

CORCO CHEMICAL CORPORATION

Manufacturers of ACS Reagents and Semiconductor Grade Chemicals

SAFETY DATA SHEET

Ethyl Alcohol (Denatured) Reagent Alcohol, Anhydrous ACS Reagent Grade

1. IDENTIFICATION

Product identifier: Alcohol, Anhydrous, ACS Reagent

Product Code Number: 1002

Company Identification:

Corco Chemical Corporation
299 Cedar Lane
Fairless Hills, PA 19030
Phone: 215-295-5006
Fax: 215-295-0781

**24 Hour Emergency Telephone
Number:**

CHEMTREC (U.S.): 1-800-424-9300
CHEMTREC (Outside U.S. 1-703-527-3887)

Trade Name:

Alcohol, Anhydrous, Reagent

Synonyms:

Reagent Alcohol, Ethyl Alcohol, Ethanol,
Denatured Alcohol

Chemical Formula:

C₂H₅OH

Product use:

Process chemical, Laboratory and
scientific research and development

2. HAZARD(S) IDENTIFICATION

Physical hazards:

Flammable liquids

Category 2

Health hazards:

Serious eye damage/eye irritation

Category 2A

Sensitization, respiratory

Category 1

Germ cell mutagenicity

Category 1B

Reproductive toxicity
Specific target organ toxicity,
single exposure

Category 1A

Category 1
(central nervous
system, kidney,
systemic toxicity)

Specific target organ toxicity,
single exposure

Category 3
respiratory tract
irritation

Specific target organ toxicity,
single exposure

Category 3
narcotic effects

Specific target organ toxicity,
Repeated exposure

Category 1
(central nervous
system, liver,
visual organs)

OSHA hazard(s):

Not classified

Label Elements:



Signal word **Danger**

Hazard statement: Highly flammable liquid and vapor. Causes serious eye irritation. May cause allergy or asthma symptoms or breathing difficulties if inhaled. May cause respiratory irritation. May cause drowsiness or dizziness. May cause genetic defects. May damage fertility or the unborn child. Causes damage to organs (central nervous system, kidney, systemic toxicity). Causes damage to organs (central nervous system, liver, visual organs) through prolonged or repeated exposure. Toxic to aquatic life. Toxic to aquatic life with long lasting effects.

Precautionary statement: Prevention - Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Use only outdoors or in a well-ventilated area. Keep container tightly closed. Ground/bond container and

receiving equipment. Use explosion-proof electrical/ventilating/lighting equipment. Use only non-sparking tools. Take precautionary measures against static discharge. Do not breathe mist or vapor. Wash thoroughly after handling. Do not eat, drink or smoke when using this product. Wear protective gloves/protective clothing/eye protection/face protection. In case of inadequate ventilation wear respiratory protection.

Response: Eliminate all ignition sources if safe to do so. If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. If inhaled: Remove person to fresh air and keep comfortable for breathing. If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If exposed or concerned: Get medical advice/attention. If eye irritation persists: Get medical advice/attention. In case of fire: Use appropriate media for extinction.

Storage: Store in a well-ventilated place. Keep container tightly closed. Store in a well-ventilated place. Keep cool. Store locked up.

Disposal: Dispose of contents/container to an approved incineration plant.

Emergency Overview: Poison! Harmful if inhaled or absorbed through the skin. May be harmful if swallowed. Affects central nervous system. Causes severe eye irritation and irritation to the respiratory tract. May affect liver, kidneys, and heart. Causes adverse reproductive and fetal effects in humans. Highly flammable liquid and vapor! Target Organs: Kidneys, heart central nervous system, liver, eyes, and optic nerve.

3. Composition/information on ingredients

Ingredient	CAS No.	Percent	Hazardous
Ethyl Alcohol	64-17-5	90%	Yes
Methyl Alcohol	67-56-1	5%	Yes
Isopropyl Alcohol	67-63-0	5%	Yes

4. First-aid measures

Inhalation: If breathing is difficult, remove to fresh air and keep at rest in a position comfortable for breathing. Oxygen or artificial respiration if needed. Do not use mouth-to-mouth method if victim inhaled the substance. Induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. If experiencing respiratory symptoms: Call a POISON CENTER or doctor/physician.

Skin contact: Take off immediately all contaminated clothing. Rinse skin with water/shower. Get medical attention if irritation develops and persists.
Eye contact Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention if irritation develops and persists.

Ingestion: Rinse mouth. If ingestion of a large amount does occur, call a poison control center immediately.

General information: Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. IF exposed or concerned: Get medical advice/attention.

5. Fire-fighting measures

Flammability: Highly flammable liquid and vapor (GHS Category 2).

Auto-ignition Temperature: 362o C (685o F)

Flash Point: 13.9o C (57o F)

Flammable Limits: Lower Limit – 3.3 vol %, Upper Limit – 19 vol %

Products of Combustion: May decompose into irritating and highly toxic gases under fire conditions (carbon monoxide and carbon dioxide).

Specific Fire Hazards: As in any fire, always wear self-contained breathing apparatus in pressure-demand (MSA/NIOSH approved or equivalent), and full protective gear. Vapors may form explosive mixtures with air. Use water spray to keep fire exposed containers cool. Approach fire from upwind to avoid hazardous vapors and toxic decomposition products. Vapors are heavier than air and may travel to a source of ignition and flash back. Vapors can spread along the ground and collect in low or confined areas.

Specific Explosion Hazards: May form explosive peroxides.

Fire Fighting Media: Water may be ineffective. Do not use straight streams of water. For small fires, use dry chemical, carbon dioxide, water spray, or alcohol-resistant foam. For larger fires, use water spray, fog, or alcohol-resistant foam. Cool containers with flooding quantities of water and well after fire is out.

National Fire Protective Association: Health - 1, Flammability - 3, Reactivity - 0

NOTE: NFPA ratings use a numbering scale that ranges from 0 - 4 to indicate the degree of hazard. A value of zero means the chemical presents no hazard while a value of four indicates a high hazard. They are for use by emergency personnel to address the hazards that are presented by short term, acute exposure to this product under fire, spill, or similar emergencies. Ratings involve data and interpretations that may vary from company to company.

6. Accidental release measures

Use water spray to reduce vapors. Water spray may reduce vapors but still not prevent ignition in closed spaces. Absorb spilled liquid with sorbent pads, socks, or other inert material such as vermiculite, sand, or earth. Do not use sawdust or any combustible material. Use spark-proof tools. Provide ventilation to the affected area and remove all ignition sources. Approach the spill from upwind and pick up absorbed material and place it in a suitable container. Always use proper personal protective equipment as described in section 8.

Fire-fighting equipment/instructions: In case of fire and/or explosion do not breathe fumes. Use standard firefighting procedures and consider the hazards of other involved materials. Move containers from fire area if you can do so without risk. Water runoff can cause environmental damage.

Specific methods In the event of fire and/or explosion: Do not breathe fumes Self-contained breathing apparatus and full protective clothing must be worn in case of fire. Use standard firefighting procedures and consider the hazards of other involved materials. Move container from fire area if it can be done without risk.

7. Handling and storage

Precautions: Always use proper personal protective equipment as described in section 8. Wash thoroughly after handling. Ground and bond containers when transferring material. Use spark-proof tools and explosion proof equipment. Avoid contact with eyes, skin, and clothing. Remove contaminated clothing and wash before reuse. Empty containers contain product residue (liquid and vapor) and can be dangerous. Keep container tightly closed and away from heat, spark, and flame. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks, or open flames. Use with adequate ventilation. Avoid breathing vapor or mist.

Storage: Keep in a flammables area away from direct sunlight and all sources of ignition and oxidizing materials. Keep in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep from contact with oxidizing materials.

8. Exposure controls/personal protection

Engineering Controls: Use explosion-proof ventilation equipment. Facilities storing or using the material should be equipped with eyewash station and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Personal Protection: Wear protective chemical goggles or other appropriate eye protection. Use butyl rubber gloves and protective clothing to prevent skin exposure. A respiratory protection program that meets OSHA 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever possible. Always use a NOISH or European Standard EN 149 approved respirator when necessary.

Exposure Limits (Ethanol):

CGIH – 1000 ppm TWA;
IOSH – 1000 ppm TWA; 1900 mg/m³ TWA; 3300 ppm IDLH
SHA Final PELs – 1000 ppm TWA; 1900 mg/m³ TWA
SHA Vacated PELs: 1000 ppm TWA; 1900 mg/m³ TWA

Exposure Limits (Methanol):

CGIH – 200 ppm TWA; 250 ppm STEL; Skin – potential significant contribution to overall exposure by cutaneous route
NIOSH– 200 ppm TWA; 260 mg/m³ TWA; 6000 ppm IDLH
OSHA Final PELs – 200 ppm TWA; 260 mg/m³ TWA
OSHA Vacated PELs: 1000 ppm TWA; 1900 mg/m³ TWA

Exposure Limits (Isopropanol):

ACGIH – 200 ppm TWA; 400 ppm STEL
NIOSH – 400 ppm TWA; 980 mg/m³ TWA; 2000 ppm IDLH
OSHA Final PELs – 400 ppm TWA; 980 mg/m³ TWA
OSHA Vacated PELs: 400 ppm TWA; 980 mg/m³ TWA

General hygiene considerations: When using, do not eat, drink or smoke. Avoid contact with eyes. Wash hands before breaks and immediately after handling the product. Handle in accordance with good industrial hygiene and safety practice.

9. Physical and chemical properties

Appearance:	Clear
Physical state:	Liquid
Form:	Liquid
Color:	Colorless
Odor:	Alcoholic
Odor threshold:	Not Available
pH	Not Available
Melting point/ freezing point:	-169°F (-112.005 °C) estimated
Initial boiling point and boiling range:	172.4 °F (78 °C)
Flash point:	55.40 °F (13.00 °C)
Evaporation rate:	Not available

Flammability (solid, gas):	Not applicable
Upper/lower flammability or explosive limits:	
Flammability limit – lower (%):	3.5% estimated
Flammability limit - upper (%):	24 % estimated
Explosive limit – lower (%):	Not Available
Explosive limit – upper (%):	Not Available
Vapor pressure:	82.645284 hPa estimated
Vapor density:	1.6
Relative density:	Not Available
Solubility(ies):	Miscible
Partition coefficient (n-octanol/water)	Not Available
Auto-ignition temperature:	677.21 °F (358.45 °C) estimated
Decomposition temperature:	Not Available
Viscosity:	Not Available
Other information:	
Density:	0.79 g/cm ³
Flammability class:	Flammable IB estimated
Flash point class:	Flammable IB
Percent volatile:	100 %
Specific gravity:	0.79
VOC (Weight %):	100 % estimated

10. Stability and reactivity

Stability: Stable under normal temperatures and pressure.

Conditions to Avoid: Incompatible materials, ignition sources, excess heat, oxidizers.

Incompatibility With Various Substances: Strong oxidizing agents, acids, alkali metals, ammonia, hydrazine, peroxides, sodium, acid anhydrides, calcium hypochlorite, chromyl chloride, nitrosyl perchlorate, bromine pentafluoride, perchloric acid, silver nitrate, mercuric nitrate, potassium tert-butoxide, magnesium perchlorate, acid chlorides, platinum, uranium hexafluoride, silver oxide, iodine heptafluoride, acetyl bromide, disulfuryl difluoride, tetrachlorosilane+water, acetyl chloride, permanganic acid, ruthenium (III) oxide, uranyl perchlorate, potassium dioxide.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide, irritating and toxic fumes.

Hazardous Polymerization: Has not been reported.

11. Toxicological information

Information on likely routes of exposure:

Acute Exposure Hazards:

INHALATION HAZARD: Inhalation of high concentrations may cause central nervous effects characterized by nausea, headache, dizziness, unconsciousness, and coma. May cause narcotic effects in high concentrations. Inhalation of vapors may cause drowsiness and dizziness.

INGESTION HAZARD: Causes gastrointestinal irritation with nausea, vomiting, and diarrhea. May cause systemic toxicity with acidosis. May cause central nervous system depression with excitement followed by headache, drowsiness, nausea, and vomiting. Advanced stages may cause collapse, unconsciousness, coma, and possible death.

SKIN CONTACT HAZARD: Causes moderate skin irritation. May cause cyanosis of the extremities. Skin absorption of methanol can systemic effects, including disturbances in vision.

EYE CONTACT HAZARD: Causes severe eye irritation and possible chemical conjunctivitis and/or corneal damage. May cause transient corneal injury. May cause painful sensitization to light. Inhalation, ingestion, or skin absorption of methanol can cause significant disturbances in vision, including blindness.

Chronic Exposure Hazards: May cause reproductive and fetal effects. Laboratory experiments have resulted in mutagenic effects. Animal studies have reported the development of tumors. Repeated or prolonged exposure may cause liver, kidney, and heart damage.

Animal Toxicity for Ethanol:

Draize test, rabbit, eye: 500 mg Severe;
Draize test, rabbit, eye: 500 mg/24 hr Mild;
Draize test, rabbit, skin: 20 mg/24 hr Moderate;
Inhalation, mouse: LC50 = 39 g/m³ /4 hr;
Inhalation, rat: LC50 = 2000 ppm/10 hr;
Oral, mouse: LD50 = 3450 mg/kg;
Oral, rabbit: LD50 = 6300 mg/kg;
Oral, rat: LD50 = 7060 mg/kg;
Oral, rat: LD50 = 9000 mg/kg;

Animal Toxicity for Methanol:

Draize test, rabbit, eye: 40 mg Moderate;
Draize test, rabbit, eye: 100 mg/24 hr Moderate;
Draize test, rabbit, skin: 20 mg/24 hr Moderate;
Inhalation, rabbit: LC50 = 81000 mg/m³/14 hr;

Inhalation, rat: LC50 = 64000 ppm/4 hr;
Oral, mouse: LD50 = 7300 mg/kg;
Oral, rabbit: LD50 = 14200 mg/kg;
Oral, rat: LD50 = 5600 mg/kg;
Skin, rabbit: LD50 = 15800 mg/kg;
Skin, monkey LDLo = 393 mg/kg;

Human Toxicity for Methanol:

Inhalation, human: TCLo = 300 ppm caused visual field changes and headache;
Oral, human: LDLo = 143 mg/kg;
Oral, human: LDLo = 428 mg/kg;
Methanol is significantly less toxic to most experimental animals than to humans, because most animal species metabolize methanol differently. Non-primate species do not ordinarily show symptoms of metabolic acidosis or the visual effects that have been observed in primates and humans.

Animal Toxicity for Isopropanol:

Draize test, rabbit, eye: 100 mg Severe;
Draize test, rabbit, eye: 10 mg Moderate;
Draize test, rabbit, eye: 100 mg/24 hr Moderate;
Draize test, rabbit, skin: 500 mg Mild;
Inhalation, mouse: LC50 = 53,000 mg/m³;
Inhalation, rat: LC50 = 16,000 ppm/8 hr;
Inhalation, rat: LC50 = 72,600 mg/kg;
Oral, mouse: LD50 = 3600 mg/kg;
Oral, mouse: LD50 = 3600 mg/kg;
Oral, rabbit: LD50 = 6410 mg/kg;
Oral, rat: LD50 = 5045 mg/kg;
Oral, rat: LD50 = 5000 mg/kg;
Skin, rabbit: LD50 = 12,800 mg/kg;

Carcinogenicity: Ethanol, methanol, and isopropanol are not listed as carcinogens by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: Ethanol - has been shown to produce fetotoxicity in the embryo or fetus of laboratory animals. Prenatal exposure to ethanol is associated with a distinct pattern of congenital malformations that have been collectively termed "fetal alcohol syndrome." Methanol - has been shown to produce fetotoxicity in the embryo of laboratory animals. Specific developmental abnormalities include cardiovascular, musculoskeletal, and urogenital systems. Isopropanol - experimental teratogenic and reproductive effects have been reported. Early epidemiological studies have suggested an association between the strong acid manufacture of isopropyl alcohol and paranasal sinus cancer in workers.

Teratogenicity:

Oral, human – woman: TDLo = 41 g/kg (female 41 weeks after conception) Effects on newborn – Apgar score (human only)

and Effects on newborn – other neonatal measures or effects and Effects on newborn – drug dependence.

Methanol - No human information is available. Based on animal data, methyl alcohol is considered a potential

developmental hazard. Animal studies have shown fetotoxic and teratogenic effects without maternal toxicity. Isopropanol -

A rat and rabbit developmental toxicity study showed no teratogenic effects at doses that were clearly toxic to the mother. In

a separate rate study, no evidence of developmental neurotoxicity was associated with gestational exposures to isopropanol up to 1200 mg/kg/d.

Reproductive Effects: Intrauterine, human – woman: TDLO = 200 mg/kg (female 5 days pre-mating) Fertility – female fertility

index e.g. # females pregnant per # sperm positive females; # female pregnant per # females mated)

Numerical Measures of Toxicity: Cancer Lists: NTP Carcinogen

Ingredient	Known	Anticipated	IARC Category
Ethyl Alcohol (64-17-5)	No	No	None
Methyl Alcohol (67-56-1)	No	No	None
Isopropyl Alcohol (67-63-0)	No	No	None

12. Ecological information

Ecotoxicity:

Fish: Rainbow trout: LC50 = 12,900-15,300 mg/L, 96H, flow-through at 24-24.3o C

Fish: Rainbow trout: LC50 = 11,200 mg/L, 24H, fingerling (unspecified)

Bacteria: Phytobacterium phosphoreum: EC50 = 34,900 mg/L, 5-30M, Microtox test.

When spilled on land, it is apt to volatilize, biodegrade, and leach into the ground water, but no data on the rates of these processes could be found. Its fate in ground water is unknown. When released into water it will probably volatilize and biodegrade. It would not be expected to adsorb to soil or bioconcentrate in fish.

Environmental Fate: No information available.

Physical: THOD: 2.40 g oxygen/g; COD: 2.23 g oxygen/g; BOD-5: 1.19-1.72 g oxygen/g

13. Disposal considerations

Disposal instructions: Collect and reclaim or dispose in sealed containers at licensed waste disposal site. This material and its container must be disposed of as hazardous waste. Incinerate the material under controlled conditions in an approved incinerator. Do not incinerate sealed containers. Do not allow this material to drain into sewers/water supplies. Do not contaminate ponds, waterways or ditches with chemical or used container. If discarded, this product is considered a RCRA ignitable waste, D001. Dispose of contents/container in accordance with local/regional/national/international regulations.

Local disposal regulations: Not available.

Hazardous waste code D001: Waste Flammable material with a flash point <140 F

Waste from residues / unused products: Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions). Contaminated packaging Empty containers should be taken to an approved waste handling site for recycling or disposal. Since emptied containers may retain product residue, follow label warnings even after container is emptied.

14. Transportation Information

UN Number: UN1987

UN Proper Shipping Name: Alcohols n.o.s.

Packing Group: II

Hazard Class: 3

Marine Pollutant: No

DOT



IMDG / IATA



Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code:
No information available

15. Regulatory information

US federal regulations All components are on the U.S. EPA TSCA Inventory List.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated.

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not on regulatory list.

CERCLA Hazardous Substance List (40 CFR 302.4)

METHYL ALCOHOL (CAS 67-56-1) LISTED

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories Immediate Hazard - Yes

Delayed Hazard - Yes

Fire Hazard - Yes

Pressure Hazard - No

Reactivity Hazard - No

SARA 302 Extremely hazardous substance

No

SARA 311/312 Hazardous chemical

No

Other federal regulations:

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

METHYL ALCOHOL (CAS 67-56-1)

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

Not regulated.

Safe Drinking Water Act (SDWA)

Not regulated.

Drug Enforcement Administration (DEA). List 2, Essential Chemicals (21 CFR

1310.02(b) and 1310.04(f)(2) and Chemical Code Number

Not listed.

Drug Enforcement Administration (DEA). List 1 & 2 Exempt Chemical Mixtures
(21 CFR 1310.12(c))

Not regulated.

DEA Exempt Chemical Mixtures Code Number

Not regulated.

Food and Drug Administration (FDA)

Not regulated.

US state regulations **WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.**

US. Massachusetts RTK - Substance List

ETHYL ALCOHOL (CAS 64-17-5)

ISOPROPYL ALCOHOL (CAS 67-63-0)

METHYL ALCOHOL (CAS 67-56-1)

US. New Jersey Worker and Community Right-to-Know Act
 METHYL ALCOHOL (CAS 67-56-1) 500 LBS
 US. Pennsylvania RTK - Hazardous Substances
 ETHYL ALCOHOL (CAS 64-17-5)
 ISOPROPYL ALCOHOL (CAS 67-63-0)
 METHYL ALCOHOL (CAS 67-56-1)
 US. Rhode Island RTK
 ISOPROPYL ALCOHOL (CAS 67-63-0)
 METHYL ALCOHOL (CAS 67-56-1)
 US - California Proposition 65 - Carcinogens & Reproductive Toxicity (CRT):
 Listed substance
 METHYL ALCOHOL (CAS 67-56-1)

International Inventories:

<u>Country(s) or region</u>	<u>Inventory name</u>	<u>On inventory (yes/no)*</u>
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	Yes
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

16. Other information

Disclaimer - The information in the sheet was written based on the best knowledge and experience currently available. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and

release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

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