SAFETY DATA SHEET

501188 METHYL-5 FURFURAL

Revision Date: 01-09-2018
Page 1 of 9
Version # 02
Print Date: 01-09-2018

1. IDENTIFICATION

Product Description: METHYL-5 FURFURAL
CAS # 620-02-0
FEMA Number 2702
Other means of identification
Vigon Item # 501188
Recommended use Concentrated aromatic and flavor ingredient which may be used in flavor and fragrance compounds according to legal and IFRA or FEMA GRAS/FDA guidelines.
Recommended restrictions For Manufacturing Use Only

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.

Company
Vigon International, Inc.
127 Airport Road
E. Stroudsburg, PA 18301
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 Not available.
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 4
Health hazards Acute toxicity, oral Category 5
Environmental hazards Not classified.

Label elements
Hazard symbol None.
Signal word Warning
Hazard statement Combustible liquid. May be harmful if swallowed.
Precautionary statement
Prevention Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Wear protective gloves/protective clothing/eye protection/face protection.
Response Call a POISON CENTER/doctor if you feel unwell. In case of fire: Use appropriate media to extinguish.
SAFETY DATA SHEET

501188 METHYL-5 FURFURAL

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>5-METHYL FURFURAL</td>
<td>5-methylfuran-2-carbaldehyde 5-methylfuran-2-al 2-formyl-5-methyl furan 5-Methyl-2-furancarboxaldehyde; 5-Methylfurfural 2-Furancarboxaldehyde, 5-methyl-</td>
<td>620-02-0</td>
<td>100</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
Direct contact with eyes may cause temporary irritation.

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. Porous material such as rags, paper, insulation, or organic clay may spontaneously combust when wetted with this material.
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

Keep unnecessary personnel away. Avoid contact with skin or inhalation of spillage, dust or vapor. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ventilate closed spaces before entering them. Eliminate all sources of ignition.

Methods and materials for containment and cleaning up

Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area). Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. 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.

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. Prevent product from entering drains. 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.

Never return spills in original containers for re-use. This material and its container must be disposed of as hazardous waste. Collect and dispose of spillage as indicated in section 13 of the SDS.

Environmental precautions

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

7. HANDLING AND STORAGE

Precautions for safe handling

Do not handle or store near an open flame, heat or other sources of ignition. Porous material such as rags, paper, insulation, or organic clay may spontaneously combust when wetted with this material. May auto-oxidize with sufficient heat generation to ignite if spread (as a thin film) or absorbed on porous or fibrous material. Take precautionary measures against static discharges. All equipment used when handling the product must be grounded. Contaminated rags and cloths must be put in fireproof containers for disposal. Avoid breathing vapor. Avoid contact with eyes, skin, and clothing. Avoid prolonged exposure. Wash thoroughly after handling.

Conditions for safe storage, including any incompatibilities

Do not store in direct sunlight. Keep container closed. Handle containers with care. Open slowly in order to control possible pressure release. Store in a cool, well-ventilated area. Keep under a nitrogen blanket.
### 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

<table>
<thead>
<tr>
<th>Occupational exposure limits</th>
<th>This substance has no PEL, TLV, or other recommended exposure limit.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biological limit values</td>
<td>No biological exposure limits noted for the ingredient(s).</td>
</tr>
<tr>
<td>Appropriate engineering controls</td>
<td>Use explosion-proof ventilation equipment to stay below exposure limits. Adequate ventilation should be provided so that exposure limits are not exceeded.</td>
</tr>
<tr>
<td>Individual protection measures, such as personal protective equipment</td>
<td></td>
</tr>
<tr>
<td>Eye/face protection</td>
<td>Wear safety glasses with side shields (or goggles).</td>
</tr>
<tr>
<td>Skin protection</td>
<td></td>
</tr>
<tr>
<td>Hand protection</td>
<td>Chemical resistant gloves.</td>
</tr>
<tr>
<td>Other</td>
<td>Not available.</td>
</tr>
<tr>
<td>Respiratory protection</td>
<td>Respiratory protection not required. If ventilation is insufficient, suitable respiratory protection must be provided.</td>
</tr>
<tr>
<td>Thermal hazards</td>
<td>Wear appropriate thermal protective clothing, when necessary.</td>
</tr>
<tr>
<td>General hygiene considerations</td>
<td>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.</td>
</tr>
</tbody>
</table>

### 9. PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance Refer to Spec Sheet</td>
<td></td>
</tr>
<tr>
<td>Physical state Liquid</td>
<td></td>
</tr>
<tr>
<td>Form Liquid</td>
<td></td>
</tr>
<tr>
<td>Color Refer to Spec Sheet</td>
<td></td>
</tr>
<tr>
<td>Odor Characteristic</td>
<td></td>
</tr>
<tr>
<td>Odor threshold Not available.</td>
<td></td>
</tr>
<tr>
<td>pH Not available.</td>
<td></td>
</tr>
<tr>
<td>Melting point/freezing point Not avail.</td>
<td></td>
</tr>
<tr>
<td>Initial boiling point and boiling</td>
<td>368.6 - 372.2 °F (187 - 189 °C)</td>
</tr>
<tr>
<td>range</td>
<td></td>
</tr>
<tr>
<td>Flash point 160.0 °F (71.1 °C) Closed Cup</td>
<td></td>
</tr>
<tr>
<td>Evaporation rate Not available.</td>
<td></td>
</tr>
<tr>
<td>Flammability (solid, gas) Not applic.</td>
<td></td>
</tr>
<tr>
<td>Upper/lower flammability or explosive limits</td>
<td></td>
</tr>
<tr>
<td>Flammability limit - lower (%) Not avail.</td>
<td></td>
</tr>
<tr>
<td>Flammability limit - upper (%) Not avail.</td>
<td></td>
</tr>
<tr>
<td>Explosive limit - lower (%) Not avail.</td>
<td></td>
</tr>
<tr>
<td>Explosive limit - upper (%) Not avail.</td>
<td></td>
</tr>
<tr>
<td>Vapor pressure 0.64 mm Hg at 25 °C</td>
<td></td>
</tr>
<tr>
<td>Vapor density 3.8</td>
<td></td>
</tr>
</tbody>
</table>
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Relative density
Solubility(ies)
  Solubility (water)
  Partition coefficient (n-octanol/water)
Auto-ignition temperature
Decomposition temperature
Viscosity
Other information
  Explosive properties
  Molecular formula
  Molecular weight
  Oxidizing properties
  Specific gravity

10. STABILITY AND REACTIVITY
Reactivity
Chemical stability
Possibility of hazardous reactions
Conditions to avoid
Incompatible materials
Hazardous decomposition products

11. TOXICOLOGICAL INFORMATION
Information on likely routes of exposure
  Inhalation
  Skin contact
  Eye contact
  Ingestion
Symptoms related to the physical, chemical and toxicological characteristics
Information on toxicological effects
  Acute toxicity

Not available.
Insoluble
Not available.
Not available.
Not available.
Not available.
Not explosive.
C6H6O2
150.22 g/mol
Not oxidizing.
1.1 at 25 °C
The product is stable and non-reactive under normal conditions of use, storage and transport.
Material is stable under normal conditions.
No dangerous reaction known under conditions of normal use.
Porous material such as rags, paper, insulation, or organic clay may spontaneously combust when wetted with this material.
Strong oxidizing agents.
No hazardous decomposition products if stored and handled as indicated.
No adverse effects due to inhalation are expected.
No adverse effects due to skin contact are expected.
Direct contact with eyes may cause temporary irritation.
May be harmful if swallowed.
Direct contact with eyes may cause temporary irritation.
May be harmful if swallowed.
Not a respiratory sensitizer.

5-METHYLFURFURAL (CAS 620-02-0)

Revision Date: 01-09-2018
Version # 02

Product               | Species | Test Results
---                   | ---     | ---
5-METHYL FURFURAL (CAS 620-02-0) |         | 
  Acute               |         | 
    Oral              |         | 
    LD50               | Rat     | 2200 mg/kg
Skin corrosion/irritation |         | Prolonged skin contact may cause temporary irritation.
Serious eye damage/eye irritation |         | Direct contact with eyes may cause temporary irritation.
Respiratory or skin sensitization |         | 
  Respiratory sensitization |         | Not a respiratory sensitizer.
  Skin sensitization |         | This product is not expected to cause skin sensitization.
Germ cell mutagenicity |         | No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.

Carcinogenicity

  IARC Monographs. Overall Evaluation of Carcinogenicity |         | Not listed.
  US. National Toxicology Program (NTP) Report on Carcinogens |         | Not listed.

  Reproductive toxicity |         | This product is not expected to cause reproductive or developmental effects.
Specific target organ toxicity - single exposure |         | Not classified.
Specific target organ toxicity - repeated exposure |         | Not classified.
Aspiration hazard |         | Not an aspiration hazard.

12. ECOLOGICAL INFORMATION

Ecotoxicity |         | The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.
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.

Waste from residues / unused products: Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).

Contaminated packaging: Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal.

14. TRANSPORT INFORMATION

ADN: Not regulated as dangerous goods.

ADR: Not regulated as dangerous goods.

RID: Not regulated as dangerous goods.

DOT

BULK

UN number: NA1993
Proper shipping name: COMBUSTIBLE LIQUID, N.O.S. (METHYL-5 FURFURAL)
Hazard class: Combustible liq
Packing group: III
Environmental hazards:
  Marine pollutant: No
  Packaging exceptions: 150
  Packaging bulk: 241
  Labels required: 3

DOT

NON-BULK: Not regulated as dangerous goods.

IATA: Not regulated as dangerous goods.

IMDG: Not regulated as dangerous goods.

15. REGULATORY INFORMATION

US federal regulations: This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.
CERCLA Hazardous Substance List (40 CFR 302.4)
Not listed.

SARA 304 Emergency release notification
Not regulated.

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)
Not available.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1052)
Not regulated.

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

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)

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.

US state regulations
California Proposition 65
California Proposition 65 - Carcinogens & Reproductive Toxicity (CRT): Listed substance
Not listed.

International Inventories

<table>
<thead>
<tr>
<th>Country(s) or region</th>
<th>Inventory name</th>
<th>On inventory (yes/no)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>Australian Inventory of Chemical Substances (AICS)</td>
<td>Yes</td>
</tr>
<tr>
<td>Canada</td>
<td>Domestic Substances List (DSL)</td>
<td>Yes</td>
</tr>
<tr>
<td>Canada</td>
<td>Non-Domestic Substances List (NDSSL)</td>
<td>No</td>
</tr>
<tr>
<td>China</td>
<td>Inventory of Existing Chemical Substances in China (IECSC)</td>
<td>Yes</td>
</tr>
<tr>
<td>Europe</td>
<td>European Inventory of Existing Commercial Chemical Substances (EINECS)</td>
<td>Yes</td>
</tr>
<tr>
<td>Europe</td>
<td>European List of Notified Chemical Substances (ELINCS)</td>
<td>No</td>
</tr>
<tr>
<td>Japan</td>
<td>Inventory of Existing and New Chemical Substances (ENCS)</td>
<td>Yes</td>
</tr>
<tr>
<td>Korea</td>
<td>Existing Chemicals List (ECL)</td>
<td>Yes</td>
</tr>
</tbody>
</table>
16. OTHER INFORMATION, INCLUDING DATE OF PREPARATION OR LAST REVISION

Issue date: 09-29-2017
Revision date: 01-09-2018
Version #: 02
HMIS® ratings:
- Health: 1
- 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.

Revision information:
This document has undergone significant changes and should be reviewed in its entirety.