Humco Holding Group, Inc.
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MATERIAL SAFETY DATA SHEET

Isopropanol, Anhydrous **Date Prepared:** 01/11/00

SECTION 1 PRODUCT IDENTIFICATION

Product Name: Isopropanol Anhydrous **Chemical Name:** Isopropyl Alcohol

Chemical Family: Alcohols **Formula:** $(CH_3)_2$ CHOH

Molecular Weight: 60.10 **Synonyms:** 2-Propanol; dimethyl carbinol

Emergency Telephone Numbers:
Humco Holding Group, Inc. 800-662-3435
Chemtrec 800-424-9300

SECTION 2 PHYSICAL DATA

Boiling Point, 760 mm Hg: 82.3°C (180.1°F) **Vapor Pressure @ 20°C:** 4.4 kPa (33 mmHg)

Specific Gravity (H_20 = 1): 0.787 @ 20/20°C **Freezing Point:** -89°C (-127°F)

Evaporation Rate (Butyl Acetate = 1): 2.9 **Vapor Density (Air = 1):** 2.1

Solubility in Water by wt: Complete @ 20°C **Appearance:** Transparent, colorless

Odor: Slight ethanol/acetone-like **Physical State:** Liquid

Percent Volatiles (by weight): 100 **pH:** no currently available.

Flash Point – Closed Cup: Tag Closed Cup ASTM D 56 12°C 53°F

Flash Point – Open Cup: Tag Open Cup ASTM D 1310 17°C 63°F

Molecular Weight: 60.10 g/mol **Melting Point:** NA

SECTION 3 INGREDIENTS

%	Component	CAS #
<=100	Isopropanol	67-63-0

SECTION 4 FIRE & EXPLOSION HAZARD

Flashpoint: 53°F 12°C **METHOD:** Tag Closed Cup ASTM D 56
63°F 17°C Tag Open Cup ASTM D 1310

Flammable Limits in the Air (% by volume): Lower: 2.0 **Upper:** 12.7 @ 200°F

Autoignition Temperature: Not currently available.

Extinguishing Media: Apply alcohol-type or all-purpose-type foam by manufacturer's recommended techniques for large fires. Use carbon dioxide or dry chemical media for small fires.

Extinguishing Media to Avoid: No information currently available.

Special Fire Fighting Procedures: Use water spray to cool fire-exposed containers and structures. Use water spray to disperse vapors; re-ignition is possible.

Special Protective Equipment for Firefighters: Use self-contained breathing apparatus and protective clothing.

Unusual Fire and Explosion Hazards: Vapors form from this product and may travel or be moved by air currents and ignited by pilot lights, other flames, smoking, sparks, heaters, electrical equipment, static discharges or other ignition sources at locations distant from product handling point. Vapors from this material may settle in low or confined areas or travel a long distance to an ignition source and flash back explosively. Static ignition hazard can result from handling and use. Electrically bond and ground all containers, personnel and equipment before transfer or use of material. Use proper bonding and grounding during product transfer as described in National Fire Protection Association Document NFPA 77. This material may produce a floating fire hazard. Flame may be invisible. Approach fire with caution.

Hazardous Combustion Products: Burning can produce the following products: Carbon monoxide and/or carbon dioxide. Carbon monoxide is highly toxic if inhaled; carbon dioxide in sufficient concentrations can act as an asphyxiant.

SECTION 5 HEALTH HAZARD DATA

Effects of Single Acute Overexposure

Swallowing: Slightly toxic. May cause dizziness, faintness, drowsiness, decreased awareness and responsiveness, lack of coordination, abdominal discomfort, nausea, vomiting and diarrhea.

Skin Absorption: Exposure to small quantities is not expected to cause adverse health effects. Widespread or prolonged exposure may result in the absorption of harmful amounts of material, particularly in infants, leading to signs and symptoms as described for swallowing.

Inhalation: High concentrations of vapor may cause central nervous system depression, with weakness, drowsiness, and loss of consciousness. Vapor causes irritation of the respiratory tract, with coughing and chest discomfort.

Skin Contact: May cause minor irritation with itching and possible slight local redness. Prolonged or repeated contact may cause defatting and drying of the skin.

Eye Contact: Causes irritation, experienced as stinging and discomfort or pain. Corneal injury may occur.

Chronic, Prolonged or Repeated Overexposure

Effects of Repeated Overexposure: Prolonged or repeated skin exposure may cause defatting of the skin.

Other Effects of Overexposure: None currently known.

Medical Conditions Aggravated by Overexposure: Skin contact may aggravate an existing dermatitis.

Peroral: rat LD50 6.48 (4.80 – 8.76) ml/kg

Major Signs: unsteady gait, prostration, heavy breathing
Gross Pathology: lungs and abdominal viscera discolored

Percutaneous: rabbit LD50 24 hr. occluded 8.0 (4.9 – 13.1) ml/kg

Gross Pathology: Lungs, liver, stomach discolored

Inhalation: static generation of vapor Exposure Time 2 h
Rabbit
Room Temperature
Kill Rate: 4/6
Major Signs: lacrimation, loss of coordination, prostration
Gross Pathology: lungs discolored

Inhalation: dynamic generation of vapor Exposure Time 4 h 12000 ppm
Rabbit
Kill Rate: 0/12
Major Signs: prostration
Gross Pathology: lungs, kidneys & liver discolored

Inhalation: dynamic generation of vapor Exposure Time 8 h 12000 ppm
Rabbit
Kill Rate: 8/12
Major Signs: prostration
Gross Pathology: lungs, kidneys & liver discolored

Inhalation: dynamic generation of vapor Exposure Time 8 h 8000 ppm
Rabbit
Kill Rate: 0/12
Major Signs: prostration
Gross Pathology: lungs, kidneys & liver discolored

Inhalation: static generation of vapor Exposure Time 4 h
Rabbit
Room Temperature
Kill Rate: 6/6
Major Signs: lacrimation, loss of coordination, prostration
Gross Pathology: lungs discolored

Inhalation: static generation of vapor Exposure Time 1 h
Rabbit
Room Temperature
Kill Rate: 0/6
Major Signs: lacrimation, loss of coordination, prostration
Gross Pathology: lungs discolored

IRRATATION

Skin: rabbit 24 hr. uncovered no irritation

Eye: rabbit 0.02 ml moderate corneal injury

Additional Toxicity Information: The following is a summary of TSCA Section 4 Test Rule results: Large doses (>800 mg/kg/day)of isopropanol given orally to pregnant rats during the critical period of gestation produced slight decreases in fetal weight. These doses also caused evidence of toxicity in the mothers. Oral doses as high as 480 mg/kg/day caused evidence of toxicity in pregnant rabbits but did not produce evidence of embryo or fetal toxicity. Isopropanol did not produce an increased incidence of malformations (teratogenicity) in either species. An indication of reduced mating performance in 2nd generation male rats was noted at oral doses of 1000 mg/kg/day in a two generation reproductive study. No evidence of neurotoxic effects was observed in studies specifically designed to assess neurobehavio rial functions in neonatal rats after oral dosing of mothers during gestation and lactation. In an acute vapor inhalation study, high concentrations of isopropanol (1500 ppm and greater) caused a spectrum of transient effects indicative of narcosis. In repeated inhalation exposure studies, high vapor concentrations (5000 ppm) produced an increase in motor activity in rats first noted after 4 weeks of exposure. The effect was reversible completely resolving within 14 days after 13 weeks of exposure. No evidence of damage to nerve tissue was seen in this study. Lifetime exposure of laboratory animals to high concentrations of isopropanol vapor (greater than 1500 ppm) exacerbated chronic progressive nephropathy commonly seen in aged animals. The relevance of this finding to human health hazard evaluation is unknown. No evidence suggestive of carcinogenic activity was noted in chronic vapor inhalation studies with isopropanol in rats and mice.

EMERGENCY AND FIRST AID PROCEDURES

Swallowing: If patient is fully conscious, give two glasses of water. Induce vomiting. This should be done only by medical or experienced first-aid personnel. Obtain medical attentio n.

Skin: Remove contaminated clothing. Wash skin with soap and water. If irritation persists or if contact has been prolonged, obtain medical attention.

Inhalation: Remove to fresh air. Give artificial respiration if not breathing. If breathing is difficult, oxygen may be given by qualified personnel. Obtain medical attention.

Eyes: Immediately flush eyes with water and continue washing for several minutes. Remove contact lenses, if worn. Obtain medical attention.

Notes to Physician: There is no specific antidote. Treatment of overexposure should be directed at the control of symptoms and the clinical condition of the patient.

SECTION 6 REACTIVITY DATA

Stability: Stable. **Conditions to Avoid:** None known.

Incompatibility (materials to avoid): Strong oxidizing agents, halogens, strong inorganic acids, aldehydes & halogen compounds.

Inhibitors/Stabilizers: NA

Hazardous Polymerization: Will not occur. **Conditions to Avoid:** None known.

		4 = Severe
Health	1	3 = Serious
Flammability	3	2 = Moderate
Reactivity	0	1 = Slight

SECTION 7 SPILL OR LEAK PROCEDURES

Steps to be Taken if Material is Released or Spilled: Extinguish and do not turn on any ignition source until the area is determined to be free from fire or explosion hazard. Small spills can be flushed with large amounts of water; larger spills should be collected for disposal.

Personal Precautions: Wear suitable protective equipment. Avoid contact with eyes.

Waste Disposal Method: Incinerate in a furnace where permitted under Federal, State and local regulations. Dispose in accordance with all applicable Federal, State, Provincial, and local environmental regulations. Empty containers should be recycled or disposed of through an approved waste management facility.

Disposal Considerations: At very low concentrations in water, this product is biodegradable in a biological wastewater treatment plant. Disposal methods identified are for the product as sold. For proper disposal of used material, an assessment must be completed to determine the proper and permissible waste management options permissible under applicable rules, regulations and/or laws governing your location.

SECTION 8 EXPOSURE CONTROLS & PERSONAL PROTECTION

Exposure Limits

Component	Exposure Limits	Skin	IH State
Isopropanol	400 ppm TWA8 ACGIH 983 mg/m3 TWA8 ACGIH 1230 mg/m3 STEL ACGIH 500 ppm STEL ACGIH 400 ppm TWA8 OSHA 980 mg/m3 STEL OSHA 1225 mg/m3 STEL OSHA 500 ppm STEL OSHA		

Respiratory Protection: Use self-contained breathing apparatus in high vapor concentrations.

Ventilation: General (mechanical) room ventilation is expected to be satisfactory where this product is stored and handled in closed equipment. Special, local ventilation is needed at points where vapors can be expected to escape to the workplace air.

Protective Gloves: Plastic or rubber. **Eye Protection:** Monogoggles

Other Protective Equipment: Eye Bath, Safety Shower

Engineering Controls

Process Hazard: Sudden release of hot organic chemical vapors or mists from process equipment operating at elevated temperature and pressure, or sudden ingress of air into hot equipment under a vacuum, may result in ignitions without the presence of obvious ignition sources. Published "autoignition" or "ignition" temperature values cannot be treated as safe operating temperatures in chemical processes without analysis of the actual process conditions. Any use of this product in elevated-temperature processes should be thoroughly evaluated to establish and maintain safe operating conditions. Further information is available in a technical bulletin entitled "Ignition Hazards of organic Chemical Vapors."

SECTION 9 HANDLING & STORAGE

General Handling: Flammable. Causes eye irritation. Keep away from heat, sparks and flame. Avoid contact with eyes. Keep container closed. Use with adequate ventilation. Vapors form from this product and may travel or be moved by air currents and ignited by pilot lights, other flames, smoking, sparks, heaters, electrical equipment, static discharges or other ignition sources at locations distant from product handling point and may flashback explosively. Wash thoroughly after handling. FOR INDUSTRY USE ONLY.

Ventilation: General (mechanical) room ventilation is expected to be satisfactory where this product is stored and handled in closed equipment. Special, local ventilation is needed at points where vapors can be expected to escape to the workplace air.

Other Precautions: Vapor may settle in low or confined areas, or travel a long distance to an ignition source and flashback explosively.

Storage: No information currently available.

SECTION 10 REGULATORY INFORMATION

Status on Substance Lists: The concentrations shown are maximum or ceiling levels (weight %) to be used for calculations for regulations. Trade Secrets are indicated by "TS".

Federal/National

CERCLA (Comprehensive Environmental Response Compensation, & Liability Act of 1980 Section 103)
The following components of this product are specifically listed as hazardous substances in 40 CFR 302.4. (unlisted hazardous substances are not identified) and are present at levels which could require reporting:
NONE

Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III Sections 302 & 304
The following components of this product are listed as extremely hazardous substances in 40 CFR Part 355 and are present at levels which could require reporting and emergency planning: **NONE**

Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III Section 313
The following components of this product are listed as toxic chemicals in 40 CFR 372.65 and are present at levels which could require reporting and customer notification under Section 313 and 40 CFR Part 372: **This product does not contain toxic chemicals at levels which require reporting under the statute.**

Superfund Amendments & Reauthorization Act of 1986 (SARA) Title III Sections 311 & 312

Delayed Hazard: Yes
Fire Hazard: Yes
Immediate Health Hazard: Yes
Reactive Hazard: No
Sudden Release of Pressure Hazard: No

Toxic Substances Control Act (TSCA): All components of this product are on the TSCA Inventory or are exempt from TESC Inventory requirements.

State/Local

Pennsylvania (Worker & Community Right-To-Know Act)

This product is sujbect to the Worker & Community Right-To-Know Act. The following components of this product are at levels which could require identification in the MSDS:

Component	CAS #	Amount
Isopropanol	67-63-0	<=100.0000%

California Proposition 65 (Safe Drinking Water & Toxic Enforcement Act of 1986)
This product contains no listed substances known to the State of California to cause cancer, birth defects, or other reproductive harm, at levels which would require a warning under the statute.

Massachusetts (Hazardous Substances Disclosure by Employers)
The following components of this product appear on the Massachusetts Substance List and are present at levels, which could require identification in the MSDS:

Component	CAS #	Amount
Isopropanol	67-63-0	<=100.0000%

California SCAQMD Rule 443.1 (South Coast Air Quality management District Rule 443.1 Labeling of mateials Containing Organic Solvents)
VOC: 785 g/l; Vapor Pressure 33 mmHg @ 20°C

SECTION 11 ECOLOGICAL INFORMATION

Environmental Fate

BOD (% Oxygen consumption)

Day 5	Day 10	Day 15	Day 20	Day 30
28%	77%		78%	

Ecotoxicity

Ecotoxicity to Micro-organisms: Bacterial/NA IC50 5000 mg/l

Ecotoxicity to Aquatic Invertebrates: Daphnia LC50 48 h 7550 mg/l

Ecotoxicity to Fish: Fathead Minnow LC50 96 h 8300 mg/l

Further Information

TIIOD (measured) 2.30 mg/mg

THOD (calculated) 2.40 mg/mg

Octanol/Water partition Coefficient – Measured: 0.14

SECTION 12 TRANSPORT INFORMATION

U.S. D.O.T.

NON-BULK
Proper Shipping Name: Isopropanol
ID Number: UN1219
Hazard Class: 3
Packing Group: PG II

BULK
Proper Shipping Name: Isopropanol
ID Number: UN1219
Hazard Class: 3
Packing Group: PG II