1. IDENTIFICATION

Product Description: MUSTARD OIL NATURAL

CAS # 57-06-7
FEMA Number 2034

Other means of identification
Vigon Item # 501675

Recommended use Concentrated flavor ingredient which may be used in flavor compounds according to legal and FEMA GRAS/FDA guidelines.

Recommended restrictions For Manufacturing Use Only

Company Vigon International, Inc.
127 Airport Road
E. Stroudsburg, PA 18301

24 Hour Emergency Response Information
INFOTRAC (ACCT# 78928);
1-800-535-5053 WITHIN THE U.S.A.
1-352-323-3500 OUTSIDE THE U.S.A.

For information call: 570-476-6300
Web Site: www.vigon.com

Manufacturer/Importer/Supplier/Distributor information

Manufacturer
Company name Vigon International, Inc.
Address 127 Airport Road
E. Stroudsburg, PA 18301
United States

Telephone For information call: 570-476-6300
Website www.vigon.com
E-mail regulatory@vigon.com

Emergency phone number INFOTRAC (ACCT# 78928);
1-800-535-5053 WITHIN THE U.S.A.
1-352-323-3500 OUTSIDE THE U.S.A.

2. HAZARD(S) IDENTIFICATION

Physical hazards Flammable liquids Category 3
Acute toxicity, oral Category 3

Health hazards Acute toxicity, dermal Category 2
Acute toxicity, inhalation Category 3
Skin corrosion/irritation Category 2
Serious eye damage/eye irritation Category 2A
Sensitization, respiratory Category 1
Sensitization, skin Category 1
Specific target organ toxicity, single exposure Category 3 respiratory tract irritation

Environmental hazards Hazardous to the aquatic environment, acute hazard Category 1
Hazardous to the aquatic environment, long-term hazard

Category 1

Signal word
Danger

Hazard statement
Flammable liquid and vapor. Toxic if swallowed or if inhaled. Fatal in contact with skin. Causes skin irritation. Causes skin and eye irritation. May cause an allergic skin reaction. Causes serious eye irritation. May cause allergy or asthma symptoms or breathing difficulties if inhaled. May cause respiratory irritation. Very toxic to aquatic life. Very toxic to aquatic life with long lasting effects.

Precautionary statement

Prevention
Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Keep container tightly closed. Ground and bond container and receiving equipment. Use explosion-proof electrical/ventilating/lighting equipment. Use non-sparking tools. Take action to prevent static discharges. Do not get in eyes, on skin, or on clothing. Wash thoroughly after handling. Do not eat, drink or smoke when using this product. Use only outdoors or in a well-ventilated area. Contaminated work clothing should not be allowed out of the workplace. Avoid release to the environment. Wear protective gloves/protective clothing/eye protection/face protection. Wear respiratory protection.

Response
IF SWALLOWED: Immediately call a POISON CENTER/doctor. Rinse mouth. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water. IF INHALED: Remove person to fresh air and keep comfortable for breathing. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/doctor. If skin irritation or rash occurs: Get medical advice/attention. If eye irritation persists: Get medical advice/attention. Take off immediately all contaminated clothing and wash it before reuse. In case of fire: Use appropriate media to extinguish. Collect spillage.

Storage
Keep cool. Store in a well-ventilated place. Keep container tightly closed. Store locked up.

Disposal
Dispose of contents/container in accordance with local/regional/national/international regulations.
Hazard(s) not otherwise classified (HNOC)
None known.

Supplemental information
None.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substances

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>Common name and synonyms</th>
<th>CAS number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>MUSTARD OIL</td>
<td>allyl thiocarbonimide</td>
<td>57-06-7</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>propenyl isothiocyanate</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3-isothiocyanatoprop-1-ene</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ALLYL ISOTHIOCYANATE</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
4. FIRST-AID MEASURES

Inhalation
If breathing is difficult, remove to fresh air and keep at rest in a position comfortable for breathing. For breathing difficulties, oxygen may be necessary. Call a physician if symptoms develop or persist.

Skin contact
Take off immediately all contaminated clothing. Get medical attention if irritation develops and persists. Wash skin thoroughly with soap and water for several minutes.

Eye contact
Remove contact lenses, if present and easy to do. Get medical attention if irritation develops and persists. Promptly wash eyes with plenty of water while lifting the eye lids.

Ingestion
Call a physician or poison control center immediately. If swallowed, rinse mouth with water (only if the person is conscious). Do not induce vomiting. If vomiting occurs, the head should be kept low so that stomach vomit doesn't enter the lungs.

Most important symptoms/effects, acute and delayed
Severe eye irritation. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. May cause respiratory irritation. Difficulty in breathing. Skin irritation. May cause redness and pain. May cause an allergic skin reaction. Dermatitis. Rash.

Indication of immediate medical attention and special treatment needed
Not available.

General information
Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Show this safety data sheet to the doctor in attendance.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media
Water spray, fog, CO2, dry chemical, or alcohol resistant foam.

Unsuitable extinguishing media
Do not use a solid water stream as it may scatter and spread fire.

Specific hazards arising from the chemical
Fire may produce irritating, corrosive and/or toxic gases.

Special protective equipment and precautions for firefighters
Firefighters must use standard protective equipment including flame retardant coat, helmet with face shield, gloves, rubber boots, and in enclosed spaces, SCBA. Structural firefighters protective clothing will only provide limited protection. Wear self-contained breathing apparatus with a full facepiece operated in the positive pressure demand mode when fighting fires.

Fire fighting equipment/instructions
In case of fire and/or explosion do not breathe fumes. Use standard firefighting procedures and consider the hazards of other involved materials. Move containers from fire area if you can do so without risk. Water runoff can cause environmental damage. Ventilate closed spaces before entering them. Keep run-off water out of sewers and water sources. Dike for water control.

Specific methods
Use water spray to cool unopened containers.

General fire hazards
Static charges generated by emptying package in or near flammable vapor may cause flash fire.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures
Eliminate all sources of ignition. Avoid contact with skin or inhalation of spillage, dust or vapor. Keep unnecessary personnel away. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ventilate closed spaces before entering them.
SAFETY DATA SHEET
501675 MUSTARD OIL NATURAL

Methods and materials for containment and cleaning up
Collect and dispose of spillage as indicated in section 13 of the SDS.
Absorb with inert absorbent such as dry clay, sand or diatomaceous earth, commercial sorbents, or recover using pumps.
The product is immiscible with water and will spread on the water surface.
Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible.
Never return spills in original containers for re-use. This material and its container must be disposed of as hazardous waste. Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area). Prevent product from entering drains.
Large Spills: Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Cover with plastic sheet to prevent spreading. Absorb in vermiculite, dry sand or earth and place into containers.
Small Spills: Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination.

Environmental precautions
Retain and dispose of contaminated wash water. Avoid release to the environment. Contact local authorities in case of spillage to drain/aquatic environment. Prevent further leakage or spillage if safe to do so. Do not contaminate water.

7. HANDLING AND STORAGE
Precautions for safe handling
Do not handle or store near an open flame, heat or other sources of ignition. Take precautionary measures against static discharges. All equipment used when handling the product must be grounded. Avoid breathing vapor. Avoid contact with eyes, skin, and clothing. Avoid prolonged exposure. Wash thoroughly after handling.
Conditions for safe storage, including any incompatibilities
Keep container closed. Handle containers with care. Open slowly in order to control possible pressure release. Store in a cool, well-ventilated area.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION
Occupational exposure limits
US. Workplace Environmental Exposure Level (WEEL) Guides

<table>
<thead>
<tr>
<th>Material</th>
<th>Type</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>MUSTARD OIL (CAS 57-06-7)</td>
<td>STEL</td>
<td>4 mg/m3</td>
</tr>
</tbody>
</table>

No biological exposure limits noted for the ingredient(s).

Exposure guidelines
US - Minnesota Haz Subs: Skin designation applies
- MUSTARD OIL (CAS 57-06-7) Skin designation applies.
US WEEL Guides: Skin designation
- MUSTARD OIL (CAS 57-06-7) Can be absorbed through the skin.

Appropriate engineering controls
Use explosion-proof ventilation equipment to stay below exposure limits. Adequate ventilation should be provided so that exposure limits are not exceeded.
Individual protection measures, such as personal protective equipment
Eye/face protection  Avoid contact with eyes.
Skin protection
Hand protection  Chemical resistant gloves.
Other  Use of an impervious apron is recommended. Chemical resistant gloves.
Respiratory protection  Chemical respirator with organic vapor cartridge and full facepiece.
Thermal hazards  Wear appropriate thermal protective clothing, when necessary.
General hygiene considerations
When using do not smoke. Keep away from food and drink. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Contaminated work clothing should not be allowed out of the workplace.

9. PHYSICAL AND CHEMICAL PROPERTIES
Appearance  Refer to Spec Sheet
Physical state  Liquid.
Form  Liquid.
Color  Refer to Spec Sheet
Odor  Characteristic.
Odor threshold  Not available.
pH  Not available.
Melting point/freezing point -112 °F (-80 °C)
Initial boiling point and boiling range  298.4 - 309.2 °F (148 - 154 °C)
Flash point  115.0 °F (46.1 °C) Closed Cup
Evaporation rate  Not available.
Flammability (solid, gas)  Not applicable.
Upper/lower flammability or explosive limits
Flammability limit - lower (%)  Not available.
Flammability limit - upper (%)  Not available.
Explosive limit - lower (%)  Not available.
Explosive limit - upper (%)  Not available.
Vapor pressure  10 mm Hg at 38.3 °C
Vapor density  3.41
Relative density  Not available.
Solubility(ies)
Solubility (water)  Insoluble
Partition coefficient (n-octanol/water)  Not available.
SAFETY DATA SHEET

501675 MUSTARD OIL NATURAL

Revision Date: 05-06-2020
Version # 09

Auto-ignition temperature: Not available.
Decomposition temperature: Not available.
Viscosity: Not available.

Other information
Density: 1.01 g/cm3 estimated
Explosive properties: Not explosive.
Flammability class: Combustible II estimated
Molecular formula: C4-H5-N-S
Molecular weight: 99.15 g/mol
Oxidizing properties: Not oxidizing.
Specific gravity: 1.01 at 25 °C

10. STABILITY AND REACTIVITY

Reactivity: The product is stable and non-reactive under normal conditions of use, storage and transport.
Chemical stability: Material is stable under normal conditions.
Possibility of hazardous reactions: No dangerous reaction known under conditions of normal use.
Conditions to avoid: Avoid heat, sparks, open flames and other ignition sources. Avoid temperatures exceeding the flash point. Contact with incompatible materials.
Hazardous decomposition products: No hazardous decomposition products if stored and handled as indicated.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure
Inhalation: Toxic if inhaled. May cause allergy or asthma symptoms or breathing difficulties if inhaled.
Skin contact: Fatal in contact with skin. Causes skin irritation. May cause an allergic skin reaction.
Eye contact: Causes serious eye irritation.
Ingestion: Toxic if swallowed.

Symptoms related to the physical, chemical and toxicological characteristics
Severe eye irritation. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. May cause respiratory irritation. Difficulty in breathing. Skin irritation. May cause redness and pain. May cause an allergic skin reaction. Dermatitis. Rash.

Information on toxicological effects
Acute toxicity: Fatal in contact with skin. Toxic if inhaled. Toxic if swallowed.

Product | Species | Test Results
--- | --- | ---
MUSTARD OIL (CAS 57-06-7) | | |
Acute | | |
Dermal | | |
LD50 | Rabbit | 88 mg/kg
Inhalation | | |
LC50 | Rat | 0.5 mg/kg
Skin corrosion/irritation: Causes skin irritation.
Serious eye damage/eye irritation: Causes serious eye irritation.
Respiratory or skin sensitization:
  Respiratory sensitization: May cause allergy or asthma symptoms or breathing difficulties if inhaled.
  Skin sensitization: May cause an allergic skin reaction.
Germ cell mutagenicity: Due to partial or complete lack of data the classification is not possible.
Carcinogenicity: Due to partial or complete lack of data the classification is not possible.

IARC Monographs. Overall Evaluation of Carcinogenicity:
  MUSTARD OIL (CAS 57-06-7): Not classifiable as to carcinogenicity to humans.
US. National Toxicology Program (NTP) Report on Carcinogens: Not listed.

Reproductive toxicity: Due to partial or complete lack of data the classification is not possible.
Specific target organ toxicity - single exposure: May cause respiratory irritation.
Specific target organ toxicity - repeated exposure: Knowledge about health hazard is incomplete.
Aspiration hazard: Due to partial or complete lack of data the classification is not possible.

12. ECOLOGICAL INFORMATION
Ecotoxicity: Very toxic to aquatic life with long lasting effects.

<table>
<thead>
<tr>
<th>Product</th>
<th>Species</th>
<th>Test Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>MUSTARD OIL (CAS 57-06-7)</td>
<td></td>
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<tr>
<td>Aquatic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fish</td>
<td>LC50</td>
<td>Fathead minnow (Pimephales promelas) 0.0856 mg/l, 96 hours</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Medaka, high-eyes (Oryzias latipes) &gt; 0.054 - &lt; 0.109 mg/l, 96 hours</td>
</tr>
</tbody>
</table>

Persistence and degradability: No data is available on the degradability of this substance.
Bioaccumulative potential: No data available.
Mobility in soil: No data available.
Other adverse effects: No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.

13. DISPOSAL CONSIDERATIONS
Disposal instructions: Do not discharge into drains, water courses or onto the ground. Do not allow this material to drain into sewers/water supplies. Do not contaminate ponds, waterways or ditches with chemical or used container. Dispose of contents/container in accordance with local/regional/national/international regulations.
Local disposal regulations: Dispose in accordance with all applicable regulations.
Hazardous waste code: Not established.
14. TRANSPORT INFORMATION

**ADN**

<table>
<thead>
<tr>
<th>UN number</th>
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<tbody>
<tr>
<td>UN proper shipping name</td>
<td>ALLYL ISOTHIOCYANATE, STABILIZED</td>
</tr>
<tr>
<td>Transport hazard class(es)</td>
<td>6.1(PGI, II)</td>
</tr>
<tr>
<td>Subsidiary class(es)</td>
<td>3</td>
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<tr>
<td>Packing group</td>
<td>II</td>
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<tr>
<td>Environmental hazards</td>
<td>Yes</td>
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**ADR**

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<td>Environmental hazards</td>
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**RID**

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<tr>
<td>Transport hazard class(es)</td>
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<tr>
<td>Subsidiary class(es)</td>
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<tr>
<td>Packing Group</td>
<td>II</td>
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<tr>
<td>Environmental Hazards</td>
<td>Yes</td>
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<tr>
<td>Labels required</td>
<td>6.1(PGI, II), 3</td>
</tr>
</tbody>
</table>

**Special precautions for user**

Read safety instructions, SDS and emergency procedures before handling.

**DOT**

**BULK**

<table>
<thead>
<tr>
<th>UN number</th>
<th>1545</th>
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<tbody>
<tr>
<td>Proper shipping name</td>
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</tr>
<tr>
<td>Hazard class</td>
<td>6.1(PGI, II)</td>
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<tr>
<td>Subsidiary hazard class</td>
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<tr>
<td>Packing group</td>
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<tr>
<td>Environmental hazards</td>
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<tr>
<td>Marine pollutant</td>
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<tr>
<td>Labels required</td>
<td>6.1(PGI, II), 3</td>
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</table>

**DOT**

**NON-BULK**

<table>
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<tbody>
<tr>
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</tbody>
</table>
Hazard class: 6.1(PGI, II)
Subsidiary hazard class: 3
Packing group: II
Environmental hazards:
  Marine pollutant: No
Labels required: 6.1(PGI, II), 3

IATA
UN number: 1545
UN proper shipping name: ALLYL ISOTHIOCYANATE, STABILIZED
Transport hazard class(es): 6.1(PGI, II)
Subsidiary class(es): 3
Packing group: II
Environmental hazards: No
Labels required: 6.1(PGI, II), 3

IMDG
UN number: 1545
UN proper shipping name: ALLYL ISOTHIOCYANATE, STABILIZED
Transport hazard class(es): 6.1(PGI, II)
Subsidiary class(es): 3
Packing group: II
Environmental hazards:
  Marine pollutant: Yes
Labels required: 6.1(PGI, II), 3
Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code: Not applicable.

ADN; ADR; IATA; IMDG; RID
15. REGULATORY INFORMATION

US federal regulations

This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

Toxic Substances Control Act (TSCA)

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)
Not regulated.

CERCLA Hazardous Substance List (40 CFR 302.4)
Not listed.

SARA 304 Emergency release notification
Not regulated.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1053)
Not listed.

Superfund Amendments and Reauthorization Act of 1986 (SARA)

SARA 302 Extremely hazardous substance
Not listed.

SARA 311/312 Hazardous chemical

Yes

Classified hazard categories

Flammable (gases, aerosols, liquids, or solids)
Acute toxicity (any route of exposure)
Skin corrosion or irritation
Serious eye damage or eye irritation
Respiratory or skin sensitization
Specific target organ toxicity (single or repeated exposure)
SARA 313 (TRI reporting)
Not regulated.

Other federal regulations
- Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List
  Not regulated.
- Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)
  Not regulated.
- Safe Drinking Water Act (SDWA)
  Not regulated.

### 16. OTHER INFORMATION, INCLUDING DATE OF PREPARATION OR LAST REVISION

<table>
<thead>
<tr>
<th>Issue date</th>
<th>11-26-2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revision date</td>
<td>05-06-2020</td>
</tr>
<tr>
<td>Version #</td>
<td>09</td>
</tr>
</tbody>
</table>
| HMIS® ratings | Health: 2*
  Flammability: 2
  Physical hazard: 0 |

**Disclaimer**
Vigon International, Inc. cannot anticipate all conditions under which this information and its product, or the products of other manufacturers in combination with its product, may be used. It is the user’s responsibility to ensure safe conditions for handling, storage and disposal of the product, and to assume liability for loss, injury, damage or expense due to improper use. The information in the sheet was written based on the best knowledge and experience currently available. The above information relates only to this product and not to its use in combination with any other material or any particular process and is designed only as guidance for the safe handling, use, processing, storage, transportation, and disposal and should not be considered as a guarantee or quality specification. This product has not been evaluated for safe use in e-cigarettes or any vaping application where the product(s) is/are intentionally vaporized and inhaled. Vigon International, Inc. has performed no testing on these products in e-cig/vaping applications. It is the sole responsibility of the individual(s) purchasing this product to assess its’ safety in the final application. The above information relates only to this product and not to its use in combination with any other material or any particular process and is designed only as guidance for the safe handling, use, processing, storage, transportation, disposal, and should not be considered as a guarantee or quality specification. The above information is based on data provided by and collected from recognized sources such as distributors, manufacturers, and technical groups and is considered to be accurate to the best of Vigon’s knowledge as of the date of this document. It is the responsibility of the user to review all safety information about this product and determine its safety and suitability in their own processes and operations. Appropriate warnings and safe handling procedures should be provided to all handlers and users, taking into account the intended use and the specific conditions and factors relating to such use in accordance with all applicable laws and regulations.
HAZARD(S) IDENTIFICATION: Response
FIRST-AID MEASURES: Most important symptoms/effects, acute and delayed
EXPOSURE CONTROLS/PERSONAL PROTECTION: Other
Physical & Chemical Properties: Multiple Properties
Toxicological Information: Toxicological Data
TOXICOLOGICAL INFORMATION: Corrosivity
TOXICOLOGICAL INFORMATION: Eye contact
TOXICOLOGICAL INFORMATION: Skin contact
TOXICOLOGICAL INFORMATION: Symptoms related to the physical, chemical and toxicological characteristics