

Material Safety Data Sheet

Section 1. Product and Company Identification

Product Name	Ethanol, 70% w/v	Product Code	EX0281
Manufacturer	EMD Chemicals Inc. P.O. Box 70 480 Democrat Road Gibbstown, NJ 08027 Prior to January 1, 2003 EMD Chemicals Inc. was EM Industries, Inc. or EM Science, Division of EM Industries, Inc.	Effective Date	3/3/2003
For More Information Call	856-423-6300 Technical Service Monday-Friday: 8:00 AM - 5:00 PM	In Case of Emergency Call	800-424-9300 CHEMTREC (USA) 613-996-6666 CANUTEC (Canada) 24 Hours/Day: 7 Days/Week
Synonym	None.		
Material Uses	Analytical reagent.		
Chemical Family	Solution.		

Section 2. Composition and Information on Ingredients

Component	CAS #	% by Weight
ETHANOL	64-17-5	60-70
WATER	7732-18-5	30
4-METHYL-2-PENTANONE	108-10-1	0-1
METHANOL	67-56-1	0-5
ETHYL ACETATE	141-78-6	0-1

Section 3. Hazards Identification

Physical State and Appearance	Liquid.
Emergency Overview	DANGER! POISON! FLAMMABLE LIQUID AND VAPOR. VAPOR MAY CAUSE FLASH FIRE. MAY BE FATAL IF SWALLOWED. MAY CAUSE BLINDNESS IF SWALLOWED. CANNOT BE MADE NON-POISONOUS. BIRTH DEFECT HAZARD. CONTAINS MATERIAL WHICH CAN CAUSE BIRTH DEFECT. HARMFUL IF INHALED OR ABSORBED THROUGH SKIN. CAUSES RESPIRATORY TRACT, EYE AND SKIN IRRITATION. CONTAINS MATERIAL WHICH CAUSES DAMAGE TO THE FOLLOWING ORGANS: BLOOD, KIDNEYS, REPRODUCTIVE SYSTEM, LIVER, GASTROINTESTINAL TRACT, RESPIRATORY TRACT, SKIN, CENTRAL NERVOUS SYSTEM, EYE, LENS OR CORNEA.
Routes of Entry	Absorbed through skin. Dermal contact. Eye contact. Inhalation. Ingestion.
Potential Acute Health Effects	<p>Eyes Hazardous in case of eye contact (irritant). Inflammation of the eye is characterized by redness, watering, and itching.</p> <p>Skin Hazardous in case of skin contact (permeator, irritant). Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.</p> <p>Inhalation Hazardous in case of inhalation (lung irritant).</p> <p>Ingestion Extremely hazardous in case of ingestion. May be fatal or cause blindness if swallowed.</p>
Potential Chronic Health Effects	<p>Carcinogenic Effects This material is not known to cause cancer in animals or humans.</p> <p>Additional information See Toxicological Information (section 11)</p>
Medical Conditions Aggravated by Overexposure:	Repeated exposure to a highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.

Section 4. First Aid Measures

Eye Contact	Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.
Skin Contact	In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention

Inhalation	immediately. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.
Ingestion	If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5. Fire Fighting Measures

Flammability of the Product	Product will burn.
Auto-ignition Temperature	The lowest known value is 398.9°C (750°F) (ETHANOL).
Flash Points	Closed cup: 10.556°C (51°F).
Flammable Limits	LOWER: 3.3% UPPER: 19%
Products of Combustion	These products are carbon oxides (CO, CO ₂).
Fire Hazards in Presence of Various Substances	Highly flammable in presence of open flames, sparks and static discharge, of heat, of oxidizing materials.
Explosion Hazards in Presence of Various Substances	Flammable in presence of shocks. Risks of explosion of the product in presence of static discharge: Highly flammable in presence of open flames, sparks and static discharge. Explosive in presence of open flames, sparks and static discharge. Risks of explosion of the product in presence of mechanical impact: Flammable in presence of shocks. Explosive in presence of shocks. SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use alcohol foam, water spray or fog. Cool containing vessels with water jet in order to prevent pressure build-up, autoignition or explosion. Be sure to use an approved/certified respirator or equivalent. Vapor may travel considerable distance to source of ignition and flash back. (ETHANOL)
Fire Fighting Media and Instructions	
Protective Clothing (Fire)	
Special Remarks on Fire Hazards	
Special Remarks on Explosion Hazards	Not available.

Section 6. Accidental Release Measures

Small Spill and Leak	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill and Leak	Keep away from heat. Keep away from sources of ignition. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.
Spill Kit Information	The following EMD Chemicals Inc. SpillSolv® absorbent is recommended for this product: SX1330 Solvent Treatment Kit

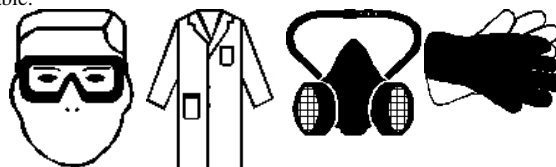
Section 7. Handling and Storage

Handling	Keep away from heat, sparks and flame. Keep container closed. Do not get in eyes, on skin, or on clothing. Do not ingest. Avoid breathing vapors or spray mists.
Storage	Keep container in a cool, well-ventilated area.

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 threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal Protection	<p>Eyes Splash goggles.</p> <p>Body Lab coat.</p> <p>Respiratory Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate.</p> <p>Hands Gloves.</p> <p>Feet Not applicable.</p>

Protective Clothing (Pictograms)



Personal Protection in Case Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self-contained breathing apparatus should be

of a Large Spill

used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Product Name

ETHANOL

Exposure Limits**NIOSH REL (United States, 2000).**TWA: 1900 mg/m³ Period: 10 hour(s).

TWA: 1000 ppm Period: 10 hour(s).

OSHA Final Rule (United States, 1989).TWA: 1900 mg/m³

TWA: 1000 ppm

AUVA (Austria, 1995).Spitzenbegrenzung: 3800 mg/m³ 3 times per shift, Period: 60 minute(s).Spitzenbegrenzung: 2000 ML/M³ 3 times per shift, Period: 60 minute(s).MAK: 1900 mg/m³MAK: 1000 ML/M³**NOHSC (Australia, 1995).**TWA: 1880 mg/m³

TWA: 1000 ppm

Lijst Grenswaarden (Belgium, 1998).VL: 1907 mg/m³

VL: 1000 ppm

SUVA (Switzerland, 1997).MAK: 1900 mg/m³MAK: 1000 ML/M³**Ministry of Health (CL, 1992).**TWA: 1500 mg/m³

TWA: 800 ppm

MAK-Werte Liste (Germany, 1998).Spitzenbegrenzung: 1920 mg/m³ 4 times per shift, Period: 30 minute(s).Spitzenbegrenzung: 1000 ML/M³ 4 times per shift, Period: 30 minute(s).MAK: 960 mg/m³MAK: 500 ML/M³**TRGS900 (Germany, 1999).**Spitzenbegrenzung: 7600 mg/m³Spitzenbegrenzung: 4000 ML/M³MAK: 1900 mg/m³MAK: 1000 ML/M³**Arbejdstilsynet (Denmark, 1996).**GV: 1900 mg/m³

GV: 1000 ppm

Tyterveyslaitos (Finland, 1998).STEL: 2500 mg/m³

STEL: 1300 ppm

TWA: 1900 mg/m³

TWA: 1000 ppm

INRS (France, 1999).VLE: 9500 mg/m³

VLE: 5000 ppm

VME: 1900 mg/m³

VME: 1000 ppm

EH40-OES (United Kingdom (UK), 2000).TWA: 1920 mg/m³

TWA: 1000 ppm

NAOSH (Ireland, 1999).OEL: 1900 mg/m³

OEL: 1000 ppm

Ministry of Labour (KR, 1997).TWA: 1900 mg/m³

TWA: 1000 ppm

Secretary of Work and Social security (MX, 1994).CPT: 1900 mg/m³ Period: 8 hour(s).

CPT: 1000 ppm Period: 8 hour(s).

Nationale MAC-lijst (Netherlands, 2000).TGG 8 uur: 1000 mg/m³

TGG 8 uur: 500 ppm

NZ OSH (NZ, 1994).TWA: 1880 mg/m³

TWA: 1000 ppm

AFS (Sweden, 1996).TGV: 1900 mg/m³

TGV: 1000 ppm

NGV: 1000 mg/m³

NGV: 500 ppm

ACGIH TLV (United States, 2000).TWA: 1880 mg/m³

TWA: 1000 ppm

Not available.

ACGIH (United States, 1994).

WATER

4-METHYL-2-PENTANONE

	STEL: 307 mg/m ³
	STEL: 75 ppm
	TWA: 205 mg/m ³
	TWA: 50 ppm
	NIOSH REL (United States, 1994).
	STEL: 300 mg/m ³
	STEL: 75 ppm
	TWA: 205 mg/m ³ Period: 10 hour(s).
	TWA: 50 ppm Period: 10 hour(s).
	OSHA Final Rule (United States, 1989).
	STEL: 300 mg/m ³
	STEL: 75 ppm
	TWA: 205 mg/m ³
	TWA: 50 ppm
METHANOL	ACGIH (United States, 1994). Skin
	TWA: 262 mg/m ³
	STEL: 328 mg/m ³
	OSHA (United States, 1989). Skin
	TWA: 260 mg/m ³
	STEL: 325 mg/m ³
	ACGIH (United States, 1994). Skin
	STEL: 328 mg/m ³
	STEL: 250 ppm
	TWA: 262 mg/m ³
	TWA: 200 ppm
	NIOSH REL (United States, 1994). Skin
	STEL: 325 mg/m ³
	STEL: 250 ppm
	TWA: 260 mg/m ³ Period: 10 hour(s).
	TWA: 200 ppm Period: 10 hour(s).
	OSHA Final Rule (United States, 1989). Skin
	STEL: 325 mg/m ³
	STEL: 250 ppm
	TWA: 260 mg/m ³
	TWA: 200 ppm
ETHYL ACETATE	ACGIH (United States, 1996).
	TWA: 1440 mg/m ³
	TWA: 400 ppm
	NIOSH REL (United States, 1994).
	TWA: 1400 mg/m ³ Period: 10 hour(s).
	TWA: 400 ppm Period: 10 hour(s).
	OSHA Final Rule (United States, 1989).
	TWA: 1400 mg/m ³
	TWA: 400 ppm

Section 9. Physical and Chemical Properties

Odor	Characteristic.
Color	Colorless.
Physical State and Appearance	Liquid.
Molecular Weight	Not applicable.
Molecular Formula	Not applicable.
pH	Not available.
Boiling/Condensation Point	The lowest known value is 64.55°C (148.2°F) (METHANOL). Weighted average: 84.66°C (184.4°F)
Melting/Freezing Point	May start to solidify at -0.1°C (31.8°F) based on data for: WATER. Weighted average: -78.43°C (-109.2°F)
Specific Gravity	Weighted average: 0.79 (Water = 1)
Vapor Pressure	The highest known value is 12.9 kPa (97 mmHg) (@ 20°C) (METHANOL).
Vapor Density	The highest known value is 1.6 (Air = 1) (ETHANOL). Weighted average: 1.58 (Air = 1)
Volatility	99.9% (v/v). (METHANOL.)
Odor Threshold	The highest known value is 100 ppm (METHANOL)
Evaporation Rate	The highest known value is 5.91 (METHANOL) Weighted average: 1.4 compared to (n-BUTYL ACETATE=1)
VOC	70 (%)
LogKow	Not available.
Solubility	Soluble in water.

Section 10. Stability and Reactivity

Stability and Reactivity	The product is stable.
Conditions of Instability	Not available.
Incompatibility with Various Substances	Highly reactive with oxidizing agents. Slightly reactive to reactive with acids.

Rem/Incompatibility	Not available.
Hazardous Decomposition Products	Not available.
Hazardous Polymerization	Will not occur.

Section 11. Toxicological Information

RTECS Number:	ETHANOL Water 4-Methyl-2-pentanone Methanol Ethyl Acetate	KQ6300000 ZC0110000 SA9275000 PC1400000 AH5425000
Toxicity	Acute oral toxicity (LD50): 3450 mg/kg [Mouse]. (ETHANOL). Acute dermal toxicity (LD50): 15800 mg/kg [Rabbit]. (METHANOL). Acute toxicity of the vapor (LC50): 64000 ppm 4 hour(s) [Rat]. (METHANOL).	
Chronic Effects on Humans	DEVELOPMENTAL TOXICITY: Classified Reproductive system/toxin/female, Reproductive system/toxin/male [PROVEN] [ETHANOL].	
Acute Effects on Humans	Hazardous in case of eye contact (irritant). Inflammation of the eye is characterized by redness, watering, and itching. Hazardous in case of skin contact (permeator, irritant). Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering. Hazardous in case of inhalation (lung irritant). Extremely hazardous in case of ingestion. May be fatal if swallowed.	
Synergetic Products (Toxicologically)	Not available.	
Irritancy	Draize Test: Not available.	
Sensitization	Not available.	
Carcinogenic Effects	This material is not known to cause cancer in animals or humans.	
Toxicity to Reproductive System	Classified Reproductive system/toxin/female, Reproductive system/toxin/male [PROVEN] [ETHANOL].	
Teratogenic Effects	Not available.	
Mutagenic Effects	Not available.	

Section 12. Ecological Information

Ecotoxicity	Not available.
BOD5 and COD	Not available.
Toxicity of the Products of Biodegradation	The products of degradation are less toxic than the product itself.

Section 13. Disposal Considerations

EPA Waste Number	D001
Treatment	Incineration, fuels blending or recycle. Contact your local permitted waste disposal site (TSD) for permissible treatment sites. Always contact a permitted waste disposal (TSD) to assure compliance with all current local, state, and Federal Regulations.

Section 14. Transport Information

DOT Classification	Proper Shipping Name: ETHYL ALCOHOL Hazard Class: 3 UN number: UN1170 Packing Group: II RQ: Not applicable.
TDG Classification	Not available.
IMO/IMDG Classification	Proper Shipping Name: ETHYL ALCOHOL Hazard Class: 3 UN number: UN1170 Packing Group: II RQ: Not applicable.
ICAO/IATA Classification	Not available.

Section 15. Regulatory Information

U.S. Federal Regulations	TSCA 4(a) final test rules: 4-METHYL-2-PENTANONE; ETHYL ACETATE TSCA 8(b) inventory: ETHANOL; WATER; 4-METHYL-2-PENTANONE; METHANOL; ETHYL ACETATE TSCA 8(d) H and S data reporting: 4-METHYL-2-PENTANONE: 1982 TSCA 12(b) one time export: 4-METHYL-2-PENTANONE; ETHYL ACETATE
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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; 4-METHYL-2-PENTANONE; METHANOL; ETHYL ACETATE
 SARA 311/312 MSDS distribution - chemical inventory - hazard identification: ETHANOL: Fire Hazard, Immediate (Acute) Health Hazard, Delayed (Chronic) Health Hazard; 4-METHYL-2-PENTANONE: Fire Hazard, Immediate (Acute) Health Hazard, Delayed (Chronic) Health Hazard; METHANOL: Fire Hazard, Immediate (Acute) Health Hazard, Delayed (Chronic) Health Hazard; ETHYL ACETATE: Fire Hazard, Immediate (Acute) Health Hazard, Delayed (Chronic) Health Hazard
 SARA 313 toxic chemical notification and release reporting: METHANOL 2.5%
 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.
 CLASS B-2: Flammable liquid with a flash point lower than 37.8°C (100°F).
 Class D-1A: Material causing immediate and serious toxic effects (VERY TOXIC).
 Class D-2A: Material causing other toxic effects (VERY TOXIC).
 Class D-2B: Material causing other toxic effects (TOXIC).
 CEPA DSL: ETHANOL; WATER; 4-METHYL-2-PENTANONE; METHANOL; ETHYL ACETATE
 This product has been classified in accordance with the hazard criteria of the Controlled Product Regulations and the MSDS contains all required information.

WHMIS (Canada)**International Regulations****EINECS**

ETHANOL 200-578-6
 WATER 231-791-2
 4-METHYL-2-PENTANONE 203-550-1
 METHANOL 200-659-6
 ETHYL ACETATE 205-500-4

DSCL (EEC)**International Lists**

R11- Highly flammable.
 Australia (NICNAS): ETHANOL; WATER; 4-METHYL-2-PENTANONE; METHANOL; ETHYL ACETATE
 Germany water class: ETHANOL
 Japan (MITI): ETHANOL; WATER; 4-METHYL-2-PENTANONE; METHANOL; ETHYL ACETATE
 Korea (TCCL): ETHANOL; WATER; 4-METHYL-2-PENTANONE; METHANOL; ETHYL ACETATE
 Philippines (RA6969): ETHANOL; WATER; 4-METHYL-2-PENTANONE; METHANOL; ETHYL ACETATE
 China: No products were found.
 Pennsylvania RTK: ETHANOL: (generic environmental hazard); 4-METHYL-2-PENTANONE: (environmental hazard, generic environmental hazard); METHANOL: (environmental hazard, generic environmental hazard); ETHYL ACETATE: (environmental hazard, generic environmental hazard)
 Massachusetts RTK: ETHANOL; 4-METHYL-2-PENTANONE; METHANOL; ETHYL ACETATE
 New Jersey: ETHANOL; 4-METHYL-2-PENTANONE; METHANOL; ETHYL ACETATE
 California prop. 65: No products were found.

State Regulations**Section 16. Other Information**

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

3 Fire Hazard
1 0 Reactivity
 Specific Hazard

Changed Since Last
 Revision +
 Notice to Reader

The statements contained herein are based upon technical data that EMD Chemicals Inc. believes to be reliable, are offered for information purposes only and as a guide to the appropriate precautionary and emergency handling of the material by a properly trained person having the necessary technical skills. Users should consider these data only as a supplement to other information gathered by them and must make independent determinations of suitability and completeness of information from all sources to assure proper use, storage and disposal of these materials and the safety and health of employees and customers and the protection of the environment. EMD CHEMICALS INC. MAKES NO REPRESENTATION OR WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE, WITH RESPECT TO THE INFORMATION HEREIN OR THE PRODUCT TO WHICH THE INFORMATION REFERS.