



U.S. Department  
of Transportation  
**Research and  
Special Programs  
Administration**

400 Seventh St., S.W.  
Washington, D.C. 20590

JUL 13 2001

Ms. Carol McCulley  
Explant Services  
World Heart, Inc.  
7799 Pardee Lane  
Oakland, CA 94612

Reference No.: 01-0120

This is in response to your May 10, 2000 letter requesting clarification of the proper shipping name for a Formaldehyde solution containing 10% neutral buffered formalin under the Hazardous Materials Regulations (HMR; 49 CFR Parts 171-180). Specifically, you ask whether the proper shipping name should be "Environmentally hazardous substances, liquid, n.o.s." or "Aviation regulated liquid, n.o.s."

Either shipping name may be used, however, the preferred proper shipping name is "Aviation regulated liquid, n.o.s." The entry "Aviation regulated liquid, n.o.s." was added to the § 172.101 Hazardous Materials Table in a final rule published March 5, 1999 (Docket HM-215C; 64 FR 10741) for alignment with the ICAO Technical Instructions and the UN Recommendations.

I trust you find the information helpful.

Sincerely,

Hattie L. Mitchell  
Chief, Regulatory Review and Reinvention  
Office of Hazardous Materials Standards

**WORLDHEART**

World Heart Inc.  
7799 Pardee Lane  
Oakland, CA 94621  
Phone: 510.563.5000 Fax: 510.563.5005  
www.worldheart.com

Corbin  
\$172.101  
Proper Shipping Name

10 May, 2000

Attention: Edward Mazzulo  
Director of Hazardous Materials Standards  
Department of Transportation  
400 7th Street, SW  
Washington, D.C. 20590

Dear Mr. Mazzulo:

We provide a shipping box for our customers to return our Left Ventricular Assist Device when it is removed from a patient. The box contains a total amount of approximately 560 ml of 10% neutral buffered formalin in five containers when returned to us. We do not provide the 10% neutral buffered formalin.

Currently, our shipping information is: Environmentally hazardous substances, liquid, n.o.s. (formaldehyde), UN3082, packing group III, hazard class 9. I have MSDS forms from various manufacturers of 10% neutral buffered formalin. They disagree as to the proper shipping name and UN classification. I have been informed by the manufacturer of the shipping box we use that the correct information should now be: Aviation regulated liquid, n.o.s. (10% buffered formalin), UN3334, no packing group, hazard class 9.

We would appreciate confirmation that Aviation regulated liquid, n.o.s. (10% buffered formalin) UN3334, no packing group, hazard class 9 is the proper shipping name/description and shipping information.

Thank you very much.

Regards,



Carol McCulley  
Explant Services  
World Heart, Inc.  
(510) 563-4971 (phone)  
(510) 569-4914 (fax)  
carol.mcculley@worldheart.com (e-mail)

Attachments: 4 MSDS forms from various manufacturers



**WORLDHEART**

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www.worldheart.com

Department of Transportation  
400 7th Street, SW  
Washington, DC 20590  
Attn: Edward Mazzulo  
Director of Hazardous Materials



# SIGMA-ALDRICH

## Material Safety Data Sheet

Date Printed: 04/18/2001  
Date Updated: 10/27/2000  
Version 1.20

### Section 1 - Product and Company Information

Product Name	FORMALDEHYDE		
Product Number	F1635		
Brand	Sigma Chemical		
Company	Sigma-Aldrich		
Street Address	3050 Spruce Street		
City, State, Zip, Country	St. Louis, MO 63103 US		
Technical Phone:	314 771 5765	Emergency Phone:	414 273 3850 Ext.5996
Fax:	800 325 5052		

### Section 2 - Composition/Information on Ingredient

Substance Name  
FORMALDEHYDE

CAS #  
50-00-0

SARA 313  
Yes

Formula  
Synonyms

CH<sub>2</sub>O  
Aldehyde formique (French), Aldehyd mravenci (Czech), Aldeide formica (Italian), BFV, Fannoform, Formaldehyde (ACGIH:OSHA), Formaldehyd (Czech, Polish), Formaldehyde, gas, Formalin, Formalin 40, Formalina (Italian), Formaline (German), Formalin-loesungen (German), Formalith, Formic aldehyde, Formol, FYDE, Lysoform, Methaldehyde, Methanal, Methyl aldehyde, Methylene oxide, Morbiciid, NCI-C02799, Oplossingen (Dutch), Oxomethane, Oxymethylene, Paraform, RCRA waste number U122, Superlysoform

### Section 3 - Hazards Identification

#### Emergency Overview

Toxic.

Toxic by inhalation, in contact with skin, and if swallowed. Causes burns. May cause sensitization by inhalation and skin contact.

Possible risk of irreversible effects. May cause heritable genetic damage.

Potential cancer hazard. Contains formaldehyde. Readily absorbed through skin. Lachrymator. Combustible liquid. Target organ(s): Eyes. Kidneys.

#### HMIS Rating

Health: 3\*      Flammability: 2      Reactivity: 1

#### NFPA Rating

Health: 3      Flammability: 2      Reactivity: 1

\*additional chronic hazards present. For additional information on toxicity, please refer to Section 11.

### Section 4 - First Aid Measures

#### Oral Exposure

If swallowed, wash out mouth with water provided person is conscious. Call a physician immediately.

#### Inhalation Exposure

If inhaled, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen.

**Dermal Exposure**

In case of skin contact, flush with copious amounts of water for at least 15 minutes. Remove contaminated clothing and shoes. Call a physician.

**Eye Exposure**

In case of contact with eyes, flush with copious amounts of water for at least 15 minutes. Assure adequate flushing by separating the eyelids with fingers. Call a physician.

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**Section 5 - Fire Fighting Measures**

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Flash Point: 147.2 °F 64 °C  
Explosion Limits: Lower: 7 % Upper: 73 %  
Autoignition Temp: 300 °C

Not Class 3!  
Class 3!  
Reclassified  
DHM-21.2  
7/11/01

**Extinguishing Media****Suitable**

Carbon dioxide, dry chemical powder, or appropriate foam.

**Firefighting****Protective Equipment**

Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

**Specific Hazard(s)**

Combustible liquid. Emits toxic fumes under fire conditions.

**Specific Method(s) of Fire Fighting**

Use water spray to cool fire-exposed containers.

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**Section 6 - Accidental Release Measures**

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**Procedure to be Followed in Case of Leak or Spill**

Evacuate area.

**Procedure(s) of Personal Precaution(s)**

Wear self-contained breathing apparatus, rubber boots, and heavy rubber gloves.

**Methods for Cleaning Up**

Cover with dry lime or soda ash, pick up, keep in a closed container, and hold for waste disposal. Ventilate area and wash spill site after material pickup is complete.

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**Section 7 - Handling and Storage**

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**Handling****User Exposure**

Do not breathe vapor. Do not get in eyes, on skin, on clothing. Avoid prolonged or repeated exposure.

**Storage****Suitable**

Keep tightly closed. Keep away from heat and open flame. Store in a cool dry place.

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**Section 8 - Exposure Controls / PPE**

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**Engineering Controls**

Use only in a chemical fume hood. Safety shower and eye bath.

**Personal Protective Equipment****Respiratory**

NIOSH/MSHA-approved respirator.

**Hand**

Compatible chemical-resistant gloves.

**Eye**  
Chemical safety goggles.  
**Other**  
Faceshield (8-inch minimum).

**General Hygiene Measures**

Wash contaminated clothing before reuse. Discard contaminated shoes. Wash thoroughly after handling.

**Exposure Limits, RTECS**

<u>Country</u>	<u>Source</u>	<u>Type</u>	<u>Value</u>	<u>Remarks</u>
USA	ACGIH	Ceiling	0.37 MG/M3 (0.3 PPM)	
USA	MSHA Standard	concentration		
		Ceiling	2 PPM (3 MG/M3)	
USA	OSHA.	concentration		
New Zealand	OEL	PEL	SEE 1910.1048	
USA	NIOSH	TWA Ceiling	0.016 PPM 0.1 PPM/15M	check ACGIH TLV
		concentration		

**Section 9 - Physical/Chemical Properties**

<b>Appearance</b>		
<b>Physical State</b>	<b>Color</b>	<b>Form</b>
Liquid	Colorless	Clear liquid
<b>Molecular Weight:</b>	30.03 AMU	
<b><u>Property</u></b>	<b><u>Value</u></b>	<b><u>At Temperature or Pressure</u></b>
pH	N/A	
BP/BP Range	N/A	
MP/MP Range	N/A	
Freezing Point	N/A	
Vapor Pressure	52 mmHg	37 °C
Vapor Density	1.03 g/l	
Saturated Vapor Conc.	N/A	
SG/Density	1.016 g/cm3	
Bulk Density	N/A	
Odor Threshold	N/A	
Volatile%	N/A	
VOC Content	N/A	
Water Content	N/A	
Solvent Content	N/A	
Evaporation Rate	N/A	
Viscosity	N/A	
Partition Coefficient	N/A	
Decomposition Temp.	N/A	
Flash Point °F	147.2 °F	
Flash Point °C	64 °C	
Explosion Limits	Lower: 7 %	
	Upper: 73 %	
Autoignition Temp	300 °C	
Refractive Index	1.339	
Solubility	N/A	

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## Section 10 - Stability and Reactivity

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### Stability

#### Stable

Stable.

#### Materials to Avoid

Incompatible with: aniline, phenol, isocyanates, anhydrides, Strong acids, Strong bases, Strong oxidizing agents, Amines, Peroxides.

### Hazardous Decomposition Products

#### Hazardous Decomposition Products

Carbon monoxide, Carbon dioxide.

### Hazardous Polymerization

#### Hazardous Polymerization

Will not occur.

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## Section 11 - Toxicological Information

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### Route of Exposure

#### Skin Contact

Causes burns.

#### Skin Absorption

Readily absorbed through skin. Toxic if absorbed through skin.

#### Eye Contact

Causes burns.

#### Inhalation

Toxic if inhaled. Material is extremely destructive to the tissue of the mucous membranes and upper respiratory tract.

#### Ingestion

Ingestion can cause immediate burning pain in the mouth, throat, abdomen; severe swelling of the larynx and skeletal paralysis affecting the ability to breathe, circulatory shock, and convulsions. Toxic if swallowed.

### Sensitization

#### Sensitization

May cause allergic respiratory and skin reactions

### Target Organ(s) or System(s)

Eyes. Kidneys. Liver. Heart.

### Signs and Symptoms of Exposure

Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin. Inhalation may result in spasm, inflammation and edema of the larynx and bronchi, chemical pneumonitis, and pulmonary edema. Symptoms of exposure may include burning sensation, coughing, wheezing, laryngitis, shortness of breath, headache, nausea, and vomiting. Exposure can cause: Coughing, chest pains, difficulty in breathing, Gastrointestinal disturbances. May cause convulsions. To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

RTECS Number: LP8925000

### Toxicity Data

Oral - Woman: 108 mg/kg (LDLO)

Oral - Woman: 1 ML/KG (LDLO)

Remarks: Behavioral:Coma.

Cardiac:Other changes.

Gastrointestinal:Alteration in gastric secretion.

Oral - Rat: 100 mg/kg (LD50)

Inhalation - Rat: 203 mg/m3 (LC50)

Remarks: Peripheral Nerve and Sensation:Spastic paralysis with or without sensory change.

Behavioral:Convulsions or effect on seizure threshold.

Behavioral:Excitement.

Subcutaneous - Rat: 420 MG/KG (LD50)  
Remarks: Lungs, Thorax, or Respiration:Acute pulmonary edema.  
Lungs, Thorax, or Respiration:Bronchiolar constriction.

Intravenous - Rat: 87 MG/KG (LD50)

Oral - Mouse: 42 mg/kg (LD50)  
Remarks: Behavioral:Somnolence (general depressed activity).  
Behavioral:Convulsions or effect on seizure threshold.  
Behavioral:Excitement.

Inhalation - Mouse: 454,000 mg/m3 (LC50)

Subcutaneous - Mouse: 300 MG/KG (LD50)  
Remarks: Lungs, Thorax, or Respiration:Acute pulmonary edema.  
Lungs, Thorax, or Respiration:Bronchiolar constriction.

Skin - Rabbit: 270 UL/KG (LD50)

Oral - Guinea pig: 260 mg/kg (LD50)

#### **Irritation Data**

Skin - Human: 0.15 mg 3D I  
Remarks: Mild irritation effect

Eyes - Human: 4 ppm 5M

Eyes - Human: 1 ppm 6M  
Remarks: Mild irritation effect

Skin - Rabbit: 2 mg 24H  
Remarks: Severe irritation effect

Skin - Rabbit: 540 mg  
Remarks: Open irritation test

Skin - Rabbit: 50 mg 24H  
Remarks: Moderate irritation effect

Eyes - Rabbit: 0.75 mg 24H  
Remarks: Severe irritation effect

Eyes - Rabbit: 0.75 mg  
Remarks: Severe irritation effect

Eyes - Rabbit: 10 mg  
Remarks: Severe irritation effect

#### **Chronic Exposure Carcinogen**

Result: This product is or contains a component that has been reported to be possibly carcinogenic based on its IARC, ACGIH, NTP, or EPA classification.

Rat - Oral: 109 GM/KG 2Y C  
Result: Tumorigenic:Carcinogenic by RTECS criteria. Gastrointestinal:Tumors. Blood:Leukemia

Rat - Inhalation: 14300 PPB 6H/2Y I  
Result: Tumorigenic:Carcinogenic by RTECS criteria. Sense Organs and Special Senses (Nose, Eye, Ear, and Taste):Olfaction:Tumors.

Rat - Subcutaneous: 1170 MG/KG 65W I  
Result: Tumorigenic:Equivocal tumorigenic agent by RTECS criteria. Tumorigenic:Tumors at site or application.

Mouse - Inhalation: 14300 PPB 6H/2Y I  
Result: Tumorigenic:Equivocal tumorigenic agent by RTECS criteria. Sense Organs and Special Senses (Nose, Eye, Ear, and Taste):Olfaction:Tumors.

Rat - Inhalation: 15 PPM 6H/78W I  
Result: Tumorigenic:Carcinogenic by RTECS criteria. Sense Organs and Special Senses (Nose, Eye, Ear, and Taste):Olfaction:Tumors.

Rat - Subcutaneous: 350 MG/KG 78W I  
Result: Tumorigenic:Equivocal tumorigenic agent by RTECS criteria. Skin and Appendages: Other: Tumors.  
Tumorigenic:Tumors at site or application.



Rat - Inhalation: 6 PPM 6H/2Y I  
Result: Tumorigenic: Equivocal tumorigenic agent by RTECS criteria. Sense Organs and Special Senses (Nose, Eye, Ear, and Taste): Olfaction: Tumors.

Rat - Inhalation: 15 PPM 6H/86W I  
Result: Tumorigenic: Carcinogenic by RTECS criteria. Sense Organs and Special Senses (Nose, Eye, Ear, and Taste): Olfaction: Tumors.

Rat - Inhalation: 14 PPM 6H/84W I  
Result: Tumorigenic: Carcinogenic by RTECS criteria. Sense Organs and Special Senses (Nose, Eye, Ear, and Taste): Olfaction: Tumors.

Rat - Inhalation: 18750 UG/M3 2Y- I  
Result: Tumorigenic: Equivocal tumorigenic agent by RTECS criteria. Sense Organs and Special Senses (Nose, Eye, Ear, and Taste): Olfaction: Tumors.

Mouse - Inhalation: 15 PPM 6H/104W I  
Result: Tumorigenic: Equivocal tumorigenic agent by RTECS criteria. Sense Organs and Special Senses (Nose, Eye, Ear, and Taste): Olfaction: Tumors.

Rat - Inhalation: 15 PPM 6H/2Y I  
Result: Tumorigenic: Carcinogenic by RTECS criteria. Sense Organs and Special Senses (Nose, Eye, Ear, and Taste): Olfaction: Tumors.

Rat - Inhalation: 5600 PPB 6H/2Y I  
Result: Tumorigenic: Equivocal tumorigenic agent by RTECS criteria. Sense Organs and Special Senses (Nose, Eye, Ear, and Taste): Olfaction: Tumors.

Rat - Inhalation: 14300 PPB 6H/2Y I  
Result: Tumorigenic: Equivocal tumorigenic agent by RTECS criteria. Sense Organs and Special Senses (Nose, Eye, Ear, and Taste): Olfaction: Tumors.

#### OSHA Carcinogen List

##### Rating

Potential cancer hazard.

#### IARC Carcinogen List

##### Rating

Group 2A

#### NTP Carcinogen List

##### Rating

Anticipated to be a carcinogen.

#### ACGIH Carcinogen List

##### Rating

A2

#### Chronic Exposure - Teratogen

<u>Species</u>	<u>Dose</u>	<u>Route of Application</u>	<u>Exposure Time</u>
Rat	168 MG/KG	Oral	(1-21D PREG)
	Result: Specific Developmental Abnormalities: Hepatobiliary system.		
Rat	1 MG/M3/24H	Inhalation	(1-22D PREG)
	Result: Effects on Embryo or Fetus: Cytological changes (including somatic cell genetic material).		
Rat	500 UG/M3/4H	Inhalation	(1-19D PREG)
	Result: Specific Developmental Abnormalities: Musculoskeletal system.		
	Effects on Newborn: Behavioral.		
Rat	168 MG/KG	Oral	(1-21D PREG)
	Result: Specific Developmental Abnormalities: Hepatobiliary system.		
Mouse	240 MG/KG	Intraperitoneal	(7-14D PREG)
	Result: Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).		
	Specific Developmental Abnormalities: Craniofacial (including nose and tongue).		
	Specific Developmental Abnormalities: Musculoskeletal system.		
Mouse	240 MG/KG	Intraperitoneal	(7-14D PREG)
	Result: Effects on Embryo or Fetus: Fetal death.		
Mouse	160 MG/KG	Intraperitoneal	(7-14D PREG)
	Result: Specific Developmental Abnormalities: Other developmental abnormalities.		

**Chronic Exposure - Mutagen**

<u>Species</u>	<u>Dose</u>	<u>Route</u>	<u>Exposure Time</u>	<u>Cell Type</u>	<u>Mutation test</u>
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Result: May alter genetic material.

Human	10 UMOL/L			lymphocyte	DNA damage
Human	100 UMOL/L			fibroblast	DNA damage
Human	100 UMOL/L			lung	DNA damage
Human	100 UMOL/L			Other cell types	DNA damage
Human	10 NMOL/L			HeLa cell	Unscheduled DNA synthesis
Human	210 UMOL/L			Other cell types	DNA inhibition
Human	210 UMOL/L			Other cell types	Other mutation test systems
Human	400 UMOL/L			HeLa cell	DNA inhibition
Human	10 MG/L			lymphocyte	Other mutation test systems
Human	10 MG/L			lymphocyte	Cytogenetic analysis
Human	2 MMOL/L			fibroblast	Cytogenetic analysis
Human	125 UMOL/L			lymphocyte	Sister chromatid exchange
Human	130 UMOL/L			lymphocyte	Mutation in mammalian somatic cells,
Rat	200 MG/KG	Oral	30H		Micronucleus test
Rat	100 UMOL/L		3H		Morphological transformation.
Rat	1 MMOL/L			kidney	DNA damage
Rat	35 UG/M3/8W-I	Inhalation		liver	DNA damage
Rat	10 UMOL/KG	Oral			DNA damage
Rat	500 UMOL/L				DNA damage
Rat	200 UMOL/L			Other cell types	DNA damage
Rat	50 UMOL/L			Other cell types	DNA damage
Rat	55 MG/KG	Oral		Other cell types	Unscheduled DNA synthesis
Rat	400 MMOL/L				Unscheduled DNA synthesis
Rat	100 UMOL/L			liver	Unscheduled DNA synthesis
Rat	100 UMOL/L			Other cell types	DNA inhibition
Rat	500	Inhalation		Other cell types	Other mutation test systems
Rat	UG/M3/17W-C				Cytogenetic analysis
Rat	15 PPM	Inhalation	5D		Cytogenetic analysis
Rat	625 UG/KG	Intraperitoneal	5D		Dominant lethal test
Rat	200 MG/KG	Oral			sperm
Rat	625 UG/KG	Intraperitoneal	5D		sperm
Mouse	25 MG/L (+S9)			lymphocyte	Mutation in microorganisms
Mouse	1 MG/L			Embryo	Morphological transformation.
Mouse	250 UMOL/L			liver	DNA damage
Mouse	125 UMOL/L			leukocyte	DNA damage
Mouse	100 MG/KG	Oral			Cytogenetic analysis
Mouse	15 MG/KG	Intraperitoneal			Cytogenetic analysis
Mouse	74 MG/L			lymphocyte	Mutation in mammalian somatic cells.
Mouse	10 MG/KG			E. coli	Host-mediated assay
Hamster	125 UG/L			Embryo	Morphological transformation.
Hamster	4 MG/L			kidney	Morphological transformation.
Hamster	1 MMOL/L			ovary	DNA damage
Hamster	3 UL/L			Embryo	Phage inhibition capacity
Hamster	18 MG/L			lung	Cytogenetic analysis
Hamster	200 UG/L			ovary	Cytogenetic analysis
Hamster	67 UMOL/L			lung	Sister chromatid exchange
Hamster	110 UG/L			ovary	Sister chromatid exchange
Hamster	1 MMOL/L			ovary	Mutation in mammalian somatic cells.
Chicken	500 PPM			leukocyte	DNA damage
Domestic Animals	23 MG/KG	Intratesticular			sperm
Mammal	500 PPM			lymphocyte	DNA
Mammal	660 MMOL/L			lymphocyte	DNA damage

**Chronic Exposure - Reproductive Hazard**

<u>Species</u>	<u>Dose</u>	<u>Route of Application</u>	<u>Exposure Time</u>
Rat	200 MG/KG	Oral	(1D MALE)
Result: Paternal Effects: Spermatogenesis (including genetic material, sperm morphology, motility, and count).			
Rat	168 MG/KG	Oral	(1-21D PREG)
Result: Effects on Newborn: Biochemical and metabolic.			
Rat	12 UG/M3/24H	Inhalation	(15D PRE/1-22D PREG)
Result: Effects on Newborn: Growth statistics (e.g., reduced weight gain). Effects on Newborn: Other postnatal measures or effects.			
Rat	12 UG/M3/24H	Inhalation	(1-22D PREG)
Result: Effects on Newborn: Biochemical and metabolic.			
Rat	35 UG/M3/8H	Inhalation	(60D MALE)
Result: Paternal Effects: Spermatogenesis (including genetic material, sperm morphology, motility, and count). Paternal Effects: Other effects on male.			
Rat	12 UG/M3/24H	Inhalation	(20D PRE/1-22D PREG)
Result: Effects on Newborn: Biochemical and metabolic.			
Rat	80 MG/KG	Intraperitoneal	(10D MALE)
Result: Paternal Effects: Testes, epididymis, sperm duct. Paternal Effects: Prostate, seminal vesicle, Cowper's gland, accessory glands.			
Rat	46243 MG/KG	Subcutaneous	(20D MALE)
Result: Paternal Effects: Testes, epididymis, sperm duct.			
Rat	400 MG/KG	Intratesticular	(1D MALE)
Result: Effects on Fertility: Male fertility index (e.g., # males impregnating females per # males exposed to fertile nonpregnant females).			
Mouse	500 MG/KG	Intraperitoneal	(5D MALE)
Result: Paternal Effects: Spermatogenesis (including genetic material, sperm morphology, motility, and count).			
Mouse	259 MG/KG	Intramuscular	(11D PREG)
Result: Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants). Effects on Embryo or Fetus: Fetal death.			
Dog	7 MG/KG	Intratesticular	(1D MALE)
Result: Paternal Effects: Testes, epididymis, sperm duct.			
Monkey	4 MG/KG	Intratesticular	(1D MALE)
Result: Paternal Effects: Spermatogenesis (including genetic material, sperm morphology, motility, and count).			
Domestic Animals	6687 UG/KG	Intratesticular	(1D MALE)
Result: Paternal Effects: Spermatogenesis (including genetic material, sperm morphology, motility, and count). Paternal Effects: Testes, epididymis, sperm duct.			

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**Section 12 - Ecological Information**

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**Section 13 - Disposal Considerations**

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**Appropriate Method of Disposal of Substance or Preparation**

Contact a licensed professional waste disposal service to dispose of this material.

Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Observe all federal, state, and local environmental regulations.

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**Section 14 - Transport Information**

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**DOT**

Proper Shipping Name: Formaldehyde, solutions, flammable

UN#: 1198

Class: 3

Packing Group: Packing Group III

PIH: Not PIH

**IATA**

Proper Shipping Name: Formaldehyde solution, flammable

IATA Number: 1198

Hazard Class: 3

Packing Group: III

pg 2 flashpt: 147.2°F  
64°C  
is Not Class 3!

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## Section 15 - Regulatory Information

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### EU Directives Classification

**Symbol of Danger:** T

**Indication of Danger**

Toxic.

**Risk Statements**

**R:** 23/24/25 34 40 43

Toxic by inhalation, in contact with skin, and if swallowed. Causes burns. Possible risk of irreversible effects. May cause sensitization by skin contact.

**Safety Statements**

**S:** 26 36/37 39 45 51

In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Wear suitable protective clothing and gloves. Wear eye/face protection. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). Use only in well ventilated areas.

### US Classification and Label Text

**Indication of Danger**

Toxic.

**Risk Statements**

Toxic by inhalation, in contact with skin, and if swallowed. Causes burns. May cause sensitization by inhalation and skin contact. Possible risk of irreversible effects. May cause heritable genetic damage.

**Safety Statements**

In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Wear suitable protective clothing, gloves, and eye/face protection. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). Use only in well ventilated areas.

**US Statements**

Potential cancer hazard. Contains formaldehyde. Readily absorbed through skin. Lachrymator. Combustible liquid. Target organ(s): Eyes. Kidneys.

### United States Regulatory Information

**Listed:** Yes

**Deminimis:** 0.1 %

**Notes:** This product is subject to SARA section 313 reporting requirements.

**TSCA Inventory Item:** Yes

### United States - State Regulatory Information

**California Prop - 65**

California Proposition 65: This product is or contains chemical(s) known to the state of California to cause cancer. California

Proposition 65: This product is or contains chemical(s) known to the state of California to cause cancer.

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## Section 16 - Other Information

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### Warranty

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. Sigma-Aldrich Inc., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale. Copyright 2001 Sigma-Aldrich Co. License granted to make unlimited paper copies for internal use only.



**SIGMA-ALDRICH**

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St. Louis, MO 63103 US  
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Emergency Phone: 414 273 3850 Ext. 5696  
Fax: 800 325 5052  
[www.sigma-aldrich.com](http://www.sigma-aldrich.com)

4/18/01

## Sigma-Aldrich MSDS

### ***The MSDS that surpasses them all.***

The MSDS for more than 85,000 Sigma, Aldrich, Fluka, Supelco, and Riedel-de Haen chemicals on compact disc or magnetic tape. MSDS are arranged in 16 chapter format and are available in six languages:

- ◆ English
- ◆ Dutch
- ◆ French
- ◆ German
- ◆ Italian
- ◆ Spanish

Subscribers receive quarterly updates on a new CD-ROM or magnetic tape that includes new products and updated safety information. The CD-ROM includes versions for Microsoft Window...etc.

To order call your local Sigma-Aldrich office or visit [www.sigma-aldrich.com](http://www.sigma-aldrich.com)

### **[www.sigma-aldrich.com](http://www.sigma-aldrich.com) has a new look!**

We have made some exciting upgrades to our website as well as given it a new look. Some of the things you've been familiar with are improved upon and have possibly been relocated. Please take some time to familiarize yourself with our new, more unified, navigation system.



# SIGMA-ALDRICH

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CAROL MCCULLEY  
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US

4/18/01

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Dear Sigma-Aldrich Customer

We recently reorganized our MSDS to better serve you, our valued customer. In addition to an updated look, our sheets now feature a revision date, NFPA/HMIS ratings, and transportation information.

As always, customer service is our top priority. Please contact the MSDS department toll-free at 800-521-8956 ext. 2143 if you have any questions or comments.

**MSDS Reference Number: P10515789**

**Attached please find the Material Safety Data Sheets you requested.**

Material: Sigma Chemical - F1635 FORMALDEHYDE  
Substance : 50-00-0 FORMALDEHYDE SARA 313: Yes

# Material Safety Data Sheet

## 10 % Buffered Formalin

ACC# 41129

### Section 1 - Chemical Product and Company Identification

**MSDS Name:** 10 % Buffered Formalin

**Catalog Numbers:** SF99 20, SF99 4, SF9920, SF994

**Synonyms:** None.

**Company Identification:**

Fisher Scientific  
1 Reagent Lane  
Fair Lawn, NJ 07410

**For information, call:** 201-796-7100

**Emergency Number:** 201-796-7100

**For CHEMTREC assistance, call:** 800-424-9300

**For International CHEMTREC assistance, call:** 703-527-3887

### Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
50-00-0	Formaldehyde	3.9-4.0	200-001-8
67-56-1	Methyl Alcohol	2.0 %	200-659-6
127-09-3	Sodium Acetate	1.2-2.0	204-823-8
7732-18-5	Water	Balance	231-791-2

### Section 3 - Hazards Identification

#### EMERGENCY OVERVIEW

Appearance: not available. Flash Point: > 194 deg F. **Danger!** May cause allergic respiratory reaction. May cause allergic skin reaction. This substance has caused adverse reproductive and fetal effects in animals. May cause central nervous system depression. Causes eye and skin irritation. Causes digestive and respiratory tract irritation. Contains formaldehyde. Potential cancer hazard. May be harmful if swallowed or absorbed through the skin.

**Target Organs:** Central nervous system.

#### Potential Health Effects

**Eye:** Causes eye irritation.

**Skin:** Causes skin irritation. May cause skin sensitization, an allergic reaction, which becomes evident upon re-exposure to this material.

**Ingestion:** Cannot be made non-poisonous. May cause central nervous system depression, kidney damage, and liver damage. Causes gastrointestinal irritation with nausea, vomiting and diarrhea.

**Inhalation:** Causes respiratory tract irritation. May cause allergic respiratory reaction.

**Chronic:** May cause cancer according to animal studies. May cause reproductive and fetal effects.



## Section 4 - First Aid Measures

**Eyes:** Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

**Skin:** Get medical aid. Flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes.

**Ingestion:** Do NOT induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.

**Inhalation:** Remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

**Notes to Physician:** Treat symptomatically and supportively.

## Section 5 - Firefighting Measures

**General Information:** As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

**Extinguishing Media:** For small fires, use dry chemical, carbon dioxide, water spray or alcohol-resistant foam. Cool containers with flooding quantities of water until well after fire is out.

## Section 6 - Accidental Release Measures

**General Information:** Use proper personal protective equipment as indicated in Section 8.

**Spills/Leaks:** Absorb spill with inert material, (e.g., dry sand or earth), then place into a chemical waste container. Clean up spills immediately, observing precautions in the Protective Equipment section.

## Section 7 - Handling and Storage

**Handling:** Wash thoroughly after handling. Wash hands before eating. Use only in a well-ventilated area. Do not get in eyes, on skin, or on clothing. Keep container tightly closed. Do not ingest or inhale.

**Storage:** Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

## Section 8 - Exposure Controls, Personal Protection

**Engineering Controls:** Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

**Exposure Limits**

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Formaldehyde	C 0.3 ppm	0.016 ppm TWA; NIOSH Potential Occupational Carcinogen - see Appendix A Potential NIOSH carcinogen.	0.75 ppm TWA PEL; 2 ppm STEL; 0.5 ppm TWA action level
Methyl Alcohol	200 ppm; 250 ppm STEL; skin - potential for cutaneous absorption	200 ppm TWA; 260 mg/m3 TWA 6000 ppm IDLH	200 ppm TWA; 260 mg/m3 TWA
Sodium Acetate	none listed	none listed	none listed
Water	none listed	none listed	none listed

**OSHA Vacated PELs:** Formaldehyde: 3 ppm TWA (unless specified in 1910.1048) Methyl Alcohol: 200 ppm TWA; 260 mg/m3 TWA Sodium Acetate: No OSHA Vacated PELs are listed for this chemical. Water: No OSHA Vacated PELs are listed for this chemical.

#### **Personal Protective Equipment**

**Eyes:** Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

**Skin:** Wear appropriate protective gloves to prevent skin exposure.

**Clothing:** Wear appropriate protective clothing to prevent skin exposure.

**Respirators:** Follow the OSHA respirator regulations found in 29CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.

## Section 9 - Physical and Chemical Properties

**Physical State:** Liquid

**Appearance:** not available

**Odor:** None reported

**pH:** Not available.

**Vapor Pressure:** Not available.

**Vapor Density:** Not available.

**Evaporation Rate:** Not available.

**Viscosity:** Not available.

**Boiling Point:** Not available.

**Freezing/Melting Point:** Not available.

**Decomposition Temperature:** Not available.

**Autoignition Temperature:** Not applicable.

**Flash Point:** > 194 deg F (> 90.00 deg C)

**NFPA Rating:** Not published.

**Explosion Limits, Lower:** Not available.

**Upper:** Not available.

**Solubility:** Soluble in water.

**Specific Gravity/Density:** Not available.

**Molecular Formula:** Mixture

**Molecular Weight:** Not applicable.

## Section 10 - Stability and Reactivity

**Chemical Stability:** Stable under normal temperatures and pressures.

**Conditions to Avoid:** Incompatible materials, excess heat.

**Incompatibilities with Other Materials:** Strong oxidants.  
**Hazardous Decomposition Products:** Irritating and toxic gases.  
**Hazardous Polymerization:** Has not been reported

## Section 11 - Toxicological Information

**RTECS#:**

**CAS# 50-00-0:** LP8925000

**CAS# 67-56-1:** PC1400000

**CAS# 127-09-3:** AJ4300010

**CAS# 7732-18-5:** ZC0110000

**LD50/LC50:**

**CAS# 50-00-0:**

Inhalation, mouse: LC50 = 400 mg/m<sup>3</sup>/2H;

Inhalation, rat: LC50 = 203 mg/m<sup>3</sup>;

Oral, mouse: LD50 = 42 mg/kg;

Oral, rat: LD50 = 100 mg/kg;

Skin, rabbit: LD50 = 270 mg/kg;

**CAS# 67-56-1:**

Inhalation, rat: LC50 = 64000 ppm/4H;

Oral, mouse: LD50 = 7300 mg/kg;

Oral, rabbit: LD50 = 14200 mg/kg;

Oral, rat: LD50 = 5628 mg/kg;

Skin, rabbit: LD50 = 15800 mg/kg;

**CAS# 127-09-3:**

Oral, mouse: LD50 = 6891 mg/kg;

Oral, rat: LD50 = 3530 mg/kg;

**CAS# 7732-18-5:**

Oral, rat: LD50 = >90 mL/kg;

**Carcinogenicity:**

**CAS# 50-00-0:**

**ACGIH:** A2 - suspected human carcinogen

**California:** carcinogen; initial date 1/1/88

**NIOSH:** occupational carcinogen

**NTP:** Suspect carcinogen

**OSHA:** Possible Select carcinogen

**IARC:** Group 2A carcinogen **CAS# 67-56-1:** Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA.

**CAS# 127-09-3:** Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA. **CAS# 7732-18-5:** Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA.

**Epidemiology:** No information available.

**Teratogenicity:** Formaldehyde effects on Newborn: behavioral, ihl-rat TCLo=50 ug/m<sup>3</sup>/4H; biochemical/metabolic and reduced weight gain, ihl-rat TCLo=12 ug/m<sup>3</sup>/24H. Embryo or Fetus: cytological changes, ihl-rat TCLo=1 mg/m<sup>3</sup>/24H; stunted fetus and death, ipr-mouse TDLo=240 mg/kg. Specific Developmental Abnormalities: craniofacial and musculoskeletal, ipr-mouse TDLo=240 mg/kg.

**Reproductive Effects:** Formaldehyde effects on Fertility: male index, itt-rat TDLo=400 mg/kg; post- implantation mortality, ims-mouse TDLo=259 mg/kg. Paternal Effects: spermatogenesis, ori-rat TDLo=200 mg/kg; testes/sperm duct/epididymis, ipr-rat TDLo=80 mg/kg.

**Neurotoxicity:** No information available.

**Mutagenicity:** Formaldehyde DNA Damage: human fibroblast 100 umol/L DNA Inhibition: human cell types 210 umol/L. Unscheduled DNA Synthesis: rat cell types 50 umol/L. Gene Mutation in Mammalian Cells: human lymphocyte 130 umol/L.

**Other Studies:** No data available.

## Section 12 - Ecological Information

**Ecotoxicity:** Atlantic salmon LC50=173 uL/L/96H; Catfish (fresh water) TLM=32ppm/24H; Flounder (salt water) TLM=100-330 ppm/48H; Fathead minnow LC50=10-100 uL/L/96H; Rainbow trout LC50= 168mg/L/48H; Zebrafish LC50=41mg/L/96H; Water flea LC50=52 mg/L/24H. Cas# 50-00-0: LC50(96Hr.) rainbow trout = 0.12 mL/L; flowthrough bioassay; LC50 (96Hr.) fathead minnow = 24.1 mg/L; flowthrough conditions; LC50 (96Hr.) bluegill = 0.10 mg/L; Flow-through conditions; EC50 (96Hr.) water flea = 20 mg/L; EC50 (30 min) photobacterium phospherum = 3.00-10.2 mg/L; Microtox.

**Environmental Fate:** No information found.

**Physical/Chemical:** No information found.

**Other:** Not available.

## Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

**RCRA P-Series:** None listed.

**RCRA U-Series:** CAS# 50-00-0: waste number U122. CAS# 67-56-1: waste number U154; (Ignitable waste).

## Section 14 - Transport Information

	US DOT	IATA	RID/ADR	IMO	Canada TDG
<b>Shipping Name:</b>	AVIATION REGULATED LIQUID, N.O.S. (10% FORMALIN)				No information available.
<b>Hazard Class:</b>	9				
<b>UN Number:</b>	UN3334				
<b>Packing Group:</b>					

## Section 15 - Regulatory Information

### US FEDERAL

#### TSCA

CAS# 50-00-0 is listed on the TSCA inventory.

CAS# 67-56-1 is listed on the TSCA inventory.

CAS# 127-09-3 is listed on the TSCA inventory.

CAS# 7732-18-5 is listed on the TSCA inventory.

#### Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

**Chemical Test Rules**

None of the chemicals in this product are under a Chemical Test Rule.

**Section 12b**

None of the chemicals are listed under TSCA Section 12b.

**TSCA Significant New Use Rule**

None of the chemicals in this material have a SNUR under TSCA.

**SARA****Section 302 (RQ)**

CAS# 50-00-0: final RQ = 100 pounds (45.4 kg) CAS# 67-56-1: final RQ = 5000 pounds (2270 kg)

**Section 302 (TPQ)**

CAS# 50-00-0: TPQ = 500 pounds; RQ = 100 pounds (does not meet toxicity criteria but because of high production volume and recognized toxicity is considered a chemical of concern)

**SARA Codes**

CAS # 50-00-0: acute, chronic. CAS # 67-56-1: acute, flammable.

**Section 313**

This material contains Formaldehyde (CAS# 50-00-0, 3.94%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373. This material contains Methyl Alcohol (CAS# 67-56-1, 2.0%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

**Clean Air Act:**

CAS# 50-00-0 is listed as a hazardous air pollutant (HAP). CAS# 67-56-1 is listed as a hazardous air pollutant (HAP). This material does not contain any Class 1 Ozone depleters. This material does not contain any Class 2 Ozone depleters.

**Clean Water Act:**

CAS# 50-00-0 is listed as a Hazardous Substance under the CWA. None of the chemicals in this product are listed as Priority Pollutants under the CWA. None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

**OSHA:**

CAS# 50-00-0 is considered highly hazardous by OSHA.

**STATE**

CAS# 50-00-0 can be found on the following state right to know lists: California, New Jersey, Florida, Pennsylvania, Minnesota, Massachusetts.

CAS# 67-56-1 can be found on the following state right to know lists: California, New Jersey, Florida, Pennsylvania, Minnesota, Massachusetts.

CAS# 127-09-3 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

CAS# 7732-18-5 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

**The following statement(s) is(are) made in order to comply with the California Safe**

**Drinking Water Act:** WARNING: This product contains Formaldehyde, a chemical known to the state of California to cause cancer. California No Significant Risk Level: CAS# 50-00-0: no

significant risk level = 40 ug/day **European/International Regulations**

**European Labeling in Accordance with EC Directives****Hazard Symbols:**

Not available.

**Risk Phrases:****Safety Phrases:****WGK (Water Danger/Protection)**

CAS# 50-00-0: 2

CAS# 67-56-1: 1

CAS# 127-09-3: 1

CAS# 7732-18-5: No information available.

**Canada**

CAS# 50-00-0 is listed on Canada's DSL/NDSL List.

CAS# 67-56-1 is listed on Canada's DSL/NDSL List.

CAS# 127-09-3 is listed on Canada's DSL/NDSL List.

CAS# 7732-18-5 is listed on Canada's DSL/NDSL List.

This product has a WHMIS classification of D1B, D2A.

CAS# 50-00-0 is not listed on Canada's Ingredient Disclosure List.

CAS# 67-56-1 is not listed on Canada's Ingredient Disclosure List.

CAS# 127-09-3 is not listed on Canada's Ingredient Disclosure List.

CAS# 7732-18-5 is not listed on Canada's Ingredient Disclosure List.

#### Exposure Limits

CAS# 50-00-0: OEL-ARAB Republic of Egypt:TWA 2 ppm (3 mg/m<sup>3</sup>) OEL-AUSTRALIA:TWA 1 ppm (1.5 mg/m<sup>3</sup>);STEL 2 ppm (3 mg/m<sup>3</sup>);CAR OEL-BELGIUM:TWA 1 ppm (1.2 mg/m<sup>3</sup>);STEL 2 ppm (2.5 mg/m<sup>3</sup>);CAR OEL-CZECHOSLOVAKIA:TWA 0.5 mg/m<sup>3</sup>;STEL 1 mg/m<sup>3</sup> OEL-DENMARK:STEL 0.3 ppm (0.4 mg/m<sup>3</sup>);Carcinogen OEL-FINLAND:STEL 1 ppm (1.3 mg/m<sup>3</sup>);Skin OEL-FRANCE:STEL 2 ppm (3 mg/m<sup>3</sup>) OEL-GERMANY:TWA 0.5 ppm (0.6 mg/m<sup>3</sup>);Carcinogen OEL-HUNGARY:STEL 0.6 mg/m<sup>3</sup>;Carcinogen OEL-JAPAN:TWA 0.5 ppm (0.61 mg/m<sup>3</sup>);Carcinogen OEL-THE NETHERLANDS:TWA 1 ppm (1.5 mg/m<sup>3</sup>);STEL 2 ppm (3 mg/m<sup>3</sup>) OEL-THE PHILIPPINES:TWA 5 ppm (6 mg/m<sup>3</sup>) OEL-POLAND:TWA 2 mg/m<sup>3</sup> OEL-RUSSIA:TWA 0.5 ppm;STEL 0.5 mg/m<sup>3</sup>;Skin OEL-SWEDEN:TWA 0.5 ppm (0.6 mg/m<sup>3</sup>);STEL 1 ppm (1. mg/m<sup>3</sup>) OEL-SWITZERLAND:TWA 0.5 ppm (0.6 mg/m<sup>3</sup>);STEL 1 ppm (1.2 mg/m<sup>3</sup>) OEL-THAILAND:TWA 3 ppm;STEL 5 ppm OEL-TURKEY:TWA 5 ppm (6 mg/m<sup>3</sup>) OEL-UNITED KINGDOM:TWA 2 ppm (2.5 mg/m<sup>3</sup>);STEL 2 ppm (2.5 mg/m<sup>3</sup>) OEL IN BULGARIA, COLOMBIA, JORDAN, KOREA check ACGIH TLV OEL IN NEW ZEALAND, SINGAPORE, VIETNAM check ACGI TLV

CAS# 67-56-1: OEL-ARAB Republic of Egypt:TWA 200 ppm (260 mg/m<sup>3</sup>);Skin OEL-AUSTRALIA:TWA 200 ppm (260 mg/m<sup>3</sup>);STEL 250 ppm;Skin OEL-BELGIUM:TWA 200 ppm (262 mg/m<sup>3</sup>);STEL 250 ppm;Skin OEL-CZECHOSLOVAKIA:TWA 100 mg/m<sup>3</sup>;STEL 500 mg/m<sup>3</sup> OEL-DENMARK:TWA 200 ppm (260 mg/m<sup>3</sup>);Skin OEL-FINLAND:TWA 200 ppm (260 mg/m<sup>3</sup>);STEL 250 ppm;Skin OEL-FRANCE:TWA 200 ppm (260 mg/m<sup>3</sup>);STEL 1000 ppm (1300 mg/m<sup>3</sup>) OEL-GERMANY:TWA 200 ppm (260 mg/m<sup>3</sup>);Skin OEL-HUNGARY:TWA 50 mg/m<sup>3</sup>;STEL 100 mg/m<sup>3</sup>;Skin OEL-JAPAN:TWA 200 ppm (260 mg/m<sup>3</sup>);Skin OEL-THE NETHERLANDS:TWA 200 ppm (260 mg/m<sup>3</sup>);Skin OEL-THE PHILIPPINES:TWA 200 ppm (260 mg/m<sup>3</sup>) OEL-POLAND:TWA 100 mg/m<sup>3</sup> OEL-RUSSIA:TWA 200 ppm;STEL 5 mg/m<sup>3</sup>;Skin OEL-SWEDEN:TWA 200 ppm (250 mg/m<sup>3</sup>);STEL 250 ppm (350 mg/m<sup>3</sup>);Skin OEL-SWITZERLAND:TWA 200 ppm (260 mg/m<sup>3</sup>);STEL 400 ppm;Skin OEL-THAILAND:TWA 200 ppm (260 mg/m<sup>3</sup>) OEL-TURKEY:TWA 200 ppm (260 mg/m<sup>3</sup>) OEL-UNITED KINGDOM:TWA 200 ppm (260 mg/m<sup>3</sup>);STEL 250 ppm;Skin OEL IN BULGARIA, COLOMBIA, JORDAN, KOREA check ACGIH TLV OEL IN NEW ZEALAND, SINGAPORE, VIETNAM check ACGI TLV

## Section 16 - Additional Information

**MSDS Creation Date:** 7/12/1999

**Revision #3 Date:** 8/02/2000

*The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no way shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.*

# Material Safety Data Sheet

## Formalin Neutral Buffered 10% w/v

ACC# 41127

### Section 1 - Chemical Product and Company Identification

**MSDS Name:** Formalin Neutral Buffered 10% w/v

**Catalog Numbers:** SF100 20, SF100 200, SF100 4, SF10020, SF100200, SF1004

**Synonyms:** None

**Company Identification:**

Fisher Scientific  
1 Reagent Lane  
Fair Lawn, NJ 07410

**For information, call:** 201-796-7100

**Emergency Number:** 201-796-7100

**For CHEMTREC assistance, call:** 800-424-9300

**For International CHEMTREC assistance, call:** 703-527-3887

### Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
50-00-0	Formaldehyde	4.0	200-001-8
67-56-1	Methyl alcohol	1.0-2.0	200-659-6
7558-79-4	Sodium phosphate dibasic	0.65	231-448-7
7732-18-5	Water	91.9-92.	231-791-2
10049-21-5	Sodium phosphate, Monobasic, Monohydrate	0.4	unlisted

### Section 3 - Hazards Identification

#### EMERGENCY OVERVIEW

Appearance: clear. **Danger!** May cause allergic skin reaction. This substance has caused adverse reproductive and fetal effects in animals. May cause central nervous system depression. Causes eye and skin irritation. Causes digestive and respiratory tract irritation. Contains formaldehyde. Respiratory sensitizer. Potential cancer hazard.

**Target Organs:** Central nervous system.

#### Potential Health Effects

**Eye:** Causes eye irritation. Contact may cause ulceration of the conjunctiva and cornea.

**Skin:** Causes skin irritation. May cause skin sensitization, an allergic reaction, which becomes evident upon re-exposure to this material.

**Ingestion:** Causes gastrointestinal irritation with nausea, vomiting and diarrhea. May cause central nervous system depression, characterized by excitement, followed by headache, dizziness, drowsiness, and nausea. Advanced stages may cause collapse, unconsciousness, coma and possible death due to respiratory failure. May cause systemic toxicity including central nervous system depression, convulsions, coma, and possible death due to respiratory failure.

**Inhalation:** May cause asthmatic attacks due to allergic sensitization of the respiratory tract.  
**Chronic:** Formaldehyde has been associated with nasal and nasopharyngeal cancers. Repeated exposure may cause skin discoloration and thickening and nail decay.

## Section 4 - First Aid Measures

**Eyes:** Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately. Do NOT allow victim to rub or keep eyes closed.

**Skin:** Immediately flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists. Wash clothing before reuse. Destroy contaminated shoes.

**Ingestion:** Do NOT induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

**Inhalation:** Get medical aid immediately. Remove from exposure to fresh air immediately. If breathing is difficult, give oxygen. DO NOT use mouth-to-mouth respiration. If breathing has ceased apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask.

**Notes to Physician:** Treat symptomatically and supportively.

## Section 5 - Firefighting Measures

**General Information:** As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Use water spray to keep fire-exposed containers cool. Vapors may be heavier than air. They can spread along the ground and collect in low or confined areas. Containers may explode when heated.

**Extinguishing Media:** For small fires, use dry chemical, carbon dioxide, water spray or alcohol-resistant foam. For large fires, use dry chemical, carbon dioxide, alcohol-resistant foam, or water spray. Cool containers with flooding quantities of water until well after fire is out.

## Section 6 - Accidental Release Measures

**General Information:** Use proper personal protective equipment as indicated in Section 8.

**Spills/Leaks:** Remove all sources of ignition. Absorb spill using an absorbent, non-combustible material such as earth, sand, or vermiculite. Provide ventilation. A vapor suppressing foam may be used to reduce vapors. Water spray may reduce vapor but may not prevent ignition in closed spaces.

## Section 7 - Handling and Storage

**Handling:** Wash thoroughly after handling. Use only in a well-ventilated area. Avoid contact with eyes, skin, and clothing. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Keep container tightly closed. Avoid contact with heat, sparks and flame. Do not ingest or inhale. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames.

**Storage:** Keep away from heat, sparks, and flame. Keep away from sources of ignition. Store in



a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances.

## Section 8 - Exposure Controls, Personal Protection

**Engineering Controls:** Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

### Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Formaldehyde	C 0.3 ppm	0.016 ppm TWA; NIOSH Potential Occupational Carcinogen - see Appendix A Potential NIOSH carcinogen.	0.75 ppm TWA PEL; 2 ppm STEL; 0.5 ppm TWA action level
Methyl alcohol	200 ppm; 250 ppm STEL; skin - potential for cutaneous absorption	200 ppm TWA; 260 mg/m <sup>3</sup> TWA 6000 ppm IDLH	200 ppm TWA; 260 mg/m <sup>3</sup> TWA
Sodium phosphate dibasic	none listed	none listed	none listed
Water	none listed	none listed	none listed
Sodium phosphate, Monobasic, Monohydrate	none listed	none listed	none listed

**OSHA Vacated PELs:** Formaldehyde: 3 ppm TWA (unless specified in 1910.1048) Methyl alcohol: 200 ppm TWA; 260 mg/m<sup>3</sup> TWA Sodium phosphate dibasic: No OSHA Vacated PELs are listed for this chemical. Water: No OSHA Vacated PELs are listed for this chemical. Sodium phosphate, Monobasic, Monohydrate: No OSHA Vacated PELs are listed for this chemical.

### Personal Protective Equipment

**Eyes:** Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

**Skin:** Wear appropriate protective gloves to prevent skin exposure.

**Clothing:** Wear appropriate protective clothing to prevent skin exposure.

**Respirators:** Follow the OSHA respirator regulations found in 29CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.

## Section 9 - Physical and Chemical Properties

**Physical State:** Liquid

**Appearance:** clear

**Odor:** strong odor - pungent odor

**pH:** 6.9-7.1

**Vapor Pressure:** Not available.

**Vapor Density:** 1.0

**Evaporation Rate:** >1.0

**Viscosity:** Not available.

**Boiling Point:** 201-212 deg F

**Freezing/Melting Point:** 32 deg F

**Decomposition Temperature:** Not available.

**Autoignition Temperature:** Not applicable.

**Flash Point:** Not applicable.

**NFPA Rating:** Not published.  
**Explosion Limits, Lower:** 7.0%  
**Upper:** Not available.  
**Solubility:** Soluble in water.  
**Specific Gravity/Density:** 1.10  
**Molecular Formula:** Mixture  
**Molecular Weight:** Not available.

## Section 10 - Stability and Reactivity

**Chemical Stability:** Stable under normal temperatures and pressures.

**Conditions to Avoid:** Ignition sources, oxidizers.

**Incompatibilities with Other Materials:** This solution will polymerize and separate below 0°C and above 67°C. Formaldehyde reacts with hydrochloric acid to form a potent carcinogen, bis-chloromethyl ether. It reacts explosively with nitrogen dioxide, nitromethane, perchloric acid, aniline or peroxyformic acid. Formaldehyde reacts violently when mixed with strong oxidizers.

**Hazardous Decomposition Products:** Carbon monoxide, irritating and toxic gases, carbon dioxide, formaldehyde.

**Hazardous Polymerization:** Has not been reported.

## Section 11 - Toxicological Information

### **RTECS#:**

**CAS#** 50-00-0: LP8925000

**CAS#** 67-56-1: PC1400000

**CAS#** 7558-79-4: WC4500000

**CAS#** 7732-18-5: ZC0110000

**CAS#** 10049-21-5 unlisted.

### **LD50/LC50:**

**CAS#** 50-00-0:

Inhalation, mouse: LC50 = 400 mg/m<sup>3</sup>/2H;

Inhalation, rat: LC50 = 203 mg/m<sup>3</sup>;

Oral, mouse: LD50 = 42 mg/kg;

Oral, rat: LD50 = 100 mg/kg;

Skin, rabbit: LD50 = 270 mg/kg;

**CAS#** 67-56-1:

Inhalation, rat: LC50 = 64000 ppm/4H;

Oral, mouse: LD50 = 7300 mg/kg;

Oral, rabbit: LD50 = 14200 mg/kg;

Oral, rat: LD50 = 5628 mg/kg;

Skin, rabbit: LD50 = 15800 mg/kg;

**CAS#** 7558-79-4:

Oral, rat: LD50 = 17 gm/kg;

**CAS#** 7732-18-5:

Oral, rat: LD50 = >90 mL/kg;

**CAS#** 10049-21-5:

### **Carcinogenicity:**

**CAS#** 50-00-0:

**ACGIH:** A2 - suspected human carcinogen

**California:** carcinogen; initial date 1/1/88

**NIOSH:** occupational carcinogen

**NTP:** Suspect carcinogen

**OSHA:** Possible Select carcinogen

**IARC:** Group 2A carcinogen CAS# 67-56-1: Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA. CAS# 7558-79-4: Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA. CAS# 7732-18-5: Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA. CAS# 10049-21-5: Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA.

**Epidemiology:** Formaldehyde has been shown to increase the incidence of lung cancer in workers. In another study, there was increase in mortality from lung cancer when workers were exposed to conc. over 2 ppm of formaldehyde.

**Teratogenicity:** Formaldehyde effects on Newborn: behavioral, ihl-rat TCLo=50 ug/m3/4H; biochemical/metabolic and reduced weight gain, ihl-rat TCLo=12 ug/m3/24H. Embryo or Fetus: cytological changes, ihl-rat TCLo=1mg/m3/24H; stunted fetus and death, ipr-mouse TDLo=240 mg/kg. Specific Developmental Abnormalities: craniofacial and musculoskeletal, ipr-mouse TDLo=240 mg/kg.

**Reproductive Effects:** Formaldehyde effects on Fertility: male index, itt-rat TDLo=400 mg/kg; post- implantation mortality, ims-mouse TDLo=259 mg/kg. Paternal Effects: spermatogenesis, orl-rat TDLo=200 mg/kg; testes/sperm duct/epididymis, ipr-rat TDLo=80 mg/kg.

**Neurotoxicity:** No information available.

**Mutagenicity:** Formaldehyde DNA Damage: human fibroblast 100 umol/L DNA Inhibition: human cell types 210 umol/L; Unscheduled DNA Synthesis: rat cell types 50 umol/L; Gene Mutation in Mammalian Cells: human lymphocyte 130 umol/L.

**Other Studies:** See actual entry in RTECS for complete information.

## Section 12 - Ecological Information

**Ecotoxicity:** Atlantic salmon LC50=173 uL/L/96H; Catfish (fresh water)TLm=32 ppm/24H; Flounder (salt water) TLM=100-330 ppm/48H; Fathead minnowLC50=10-100 uL/L/96H; Rainbow trout LC50= 168mg/L/48H; Zebrafish LC50=41mg/L/96H; Water flea LC50=52 mg/L/24H. LC50(96Hr.) rainbow trout = 0.12 mL/L; flowthrough bioassay;LC50 (96Hr.) fathead minnow = 24.1 mg/L; flowthrough conditions;LC50 (96Hr.) bluegill = 0.10 mg/L; Flow-through conditions;EC50 (96Hr.) water flea = 20 mg/L; EC50 (30 min) photobacterium phospherum = 3.00-10.2 mg/L; Microtox.

**Environmental Fate:** No information found.

**Physical/Chemical:** No information found.

**Other:** Not available.

## Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

**RCRA P-Series:** None listed.

**RCRA U-Series:** CAS# 50-00-0: waste number U122. CAS# 67-56-1: waste number U154; (Ignitable waste).

## Section 14 - Transport Information

	US DOT	IATA	RID/ADR	IMO	Canada TDG
Shipping Name:	AVIATION REGULATED LIQUID, N.O.S. (10% FORMALIN)				FORMALDEHYDE SOLUTIONS
Hazard Class:	9				3(8)(9.2)
UN Number:	UN3334				UN1198
Packing Group:					III

## Section 15 - Regulatory Information

### US FEDERAL

#### TSCA

CAS# 50-00-0 is listed on the TSCA inventory.

CAS# 67-56-1 is listed on the TSCA inventory.

CAS# 7558-79-4 is listed on the TSCA inventory.

CAS# 7732-18-5 is listed on the TSCA inventory.

CAS# 10049-21-5 is not on the TSCA Inventory. It is a hydrate and exempt from TSCA Inventory requirements (40CFR720.3(u)(2)).

#### Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

#### Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

#### Section 12b

None of the chemicals are listed under TSCA Section 12b.

#### TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

#### SARA

#### Section 302 (RQ)

CAS# 50-00-0: final RQ = 100 pounds (45.4 kg) CAS# 67-56-1: final RQ = 5000 pounds (2270 kg) CAS# 7558-79-4: final RQ = 5000 pounds (2270 kg)

#### Section 302 (TPQ)

CAS# 50-00-0: TPQ = 500 pounds; RQ = 100 pounds (does not meet toxicity criteria but because of high production volume and recognized toxicity is considered a chemical of concern)

#### SARA Codes

CAS # 50-00-0: acute, chronic. CAS # 67-56-1: acute, flammable.

#### Section 313

This material contains Formaldehyde (CAS# 50-00-0, 4.0%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373. This material contains Methyl alcohol (CAS# 67-56-1, 1.020%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

#### Clean Air Act:

CAS# 50-00-0 is listed as a hazardous air pollutant (HAP). CAS# 67-56-1 is listed as a hazardous air pollutant (HAP). This material does not contain any Class 1 Ozone depleters. This material does not contain any Class 2 Ozone depleters.

#### Clean Water Act:

CAS# 50-00-0 is listed as a Hazardous Substance under the CWA. CAS# 7558-79-4 is listed as a Hazardous Substance under the CWA. None of the chemicals in this product are listed as Priority Pollutants under the CWA. None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

#### OSHA:

CAS# 50-00-0 is considered highly hazardous by OSHA.

#### STATE

CAS# 50-00-0 can be found on the following state right to know lists: California, New Jersey, Florida, Pennsylvania, Minnesota, Massachusetts.

CAS# 67-56-1 can be found on the following state right to know lists: California, New Jersey, Florida, Pennsylvania, Minnesota, Massachusetts.

CAS# 7558-79-4 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Massachusetts.

CAS# 7732-18-5 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

CAS# 10049-21-5 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

**The following statement(s) is(are) made in order to comply with the California Safe Drinking Water Act:** WARNING: This product contains Formaldehyde, a chemical known to the state of California to cause cancer. California No Significant Risk Level: CAS# 50-00-0: no significant risk level = 40 ug/day **European/International Regulations**

**European Labeling in Accordance with EC Directives**

#### Hazard Symbols:

Not available.

#### Risk Phrases:

#### Safety Phrases:

#### WGK (Water Danger/Protection)

CAS# 50-00-0: 2

CAS# 67-56-1: 1

CAS# 7558-79-4: 1

CAS# 7732-18-5: No information available.

CAS# 10049-21-5: 1

#### Canada

CAS# 50-00-0 is listed on Canada's DSL/NDSL List.

CAS# 67-56-1 is listed on Canada's DSL/NDSL List.

CAS# 7558-79-4 is listed on Canada's DSL/NDSL List.

CAS# 7732-18-5 is listed on Canada's DSL/NDSL List.

This product has a WHMIS classification of D1B, D2A.

CAS# 50-00-0 is not listed on Canada's Ingredient Disclosure List.

CAS# 67-56-1 is not listed on Canada's Ingredient Disclosure List.

CAS# 7558-79-4 is not listed on Canada's Ingredient Disclosure List.

CAS# 7732-18-5 is not listed on Canada's Ingredient Disclosure List.

CAS# 10049-21-5 is not listed on Canada's Ingredient Disclosure List.

#### Exposure Limits

CAS# 50-00-0: OEL-ARAB Republic of Egypt:TWA 2 ppm (3 mg/m<sup>3</sup>) OEL-AUSTRALIA:TWA 1 ppm (1.5 mg/m<sup>3</sup>);STEL 2 ppm (3 mg/m<sup>3</sup>);CAR OEL-BELGIUM:TWA 1 ppm (1.2 mg/m<sup>3</sup>);STEL 2 ppm (2.5 mg/m<sup>3</sup>);CAR OEL-CZECHOSLOVAKIA:TWA 0.5 mg/m<sup>3</sup>;STEL 1 mg/m<sup>3</sup> OEL-DENMARK:STEL 0.3 ppm (0.4 mg/m<sup>3</sup>);Carcinogen OEL-FINLAND:STEL 1 ppm (1.3 mg/m<sup>3</sup>);Skin OEL-FRANCE:STEL 2 ppm (3 mg/m<sup>3</sup>) OEL-GERMANY:TWA 0.5 ppm (0.6 mg/m<sup>3</sup>);Carcinogen OEL-HUNGARY:STEL 0.6 mg/m<sup>3</sup>;Carcinogen OEL-JAPAN:TWA 0.5 ppm (0.61 mg/m<sup>3</sup>);Carcinogen OEL-THE NETHERLANDS:TWA 1 ppm (1.5 mg/m<sup>3</sup>);STEL 2 ppm (3 mg/m<sup>3</sup>) OEL-THE PHILIPPINES:TWA 5 ppm (6 mg/m<sup>3</sup>) OEL-POLAND:TWA 2 mg/m<sup>3</sup> OEL-RUSSIA:TWA 0.5 ppm;STEL 0.5 mg/m<sup>3</sup>;Skin OEL-SWEDEN:TWA 0.5 ppm (0.6 mg/m<sup>3</sup>);STEL 1 ppm (1. mg/m<sup>3</sup>) OEL-SWITZERLAND:TWA 0.5 ppm (0.6 mg/m<sup>3</sup>);STEL 1 ppm (1.2 mg/m<sup>3</sup>) OEL-THAILAND:TWA 3 ppm;STEL 5 ppm OEL-TURKEY:TWA 5 ppm (6 mg/m<sup>3</sup>) OEL-UNITED KINGDOM:TWA 2 ppm (2.5 mg/m<sup>3</sup>);STEL 2 ppm (2.5 mg/m<sup>3</sup>) OEL IN BULGARIA, COLOMBIA, JORDAN, KOREA check ACGIH TLV OEL IN NEW ZEALAND, SINGAPORE, VIETNAM check ACGI TLV

CAS# 67-56-1: OEL-ARAB Republic of Egypt:TWA 200 ppm (260 mg/m<sup>3</sup>);Ski

n OEL-AUSTRALIA:TWA 200 ppm (260 mg/m<sup>3</sup>);STEL 250 ppm;Skin OEL-BELGIUM:TWA 200 ppm (262 mg/m<sup>3</sup>);STEL 250 ppm;Skin OEL-CZECHOSLOVAKIA:TWA 100 mg/m<sup>3</sup>;STEL 500 mg/m<sup>3</sup> OEL-DENMARK:TWA 200 ppm (260 mg/m<sup>3</sup>);Skin OEL-FINLAND:TWA 200 ppm (260 mg/m<sup>3</sup>);STEL 250 ppm;Skin OEL-FRANCE:TWA 200 ppm (260 mg/m<sup>3</sup>);STEL 1000 ppm (1300 mg/m<sup>3</sup>) OEL-GERMANY:TWA 200 ppm (260 mg/m<sup>3</sup>);Skin OEL-HUNGARY:TWA 50 mg/m<sup>3</sup>;STEL 100 mg/m<sup>3</sup>;Skin OEL-JAPAN:TWA 200 ppm (260 mg/m<sup>3</sup>);Skin OEL-THE NETHERLANDS:TWA 200 ppm (260 mg/m<sup>3</sup>);Skin OEL-THE PHILIPPINES:TWA 200 ppm (260 mg/m<sup>3</sup>) OEL-POLAND:TWA 100 mg/m<sup>3</sup> OEL-RUSSIA:TWA 200 ppm;STEL 5 mg/m<sup>3</sup>;Skin OEL-SWEDEN:TWA 200 ppm (250 mg/m<sup>3</sup>);STEL 250 ppm (350 mg/m<sup>3</sup>);Skin OEL-SWITZERLAND:TWA 200 ppm (260 mg/m<sup>3</sup>);STEL 400 ppm;Skin OEL-THAILAND:TWA 200 ppm (260 mg/m<sup>3</sup>) OEL-TURKEY:TWA 200 ppm (260 mg/m<sup>3</sup>) OEL-UNITED KINGDOM:TWA 200 ppm (260 mg/m<sup>3</sup>);STEL 250 ppm;Skin OEL IN BULGARIA, COLOMBIA, JORDAN, KOREA check ACGIH TLV OEL IN NEW ZEALAND, SINGAPORE, VIETNAM check ACGI TLV

## Section 16 - Additional Information

**MSDS Creation Date:** 7/12/1999

**Revision #4 Date:** 8/02/2000

*The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no way shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.*

BDH INC.  
M A T E R I A L   S A F E T Y   D A T A   S H E E T

SECTION I CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MANUFACTURER:

BDH INC.  
350 EVANS AVENUE  
TORONTO, ONTARIO  
CANADA, M8Z 1K5

INFORMATION PHONE NO.: 416-255-8521  
HOURS: MON. TO FRI. (0830 - 1630)  
CHEMTREC TRANSPORTATION EMERGENCY CENTER  
(CHEMTREC) 24-HOUR: 1-800-424-9300

416 626 9555 *Smylen@VWR*

PRODUCT NAME: BUFFERED NEUTRAL FORMALIN 10%, FORMALDEHYDE 10%, BUFFERED NEUTRAL 23%

CATALOGUE NUMBER(S): VW3239, VW3323, VW5801

THE PRODUCT FORMALDEHYDE 10%, PRODUCT #VW3323 DOES NOT CONTAIN ANY PHOSPHATES WHILE VW3239 DOES CONTAIN PHOSPHATES

CHEMICAL NAME/OTHER NAME: BUFFERED NEUTRAL FORMALIN 10%; FORMALDEHYDE 10%, 23%

CHEMICAL FORMULA: H<sub>2</sub>O, HCHO, Na<sub>2</sub>HPO<sub>4</sub>, NaH<sub>2</sub>PO<sub>4</sub>.H<sub>2</sub>O  
CHEMICAL FAMILY: MIXTURE

SECTION II COMPOSITION/INFORMATION ON INGREDIENTS

CHEMICAL NAME	CAS NO.	OSHA PEL	ACGIH TLV	%(W/V)
FORMALDEHYDE	50-00-0	0.3 PPM	0.3 PPM	4-9
SODIUM PHOSPHATE	7558-79-4	-	-	0.65
SODIUM PHOSPHATE	10049-21-5	-	-	0.4
WATER	7732-18-5	-	-	

SECTION III HAZARDS IDENTIFICATION

APPEARANCE: CLEAR, COLORLESS LIQUID

\*\*\*\*\* EMERGENCY OVERVIEW \*\*\*\*\*

- \* CONTAINS MATERIAL (FORMALDEHYDE) WHICH MAY CAUSE CANCER \*
- \* IRRITATING TO THE SKIN, EYES AND MUCOUS MEMBRANES \*
- \* HARMFUL IF INHALED, SWALLOWED OR ABSORBED THROUGH SKIN \*

\*\*\*\*\*

(REFER TO LAST PAGE FOR DISCLAIMER)

VW3239      PAGE:      1

## POTENTIAL HEALTH EFFECTS (ACUTE & CHRONIC)

SYMPTOMS OF EXPOSURE: VAPOR IS IRRITATING TO THE EYES AND TISSUES OF THE RESPIRATORY TRACT. EYE CONTACT MAY RESULT IN DAMAGE.  
MEDICAL CONDITION AGGRAVATED BY EXPOSURE: RESPIRATORY CONDITIONS  
ROUTES OF ENTRY: INHALATION, INGESTION  
CARCINOGENICITY: FORMALDEHYDE IS LISTED AS A CARCINOGEN (IARC)

### SECTION IV FIRST AID MEASURES

15 EYE: IN CASE OF EYE CONTACT, FLUSH WITH PLENTY OF WATER FOR AT LEAST MINUTES WHILE HOLDING THE EYELIDS OPEN. HAVE EYES EXAMINED BY MEDICAL PERSONNEL.

SKIN: IN CASE OF SKIN CONTACT, IMMEDIATELY FLUSH SKIN WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES WHILE REMOVING CONTAMINATED CLOTHING AND SHOES.

INGESTION: IF SWALLOWED, DO NOT INDUCE VOMITING. GIVE VICTIM A GLASS OF WATER OR MILK. CALL A PHYSICIAN IMMEDIATELY. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.

INHALATION: IF INHALED, REMOVE TO FRESH AIR. IF NOT BREATHING, TRAINED PERSONNEL SHOULD BEGIN ARTIFICIAL RESPIRATION. SEEK MEDICAL ATTENTION.

### SECTION V FIRE FIGHTING MEASURES

FLAMMABILITY CLASSIFICATION: NONCOMBUSTIBLE

EXTINGUISHING MEDIA: CARBON DIOXIDE, FOAM OR WATER SPRAY

FLASH POINT(F)/METHOD: NOT AVAILABLE

FIRE & EXPLOSION HAZARD: MAY EMIT TOXIC FUMES ON THERMAL DECOMPOSITION.

UPPER FLAMMABLE LIMIT (%): NOT AVAILABLE

LOWER FLAMMABLE LIMIT (%): NOT AVAILABLE

AUTOIGNITION TEMPERATURE: NOT AVAILABLE

FIREFIGHTING PROCEDURES: FIREFIGHTERS SHOULD WEAR A SELF CONTAINED BREATHING APPARATUS.

HAZARDOUS COMBUSTION PRODUCTS: COX

SENSITIVITY TO STATIC DISCHARGE: NO

SENSITIVITY TO MECHANICAL IMPACT: NO

### SECTION VI ACCIDENTAL RELEASE MEASURES

LEAK OR SPILL CLEANUP: EVACUATE THE AREA OF ALL UNNECESSARY PERSONNEL. WEAR

(REFER TO LAST PAGE FOR DISCLAIMER)

VW3239

PAGE: 2



SUITABLE PROTECTIVE EQUIPMENT LISTED IN EXPOSURE CONTROLS/PERSONAL PROTECTION. CONTAIN THE RELEASE AND ELIMINATE IT'S SOURCE, IF THIS CAN BE DONE WITHOUT RISK. TAKE UP AND CONTAINERIZE FOR PROPER DISPOSAL AS DESCRIBED UNDER DISPOSAL. COMPLY WITH FEDERAL, STATE, AND LOCAL REGULATIONS ON REPORTING RELEASES. REFER TO REGULATORY INFORMATION FOR REPORTABLE QUANTITY AND OTHER REGULATORY DATA.

#### SECTION VII HANDLING & STORAGE

HANDLING & STORAGE: KEEP CONTAINER TIGHTLY CLOSED. STORE AWAY FROM HEAT, SPARKS AND OPEN FLAME. DO NOT BREATHE VAPOR OR MIST.

#### SECTION VIII EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS: ENGINEERING AND/OR ADMINISTRATIVE CONTROLS SHOULD BE IMPLEMENTED TO REDUCE EXPOSURE.

##### PERSONAL PROTECTIVE EQUIPMENT

GLOVES: NEOPRENE, NITRILE OR EQUIVALENT  
RESPIRATORY PROTECTION: FUME HOOD OR NIOSH/MSHA RESPIRATORS AS APPROPRIATE  
EYE PROTECTION: SAFETY GLASSES WITH SIDE SHIELDS  
CLOTHING: IMPERVIOUS PROTECTIVE CLOTHING SHOULD BE WORN TO PREVENT SKIN CONTACT.

#### SECTION IX PHYSICAL & CHEMICAL PROPERTIES

PHYSICAL STATE: LIQUID  
APPEARANCE: CLEAR, COLORLESS LIQUID  
ODOR: FORMALDEHYDE ODOR  
ODOR THRESHOLD: NOT AVAILABLE  
VAPOR PRESSURE: NOT AVAILABLE  
VAPOR DENSITY: NOT AVAILABLE  
SPECIFIC GRAVITY: NOT AVAILABLE  
BOILING POINT (F): DECOMPOSES  
MELTING POINT (F): NOT AVAILABLE  
EVAPORATION RATE: NOT AVAILABLE  
PH: NOT AVAILABLE  
SOLUBILITY IN WATER: MISCIBLE  
OCTANOL/WATER PARTITION COEFFICIENT: NOT AVAILABLE  
PER CENT VOLATILE BY VOL (%): 100  
MOLECULAR WEIGHT: 30.03 (FORMALDEHYDE)

#### SECTION X STABILITY & REACTIVITY

(REFER TO LAST PAGE FOR DISCLAIMER)

VW3239

PAGE: 3

CHEMICAL STABILITY: NORMALLY STABLE  
CONDITIONS TO AVOID: CONTACT WITH IGNITION SOURCES  
MATERIALS TO AVOID: HYDROCHLORIC ACID (FORMATION OF BISCHLORDIMETHYL ETHER, A  
POTENT CARCINOGEN)  
HAZARDOUS POLYMERIZATION: DOES NOT OCCUR  
HAZARDOUS DECOMPOSITION PRODUCTS: COX

#### SECTION XI TOXICOLOGICAL INFORMATION

EFFECTS OF ACUTE EXPOSURE: VAPOR IS IRRITATING TO THE EYES, NOSE AND THROAT.  
CONTACT WITH THE EYES MAY RESULT IN DAMAGE.  
EFFECTS OF CHRONIC EXPOSURE: IN HUMANS, FORMALDEHYDE EXPOSURE HAS BEEN  
ASSOCIATED WITH CANCERS OF THE LUNGS AND RESPIRATORY PASSAGES.  
LD50: NOT AVAILABLE  
LC50: NOT AVAILABLE  
IRRITANCY (DRAIZE TEST RESULTS): NO INFORMATION AVAILABLE  
CARCINOGENICITY: FORMALDEHYDE IS LISTED AS A CARCINOGEN (IARC)  
TERATOGENICITY: NO INFORMATION AVAILABLE  
MUTAGENICITY: MAY CAUSE ADVERSE MUTAGENIC EFFECTS (FORMALDEHYDE)  
REPRODUCTIVE EFFECTS: MAY CAUSE ADVERSE REPRODUCTIVE EFFECTS (FORMALDEHYDE)  
SENSITIZATION TO PRODUCT: NO INFORMATION AVAILABLE  
TARGET ORGANS: NONE IDENTIFIED

#### SECTION XII DISPOSAL CONSIDERATIONS

EPA WASTE NUMBER(S): U122  
TREATMENT: INCINERATION, FUELS BLENDING OR RECYCLE. CONTACT YOUR LOCAL  
PERMITTED WASTE DISPOSAL SITE (TSD) FOR PERMISSIBLE TREATMENT SITES.  
ALWAYS CONTACT A PERMITTED WASTE DISPOSER (TSD) TO ASSURE COMPLIANCE WITH ALL  
CURRENT LOCAL, STATE AND FEDERAL REGULATIONS

#### SECTION XIII TRANSPORT INFORMATION

DOT SHIPPING NAME: ENVIRONMENTALLY HAZARDOUS SUBSTANCES, LIQUID, N.O.S. (FORMALDEHYDE)  
DOT NUMBER (UN): 3082  
PACKING GROUP: III  
HAZARD CLASS: 9.2

#### SECTION XIV REGULATORY INFORMATION

TSCA INVENTORY (YES/NO): YES, THIS MATERIAL IS A MIXTURE. THE CAS NUMBERS OF  
ALL COMPONENTS ARE LISTED ON THE TSCA INVENTORY.

(REFER TO LAST PAGE FOR DISCLAIMER)

VW3239

PAGE: 4

COMPONENT	SARA EHS (302)	SARA EHS TPO (LBS)	CERCLA RQ (LBS)
FORMALDEHYDE	Y	500	100
WATER	-	-	-
SODIUM PHOSPHATE	-	-	-
MONOBASIC	-	-	-
SODIUM PHOSPHATE	-	-	-
DIBASIC	-	-	-

COMPONENT	OSHA FLOOR LIST	SARA 313	DEMINIMIS (SARA 313)(%)
FORMALDEHYDE	Y	Y	0.1
WATER	-	-	-
SODIUM PHOSPHATE	-	-	-
MONOBASIC	-	-	-
SODIUM PHOSPHATE	-	-	-
DIBASIC	-	-	-

#### SECTION XV OTHER INFORMATION

##### NFPA HAZARD RATINGS (0-4)

HEALTH: 2

FLAMMABILITY: 1

REACTIVITY: 0

NFPA SPECIAL WARNINGS: NONE

PREPARATION DATE: APRIL 6, 1993

REVISION HISTORY: APRIL 6, 1993; MARCH 23, 1995

COMMENTS: NONE

PREPARED BY: TECHNICAL AFFAIRS DEPARTMENT, BDH INC.,  
TORONTO, ONTARIO, CANADA  
(416) 255-8521

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VW3239-1

R04586

"ISSUED BY VWR 09-10-97"

VW3239

PAGE: 5

BDH INC.  
M A T E R I A L   S A F E T Y   D A T A   S H E E T

SECTION I   PRODUCT IDENTIFICATION AND USE

MANUFACTURER:  
BDH INC.  
350 EVANS AVENUE  
TORONTO  
ONTARIO  
M8Z 1K5

EMERGENCY TELEPHONE NO.:  
416-201-6383 (24 HR.)  
INFORMATION TELEPHONE NO.:  
416-255-8521 (0830-1630)

PRODUCT NAME: FORMALIN 10% OR BUFFERED NEUTRAL FORMALIN 10%  
PRODUCT CODE(S): R04586, VW3239, FX0419  
CHEMICAL NAME/OTHER NAME: FORMALIN 10%; FORMALDEHYDE SOLUTION 10%  
CHEMICAL FORMULA:  $\text{HCHO}$ ,  $\text{CH}_3\text{OH}$ ,  $\text{NA}_2\text{HPO}_4$ ,  $\text{NAH}_2\text{PO}_4$ ,  $\text{H}_2\text{O}$   
CHEMICAL FAMILY: MIXTURE  
TDG SHIPPING NAME/UN: NOT REGULATED  
TDG CLASSIFICATION/PACKING GROUP: NOT REGULATED  
USE: LABORATORY REAGENT

SECTION II   HAZARDOUS INGREDIENTS

CHEMICAL NAME	CAS NO.	LD50	%
FORMALDEHYDE	50-00-0	800 MG/KG (ORL, RAT)	4.
0 METHANOL	67-56-1	5628 MG/KG (ORL, RAT)	1-
1.5			

SECTION III   PHYSICAL DATA

PHYSICAL STATE: LIQUID  
APPEARANCE AND ODOUR: CLEAR, COLOURLESS LIQUID; SLIGHTLY PUNGENT HAY-LIKE ODOUR  
ODOUR THRESHOLD: 0.8 PPM (AS FORMALDEHYDE)  
SPECIFIC GRAVITY: 1.01  
VAPOUR PRESSURE: NOT AVAILABLE  
VAPOUR DENSITY: NOT AVAILABLE  
EVAPORATION RATE: NOT AVAILABLE  
BOILING POINT: NOT AVAILABLE  
FREEZING POINT: NOT AVAILABLE  
PH: 7.0 (+/- 0.2)  
COEFFICIENT OF WATER/OIL DISTRIBUTION: NOT AVAILABLE

SECTION IV   FIRE OR EXPLOSION HAZARD

CONDITIONS OF FLAMMABILITY: NONCOMBUSTIBLE  
EXTINGUISHING MEDIA: DRY POWDER, CARBON DIOXIDE  
FLASH POINT / METHOD: NOT AVAILABLE

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R04586

PAGE: 1

UEL: NOT AVAILABLE  
LEL: NOT AVAILABLE  
AUTOIGNITION TEMPERATURE: NOT AVAILABLE  
HAZARDOUS COMBUSTION PRODUCTS: COX, NA2O  
EXPLOSION DATA - SENSITIVITY TO MECHANICAL IMPACT: NO  
- SENSITIVITY TO STATIC DISCHARGE: NO

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SECTION V REACTIVITY DATA

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CONDITIONS OF INSTABILITY: NORMALLY STABLE  
INCOMPATIBILITIES: ACIDS, ALKALIES, ISOCYANATES, PHENOL, OXIDIZERS, GELATIN,  
BISULPHIDES, UREA, TANNIN  
CONDITIONS OF REACTIVITY: NORMALLY STABLE  
HAZARDOUS DECOMPOSITION PRODUCTS: COX, NA2O

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SECTION VI TOXICOLOGICAL PROPERTIES / HEALTH HAZARD DATA

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ROUTE OF ENTRY:

- SKIN CONTACT: IRRITATES
- SKIN ABSORPTION: NO INFORMATION AVAILABLE
- EYE CONTACT: IRRITATES
- INHALATION: IRRITATES
- INGESTION: HARMFUL

LC50: NOT AVAILABLE

LD50: NOT AVAILABLE

EXPOSURE LIMITS: TLV: 1 PPM (AS FORMALDEHYDE); 200 PPM (AS METHANOL)

EFFECTS OF ACUTE EXPOSURE: CONTACT OF THIS SUBSTANCE WITH THE EYES OR SKIN  
MAY

RESULT IN IRRITATION AND INGESTION MAY BE HARMFUL.

EFFECTS OF CHRONIC EXPOSURE: PROLONGED OR REPEATED SKIN CONTACT MAY RESULT IN

DERMATITIS.

IRRITANCY: NO EXPERIMENTAL INFORMATION AVAILABLE

SENSITIZATION TO PRODUCT: NO INFORMATION AVAILABLE

CARCINOGENICITY: PROBABLE CARCINOGEN, IARC 29, 345-389 (1982) (FORMALDEHYDE)

REPRODUCTIVE TOXICITY: MAY CAUSE REPRODUCTIVE EFFECTS, REFERENCES CITED: RTECS#

LP8925000 (FORMALDEHYDE), RTECS#PC1400000 (METHANOL)

TERATOGENICITY: MAY CAUSE TERATOGENIC EFFECTS, REFERENCES CITED: RTECS#

PC1400000 (METHANOL)

MUTAGENICITY: MAY CAUSE MUTAGENIC EFFECTS, REFERENCES CITED: RTECS#PC1400000  
(METHANOL)

TOXICOLOGICALLY SYNERGISTIC PRODUCTS: NONE FOUND

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SECTION VII FIRST AID MEASURES

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SKIN: FLUSH THE CONTACT AREA WITH LUKEWARM RUNNING WATER FOR AT LEAST 15  
MINUTES. REMOVE CONTAMINATED CLOTHING, TAKING CARE NOT TO SPREAD THE CHEMICAL.

(REFER TO LAST PAGE FOR DISCLAIMER)

R04586

PAGE: 2

IF CONTAMINATION IS EXTENSIVE, REMOVE CLOTHING UNDER RUNNING WATER. DISCARD OR DECONTAMINATE CLOTHING UNDER RUNNING WATER. DISCARD OR DECONTAMINATE CLOTHING

BEFORE USE. UNLESS CONTACT HAS BEEN SLIGHT, SEEK MEDICAL ATTENTION. SEEK MEDICAL ATTENTION IF IRRITATION PERSISTS.

EYE: FLUSH THE CONTAMINATED EYE(S) FOR AT LEAST 15 MINUTES WITH LUKEWARM RUNNING WATER, HOLDING THE EYELIDS OPEN. TAKE CARE NOT TO RINSE CONTAMINATED WATER INTO THE NON-AFFECTED EYE. ALWAYS SEEK MEDICAL ATTENTION FOR ACCIDENTS INVOLVING THE EYES.

INHALATION: TAKE PROPER PRECAUTIONS TO ENSURE YOUR OWN SAFETY BEFORE ATTEMPTING RESCUE. REMOVE SOURCE OF CONTAMINATION OR MOVE VICTIM TO FRESH AIR.

IF BREATHING HAS STOPPED, TRAINED PERSONNEL SHOULD BEGIN ARTIFICIAL RESPIRATION, OR IF THE HEART HAS STOPPED, CARDIOPULMONARY RESUSCITATION (CPR) IMMEDIATELY.

SEEK MEDICAL ATTENTION.

INGESTION: NEVER GIVE ANYTHING BY MOUTH IF VICTIM IS RAPIDLY LOSING CONSCIOUSNESS, OR IS UNCONSCIOUS OR CONVULSING. RINSE MOUTH THOROUGHLY WITH WATER. DO NOT INDUCE VOMITING. HAVE VICTIM DRINK 200-400 ML OF WATER TO DILUTE. IF BREATHING HAS STOPPED, TRAINED PERSONNEL SHOULD BEGIN ARTIFICIAL RESPIRATION, OR IF THE HEART HAS STOPPED, CARDIOPULMONARY RESUSCITATION (CPR)

IMMEDIATELY. SEEK MEDICAL ATTENTION.

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#### SECTION VIII PREVENTIVE MEASURES

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ENGINEERING CONTROLS: ENGINEERING CONTROL METHODS TO REDUCE HAZARDOUS EXPOSURES ARE PREFERRED. METHODS INCLUDE MECHANICAL VENTILATION (DILUTION AND LOCAL

EXHAUST), PROCESS OR PERSONNEL ENCLOSURE, CONTROL OF PROCESS CONDITIONS, AND PROCESS MODIFICATION. ADMINISTRATIVE CONTROLS AND PERSONAL PROTECTIVE EQUIPMENT MAY ALSO BE REQUIRED.

PERSONAL PROTECTIVE EQUIPMENT:

- GLOVES: PLASTIC

- RESPIRATORY PROTECTION: FUMEHOOD AS APPROPRIATE

- EYE PROTECTION: CHEMICAL SAFETY GOGGLES

- CLOTHING: PLASTIC APRON, SLEEVES AND BOOTS AS APPROPRIATE

STORAGE REQUIREMENTS: STORE IN SUITABLE LABELLED CONTAINERS. KEEP CONTAINERS TIGHTLY CLOSED WHEN NOT IN USE AND WHEN EMPTY. PROTECT FROM DAMAGE. STORE IN A

COOL, DRY, WELL-VENTILATED AREA, OUT OF DIRECT SUNLIGHT. STORE AWAY FROM INCOMPATIBLE MATERIALS.

HANDLING PROCEDURES AND EQUIPMENT: AVOID GENERATING MIST. FOLLOW ROUTINE SAFE HANDLING PROCEDURES.

LEAK OR SPILL CLEAN-UP: BEFORE DEALING WITH SPILLAGES TAKE NECESSARY PROTECTIVE MEASURES, INFORM OTHERS TO KEEP AT A SAFE DISTANCE AND, FOR FLAMMABLE

MATERIALS, SHUT OFF ALL POSSIBLE SOURCES OF IGNITION. ABSORB ON INERT ABSORBENT, TRANSFER TO CONTAINER AND ARRANGE REMOVAL BY DISPOSAL COMPANY.

(REFER TO LAST PAGE FOR DISCLAIMER)

R04586

PAGE: 3

WASH SITE OF  
SPILLAGE THOROUGHLY WITH WATER AND DETERGENT. OR USE VYTAC FNC (FORMALDEHYDE  
NEUTRALIZING CONCENTRATE).  
DISPOSAL: FOLLOW ALL FEDERAL, PROVINCIAL AND LOCAL REGULATIONS FOR DISPOSAL.

USE ONLY LICENSED DISPOSAL AND WASTE HAULING COMPANIES. DISPOSAL OF SMALL  
AMOUNTS OF SPILLED MATERIAL MAY BE HANDLED AS DESCRIBED UNDER "LEAK OR SPILL  
CLEANUP". LARGE SPILLS MUST BE DEALT WITH SEPARATELY AND MUST BE HANDLED BY  
QUALIFIED DISPOSAL COMPANIES.  
SPECIAL SHIPPING INFORMATION: FOLLOW ALL TDG REGULATIONS AND SEE

CLASSIFICATION IN SECTION I

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SECTION IX PREPARATION INFORMATION

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PREPARED BY: TECHNICAL AFFAIRS DEPARTMENT, BDH INC.,  
TORONTO, ONTARIO  
(416)255-8521

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R04586

PAGE: 4