1 Identification

· Trade name: 2-Methyl-3-Furanthiol 5% in Ethyl Acetate natural

· Application of the substance / the mixture: Food flavorings

2 Hazard(s) identification

· Classification of the substance or mixture
  GHS02 Flame
  Flam. Liq. 3 H226 Flammable liquid and vapor.

  GHS06 Skull and crossbones
  Acute Tox. 3 H331 Toxic if inhaled.

  GHS05 Corrosion
  Eye Dam. 1 H318 Causes serious eye damage.

  GHS07
  Acute Tox. 4 H302 Harmful if swallowed.
Trade name: 2-Methyl-3-Furanthiol 5% in Ethyl Acetate natural

STOT SE 3 H336 May cause drowsiness or dizziness.

· Label elements Harmful in contact with skin or if inhaled.
· GHS label elements
  Pictograms on label shall be in the shape of a square set at a point and shall include a black hazard symbol on a white background with a red frame sufficiently wide to be clearly visible.
  The product is classified and labeled according to the Globally Harmonized System (GHS).
· Hazard pictograms
  ![Pictograms](image)
  GHS02 GHS05 GHS06 GHS07

· Signal word Danger
· Hazard-determining components of labeling:
  2-Methyl-3-Furanthiol
  ethyl acetate
· Hazard statements
  H226 Flammable liquid and vapor.
  H302 Harmful if swallowed.
  H318 Causes serious eye damage.
  H336 May cause drowsiness or dizziness.
· Precautionary statements
  P210 Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
  P303+P361+P353 If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
  P305+P351+P338 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
  P310 Immediately call a poison center/doctor.
  P321 Specific treatment (see on this label).
  P330 Rinse mouth.
  P405 Store locked up.
  P501 Dispose of contents/container in accordance with local/regional/national/international regulations.
· Classification system:
  · NFPA ratings (scale 0 - 4)
    ![NFPA Ratings](image)
    Health = 3
    Fire = 3
    Reactivity = 0
  · HMIS-ratings (scale 0 - 4)
    ![HMIS Ratings](image)
    Health = *3
    Fire = 3
    Reactivity = 0
· Other hazards
  · Results of PBT and vPvB assessment
    PBT: Not applicable.
3 Composition/information on ingredients

· Description: Mixture of the substances listed below with nonhazardous additions.

<table>
<thead>
<tr>
<th>CAS</th>
<th>Ingredient</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>141-78-6</td>
<td>ethyl acetate</td>
<td>90.0%</td>
</tr>
<tr>
<td>28588-74-1</td>
<td>2-Methyl-3-Furanthiol</td>
<td>5.4%</td>
</tr>
</tbody>
</table>

4 First-aid measures

· Description of first aid measures
· General information:
  Immediately remove any clothing soiled by the product.
  Symptoms of poisoning may even occur after several hours; therefore medical observation for at least 48 hours after the accident.
  Remove breathing apparatus only after contaminated clothing have been completely removed.
  In case of irregular breathing or respiratory arrest provide artificial respiration.
· After inhalation:
  Supply fresh air or oxygen; call for doctor.
  In case of unconsciousness place patient stably in side position for transportation.
· After skin contact:
  Immediately wash with water and soap and rinse thoroughly.
· After eye contact:
  Rinse opened eye for several minutes under running water. Then consult a doctor.
· After swallowing:
  Immediately call a doctor.
· Information for doctor:
  Most important symptoms and effects, both acute and delayed
  No further relevant information available.
  Indication of any immediate medical attention and special treatment needed
  No further relevant information available.

5 Fire-fighting measures

· Extinguishing media
  · Suitable extinguishing agents:
    CO2, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
  · For safety reasons unsuitable extinguishing agents: Water with full jet
  · Special hazards arising from the substance or mixture No further relevant information available.
  · Advice for firefighters
  · Protective equipment: Mouth respiratory protective device.
  · Additional information
    Cool endangered receptacles with water spray.
    Collect contaminated fire fighting water separately. It must not enter the sewage system.
6 Accidental release measures

- Personal precautions, protective equipment and emergency procedures
  Wear protective equipment. Keep unprotected persons away.
- Environmental precautions: Do not allow to enter sewers/ surface or ground water.
- Methods and material for containment and cleaning up:
  Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
  Use neutralizing agent.
  Dispose contaminated material as waste according to item 13.
  Ensure adequate ventilation.
- Reference to other sections
  See Section 7 for information on safe handling.
  See Section 8 for information on personal protection equipment.
  See Section 13 for disposal information.
- Protective Action Criteria for Chemicals
  - PAC-1:
    | CAS: 141-78-6 | ethyl acetate | 1,200 ppm |
  - PAC-2:
    | CAS: 141-78-6 | ethyl acetate | 1,700 ppm |
  - PAC-3:
    | CAS: 141-78-6 | ethyl acetate | 10000** ppm |

7 Handling and storage

- Handling:
  - Precautions for safe handling
    Ensure good ventilation/exhaustion at the workplace.
    Open and handle receptacle with care.
    Prevent formation of aerosols.
  - Information about protection against explosions and fires:
    Keep ignition sources away - Do not smoke.
    Protect against electrostatic charges.
    Keep respiratory protective device available.
- Conditions for safe storage, including any incompatibilities
- Storage:
  - Requirements to be met by storerooms and receptacles:
    No special requirements.
    Please refer to product specification for product storage requirements.
  - Information about storage in one common storage facility: Not required.
  - Further information about storage conditions: Keep receptacle tightly sealed.
  - Specific end use(s) No further relevant information available.

8 Exposure controls/personal protection

- Additional information about design of technical systems: No further data; see item 7.
Trade name: 2-Methyl-3-Furanthiol 5% in Ethyl Acetate natural

- Control parameters
  - Components with limit values that require monitoring at the workplace:
    The following constituent is the only constituent of the product which has a PEL, TLV or other recommended exposure limit.
    At this time, the remaining constituent has no known exposure limits.

<table>
<thead>
<tr>
<th>CAS: 141-78-6 ethyl acetate</th>
</tr>
</thead>
<tbody>
<tr>
<td>PEL</td>
</tr>
<tr>
<td>REL</td>
</tr>
<tr>
<td>TLV</td>
</tr>
</tbody>
</table>

- Additional information: The lists that were valid during the creation were used as a basis.

- Exposure controls
  - Personal protective equipment:
    - General protective and hygienic measures:
      Keep away from foodstuffs, beverages and feed.
      Immediately remove all soiled and contaminated clothing.
      Wash hands before breaks and at the end of work.
      Store protective clothing separately.
      Avoid contact with the eyes.
      Avoid contact with the eyes and skin.

- Breathing equipment:
  In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use respiratory protective device that is independent of circulating air.

- Protection of hands:

  Protective gloves

  The glove material has to be impermeable and resistant to the product/ the substance/ the preparation. Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.
  Selection of the glove material should be based on consideration of the penetration times, rates of diffusion and the degradation.

  Material of gloves
  The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.

  Penetration time of glove material
  The exact break through time has to be determined by the manufacturer of the protective gloves and has to be observed.

- Eye protection:

  Tightly sealed goggles

(Continued on page 6)
### 9 Physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Appearance</strong></td>
<td>Liquid</td>
</tr>
<tr>
<td>Form:</td>
<td>Liquid</td>
</tr>
<tr>
<td>Color:</td>
<td>According to product specification</td>
</tr>
<tr>
<td>Odor:</td>
<td>According to product specification</td>
</tr>
<tr>
<td>Odor threshold:</td>
<td>Not determined.</td>
</tr>
<tr>
<td><strong>pH-value</strong></td>
<td>Not determined.</td>
</tr>
<tr>
<td><strong>Change in condition</strong></td>
<td></td>
</tr>
<tr>
<td>Melting point/Melting range:</td>
<td>Undetermined.</td>
</tr>
<tr>
<td>Boiling point/Boiling range:</td>
<td>Undetermined.</td>
</tr>
<tr>
<td><strong>Flash point</strong></td>
<td>&lt;30 °C (&lt;86 °F)</td>
</tr>
<tr>
<td><strong>Flammability (solid, gaseous)</strong></td>
<td>Not applicable.</td>
</tr>
<tr>
<td><strong>Ignition temperature</strong></td>
<td>460 °C (860 °F)</td>
</tr>
<tr>
<td><strong>Decomposition temperature</strong></td>
<td>Not determined.</td>
</tr>
<tr>
<td><strong>Auto igniting</strong></td>
<td>Product is not selfigniting.</td>
</tr>
<tr>
<td><strong>Danger of explosion</strong></td>
<td>Product is not explosive. However, formation of explosive air/vapor mixtures are possible.</td>
</tr>
<tr>
<td><strong>Explosion limits</strong></td>
<td></td>
</tr>
<tr>
<td>Lower: 2.1 Vol %</td>
<td></td>
</tr>
<tr>
<td>Upper: 11.5 Vol %</td>
<td></td>
</tr>
<tr>
<td><strong>Vapor pressure at 20 °C (68 °F):</strong></td>
<td>97 hPa (72.8 mm Hg)</td>
</tr>
<tr>
<td><strong>Density at 20 °C (68 °F):</strong></td>
<td>0.915 g/cm³ (7.63568 lbs/gal)</td>
</tr>
<tr>
<td>Relative density</td>
<td>Not determined.</td>
</tr>
<tr>
<td><strong>Vapor density</strong></td>
<td>Not determined.</td>
</tr>
<tr>
<td><strong>Evaporation rate</strong></td>
<td>Not determined.</td>
</tr>
<tr>
<td><strong>Solubility in / Miscibility with Water</strong></td>
<td>Not miscible or difficult to mix.</td>
</tr>
<tr>
<td><strong>Partition coefficient (n-octanol/water):</strong></td>
<td>Not determined.</td>
</tr>
<tr>
<td><strong>Viscosity</strong></td>
<td></td>
</tr>
<tr>
<td>Dynamic: Not determined.</td>
<td></td>
</tr>
<tr>
<td>Kinematic:</td>
<td>Not determined.</td>
</tr>
<tr>
<td><strong>Solvent content:</strong></td>
<td></td>
</tr>
<tr>
<td>Organic solvents:</td>
<td>90.0 %</td>
</tr>
<tr>
<td>VOC content:</td>
<td>90.00 %</td>
</tr>
<tr>
<td>823.5 g/l / 6.87 lb/gal</td>
<td></td>
</tr>
<tr>
<td><strong>Solids content:</strong></td>
<td>4.6 %</td>
</tr>
<tr>
<td><strong>Other information</strong></td>
<td>No further relevant information available.</td>
</tr>
</tbody>
</table>
10 Stability and reactivity

- **Reactivity**: No further relevant information available.
- **Chemical stability**: No decomposition if used according to specifications.
- **Possibility of hazardous reactions**: No dangerous reactions known.
- **Conditions to avoid**: No further relevant information available.
- **Incompatible materials**: No further relevant information available.
- **Hazardous decomposition products**: No dangerous decomposition products known.

11 Toxicological information

- **Information on toxicological effects**
- **Acute toxicity**:
  - LD/LC50 values that are relevant for classification:
    - **ATE (Acute Toxicity Estimate)**
      - Oral: LD50 1,852 mg/kg (mouse)
      - Inhalative: LC50/4 h 3.88 mg/l (rat)
    - **CAS: 141-78-6 ethyl acetate**
      - Oral: LD50 5,620 mg/kg (rabbit)
      - Inhalative: LC50/4 h 1,600 mg/l (rat)
    - **CAS: 28588-74-1 2-Methyl-3-Furanthiol**
      - Oral: LD50 100 mg/kg (mouse)
      - Dermal: LD50 300 mg/kg (ATE)
      - Inhalative: LC50/4 h 0.21 mg/l (rat)
- **Primary irritant effect**:
  - **on the skin**: No irritant effect.
  - **on the eye**: Strong irritant with the danger of severe eye injury.
- **Sensitization**: No sensitizing effects known.
- **Additional toxicological information**:
  The product shows the following dangers according to internally approved calculation methods for preparations:
  - Toxic
  - Harmful
  - Irritant
- **Carcinogenic categories**
  - **IARC (International Agency for Research on Cancer)**
    None of the ingredients is listed.
  - **NTP (National Toxicology Program)**
    None of the ingredients is listed.
  - **OSHA-Ca (Occupational Safety & Health Administration)**
    None of the ingredients is listed.
12 Ecological information

- Toxicity
- Aquatic toxicity: No further relevant information available.
- Persistence and degradability No further relevant information available.
- Behavior in environmental systems:
- Bioaccumulative potential No further relevant information available.
- Mobility in soil No further relevant information available.
- Additional ecological information:
  - General notes:
    Water hazard class 1 (Self-assessment): slightly hazardous for water
    Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.
    Must not reach bodies of water or drainage ditch undiluted or unneutralized.
  - Results of PBT and vPvB assessment
    - PBT: Not applicable.
    - vPvB: Not applicable.
  - Other adverse effects No further relevant information available.

13 Disposal considerations

- Waste treatment methods
  - Recommendation:
    Must not be disposed of together with household garbage. Do not allow product to reach sewage system.
- Uncleaned packagings:
  - Recommendation: Disposal must be made according to official regulations.

14 Transport information

- UN-Number
  - DOT, ADR, IMDG, IATA: UN1992
- UN proper shipping name
  - DOT: Flammable liquids, toxic, n.o.s. (Ethyl acetate, 2-Methyl-3-Furanthiol)
  - ADR: 1992 FLAMMABLE LIQUID, TOXIC, N.O.S. (ETHYL ACETATE, 2-Methyl-3-Furanthiol)
  - IMDG, IATA: FLAMMABLE LIQUID, TOXIC, N.O.S. (ETHYL ACETATE, 2-Methyl-3-Furanthiol)

- Transport hazard class(es)
  - DOT
    - Class: 3 Flammable liquids
    - (Continued on page 9)
### Trade name: 2-Methyl-3-Furanthiol 5% in Ethyl Acetate natural

| · Label       | 3, 6.1         |
| · ADR         |                |
| · Class       | 3 (FT1) Flammable liquids |
| · Label       | 3+6.1          |
| · IMDG        |                |
| · Class       | 3 Flammable liquids |
| · Label       | 3/6.1          |
| · IATA        |                |
| · Class       | 3 Flammable liquids |
| · Label       | 3 (6.1)        |
| · Packing group | III          |
| · DOT, ADR, IMDG, IATA | III          |
| · Environmental hazards: | Not applicable. |
| · Special precautions for user | Warning: Flammable liquids |
| · Danger code (Kemler): | 36          |
| · EMS Number: | F-E,S-D        |
| · Stowage Category | A            |
| · Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code | Not applicable. |
| · Transport/Additional information: |                  |
| · DOT         |                |
| · Quantity limitations | On passenger aircraft/rail: 60 L  
On cargo aircraft only: 220 L |
| · ADR         |                |
| · Exempted quantities (EQ) | Code: E1  
Maximum net quantity per inner packaging: 30 ml  
Maximum net quantity per outer packaging: 1000 ml |
| · IMDG        |                |
| · Limited quantities (LQ) | 5L           |
Trade name: 2-Methyl-3-Furanthiol 5% in Ethyl Acetate natural

- **Excepted quantities (EQ)**
  - Code: E1
  - Maximum net quantity per inner packaging: 30 ml
  - Maximum net quantity per outer packaging: 1000 ml
- **UN "Model Regulation"**:
  - UN 1992 FLAMMABLE LIQUID, TOXIC, N.O.S. (ETHYL ACETATE, 2-METHYL-3-FURANTHIOL), 3 (6.1), III

### 15 Regulatory information

- **Safety, health and environmental regulations/legislation specific for the substance or mixture**
  - **Sara**
    - Section 355 (extremely hazardous substances):
      - None of the ingredients is listed.
  - Section 313 (Specific toxic chemical listings):
    - None of the ingredients is listed.
  - TSCA (Toxic Substances Control Act):
    - All ingredients are listed.
  - TSCA new (21st Century Act): (Substances not listed)
  - CAS: 28588-74-1 2-Methyl-3-Furanthiol
  - Proposition 65
    - Chemicals known to cause cancer:
      - None of the ingredients is listed.
    - Chemicals known to cause reproductive toxicity for females:
      - None of the ingredients is listed.
    - Chemicals known to cause reproductive toxicity for males:
      - None of the ingredients is listed.
    - Chemicals known to cause developmental toxicity:
      - None of the ingredients is listed.
- **Carcinogenic categories**
  - EPA (Environmental Protection Agency)
    - None of the ingredients is listed.
  - TLV (Threshold Limit Value established by ACGIH)
    - None of the ingredients is listed.
  - NIOSH-Ca (National Institute for Occupational Safety and Health)
    - None of the ingredients is listed.
- **GHS label elements**
  - Pictograms on label shall be in the shape of a square set at a point and shall include a black hazard symbol on a white background with a red frame sufficiently wide to be clearly visible.
  - The product is classified and labeled according to the Globally Harmonized System (GHS).
Trade name: 2-Methyl-3-Furanthiol 5% in Ethyl Acetate natural

- **Hazard pictograms**
  - GHS02 Flammable
  - GHS05 Oxidising
  - GHS06 Corrosive
  - GHS07 Health Hazard

- **Signal word** Danger

- **Hazard-determining components of labeling:**
  - 2-Methyl-3-Furanthiol
  - ethyl acetate

- **Hazard statements**
  - H226 Flammable liquid and vapor.
  - H302 Harmful if swallowed.
  - H331 Toxic if inhaled.
  - H318 Causes serious eye damage.
  - H336 May cause drowsiness or dizziness.

- **Precautionary statements**
  - P210 Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
  - P303+P361+P353 If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
  - P305+P351+P338 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
  - P310 Immediately call a poison center/doctor.
  - P321 Specific treatment (see on this label).
  - P330 Rinse mouth.
  - P405 Store locked up.
  - P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

- **Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

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**16 Other information**

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

- **Relevant phrases**
  - H225 Highly flammable liquid and vapor.
  - H226 Flammable liquid and vapor.
  - H300 Fatal if swallowed.
  - H311 Toxic in contact with skin.
  - H318 Causes serious eye damage.
  - H319 Causes serious eye irritation.
  - H330 Fatal if inhaled.
  - H336 May cause drowsiness or dizziness.

- **Department issuing SDS:** Product Safety Department

- **Contact:**
  - Product Safety Department
  - productsafety@adv-bio.com

- **Date of preparation / last revision** 02/11/2019 / -
Abbreviations and acronyms:
- ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
- IMDG: International Maritime Code for Dangerous Goods
- DOT: US Department of Transportation
- IATA: International Air Transport Association
- ACGIH: American Conference of Governmental Industrial Hygienists
- EINECS: European Inventory of Existing Commercial Chemical Substances
- ELINCS: European List of Notified Chemical Substances
- CAS: Chemical Abstracts Service (division of the American Chemical Society)
- NFPA: National Fire Protection Association (USA)
- HMIS: Hazardous Materials Identification System (USA)
- VOC: Volatile Organic Compounds (USA, EU)
- LC50: Lethal concentration, 50 percent
- LD50: Lethal dose, 50 percent
- PBT: Persistent, Bioaccumulative and Toxic
- vPvB: very Persistent and very Bioaccumulative
- NIOSH: National Institute for Occupational Safety
- OSHA: Occupational Safety & Health
- TLV: Threshold Limit Value
- PEL: Permissible Exposure Limit
- REL: Recommended Exposure Limit
- Flam. Liq. 2: Flammable liquids – Category 2
- Flam. Liq. 3: Flammable liquids – Category 3
- Acute Tox. 2: Acute toxicity – Category 2
- Acute Tox. 4: Acute toxicity – Category 4
- Acute Tox. 3: Acute toxicity – Category 3
- Acute Tox. 1: Acute toxicity – Category 1
- Eye Dam. 1: Serious eye damage/eye irritation – Category 1
- Eye Irrit. 2A: Serious eye damage/eye irritation – Category 2A
- STOT SE 3: Specific target organ toxicity (single exposure) – Category 3