

Repeated dose toxicity

Components:

1-Methoxy-2-propyl acetate:

Species	:	Rat
Application Route	:	Inhalation
Test atmosphere	:	vapour
Exposure time	:	24 Months
Remarks	:	No toxicologically significant effects were found. Information given is based on data obtained from similar substances.

Species	:	Rabbit
Application Route	:	Dermal
Exposure time	:	21 d
Method	:	OECD Test Guideline 410
Remarks	:	No toxicologically significant effects were found. Information given is based on data obtained from similar substances.

n-Butyl acetate:

Species	:	Rat

Application Route	:	Inhalation
Test atmosphere	:	vapour
Exposure time	:	90 d
Remarks	:	No toxicologically significant effects were found.

Dibutyl phthalate:

Species	:	Rat
NOAEL	:	152 mg/kg
LOAEL	:	752 mg/kg
Application Route	:	Ingestion
Exposure time	:	90 d
Method	:	OECD Test Guideline 408
Remarks	:	No toxicologically significant effects were found.

Species	:	Rat
NOAEL	:	509 mg/m3
Application Route	:	Inhalation
Test atmosphere	:	dust/mist
Exposure time	:	28 d
Method	:	OECD Test Guideline 412
Remarks	:	No toxicologically significant effects were found.

2-Methoxypropyl acetate:

Species	:	Rat
Application Route	:	Inhalation
Test atmosphere	:	vapour
Exposure time	:	28 d
Remarks	:	Thymus effects No toxicological effects warranting significant target organ toxicity classification were seen below the recommended guidance values for classification.

Aspiration toxicity

Not classified due to lack of data.

Components:

Silver Powder (particle diameter >100 nm <1mm):

No aspiration toxicity classification

n-Butyl acetate:

The substance or mixture causes concern owing to the assumption that it causes a human aspiration toxicity hazard.

Dibutyl phthalate:

No aspiration toxicity classification

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Components:

Silver Powder (particle diameter >100 nm <1mm):

Toxicity to fish	:	LC50 (Pimephales promelas (fathead minnow)): 0.016 mg/l Exposure time: 96 h Remarks: Information given is based on data obtained from similar substances.
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): 0.0125 mg/l Exposure time: 48 h Remarks: Information given is based on data obtained from similar substances.
Toxicity to algae/aquatic plants	:	EC50 (Pseudokirchneriella subcapitata (green algae)): 0.19 mg/l Exposure time: 96 h Remarks: Information given is based on data obtained from similar substances. EC10 (Pseudokirchneriella subcapitata (green algae)): 0.03462 mg/l Exposure time: 72 h Remarks: Information given is based on data obtained from similar substances.
Toxicity to fish (Chronic toxicity)	:	NOEC (Oncorhynchus mykiss (rainbow trout)): 0.0012 mg/l Exposure time: 32 d Remarks: Information given is based on data obtained from similar substances.
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	NOEC (Daphnia magna (Water flea)): 0.00327 mg/l Exposure time: 21 d Remarks: Information given is based on data obtained from similar substances.

Ecotoxicology Assessment

Acute aquatic toxicity	:	Very toxic to aquatic life.
Chronic aquatic toxicity	:	Very toxic to aquatic life with long lasting effects.

1-Methoxy-2-propyl acetate:

Toxicity to fish	:	LC50 (Oncorhynchus mykiss (rainbow trout)): > 100 mg/l Exposure time: 96 h Method: OECD Test Guideline 203
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): > 500 mg/l Exposure time: 48 h
Toxicity to algae/aquatic plants	:	ErC50 (Pseudokirchneriella subcapitata (green algae)): > 1,000 mg/l

Exposure time: 96 h
Method: OECD Test Guideline 201

NOEC (Pseudokirchneriella subcapitata (green algae)): > 1,000 mg/l
Exposure time: 96 h
Method: OECD Test Guideline 201

Toxicity to fish (Chronic toxicity) : NOEC (Oryzias latipes (Orange-red killifish)): 47.5 mg/l
Exposure time: 14 d
Method: OECD Test Guideline 204

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (Daphnia magna (Water flea)): > 100 mg/l
Exposure time: 21 d
Method: OECD Test Guideline 211

Ecotoxicology Assessment

Acute aquatic toxicity : This product has no known ecotoxicological effects.

Chronic aquatic toxicity : This product has no known ecotoxicological effects.

n-Butyl acetate:

Toxicity to fish : LC50 (Pimephales promelas (fathead minnow)): 18 mg/l
Exposure time: 96 h
Method: OECD Test Guideline 203

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia (water flea)): 44 mg/l
Exposure time: 48 h
Method: OECD Test Guideline 202

Toxicity to algae/aquatic plants : EC50 (Pseudokirchneriella subcapitata (green algae)): 397 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201
Remarks: Information given is based on data obtained from similar substances.

NOEC (Pseudokirchneriella subcapitata (green algae)): 196 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201
Remarks: Information given is based on data obtained from similar substances.

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (Daphnia magna (Water flea)): 23.2 mg/l
Exposure time: 21 d
Method: OECD Test Guideline 211
Remarks: Information given is based on data obtained from similar substances.

Ecotoxicology Assessment

Acute aquatic toxicity : Harmful to aquatic life.

Chronic aquatic toxicity : This product has no known ecotoxicological effects.

Dibutyl phthalate:

Toxicity to fish	:	LC50 (Lepomis macrochirus (Bluegill sunfish)): 0.48 mg/l Exposure time: 96 h Method: OECD Test Guideline 203
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): 2.2 mg/l Exposure time: 48 h Method: OECD Test Guideline 202
Toxicity to algae/aquatic plants	:	EC50 (Pseudokirchneriella subcapitata (green algae)): 1.39 mg/l Exposure time: 72 h Method: OECD Test Guideline 201 NOEC (Pseudokirchneriella subcapitata (green algae)): 0.292 mg/l Exposure time: 72 h Method: OECD Test Guideline 201
Toxicity to fish (Chronic toxicity)	:	NOEC (Oncorhynchus mykiss (rainbow trout)): 0.1 mg/l Exposure time: 99 d
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	NOEC (Daphnia magna (Water flea)): 0.158 mg/l Exposure time: 21 d Method: OECD Test Guideline 211

Ecotoxicology Assessment

Acute aquatic toxicity	:	Very toxic to aquatic life.
Chronic aquatic toxicity	:	Toxic to aquatic life with long lasting effects.

2-Methoxypropyl acetate:

Toxicity to fish	:	LC50 (Oncorhynchus mykiss (rainbow trout)): > 100 mg/l Exposure time: 96 h Method: OECD Test Guideline 203 Remarks: Information given is based on data obtained from similar substances.
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): > 500 mg/l Exposure time: 48 h Method: Directive 67/548/EEC, Annex V, C.2. Remarks: Information given is based on data obtained from similar substances.
Toxicity to algae/aquatic plants	:	ErC50 (Pseudokirchneriella subcapitata (green algae)): > 1,000 mg/l Exposure time: 96 h Method: OECD Test Guideline 201 Remarks: Information given is based on data obtained from similar substances. NOEC (Pseudokirchneriella subcapitata (green algae)): > 1,000 mg/l

Exposure time: 96 h
Method: OECD Test Guideline 201
Remarks: Information given is based on data obtained from similar substances.

Toxicity to fish (Chronic toxicity) : NOEC (Oryzias latipes (Orange-red killifish)): 47.5 mg/l
Exposure time: 14 d
Method: OECD Test Guideline 204
Remarks: Information given is based on data obtained from similar substances.

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (Daphnia magna (Water flea)): > 100 mg/l
Exposure time: 21 d
Method: OECD Test Guideline 211
Remarks: Information given is based on data obtained from similar substances.

Ecotoxicology Assessment

Acute aquatic toxicity : This product has no known ecotoxicological effects.

Chronic aquatic toxicity : This product has no known ecotoxicological effects.

Persistence and degradability

Components:

1-Methoxy-2-propyl acetate:

Biodegradability : Result: Biodegradable
Method: OECD Test Guideline 301
Remarks: Readily biodegradable.

n-Butyl acetate:

Biodegradability : Result: Biodegradable
Method: OECD Test Guideline 301D

Dibutyl phthalate:

Biodegradability : Result: Biodegradable
Remarks: Readily biodegradable.

Biodegradation: 72 %
Exposure time: 28 d
Method: OECD Test Guideline 301B

2-Methoxypropyl acetate:

Biodegradability : Result: Biodegradable
Method: OECD Test Guideline 301
Remarks: Information given is based on data obtained from similar substances.

Bioaccumulative potential

Components:

Silver Powder (particle diameter >100 nm <1mm):

Bioaccumulation	:	Remarks: Bioaccumulation is unlikely. Information given is based on data obtained from similar substances.
Partition coefficient: n-octanol/water	:	Remarks: Not applicable

1-Methoxy-2-propyl acetate:

Bioaccumulation	:	Remarks: Bioaccumulation is unlikely.
Partition coefficient: n-octanol/water	:	log Pow: 1.2 (68 °F / 20 °C) pH: 6.8 Method: High-performance liquid chromatography

n-Butyl acetate:

Bioaccumulation	:	Remarks: Bioaccumulation is unlikely.
Partition coefficient: n-octanol/water	:	log Pow: 2.3 (77 °F / 25 °C) pH: 7

Dibutyl phthalate:

Bioaccumulation	:	Remarks: Does not bioaccumulate.
Partition coefficient: n-octanol/water	:	log Pow: 4.46 (86 °F / 30 °C) pH: 5 - 8

2-Methoxypropyl acetate:

Partition coefficient: n-octanol/water	:	log Pow: 0.52

Mobility in soil

No data available

Other adverse effects

Product:

Additional ecological information	:	No data is available on the product itself.

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods

Waste from residues	:	If recycling is not practicable, dispose of in compliance with local regulations. Do not reuse empty container.Never place unused product down any indoor or out door drain. Contaminated/not cleaned containers should be treated/handled like product waste.Dispose of container properly.Refer to applicable Local, State/Provincial, and Federal

Regulations, as well as industry Standards.

SECTION 14. TRANSPORT INFORMATION

International Regulations

UNRTDG

UN number	:	UN 1993
Proper shipping name	:	FLAMMABLE LIQUID, N.O.S. (1-Methoxy-2-propyl acetate, n-Butyl acetate)
Class	:	3
Packing group	:	III
Labels	:	3
Environmentally hazardous	:	no

IATA-DGR

UN/ID No.	:	UN 1993
Proper shipping name	:	Flammable liquid, n.o.s. (1-Methoxy-2-propyl acetate, n-Butyl acetate)
Class	:	3
Packing group	:	III
Labels	:	Flammable Liquids
Packing instruction (cargo aircraft)	:	366
Packing instruction (passenger aircraft)	:	355

IMDG-Code

UN number	:	UN 1993
Proper shipping name	:	FLAMMABLE LIQUID, N.O.S. (1-Methoxy-2-propyl acetate, n-Butyl acetate)
Class	:	3
Packing group	:	III
Labels	:	3
EmS Code	:	F-E, S-E
Marine pollutant	:	no

Transport in bulk according to IMO instruments

Not applicable for product as supplied.

National Regulations

49 CFR

UN/ID/NA number	:	UN 1993
Proper shipping name	:	Flammable liquid, n.o.s. (1-Methoxy-2-propyl acetate, n-Butyl acetate)
Class	:	3
Packing group	:	III
Labels	:	FLAMMABLE LIQUID
ERG Code	:	128
Marine pollutant	:	no

Special precautions for user

The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

SECTION 15. REGULATORY INFORMATION

SARA 302 Extremely Hazardous Substances Threshold Planning Quantity

This material does not contain any components with a section 302 EHS TPQ.

SARA 311/312 Hazards : Flammable (gases, aerosols, liquids, or solids)
Specific target organ toxicity (single or repeated exposure)
Reproductive toxicity

SARA 313 : The following components are subject to reporting levels established by SARA Title III, Section 313:

Silver Powder (particle diameter >100 nm <1mm)	7440-22-4
Dibutyl phthalate	84-74-2

California Prop. 65

WARNING: This product can expose you to chemicals including Dibutyl phthalate, which is/are known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

TSCA list

In compliance with TSCA-active Inventory requirements for commercial purposes.

No substances are subject to a Significant New Use Rule.

No substances are subject to TSCA 12(b) export notification requirements.

SECTION 16. OTHER INFORMATION

Full text of other abbreviations

ACGIH	:	USA. ACGIH Threshold Limit Values (TLV)
NIOSH REL	:	USA. NIOSH Recommended Exposure Limits
OSHA P0	:	USA. Table Z-1-A Limits for Air Contaminants (1989 vacated values)
OSHA Z-1	:	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
US WEEL	:	USA. Workplace Environmental Exposure Levels (WEEL)
ACGIH / TWA	:	8-hour, time-weighted average
ACGIH / STEL	:	Short-term exposure limit
NIOSH REL / TWA	:	Time-weighted average concentration for up to a 10-hour workday during a 40-hour workweek
NIOSH REL / ST	:	STEL - 15-minute TWA exposure that should not be exceeded at any time during a workday
OSHA P0 / TWA	:	8-hour time weighted average
OSHA P0 / STEL	:	Short-term exposure limit
OSHA Z-1 / TWA	:	8-hour time weighted average
US WEEL / TWA	:	8-hr TWA

AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely Hazardous Substance; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; HMIS - Hazardous Materials Identification System; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TECI - Thailand Existing Chemicals Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

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The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

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