**SECTION 1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING**

<table>
<thead>
<tr>
<th>Product Description:</th>
<th>Ethyl 2-methylbutyrate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cat No. :</td>
<td>L06743</td>
</tr>
<tr>
<td>Synonyms</td>
<td>Ethyl 2-methylbutanoate</td>
</tr>
<tr>
<td>CAS-No</td>
<td>7452-79-1</td>
</tr>
<tr>
<td>Molecular Formula</td>
<td>C7 H14 O2</td>
</tr>
<tr>
<td>Supplier</td>
<td>Alfa Aesar</td>
</tr>
<tr>
<td></td>
<td>Avocado Research Chemicals, Ltd.</td>
</tr>
<tr>
<td></td>
<td>Shore Road</td>
</tr>
<tr>
<td></td>
<td>Port of Heysham Industrial Park</td>
</tr>
<tr>
<td></td>
<td>Heysham, Lancashire LA3 2XY</td>
</tr>
<tr>
<td></td>
<td>United Kingdom</td>
</tr>
<tr>
<td></td>
<td>Office Tel: +44 (0) 1524 850506</td>
</tr>
<tr>
<td></td>
<td>Office Fax: +44 (0) 1524 850608</td>
</tr>
<tr>
<td>Emergency Telephone Number</td>
<td>Call Carechem 24 at</td>
</tr>
<tr>
<td></td>
<td>+44 (0) 1865 407333 (English only);</td>
</tr>
<tr>
<td></td>
<td>+44 (0) 1235 239670 (Multi-language)</td>
</tr>
<tr>
<td>E-mail address</td>
<td><a href="mailto:uktech@alfa.com">uktech@alfa.com</a></td>
</tr>
<tr>
<td></td>
<td><a href="http://www.alfa.com">www.alfa.com</a></td>
</tr>
<tr>
<td></td>
<td>Product Safety Department</td>
</tr>
<tr>
<td>Recommended Use</td>
<td>Laboratory chemicals.</td>
</tr>
<tr>
<td>Uses advised against</td>
<td>No Information available</td>
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</table>

**SECTION 2. HAZARD IDENTIFICATION**

<table>
<thead>
<tr>
<th>Physical State</th>
<th>Appearance</th>
<th>Odor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liquid</td>
<td>Colorless</td>
<td>No information available</td>
</tr>
</tbody>
</table>

**Emergency Overview**

Highly flammable liquid and vapor.

**Classification of the substance or mixture**

| Flammable liquids. | Category 3 |

**Label Elements**

[Flammable symbol]
Signal Word
Warning

Hazard Statements
H226 - Flammable liquid and vapor

Precautionary Statements
Prevention
P210 - Keep away from heat/sparks/open flames/hot surfaces. - No smoking
P233 - Keep container tightly closed
P240 - Ground/bond container and receiving equipment
P241 - Use explosion-proof electrical/ ventilating/ lighting/ equipment
P242 - Use only non-sparking tools
P243 - Take precautionary measures against static discharge
P280 - Wear protective gloves/ protective clothing/ eye protection/ face protection

Response
P303 + P361 + P353 - IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower
P370 + P378 - In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction

Storage
P403 + P235 - Store in a well-ventilated place. Keep cool

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

Physical and Chemical Hazards
Highly flammable. Vapors may cause flash fire or explosion.

Health Hazards
The product contains no substances which at their given concentration are considered to be hazardous to health.

Environmental hazards
Contains no substances known to be hazardous to the environment or not degradable in waste water treatment plants. Will likely be mobile in the environment due to its water solubility. The product is water soluble, and may spread in water systems.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No</th>
<th>Weight %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Butanoic acid, 2-methyl-, ethyl ester</td>
<td>7452-79-1</td>
<td>99</td>
</tr>
</tbody>
</table>

SECTION 4. FIRST AID MEASURES

Eye Contact
Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Get medical attention.

Skin Contact
Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes. Obtain medical attention.

Inhalation
Remove from exposure, lie down. Move to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Obtain medical attention.

Ingestion
Do not induce vomiting. Clean mouth with water. Get medical attention.

Most important symptoms and effects
Breathing difficulties. Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting

Self-Protection of the First Aider
Ensure that medical personnel are aware of the material(s) involved, take precautions to protect themselves and prevent spread of contamination.
Notes to Physician
Treat symptomatically.

SECTION 5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media

Extinguishing media which must not be used for safety reasons
No information available.

Specific Hazards Arising from the Chemical
Flammable. Vapors may travel to source of ignition and flash back. Containers may explode when heated. Vapors may form explosive mixtures with air.

Protective Equipment and Precautions for Firefighters
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal Precautions
Remove all sources of ignition. Take precautionary measures against static discharges.

Environmental Precautions
See Section 12 for additional ecological information.

Methods for Containment and Clean Up
Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). Keep in suitable, closed containers for disposal. Remove all sources of ignition. Use spark-proof tools and explosion-proof equipment.

Refer to protective measures listed in Sections 8 and 13.

SECTION 7. HANDLING AND STORAGE

Handling
Avoid contact with skin and eyes. Do not breathe vapors or spray mist. Use explosion-proof equipment. Use only non-sparking tools. Keep away from open flames, hot surfaces and sources of ignition. Take precautionary measures against static discharges.

Storage
Keep in a dry, cool and well-ventilated place. Keep container tightly closed. Keep away from heat and sources of ignition. Flammables area. Keep container tightly closed in a dry and well-ventilated place.

Specific Use(s)
Use in laboratories

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control Parameters

Monitoring methods
BS EN 14042:2003 Title Identifier: Workplace atmospheres. Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents. MDHS70 General methods for sampling airborne gases and vapours MDHS 88 Volatile organic compounds in air. Laboratory method using diffusive samplers, solvent desorption and gas chromatography MDHS 96 Volatile organic compounds in air - Laboratory method using pumped solid sorbent tubes, solvent desorption and gas
chromatography

Exposure Controls

Engineering Measures
Ensure adequate ventilation, especially in confined areas. Use explosion-proof electrical/ventilating/lighting/equipment. Wherever possible, engineering control measures such as the isolation or enclosure of the process, the introduction of process or equipment changes to minimise release or contact, and the use of properly designed ventilation systems, should be adopted to control hazardous materials at source.

Personal protective equipment

Eye Protection Safety glasses with side-shields (European standard - EN 166)

Hand Protection Protective gloves

Inspect gloves before use. Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. (Refer to manufacturer/supplier for information)

Ensure gloves are suitable for the task: Chemical compatability, Dexterity, Operational conditions, User susceptibility, e.g. sensitisation effects, also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion.

Remove gloves with care avoiding skin contamination.

Skin and body protection Wear appropriate protective gloves and clothing to prevent skin exposure

Respiratory Protection No protective equipment is needed under normal use conditions.

Large scale/emergency use Use a NIOSH/MSHA or European Standard EN 136 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced

Small scale/Laboratory use Maintain adequate ventilation

Hygiene Measures Handle in accordance with good industrial hygiene and safety practice.

Environmental exposure controls No information available.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

| Appearance | Colorless |
| Physical State | Liquid |
| Odor | No information available |
| Odor Threshold | No data available |
| pH | No information available |
| Melting Point/Range | No data available |
| Softening Point | No data available |
| Boiling Point/Range | 132 - 133 °C / 269.6 - 271.4 °F @ 760 mmHg |
| Flash Point | 26 °C / 78.8 °F Method - No information available |
| Evaporation Rate | No data available |
| Flammability (solid,gas) | Not applicable |
| Explosion Limits | No data available |
| Vapor Pressure | No data available |
| Vapor Density | 4.49 (Air = 1.0) |
Ethyl 2-methylbutyrate

SECTION 10. STABILITY AND REACTIVITY

Stability
Stable under normal conditions.

Hazardous Reactions
No information available.

Hazardous Polymerization
No information available.

Conditions to Avoid
Keep away from open flames, hot surfaces and sources of ignition. Incompatible products.

Materials to avoid
Strong oxidizing agents. Strong bases.

Hazardous Decomposition Products
Carbon monoxide (CO). Carbon dioxide (CO₂).

SECTION 11. TOXICOLOGICAL INFORMATION

Product Information
No acute toxicity information is available for this product

(a) acute toxicity;
No data available

(b) skin corrosion/irritation;
No data available

(c) serious eye damage/irritation;
No data available

(d) respiratory or skin sensitization;
Respiratory
No data available
Skin
No data available

(e) germ cell mutagenicity;
No data available

(f) carcinogenicity;
No data available
There are no known carcinogenic chemicals in this product

(g) reproductive toxicity;
No data available

(h) STOT-single exposure;
No data available

(i) STOT-repeated exposure;
No data available
Target Organs
No information available.

(j) aspiration hazard; No data available

Symptoms / effects, both acute and delayed
Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity effects
Contains no substances known to be hazardous to the environment or that are not degradable in waste water treatment plants.

Persistence and Degradability
Persistence
Soluble in water, Persistence is unlikely, based on information available.

Bioaccumulative Potential
Bioaccumulation is unlikely

Mobility in soil
The product is water soluble, and may spread in water systems Will likely be mobile in the environment due to its water solubility. Highly mobile in soils

Endocrine Disruptor Information
This product does not contain any known or suspected endocrine disruptors

Persistent Organic Pollutant
This product does not contain any known or suspected substance

Ozone Depletion Potential
This product does not contain any known or suspected substance

SECTION 13. DISPOSAL CONSIDERATIONS

Waste from Residues / Unused Products
Waste is classified as hazardous. Dispose of in accordance with the European Directives on waste and hazardous waste. Dispose of in accordance with local regulations.

Contaminated Packaging
Dispose of this container to hazardous or special waste collection point. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Keep product and empty container away from heat and sources of ignition.

Other Information
Waste codes should be assigned by the user based on the application for which the product was used. Do not dispose of waste into sewer. Can be incinerated, when in compliance with local regulations.

SECTION 14. TRANSPORT INFORMATION

Road and Rail Transport
UN-No 1993
Proper Shipping Name FLAMMABLE LIQUID, N.O.S
Hazard Class 3
Packing Group III

IMDG/IMO
UN-No 1993
Proper Shipping Name Flammable liquid, n.o.s
Hazard Class 3
Packing Group III
IATA

UN-No  1993
Proper Shipping Name  FLAMMABLE LIQUID, N.O.S.*
Hazard Class  3
Packing Group  III

Special Precautions for User  No special precautions required

SECTION 15. REGULATORY INFORMATION

International Inventories  X = listed

<table>
<thead>
<tr>
<th>Component</th>
<th>The Inventory of Hazardous Chemicals (2015 Edition)</th>
<th>List of dangerous goods GB 12256 - 2012</th>
<th>Taiwan Toxic Chemicals Inventory</th>
<th>IECSC</th>
<th>EINECS</th>
<th>TSCA</th>
<th>DSL</th>
<th>PICCS</th>
<th>ENCS</th>
<th>AICS</th>
<th>KECL</th>
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</thead>
<tbody>
<tr>
<td>Butanoic acid, 2-methyl-, ethyl ester</td>
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<td>-</td>
<td>X</td>
<td>X</td>
<td>231-225-4</td>
<td>X</td>
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</table>

National Regulations

SECTION 16. OTHER INFORMATION

Prepared By  Health, Safety and Environmental Department
Revision Date  13-Mar-2018

Training Advice
Chemical hazard awareness training, incorporating labelling, Safety Data Sheets (SDS), Personal Protective Equipment (PPE) and hygiene.
Use of personal protective equipment, covering appropriate selection, compatibility, breakthrough thresholds, care, maintenance, fit and standards.
First aid for chemical exposure, including the use of eye wash and safety showers.

Legend

CAS - Chemical Abstracts Service
EINECS/ELINCS - European Inventory of Existing Commercial Chemical Substances/EU List of Notified Chemical Substances
PICCS - Philippines Inventory of Chemicals and Chemical Substances
IECSC - Chinese Inventory of Existing Chemical Substances
KECL - Korean Existing and Evaluated Chemical Substances
WEL - Workplace Exposure Limit
ACGIH - American Conference of Governmental Industrial Hygienists
DNEL - Derived No Effect Level
RPE - Respiratory Protective Equipment
LC50 - Lethal Concentration 50%
NOEC - No Observed Effect Concentration
PBT - Persistent, Bioaccumulative, Toxic

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List
ENCS - Japanese Existing and New Chemical Substances
AICS - Australian Inventory of Chemical Substances
NZIoC - New Zealand Inventory of Chemicals

TWA - Time Weighted Average
IARC - International Agency for Research on Cancer
PNEC - Predicted No Effect Concentration
LD50 - Lethal Dose 50%
EC50 - Effective Concentration 50%
POW - Partition coefficient Octanol:Water
vPvB - very Persistent, very Bioaccumulative
Key literature references and sources for data
Suppliers safety data sheet, Chemadvisor - LOLI, Merck index, RTECS

Disclaimer
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.

End of Safety Data Sheet