

**BREWER SCIENCE INC.
SAFETY DATA SHEET**

This Safety Data Sheet has been prepared to comply with the EU Regulation, Canadian WHMIS and the OSHA Hazard Communication Standard.

**SECTION 1: IDENTIFICATION OF THE SUBSTANCE/PREPARATION
AND THE COMPANY/UNDERTAKING**

1.1 Product Identifier:

Trade Name: BrewerBOND[®] 510

1.2 Relevant Identified Uses of the Substance or Mixture and Uses Advised Against:

Product Use: Release layer for temporary adhesives

Uses Advised Against: None

1.3 Details of the Supplier of the Safety Data Sheet:

Manufacturer:	Brewer Science, Inc. 2401 Brewer Drive Rolla, MO 65401	Sales Office: Brewer Science, Limited North Mill, 2nd Floor Darley Abbey Mills Derby, England DE22 1DZ
Information Phone Number:	(573) 364-0300	+44 1332 545888
Fax Number:	(573) 368-3318	+44 1332.545878
E-mail:	msds@brewerscience.com	msds@brewerscience.com

1.4 Emergency Telephone Number:

Emergency Spill Information: Chemtrec Domestic North America: (800) 424-9300
Chemtrec International: (703) 527-3887
Chemtrec Taiwan: 00801-14-8954

SECTION 2: HAZARDS IDENTIFICATION

2.1 Classification of the Substance or Mixture:

GHS Classification:

Acute Toxicity Category 5 (H303)
Aquatic Acute Toxicity Category 3 (H402)
Eye Irritant Category 2B (H320)
Flammable Liquid Category 3 (H226)
Skin Irritant Category 3 (H316)

EU Classification:

Flammable R10, R52

2.2 Label Elements:

Warning!



Contains: Ethyl-3-ethoxypropionate

Hazard Phrases

H226	Flammable liquid and vapor.
H303	May be harmful if swallowed.
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H316	Causes mild skin irritation.
H320	Causes eye irritation.
H402	Harmful to aquatic life.

Precautionary Phrases

P210	Keep away from heat, sparks, open flames, and hot surfaces. – No smoking.
P233	Keep container tightly closed.
P240	Ground or bond container and receiving equipment.
P241	Use explosion-proof electrical, ventilating, or lighting equipment.
P242	Use only non-sparking tools.
P243	Take precautionary measures against static discharge.
P264	Wash thoroughly after handling.
P273	Avoid release to the environment.
P280	Wear protective gloves, protective clothing, eye protection, and face protection.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337 + P313	If eye irritation persists: Get medical attention.
P303 + P361 + P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower.
P332 + P313	If skin irritation occurs: Get medical attention.
P312	Call a POISON CENTER or physician if you feel unwell.
P370 + P378	In case of fire: Use water fog or spray, universal foam, carbon dioxide or dry chemical for extinction.
P403 + P235	Store in a well-ventilated place. Keep cool.
P501	Dispose of contents and container in accordance with local and national regulations.

2.3 Other Hazards: None known.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.2 Mixture:

Chemical Name	CAS#	EINECS#	ENCS/ ISHL	EU Classification (67/548/EEC)	CLP Annex VI Classification	%
Ethyl-3-ethoxypropionate (EEP)	763-69-9	212-112-9	(2)-1350, (2)-1379/ 2-(6)-147	R10, R19, R66, R52	Flam. Liq. Cat 3 (H226), Acute Tox. Cat 5 (H303), Skin Irrit. Cat 3 (H316), Eye Irrit. Cat 2B (H320), Aquatic Acute Cat 3 (H402) EUH019, EUH066	90-<100
1-Methoxy-2-propanol (Propylene glycol monomethyl ether, PGME)	107-98-2	203-539-1	(2)-404 / (2)-404	R10, R67	Flam. Liq. Cat 3 (H226), STOT SE Cat 3 (H336)	1-10
Polymer Solids	Proprietary	Proprietary		No EU Classification or R phrase	No GHS Classification	<1-10

See Section 16 for further information on EU and GHS Classification.

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SECTION 4: FIRST AID MEASURES

4.1 Description of First Aid Measures:

Eye: Rinse thoroughly with water, while holding the eye lids open to be sure the material is washed out. If irritation persists, get medical attention.

Skin: Remove contaminated clothing. Wash contact area thoroughly with soap and water. Get medical attention if irritation occurs. Launder clothing before re-use.

Inhalation: Remove victim to fresh air. Give artificial respiration if needed. If breathing is difficult, oxygen should be administered by qualified personnel. Get medical attention if symptoms of exposure persist.

Ingestion: Do not induce vomiting unless directed to do so by medical personnel. Keep the victim calm and warm. Get medical attention if you feel unwell.

4.2 Most Important symptoms and effects, both acute and delayed: May cause eye, skin, and respiratory irritation. May cause headache, dizziness, nausea and other symptoms of central nervous system depression by inhalation. May be harmful if swallowed.

4.3 Indication of any immediate medical attention and special treatment needed: Immediate medical attention should not be required.

SECTION 5: FIRE-FIGHTING MEASURES

5.1 Extinguishing Media: Use water fog or spray, universal foam, carbon dioxide or dry chemical.

5.2 Special Hazards Arising from the Substance or Mixture

Unusual Fire and Explosion Hazards: Vapors are heavier than air and may travel along surfaces to remote ignition sources and flash back. Vapors may form explosive mixtures with air in confined areas. As with any ether 1-Methoxy-2-propanol and ethyl-3-ethoxypropionate may form highly reactive peroxides upon contact with air.

Combustion Products: Oxides of carbon and unknown materials.

5.3 Advice for Fire-Fighters:

Wear an approved, positive pressure, self-contained breathing apparatus and full protective clothing. Cool fire exposed containers with water. Contain water used in firefighting from entering sewers or natural waterways.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1 Personal Precautions, Protective Equipment and Emergency Procedures:

Remove all ignition sources such as open flames, spark producing equipment, pilot lights, etc. Wear appropriate protective clothing to prevent eye and skin contact including impervious gloves, safety goggles and respirator if needed. Ventilate area.

6.2 Environmental Precautions:

Avoid releases to the environment. Report spills and releases as required to appropriate authorities.

6.3 Methods and Material for Containment and Cleaning Up:

Cover with an inert absorbent material and collect into an appropriate container for disposal.

6.4 Reference to Other Sections:

Refer to Section 8 for Personal Protective Equipment and Section 13 for Disposal information.

SECTION 7: HANDLING AND STORAGE

7.1 Precautions for Safe Handling: Avoid breathing vapors, aerosols and mists. Use with adequate ventilation. Avoid contact with the eyes, skin and clothing. Always wear impervious gloves, chemical safety goggles and protective clothing when handling this material. Wash thoroughly after handling. Do not eat, drink or smoke in the work area. Keep product away from heat, sparks, flames and all other sources of ignition. No smoking in storage or use areas. Keep containers closed when not in use. If peroxide formation is suspected, do not move or open container.

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7.2 Conditions for Safe Storage, Including any Incompatibilities: Store in a cool, dry, well-ventilated location away from oxidizers and other incompatible materials. Keep containers closed when not in use.

7.3 Specific end use(s): Industrial use only

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control Parameters:

Chemical Name	Exposure Limits
Ethyl-3-ethoxypropionate	100 ppm TWA, 100 ppm STEL (15 minute average value) DFG MAK Skin
1-Methoxy-2-propanol	50 ppm TWA, 100 ppm STEL ACGIH TLV 100 ppm TWA, 200 ppm STEL DFG MAK 100 ppm UK-TWA, 150 ppm UK-STEL skin 100 ppm EU-TWA, 150 ppm EU STEL skin 100 ppm TWA, 150 ppm STEL South Korea
Polymer Solids	None Established

8.2 Exposure Controls:

Ventilation: Use with adequate general or local exhaust ventilation to maintain exposure levels below the occupational exposure limits. Use explosion proof electrical equipment and wiring where required.

Personal Protective Equipment:

Respiratory Protection: If needed, an approved respirator with organic vapor cartridges may be used. For higher exposures a supplied air respirator may be required. Respirator selection and use should be based on contaminant type, form and concentration. Follow applicable regulations and good Industrial Hygiene practice.

Skin Protection: Impervious gloves such as 4H or Silver Shield gloves are suggested. Contact your glove supplier for selection assistance. In Europe follow EN 374.

Eye Protection: Chemical safety goggles are recommended. In Europe follow EN 166.

Other Protective Equipment: Impervious clothing is required to prevent skin contact and contamination of personal clothing. In Europe follow EN 13034. An eye wash facility and safety shower should be available in the work area.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic Physical and Chemical Properties

Appearance: Clear to tint Liquid	Vapor Density: Greater than 5
Odor: Slight odor	Specific Gravity: No data available
Odor Threshold: No data available	Solubility: Partially soluble
pH: No data available	Octanol/Water Partition Coefficient: No data available
Melting Point/Freezing Point: <-50°C (< -58°F) (EEP)	Autoignition Temperature: No data available
Initial Boiling Point/Range: 166°C (331°F) (EEP)	Decomposition Temperature: No data available
Flash Point: 59°C (138°F) (EEP)	Viscosity: No data available
Evaporation Rate: No data available	Explosive Properties: This EEP in this product is stabilized.
Flammable Limits: LEL: 1.05 vol % (EEP) UEL: 13.74% (PGME)	Oxidizing Properties: Not an oxidizer
Vapor Pressure: 1.5 mmHg @ 25°C (77°F) (EEP)	Relative Density: No data available
Molecular Formula: Mixture	Flammability (solid, gas): Not applicable
Molecular Weight: Mixture	

9.2 Other Information: None available

SECTION 10: STABILITY AND REACTIVITY

10.1 Reactivity: None known.

10.2 Chemical Stability: Stable under normal storage and handling conditions.

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10.3 Possibility of Hazardous Reactions: Will not occur.

10.4 Conditions to Avoid: Avoid high temperatures. Keep away from heat, sparks, flames and other sources of ignition.

10.5 Incompatible Materials: Strong oxidizing agents, strong bases, acids and reducing agents.

10.6 Hazardous Decomposition Products: Combustion will produce oxides of carbon and unknown materials.

SECTION 11: TOXICOLOGICAL INFORMATION

11.1 Information on Toxicological Effects:

Potential Health Effects:

Eye: May cause mild to moderate eye irritation. Corneal injury is unlikely.

Skin: May cause mild skin irritation with prolonged or repeated exposure.

Inhalation: Inhalation of vapors, mists, or aerosols may cause nose and throat irritation with the possibility of central nervous system depression. Symptoms of central nervous system depression include headache, dizziness, drowsiness, nausea and unconsciousness.

Ingestion: Swallowing may cause gastrointestinal irritation and central nervous system depression with symptoms similar to those described under inhalation.

Chronic Hazards: Chronic absorption may cause kidney or liver damage based on studies with laboratory animals.

Acute Toxicity Values:

Ethyl 3-ethoxypropionate: Oral rat LD50 - 4039 mg/kg; Inhalation rat LC50 - >998 ppm/6 hr; Skin rabbit LD50 - 4080-4680 mg/kg

1-Methoxy-2-propanol: Oral rat LD50 - 5660 mg/kg; Inhalation rat LC50 - 10,000 ppm/5 hr; Skin rabbit LD50 - 13 gm/kg

Polymer Solids: No toxicity data available

Skin corrosion/irritation: Ethyl 3-ethoxypropionate: Slightly irritating to skin in guinea pigs. 1-Methoxy-2-propanol: Non-irritating to rabbit skin.

Eye damage/irritation: Ethyl 3-ethoxypropionate: Slight eye irritation in rabbits. 1-Methoxy-2-propanol: Slightly irritating to rabbit eyes.

Respiratory Irritation: No data available.

Respiratory Sensitization: No data available.

Skin Sensitization: Ethyl 3-ethoxypropionate: Non-sensitizing in guinea pig maximization test. 1-Methoxy-2-propanol: Non-sensitizing in guinea pig maximization test.

Germ Cell Mutagenicity: Ethyl 3-ethoxypropionate: Negative in Ames test. 1-Methoxy-2-propanol: Negative in Ames test, in vitro cytogenic assay and unscheduled DNA synthesis.

Carcinogenicity: None of the components of this product are listed as carcinogens by OSHA, IARC, NTP, ACGIH and the EU CLP..

Reproductive Toxicity: Ethyl 3-ethoxypropionate: EEP is not teratogenic in rats and rabbits and produced only slightly fetotoxicity in rats at maternally toxic concentrations of 1000 ppm. 1-Methoxy-2-propanol: No maternal or fetal effects in rats and rabbits -NOAEL 1000 ppm. Liver and kidney effects were observed in a 13 week oral feeding study with rats - LOAEL 459.5 mg/kg/day. No adverse effects were observed in a 90 day dermal study in rabbits – NOEL 1838 mg/kg/day.

Specific Target Organ Toxicity:

Single Exposure: No data available

Repeat Exposure: Ethyl 3-ethoxypropionate: A 90 day inhalation study in rats showed no effects in exposure levels to 250 ppm. Effects at 500 ppm were decreased body weight gain. A 28 day oral study in rats showed minimal effects - NOEL 100 mg/kg/day. 1-Methoxy-2-propanol: No adverse effects observed in a 13 week inhalation study in rats and rabbits -NOAEL 1000 ppm. Liver and kidney effects were observed in a 13 week oral feeding study with rats - LOAEL 459.5 mg/kg/day. No adverse effects were observed in a 90 day dermal study in rabbits – NOEL 1838 mg/kg/day.

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SECTION 12: ECOLOGICAL INFORMATION

12.1 Toxicity:

Ethyl 3-ethoxypropionate: 96 hr LC50 Fathead minnow - 50 mg/L; 48 hr EC50 Daphnia magna - >480 mg/L; 72 hr EC50 algae - >115 mg/L

1-Methoxy-2-propanol: 96 hr LC50 Fathead minnow - 20800 mg/L; 48 hr LC50 Daphnia Magna - 23300 mg/L

12.2 Persistence and Degradability: Ethyl 3-ethoxypropionate: Moderately biodegradable- 43% after 18 days. 1-Methoxy-2-propanol: Readily biodegradable - 90% after 29 days.

12.3 Bioaccumulative Potential: No data available

12.4 Mobility in Soil: No data available

12.5 Results of PBT and vPvB Assessment: No data available

12.6 Other Adverse Effects: Not applicable

SECTION 13: DISPOSAL CONSIDERATIONS

13.1 Waste Treatment Methods:

Dispose in accordance with all local, state and federal regulations.

SECTION 14: TRANSPORTATION INFORMATION

	14.1 UN Number	14.2 UN Proper Shipping Name	14.3 Hazard Class(s)	14.4 Packing Group	14.5 Environmental Hazards
US DOT	UN1866	Resin Solution, Flammable	3	PG III	Not applicable
Canadian TDG	UN1866	Resin Solution, Flammable	3	PG III	Not applicable
EU ADR/RID	UN1866	Resin Solution, Flammable	3	PG III	Not applicable
IMDG	UN1866	Resin Solution, Flammable	3	PG III	Not applicable
IATA/ICAO	UN1866	Resin Solution, Flammable	3	PG III	Not applicable

14.6 Special Precautions for User: Not applicable

14.7 Transport in Bulk According to Annex II of MARPOL 73/78 and the IBC Code: Not applicable

SECTION 15: REGULATORY INFORMATION

15.1 Safety, Health and Environment Regulations/Legislation Specific for the Substance or Mixture:

U.S. FEDERAL REGULATIONS:

CERCLA 103 Reportable Quantity: This product is not subject to reporting under CERCLA. Some states have more stringent reporting requirements. Report all spills in accordance with local, state, and federal regulations.

SARA TITLE III:

Hazard Category for Section 311/312: Acute Health, Fire Hazard

Section 313 Toxic Chemicals: This product contains the following chemicals subject to SARA Title III Section 313 Reporting requirements: None

Section 302 Extremely Hazardous Substances (TPQ): None

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EPA Toxic Substances Control Act (TSCA) Status: This product contains a substance(s) that is not listed on the EPA TSCA inventory. A low volume exemption has been granted. This exemption restricts the use of this product to Microelectronic Manufacturing Applications.

STATE REGULATIONS:

California Proposition 65: This product contains a substance known in the State of California to cause cancer and/or reproductive harm.

INTERNATIONAL REGULATIONS:

EUROPEAN REGULATIONS

REACH: Brewer products comply with REACH regulation as applicable. For more information, contact the Brewer REACH coordinator.

SVHC: This product contains the following Substances of Very High Concern (SVHCs): None.

JAPANESE REGULATIONS

Industrial Safety and Health Law:

Manufacture Prohibited	Manufacture Allowed	Notification Obligation	Labeling Obligation	MSDS Obligation	Dangerous Substance
Not applicable	Not applicable	Not applicable	Not applicable	≥ 1 (1-Methoxy-2-propanol)	Flammable Substance-Group 4

Poisonous and Deleterious Substances Control Law (PDSCL): None of the chemicals are listed.

Pollutant Release and Transfer Register (PRTP): None of the chemicals are listed.

Law Concerning the Protection of the Ozone Layer: None of the chemicals are listed.

Fire Service Law: Group 4 - Flammable liquids (2nd Class petroleum)

Ship Safety Act: Flammable liquid (Hazard Regulation Article 3, hazardous substance notice appendix 1)

Aviation Law: Flammable liquid (regulation Article 194, hazardous substance notice appendix 1)

Air Pollution Control Law: None of the chemicals are listed.

Water Pollution Control Act: None of the chemicals are listed.

Soil Contamination Countermeasures Law: None of the chemicals are listed.

Offensive Odor Control Law: None of the chemicals are listed.

Act on Prevention of Marine Pollution and Maritime Disaster: None of the chemicals are listed.

15.2 Chemical Safety Assessment: No data available

SECTION 16: OTHER INFORMATION

HMIS Ratings: Health – 2 Flammability - 2 Physical Hazard - 0
NFPA Ratings: Health - 2 Flammability - 2 Instability- 0

SDS Revision History:

7/22/14: New SDS

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1/28/15: Updated header, name, address, carcinogen statement, toxicity data, and added EN codes.

GHS Classification for Reference (See Sections 2 and 3):

Acute Tox. Cat 5 Acute Toxicity Category 5
Aquatic Acute Cat 3 Aquatic Acute Toxicity Category 3
STOT SE Cat 3 Specific Target Organ Toxicity Single Exposure Category 3
Eye Irrit. Cat 2B Eye Irritant Category 2B
Flam. Liq. Cat 3 Flammable Liquid Category 3
Skin Irrit. Cat 3 Skin Irritant Category 3
H226 Flammable liquid and vapor.
H303 May be harmful if swallowed.
H316 Causes mild skin irritation.
H320 Causes eye irritation.
H336 May cause drowsiness or dizziness.
H402 Harmful to aquatic life.
EUH019 May form explosive peroxides.

EU Classes and Risk Phrases for Reference (See Sections 2 and 3):

Xn Harmful
R10 Flammable
R19 May form explosive peroxides.
R52 Harmful to aquatic organisms.

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This above information is believed to be correct but does not propose to be all inclusive and shall be used only as a guide. Brewer Science, Inc. shall not be held liable for any damage resulting from handling or from contact with the above product.

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