1 Identification

- Product identifier
  - Trade name: 2-Methyl-1-Butanol natural
  - Product number: 1275
  - CAS Number: 137-32-6
  - EC number: 205-289-9
- 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.
  - GHS07
    - Acute Tox. 4  H302 Harmful if swallowed.
    - Acute Tox. 4  H332 Harmful if inhaled.
    - STOT SE 3  H335 May cause respiratory irritation.
- Label elements Harmful in contact with skin or if inhaled.

(Continued on page 2)
Safety Data Sheet
acc. to OSHA HCS

Printing date 08/24/2018
Reviewed on 03/31/2018

Trade name: 2-Methyl-1-Butanol natural

· 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 substance is classified and labeled according to the Globally Harmonized System (GHS).

· Hazard pictograms
   ![GHS02](image)
   ![GHS07](image)

· Signal word Warning

· Hazard-determining components of labeling:
   2-methylbutanol

· Hazard statements
   H226 Flammable liquid and vapor.
   H302+H332 Harmful if swallowed or if inhaled.
   H335 May cause respiratory irritation.

· Precautionary statements
   P210 Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
   P241 Use explosion-proof electrical/ventilating/lighting/equipment.
   P261 Avoid breathing dust/fume/gas/mist/vapors/spray
   P303+P361+P353 If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
   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)

· HMIS-ratings (scale 0 - 4)
   ![HMIS Ratings](image)

· Other hazards
· Results of PBT and vPvB assessment
   · PBT: Not applicable.
   · vPvB: Not applicable.
3 Composition/information on ingredients

- Chemical characterization: Substances
- CAS No. Description
  137-32-6 2-methylbutanol
- Identification number(s)
- EC number: 205-289-9

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.
- After inhalation:
  Supply fresh air. If required, provide artificial respiration. Keep patient warm. Consult doctor if symptoms persist.
  In case of unconsciousness place patient stably in side position for transportation.
- After skin contact:
  Immediately rinse with water.
- After eye contact:
  Rinse opened eye for several minutes under running water.
- 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: Prevent seepage into sewage system, workpits and cellars.
· Methods and material for containment and cleaning up:
  Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
  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:
    Substance is not listed.
  · PAC-2:
    Substance is not listed.
  · PAC-3:
    Substance is not listed.

7 Handling and storage

· Handling:
  · Precautions for safe handling
    Ensure good ventilation/exhaustion at the workplace.
    Prevent formation of aerosols.
  · Information about protection against explosions and fires:
    Keep ignition sources away - Do not smoke.
    Protect against electrostatic charges.
· Conditions for safe storage, including any incompatibilities
  · Storage:
    · Requirements to be met by storerooms and receptacles: No special 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.
· Control parameters
· Components with limit values that require monitoring at the workplace: Not required.
· 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.

(Continued on page 5)
Trade name: 2-Methyl-1-Butanol natural

Wash hands before breaks and at the end of work.

- **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.

  **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

---

### 9 Physical and chemical properties

- **Information on basic physical and chemical properties**

  - **General Information**
  
    - **Appearance:**
      
      - **Form:** Liquid
      - **Color:** According to product specification
      - **Odor:** According to product specification
      - **Odor threshold:** Not determined.

    - **pH-value:** Not determined.

  - **Change in condition**
    
    - **Melting point/Melting range:** -70 °C (-94 °F)
    - **Boiling point/Boiling range:** 130 °C (266 °F)

  - **Flash point:** 43 °C (109.4 °F)

  - **Flammability (solid, gaseous):** Not applicable.

  - **Ignition temperature:** 400 °C (752 °F)
### 10 Stability and reactivity

- **Reactivity** No further relevant information available.
- **Chemical stability**
- **Thermal decomposition / conditions to be avoided:**
  - 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 1,000 mg/kg (rat)
      - Dermal: LD50 3,540 mg/kg (rabbit)
      - Inhalative: LC50/4 h 11 mg/l
    - CAS: 137-32-6 2-methylbutanol
      - Oral: LD50 1,000 mg/kg (rat)
      - Dermal: LD50 3,540 mg/kg (rabbit)
      - Inhalative: LC50/4 h 11 mg/l (ATE)

- Primary irritant effect:
  - on the skin: No irritant effect.
  - on the eye: No irritating effect.
  - Sensitization: No sensitizing effects known.

- Additional toxicological information:
  - Carcinogenic categories
    - IARC (International Agency for Research on Cancer)
      - Substance is not listed.
    - NTP (National Toxicology Program)
      - Substance is not listed.
    - OSHA-Ca (Occupational Safety & Health Administration)
      - Substance is not 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: Generally not hazardous for water
    - 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: UN1993

- **UN proper shipping name**
  - DOT: Flammable liquids, n.o.s. (Pentanols)
  - ADR: 1993 Flammable liquids, n.o.s. (Pentanols)
  - IMDG, IATA: FLAMMABLE LIQUID, N.O.S. (PENTANOLS)

- Transport hazard class(es)
  - DOT: Class 3 Flammable liquids
  - ADR, IMDG, IATA: Class 3 Flammable liquids

- Packing group
  - DOT, ADR, IMDG, IATA: III

- Environmental hazards:
  - Marine pollutant: No

- Special precautions for user
  - Warning: Flammable liquids

- Stowage Category
  - A

- Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code
  - Not applicable.
### 15 Regulatory information

- **Safety, health and environmental regulations/legislation specific for the substance or mixture**
  - **Sara**
    - Section 355 (extremely hazardous substances):
      - Substance is not listed.
    - Section 313 (Specific toxic chemical listings):
      - Substance is not listed.
  - **TSCA (Toxic Substances Control Act):**
    - Substance is listed.
  - **Proposition 65**
    - Chemicals known to cause cancer:
      - Substance is not listed.
    - Chemicals known to cause reproductive toxicity for females:
      - Substance is not listed.
    - Chemicals known to cause reproductive toxicity for males:
      - Substance is not listed.
    - Chemicals known to cause developmental toxicity:
      - Substance is not listed.
  - **Carcinogenic categories**
    - EPA (Environmental Protection Agency)
      - Substance is not listed.
    - TLV (Threshold Limit Value established by ACGIH)
      - Substance is not listed.
    - NIOSH-Ca (National Institute for Occupational Safety and Health)
      - Substance is not listed.
Trade name: 2-Methyl-1-Butanol natural

- **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 substance is classified and labeled according to the Globally Harmonized System (GHS).

- **Hazard pictograms**
  ![GHS02](image1)  ![GHS07](image2)

- **Signal word** Warning

- **Hazard-determining components of labeling:**
  2-methylbutanol

- **Hazard statements**
  H226 Flammable liquid and vapor.
  H302+H332 Harmful if swallowed or if inhaled.
  H335 May cause respiratory irritation.

- **Precautionary statements**
  P210 Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
  P241 Use explosion-proof electrical/ventilating/lighting/equipment.
  P261 Avoid breathing dust/fume/gas/mist/vapors/spray
  P303+P361+P353 If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
  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.

---

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.

- **Department issuing SDS:** Product Safety Department
- **Contact:**
  Product Safety Department
  productsafety@adv-bio.com
- **Date of preparation / last revision:** 08/24/2018 / -
- **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
  CAS: Chemical Abstracts Service (division of the American Chemical Society)
  NFPA: National Fire Protection Association (USA)
  HMIS: Hazardous Materials Identification System (USA)
Trade name: 2-Methyl-1-Butanol natural

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. 3: Flammable liquids – Category 3
Acute Tox. 4: Acute toxicity – Category 4
STOT SE 3: Specific target organ toxicity (single exposure) – Category 3