

MATERIAL SAFETY DATA SHEET

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FORMALIN
Revision A

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SECTION I. MATERIAL IDENTIFICATION

MATERIAL NAME: FORMALIN
DESCRIPTION: A water solution of formaldehyde (37% or 50%) which may contain up to about 15% methanol stabilizer.
OTHER DESIGNATIONS: Formaldehyde, Aqueous; Methanal, Aqueous; Methylene oxide solution; Methyl aldehyde solution; GE Material D5H1; ASTM D2378; CAS #000 050 000
MANUFACTURER: Available from several suppliers.

SECTION II. INGREDIENTS AND HAZARDS

	%	HAZARD DATA
Formaldehyde (HCHO)	37-55*	TLV 2 ppm (C)**
Methanol (CH ₃ OH) (MSDS #352)	0.0-15*	8-hr TWA 200 ppm (skin)
Formic acid (HCOOH) (MSDS #416)	Trace	8-hr TWA 5 ppm
Water	Remainder	

*Level is controlled by the purchase specification.
**ACGIH (1981) ceiling level 2 ppm. NIOSH (1977) proposed 1.0 ppm TWA (30 minute sampling period). Current OSHA 8-hr TWA is 3 ppm.
"Formaldehyde should be handled as a potential occupational carcinogen". OSHA/NIOSH (1981).

HCHO
Rat, Inhalation
TDLo 6-15 ppm/24Mo-I
(Nasal Cancer)

SECTION III. PHYSICAL DATA

	37% HCHO		50% HCHO	
	1% CH ₃ OH	7% CH ₃ OH	15% CH ₃ OH	1.5% CH ₃ OH
Boiling pt, 1 atm, deg C	ca 100	ca 100	ca 100	ca 100
Specific gravity, 25/25 C	1.11	1.09	1.075	1.14
Water solubility at 25 C	Soluble	Soluble	Soluble	Soluble
Flash pt (TCC), deg F (C)	177 (80.5)	156 (69)	122 (50)	155 (68.5)
Min. storage temp, deg F (C)	ca 70 (21.1)	ca 60 (15.6)	ca 40 (4.4)	ca 120 (49)

Appearance & Odor: Clear, water-white liquid with a pungent odor which is detectable at about 1 ppm HCHO.

SECTION IV. FIRE AND EXPLOSION DATA

	LOWER	UPPER
Flash Point and Method (TCC) 120-185 F (50-80 C) (See Sect. III)		
Autoignition Temp.	7	73
Flammability Limits In Air % HCHO by vol.		

Extinguishing Media: Water spray, dry chemical, "alcohol" foam, or CO₂. Use water spray to flush spills from area of exposure and/or to dilute to nonflammable mixtures. Use water spray to cool fire-exposed containers.
Firefighters should use self-contained breathing apparatus and full protection for eyes and skin when this material is involved in a fire situation.

SECTION V. REACTIVITY DATA

Formalin solutions can undergo a nonhazardous self-polymerization to form paraformaldehyde which precipitates out of solution. (Methanol content stabilizer.) Will polymerize with active organic materials such as phenol.
Oxygen from the air can oxidize formaldehyde to formic acid, especially when heated.
Formic acid is corrosive!
Acid catalysis can produce impurities: methylal, CH₂(OCH₃)₂ (from HCHO and CH₃OH) and methyl formate (from HCOOH and CH₃OH).
Avoid contact of this combustible liquid with strong oxidizing agents!

SECTION VI. HEALTH HAZARD INFORMATION

TLV 2 ppm or 3 mg/m³ Ceiling Level

Formaldehyde is toxic by inhalation, by repeated or prolonged skin contact, or by ingestion. Inhaled vapors (2-5 ppm) can be irritating to the eyes, nose and upper respiratory tract. It can irritate and damage all body tissue it contacts and can cause allergic sensitization. Repeated or prolonged contact with skin can cause hardening and cracking. Ingestion causes severe acidosis from metabolism of formaldehyde to formic acid resulting in severe stomach pain, nausea, coma, and even death; a mean lethal dose is about 2 oz of 37% formalin.

FIRST AID:

- Eye Contact: Immediately rinse with running water for 15 minutes. Contact physician.
- Skin Contact: Wash thoroughly and promptly with soap and water.
- Inhalation: Remove from exposure. Get medical attention for severe exposure or if irritation persists. [Possible edema for high level exposure (ca 50 ppm)].
- Ingestion: Given victim 2 or 3 glasses of milk or water and induce vomiting. Get medical attention. Combat shock and respiratory failure.

SECTION VII. SPILL, LEAK, AND DISPOSAL PROCEDURES

Plan in advance for prompt handling of emergency situations. Evacuate area for massive spills. Remove sources of heat or ignition. Provide adequate ventilation. Clean up personnel to use approved respirators and appropriate protective clothing. Confine spills by diking. Neutralize with aqueous ammonia or complex with sodium sulfite. Wash residue with dilute ammonia to eliminate vapor.

DISPOSAL: Waste formalin can be incinerated. Neutralized solutions to be disposed in an approved landfill. Follow Federal, State and Local regulations. (EPA hazardous waste number under RCRA for formaldehyde is U122, 40CRF261).

AQUATIC TOXICITY: TLm 96: 100-10 ppm. Keep formalin out of sewage system and surface water. EPA (CWA) Reportable quantity (RQ) in event of spills is 1000 lb.

SECTION VIII. SPECIAL PROTECTION INFORMATION

Provide adequate exhaust ventilation to meet TLV requirements. Use totally enclosed processing as much as possible and reduce workplace exposure to minimum feasible level. For nonroutine or emergencies above the TLV use organic cartridge respirator up to 12 mg/m³, canister respirator up to 120 mg/m³, or a self-contained or air-supplied respirator above 120 mg/m³. A full facepiece is required for all levels of exposure above the TLV.

Prevent skin contact by using impervious gloves, sleeves, aprons, trousers, and rubber boots as required. Use chemical safety goggles where splashing is possible plus a face shield where splashing is probable.

Provide safety showers, washing facilities, and eyewash stations in areas where formalin is handled or used.

SECTION IX. SPECIAL PRECAUTIONS AND COMMENTS

Store in closed containers, well protected from possible damage. Store under controlled temp. (See Sects. III, V). Control inventory. Transfers of formalin must follow established safe procedures. Personnel working with formaldehyde must be trained in its use and for emergency situations. They should be medically evaluated regularly. Avoid prolonged or repeated contact or breathing of vapors. Use adequate ventilation. Practice good personal hygiene. No eating or smoking in use or storage area. Wash contaminated clothing before re-use. Discard contaminated shoes.

DOT: Combustible liquid or ORM-A (containers less than 110 gal.)

I.D. No. UN2209, 1198

DATA SOURCE(S) CODE: 2-12, 16, 19, 23-26, 31, 34, 37-39

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