MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product name: PRO-SOFT DEHYDRANT

Catalog numbers: 311, 315, 319

General use: Dehydrant for tissue processing in histology and surgical pathology.

Product description: Mixture of propylene glycol ether and propylene glycol esters in alcohol.

Manufacturer	**Emergency contact information**			
Anatech Ltd. 1020 Harts Lake Road Battle Creek, MI 49037 USA	Health: Transportation:	Anatech Ltd. CHEMTREC	800-262-8324 800-424-9300	8 am - 5 pm ET, M-F 24 hours

2. COMPOSITION AND INFORMATION ON INGREDIENTS

(Note: Percentage composition is withheld as a trade secret.)

Component	**CAS #**	**Exposure limits**
Propylene glycol ether	034590-94-8	100 ppm (OSHA, NIOSH, ACGIH 8 hour TWA) 150 ppm (ACGIH 15 minute STEL)
Propylene glycol ester	68171-38-0	Not established.
Isopropanol	67-63-0	400 ppm (OSHA, NIOSH 8 hour TWA) 200 ppm (ACGIH 8 hour TWA) 400 ppm (ACGIH 15 minute STEL) 500 ppm (NIOSH 15 minute STEL)

3. HAZARDS IDENTIFICATION

Emergency Overview

Clear, colorless liquid. Mild alcohol odor.

Irritant to eyes and skin. Not likely to pose an inhalation threat under normal conditions of use. Excessive inhalation of vapors can cause nasal and respiratory irritation. Prolonged exposure to skin can cause irritation and/or drying. Ingestion will irritate gastrointestinal tract.

Flammable liquid.

3. HAZARDS IDENTIFICATION (continued)

Potential health effects
(Human health effects only; animal effects in Section 11: Toxicological Information.)

Primary route(s) of exposure: Eyes and skin.

Inhalation: Inhalation of vapors during normal conditions of use are not likely to present a health hazard. Excessive breathing of vapors is likely to cause drowsiness and irritation of the respiratory tract.

Eye: Contact of liquid with eyes may cause irritation.

Skin: Extended contact of liquid with skin will cause irritation and/or drying. Brief contact is not likely to produce adverse effects.

Ingestion: Slightly toxic due to isopropanol content. Ingestion of liquid is likely to produce adverse effects on the gastrointestinal system (abdominal discomfort, nausea, vomiting and diarrhea).

Chronic effects: No chronic effects reported.

Signs and symptoms: Affected skin will appear dry, tough and perhaps cracked. Eyes may water, become reddened and sting. Effects on the gastrointestinal tract include nausea and/or vomiting. Additional symptoms include coughing, dizziness and drowsiness.

4. FIRST AID MEASURES

Inhalation: Remove victim to fresh air if coughing or difficulty in breathing is experienced. Consult a physician if symptoms persist or worsen. Administer oxygen or artificial respiration as needed.

Eye: Flush eyes for at least 15 minutes in an eyewash station. If symptoms persist after washing, consult a physician.

Skin: Remove contaminated clothing, including footwear; wash before reuse or discard. For minor exposure, wash affected area with water and mild soap, rinsing thoroughly; apply a good quality skin lotion. In cases of prolonged, repeated or extensive exposure, rinse affected area or entire body for at least 15 minutes. For severe conditions, consult a physician.

Ingestion: Call a poison control center immediately. If victim is conscious, have him/her drink several glasses of water to dilute the solution. Induce vomiting only upon the advice of a physician or poison control authority.

5. FIRE FIGHTING MEASURES

Flammable properties

Flash point: 66°F (18.9°C), closed-cup.

Flammable limit: Not determined.

Autoignition temperature: Not determined.

Flammability classification: Flammable liquid (OSHA).

Flame propagation: Vapors can travel to source of ignition and flash back to liquid if vapor temperature exceeds flash point.

5. FIRE FIGHTING MEASURES (continued)

Hazardous products of combustion: Carbon monoxide and carbon dioxide.

Extinguishing media: ABC rated portable fire extinguishers should be used. Professional fire fighters may use water spray, dry chemical or carbon dioxide.

Fire fighting instructions: Sealed chemical suits and self contained breathing apparatus are necessary for fighting fires involving substantial volumes of this product.

6. ACCIDENTAL RELEASE MEASURES

The size of a spill is defined in part by the local situation, especially regarding ventilation. At room temperature in a well ventilated room, a few hundred milliliters might be considered a small spill. Flammable vapors are generated during a spill and may exceed OSHA's Permissible Exposure Limits. Wear protective gloves, rubber boots, impermeable aprons and full-face respirators. Use a damp sponge or mop to remove spilled liquid. Wash contaminated area with water. Discard absorbents and other contaminated solids in a receptacle suitable for hazardous chemical waste. Liquid waste may be discarded down the drain with approval by wastewater authorities, or may be removed by a licensed waste hauler.

With large spills, evacuate the area and have an emergency response team perform the cleanup. Have a licensed waste hauler remove contaminated solids and recovered liquid.

Comply with all applicable governmental regulations on spill reporting and on the handling and disposal of hazardous waste.

7. HANDLING AND STORAGE

Handling: Wear a plastic or rubber apron, protective gloves and splash-proof goggles. Avoid contact with skin and eyes. Do not continue to wear contaminated clothing after a spill.

Storage: Store in a flammable storage cabinet.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Engineering controls: Good general room ventilation is essential. Product should be used with local ventilation (fume hood).

Personal protective equipment

Respiratory protection: A NIOSH-approved respirator suitable for organic vapors must be used if vapor levels exceed the exposure limits.

Skin protection: Anatech Ltd. recommends nitrile gloves. Do not use latex surgical gloves for protection against any hazardous liquid. An eyewash station and safety shower must be nearby, preferably in the same room, no more than 10 seconds away.

Eye protection: Use splash-proof goggles. Do not use safety glasses. If a face shield is worn as protection against biohazards, splash-proof goggles also should be used. An eyewash station and safety shower must be nearby, preferably in the same room, no more than 10 seconds away.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Colorless liquid.

Odor: Mild alcohol odor.

Physical state: Liquid.

pH: Not determined.

Vapor pressure: Not determined.

Vapor density: Not determined

Boiling point range: 183°F - 367°F (84°C - 186°C).

Freezing point: Not determined.

Solubility in water: Complete.

Specific gravity: 0.8624 at 20°C.

10. STABILITY AND REACTIVITY

Chemical stability: Stable.

Conditions to avoid: Heating this solution will give off irritating and flammable vapors. Keep away from heat, sparks and flames.

Incompatibility with other materials: Strong oxidants.

Hazardous decomposition products: None.

Hazardous polymerization: None.

11. TOXICOLOGICAL INFORMATION

Acute eye effects: Propylene glycol ester applied to the eyes of albino rats resulted in mild erythema indicating a low order of irritation. Moderate effects were observed on rabbits with 10 mg of isopropanol.

Acute skin effects: Mild effects were observed on rabbits with 500 mg of isopropanol. Cases of human skin sensitization have been reported with isopropanol.

Acute oral effects: Large doses (>800 mg/kg/day) of isopropanol given orally to pregnant rats during the critical periods of gestation produced slight decrease 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 not produce evidence of embryo or fetal toxicity. Isopropanol did not produce an increase of malformations (tetragenicity) in either species.

OSHA considers chemicals to be toxic if their LD_{50} is at or below 500 mg/kg. LD_{50} is the dose killing 50% of the test animals in a given time (usually 4 hours); LD_{Lo} is the lowest dose causing death. Isopropanol produced an LD_{50} of 5,800 mg/kg in rats; 7,900 mg/kg in rabbits and 6,200 mg/kg in dogs. LD_{Lo} of isopropanol in humans is 3570 mg/kg. Propylene glycol ester produced an LD_{50} of 52-64 cc/kg in albino rats and 5.4 ml/kg in rats.

11. TOXICOLOGICAL INFORMATION (continued)

Acute inhalation effects: OSHA considers chemicals to be toxic if their LC_{50} is at or below 20 mg/kg. LC_{50} is the airborne concentration killing 50% of the test animals. In an acute vapor inhalation study of rats, high concentrations of isopropanol (>1500 ppm) caused a spectrum of transient effects indicative of narcosis. Isopropanol's LC_{50} in rat is 5,800 mg/kg.

Chronic effects/carcinogenicity: None known.

Teratology: None known.

Reproductive effects: See Acute Oral Effects.

Mutagenicity: Propylene glycol ether: negative. None is known for the other components.

12. ECOLOGICAL INFORMATION

Ecotoxicity:

The following data are from studies using 100% propylene glycol ether:

Notropis atherinoides (emerald shiner): acute $LC_{50} > 150$ mg/L

Pimephales promelas (fathead minnow): acute $LC_{50} > 10{,}000$ mg/L

Daphnia magna (water flea): acute $LC_{50} > 1{,}919$ mg/L

Growth inhibition threshold (bacteria): 4168 mg/L

Growth inhibition green algae (*Selenastrum capricornutum)*: $EC_{50} > 969$ mg/L

Modified OECD Screening Test, 28 days: 72.9%

Biological Oxygen Demand (BOD), 20 day: 650 mg/g

The following data are from studies using 100% isopropanol:

Fathead minnow: 96 hour $LC_{50} = 8300$ mg/L

Golden orfe: 48 hour $LC_{50} = 8{,}970$ - 9280 mg/L

Daphnia: 48 hour $LC_{50} = 7{,}550$ mg/L

Bacterial inhibition in bacteria: 5,000 mg/L

Chemical Oxygen Demand (COD): 2,230 mg/g

Theoretical Oxygen Demand (ThOD): 2,400 mg/g

Biological Oxygen Demand (BOD), 5 day: 1,190 - 1,720 mg/g

Biological Oxygen Demand (BOD), 20 day: 1,680 mg/g

No environmental data was found for propylene glycol ester.

Environmental fate: All ingredients in Pro-Soft Dehydrant consist solely of carbon, hydrogen and oxygen. Pro-Soft Dehydrant is readily biodegradable to carbon dioxide and water.

13. DISPOSAL CONSIDERATIONS

Pro-Soft Dehydrant is flammable and should be disposed via a licensed waste hauler. Do not mix waste streams unless instructed to do so by your waste hauler.

Some wastewater treatment authorities may grant permission for drain disposal of limited amounts of this solution.

Pro-Soft Dehydrant is not recyclable.

Canadian disposal regulations generally parallel those in the United States.

Regardless of the method chosen for disposal, be sure to follow federal, state (provincial) and local regulations. Proper waste disposal is the generator's responsibility.

14. TRANSPORTATION INFORMATION

Packaging for hazardous shipments must meet the specifications as required by the current editions of *International Air Transportation Association (IATA) Dangerous Goods Regulations* and the United States Department of Transportation *49 CFR*.

DOT (ground and air) and IATA:	**Proper Shipping Name**: Flammable liquid, n.o.s. (propyl alcohol) **UN #:** 1993 **Hazard Class:** 3 **Packing Group:** II

15. REGULATORY INFORMATION

OSHA (USA): Under the Hazard Communication Standard and the Laboratory Standard, Pro-Soft Dehydrant is a hazardous material: it is an irritant and it is flammable.

The two OSHA Standards cited above mandate that exposed workers receive proper training in the properties of this product, work practices involved with its handling and disposal, and interpretation of its MSDS.

FDA (USA): Pro-Soft Dehydrant is for in vitro diagnostic use as a tissue processing dehydrant in histology.

EPA (USA): Pro-Soft Dehydrant is ignitable. It is a reportable substance under SARA Title III.

16. OTHER INFORMATION

Label warnings: Flammable. Keep away from heat and open flame. Avoid extensive or repeated contact with skin. Remove contaminated clothing. Avoid contact with eyes. Use with adequate ventilation. If swallowed, contact a physician.

NFPA (National Fire Protection Association) Rating:

General note: This rating is applicable only to safeguard the lives of individuals who may be concerned with fires occurring in an industrial plant or storage location. The ratings provide information to emergency personnel on whether to evacuate the area or how to perform control procedures. It is not descriptive of hazards under normal conditions of occupational use, and is even less applicable to anticipated laboratory-scale use.

For the concentrate

Health 1: Materials that, under emergency conditions, can cause significant irritation.

Flammability 3: Materials that can be ignited under almost all ambient temperature conditions.

Instability 0: Materials that are normally stable even under fire conditions.