Material Safety Data Sheet

Ethanol

Section 1. Chemical product and company identification

Product Name : Ethanol

Supplier : AIRGAS INC., on behalf of its subsidiaries
259 North Radnor-Chester Road
Suite 100
Radnor, PA 19087-5283
1-610-687-5253

Synonym : denatured spirits,Ethyl Alcohol

Material uses : Other non specified industry: MANUFACTURE OF ACETALDEHYDE AND OTHER CHEMICALS; SOLVENTS; ANTIFREEZE AND BRAKE FLUIDS; FUEL.

MSDS# : 001114

Date of Preparation/Revision : **5/30/2007.**

In case of emergency : 1-866-734-3438

Section 2. Hazards identification

Physical state : Liquid. (CLEAR, COLORLESS LIQUID WITH A WEAK, ETHEREAL, VINOUS ODOR)

Emergency overview : Danger!

HIGHLY FLAMMABLE LIQUID AND VAPOR.
CAUSES DAMAGE TO THE FOLLOWING ORGANS: BLOOD, REPRODUCTIVE SYSTEM, LIVER, RESPIRATORY TRACT, SKIN, CENTRAL NERVOUS SYSTEM, EYE, LENS OR CORNEA.
VAPOR MAY CAUSE FLASH FIRE.

Keep away from heat, sparks and flame. Keep container closed. Use only with adequate ventilation.

Potential acute health effects

Eyes : Irritating to eyes.

Skin : Irritating to skin.

Inhalation : Irritating to respiratory system.

Ingestion : Practically non-toxic if swallowed.

Potential chronic health effects : **CARCINOGENIC EFFECTS** A4 (Not classifiable for human or animal.) by ACGIH.
MUTAGENIC EFFECTS Not available.
TERATOGENIC EFFECTS: Not available.

Medical conditions aggravated by overexposure : Repeated or prolonged exposure is not known to aggravate medical condition.

See toxicological Information (section 11)

Section 3. Composition, Information on Ingredients

United States

			Exposure limits
ethanol	64-17-5	100	**ACGIH TLV (United States, 1/2005). Notes: 1996 Adoption Refers to Appendix A -- Carcinogens.** TWA: 1880 mg/m^3 8 hour(s). Form: All forms TWA: 1000 ppm 8 hour(s). Form: All forms **NIOSH REL (United States, 12/2001).** TWA: 1900 mg/m^3 10 hour(s). Form: All forms TWA: 1000 ppm 10 hour(s). Form: All forms **OSHA PEL (United States, 8/1997).** TWA: 1900 mg/m^3 8 hour(s). Form: All forms TWA: 1000 ppm 8 hour(s). Form: All forms

Section 4. First aid measures

Eye contact : In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention if irritation occurs.

Skin contact : In case of contact, immediately flush skin with plenty of water. Remove contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

Inhalation : If inhaled, remove to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Get medical attention.

Ingestion : Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention if symptoms appear.

Section 5. Fire fighting measures

Flammability of the product : Flammable.

Auto-ignition temperature : 398.85°C (749.9°F)

Flash point : Closed cup: 12.85°C (55.1°F).

Flammable limits : Lower: 3.3% Upper: 19%

Products of combustion : These products are carbon oxides (CO, CO_2).

Fire fighting media and instructions : In case of fire, use water spray (fog), foam, dry chemicals, or CO_2.

Highly flammable liquid and vapor. Vapor may cause flash fire. Vapors may accumulate in low or confined areas, travel considerable distance to source of ignition and flash back. Runoff to sewer may create fire or explosion hazard.

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

Section 6. Accidental release measures

Personal precautions : Immediately contact emergency personnel. Eliminate all ignition sources. Keep unnecessary personnel away. Use suitable protective equipment (Section 8). Do not touch or walk through spilled material.

Environmental precautions : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Methods for cleaning up : If emergency personnel are unavailable, contain spilled material. For small spills add absorbent (soil may be used in the absence of other suitable materials) and use a non-sparking or explosion proof means to transfer material to a sealed, appropriate container for disposal. For large spills dike spilled material or otherwise contain material to ensure runoff does not reach a waterway. Place spilled material in an appropriate container for disposal.

Section 7. Handling and storage

Handling : Keep container closed. Use only with adequate ventilation. Keep away from heat, sparks and flame. To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before transferring material. Use explosion-proof electrical (ventilating, lighting and material handling) equipment.

Storage : Store in a segregated and approved area. Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Avoid all possible sources of ignition (spark or flame).

Section 8. Exposure Controls, Personal Protection

Engineering controls : Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective occupational exposure limits. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal protection

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.

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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.

Respiratory : Use a properly fitted, air-purifying or air-fed 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 or gauntlets complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

Personal protection in case of a large spill : Splash goggles. Full suit. Boots. Gloves. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Product name	Exposure limits
United States	
ethanol	**ACGIH TLV (United States, 1/2005). Notes: 1996 Adoption Refers to Appendix A -- Carcinogens.** TWA: 1880 mg/m^3 8 hour(s). Form: All forms TWA: 1000 ppm 8 hour(s). Form: All forms **NIOSH REL (United States, 12/2001).** TWA: 1900 mg/m^3 10 hour(s). Form: All forms TWA: 1000 ppm 10 hour(s). Form: All forms **OSHA PEL (United States, 8/1997).** TWA: 1900 mg/m^3 8 hour(s). Form: All forms TWA: 1000 ppm 8 hour(s). Form: All forms

Section 9. Physical and chemical properties

Physical state : Liquid. (CLEAR, COLORLESS LIQUID WITH A WEAK, ETHEREAL, VINOUS ODOR)

Molecular weight : 46.08 g/mole

Molecular formula : C2-H6-O

Boiling/condensation point : 78.35°C (173°F)

Melting/freezing point : -113.89°C (-173°F)

Specific gravity : 0.79 (Water = 1)

Vapor pressure : 5.9 kPa (44 mm Hg) (at 20°C)

Vapor density : 1.6 (Air = 1)

Evaporation rate : 1.7 compared to Butyl acetate.

Section 10. Stability and reactivity

Stability and reactivity : The product is stable.

Incompatibility with various substances : Highly reactive with oxidizing agents, alkalis.

Section 11. Toxicological information

Toxicity data

Ingredient name	Test	Result	Route	Species
ethanol	LD50	7060 mg/kg	Oral	Rat
	LD50	6300 mg/kg	Oral	Rabbit
	LD50	3450 mg/kg	Oral	Mouse
	LDLo	1400 mg/kg	Oral	human
	LDLo	5500 mg/kg	Oral	Dog

IDLH : 3300 ppm

Chronic effects on humans : **CARCINOGENIC EFFECTS** A4 (Not classifiable for human or animal.) by ACGIH. Causes damage to the following organs: blood, the reproductive system, liver, upper respiratory tract, skin, central nervous system (CNS), eye, lens or cornea.

Other toxic effects on humans : Not considered to be toxic for humans.

Specific effects

Ethanol

Carcinogenic effects : No known significant effects or critical hazards.

Mutagenic effects : No known significant effects or critical hazards.

Reproduction toxicity : No known significant effects or critical hazards.

Section 12. Ecological information

Ingredient name	Species	Period	Result
ethanol	Daphnia magna (EC50)	48 hour(s)	2 mg/l
	Daphnia magna (EC50)	48 hour(s)	9.3 mg/l
	Daphnia magna (EC50)	48 hour(s)	>100 mg/l
	Daphnia magna (LC50)	96 hour(s)	>100 mg/l
	Pimephales promelas (LC50)	96 hour(s)	>100 mg/l
	Oncorhynchus mykiss (LC50)	96 hour(s)	13000 mg/l

Products of degradation : These products are carbon oxides (CO, CO_2) and water.

Toxicity of the products of biodegradation : The product itself and its products of degradation are not toxic.

Section 13. Disposal considerations

Waste disposal : The generation of waste should be avoided or minimized wherever possible. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. 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.

Consult your local or regional authorities.

Section 14. Transport information

Regulatory information	UN number	Proper shipping name	Class	Packing group	Label	Additional information
DOT Classification	UN1170	ETHANOL OR ETHYL ALCOHOL OR ETHANOL SOLUTIONS OR ETHYL ALCOHOL SOLUTIONS	3	II		**Limited quantity** Yes. **Packaging instruction** **Passenger Aircraft** Quantity limitation: 5 L **Cargo Aircraft** Quantity limitation: 60 L **Special provisions** 24, IB2, T4, TP1
TDG Classification	UN1170	ETHANOL MORE THAN 24 PER CENT ETHANOL, BY VOLUME; ETHANOL SOLUTION MORE THAN 24 PER CENT ETHANOL, BY VOLUME; ETHYL ALCOHOL MORE THAN 24 PER CENT ETHANOL, BY VOLUME; OR ETHYL ALCOHOL	3	III		**Explosive Limit and Limited Quantity Index** 5 **Passenger Carrying Road or Rail Index** 60

Ethanol						
		SOLUTION MORE THAN 24 PER CENT ETHANOL, BY VOLUME				
Mexico Classification	UN1170	ETHANOL OR ETHYL ALCOHOL OR ETHANOL SOLUTIONS OR ETHYL ALCOHOL SOLUTIONS	3	II		**Limited quantity** Yes. **Packaging instruction** **Passenger Aircraft** Quantity limitation: 5 L **Cargo Aircraft** Quantity limitation: 60 L **Special provisions** 24, IB2, T4, TP1

Section 15. Regulatory information

United States

HCS Classification : Flammable liquid
Target organ effects

U.S. Federal regulations : TSCA 8(b) inventory: ethanol

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: ethanol
SARA 311/312 MSDS distribution - chemical inventory - hazard identification: ethanol: Fire hazard, Immediate (Acute) Health Hazard, Delayed (Chronic) Health Hazard

Clean Water Act (CWA) 307: No products were found.

Clean Water Act (CWA) 311: No products were found.

Clean air act (CAA) 112 accidental release prevention: No products were found.

Clean air act (CAA) 112 regulated flammable substances: No products were found.

Clean air act (CAA) 112 regulated toxic substances: No products were found.

State regulations : Pennsylvania RTK: ethanol: (generic environmental hazard)
Massachusetts RTK: ethanol
New Jersey: ethanol

Canada

WHMIS (Canada) : Class B-2: Flammable liquid with a flash point lower than 37.8°C (100°F).
Class D-2B: Material causing other toxic effects (TOXIC).

CEPA DSL: ethanol

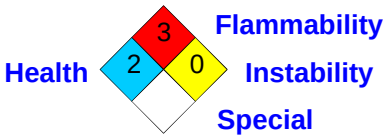
Section 16. Other information

Label Requirements : HIGHLY FLAMMABLE LIQUID AND VAPOR.
CAUSES DAMAGE TO THE FOLLOWING ORGANS: BLOOD, REPRODUCTIVE SYSTEM, LIVER, RESPIRATORY TRACT, SKIN, CENTRAL NERVOUS SYSTEM, EYE, LENS OR CORNEA.
VAPOR MAY CAUSE FLASH FIRE.

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

Health	*	2
Fire hazard		3
Reactivity		0
Personal protection		C

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



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