MATERIAL SAFETY DATA SHEET

ETHANOL

ETHANOL 96 % v/v **E003/MS1**

C_2H_5OH **2010-10-10**

SRI BALAJI ANAND CHEMICALS
(ALCOHOL & SUGAR DIV)
HYDERABAD, ANDHRA PRADESH
INDIA – 500073

EMERGENCY TELEPHONE No.: +91 (40) 4003 1000

1. PRODUCT IDENTIFICATION

TRADE NAME	Extra Neutral Potable Ethanol
CHEMICAL FAMILY	Aliphatic Alcohol
CHEMICAL NAME	Ethyl Alcohol
SYNONYMS	Potable Ethyl Alcohol
CHEMICAL ABSTRACTS No.	64-17-5
NIOSH No.	KQ 6300000
HAZCHEM CODE	2(S)E
UN No.	1170

2. COMPOSITION

HAZARDOUS COMPONENTS	Ethyl Alcohol (96,4 % v/v)
EEC CLASSIFICATION	Not available
R PHRASES	R11

3. HAZARD IDENTIFICATION

MAIN HAZARDS

FLAMMABILITY

Flash Point 28°C
Extremely flammable liquid (R11)

HEALTH

Harmful if swallowed or inhaled.
Possible aspiration hazard if swallowed (can enter lungs and cause damage).
May be irritating to the skin, eyes and respiratory tract.
Over exposure may cause CNS depression.
Possible reproductive hazard.

CHEMICAL HAZARDS

Ethanol is a flammable liquid whose vapours can form ignitable and explosive mixtures with air at normal room temperatures. Thus, an aqueous mixture containing 30% ethanol can produce a flammable mixture of vapour and air at 29°C, and even one containing only 5% alcohol can produce a flammable mixture at 62°C (1). Ethanol reacts vigorously with a wide range of oxidising materials and other chemicals (2). eg. disulphuryl difluoride, silver nitrate, bromine pentafluoride, potassium perchlorate, nitrosyl perchlorate, chromyl chloride, chloryl perchloride, uranyl perchlorite, chromium trioxide, fluorine nitrate, dioxygen difluoride, uranium hexafluoride, iodine heptafluoride, tetrachlorosilane, permanganic acid, nitric acid [the nitric acid fizz reaction used formerly for cleaning laboratory glassware should not be used (3,5)], hydrogen peroxide, peroxodisulphuric acid, potassium dioxide, sodium peroxide, potassium permanganate, ruthenium (VIII) oxide, platinum, potassium (6), potassium *tert*-butoxide, silver oxide, and sodium (7).

BIOLOGICAL HAZARDS

Ethanol is rapidly oxidised in the body to acetaldehyde, then to acetate, and finally to carbon dioxide and water; unoxidised alcohol is excreted in the urine and expired in the air (8,9).

HEALTH EFFECTS - EYES

Moderately irritating. Exposure to liquid, vapours, fumes or mists may cause irritation. Direct contact may cause irritation, pain, corneal inflammation and possible corneal damage.

HEALTH EFFECTS - SKIN

Repeated or prolonged contact may result in defatting, redness, itching, inflammation, cracking and possible secondary infection. Repeated skin contact may result in allergic skin reaction in a very small proportion of individuals.

HEALTH EFFECTS - INGESTION

Large doses lead to alcohol poisoning while repeated ingestion can lead to alcoholism. Alcohol abuse and dependence can have a profound effect on work performance and tendency to accidents at work (see 11-13, for discussions of alcoholism, including its relation to occupational health). The presence of denaturants, eg. methanol, pyridines, and benzene in industrial alcohol greatly increases the toxicity on ingestion. Ethanol drinking is also suspected of increasing the toxic effects of other chemicals encountered in the laboratory and the workplace by inhibition of their metabolism or excretion (14); eg. 1,1,1-trichloroethane (15), xylene, trichloroethylene and dimethylformamide (16), benzene (17) and lead (18, 19). May cause harmful central nervous system effects. Effects may include excitation, euphoria, headache, dizziness, drowsiness, blurred vision, fatigue, tremors,convulsions, loss of consciousness, coma, respiratory arrest and death. Severe acute intoxication may cause hypoglycemia, hypothermia and extensor rigidity.

HEALTH EFFECTS - INHALATION

The effects of inhalation are not likely to be serious under reasonable laboratory or industrial use. There is no evidence that repeated exposure to ethanol vapour results in cirrhosis of the liver. Prolonged inhalation of

concentrations (over 5000 ppm), besides irritation of eyes and upper respiratory tract, may cause central nervous system symptoms similar to those listed under "Ingestion".

CARCINOGENICITY

There is no evidence of carcinogenicity due to ethanol itself, although some studies (20,21) have shown an excess incidence of laryngeal cancer over the expected from exposure to synthetic alcohol, with diethyl sulphate probably being the causative agent.

MUTAGENICITY

Ethanol has been found to be non mutagenic in the *Salmonella* microsome test (22), but some transient mutagenic changes have been observed in male, but not female, mice treated with rather large doses (23-25).

REPRODUCTIVE HAZARDS

Some evidence for foetotoxicity (26-28) and teratogenicity (29) has been observed in experimental animals treated with high doses of ethanol during gestation. Alcohol may induce spontaneous abortions.

4. FIRST AID MEASURES

PRODUCT IN EYE

Flush immediately with water or neutral saline solution for at least 15 minutes. Seek medical attention.

PRODUCT ON SKIN

Remove contaminated clothing and rinse contaminated area with soap and water. If skin irritation persists seek medical attention.

PRODUCT INGESTED

If victim is conscious, give 1-3 glasses of water or milk to dilute stomach contents. If spontaneous vomiting occurs, or when vomiting is induced, monitor for breathing difficulty. Do not make an unconscious or semi-conscious person vomit. Keep affected person warm and at rest. Get medical attention for substantial ingestions and/or gastrointestinal symptoms.

PRODUCT INHALED

Remove the victim to fresh air. If not breathing, ensure open airway and institute cardiopulmonary resuscitation (CPR). If breathing is weak, irregular or has stopped apply artificial respiration. Oxygen may be beneficial. Keep affected person warm and at rest. Get immediate medical attention.

5. FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA

Use dry chemical, alcohol foam or carbon dioxide to extinguish fire. Water may be ineffective but should be used to cool fire-exposed containers, structures and to protect personnel. If leak or spill has not ignited, ventilate area and use water spray to disperse gas or vapour and to protect personnel attempting to stop a leak. Use water to dilute spills and to flush them away from sources of ignition. Do not flush down public sewers or other drainage systems.

SPECIAL HAZARDS

Flammable :	Flash point 12°C
Flammability Limits :	3,3

Dangerous when exposed to heat or flame. Vapours form flammable or explosive mixtures with air at room temperature. Vapour or gas may spread to distant ignition sources and flash back. Run-off to sewer may cause fire or explosion hazard. Containers may explode in heat of fire. Vapours may concentrate in confined areas. Irritating or toxic substances may be emitted upon thermal decomposition.

PROTECTIVE CLOTHING

Exposed fire fighters should wear approved self-contained breathing apparatus with full face mask and full protective equipment.

6. ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS

Protective clothing should be worn to prevent excessive skin contact.

ENVIRONMENTAL PRECAUTIONS

Prevent liquid entering sewers.
Do not allow to enter surface waters, storm drains, etc.

Small Spills

Take immediate steps to stop and contain the spill. Caution should be exercised regarding personnel safety and exposure to the spilled material. Eliminate all sources of ignition and wear protective clothing. Absorb small spills onto paper and remove to a safe area for burning or burying. Flush the contaminated area with plenty of water.

Large Spills

Stop leak if you can do it without risk. Contact your local fire department. Eliminate all sources of ignition and static, restrict access to area until completion of clean-up procedure. Wear adequate protective equipment, use self-contained breathing apparatus in confined poorly-ventilated areas. Large quantities should be absorbed on to sand or vermiculite and removed to a safe area for burning or burying. Flush the contaminated area with plenty of water. Incineration is the recommended method of disposal.

7. HANDLING AND STORAGE

SUITABLE MATERIALS
Ethanol is not corrosive to metals and may be stored in stainless steel, mild steel or aluminium containers.

HANDLING/STORAGE PRECAUTIONS
Ground lines and equipment used during transfer to reduce the possibility of static spark-initiated fire or explosion. Store in approved flammable liquid storage containers. Keep containers tightly closed as this material readily absorbs moisture. Store away from incompatible materials. Store in a cool, dry well-ventilated area away from sparks, flames and other sources of ignition. Eliminate of all sources of static electricity. Use non-sparking

electrical and ventilation systems.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

OCCUPATIONAL EXPOSURE STANDARDS

HSE	1000 ppm (1880 mg/m^3)
MAK	1000 ppm (1880 mg/m^3)
ACGIH	1000 ppm (1880 mg/m^3)

ENGINEERING CONTROL MEASURES

Engineering control methods to reduce hazardous exposures are preferred. General methods include mechanical ventilation (dilution and local exhaust), process or personnel enclosure, control of process conditions and process modification (eg. substitution of a less hazardous material). Administrative controls and personal protective equipment may also be required. Use a non-sparking, grounded ventilation system separate from other exhaust ventilation systems. Exhaust directly to the outside. Supply sufficient replacement air to make up for air removed by exhaust systems.

PERSONAL PROTECTION - RESPIRATORY

If exposure limits are exceeded or if irritation is experienced, an approved
respirator for organic vapours is generally acceptable. For high concentrations and for oxygen-deficient atmospheres, use an approved air-supplied respirator. Full respiratory protection should be readily available in case of spillage.

PERSONAL PROTECTION - HAND

Rubber or neoprene gloves are recommended.

PERSONAL PROTECTION - EYE

Prevent eye contact with this material. Wear chemical tight goggles. Provide an eyewash station immediately accessible to the work area.

PERSONAL PROTECTION - SKIN

Avoid skin contact. When working with this substance, wear appropriate chemical protective gloves. Depending upon conditions of use, additional protection may be necessary such as face shield, apron, etc.

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE	Colorless, volatile liquid.
ODOUR	Characteristic pleasant odour.
Ph	Not applicable.
BOILING POINT/RANGE	78,2°C
MELTING POINT/RANGE	-112°C
FLASH POINT	12°C
FLAMMABILITY	3,3 - 19% v/v
AUTOFLAMMABILITY	363°C
EXPLOSIVE PROPERTIES	Vapors' can form explosive mixtures with air. All sources of ignition or static must be excluded.
OXIDISING PROPERTIES	None
VAPOUR PRESSURE	59 mm Hg at 20°C

SBAC
Sri Balaji Anand Chemicals

DENSITY	801,6 kg/m^3 at 25°C

SOLUBILITY - WATER	Miscible with water in all proportions.
SOLUBILITY - SOLVENT	Miscible with ether, methanol, chloroform and acetone.
PARTITION COEFF.	

10. STABILITY AND REACTIVITY

CONDITIONS TO AVOID

Overheating, flames, sources of ignition or static electricity.

Oxidising agents.

Vapour/air mixtures are explosive.

INCOMPATIBLE MATERIALS

See section 3 (Chemical Hazards)

HAZARDOUS DECOMPOSITION PRODUCTS

Incomplete combustion can generate carbon monoxide and carbon dioxide.

11. TOXICOLOGICAL INFORMATION

ACUTE TOXICITY
See section 3.
SKIN AND EYE CONTACT
See section 3.
CHRONIC TOXICITY
See section 3 (Biological Hazards).
CARCINOGENICITY
See section 3.
MUTAGENICITY
See section 3.
REPRODUCTIVE HAZARDS

See section 3.

12. ECOLOGICAL INFORMATION

AQUATIC TOXICITY – FISH	No data available
AQUATIC TOXICITY – DAPHNIA	No data available

AQUATIC TOXICITY - ALGAE	No data available
BIODEGRADABILITY	No data available
BIO-ACCUMULATION	No data available
MOBILITY	No data available
GERMAN WGK	No data available

13. DISPOSAL CONSIDERATIONS

DISPOSAL METHODS

Only under conditions approved by local authorization. See also Section 6.

DISPOSAL OF PACKAGING

Empty containers may contain flammable and hazardous residues. Always obey hazard warnings.

14. TRANSPORT INFORMATION

UN No.	1170
SUBSTANCE IDENTITY No.	
ADR/RID CLASS	Not available
ADR/RID ITEM No.	Not available
ADR/RID HAZARD IDENTITY No.	Not available
IMDG - SHIPPING NAME	Ethanol
IMDG – CLASS	3.2
IMDG - PACKAGING GROUP	II
IMDG - MARINE POLLUTANT	
IMDG - EMS No.	Not available
IMDG - MFAG TABLE No.	3074
IATA - SHIPPING NAME	Ethanol solutions
IATA-CLASS	3
IATA - SUBSIDIARY RISK(S)	Flammable liquid
ADNR – CLASS	Not available
UK – DESCRIPTION	Not available
UK - EMERGENCY ACTION CODE	Not available
UK – CLASSIFICATION	Not available
TREMCARD No.	

15. REGULATORY INFORMATION

EEC HAZARD CLASSIFICATION	Not available
RISK PHRASES	R11
SAFETY PHRASES	S7, S16

MATERIAL SAFETY DATA SHEET

NATIONAL LEGISLATION Hazardous Substances Act 15 of 1973 and Regulations, Occupational Health and Safety Act 85 of 1993,

16. OTHER INFORMATION

CAS No.	64-17-5
EINECS No.	Not available
EEC ANNEX 1 No.	Not available
MITI No.	Not available
FDA LIST No.	Not available
LISTING – TOSCA	Not available
LISTING – ACOIN	Not available
LISTING - CANADIAN DSL/NDSL	Not available
NOTIFICATION – EEC	Not available
NOTIFICATION – USA	Not available

APPENDIX

MSDS PREPARATION DATE: **1993-12-14**
MSDS SERIAL No. **E003/MS1**
COMPILED BY **D D LIEBENBERG**

SOURCES OF INFORMATION

REFERENCES

1. *Chem. Saf. Summ.* 1984, **55**(219), 62

2. Bretherick,L.*Handbook of Reactive Chemical Hazards (3rd edition)*

3. *Univ. Saf. Assocn. Saf. News* 1982, (16),4

4. *Laboratory Hazards Bulletin* 1982, 584

MATERIAL SAFETY DATA SHEET

ETHYL ALCOHOL PAGE 9 OF 9

ETHANOL E005/MS1

C2H5OH 1993-07-22

5. *Laboratory Hazards Bulletin* 1983, 113

6. Pratt, E.F.; et al. *J. Am. Chem. Soc.* 1954, **75**, 54

7. Braendstrom, A. *Acta Chem. Scand.* 1951, **4,** 1608-1010

8. Wimer, W.W.; et al. *Alcohols Toxicology* (Noyes Data, 1983)

9. Henson, E.V. *JOM, J. Occup. Med.* 1960, **2,** 497

10. Lester, D.; Greenberg, L.A. *J. Stud. Alcohol.* 1951, **12,** 167

11. *Encyclopedia of Occupational Health & Safety* ILO. Ethyl Alcohol and Alcoholism

12. Emery, M. *Occup. Saf. Health* 1979, **9**(9), 8-13

13. Madden, J.S. *J. Soc. Occup. Med.* 1976, **26**(2), 61-64

14. Christensen, J.M. *Acta, Pharmacol. Toxicol.* 1983, 53, Suppl. II

15. Woolverton, W.L.; Balster, R.L. *Toxicol. Appl. Pharmacol.* 1981, **59**(1), 1-7

16. Riihimaki, V.; et al. *Scand. J. Work, Environ. Health* 1982, **8**(1), 77-79

17. Baarson, K.A.; et al. *Toxicol. Appl. Pharmacol.* 1982, **64**(3), 393-404

18. Munoz, P.J.; et al. *Rev. Med.* 1984, **22**(2), 79-83

19. Ito, Y.; et al. *J. Sci. Labour* 1984, **60**(6), 255-267

20. Lynch, J.; et al. *JOM, J. Occup. Med.* 1979, **21**(5), 333-341

21. Tuyns, A.J.; at al. *Int. J. Cancer* 1979, **23**(4), 443-447

22. McCann, J.; et al. *Proc. Natl. Acad. Sci.* 1975, **72**(12), 5135

23. Badr, F.M.; *R.S. Nature* 1975, **253,** 134

24. Machemer, L.; *D. Mutat. Res.* 1975, **29,** 209

25. Chaubey, R.C.; et al. *Mutat. Res.* 1977, **43,** 441

26. Tze, W.J.; Lee, M. *Nature* 1975, **257,** 479

27. Skosyreva, A.M. *Akush. Ginekol.* 1973, **4,** 15

28. Schwetz, B.A.; et al. *Teratology* 1978, **18**(3), 385

29. Hemminki, K.; Viriei, P. *Teratog. Carcinog. Mutagen.* 1985, **5**(4), 251-318

30. Chemical Safety Data Sheets Volume 1 - Royal Society of Chemistry Information Services (Numbers in parenthesis refer to this article, see below).

31. Hazardous Chemicals Data Book, Environmental Health Review No. 4 Edited by G. Weiss.

32. Canadian Centre for Occupational Health and Safety. Record No. 516022

EXCLUSION OF LIABILITY

M/s. SRI BALAJI ANAND CHEMCIALS believes that this information is correct at date of publication but does not warrant the accuracy thereof. The use of the product designated herein will be at the sole risk of the user and SRI BALAJI ANAND CHEMICALS will not accept any liability for any loss or damage, including consequential loss, howsoever caused by or arising from the use of this information of the use, application, adaption or processing of the product described herein or its use in combination with any other product, material or in any process.

For SRI BALAJI ANAND CHEMICALS.

Sd/-

MANAGING DIRECTOR