SAFETY DATA SHEET

SECTION 1  IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

Trade name  Ethanol 200 Proof
Synonyms  Ethyl hydroxide, Ethyl alcohol, Alcohol
Use  Catalyst production, Cosmetic additive, Flavors and Fragrances, Food contact, Fuel additive, Industrial & Institutional cleaning, Industrial use, Intermediate, Paint and Coatings, Personal care, Pharmaceutical, Process/Extraction Solvent, Raw material for chemical processes, Raw material for cosmetic products, Raw material for industry, Raw material for pharmaceuticals, Solvent
Company  Sasol Chemicals (USA) LLC
(Address an affiliate of Sasol Chemicals North America LLC)
Address  12120 Wickchester Lane   Houston TX 77079
Telephone  CHEMTREC North America Transportation Emergency (24-hr) (800) 424-9300
CHEMTREC World Wide (703) 527-3887
Other Emergencies (24-hr) (337) 494-5142
MSDS and Product Information (8:00am-4:30pm CST) (281) 588-3491
Health and Safety Information (7:30am-4:00pm CST) (281) 588-3492
E-mail address  SasolElectronicSDS@us.sasol.com

SECTION 2  HAZARDS IDENTIFICATION

GHS Hazards  Flammable liquids  Category 2
Eye irritation  Category 2A

LABEL ELEMENTS

Hazard symbols

Signal word  Danger

Hazard statements  H225  Highly flammable liquid and vapour.
H319  Causes serious eye irritation.

Precautionary statements

Prevention  P210  Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
P233  Keep container tightly closed.
P240  Ground/bond container and receiving equipment.
P241  Use explosion-proof electrical/ ventilating/ lighting/ equipment.
P242  Use only non-sparking tools.
SAFETY DATA SHEET

Ethanol 200 Proof

P243 Take precautionary measures against static discharge.
P280 Wear protective gloves/ eye protection/ face protection.
P264 Wash skin thoroughly after handling.

Response
P303 + P361 + P353 IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P370 + P378 In case of fire: Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide for extinction.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337 + P313 If eye irritation persists: Get medical advice/ attention.

Storage
P403 + P235 Store in a well-ventilated place. Keep cool.

Disposal
P501 Dispose of contents/ container to an approved waste disposal plant.

SECTION 3 COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Weight percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethanol</td>
<td>64-17-5</td>
<td>99.99</td>
</tr>
</tbody>
</table>

See Section 8 for Exposure Guidelines and Section 15 for Regulatory Classifications.

SECTION 4 FIRST AID MEASURES

Eye contact  Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.
Skin contact  Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes. When symptoms persist or in all cases of doubt seek medical advice. Wash contaminated clothing before re-use.
Inhalation  Remove to fresh air. If breathing is irregular or stopped, administer artificial respiration. In case of shortness of breath, give oxygen. Call a physician immediately.
Ingestion  If swallowed, call a poison control centre or doctor immediately. Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person.

SECTION 5 FIREFIGHTING MEASURES

FLAMMABLE PROPERTIES
Fire/explosion  Flash back possible over considerable distance. NFPA Class IB flammable liquid.
Suitable extinguishing media  Water spray, Alcohol-resistant foam, Dry chemical, Carbon dioxide (CO2)
Protective equipment and precautions for  Wear self-contained breathing apparatus and protective suit. Keep containers and surroundings cool with water spray.
SECTION 6  ACCIDENTAL RELEASE MEASURES

Methods and materials for containment and cleaning up
Evacuate personnel to safe areas. Remove all sources of ignition. Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13). Do not flush into surface water or sanitary sewer system.

Spill precautions Material can create slippery conditions.

SECTION 7  HANDLING AND STORAGE

Safe handling advice
Ensure all equipment is electrically grounded before beginning transfer operations. Keep away from heat and sources of ignition.

Storage/Transport pressure
Ambient

Load/Unload temperature
Ambient

SECTION 8  EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING MEASURES
Ensure adequate ventilation, especially in confined areas.

PERSONAL PROTECTIVE EQUIPMENT

Eyes
Wear as appropriate: Goggles, Face-shield

Skin
Wear suitable protective clothing, gloves and eye/face protection.

Inhalation
Respiratory protection is normally not required except in emergencies or when conditions cause excessive airborne levels of mists or vapors. Use NIOSH approved respiratory protection.

EXPOSURE GUIDELINES

<table>
<thead>
<tr>
<th>Components</th>
<th>Exposure limit(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethanol</td>
<td>ACGIH STEL 1,000 ppm</td>
</tr>
<tr>
<td></td>
<td>OSHA PEL 1,000 ppm 1,900 mg/m3</td>
</tr>
</tbody>
</table>

PEL= Permissible Exposure Limits
TLV= Threshold Limit Value
EL= Excursion Limit
TWA= Time Weighted Average (8 hr.)
STEL= Short Term Exposure Limit (15 min.)
WEEL= Workplace Environmental Exposure Level
SAFETY DATA SHEET

Ethanol 200 Proof

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>liquid;</td>
</tr>
<tr>
<td>Colour</td>
<td>Clear, colorless</td>
</tr>
<tr>
<td>Form</td>
<td>liquid</td>
</tr>
<tr>
<td>Odour</td>
<td>alcohol-like</td>
</tr>
<tr>
<td>Odour Threshold</td>
<td>no data available</td>
</tr>
<tr>
<td>Flash point</td>
<td>12.78 °C, 55 °F; (Cleveland);</td>
</tr>
<tr>
<td>Flammability</td>
<td>Upper explosion limit: 19 %(V)</td>
</tr>
<tr>
<td></td>
<td>Lower explosion limit: 3.3 %(V)</td>
</tr>
<tr>
<td>Boiling point/boiling range</td>
<td>78.5 °C, 173.3 °F;</td>
</tr>
<tr>
<td>Melting point/range</td>
<td>-114.1 °C, -173.4 °F;</td>
</tr>
<tr>
<td>Auto-ignition temperature</td>
<td>363 °C, 685.4 °F;</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>no data available</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>no data available</td>
</tr>
<tr>
<td>Vapour pressure</td>
<td>57.33 hPa @ 20 °C, 68 °F;</td>
</tr>
<tr>
<td>Vapour density</td>
<td>no data available</td>
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<tr>
<td>Density</td>
<td>0.79 g/cm³</td>
</tr>
<tr>
<td>Specific gravity</td>
<td>no data available</td>
</tr>
<tr>
<td>Water solubility</td>
<td>soluble</td>
</tr>
<tr>
<td>Viscosity</td>
<td>no data available</td>
</tr>
<tr>
<td>pH</td>
<td>no data available</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>no data available</td>
</tr>
<tr>
<td>Partition coefficient: n-octanol/water</td>
<td>no data available</td>
</tr>
<tr>
<td>Volatile organic compounds (VOC) content</td>
<td>100 %</td>
</tr>
</tbody>
</table>
SECTION 10  STABILITY AND REACTIVITY

Reactivity  Stable at normal ambient temperature and pressure.

Chemical stability  No decomposition if stored and applied as directed.

Conditions to avoid  Keep away from heat and sources of ignition.

Hazardous decomposition products  Combustion products include carbon dioxide, carbon monoxide and possibly other unidentified organic compounds.

Materials to avoid  Can react with strong oxidizers, inorganic acids, and halogens.

Hazardous polymerisation  None.

SECTION 11  TOXICOLOGICAL INFORMATION

Acute dermal toxicity  LD50 rabbit: > 2,000 mg/kg; OECD Test Guideline 402 (literature value)

Acute inhalation toxicity  LC50 mouse (4 hours): > 20 mg/l (literature value)

Acute oral toxicity  LD50 rat: 2,000 mg/kg; OECD Test Guideline 401 (literature value)

Skin corrosion/irritation  (rabbit): OECD Test Guideline 404 Not irritating, (literature value)

Eye damage/irritation  (rabbit): OECD Test Guideline 405 irritating, (literature value)

Respiratory or skin sensitization  guinea pig: not sensitizing; Maximisation Test (literature value)

Germ cell mutagenicity  Genotoxicity in vitro:
Type: Ames test; OECD Test Guideline 471
System: Salmonella typhimurium; with and without metabolic activation
Result: In vitro tests did not show mutagenic effects. (literature value)

Genotoxicity in vivo: no data available

Assessment Mutagenicity: Based on available data, the classification criteria are not met.

Reproductive toxicity  Reproductive toxicity: no data available
Ethanol 200 Proof

Assessment Reproductive toxicity:
no data available

Teratogenicity:
no data available

Assessment teratogenicity:
no data available

STOT - single exposure
no data available

STOT - repeated exposure
rat; Oral; 90-day;
NOAEL: 1,730 mg/kg
LOAEL: 3,160 mg/kg
Based on available data, the classification criteria are not met.

Aspiration toxicity
no data available

Carcinogenicity
Assessment carcinogenicity:
Contains no ingredient listed as a carcinogen

SECTION 12 ECOLOGICAL INFORMATION

Toxicity to fish
LC50 (Pimephales promelas (fathead minnow)) 96 hours: > 100 mg/l; flow-through test (literature value)

Toxicity to aquatic invertebrates
EC50 (Ceriodaphnia Dubia (water flea)) 48 hours: > 100 mg/l; static test (literature value)

Toxicity to algae
EC50 (Chlorella vulgaris) 72 hours: > 100 mg/l; static test; OECD Test Guideline 201 (literature value)

Chronic toxicity to aquatic invertebrates
NOEC (Ceriodaphnia Dubia (water flea)) 10 d: 9.6 mg/l; semi-static test (literature value)

Biodegradation
Readily biodegradable.

OECD Test Guideline 301B (28 d): > 60 % (literature value)

Bioaccumulation
No bioaccumulation is to be expected (log Pow <= 4).

Mobility in soil
no data available

Other adverse effects
no data available

SECTION 13 DISPOSAL CONSIDERATIONS
Ethanol 200 Proof

Waste Code
D001 - Ignitability (RQ 100 LB). This product has the RCRA characteristic of ignitability. Re-evaluation of the product may be required by the user at the time of disposal, since the product uses, transformations, mixtures, contamination, and spillage may change the classification.

Disposal methods
Dispose of only in accordance with local, state, and federal regulations. Do not contaminate any lakes, streams, ponds, groundwater or soil.

Empty containers.
Empty containers retain product residue (liquid and/or vapor) and can be dangerous. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND, OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH. Empty drums should be completely drained, triple-rinsed, properly bunged and promptly returned to a drum reconditioner, or properly disposed.

SECTION 14 TRANSPORT INFORMATION

DOT UN 1170, Ethanol, 3, II
IATA UN 1170, Ethanol, 3, II
IMDG UN 1170, Ethanol, 3, II

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Remarks no data available

SECTION 15 REGULATORY INFORMATION

U.S. FEDERAL REGULATIONS

OSHA Hazards (HCS 1994)
Flammable liquid, Eye irritation, Skin irritation

TSCA Inventory Listing
Components
Ethanol CAS-No. 64-17-5

SARA 302 Status
Components
SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 311/312 Classification
"Immediate (acute) health hazard" "Fire hazard"

SARA 313 Chemical Components
CAS-No. Weight percent

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SARA 313: This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

US. EPA CERCLA Hazardous Substances (40 CFR 302)

<table>
<thead>
<tr>
<th>Components</th>
<th>Reportable Quantity</th>
<th>Weight percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>none</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

INTERNATIONAL REGULATIONS

WHMIS Classification
Class B, Division 2: Flammable liquid.
Class D, Division 2, Subdivision B: Toxic material.

European Union
Classification according to Regulation (EU) 1272/2008.
- Flammable liquids, Category 2
- Eye irritation, Category 2

Australia. Inventory of Chemical Substances (AICS) Listed
Japan. Inventory of Existing and New Chemical Substances (ENCS) Listed
Japan. Industrial Safety & Health Law (ISHL) Inventory Listed
Canada. Domestic Substances List (DSL) Inventory Listed
Canadian Non-Domestic Substance Listing (NDSL) Not listed
European Inventory of Existing Commercial Chemical Substances (EINECS) Listing Listed
Philippines. Inventory of Chemicals / Chemical Substances (PICCS) Listed
Korea. Existing Chemicals Inventory (KECI) Listed
China. Inventory of Existing Chemical Substances (IECSC) Listed
Mexico. National Inventory of Chemical Substances (INSQ) Listed
New Zealand. Inventory of Chemicals (NZIoC) Listed
Switzerland. Inventory of Notified New Substances (CHINV) Listed
Taiwan. National Existing Chemical Inventory (NECI) Listed

Please note: The names and CAS numbers which are used for this product in the stated inventories may deviate from the information which is listed in Section 3.
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STATE REGULATIONS

California Prop. 65
Components: none

SECTION 16 OTHER INFORMATION

HAZARD RATINGS

<table>
<thead>
<tr>
<th>HMIS®</th>
<th>Health</th>
<th>Flammability</th>
<th>Physical Hazard/Instability</th>
</tr>
</thead>
<tbody>
<tr>
<td>NFPA</td>
<td>2</td>
<td>3</td>
<td>0</td>
</tr>
</tbody>
</table>

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