1 IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND COMPANY/UNDERTAKING

Base Chemical Name	:	ETHYL ALCOHOL
Primary Name	:	ETHANOL (UN-DENATURED)
CAS Number	:	64-17-5
8 Digits HS Code	:	22071000
UN/ID NUMBER	:	UN1170
WLN	:	Q2

SYNONYMS: ALCOHOL, ETHYL ALCOHOL, HYDROUS ALCOHOL, ETHYL HYDRATE, ETHYL HYDROXIDE, METHYLCARBINOL, ABSOLUTE ETHANOL, ANHYDROUS ALCOHOL, FUEL GRADE ALCOHOL, GRAIN ALCHOL, COLOGNE SPIRIT, FERMENTATION ALCOHOL, AYSOL, JAYSOL S, MOLASSES ALCOHOL, NCI-C03134, POTATO ALCOHOL, SPIRIT, SPIRITS OF WINE, TECSOL, (ALCOHOL, ANHYDROUS), (ALCOHOL DEHYDRATED – ABSOLUTE ALCOHOL), ANHYDROL, ETHANOL 200 PROOF, ETHYL ALCOHOL ANHYDROUS, COLOGNE SPIRITS (ALCOHOL), ETHANOL SOLUTION, SD ALCOHOL 23-HYDROGEN,

2 COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS	Proportion
Ethyl Alcohol	64-17-5	95% by volume
Water	7732-18-5	5 % by volume

3 HAZARDS IDENTIFICATION

Danger classification: Flammable

LD50 LC50 Mixture : Oral Rating: 6.2 TO 17.8g/kg
Routes of Entry : Inhalation, Skin, Ingestion
Health Hazards Acute and Chronic: prolonged exposure to excessive concentration of ethanol may result in irritation of mucous membranes, headache, drowsiness, fatigue and narcosis.

Effects of Overexposure
Inhalation – upper respiratory tract irritation and narcosis.
Eyes – irritation.
Skin – no specific hazardous effects known.
Medical condition aggravated by exposure - none given.

4 FIRST AID MEASURES

Skin Contact:
IMMEDIATELY flood affected skin with water while removing and isolating all contaminated clothing. Gently wash all affected skin areas thoroughly with soap and water.
If symptoms such as redness or irritation develop, IMMEDIATELY call a physician and be prepared to transport the victim to a hospital for treatment.

Inhalation:
IMMEDIATELY leave the contaminated area; take deep breaths of fresh air. If symptoms (such as wheezing, coughing, shortness of breath, or burning in the mouth, throat, or chest) develop, call a physician and be prepared to transport the victim to a hospital. Provide proper respiratory protection to rescuers entering an unknown atmosphere. Whenever possible, Self-Contained Breathing Apparatus (SCBA) should be used; if not available, use a level of protection greater than or equal to that advised under Respirator Recommendation.

Eye Contact:
First check the victim for contact lenses and remove if present. Flush victim's eyes with water or normal saline solution for 20 to 30 minutes while simultaneously calling a hospital or poison control center. Do not put any ointments, oils, or medication in the victim's eyes without specific instructions from a physician. IMMEDIATELY transport the victim after flushing eyes to a hospital even if no symptoms (such as redness or irritation) develop.

Ingestion:
DO NOT INDUCE VOMITING. Volatile chemicals have a high risk of being aspirated into the victim's lungs during vomiting which increases the medical problems. If the victim is conscious and not convulsing, give 1 or 2 glasses of water to dilute the chemical and IMMEDIATELY call a hospital or poison control center. IMMEDIATELY transport the victim to a hospital. If the victim is convulsing or unconscious, do not give anything by mouth, ensure that the victim's airway is open and lay the victim on his/her side with the head lower than the body. DO NOT INDUCE VOMITING. IMMEDIATELY transport the victim to a hospital.

Symptoms:
Symptoms of exposure to this compound may include irritation of the eyes and nose, drowsiness and headache. Other symptoms may include stupor, nausea, mental excitement or depression, vomiting, flushing and coma. It can cause irritation of the respiratory tract, intra-ocular tension, ataxia, sleepiness, narcosis, impaired perception and in-coordination. It can also cause lowered inhibitions, dizziness, shallow respiration, unconsciousness and death. Eye contact results in immediate stinging and burning, with reflex closure of the lids and tearing; transitory injury of the corneal epithelium and hyperemia of the conjunctiva. Other symptoms may include irritation of the throat, lassitude and loss of appetite. Vapor exposure may cause watering of the eyes. It can cause mild redness and burning of the skin, sensory and motor disturbances, mood swings, overconfidence, dulled then lost discrimination, memory, concentration, and insight;

vasodilatation, increased sweating and heat sensation. It can also cause drunkenness, slow comprehension, numbness and fatigue. Slurred speech, visual impairment such as blurred or double vision and slowed reaction time may result. Other symptoms may include nervousness and tremors. Chronic symptoms may include weight loss, cirrhosis of the liver, gastroenteritis, anorexia, diarrhea, polyneuritis with pain, motor and sensory loss in the extremities, op- tic atrophy and loss or impairment of other abilities, excitement, acute and chronic gastritis, malabsorption syndrome, acute and chronic pancreatitis, anemia due to acute or chronic blood

myopathy, alcoholic cardiomyopathy, lactic acidosis, hypomagnesemia, hypouricemia, hyperlipidemia, pulmonary aspiration and respiratory infections. Chronic exposure may also result in serious neurological and mental disorders (e.g. brain damage, memory loss, sleep disturbances, and psychoses). Other symptoms include mucous membrane irritation, central nervous system depression, giddiness, jaundice, pain in upper abdomen on the right side and staggering gait. It may cause liver, kidney and heart damage. The pupils are sometimes widely dilated and un-reactive to light. The liquid can de-fat the skin, producing a dermatitis characterized by drying and fissuring. It rarely causes temporary blindness. Ingestion of this compound can enhance the effects of coumarin, anticoagulants, antihistamines, hypnotics, sedatives, tranquilizers, insulin, monoamine oxidize inhibitors, and antidepressants.

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5 FIRE-FIGHTING MEASURES

Flash point: 13 C (55 F)
This chemical is flammable. Fires involving this material can be controlled with a dry chemical, carbon dioxide or Halon extinguisher. A water fog may also be used.

Lower explosion limit : 3.3%
Upper explosion limit : 19%

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6 ACCIDENTAL RELEASE MEASURES

Spills and Leakage:
If you spill this chemical, FIRST REMOVE ALL SOURCES OF IGNITION. Then, use absorbent paper to pick up all liquid spill material. Seal the absorbent paper, as well as any of your clothing which may be contaminated, in a vapor-tight plastic bag for eventual disposal. Wash any surfaces you may have contaminated with a soap and water solution. Do not re-enter the contaminated area until the Safety Officer (or other responsible person) has verified that the area has been properly cleaned.

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7 HANDLING AND STORAGE

Acute/Chronic Hazards:

This compound is harmful by ingestion, inhalation or skin absorption. It is an irritant of the eyes, nose and throat. It is also an irritant of the skin. Flashback along the vapor trail may occur. When heated to decomposition it emits toxic fumes of carbon monoxide and carbon dioxide.

Storage Precautions:
You should store this chemical in an explosion-proof refrigerator, and protect it from moisture. STORE AWAY FROM SOURCES OF IGNITION.

8 EXPOSURE CONTROLS/PERSONAL PROTECTION

Minimum Protective Clothing:
Not available

Recommended Glove Materials:
Recommended Glove Type For Use With Neat (Undiluted) Chemical:
Recommendations based on permeation test results are made for handling the neat (undiluted) chemical. If this chemical makes direct contact with your glove, or if a tear, puncture or hole develops, replace them at once.

Suggested Glove Type (RAD)	Model Number	Thickness	Breakthrough Time
Butyl rubber	North B-174	0.58 mm	480 min.
Neoprene	Edmont 29-870	0.48 mm	300 min.

Recommended Respirator:
When working with this chemical, wear a NIOSH-approved full face positive pressure supplied-air respirator or a self-contained breathing apparatus (SCBA).

9 PHYSICAL AND CHEMICAL PROPERTIES

General Information

Appearance	: very mobile liquid
Color	: clear, colorless liquid
Odor	: mild, pleasant odor

Important health, safety and environmental information

Flash point: 13 C (55 F)
This chemical is flammable. Fires involving this material can be controlled with a dry chemical, carbon dioxide or Halon extinguisher. A water fog may also be used.

Auto-ignition temperature	: 422.3°C (793 F).
Lower explosion limit	: 3.3%
Upper explosion limit	: 19%
Vapor pressure	: 40 mm Hg @ 19°C; 50 mm Hg @ 25°C
Vapor density	: 1.59

Density	: 0.809 g/ml @ 20°C
Specific gravity	: 0.8095 @ 20°C
Molecular weight	: 46.07
MP (deg C)	: -114.1°C
BP (deg C)	: 78.5°C

Solubilities:

Water	: >=100 mg/ml @ 23°C (RAD)
DMSO	: >=100 mg/ml @ 23°C (RAD)
ETHANOL	: >=100 mg/ml @ 23°C (RAD)
P Methanol	: Miscible
Acetone	: =100 mg/ml @ 23°C (RAD)
Toluene	: Not available

Other Solvents:

Chloroform	: Miscible
Ether	: Miscible
Benzene	: Soluble
Most organic solvents	: Miscible

Other Physical Data:

Refractive index: 1.3611 @ 20°C
100% volatile by volume
Solidifies below -130°C
Odor threshold: 10 ppm
Mild, pleasant odor
Burning taste

Specific gravity: 0.809 @ 20/20°C; 0.8201 @ 15/15°C
Boiling point: 39.8°C @ 130 mm Hg; 4°C @ 16 mm Hg
Vapor pressure: 60 mm Hg @ 26.0°C; 75 mm Hg @ 30°C
Forms an azeotrope in water, containing 4.43% water by weight (boiling point of 78.15°C)
Evaporation rate (butyl acetate = 1): 2.7
Critical point: 243°C @ 62.7 atmospheres
log P octanol: -0.32
Heat of combustion: 6425 cal/g

10 STABILITY AND REACTIVITY

Stability:
This chemical is hygroscopic. Solutions of this chemical in water, DMSO, 96% ethanol or acetone should be stable for 24 hours under normal lab conditions (RAD).

Reactivity:
This chemical reacts violently with a wide range of oxidants. These oxidizing agents include hydrogen peroxide, nitric acid, per- chlorates, nitrates, aluminium, chromium trioxide and sulphuric acid. It reacts violently with acetyl bromide, and Na + air. It also reacts violently with disulfuryl difluoride, phosphorous (III) oxide, platinum, and potassium tert-butoxide. It is incompatible with acids, acid anhydrides, acid chlorides, and alkali metals. It is also incompatible with acetyl chloride, bromide pentafluoride, and calcium hypochlorite. It may react with (Ag2O + NH4OH), Cr(OCl)2, (cyanuric acid + H2O), (H2O2 + H2SO4), (I + CH3OH + HgO), potassium, silver nitrate, [Mn(ClO4)2 + 2,2-dimethoxypropane], silver oxide, Hg(NO3)2, HClO4, (H2SO4 + permanganates), HMnO4, KOC(CH3)3, (Ag + HNO3), AgNO3, AgClO4, NaH3N2, and UO2(ClO4)2

11 TOXICOLOGICAL INFORMATION

NIOSH REGISTRY NUMBER: KQ6300000
Toxicity:

typ. dose	mode	specie	amount	units	other
LDLo	orl	chd	2000	mg/kg	
TDLo	orl	man	50	mg/kg	
TDLo	orl	man	1430	ug/kg	
TDLo	orl	wmn	256	gm/kg/12W	
LDLo	orl	hmn	1400	mg/kg	
LDLo	scu	inf	19440	mg/kg	
TDLo	orl	man	700	mg/kg	

AQTX/TLM96: over 1000 ppm

SAX TOXICITY EVALUATION:
THR: MODERATE-LOW via oral, intravenous and dermal routes; probably also via inhalation routes. MUTATION data. It is rapidly oxidized in the body to carbon dioxide and water, and no cumulative effect occurs. Concentrations below 1000 ppm usually produce no signs of intoxication. It is a central nervous system depressant in humans. It causes teratogenic effects, equivocal tumorigenic effects, gastrointestinal effects and glandular effects in humans.

CARCINOGENICITY**:**
Tumorigenic Data:
TDLo : orl-mus 320 mg/kg/50W-I
TD : orl-mus 400 gm/kg/57W-I
TDLo: rec-mus 120 gm/kg/18W-I
Review : IARC Cancer Review: Animal Inadequate Evidence
IARC human carcinogen (Group 1)

Mutation Data:

test	lowest dose	test	lowest dose
mmo-asn	20 pph	cyt-hmn:lym	1160 gm/L
cyt-hmn:fbr	12000 ppm	mnt-mus-ipr	1240 mg/kg/2D
sce-mus-orl	420 mg/kg/3W	dlt-mus-orl	3720 mg/kg/3D
spm-mus-orl	1500 mg/kg/50D	sln-asn	30 gm/L
mmo-smc	24 pph	cyt-smc	1 mol/tube
dni-hmn:lym	220 mmol/L	cyt-rat-orl	2 gm/kg
cyt-mus-orl	40 gm/kg	sce-ham:ovr	3900 mg/L
mnt-dog:lym	400 umol/L	cyt-hmn:leu	1 pph/72H-C
mmo-esc	140 gm/L	sce-hmn:lym	500 ppm/72H-C
cyt-ham:ovr	100 ppm	oth-rat-orl	3 gm/kg
mrc-asn	5 pph		

TERATOGENICITY:

Reproductive Effects Data:

TDLo : orl-wmn 41 gm/kg (41W preg)
TDLo : ivn-wmn 8 gm/kg (32W preg)
TDLo : iut-wmn 200 mg/kg (5D pre)

STANDARDS, REGULATIONS & RECOMMENDATIONS:

OSHA: Federal Register (1/19/89) and 29 CFR 1910.1000 Subpart Z
Transitional Limit: PEL-TWA 1000 ppm
Final Limit: PEL-TWA 1000 ppm
ACGIH: TLV-TWA 1000 ppm
NIOSH Criteria Document: None
NFPA Hazard Rating : Health (H) : 0
Flammability (F) : 3
Reactivity (R) : 0

H0: Materials which on exposure under fire conditions would offer no hazard beyond that of ordinary combustible material (see NFPA for details).
F3: Materials which can be ignited under almost all normal temperature conditions (see NFPA for details).
R0: Materials which are normally stable even under fire exposure conditions and which are not reactive with water (see NFPA for details).

12 ECOLOGICAL INFORMATION

Flash point: 13 C (55 F)
This chemical is flammable. Fires involving this material can be controlled with a dry chemical, carbon dioxide or Halon extinguisher. A water fog may also be used.

Autoignition temperature	: 422.3 C (793 F).
Lower explosion limit	: 3.3%
Upper explosion limit	: 19%
Vapour pressure	: 40 mm Hg @ 19 C; 50 mm Hg @ 25 C
Vapor density	: 1.59
Density	: 0.809 g/mL @ 20
Specific gravity	: 0.8095 @ 20 C
Molecuilar weight	: 46.07
MP (deg C)	: -114.1 C
BP (deg C)	: 78.5 C

Other Toxicity Data:
Skin and Eye Irritation Data:

skn-rbt	400 mg open MLD
skn-rbt	500 mg/24H SEV
eye-rbt	79 mg eye-rbt 100 mg/24H MOD
eye-rbt	100 mg/4S rns MOD

Review : Toxicology Review-12
Standards and Regulations : DOT-Hazard : Flammable liquid; Label : Flammable liquid
DOT-IMO : Flammable or combustible liquid;
Label : Flammable liquid

Status:
EPA TSCA Chemical Inventory, 1986
NIOSH Analytical Methods: see Alcohols I, 1400; in blood, see 2-Butanone, Ethanol 8002
EPA TSCA Test Submission (TSCATS) Data Base, December 1986
EPA Genetox Program 1986, Positive: Rodent dominant lethal
EPA Genetox Program 1986, Negative/limited: Carcinogenicity-mouse/rat
EPA Genetox Program 1986, Negative: Aspergillus-forward mutation; SHE-clonal assay
EPA Genetox Program 1986, Negative: Cell transform.-RLV F344 rat embryo
EPA Genetox Program 1986, Negative: In vitro cytogenetics-nonhuman; Mammalian micronucleus
EPA Genetox Program 1986, Negative: N crassa-aneuploidy; Histidine reversion-Ames test
EPA Genetox Program 1986, Negative: In vitro SCE-human lymphocytes; In vitro SCE- human
EPA Genetox Program 1986, Negative: In vitro SCE-nonhuman; Sperm morphology-mouse
Meets criteria for proposed OSHA Medical Records Rule

13 DISPOSAL CONSIDERATIONS

You should dispose of all waste and contaminated materials associated with this chemical as specified by existing local, state and federal regulations concerning hazardous waste disposal. It is suggested that your contaminated materials should be destroyed by incineration in a special, high temperature (>2000 degrees F), chemical incinerator facility.

14 TRANSPORT INFORMATION

Hazard Class	:	3
Labels Required	:	Flammable liquid
UN No.	:	UN1170
Transport document name	:	Ethanol
Packing group	:	II
IMDG Class	:	3
Labels Required	:	Flammable liquid
UN-No.	:	1170
Proper shipping name (IATA):		Ethanol
Packing group	:	II
Packing group > 30 L	:	II
Marine pollutant	:	No
UN/ID Number	:	UN1170
Subsidiary Risk	:	None

15 REGULATORY INFORMATION

Proper Shipping Name (IATA) : Ethanol
UN/ID Number : UN1170
Hazard Class : 3
Subsidiary Risk : None
Packing Group : II
Labels Required : Flammable liquid

16 OTHER INFORMATION

Packaging:
Passenger : Pkg. Instr.: 305, Y305 Maximum Quantity: 5 L,
Cargo : Pkg. Instr.: 307 Maximum Quantity: 30,000 L
Manufacturer : PT.Molindo Raya Industrial

Special Provisions : A58

Uses:
Alcoholic beverages; solvent in laboratory and industry (for resins, fats, fatty acids, oils, and hydrocarbons); extraction medium; antiseptic; sedative; manufacture of perfumes, pharmaceuticals (rubbing compounds, lotions, tonics, and colognes), denatured alcohol, acetaldehyde, acetic acid, ethyl- acetate, ethylene, 2-ethyl hexanol, nitrocellulose, ethylchloride, ether, butadiene, ethylene dibromide, lacquers, plastics and plasticizers, cosmetics, rubber and rubber accelerators, aerosols, mouthwash products, soaps and cleaning preparations, polishes, dyes, adhesives, inks, preservatives, pesticides, and explosives; gasoline additive/substitute; elastomers; surface coatings; antifreeze; yeast growth medium; organic synthesis; in veterinary medicine as an antiseptic, to destroy nerve tissue and as a solvent and dehydrating agent.

COMMENTS: Not available