Material Safety Data Sheet

2-ETHYLHEXYL NITRATE

1. Product and company identification

Product name: 2-ETHYLHEXYL NITRATE
Synonym: 2-ethylhexyl nitrate
Material uses: Fuel additive (Cetane improver).
Code: 4803
Supplier/Manufacturer: Eurenco Inc.

6720 Dixie Drive
Houston, Texas 77087
Office: (713) 643-8900
Mobile: (281) 960-1355

MSDS authored by: KMK Regulatory Services Inc.

In case of emergency
281-960-1355

2. Hazards identification

Emergency overview

Physical state: Liquid. [Slightly viscous.]
Color: Clear. Colorless to light yellow.
Signal word: WARNING!

Hazard statements: COMBUSTIBLE LIQUID AND VAPOR. HARMFUL IF INHALED OR ABSORBED THROUGH SKIN. MAY CAUSE EYE AND SKIN IRRITATION.

Precautionary measures: Avoid breathing vapor or mist. Use only with adequate ventilation. Avoid contact with eyes, skin and clothing. Keep away from heat and flame. Keep container closed. Wash thoroughly after handling.

OSHA/HCS status: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Routes of entry: Dermal contact. Eye contact. Inhalation. Ingestion.

Potential acute health effects

Inhalation: Toxic by inhalation. Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.

Ingestion: No known significant effects or critical hazards.

Skin: Toxic in contact with skin. Moderately irritating to the skin.

Eyes: Moderately irritating to eyes.

Potential chronic health effects

Chronic effects: No known significant effects or critical hazards.
Carcinogenicity: No known significant effects or critical hazards.
Mutagenicity: No known significant effects or critical hazards.
Teratogenicity: No known significant effects or critical hazards.
Developmental effects: No known significant effects or critical hazards.
Fertility effects: No known significant effects or critical hazards.

Over-exposure signs/symptoms

Inhalation: No specific data.
2. Hazards identification

**Ingestion** : No specific data.

**Skin** : Adverse symptoms may include the following:
- irritation
- redness

**Eyes** : Adverse symptoms may include the following:
- irritation
- watering
- redness

**Medical conditions aggravated by over-exposure** : None known.

See toxicological information (Section 11)

3. Composition/information on ingredients

<table>
<thead>
<tr>
<th>Name</th>
<th>CAS number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-Ethylhexyl nitrate</td>
<td>27247-96-7</td>
<td>60 - 100</td>
</tr>
</tbody>
</table>

**United States**

**Canada**

<table>
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<tr>
<th>Name</th>
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There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

4. First aid measures

**Eye contact** : Check for and remove any contact lenses. Immediately flush eyes with plenty of water for at least 20 minutes, occasionally lifting the upper and lower eyelids. Get medical attention immediately.

**Skin contact** : In case of contact, immediately flush skin with plenty of water for at least 20 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention immediately.

**Inhalation** : Move exposed person to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

**Ingestion** : Wash out mouth with water. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention immediately.

**Protection of first-aiders** : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

**Notes to physician** : In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.
5. Fire-fighting measures

**Flammability of the product**: Combustible liquid. The vapor/gas is heavier than air and will spread along the ground. Vapors may accumulate in low or confined areas or travel a considerable distance to a source of ignition and flash back.

**Extinguishing media**

**Suitable**: Use dry chemical, CO₂, water spray (fog) or foam.

**Not suitable**: Do not use water jet.

**Special exposure hazards**: Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.

**Hazardous thermal decomposition products**: Decomposition products may include the following materials:
- Carbon dioxide
- Carbon monoxide
- Nitrogen oxides

**Special protective equipment for fire-fighters**: Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

6. Accidental release measures

**Personal precautions**: No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Shut off all ignition sources. Do not breathe vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see Section 8).

**Environmental precautions**: Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities.

**Methods for cleaning up**

**Spill**: Stop leak if without risk. Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see section 13). Use spark-proof tools and explosion-proof equipment. Dispose via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see section 1 for emergency contact information and section 13 for waste disposal.

7. Handling and storage

**Handling**: Put on appropriate personal protective equipment (see Section 8). Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not ingest. Avoid release to the environment. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use non-sparking tools. Take precautionary measures against electrostatic discharges. To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before transferring material. Empty containers remain...
7. Handling and storage

Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see section 10) and food and drink. Eliminate all ignition sources. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

8. Exposure controls/personal protection

Canada

Occupational exposure limits
No exposure limit value known.

Consult local authorities for acceptable exposure limits.

Recommended monitoring procedures: If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.

Engineering measures: Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapor or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

Hygiene measures: Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal protection

Respiratory: Use a properly fitted, air-purifying or supplied air respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Hands: Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

Eyes: Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts.

Skin: Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Environmental exposure controls: Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.
9. Physical and chemical properties

Physical state: Liquid. [Slightly viscous.]
Flash point: Closed cup: 81°C (177.8°F) [NF T6 0-103]
Burning time: Not applicable.
Burning rate: Not applicable.
Auto-ignition temperature: 215°C (419°F)
Flammable limits: Lower: 0.25%
Color: Clear. Colorless to light yellow.
Taste: Not available.
Molecular weight: 175.26 g/mole
Molecular formula: C₈H₁₇NO₃
pH: Not available.
Boiling/condensation point: Not available.
Melting/freezing point: <−50°C (<−58°F)
Critical temperature: Not available.
Relative density: 0.963
Vapor pressure: 0.027 kPa (0.20252 mm Hg) [20°C]
Vapor density: >1 [Air = 1]
Volutility: Not available.
Odor threshold: Not available.
Evaporation rate: Not available.
SADT: Not available.
Viscosity: Kinematic: 0.018 cm²/s (1.8 cSt)
Ionicity (in water): Not available.
Dispersibility properties: Not available.
Solubility: Easily soluble in the following materials: Methanol.
Very slightly soluble in the following materials: cold water and hot water.
Physical/chemical properties comments: Not available.

10. Stability and reactivity

Chemical stability: The product is stable.
Conditions to avoid: Avoid all possible sources of ignition (spark or flame). Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition. Do not allow vapor to accumulate in low or confined areas.
Incompatible materials: Extremely reactive or incompatible with the following materials: oxidizing materials and combustible materials.
Reactive or incompatible with the following materials: reducing materials, acids and alkalis.
Hazardous decomposition products: Under normal conditions of storage and use, hazardous decomposition products should not be produced.
Possibility of hazardous reactions: Under normal conditions of storage and use, hazardous reactions will not occur.
11. Toxicological information

**Acute toxicity**

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Dose</th>
<th>Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-Ethylhexyl nitrate</td>
<td>LD50 Dermal</td>
<td>Rabbit</td>
<td>&gt;5000 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>&gt;10000 mg/kg</td>
<td>-</td>
</tr>
</tbody>
</table>

**Chronic toxicity**
There is no data available.

**Irritation/Corrosion**

<table>
<thead>
<tr>
<th>Skin</th>
<th>There is no data available.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eyes</td>
<td>There is no data available.</td>
</tr>
<tr>
<td>Respiratory</td>
<td>There is no data available.</td>
</tr>
</tbody>
</table>

**Sensitizer**

<table>
<thead>
<tr>
<th>Skin</th>
<th>There is no data available.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respiratory</td>
<td>There is no data available.</td>
</tr>
</tbody>
</table>

**Carcinogenicity**
There is no data available.

**Mutagenicity**
There is no data available.

**Teratogenicity**
There is no data available.

**Reproductive toxicity**
There is no data available.

12. Ecological information

**Ecotoxicity**
This product shows a high bioaccumulation potential. Water polluting material. May be harmful to the environment if released in large quantities.

**Aquatic ecotoxicity**
There is no data available.

**Persistence/degradability**
There is no data available.

**Partition coefficient: n-octanol/water**
5.24

**Bioconcentration factor**
Not available.

13. Disposal considerations

**Waste disposal**
The generation of waste should be avoided or minimized wherever possible. Significant quantities of waste product residues should not be disposed of via the foul sewer but processed in a suitable effluent treatment plant. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling empty containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Vapor from product residues may create a highly flammable or explosive atmosphere inside the container. Do not cut, weld or grind used containers unless they have been cleaned thoroughly internally. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Disposal should be in accordance with applicable regional, national and local laws and regulations.
13. Disposal considerations

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

14. Transport information

<table>
<thead>
<tr>
<th>Regulatory information</th>
<th>UN number</th>
<th>Proper shipping name</th>
<th>Classes</th>
<th>PG*</th>
<th>Label</th>
<th>Additional information</th>
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</thead>
<tbody>
<tr>
<td>DOT Classification</td>
<td>NA1993</td>
<td>COMBUSTIBLE LIQUID, N.O.S. (2-Ethylhexyl nitrate).</td>
<td>Combustible liquid.</td>
<td>III</td>
<td>-</td>
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<tr>
<td>TDG Classification</td>
<td>UN3082</td>
<td>ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (2-Ethylhexyl nitrate), Marine pollutant (2-Ethylhexyl nitrate)</td>
<td>9</td>
<td>III</td>
<td>-</td>
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<tr>
<td>IMDG Class</td>
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PG*: Packing group
Exemption to the above classification may apply.

AERG: 128

15. Regulatory information

United States
HCS Classification: Combustible liquid
Toxic material
Irritating material

U.S. Federal regulations: TSCA 8(a) IUR Exempt/Partial exemption: Not determined
United States inventory (TSCA 8b): This material is listed or exempted.
SARA 302/304/311/312 extremely hazardous substances: No products were found.
SARA 302/304 emergency planning and notification: No products were found.
SARA 302/304/311/312 hazardous chemicals: No products were found.
SARA 311/312 MSDS distribution - chemical inventory - hazard identification: No products were found.

Clean Air Act Section 112(b) Hazardous Air Pollutants (HAPs): Not listed
Clean Air Act Section 602 Class I Substances: Not listed
15. Regulatory information

Clean Air Act Section 602 Class II Substances: Not listed

DEA List I Chemicals (Precursor Chemicals): Not listed

DEA List II Chemicals (Essential Chemicals): Not listed

State regulations

Massachusetts: This material is not listed.
New York: This material is not listed.
New Jersey: This material is not listed.
Pennsylvania: This material is not listed.
California Prop. 65: No products were found.

Canada

WHMIS (Canada): Class B-3: Combustible liquid with a flash point between 37.8°C (100°F) and 93.3°C (200°F).
Class D-1B: Material causing immediate and serious toxic effects (Toxic).

Canadian lists

Canadian NPR: This material is not listed.
CEPA Toxic substances: This material is not listed.
Canada inventory: This material is listed or exempted.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

16. Other information

Label requirements: COMBUSTIBLE LIQUID AND VAPOR. HARMFUL IF INHALED OR ABSORBED THROUGH SKIN. MAY CAUSE EYE AND SKIN IRRITATION.

Hazardous Material Information System (U.S.A.):

Health: 2
Flammability: 1
Physical hazards: 1

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings are not required on MSDSs under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.

The customer is responsible for determining the PPE code for this material.

National Fire Protection Association (U.S.A.):

Health: 2
Flammability: 1
Instability: 1

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Copyright ©2001, National Fire Protection Association, Quincy, MA 02269. This warning system is intended to be interpreted and applied only by properly trained individuals to identify fire, health and reactivity hazards of chemicals. The user is referred to certain limited number of chemicals with recommended classifications in NFPA 49 and NFPA 325, which would be used as a guideline only. Whether the chemicals are classified by NFPA or not, anyone using the 704 systems to classify chemicals does so at their own risk.

History

Date of issue mm/dd/yyyy: 02/15/2012
Version: 1
Revised Section(s): Not applicable.
16. Other information

Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.