1 Identification of substance:

Product details:

Product name: Ethanol, Alcohol Reagent, anhydrous, denatured
Stock number: 33361

Manufacturer/Supplier:
Alfa Aesar, A Johnson Matthey Company
Johnson Matthey Catalog Company, Inc.
30 Bond Street
Ward Hill, MA 01835-8099
Emergency Phone: (978) 521-6300
CHEMTREC: (800) 424-9300
Web Site: www.alfa.com

Information Department: Health, Safety and Environmental Department

Emergency information:
During normal hours the Health, Safety and Environmental Department. After normal hours call Chemtrec at (800) 424-9300.

2 Composition/Data on components:

Chemical characterization:
Description: (CAS#)
Ethyl alcohol (CAS# 64-17-5): 89.5-91.4%
Methyl alcohol (CAS# 67-56-1): 4.5-4.6%
Isopropyl alcohol (CAS# 67-63-0): 4-6%

3 Hazards identification

Hazard description:

Xn Harmful
F Highly flammable

Information pertaining to particular dangers for man and environment
Causes a narcotic effect.
R 11 Highly flammable.
R 20/21/22 Harmful by inhalation, in contact with skin and if swallowed.
R 36 Irritating to eyes.
R 68/20/21/22 Harmful: possible risk of irreversible effects through inhalation, in contact with skin and if swallowed.
R 67 Vapours may cause drowsiness and dizziness

Classification system
HMIS ratings (scale 0-4)
(Hazardous Materials Identification System)

<table>
<thead>
<tr>
<th>HEALTH</th>
<th>FIRE</th>
<th>REACTIVITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

Health (acute effects) = 1
Flammability = 3
Reactivity = 1

4 First aid measures

After inhalation
Supply fresh air. If required, provide artificial respiration. Keep patient warm.
Seek immediate medical advice.

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Material Safety Data Sheet
acc. to OSHA and ANSI

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Product name: Ethanol, Alcohol Reagent, anhydrous, denatured

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After skin contact
Immediately wash with water and soap and rinse thoroughly.
Seek immediate medical advice.

After eye contact
Rinse opened eye for several minutes under running water. Then consult a doctor.

After swallowing Seek immediate medical advice.

5 Fire fighting measures
Suitable extinguishing agents
In case of fire, use sand, carbon dioxide or powdered extinguishing agent. Never use water.

For safety reasons unsuitable extinguishing agents Water
Special hazards caused by the material, its products of combustion or resulting gases:
In case of fire, the following can be released:
Carbon monoxide and carbon dioxide

Protective equipment:
Wear self-contained respirator.
Wear fully protective impervious suit.

6 Accidental release measures
Person-related safety precautions:
Wear protective equipment. Keep unprotected persons away.
Ensure adequate ventilation
Keep away from ignition sources

Measures for environmental protection:
Do not allow material to be released to the environment without proper governmental permits.

Measures for cleaning/collecting:
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
Dispose contaminated material as waste according to item 13.
Ensure adequate ventilation.
Do not flush with water or aqueous cleansing agents
Keep away from ignition sources.

Additional information:
See Section 7 for information on safe handling
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

7 Handling and storage
Handling
Information for safe handling:
Keep container tightly sealed.
Store in cool, dry place in tightly closed containers.
Ensure good ventilation at the workplace.

Information about protection against explosions and fires:
Keep ignition sources away.
Protect against electrostatic charges.
Fumes can combine with air to form an explosive mixture.

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Material Safety Data Sheet
acc. to OSHA and ANSI

Product name: Ethanol, Alcohol Reagent, anhydrous, denatured

(Contd. of page 2)

Storage
Requirements to be met by storerooms and receptacles:
Store in a cool location.
Information about storage in one common storage facility:
Store away from oxidizing agents.
Do not store together with acids.
Further information about storage conditions:
Keep container tightly sealed.
Store in cool, dry conditions in well sealed containers.

8 Exposure controls and personal protection

Additional information about design of technical systems:
Properly operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute.

Components with limit values that require monitoring at the workplace:

Ethyl alcohol

ppm
ACGIH TLV 1000; Not classifiable as a human carcinogen
Austria MAK 1000
Belgium TWA 1000
Denmark TWA 1000
Finland TWA 1000; 1250-STEEL
France VME 1000; 5000-VLE
Germany MAK 1000
Hungary TWA 1000; 3000-STEEL
Korea TLV 1000; Not classifiable as a human carcinogen
Netherlands MAC-TGG 500
Norway TWA 500
Poland TWA 1000 mg/m3; 300 mg/m3-STEEL
Russia 1000 mg/m3-STEEL
Sweden NGV 500; 1000-KTV
Switzerland MAK-W 1000
United Kingdom TWA 1000
OSHA PEL 1000

Methyl alcohol

ppm
ACGIH TLV 200; 250-STEEL (skin)
Austria MAK 200 (skin)
Belgium TWA 200; 250-STEEL, (skin)
Denmark TWA 200 (skin)
Finland TWA 200; 250-STEEL (skin)
France VME 200; 1000-VLE
Hungary TWA 50 mg/m3; 100 mg/m3-STEEL (skin)
Japan OEL 200 (skin)
Korea TLV 200; 250-STEEL (skin)
Netherlands MAC-TGG 200 (skin)
Norway TWA 100
Poland TWA 100 mg/m3; 300 mg/m3-STEEL
Russia TWA 200; 5 mg/m3-STEEL (skin)
Sweden NGV 200; 250-KTV (skin)
United Kingdom TWA 200; 250-STEEL (skin)
OSHA PEL 200

Isopropyl alcohol (2-Propanol)

(Contd. on page 4)
Product name: Ethanol, Alcohol Reagent, anhydrous, denatured

(ppm)
ACGIH TLV  400; 500-STELE
Austria MAK  400
Belgium TWA  400; 500-STELE
Denmark TWA  200
France VLE  400
Germany MAK  400
Ireland TWA  400; 500-STELE (skin)
Japan TWA  400-STELE
Korea TWA  400; 500-STELE
Netherlands MAC-TGG  400 (skin)
Norway TWA  100
Poland TWA  900; 1200-STELE
Russia TWA  400-STELE
Sweden NGV  150; 250-STELE
Switzerland MAK-W  400
United Kingdom TWA  400; 500-STELE
OSHA PEL  400
Additional information: No data

Personal protective equipment
General protective and hygienic measures
The usual precautionary measures for handling chemicals should be followed.
Keep away from foodstuffs, beverages and feed.
Remove all soiled and contaminated clothing immediately.
Wash hands before breaks and at the end of work.
Avoid contact with the eyes.
Avoid contact with the eyes and skin.
Breathing equipment:
Use suitable respirator when high concentrations are present.
Protection of hands:
Check protective gloves prior to each use for their proper condition.
Impervious gloves
Material of gloves
The selection of suitable gloves not only depends on the material, but also on quality. Quality will vary from manufacturer to manufacturer.
Eye protection: Safety glasses
Body protection: Protective work clothing.

9 Physical and chemical properties:

<table>
<thead>
<tr>
<th>General Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Form: Liquid</td>
</tr>
<tr>
<td>Color: Colorless</td>
</tr>
<tr>
<td>Odor: Alcohol-like</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Change in condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Melting point/Melting range: Not determined</td>
</tr>
<tr>
<td>Boiling point/Boiling range: Not determined</td>
</tr>
<tr>
<td>Sublimation temperature / start: Not determined</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Flash point: 8°C (46°F)</th>
</tr>
</thead>
</table>

Ignition temperature: Not determined

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10 Stability and reactivity

**Thermal decomposition / conditions to be avoided:**
Decomposition will not occur if used and stored according to specifications.

**Materials to be avoided:**
Oxidizing agents
Acids

**Dangerous reactions** No dangerous reactions known

**Dangerous products of decomposition:** Carbon monoxide and carbon dioxide

11 Toxicological information

**Acute toxicity:**
LD/LC50 values that are relevant for classification:

- Methanol (CAS# 67-56-1)
  - ORL-RAT LD50: 5628 MG/KG
  - ORL-MUS LD50: 7300 MG/KG
  - SKN-RBT LD50: 15800 MG/KG
  - ORL-HMN LDLo: 143 MG/KG
- Ethanol (CAS# 64-17-5)
  - ORL-RAT LD50: 7060 MG/KG
  - ORL-MUS LD50: 3450 MG/KG
  - IHL-RAT LC50: 20000 PPM/10H

**Primary irritant effect:**
- **on the skin:** Irritant to skin and mucous membranes.
- **on the eye:** Irritating effect.
- **Sensitization:** No sensitizing effects known.

**Subacute to chronic toxicity:**
Ethyl alcohol is rapidly oxidized in the body and is less toxic than methyl alcohol. Exposure to high vapor concentrations may cause upper respiratory tract irritation and eye irritation. It is a central nervous system depressant and ingestion leads to drowsiness, lassitude, loss of appetite and inability to concentrate. Mutagenic and teratogenic data have been reported.

Symptoms of methanol overexposure may include intoxication, headache, drowsiness, nausea, vomiting, blurred vision, blindness, coma and death. It is a defatting agent and can cause skin and eye irritation. Absorption through the skin is possible. Chronic exposure may cause liver and eye injury.
2-Propanol (isopropyl alcohol) may act as a local irritant and in high concentrations as a narcotic with symptoms such as headache, nausea,
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dizziness, vomiting, mental depression, anesthesia, and coma. Similar symptoms may be caused by ingestion. It can cause corneal burns on contact with the eyes and has caused teratogenic, mutagenic and reproductive effects in laboratory animals.

Additional toxicological information:
Danger through skin absorption.
To the best of our knowledge the acute and chronic toxicity of this substance is not fully known.
IARC-3: Not classifiable as to carcinogenicity to humans.
ACGIH A4: Not classifiable as a human carcinogen: Inadequate data on which to classify the agent in terms of its carcinogenicity in humans and/or animals.
The Registry of Toxic Effects of Chemical Substances (RTECS) contains tumorigenic and/or carcinogenic and/or neoplastic data for components in this product.

12 Ecological information:
General notes:
Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.
Do not allow material to be released to the environment without proper governmental permits.

13 Disposal considerations
Product:
Recommendation
Consult state, local or national regulations to ensure proper disposal.

Uncleaned packagings:
Recommendation: Disposal must be made according to official regulations.
Recommended cleansing agent: Water, if necessary with cleansing agents.

14 Transport information
DOT regulations:

Hazard class: 3
Identification number: UN1170
Packing group: II
Proper shipping name (technical name): ETHANOL
Label: 3

Land transport ADR/RID (cross-border)

ADR/RID class: 3 (F1) Flammable liquids

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Product name: Ethanol, Alcohol Reagent, anhydrous, denatured

Danger code (Kemler): 33
UN-Number: 1170
Packaging group: II
Description of goods: 1170 ETHANOL (ETHYL ALCOHOL)

Maritime transport IMDG:

IMDG Class: 3
UN Number: 1170
Label: 3
Packaging group: II
Proper shipping name: ETHANOL (ETHYL ALCOHOL)

Air transport ICAO-TI and IATA-DGR:

ICAO/IATA Class: 3
UN/ID Number: 1170
Label: 3
Packaging group: II
Proper shipping name: ETHANOL

15 Regulations

Product related hazard informations:

Hazard symbols:
Xn Harmful
F Highly flammable

Risk phrases:
11 Highly flammable.
20/21/22 Harmful by inhalation, in contact with skin and if swallowed.
36 Irritating to eyes.
68/20/21/22 Harmful: possible risk of irreversible effects through inhalation, in contact with skin and if swallowed.
67 Vapours may cause drowsiness and dizziness

Safety phrases:
7 Keep container tightly closed.
16 Keep away from sources of ignition - No smoking.
24/25 Avoid contact with skin and eyes.
26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
36/37 Wear suitable protective clothing and gloves.
45 In case of accident or if you feel unwell, seek medical advice immediately.

(Contd. on page 8)
**National regulations**
All components of this product are listed in the U.S. Environmental Protection Agency Toxic Substances Control Act Chemical substance Inventory.
This product contains a chemical known to the state of California to cause cancer or reproductive toxicity.
All components of this product are listed on the Canadian Domestic Substances List (DSL).

**Information about limitation of use:**
For use only by technically qualified individuals.
This product is subject to the reporting requirements of section 313 of the Emergency Planning and Community Right to Know Act of 1986 and 40CFR372.

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**16 Other information:**
Employers should use this information only as a supplement to other information gathered by them, and should make independent judgement of suitability of this information to ensure proper use and protect the health and safety of employees. This information is furnished without warranty, and any use of the product not in conformance with this Material Safety Data Sheet, or in combination with any other product or process, is the responsibility of the user.

**Department issuing MSDS:** Health, Safety and Environmental Department.
**Contact:** Paul V. Connolly