TAG SOLVENT PRODUCTS (PTY)LTD.

MATERIAL SAFETY DATA SHEET
ISO-PROPYL ALCOHOL

1 CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Common name	**: ISO-PROPYL ALCOHOL**
Supplier	: TAG Solvent Products Mallet Road/Weg Knights Germiston 1401 Republic of South Africa TEL: +27 11 822-1600
Synonym	: Iso-propanol-ethanol blend.
Trade name	**:** Iso-Propyl Alcohol.
Material uses	: A solvent in lacquers, etch primers varnishes, stains, liquids inks.

2 COMPOSITION / INFORMATION ON INGREDIENTS

Name	CAS#	% By Weight	Exposure Limits
Isopropyl alcohol	67-63-0	85 (min)	**OSHA (PEL) [1992].** TWA: 400 ppm STEL: 500 ppm (1992) **ACGIH (TLV).** TWA: 400 ppm STEL: 500 ppm **OSHA (1976).** TWA: 400 ppm STEL: 500 ppm TWA: 400 ppm (1975) STEL: 500 ppm (1975)
Ethanol	64-17-5	14-15 (Max.)	**OSHA (PEL).** TWA: 1000 ppm TWA: 1900 mg/m^3

3 HAZARDS IDENTIFICATION

Physical state and appearance	: Liquid.
Emergency overview	: WARNING! HIGHLY FLAMMABLE LIQUID AND VAPOUR. VAPOUR MAY CAUSE FLASH FIRE. CONTAINS MATERIAL, WHICH CAN CAUSE BIRTH DEFECTS. CONTAINS MATERIAL, WHICH MAY CAUSE KIDNEYS, LUNGS, NERCOUS SYSTEM, REPRODUCTIVE SYSTEM, LIVER, IMMUNE SYSTEM, SKIN, EYE DAMAGE. MAY CAUSE EYE IRRITATAION. MAY CAUSE SKIN IRRITATION.
Routes of entry	: Eye contact. Ingestion. Inhalation. Absorbed through the skin.
Potential acute health effects	
Eyes	: Hazardous in case of eye contact (irritant).
Skin	: Hazardous in case of skin contact (irritant, sensitizer, permeator). Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.
Inhalation	: Hazardous in case of inhalation
Ingestion	: Very hazardous in case of ingestion
Potential chronic health effects	: CARCINOGENIC EFFECTS: A4 (Not classifiable for human or animal). By ACGIH [Ethanol]. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Classified PROVEN for human [Ethanol].
Medical conditions aggravated by overexposure	: Persons with pre-existing eye, skin, respiratory, neurological or allergic conditions may be more sensitive.
Overexposure/signs/ Symptoms	: Iso-propyl alcohol can affect you when breathed in and by passing through your skin. There is an increased risk of cancer associated with the manufacture of isopropyl alcohol. Contact can burn and irritate the skin and eyes. Repeated skin contact can cause itching, rash, drying and cracking. Breathing isopropyl alcohol can irritate the nose and throat. Overexposure can cause headache, drowsiness, unconsciousness and death.

See toxicological information (section 11)

4 FIRST AID MEASURES

Eye contact	: Check for and remove any contact lenses. Immediately flush the eyes with running water for at least 15 minutes, keep eyelids open. Cold water may be used. DO NOT use eye ointment. Get medical attention.
Skin contact	: In the case of contact, flush the skin with plenty of water. Gently and thoroughly wash the contaminated skin with running water and non-abrasive soap. Be particularly careful to clean folds. Cervices, creases and groin. Cover the irritated skin with an emollient. Wash clothes before reuse. Thoroughly clean shoes before reuse. If irritation persists seek medical attention.
Hazardous skin contact	: Wash with a disinfectant soap and cover skin with an anti-bacterial cream. Seek medical attention.
Inhalation	: If inhaled, remove to fresh air and allow victim to rest. Get medical attention.
Hazardous inhalation	: If inhaled, remove victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is laboured, give oxygen If not breathing apply artificial respiration. Get medical attention. WARNING! It may be hazardous to the person performing aid to give CPR when inhaled material is toxic, infectious or corrosive. Seek medical attention.
Ingestion	: DO NOT induce vomiting unless directed to do so by medical personnel. Examine the lips and mouth to ascertain whether the tissues are damaged, a possible indication that the toxic material was ingested; the absence of such signs, however, is not conclusive. Loosen tight clothing such as a collar, tie, belt or waistband. If not breathing apply artificial respiration. Get medical attention.
Hazardous ingestion	: No additional information
Notes to physician	: Support respiratory and cardiovascular function.

5 FIRE FIGHTING MEASURES

Flammability of the product	: Flammable
Autoignition temperature	: The lowest known value is 363ºC (685.4ºF) [Ethanol].
Flash points	: The lowest known value is CLOSED CUP: 11.67ºC (53ºF). OPEN CUP: 18.3ºC (64.9ºF) (Cleveland). [Iso-propyl alcohol].
Flammable limits	: The greatest known range is LOWER: 3.3% UPPER: 19% [Ehtanol]
Products of combustion	: These products are carbon oxides (CO, CO_2)
Fire hazards in presence of various substances	: Highly flammable in the presence of open flames and sparks, of heat and oxidizing materials, strong oxidizing materials. Flammable is the presence of combustible materials.
Explosion hazards in presence of various substances	: Vapours may form explosive mixtures with air. Vapour explosion hazard indoors, outdoors or in sewers. May polymerize explosively when heated or involved in fire. Runoff to sewer may create fire or explosive hazard.
Fire fighting media and instructions	: Flammable liquid, soluble or dispersed in water. SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use alcohol foam, water spray or fog.
Protective clothing (fire)	: Wear MSHA/NIOSH self-contained respirator or equivalent and full protective gear.

Special remarks on fire hazards	: Vapour may travel considerable distance to source of ignition and flash back. When heated to decomposition, it emits acrid smoke and fumes.
Special remarks on explosive hazards	: Containers may explode when heated.

6 ACCIDENTAL RELEASE MEASURES

Small spill or leak	: Dilute with water and mop up, or absorb with an inert DRY material and place in an appropriate waste disposal container.
Large spill or leak	: Flammable liquid. 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 touch spilled material. Prevent entry into sewers, basements or confined areas; dike if needed. Be careful that the product is not present at a concentration level above TLV. Check TLV on MSDS and with the local authorities

7 HANDLING AND STORAGE

Handling	: Keep locked up. Keep away from heat. Keep away from sources of ignition. DO NOT ingest. Do not breathe gas, fumes, vapour or spray. In the case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container label. Avoid contact with eyes and skin. Keep away from incompatibles such as oxidizing agents and acids.
Storage	: Keep container tightly closed. Keep in a well-ventilated area. Highly toxic or infectious materials should be stored in a separated locked safety storage cabinet or room.

8 EXPOSURE CONTROLS, PERSONAL PROTECTION

Engineering controls	: Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapour below their respective threshold limit values. Ensure that eyewash stations and safety showers are proximal to the work-station location.
Personal protection	
Eyes	: Splash goggles.
Body	: Lab coat.
Respiratory	: Vapour respirator. Be sure to use an MSHA/NIOSH approved respirator equivalent. Wear appropriate respirator when ventilation is inadequate.
Hands	: Butyl rubber gloves.
Feet	: Not applicable.
Protective clothing	: Splash goggles. Full chemical resistant protective suit. Vapor respirator. Butyl gloves. Chemical resistant boots.
Personal protection in case of large spills	: Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling the product.

PRODUCT NAME	**EXPOSURE LIMITS**
Iso-propyl alcohol	**OSHA (PEL) [1992].** TWA: 400 ppm STEL: 500 ppm (1992) **ACGIH (TLV).** TWA: 400 ppm STEL: 500 ppm **OSHA (1976).** TWA: 400 ppm STEL: 500 ppm TWA: 400 ppm (1975) STEL: 500 ppm (1975)
Ethanol	**OSHA (PEL).** TWA: 1000 ppm TWA: 1900 mg/m^3

9 PHYSICAL AND CHEMICAL PROPERTIES

Physical state and appearance	: Liquid.
Colour	: Colourless. Clear.
Odor	: Aromatic, pleasant, resembling a mixture of acetone and ethanol.
Taste	: Bitter, burning.
Molecular weight	: Not applicable.
Molecular formula	: Not applicable.
PH (1% soln/water)	: 7 [Neutral.]
Boiling/condensation point	: The lowest known value is 78.5ºC (173.3ºF) [Ethanol]. Weighted average: 81.66ºC (179ºF).
Melting/freezing point	: May start to solidify at –88.5º1C (-127.3ºF) based on data for Isopropyl alcohol. Weighted average: -92.23ºC (-134ºF).
Critical temperature	: The lowest known value is 232.5ºC (450.5ºF) [isopropyl alcohol].
Specific gravity	: 0.79(water=1)
Vapor pressure	: 43 mm of Hg (@20 *C) [Ethanol] Weighted average 34.46mm of Hg 9 @20ºC).
Vapor density	: 2.08 (Air=1) [Isopropyl alcohol]. Weighted average: 2.01 (Air=1)
Volatility	: 100%vlv. [Isopropyl alcohol]. Weighted average: 100% (v/v). 100(w/w) [Isopropyl alcohol]. Weighted average: 100% (w/w).
Odor threshold	: The highest known value is 200 ppm [Isopropyl alcohol]. Weighted average 197.09 ppm
Evaporation rate	: The highest known value is 2.88 [Isopropyl alcohol]. Weighted average: 2.81 compared to Butyl-acetate.
VOC	: 100 (%)
Viscosity	: The highest known value is 2.4 cP [Isopropyl alcohol]. Weighted average: 2.26 cP
LogK_{ow}	: The product is more soluble in water
Iconicity (in water)	: No data available.
Dispersion properties	: See solubility in water, methanol, diethyl ether and n-octanol.
Solubility	: Easily soluble in cold water, hot water, methanol, diethyl ether. Partially soluble in n-octanol.
Physical chemical comments	: No additional remark.

10 STABILITY AND REACTIVITY

Stability and reactivity	: The product is stable.
Conditions of instability	: No additional remark.
Incompatibility with various substances	: Reactive with oxidizing agents, acetaldehyde, chlorine, ethylene oxide, acids and isocyanates.
Hazardous decomposition products	: Emits acrid smoke and fumes when heated.
Hazardous polymerization	: It reacts with oxygen to form dangerous unstable peroxides.

11 TOXICOLOGICAL INFORMATION

Toxicity to animals	: WARNING : THE LC50 VALUES HEREUNDER ARE ESTIMATED ON THE BAIS OF A 4-HOUR EXPOSURE: Acute oral toxicity (LD50): 5045 mg/kg [Rat] [Isopropyl alcohol]. Acute toxicity of the Vapour (LC50): 18290 ppm 4 hour(s) [Rat] (Calculated value for mixture). Acute dermal toxicity (LD50): 12800 mg/kg [Rabbit]. (Isopropul alcohol).
Chronic effects on humans	: CARCINOGENIC EFFECTS: A4 (Not classifiable for human or animal) by ACGIH [Ehtanol]. TERATOGENIC EFFECTS: Classifies PROVEN for humans. DEVELOPMENTAL TOXICITY: Classified developmental toxin [PROVEN] [Ethanol]. The substance is toxic to kidneys, lungs, the nervous system, the reproductive system, liver, immune system, skin, eyes.
Other toxic effects on humans	: Very hazardous in the case of ingestion. Hazardous incase if skin contact (irritant, sensitizer, permeator), of eye contact (irritant), of inhalation.
Special remarks on toxicity to animals	: No additional remark.
Special remarks on chronic effects on humans	: Detected in maternal milk in human. [Isopropyl alcohol].
Special remarks on other toxic effects on humans	: Exposure can cause nausea, headache and vomiting. [Isopropyl alcohol].

12 ECOLOGICAL INFORMATION

Ecotoxicity	: Not available.
BOD and COD	: The COD is 52 mg/kg [hour. Day(s)] BOD = 58% in 5 days (Sewage).
Biodegradable/OECD	: No data available
Mobility	: No data available
Products of degradation	: Formaldehyde and Acetic acid.
Toxicity of the products of biodegradation	: No data available
Special remarks on the products of biodegradation	: BOD5: 58% theoretical at 20ºC in 5 days [Isopropyl alcohol].

13 DISPOSAL CONSIDERATIONS

Waste information	: Waste must be disposed of in accordance with local, regional or national regulations.
Waste stream	: Not available.

Consult your local or regional authorities.

14 TRANSPORT INFORMATION

Regulatory information	UN number	Class	Packing group	Label	Additional information

DOT Classification	UN 1987	DOT CLASS 3: Flammable liquid.	II		
Marine pollutant					Not available.
Special provision for transport					No additional remark.
TDG Classification		TDG CLASS 3: Flammable liquid.			
ADR/RID Classification		ADR CLASS: Flammable liquid A.			
IMO/IMDG Classification		IMDG CLASS 3.1: Flammable liquid (low flash point).			
ICAO/IATA Classification		IATA CLASS 3: Flammable liquid.			

15 REGULATORY INFORMATION

HCS Classification	: HCS Class: Flammable liquid having flash point lower than 37.8ºC (100ºF) HCS Class: Target organ effects. HCS Class: Sensitizing substance. HCS Class: Reproductive toxins.
U.S. Federal regulations	: TSCA 8(b) inventory: Ethanol Clean water act (CWA) 307: No products were found. Clean water act (CWA) 311: No products were found. Clean water act (CAA) 112 accidental release prevention: No products were found. Clean water act (CAA) 112 regulated flammable substances: No products were found. Clean water act (CAA) 112 regulated toxic substances: No products were found.

International Regulations	
WHMIS (Canada)	: WHMIS CLASS B-2: Flammable liquid with a flash point lower than 37.8ºC. WHMIS CLASS D-2A: Material causing other toxic effects (VERY TOXIC)
EINECS	CEPA DSL: Isopropyl alcohol; Ehtanol.
DSCL (EEC)	: Not available. : R43 – May cause sensitization by skin contact. R53 – May cause long-term adverse effects in the aquatic environment. R 61 – May cause harm to the unborn child. R36/38 – Irritating to eyes and skin.
International lists	: No products were found.
State regulations	: Pennsylvania RTK: Ethyl Acetate. Florida: Ethyl Acetate. Massachusetts RTK: Ethyl Acetate. California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute: No products were found

16 OTHER INFORMATION

Label requirements	: HIGHLY FLAMMABLE LIQUID AND VAPOUR. VAPOUR MAY CAUSE FLASH FIRE. CONTAINS MATERIAL, WHICH CAN CAUSE BIRTH DEFECTS. CONTAINS MATERIAL, WHICH MAY CAUSE KIDNEYS, LUNGS, NERCOUS SYSTEM, REPRODUCTIVE SYSTEM, LIVER, IMMUNE SYSTEM, SKIN, EYE DAMAGE. MAY CAUSE EYE IRRITATAION. MAU CAUSE SKIN IRRITATION.
Hazardous Material information System (U.S.A.)	[Frame1]
References	: -LOLI Database: The regulated List of Lists. - CHEMINFO: Canadian Centre for Occupational Health and Safety, Issue: 97-3 (August 1997). – BDH; Hazard Data Disk, Version 3. – CESARS: Chemical Evaluation and Retrieval System, Produced by: Ontario Ministry of Environment and Michigan Department of Natural Resources, Issue 97-3 (August 1997). – TOMES Plus System: Toxicology, Occupational Medicine & Environmental Series: incorporating: - MEDITEX, HAZARDTEXT, 1st Medical Response Protocols, INFOTEXT, HSDB, CHRIS, OHM/TAD, IRIS, NIOSH Pocket Guide, RTECS, NJ Facts Sheets, North American Emergency Response Guides, REPROTEXT, REPROTOX, TERIS, Shepard's Catalog of Teratogenic Agents.
Other special considerations	No additional remarks.
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Version

Notice to reader:

This MSDS summarizes at the date of issue our best knowledge of the health, safety and environmental hazard information related to the product, and in particular how to safely handle, use and transport the product in the workplace. Since TAG Solvent Products (PTY) LTD. and it's subsidiaries cannot anticipate or control the conditions under which the product may be handled, used, stored or transported, each user must, prior to usage, review MSDS in the context of how the user intends to handle, use, store or transport the product in the workplace and beyond, and communicate such information to all relevant parties. If clarification or further information is required to ensure that an appropriate assessment can be made, the user should contact the company.

We shall not assume any liability for the accuracy or completeness of the information contained herein or any advice given unless there has been gross negligence on our part. In such event our liability shall be limited only to direct damages suffered. Our responsibility for the product as sold is subject to our standards terms and conditions, a copy of which is sent to our customers and is also available upon request. All risk with possession and application of the product passes on delivery.