Material Safety Data Sheet

Formaldehyde Solution, 36%, For Histology, Glassware Washing and other General Applications

Section 1. Product and Company Identification

Product name : Formaldehyde Solution, 36%, For Histology, Glassware Washing and other General Applications

Product code : FX0415

Synonym : Formalin, Methylene Oxide, Methanal

Material uses : Other non-specified industry: Analytical reagent.

Manufacturer : EMD Chemicals Inc.
P.O. Box 70
480 Democrat Road
Gibbstown, NJ 08027
856-423-6300 Technical Service
Monday - Friday: 8:00 - 5:00 PM

Validation date : **12/13/2006.**

Print date : 12/13/2006.

In case of emergency : 800-424-9300 CHEMTREC (USA)
613-996-6666 CANUTEC (Canada)
24 Hours/Day: 7 Days/Week

Section 2. Hazards Identification

Physical state : Liquid.

Odor : Pungent.

OSHA/HCS status : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Emergency overview : DANGER!
POISON!

CAUSES EYE BURNS.
CANCER HAZARD.
CONTAINS MATERIAL WHICH CAN CAUSE CANCER.
HARMFUL IF INHALED OR ABSORBED THROUGH SKIN.
VAPOR HARMFUL.
MAY BE FATAL OR CAUSE BLINDNESS IF SWALLOWED.
CANNOT BE MADE NONPOISONOUS.
CAUSES RESPIRATORY TRACT AND SKIN IRRITATION.
CONTAINS MATERIAL WHICH CAUSES DAMAGE TO THE FOLLOWING ORGANS: MUCOUS MEMBRANES, GASTROINTESTINAL TRACT, RESPIRATORY TRACT, SKIN, CENTRAL NERVOUS SYSTEM, EYE, LENS OR CORNEA.
FLAMMABLE LIQUID AND VAPOR.
VAPOR MAY CAUSE FLASH FIRE.

MAY CAUSE SKIN BURNS.

WARNING: This product contains a chemical(s) known to the State of California to cause cancer.

Do not ingest. Do not get in eyes or on skin or clothing. Avoid breathing vapor or mist. Keep away from heat, sparks and flame. Keep container closed. Use only with adequate ventilation. Wash thoroughly after handling. Risk of cancer depends on duration and level of exposure.

Routes of entry : Dermal contact. Eye contact. Inhalation. Ingestion.

Potential acute health effects

Eyes : Corrosive to eyes.

Skin : Toxic in contact with skin. Irritating to skin. May cause skin burns.

Inhalation : Toxic by inhalation. Irritating to respiratory system.

Ingestion : Very toxic if swallowed. May cause burns to mouth, throat and stomach.

Continued on Next Page

Section 2. Hazards Identification

Carcinogenic effects : Contains material which can cause cancer. Risk of cancer depends on duration and level of exposure.

Mutagenic effects : No known significant effects or critical hazards.

Teratogenicity / Reproductive toxicity : No known significant effects or critical hazards.

Medical conditions aggravated by over-exposure : Repeated skin exposure can produce local skin destruction or dermatitis. Repeated or prolonged exposure to the substance can produce lung damage. Repeated or prolonged contact with spray or mist may produce chronic eye irritation and severe skin irritation. Repeated or prolonged exposure to the substance can produce target organs damage.

See toxicological information (section 11)

Section 3. Composition/Information on Ingredients

United States

Name	CAS number	% by Weight
Water	7732-18-5	47 - 53
Formaldehyde	50-00-0	37
Methanol	67-56-1	10 - 15

Section 4. First Aid Measures

Eye contact : Get medical attention immediately. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Chemical burns must be treated promptly by a physician.

Skin contact : Get medical attention immediately. Flush contaminated skin with plenty of water. Continue to rinse for at least 10 minutes. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing or wear gloves. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Inhalation : Get medical attention immediately. Move exposed person to fresh air. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. Keep person warm and at rest. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Ingestion : Get medical attention immediately. Wash out mouth with water. Remove dentures if any. Move exposed person to fresh air. Keep person warm and at rest. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Chemical burns must be treated promptly by a physician. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

Continued on Next Page

Section 5. Fire Fighting Measures

Flammability of the product : Flammable liquid and vapor. Vapor may cause flash fire. Vapors may accumulate in low or confined areas or travel a considerable distance to a source of ignition and flash back. Runoff to sewer may create fire or explosion hazard.

Products of combustion : These products are carbon oxides (CO, CO_2).

Extinguishing media

Suitable : Use dry chemical, CO_2, water spray (fog) or foam.

Not suitable : Do not use water jet.

Special exposure hazards : Not available.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Special remarks on fire hazards : Dangerous fire and explosion risk. Container explosion may occur under fire conditions or when heated. Vapor may travel a considerable distance to source of ignition and flash back. (Methanol)

Section 6. Accidental Release Measures

Personal precautions : Immediately contact emergency personnel. Eliminate all ignition sources. Keep unnecessary personnel away. Use suitable protective equipment. Do not touch or walk through spilled material.

Environmental precautions : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Methods for cleaning up : If emergency personnel are unavailable, contain spilled material. For small spills, add absorbent (soil may be used in the absence of other suitable materials) and use a non-sparking or explosion-proof means to transfer material to a sealable, appropriate container for disposal. For large spills, dike spilled material or otherwise contain material to ensure runoff does not reach a waterway. Place spilled material in an appropriate container for disposal.

Section 7. Handling and Storage

Handling : Do not ingest. Do not get in eyes or on skin or clothing. Keep container closed. Use only with adequate ventilation. Avoid breathing vapor or mist. Keep away from heat, sparks and flame. To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before transferring material. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Wash thoroughly after handling.

Storage : Store in a segregated and approved area. Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Avoid all possible sources of ignition (spark or flame).

Section 8. Exposure Controls/Personal Protection

Product name	Exposure limits
United States	
Formaldehyde	**ACGIH TLV (United States, 1/2005). Notes: Substance identified by other sources as a suspected or confirmed human carcinogen. Refers to Appendix A -- Carcinogens. 2000 Adoption.** CEIL: 0.37 mg/m^3 Form: All forms CEIL: 0.3 ppm Form: All forms **NIOSH REL (United States, 12/2001). Notes: See Appendix A - NIOSH Potential Occupational Carcinogen** CEIL: 0.1 ppm 15 minute/minutes. Form: All forms TWA: 0.016 ppm 10 hour/hours. Form: All forms **OSHA PEL (United States, 8/1997).** STEL: 2 ppm 15 minute/minutes. Form: All forms

Continued on Next Page

Section 8. Exposure Controls/Personal Protection

TWA: 0.75 ppm 8 hour/hours. Form: All forms

OSHA PEL 1989 (United States, 3/1989). Notes: See Table Z-2 for operations or sectors excluded from section 1910.1048 or for which limit(s) is(are) stayed. Sec. 1910.1048 Formaldehyde.

STEL: 2 ppm 15 minute/minutes. Form: All forms

TWA: 0.75 ppm 8 hour/hours. Form: All forms

OSHA PEL Z2 (United States, 8/1997). Notes: Sec. 1910.1048 Formaldehyde.

STEL: 2 ppm 15 minute/minutes. Form: All forms

TWA: 0.75 ppm 8 hour/hours. Form: All forms

Methanol

ACGIH (United States, 1994). Skin

TWA: 262 mg/m^3

STEL: 328 mg/m^3

OSHA (United States, 1989). Skin

TWA: 260 mg/m^3

STEL: 325 mg/m^3

NIOSH REL (United States, 12/2001). Skin

STEL: 325 mg/m^3 15 minute/minutes. Form: All forms

STEL: 250 ppm 15 minute/minutes. Form: All forms

TWA: 260 mg/m^3 10 hour/hours. Form: All forms

TWA: 200 ppm 10 hour/hours. Form: All forms

OSHA PEL (United States, 8/1997).

TWA: 260 mg/m^3 8 hour/hours. Form: All forms

TWA: 200 ppm 8 hour/hours. Form: All forms

OSHA PEL 1989 (United States, 3/1989). Skin

STEL: 325 mg/m^3 15 minute/minutes. Form: All forms

STEL: 250 ppm 15 minute/minutes. Form: All forms

TWA: 260 mg/m^3 8 hour/hours. Form: All forms

TWA: 200 ppm 8 hour/hours. Form: All forms

ACGIH TLV (United States, 1/2005). Skin Notes: Substances for which there is a Biological Exposure Index or Indices

STEL: 328 mg/m^3 15 minute/minutes. Form: All forms

STEL: 250 ppm 15 minute/minutes. Form: All forms

TWA: 262 mg/m^3 8 hour/hours. Form: All forms

TWA: 200 ppm 8 hour/hours. Form: All forms

Consult local authorities for acceptable exposure limits.

Engineering measures : Use only with adequate ventilation. If user operations generate dust, fumes, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapor or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

Personal protection

Eyes : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts.
Recommended: splash goggles , face shield

Skin : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
Body: Recommended: safety apron

Respiratory : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Continued on Next Page

Section 8. Exposure Controls/Personal Protection

Hands : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Recommended: nitrile rubber

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Section 9. Physical and Chemical Properties

Physical state : Liquid.

Flash point : Closed cup: 60°C (140°F).

Auto-ignition temperature : The lowest known value is 430°C (806°F) (Formaldehyde).

Flammable limits : The greatest known range is Lower: 7% Upper: 73% (Formaldehyde)

Color : Colorless.

Odor : Pungent.

Boiling/condensation point : The lowest known value is 64.5°C (148.1°F) (Methanol). Weighted average: 94.37°C (201.9°F)

Melting/freezing point : May start to solidify at -0.1°C (31.8°F) based on data for: Water. Weighted average: -46.54°C (-51.8°F)

Relative density : Weighted average: 0.99 (Water = 1)

Vapor pressure : The highest known value is 12.9 kPa (97 mm Hg) (at 20°C) (Methanol).

Vapor density : The highest known value is 1.11 (Air = 1) (Methanol). Weighted average: 1.06 (Air = 1)

Odor threshold : The lowest known value is 0.05 ppm (Formaldehyde) Weighted average: 25.29 ppm

Evaporation rate : 2.1 (Methanol) compared with Butyl acetate.

Section 10. Stability and Reactivity

Stability and reactivity : The product is stable.

Incompatibility with various substances : Highly reactive or incompatible with the following materials: oxidizing materials. Reactive or incompatible with the following materials: metals, acids and alkalis.

Hazardous polymerization : Will not occur.

Conditions of reactivity : Highly flammable in the presence of the following materials or conditions: open flames, sparks and static discharge, heat, shocks and mechanical impacts and oxidizing materials.

Highly explosive in the presence of the following materials or conditions: open flames, sparks and static discharge, heat, shocks and mechanical impacts and oxidizing materials.

Section 11. Toxicological Information

Toxicity data

United States

Product/ingredient name	Test	Result	Route	Species
Formaldehyde	LD50	100 mg/kg	Oral	Rat
	LD50	42 mg/kg	Oral	Mouse
	LD50	260 mg/kg	Oral	Guinea pig
	LDLo	108 mg/kg	Oral	woman
	LDLo	108 mg/kg	Oral	woman
Methanol	LD50	5628 mg/kg	Oral	Rat
	LD50	14200 mg/kg	Oral	Rabbit
	LD50	7300 mg/kg	Oral	Mouse

Continued on Next Page

Section 11. Toxicological Information

LD50	15800 mg/kg	Dermal	Rabbit
LDLo	143 mg/kg	Oral	human
LDLo	428 mg/kg	Oral	human
LDLo	6422 mg/kg	Oral	man
LDLo	393 mg/kg	Dermal	Monkey.
LC50	64000 ppm (4 hour/hours)	Inhalation	Rat

Chronic effects on humans : **CARCINOGENIC EFFECTS** Classified 1 (Proven for humans.) by IARC, + (Proven.) by OSHA [Formaldehyde]. Classified 3 (Possible for humans.) by European Union [Formaldehyde]. Classified A2 (Suspected for humans.) by ACGIH, 2 (Reasonably anticipated to be human carcinogens.) by NTP [Formaldehyde].
Contains material which causes damage to the following organs: mucous membranes, gastrointestinal tract, upper respiratory tract, skin, central nervous system (CNS), eye, lens or cornea.

Other toxic effects on humans : Extremely hazardous in case of ingestion.
Very hazardous in case of skin contact (permeator), of inhalation (lung irritant, lung sensitizer).
Hazardous in case of skin contact (corrosive, sensitizer), of eye contact (corrosive), of inhalation (lung corrosive).

Specific effects

Carcinogenic effects : Contains material which can cause cancer. Risk of cancer depends on duration and level of exposure.

Mutagenic effects : No known significant effects or critical hazards.

Teratogenicity / Reproductive toxicity : No known significant effects or critical hazards.

Sensitization

Ingestion : May cause burns to mouth, throat and stomach.

Inhalation : Irritating to respiratory system.

Eyes : Corrosive to eyes.

Skin : Irritating to skin. May cause skin burns.

Section 12. Ecological Information

Ecotoxicity data

United States

Product/ingredient name	Species	Period	Result
Formaldehyde	Daphnia pulex (EC50)	48 hour/hours	5.8 mg/l
	Daphnia magna (EC50)	48 hour/hours	14 mg/l
	Daphnia magna (EC50)	48 hour/hours	14.6 mg/l
	Oncorhynchus mykiss (LC50)	96 hour/hours	1.41 mg/l
	Lepomis macrochirus (LC50)	96 hour/hours	1.51 mg/l
	Lepomis macrochirus (LC50)	96 hour/hours	1.79 mg/l
Methanol	Daphnia magna (EC50)	48 hour/hours	>10000 mg/l
	Oncorhynchus mykiss (EC50)	48 hour/hours	13200 mg/l
	Lepomis macrochirus (EC50)	48 hour/hours	16000 mg/l
	Daphnia magna (LC50)	96 hour/hours	>100 mg/l
	Pimephales promelas (LC50)	96 hour/hours	>100 mg/l
	Lepomis macrochirus (LC50)	96 hour/hours	15400 mg/l

Environmental precautions : No known significant effects or critical hazards.

Products of degradation : These products are carbon oxides (CO, CO_2) and water.

Toxicity of the products of biodegradation : The products of degradation are less toxic than the product itself.

Continued on Next Page

Section 12. Ecological Information

Section 13. Disposal Considerations

Waste disposal : The generation of waste should be avoided or minimized wherever possible. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements.

Disposal should be in accordance with applicable regional, national and local laws and regulations. Local regulations may be more stringent than regional or national requirements.

The information presented below only applies to the material as supplied. The identification based on characteristic(s) or listing may not apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

Section 14. Transport Information

Regulatory information	UN number	Proper shipping name	Class	PG*	Label	Additional information
DOT Classification	UN1198	FORMALDEHYDE SOLUTION, FLAMMABLE	3, (8)	III		**Reportable quantity** 100 lbs. (45.36 kg)

PG* : Packing group

Section 15. Regulatory Information

United States

HCS Classification : Combustible liquid
Highly toxic material
Corrosive material
Carcinogen
Target organ effects

U.S. Federal regulations : TSCA 8(b) inventory: Listed

SARA 302/304/311/312 extremely hazardous substances: Formaldehyde
SARA 302/304 emergency planning and notification: Formaldehyde
SARA 302/304/311/312 hazardous chemicals: Methanol; Formaldehyde
SARA 311/312 MSDS distribution - chemical inventory - hazard identification: Methanol: Fire hazard, Immediate (acute) health hazard, Delayed (chronic) health hazard; Formaldehyde: Fire hazard, Immediate (acute) health hazard, Delayed (chronic) health hazard

Continued on Next Page

Section 15. Regulatory Information

Clean Water Act (CWA) 307: No products were found.

Clean Water Act (CWA) 311: Formaldehyde

Clean Air Act (CAA) 112 accidental release prevention: Formaldehyde

Clean Air Act (CAA) 112 regulated flammable substances: No products were found.

Clean Air Act (CAA) 112 regulated toxic substances: Formaldehyde

SARA 313

		Product name	CAS number	Concentration
Form R - Reporting requirements	:	Formaldehyde	50-00-0	37
		Methanol	67-56-1	10 - 15
Supplier notification	:	Formaldehyde	50-00-0	37
		Methanol	67-56-1	10 - 15

SARA 313 notifications must not be detached from the MSDS and any copying and redistribution of the MSDS shall include copying and redistribution of the notice attached to copies of the MSDS subsequently redistributed.

State regulations : Pennsylvania RTK: Methanol: (environmental hazard, generic environmental hazard); Formaldehyde: (special hazard, environmental hazard, generic environmental hazard)
Massachusetts RTK: Methanol; Formaldehyde
New Jersey: Water; Methanol; Formaldehyde

WARNING: This product contains a chemical(s) known to the State of California to cause cancer.

Ingredient name	Cancer	Reproductive	No significant risk level	Maximum acceptable dosage level
Formaldehyde	Yes.	No.	Yes.	No.

Canada

WHMIS (Canada) : Class B-3: Combustible liquid with a flash point between 37.8°C (100°F) and 93.3°C (200°F).
Class D-1A: Material causing immediate and serious toxic effects (Very toxic).
Class D-2A: Material causing other toxic effects (Very toxic).
Class D-2B: Material causing other toxic effects (Toxic).
Class E: Corrosive material

CEPA DSL/CEPA NDSL : CEPA DSL: Water; Methanol; Formaldehyde

This product has been classified according to the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

EU regulations

Hazard symbol/symbols :

Risk phrases : R40- Limited evidence of a carcinogenic effect.
R23/24/25- Toxic by inhalation, in contact with skin and if swallowed.
R39/23/24/25- Toxic: danger of very serious irreversible effects through inhalation, in contact with skin and if swallowed.
R34- Causes burns.
R37- Irritating to respiratory system.
R43- May cause sensitization by skin contact.

Safety phrases : S1/2- Keep locked up and out of the reach of children.
S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S36/37/39- Wear suitable protective clothing, gloves and eye/face protection.
S45- In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
S63- In case of accident by inhalation: remove casualty to fresh air and keep at rest.

Continued on Next Page

Section 15. Regulatory Information

International regulations

International lists : Australia (NICNAS): Water; Methanol; Formaldehyde

China: Methanol; Formaldehyde

Germany water class: Methanol; Formaldehyde

Japan (METI): Water; Methanol; Formaldehyde

Japan (MOL): Formaldehyde

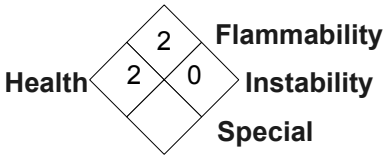
Korea (TCCL): Water; Methanol; Formaldehyde

Philippines (RA6969): Water; Methanol; Formaldehyde

Section 16. Other Information

Label requirements : DANGER!
POISON!
CAUSES EYE BURNS.
CANCER HAZARD.
CONTAINS MATERIAL WHICH CAN CAUSE CANCER.
HARMFUL IF INHALED OR ABSORBED THROUGH SKIN.
VAPOR HARMFUL.
MAY BE FATAL OR CAUSE BLINDNESS IF SWALLOWED.
CANNOT BE MADE NONPOISONOUS.
CAUSES RESPIRATORY TRACT AND SKIN IRRITATION.
CONTAINS MATERIAL WHICH CAUSES DAMAGE TO THE FOLLOWING ORGANS: MUCOUS MEMBRANES, GASTROINTESTINAL TRACT, RESPIRATORY TRACT, SKIN, CENTRAL NERVOUS SYSTEM, EYE, LENS OR CORNEA.
FLAMMABLE LIQUID AND VAPOR.
VAPOR MAY CAUSE FLASH FIRE.
MAY CAUSE SKIN BURNS.
WARNING: This product contains a chemical(s) known to the State of California to cause cancer.

National Fire Protection Association (U.S.A.) :



Notice to reader

The statements contained herein are based upon technical data that EMD Chemicals Inc. believes to be reliable, are offered for information purposes only and as a guide to the appropriate precautionary and emergency handling of the material by a properly trained person having the necessary technical skills. Users should consider these data only as a supplement to other information gathered by them and must make independent determinations of suitability and completeness of information from all sources to assure proper use, storage and disposal of these materials and the safety and health of employees and customers and the protection of the environment. EMD CHEMICALS INC. MAKES NO REPRESENTATION OR WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE, WITH RESPECT TO THE INFORMATION HEREIN OR THE PRODUCT TO WHICH THE INFORMATION REFERS.