1. PURPOSE: To establish comprehensive policies and procedures in regards to work practices and use of equipment that will aid in protecting laboratory employees from health hazards presented by hazardous chemicals used in the work place.

2. POLICY: Employees shall be informed of proper procedures and the proper use of equipment made available to protect them from health hazards presented by hazardous chemicals.

3. RESPONSIBILITIES:

   A. Service Chief - It is the responsibility of the Chief of Research to:

      (1) Implement this policy as it pertains to the Research Service.
      (2) Appoint a Chemical Hygiene Officer (CHO) for the Research Service.
      (3) Inform all employees of the Chemical Hygiene Officer.
      (4) Ensure employees are provided with the information and training required under OSHA 29 CFR 1910.1450 and this Medical Center policy.
      (5) Provide documentation of training given.

   B. Safety Management Section (SMS) - It is the responsibility of the Safety Management Section for the following:

      (1) Provide technical assistance in determining chemical toxicity classification, chemical incompatibilities, measures to protect employees and selection of personal protective equipment.
      (2) Assist PI's in performing risk assessments in regards to chemical use in laboratories.
      (3) Perform exposure monitoring when and where necessary.
      (4) Review records of certification of chemical fume hoods annually.
      (5) Review the program with the Chemical Hygiene Officer annually. Updates of the policy will be implemented, as needed, after consultation with the Chemical Hygiene Officer.
      (6) Dispose of hazardous waste.

   C. Service Chemical Hygiene Officer – This position is designated by the Research Service. It is the responsibility of the Research Service chemical Hygiene Officer for the following:

      (1) Provide technical guidance in the development and implementation of the Chemical Hygiene Plan.
      (2) Provide training and information required by this policy.
      (3) Ensure that hazard warnings are in place as required.
      (4) Establish designated areas for common chemical storage.
      (5) Monitor use and disposal of chemicals used in the laboratory.
      (6) Ensure periodic audits of compliance with this policy are performed and documented.
      (7) Help project directors develop precautions and adequate facilities.
      (8) Be familiar with current legal requirements concerning regulated substances.
      (9) Seek ways to improve chemical hygiene.
      (10) Review the Chemical Hygiene Plan annually and notify the Safety Management Section of needed changes.

D. Laboratory Supervisor - Has overall responsibility for chemical hygiene in the laboratory he/she supervises. These responsibilities include the following:

(1) Ensure that workers know and follow the chemical hygiene rules; that protective equipment is available and in working order; and that appropriate training has been provided.
(2) Provide regular, formal chemical hygiene and housekeeping inspections including routine inspections of emergency equipment.
(3) Be familiar with current legal requirements concerning regulated substances.
(4) Determine, after consultation with the SMS personnel, the required levels of protective apparel and equipment.
(5) Ensure that facilities and training are adequate for use of any material being ordered.
(6) Inform the SMS Office of any location where chemical exposure monitoring may be warranted.

E. Laboratory Workers - It is the responsibility of laboratory workers for the following:

(1) Planning and conducting each operation in accordance with the facility's chemical hygiene procedures.
(2) Develop good personal chemical use habits.
(3) Inform Supervisor of locations where they believe chemical exposure monitoring may be warranted.

4. CHEMICAL EXPOSURE MONITORING

A. Regular monitoring of airborne concentration is not usually justified or practical, in laboratories since use of chemicals often involves very small amounts or infrequent use. Monitoring may be appropriate when there is an OSHA-specific standard for the material being used or highly toxic substances are being used and the possibility of exposure exists. Monitoring may be performed at the discretion of the Safety Management Section (SMS) when an employee believes an exposure problem exists.

B. Risk assessments are conducted by the PI to determine where exposure monitoring may be needed.

C. Exposure monitoring is performed by the SMS Office.

D. The laboratory shall inform the SMS Office of any areas where it is believed by employees that monitoring is warranted.

E. If initial monitoring results disclose employee exposures at or above the action level, Permissible Exposure Level (PEL), or Threshold Limit Value (TLV), as applicable, then the exposure monitoring requirements of the relevant standard(s) shall be followed and attempts to reduce exposures below these levels will be implemented and documented.

F. Employees shall be notified of the results of exposure monitoring within 3 working days of receipt of these results. This notification shall be in writing and a copy given to the affected individual.

5. CHEMICAL HYGIENE PLAN

A. The Chemical Hygiene Plan (CHP) shall be readily available to employees and employee representatives.

B. The CHP shall be reviewed and its effectiveness evaluated annually. It shall be updated as necessary.

C. Standard Operating Procedures:

Because few laboratory chemicals are without hazards, general precautions for handling all laboratory chemicals should be adopted to include minimizing exposure and assuming that any mixture of hazardous chemicals is more toxic than the most toxic component.

The following procedures are used when working with chemicals:

(1) Accidents and spills
   a. Eye contact: promptly flush eyes with water for a prolonged period (15 minutes) and seek medical attention.
   b. Ingestion: Encourage the victim to drink large amounts of fluid, if appropriate.
   c. Skin contact: promptly flush the affected area with water and remove any contaminated clothing; use a safety shower when contact is extensive. If symptoms persist after washing, seek medical attention.
   d. Clean-up: promptly clean up spills, using appropriate protective apparel and equipment and proper disposal.
   e. If Laboratory personnel cannot safely clean up a chemical spill, they should isolate the area (evacuate) and deny entry to others, call extension 3333 indicate to the operator there is a chemical spill, the location of the spill, and the content of the spill. The Police will determine whether to call the HazMat Contractor. Lab personnel should have the MSDS available for the Police.

(2) Avoid unnecessary exposure to chemicals.
   a. Do not smell or taste chemicals.
   b. Any apparatus that can discharge toxic chemicals (vacuum pumps, distillation columns, etc.) should be vented into local exhaust devices.
   c. Inspect gloves and test glove boxes before use.
   d. Do not allow release of toxic substances in cold rooms, since these have contained re-circulated atmospheres.
   e. Use only those chemicals for which the quality of the available ventilation system is appropriate.

   f. Avoid eating, drinking, smoking, gum chewing or applying cosmetics or lip balm in areas where laboratory chemicals are present. Researchers should wash hands before conducting these activities.
   g. Avoid storing, handling, or consuming of food or beverages in chemical storage areas or in refrigerators, glassware, or utensils designated for laboratory operations.
   h. Handle and store laboratory glassware with care to avoid damage; do not use damaged glassware. Use extra care with Dewar flasks and other evacuated glass apparatus; shield or wrap them to contain chemicals and fragments should implosion occur. Use equipment for only its designed purpose.
   i. Wash areas of exposed skin thoroughly before leaving the laboratory.
   j. Avoid practical jokes or other behavior that might confuse, startle or distract another worker.
   k. Do not use mouth suction for pipetting or starting a siphon.
   l. Confine long hair, loose clothing and jewelry.
   m. Wear shoes at all times in the laboratory, but do not wear open toed shoes.

n. Keep work area clean and uncluttered, with chemicals and equipment properly labeled and stored; clean up the work area on completion of an operation and at the end of each day.
o. Ensure that appropriate eye protection, when necessary, is worn by all persons, including visitors, in areas where chemicals are being used.

p. Wear appropriate gloves when the potential for contacting toxic materials exists; inspect the gloves before each use, wash them before removal, and replace them periodically.
q. Use any other protective and emergency apparel and equipment as appropriate.
r. Remove laboratory coats immediately upon significant contamination.
s. Take necessary precautions to prevent possible spills while using toxic chemicals.
t. Use a hood for operations that might result in release of toxic chemical vapors or dust. Confirm adequate hood performance before use: keep hood sash at recommended working levels at all times except when adjustments within the hood are being made. Keep materials stored in hoods to a minimum, and do not allow materials to block vents or airflow. Leave the hood on when it is not in active use, if toxic substances are stored in it or if it is uncertain whether adequate general laboratory ventilation will be maintained when it is off.

   In the event of a ventilation outage, while working with hazardous materials close the sash immediately. Evacuate the laboratory and close the door. Notify the A/C shop (ext. 3280) of the outage and inform them that hazardous materials were in use. Contact the Research Office so they can make others aware of the ventilation outage.

(3) Specific procedures and manuals for various laboratories may be attached as appendices to this Chemical Hygiene Plan.

D. Chemical Inventory - In accordance with the Hazardous Materials Handling Policy, a chemical inventory is maintained and updated bi-annually for each laboratory and for the Research Service. These shall be submitted to the NWIHCS (Nebraska-Western Iowa Health Care System) Industrial Hygienist. Additionally, any new lab space or new chemicals should be reported to the Industrial Hygienist.

E. Material Safety Data Sheets - The MSDS's must be available to employees in the work area. The laboratory relies on the chemical manufacturer's information to ascertain whether or not the chemical is hazardous.

F. Chemical Storage - chemical storage is kept as small as practical.

(1) All chemicals must be stored in containers labeled as to the content and appropriate warnings.
(2) Chemicals should not be stored alphabetically as a general group. Rather, an effort should be made to segregate chemicals into the different compatibility groups listed in the table below, with alphabetical storage within compatible groups.

(3) Separation of compatibility groups can be achieved by using different shelves within the same cabinet.

(4) Maximal volume of flammable liquids is 2 gallon per 100 sq. ft. of lab space excluding chemicals stored in flammable cabinets. Amount allowed is doubled if half the chemicals are stored in a flammable cabinet.

(5) Cylinders of compressed gases are strapped or chained to a wall or bench top and are capped when not in use.

Compatible Storage Groups	
Group	Examples
Flammable Liquids	All alcohols, Acetone, Benzene, Methyl butane, Xylene
Compressed Gasses	Oxygen, Nitrogen, Hydrogen, Arsine
Volatile poisons	Carbon tetrachloride, Chloroform, Formaldehyde
Acids	MINERAL ACIDS Oxidizing-Sulfuric, Nitric, Chromic Non-oxidizing-Hydrochloric, phosphoric ORGANIC ACIDS Acetic, Butyric, Formic, Propionic
Liquid bases	Sodium hydroxide, Ammonium hydroxide, Calcium hydroxide, Flutaraldehyde
Liquid oxidizers	Ammonium persulfate, Hydrogen peroxide,
Non-volatile liquid poisons	Acrylamide solutions, Diethylpyrocarbonate, Ethidium bromide,
Metal hydrides and pyrophorics (air or water reactive)	Sodium borohydride, Calcium Hydride, Lithium aluminum hydride
Dry Solids	Cyanogen bromide, Oxalic Acid, Sodium Cyanide

G. Control Measures - These shall include engineering controls, the use of personal protective equipment, hygiene practices and administrative practices.

(1) Specific control measures will depend on the degree of toxicity of the substance and exposure potential. Chemicals that are known to be extremely hazardous shall have particular attention given to the selection of control measures.

(2) Protective apparel and equipment shall consist of the following:
   a. Protective apparel compatible with the required degree of protection for the substance being handled.
   b. Readily accessible drench-type safety shower.
   c. An eyewash fountain.
   d. A fire extinguisher.
   e. A telephone for emergency use should be available nearby.
   f. Other items designated by the Chemical Hygiene Officer or Laboratory Supervisor.

(3) Particularly Hazardous Substances - These are defined as select carcinogens, reproductive toxins and substances that have a high degree of acute toxicity. Specific consideration shall be given to the following provisions in regards to these substances and shall be included where appropriate:

   a. Establishment of a designated area. The area will be posted and all employees working within the area will be informed of the hazardous substance(s) used there.
   b. Use of a containment device such as a chemical fume hood. This should be considered when using volatile substances, when generation of aerosols is likely, or when reactions that may result in the uncontrollable release of the substance is likely.
   c. Procedures for safe removal of contaminated waste, indicated by filling out the disposal form and labeling the container.
   d. Decontamination procedures.
   e. Documentation, in writing, of any approved waiver of the above provisions.

(4) Prior Approval:
   a. The Service Chemical Hygiene Officer shall determine circumstances under which a particular laboratory operation, procedure or activity shall require prior approval before implementation.
   b. Prior approval must be in writing and it will detail special precaution to be taken in order to protect employees' health.
   c. Any prior approval must be forwarded to the SMS Office.

H. Fume Hoods and Other Protective Equipment - Eyewashes, emergency showers, fire extinguishers and other protective equipment must be in proper working order at all times. Specific measures to ensure proper and adequate performance include the following:

(1) Biohazard and chemical fume hoods are certified at least annually as to proper operation. The SMS Office will review this certification. Stickers attesting to certification are placed on the hoods exterior and certification reports are kept on file in the Research Office (work order on quarterly basis - AC).

(2) Eyewashes are inspected and tested weekly to verify proper operation. A written record of this is maintained (work orders on quarterly basis).

(3) Safety showers are inspected quarterly and tested and flushed annually. A written record of this is maintained by the Engineering Department.

(4) Fire extinguishers are inspected monthly by SMS.

(5) Other protective equipment shall be utilized as it pertains to individual laboratories.

I. Contaminated Waste Removal/Disposal - To prevent harm to people and the environment, the disposal of waste laboratory chemicals will be conducted in accordance with Hazardous Waste Policy SAF-005, Hazard Materials Program. All disposal is done in accordance with the Nebraska Department of Environmental Quality and the United States Environmental Protection Agency (EPA) regulations.

This facility is considered a conditionally exempt small quantity generator facility according to the EPA and an EPA ID number has been obtained.

Fill out Hazardous Waste disposal form and call the Industrial Hygienist at ex. 4461
Label containers with contents and hazard levels.
The contents will be properly disposed of through a contractor.

J. Medical Consultation and Exams:
(1) Employees shall be encouraged to receive medical attention under the following circumstances:
   a. Whenever the employee develops signs or symptoms associated with a hazardous chemical to which they may have been exposed in the lab.
   b. Routine exposures above the action level or PEL, as required by substance specific OSHA standards.
   c. Emergency exposures such as a spill, leak or other occurrence resulting in the likelihood of a hazardous exposure.

(2) The physician shall be provided the following information:
   a. The identity of the hazardous chemical (s).
   b. The MSDS for the respective chemical (s).

c. A description of the conditions under which the exposure occurred, including quantitative exposure data if available.
d. A description of the signs and symptoms of exposure that the employee is experiencing, if any.

6. HAZARD IDENTIFICATION

Hazard identification with regard to labels on containers and MSDS's, shall be accomplished as outlined in Policy SAF-005, Hazardous Materials Program (Includes Hazcom).

7. EMPLOYEE INFORMATION AND TRAINING:

A. Employees shall be provided with information training to ensure they are apprised of the hazards of the chemicals present in their work area; the training provided to employees under the following Policy: SAF-005-Hazardous Materials Program which includes Hazard Communication) and SAF-002-Chemical Waste Management. However, the following additional information and training must be given to employees:

(1) Employees must be informed of the location and availability of this policy including the OSHA standard 1910.1450 (attached to this policy), and any reference materials on the hazards, safe handling, storage and disposal of hazardous chemicals in the laboratory.

(2) The permissible exposure limits for OSHA-regulated substances or recommended exposure limits where there is no applicable OSHA standard. These limits may be obtained from MSDS's or the SMS Office.

(3) The location and proper use of available protective equipment.

(4) Emergency procedures in case of fire, accident or spill.

(5) Proper waste disposal procedures, including the existence and use of the central hazardous waste storage facility.

(6) Prior approved procedures or safety manuals.

B. This additional training must be conducted annually and upon initial assignment of an employee to the lab or a new work area of the lab. Documentation of training will be stored on the Research Database.

8. HOUSEKEEPING - Floors should be cleaned regularly by housekeeping. All employees of the housekeeping department are formally trained (by OVAMC) in the risks associated with working in a laboratory.

9. RECORDKEEPING - The SMS Office has established and will maintain an accurate record for environmental monitoring, medical consultations, and examinations, including tests or written opinion required in accordance with 29CFR 1910.1020.

10. RESPIRATOR USAGE - Respirators will be used according to the SMS Respirator Program. The employee receiving a respirator must receive medical approval and respirator training prior to being issued. The Respiratory Protection for Employee Comfort requires the following consideration.

A. User Requirements.
   (1) The employee receiving a respirator must receive both respirator training and medical approval.
   (2) Initial respirator training must be given by a formalized program.

   (3) Medical approval is issued by the Employee Health staff and indicates that the employee is physically capable of performing his/her job duties while wearing a respirator. Medical approval must be given prior to an employee wearing a respirator.
B. Inspections: Employees who are assigned their own respirators will inspect them before and after each time they are used.
C. Fit-testing: The respirators in Research are for employee comfort from rodent dander. There is no PEL for goat dander, thus no requirement for fit testing.
D. Recordkeeping.
   (1) Services will maintain the respirator training records.
   (2) The Employee Health Representative will maintain the Medical approval questionnaire for respirator usage.

11. RECORDS - All monitoring records shall be maintained for a period of 30 years as required by 29 CRF 1910.1200.

12. REFERENCES –

   a. CFR 29 1910.1450
   b. CRF 20 1910.1020
   c. CRF29 1910.1200
   d. U.S. Department of Labor, final rule part II. Federal Register 29 CRF Part 1910. Occupational Exposure to Hazardous Chemicals in Laboratories, Wednesday, January 31, 1990.
   e. National Research Council. Prudent Practices for Handling Hazardous Chemicals in Laboratories, National Academy Press, 1981.
   f. National Research council. Prudent Practices for Disposal of Chemicals from Laboratories, National Academy Press, 1983.
   g. VA Handbook 1200.6 Control of Hazardous Agents in VA Research Laboratories.
   h. VA Handbook 100.8 Safety of Personnel Engaged in Research.

14. RESCISSION: Memorandum No. 151-10 dated September, 2008.

15. FOLLOW-UP RESPONSIBILITY: Safety Program Coordinator

16. REVIEW DATE: Annually on the anniversary date of this memorandum.

17. REVISION DATE: April, 2012

Debra J. Romberger, M.D.
ACOS/Research Service

Appendix A

DEFINITIONS

1. Chemical Hygiene Officer - An employee, designated in writing by the respective Service, who is qualified by training or experience to provide technical guidance in the development and implementation of the Chemical Hygiene Plan.

2. Chemical Hygiene Plan - A written program which sets forth procedures, equipment, personal protective equipment (PPE) and work practices that are capable of protecting employees from the health hazards presented by hazardous chemicals used in their particular work area(s).

3. Designated Area - An area that may be used for work with select carcinogens (see A10" below), reproductive toxins or substances that have a high degree of acute toxicity.

4. Emergency - Any occurrence such as, but not limited to, equipment failure, rupture of containers or failure of control equipment which results in an uncontrolled release of a hazardous chemical into the work place.

5. Hazardous Chemical - Any chemical or material that presents a physical and/or health hazard.

6. Chemical Fume Hood - A device constructed and maintained to draw air from the laboratory and to prevent or minimize the escape of air contaminants into the laboratory, and which also allows chemical manipulation to be conducted in the enclosure without insertion of any portion of the employee's body other than the hands or arms.

7. Medical Consultation - A consultation which takes place between an employee and a licensed physician for the purpose of determining what medical examinations or procedures, if any, are appropriate, in cases where significant exposure to a hazardous chemical may have taken place.

8. Protective Laboratory Practices and Equipment - Those practices, procedures and equipment accepted by health and safety experts as effective or that can be shown to be effective in minimizing the potential for employee exposure to hazardous chemicals.

9. Reproductive Toxins - Chemicals which affect the reproductive capabilities, including chromosomal damage (mutations) and effects on fetuses (teratogenesis).

10. Select Carcinogens - any substance which meets one of the following criteria:

    a. It is regulated by Occupational Safety and Health Administration (OSHA) as a carcinogen (see Appendix C).

    b. It is listed under the category A known to be carcinogens, in the latest edition of the Annual Report on Carcinogens, published by the National Toxicology Program (NTP).

    c. It is listed under Group I, A carcinogenic to humans, by the International Agency for Research on Cancer (IARC) Monographs, latest edition.

    d. It is listed in either Group 2A or 2B by IARC or under the category, "reasonably anticipated to be carcinogens" by the NPT, and causes statistically significant tumor incidence in experimental animals in accordance with any of the following criteria:

(1) After inhalation exposure of 6-7 hours per day, five (5) days per week, for a significant portion of a lifetime, to dosages of less than 10 mg/m3;

(2) After repeated skin application of less than 300 mg/kg of body weight per week; or

(3) After oral doses of less than 50 mg/kg of body weight per day.

Sample MSDS

Material Safety Data Sheet
10% Neutral Buffered Formalin

Section 1. Product and Preparation Information

Product Identifier
10% Neutral Buffered Formalin

Product Use
Tissue fixation

Date Prepared
Jan 2010

Synonyms / Chemical Name
Formalin, buffered formaldehyde

Manufacturer/ Preparer

Emergency Contact

Section 2. Protective Measures

Personal Protection

Eyes: Goggles
Hands: Latex or nitrile gloves
Body: Laboratory coat
Respiratory Wear: approved/certified respirator if airborne concentrations exceed exposure limits

Emergency Overview

DANGER! - CONTAINS FORMALDEHYDE - POTENTIAL CANCER HAZARD – REPEATED OR PROLONGED EXPOSURE INCREASES RISK – HIGHLY TOXIC BY INHALATION AND IF SWALLOWED - IRRITATING TO EYES, RESPIRATORY SYSTEM AND SKIN - MAY CAUSE SENSITIZATION BY INHALATION OR SKIN CONTACT - RISK OF SERIOUS DAMAGE TO EYES - CORROSIVE – MAY CAUSE BURNS - KEEP CONTAINER CLOSED - USE WITH ADEQUATE VENTILATION – TARGET ORGANS, SKIN, EYES, RESPIRATORY TRACT. FOR LABORATORY USE ONLY.

Engineering Controls: Use exhaust ventilation or laboratory hood. Ensure that eyewash stations and quick drench showers are proximal to the workstation or tissue processor.
Handling and Storage: Avoid contact with eyes and skin. Do not breathe vapor or mist. Avoid prolonged or repeated contact with skin. If potential for splashing exists, protect skin by using sleeve protectors, aprons and face-shield. Immediately remove contaminated clothing. Wash thoroughly after handling. Keep containers closed and out of reach of children. Ground all equipment containing material. Store at room temperature.
Small Spill and Leak: Dilute with water and mop, or absorb with an inert dry material and place in an appropriate waste disposal container.

Large Spill and Leak: Keep away from heat and ignition sources. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Avoid skin and eye contact. Prevent entry into sewers, basements or confined areas: dike if needed. Ensure airborne concentrations of formaldehyde do not exceed published exposure limits. Additional protective equipment such as full-face respirator, full-body suit and boots may be required. If airborne concentrations of formaldehyde exceed 7.5 ppm, only use SCBA or supplied air respirators.
Waste Disposal
Unused Product – Dispose as a regulated hazardous waste. Spent product or spill clean up - Follow all provincial and federal rules.

Section 3. Hazardous Ingredients

Hazardous Ingredient	% wt.	CAS Number	LD50	LC50	TDG PIN
Formaldehyde	<4	50-00-0	100 mg/kg oral rat 42 mg/kg oral mouse	203 mg/m³ inhalation rat 505 mg/m³/2hr inhalation mouse	Not Regulated
Methanol	<4	67-56-1	5,600 mg/kg oral rat 7,300 mg/kg oral mouse	64,000 ppm/4 hr. inhalation rat 81,000 mg/m³/14hr inhalation rabbit	Not Regulated
Monosodium phosphate	N/A	7558-80-7	N/A	N/A	Not Regulated
Disodium phosphate	N/A	7558-79-4	17 gm/kg oral rat	N/A	Not Regulated

Section 4. First Aid Measures

Eye Contact: Immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention if irritation persists.
Skin Contact: Remove contaminated clothing immediately. Wash the affected areas with soap or mild detergent and large amounts of water for at least 15 minutes.
Inhalation: Move individual to fresh air immediately. If breathing is difficult, give oxygen. If breathing has stopped, administer artificial respiration. Get medical attention.
Ingestion: Never give anything by mouth to an unconscious person. Get medical attention immediately.

Section 5. Physical Data

Physical State	Odor and Appearance	Odor Threshold (ppm)	Solubility	Auto-ignition Temp
Liquid	Pungent odor, colorless	0.1 ppm formaldehyde	Soluble in water	795° F (423° C)
Vapor Pressure	**Vapor Density**	**Evaporation Rate**	**Boiling Point**	**Flash Point CC**
2.7mmHg@ 20C (MeOH)	1.04 air = 1	>1	212° F (100° C)	>200° F (93.3° C)
pH	**Specific Gravity**	**Coeff. Water/oil Dist.**	**Freezing Point**	**Flammable Limits**
Neutral	1.022 Water=1	N/A	-133° F (-92° C)	N/A

Section 6. Fire and Explosion

Flammability
Not flammable

Conditions
N/A

Fl. Pt - Auto Ignition - Flammable Limits
See Physical Data above

Explosivity
Not explosive under normal conditions of use.

Hazardous Combustion Products
CO, CO2, irritating, corrosive, toxic gases

Means to Extinguish
Small Fire – Use DRY chemical powder. Large Fire – Use alcohol foam, water spray or fog

Section 7. Reactivity

Stability
Product is stable under normal conditions of use.

Hazardous Decomposition Products
Strong vapors and irritants, carbon monoxide, carbon dioxide

Conditions of Reactivity
N/A

Hazardous Polymerization
No hazardous polymerization.

Incompatibility
Reactive with oxidizing materials, acids and alkalis

Section 8. Toxicological Properties

Routes of Entry Skin/eye contact, inhalation and ingestion.

Target Organs Skin, eyes and respiratory tract

Effects of Acute Exposure

Eye Hazardous in case of eye contact (irritant). May cause burns. May cause chemical conjunctivitis or corneal damage.

Skin Hazardous in case of skin contact (irritant, corrosive, sensitizer). Skin contact may produce burns. May cause skin sensitization which becomes evident upon re-exposure. Skin inflammation is characterized by itching, scaling, reddening or occasionally blistering.

Absorption Absorbed through the skin

Inhalation Hazardous in case of inhalation (lung irritant and sensitizer). Inhalation of spray mist may produce severe irritation of respiratory tract characterized by coughing, choking, or shortness of breath. May cause asthmatic attacks due to allergic sensitization.

Ingestion May be fatal if swallowed. May cause burns to mouth, throat and stomach.

Medical Conditions Aggravated by Overexposure Dermatitis, emphysema, bronchitis and conjunctivitis.

Effects of Chronic Exposure
Effects may be delayed. Formaldehyde has been associated with nasopharyngeal cancers. Repeated exposure may cause skin discoloration and nail decay. Inhalation may worsen conditions such as emphysema or bronchitis. Repeated skin exposure may cause defatting of the skin.

Carcinogenic Effects
Methanol is not classified as a human carcinogen. Formaldehyde - Potential Cancer Hazard – classified proven by NIOSH, classified A2 (suspected for human) by ACGIH, classified A2 (Probable for human) by IARC, Classified 2 (Reasonably anticipated) by NTP.

Reproductive Toxicity Animal embryotoxin

Teratogenic and Mutagenic Effects NA

Exposure Limits	OSHA PEL TWA	ACGIH TLV TWA	STEL	TWAEV (Ont.)	STEV (Ont.)	CEV (Ont.)
Formaldehyde	0.75 ppm, 0.5 Action	0.3 ppm Ceil	2 ppm	1.0 ppm	2.0 ppm	1.5 ppm
Methanol	260 ppm	200 ppm	250 ppm	200 ppm	250 ppm	N/A
Monosodium phosphate	N/A	N/A	N/A	N/A	N/A	N/A
Disodium phosphate	N/A	N/A	N/A	N/A	N/A	N/A

Section 9. Regulatory Information

OSHA Hazardous
Highly toxic 29CFR1910.1048

Cal. Prop. 65
Listed as carcinogen

Canadian WHMIS
D1A, D2A, D2B, E

RCRA Regulated
U122

SARA 302/304
Listed

SARA 313
Listed

CERCLA 102A
Listed

RQ
100 lbs. Formaldehyde

CWA 307
Listed

CWA 311
Not Listed

CAA 112 Release Prevention
Listed

CAA 112 Reg. Flam. Substance
Not Listed

CAA 112 Reg. Toxic Substance
Not Listed

TSCA Inventory
All ingredients listed

EEC Flammability
N/A

CEPA DSL
All Ingredients Listed

Proper US DOT Shipping Name
Air Transport Only - Aviation Regulated Liquid, NOS, (<4% Formaldehyde), 9, UN3334, PGIII

TDG Classification
Not regulated

IATA Classification
Not regulated

Limited Quantity
No

The information provided above is based upon unused product.

Appendix C

TARGET ORGAN POSTER

A list of target organ effects shall be posted in a central location for access by all employees as follows:

Classification	Effect	Signs and Symptoms	Chemicals
HEPATOTOXINS	Chemicals that produce liver damage	Jaundice; liver enlargement	Carbon tetrachloride; nitrosamines
NEPHROTOXINS	Chemicals that produce kidney damage	Edema; proteinuria	Halogenated hydrocarbons; uranium
NEUTROTOXINS	Chemicals that produce their primary toxic effects on the nervous system	Narcosis; behavior changes; decrease in motor functions	Mercury; carbon disulfide
AGENTS THAT ACT ON THE BLOOD OR HEMATOPOIETIC SYSTEM	Decrease hemoglobin function; deprive body tissues of oxygen	Cyanosis; loss of consciousness	Carbon monoxide; cyanides
AGENTS THAT DAMAGE THE LUNG	Chemicals that irritate or damage the pulmonary tissue	Cough; tightness in chest; shortness of breath	Silica; asbestos
REPRODUCTIVE TOXINS	Chemicals that affect the reproductive capabilities including chromosomal damage (mutations) and effects on fetuses (teratogenesis)	Birth defects; sterility	Lead
CUTANEOUS HAZARDS	Chemicals that affect the dermal layer of the body	Defatting of the skin; rashes; irritation	Ketones; chlorinated compounds
EYEHAZARDS	Chemicals that affect the eye or visual capacity	Conjunctivitis; corneal damage	Organic solvents; acids

Appendix D

RESERVED FOR SERVICE SPECIFIC LABORATORY POLICY AND PROCEDURES