Material Safety Data Sheet

Revision 0: 2/15/2005 **ID: 4594615**

Material Name: Draeger Tubes™ (which are not classified as dangerous goods)

* * * Section 1 - Chemical Product and Company Identification * * *

Product Use: Detection of gases, measuring of gas concentrations.

Manufacturer Information

Dräger Safety AG & Co. KGaA
Revalstr. 1
23560 Lübeck
Germany

Distributor/Contact Information

Draeger Safety, Inc
101 Technology Drive
Pittsburgh, PA 15275-1057

Phone: (412) 787-8383
Fax: (412) 787-2207
Emergency # 1-800-424-9300 (CHEMTREC)

General Comments

NOTE: Emergency telephone numbers are to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure, or accident involving chemicals. All non-emergency questions should be directed to customer service.

Relevant Products

Part No.	Trade Name	Part No.	Trade Name
67 26 665	Acetaldehyde 100/a	81 01 071	Acetic Acid 10/a-D
67 22 101	Acetic Acid 5/a	CH 22 901	Acetone 100/b
81 03 381	Acetone 40/a	67 28 591	Acrylonitrile 0.5/a
CH 26 901	Acrylonitrile 5/b	81 01 141	Active Tube for Formaldehyde 0.2A
CH 29 701	Alcohol 100/a	81 01 631	Alcohol 25/a
81 01 061	Amine Test	81 01 711	Ammonia 0.25/a
CH 31 901	Ammonia 0.5%/a	67 28 231	Ammonia 10/a-L
67 33 231	Ammonia 2/a	81 01 301	Ammonia 20/a-D
CH 20 501	Ammonia 5/a	81 01 941	Ammonia 5/b
67 33 171	Aniline 0.5/a	CH 20 401	Aniline 5/a
CH 25 001	Arsine 0.05/a	81 03 410	Fumigation-Test-Set
67 28 561	Benzene 0.5/a	67 18 801	Benzene 5/a
81 01 691	Petroleum Hydrocarbons 10A	67 30 201	Petroleum Hydrocarbons 100A
81 01 161	Butadiene 10/a-D	CH 30 801	Carbon Dioxide 0.01%/a
CH 23 501	Carbon Dioxide 0.1%/a	CH 31 401	Carbon Dioxide 0.5%/a
CH 25 101	Carbon Dioxide 1%/a	81 01 051	Carbon Dioxide1% a-D
81 01 811	Carbon Dioxide 100/a	67 28 521	Carbon Dioxide 100/a-P
67 28 611	Carbon Dioxide 1000/a-L	CH 20 301	Carbon Dioxide 5%/A
81 01 381	Carbon Dioxide 500/a-D	81 01 891	Carbon Disulphide 3/a
CH 23 201	Carbon Disulphide 30/a	81 01 951	Carbon Monoxide 10/c
81 03 321	Carbon Monoxide 10/d	67 33 191	Carbon Monoxide 50/a-D
81 01 791	Carbon Tetrachloride 0.2/b	81 01 021	Carbon Tetrachloride 1/a
CH 27 401	Carbon Tetrachloride 5/c	81 03 140	CDS Set I
81 03 150	CDS Set II	81 03 160	CDS Set III
81 03 200	CDS Set V	CH 24 301	Chlorine 0.2/a
67 28 411	Chlorine 0.3/b	CH 20 701	Chlorine 50/a
67 28 761	Chlorobenzene 5/a	67 18 601	Chloroformates 0.2/b
67 18 901	Chloroprene 5/a	67 28 681	Chromic Acid 0.1/a
67 28 791	Cyanide 2/a	CH 19 801	Cyanogen Chloride 0.25/a
67 25 201	Cyclohexane 100/a	67 28 931	Cyclohexylamine 2/a
67 30 501	Diethyl Ether 100/a	67 18 501	Dimethyl Formamide 10/b
67 18 701	Dimethyl Sulphate 0.005/c	67 28 451	Dimethyl Sulphide 1/a
67 28 111	Epichlorohydrin 5/b	81 01 151	Ethanol 1000/a-D
CH 20 201	Ethyl Acetate 200/a	67 28 381	Ethyl Benzene 30/a
67 26 801	Ethyl Glycol Acetate 50/a	81 01 331	Ethylene 0.1/a

81 01 351	Ethylene Glycol 10	67 28 961	Ethylene Oxide 1/a
67 28 241	Ethylene Oxide 25/a	81 01 491	Fluorine 0.1/a
67 33 081	Formaldehyde 0.2/a	81 01 751	Formaldehyde 2/a
67 22 701	Formic Acid 1/a	67 28 391	Hexane 100/a
81 03 351	Hydrazine 0.01/a	67 33 121	Hydrazine 0.2/a
CH 31 801	Hydrazine 0.25/a	67 28 571	Hydro Carbon 100/a-L
81 01 681	Hydrochloric Acid / Nitric Acid 1/a	CH 29 501	Hydrochlorid Acid 1/a
67 33 111	Hydrochloric Acid 10/a-D	67 28 181	Hydrochloric Acid 50/a
CH 25 701	Hydrocyanic Acid 2/a	67 33 221	Hydrocyanic Acid 20/a-D
81 01 511	Hydrogen 0.2%/a	CH 30 901	Hydrogen 0.5%/a
81 03 251	Hydrogen Fluoride 0.5/a	CH 30 301	Hydrogen Fluoride 1.5/b
81 01 041	Hydrogen Peroxide 0.1/a	CH 28 201	Hydrogen Sulphide + Sulphur Dioxide 0.2%/A
CH 28 101	Hydrogen Sulphide 0.2%/A	81 01 461	Hydrogen Sulphide 0.2/a
81 01 991	Hydrogen Sulphide 0.2/b	67 28 041	Hydrogen Sulphide 0.5/a
67 19 001	Hydrogen Sulphide 1/c	81 01 831	Hydrogen Sulphide 1/d
67 33 091	Hydrogen Sulphide 10/a-D	CH 29 101	Hydrogen Sulphide 100/a
81 01 211	Hydrogen Sulphide 2%/a	67 28 821	Hydrogen Sulphide 2/a
81 01 961	Hydrogen Sulphide 2/b	67 28 141	Hudrogen Sulphide 5/a-L
CH 29 801	Hydrogen Sulphide 5/b	81 03 281	Mercaptan 0.1/a
67 28 981	Mercaptan 0.5/a	81 01 871	Mercaptan 20/a
CH 23 101	Mercury Vapour 0.1/b	81 03 391	Methyl Bromide 0.2/a
81 01 671	Methyl Bromide 0.5/a	67 28 211	Methyl Bromide 3/a
CH 27 301	Methyl Bromide 5/b	81 03 071	Natural Gas odorization, tert-Butyl mercaptan (TBM)
CH 19 501	Nickel Tetracarbonyl 0.1/a	67 28 311	Nitric Acid 1/a
CH 30 001	Nitrogen Dioxide 0.5/c	81 01 111	Nitrogen Dioxide 10/a-D
67 19 101	Nitrogen Dioxide 2/c	CH 29 401	Nitrous Fumes 0.5/a
CH 31 001	Nitrous Fumes 2/a	67 24 001	Nitrous Fumes 20/a
67 28 911	Nitrous Fumes 5/a-L	81 01 921	Nitrous Fumes 50/a
CH 27 701	Nitrous Fumes 100/c	CH 31 201	Olefines 0.05%/a
CH 26 303	Organic Arsenic Compounds	CH 25 903	Organic Basic Nitrogen Compounds
67 33 181	Ozone 0.05/b	CH 21 001	Ozone 10/a
67 24 701	Pentane 100/a	81 01 551	Perchloroethylene 0.1/a
CH 30 701	Perchloroethylene 10/b	81 01 501	Perchloroethylene 2/a
81 01 401	Perchloroethylene 200/a-D	81 01 641	Phenol 1/b
81 01 521	Phosgene 0.02/a	CH 19 401	Phosgene 0.05/a
CH 28 301	Phosgene 0.25/c	81 01 611	Phosphine 0.01/a
CH 31 101	Phosphine 0.1/a	81 03 341	Phosphine 0.1/b in Acetylene
81 01 801	Phosphine 1/a	81 01 621	Phosphine 25/a
CH 21 201	Phosphine 50/a	67 28 461	Phosphoric Acid Ester 0.05/a
67 28 651	Pyridine 5/A	81 01 121	Acid Test
81 03 380	Simultaneous Test-Set for Container Fumigation	81 03 170	Simultaneous Test Set Indicator Substances
81 01 735	Simultaneous Test-Set I for inorganic fumes	81 01 736	Simultaneous Test-Set II for inorganic fumes
81 01 770	Simultaneous Test-Set III for organic vapours	67 23 301	Styrene 10/a
CH 27 601	Styrene 50/a	67 27 101	Sulphur Dioxide 0.1/a
67 28 491	Sulphur Dioxide 0.5/a	CH 31 701	Sulphur Dioxide 1/a
67 28 921	Sulphur Dioxide 2/a-L	CH 24 201	Sulphur Dioxide 20/a
81 01 091	Sulphur Dioxide 5/a-D	81 01 531	Sulphur Dioxide 50/b
67 28 781	Sulphuric Acid 1/a	81 01 341	Tetrahydrothiophene 1/b
CH 25 803	Thioether	81 01 731	Toluene 100/a
81 01 421	Toluene 100/a-D	CH 23 001	Toluene 5/a
81 01 661	Toluene 5/b	81 01 701	Toluene 50/a
67 24 501	Toluene Diisocyanate 0.02/A	CH 21 101	Trichloroethane 50/d
CH 24 401	Trichloroethylene 10/a	67 28 541	Trichloroethylene 2/a
81 01 441	Trichloroethylene 200/a-D	81 01 881	Trichloroethylene 50/a
67 18 401	Triethylamine 5/a	81 01 721	Vinyl Chloride 0.5/b
67 28 031	Vinyl Chloride 1/a	CH 19 601	Vinyl Chloride 100/a

CH 23 401	Water Vapour 0.1	81 01 321	Water Vapour 0.1/a
81 01 081	Water Vapour 1/a	81 01 781	Water Vapour 1/b
81 03 061	Water Vapour 20/a-P	67 28 531	Water Vapour 5/a-P

* * * Section 2 - Composition / Information on Ingredients * * *

CAS #	Component	Percent*
Not Available	Inert carrier material and glass of the tube	<90
Not Available	Copper salts	0-10
7803-57-8	Hydrazine hydrate	0-6
7664-93-9	Sulfuric acid	0-5
110-86-1	Pyridine	0-5
Not Available	Amine compounds	0-3
7553-56-2	Iodine	0-3
Not Available	Chromium (VI) salts	0-2
108-24-7	Acetic anhydride	0-1
Not Available	Gold salts	0-1
Not Available	Selenium salts	0-1
Not Available	Sodium salts	0-1
1330-20-7	Xylene	0-1
95-53-4	o-Toluidine	0-0.5
7647-01-0	Hydrochloric acid	0-0.5
Not Available	Palladium, inorganic compounds	0-0.2
7722-64-7	Potassium permanganate	0-0.2
91-66-7	N,N-Diethylaniline	0-0.2
10294-42-5	Cerium sulfate	0.1
2494-56-6	Butyrylcholiniodide	0-0.1
98-01-1	Furfurol	0-0.1
Not Available	Lead salts	0-0.1
12029-98-0	Iodine pentoxide	0-0.1
Not Available	Silver salts	0-0.1
22752-98-3	Pyridylpyridinium chloride	0-0.1
13435-46-6	Bariumchloroanilate	0-0.1
50-00-0	Formaldehyde	0-0.1
119-26-6	2,4-Dinitrophenylhydrazine	0-0.1
Not Available	Mercury salts	0-0.1
119-90-4	o-Dianisidine	0-0.1
10034-81-8	Magnesium perchlorate	0-0.1
Not Available	Bismuth compounds	0-0.05
7440-67-7	Zirconium	0-0.0005

Component Information/Information on Non-Hazardous Components

This product is considered not hazardous under 29 CFR 1910.1200 (Hazard Communication).

*based on the gross weight of the Draeger-Tube™.

The information contained in this MSDS is applicable to the contents of the Draeger-Tube™.

* * * Section 3 - Hazards Identification * * *

Emergency Overview

This product is a non-flammable, granulate filled glass tube. Contents of the tube are corrosive to the eyes, skin, gastrointestinal tract and may cause irritation to the respiratory tract. Improper handling, leaks and/or damage to the tube may release caustic sulfuric acid in liquid or solid form. Tube contents may react vigorously with water.

Potential Health Effects: Eyes

Eye contact with contents of tube and vapor or mist from the tube may cause corrosive damage with severe irritation, burns, and possible eye injury.

Potential Health Effects: Skin

Skin contact with contents of tube and vapor or mist from the tube may cause corrosive damage with severe irritation and burns. Burns may be enhanced in the presence of water.

Potential Health Effects: Ingestion

Product contents may be harmful or fatal if swallowed. This product may produce corrosive damage to the gastrointestinal tract if it is swallowed.

Potential Health Effects: Inhalation

Inhalation of vapor or mist from tube contents may cause severe irritation or injury to the respiratory system. Inhalation of vapor or mist from tube contents may cause pulmonary edema, emphysema, and permanent changes in pulmonary function

HMIS Ratings: Health: 3 **Fire:** 0 **Physical Hazard:** 2 **Pers. Prot.:** gloves, safety glasses with side shields

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe * = Chronic hazard

* * * Section 4 - First Aid Measures * * *

First Aid: Eyes

Immediately flush eyes with water for at least 15 minutes, while holding eyelids open. Seek medical attention at once. Danger of corneal clouding.

First Aid: Skin

Rinse with plenty of water. Discard any shoes or clothing items that cannot be decontaminated. If irritation persists, get medical attention.

First Aid: Ingestion

If the material is swallowed, get immediate medical attention or advice -- Do not induce vomiting.

First Aid: Inhalation

If mist or vapor of this product is inhaled, remove person immediately to fresh air. Seek medical attention if symptoms develop or persist.

First Aid: Notes to Physician

Tube contents can be neutralized with lime and water, or rinsed with plenty of water, then treated with polyethylene glycol 400. After ingestion, there is a danger of the esophagus and the stomach becoming perforated.

* * * Section 5 - Fire Fighting Measures * * *

Flash Point: Not applicable
Method Used: Not applicable
Upper Flammable Limit (UFL): Not applicable
Lower Flammable Limit (LFL): Not applicable
Auto Ignition: Not applicable
Flammability Classification: Not applicable
Rate of Burning: Not applicable

General Fire Hazards

This material is non-flammable. Contents of tube and vapors released from broken tube may be corrosive to eyes, skin, respiratory and gastrointestinal tract. Burns may be enhanced in the presence of water.

Hazardous Combustion Products

Thermal decomposition of tube contents may produce toxic sulfur oxides, carbon monoxide, etc.

Extinguishing Media

Dry chemical, carbon dioxide. Adapt extinguishing media to the environment. Materials in the glass tubes are non-flammable. Avoid direct contact of this product with water since this can cause a violent exothermic reaction.

Fire Fighting Equipment/Instructions

Wear full protective clothing, including helmet, self-contained positive pressure or pressure demand breathing apparatus, protective clothing and face mask.

NFPA Ratings: Health: 3 **Fire:** 0 **Reactivity:** 2

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

* * * Section 6 - Accidental Release Measures * * *

Containment Procedures

Not applicable.

Clean-Up Procedures

Sweep up or scrape broken tubes into container for disposal. Avoid the generation of dusts during clean-up. Do not pick up glass with bare hands. Dilute tube contents with water and baking soda. Shovel material into appropriate container for disposal. Thoroughly wash the area with water after a spill or leak clean-up.

Evacuation Procedures

Isolate area. Keep unnecessary personnel away.

Special Procedures

Follow all Local, State, Federal and Provincial regulations for disposal.

* * * Section 7 - Handling and Storage * * *

Handling Procedures

Contents are corrosive. Do not get this material in contact with skin or eyes. Do not inhale vapors or mists of this product. Avoid contact with water. Tubes are not recommended for qualitative mask fit-testing. Open tubes should be capped and stored in a well ventilated area until they are disposed of or completely used.

Storage Procedures

Keep the container tightly closed and dry. Do not store above 77º F (25º C). Store the product in original packaging. The expiry date on the packaging must be considered.

* * * Section 8 - Exposure Controls / Personal Protection * * *

Exposure Guidelines

A: General Product Information

With normal handling of product there should be no exposure to contents. However, if exposure does occur, follow the recommended exposure limits.

B: Component Exposure Limits

Sulfuric acid (7664-93-9)

ACGIH: 0.2 mg/m3 TWA (thoracic fraction)
OSHA: 1 mg/m3 TWA
NIOSH: 1 mg/m3 TWA

Pyridine (110-86-1)

ACGIH: 1 ppm TWA
OSHA: 5 ppm TWA; 15 mg/m3 TWA
NIOSH: 5 ppm TWA; 15 mg/m3 TWA

Iodine (7553-56-2)

ACGIH: 0.1 ppm Ceiling
OSHA: 0.1 ppm Ceiling; 1 mg/m3 Ceiling
NIOSH: 0.1 ppm Ceiling; 1 mg/m3 Ceiling

Chromium (VI) salts (Not Available)

OSHA: 0.1 mg/m3 Ceiling
NIOSH: 0.001 mg/m3 TWA (as Cr)

Xylene (1330-20-7)

ACGIH: 100 ppm TWA
150 ppm STEL
OSHA: 100 ppm TWA; 435 mg/m3 TWA
150 ppm STEL; 655 mg/m3 STEL

Acetic anhydride (108-24-7)

ACGIH: 5 ppm TWA
OSHA: 5 ppm Ceiling; 20 mg/m3 Ceiling
NIOSH: 5 ppm Ceiling; 20 mg/m3 Ceiling

o-Toluidine (95-53-4)

ACGIH: 2 ppm TWA
skin - potential for cutaneous absorption
OSHA: 5 ppm TWA; 22 mg/m3 TWA
Prevent or reduce skin absorption
NIOSH: Potential for dermal absorption

Hydrochloric acid (7647-01-0)

ACGIH: 2 ppm Ceiling
OSHA: 5 ppm Ceiling; 7 mg/m3 Ceiling
NIOSH: 5 ppm Ceiling; 7 mg/m3 Ceiling

Furfurol (98-01-1)

ACGIH: 2 ppm TWA
skin - potential for cutaneous absorption
OSHA: 2 ppm TWA; 8 mg/m3 TWA
Prevent or reduce skin absorption

Formaldehyde (50-00-0)

ACGIH: 0.3 ppm Ceiling
OSHA: 0.75 ppm TWA; 2 ppm STEL; 0.5 ppm Action Level (Irritant and potential cancer hazard - see 29 CFR 1910.1048)
NIOSH: 0.016 ppm TWA
0.1 ppm Ceiling (15 min)

Zirconium (7440-67-7)

ACGIH: 5 mg/m3 TWA
10 mg/m3 STEL
OSHA: 5 mg/m3 TWA
10 mg/m3 STEL
NIOSH: 5 mg/m3 TWA
10 mg/m3 STEL

Engineering Controls

Use general ventilation.

PERSONAL PROTECTIVE EQUIPMENT

Personal Protective Equipment: Eyes/Face

Wear safety glasses with side shields.

Personal Protective Equipment: Skin

Use impervious gloves. Observe the glove manufacturer's instructions on permeability and rupture times as well as the specific workplace conditions. Wash thoroughly after handling.

Personal Protective Equipment: Respiratory

If ventilation is not sufficient to effectively prevent buildup of aerosols or vapors, appropriate NIOSH/MSHA respiratory protection must be provided.

Personal Protective Equipment: General

Use good industrial hygiene practices in handling this material.

* * * Section 9 - Physical & Chemical Properties * * *

Appearance:	Glass tubes containing colorless and/or colored solids.	**Odor:**	Slightly pungent to odorless
Physical State:	Solid	**pH:**	Not available (strong acidic reaction)
Vapor Pressure:	Not applicable	**Vapor Density:**	Not applicable
Boiling Point:	Not applicable	**Melting Point:**	Not applicable
Solubility (H2O):	Not applicable	**Specific Gravity:**	Not applicable

* * * Section 10 - Chemical Stability & Reactivity Information * * *

Chemical Stability

Stable under normal conditions.

Chemical Stability: Conditions to Avoid

Avoid contact with water. Tube's contents react with bases. Possibility of strong exothermic reaction to water and bases. Do not store above 77º F (25º C).

Incompatibility

Avoid contact with water. Do not mix other substances with the contents of tube.

Hazardous Decomposition

Decomposition of this product produces toxic sulfur oxides, acids and solutions of iodine and manganese compounds and decomposition products of the components cited in Section 2.

Hazardous Polymerization

Hazardous polymerization can occur.

* * * Section 11 - Toxicological Information * * *

Acute and Chronic Toxicity

A: General Product Information

Components of tubes may emit toxic and choking vapors which are may cause severe irritation or injury to the eyes, throat and lungs. If the glass tube is broken, the sharp edges may cause cuts or scrapes. Sulfuric acid is corrosive to the eyes, skin, respiratory system and gastrointestinal tract. Exposure to sulfuric acid may lead to dental erosion, bronchitis, fibrosis, emphysema and pulmonary edema. Exposure to mists containing sulfuric acid have been implicated in causing cancer in humans.

B: Component Analysis - LD50/LC50

Hydrazine hydrate (7803-57-8)

Oral LD50 Rat: 129 mg/kg; Oral LD50 Mouse: 83 mg/kg

Sulfuric acid (7664-93-9)

Inhalation LC50 Rat: 510 mg/m3/2H; Inhalation LC50 Mouse: 320 mg/m3/2H; Oral LD50 Rat: 2140 mg/kg

Pyridine (110-86-1)

Inhalation LC50 Rat: 28500 mg/m3/1H; Oral LD50 Rat: 891 mg/kg; Oral LD50 Mouse: 1500 mg/kg; Dermal LD50 Rabbit: 1121 mg/kg

Iodine (7553-56-2)

Oral LD50 Rat: 14 g/kg; Oral LD50 Mouse: 22 g/kg

Xylene (1330-20-7)

Inhalation LC50 Rat: 5000 ppm/4H; Oral LD50 Rat: 4300 mg/kg; Dermal LD50 Rabbit: >1700 mg/kg

Acetic anhydride (108-24-7)

Inhalation LC50 Rat: 1000 ppm/4H; Oral LD50 Rat: 1780 mg/kg; Dermal LD50 Rabbit: 4 mL/kg

o-Toluidine (95-53-4)
Inhalation LC50 Rat: 862 ppm/4H; Oral LD50 Rat: 670 mg/kg; Oral LD50 Mouse: 520 mg/kg; Dermal LD50 Rabbit: 3250 µL/kg

Hydrochloric acid (7647-01-0)
Inhalation LC50 Rat: 3124 ppm/1H; Inhalation LC50 Mouse: 1108 ppm/1H

N,N-Diethylaniline (91-66-7)
Inhalation LC50 Rat: 1920 mg/m3/4H

Potassium permanganate (7722-64-7)
Oral LD50 Rat: 1090 mg/kg; Oral LD50 Mouse: 2157 mg/kg

Furfurol (98-01-1)
Inhalation LC50 Rat: 175 mg/kg/6H; Oral LD50 Rat: 65 mg/kg; Oral LD50 Mouse: 400 mg/kg

Formaldehyde (50-00-0)
Inhalation LC50 Mouse: 454 mg/m3/4H; Oral LD50 Rat: 100 mg/kg; Oral LD50 Mouse: 42 mg/kg; Dermal LD50 Rabbit: 270 µL/kg

o-Dianisidine (119-90-4)
Oral LD50 Rat: 1920 mg/kg

Carcinogenicity

A: General Product Information

No information available.

B: Component Carcinogenicity

Sulfuric acid (7664-93-9)
ACGIH: A2 - Suspected Human Carcinogen (contained in strong inorganic acid mists)
IARC: Monograph 54, 1992 (Group 1 (carcinogenic to humans))

Pyridine (110-86-1)
ACGIH: A3 - Confirmed animal carcinogen with unknown relevance to humans
IARC: Monograph 77, 2000 (Group 3 (not classifiable))

Chromium (VI) salts (Not Available)
NIOSH: potential occupational carcinogen

Xylene (1330-20-7)
ACGIH: A4 - Not Classifiable as a Human Carcinogen
IARC: Monograph 71, 1999; Monograph 47, 1989 (Group 3 (not classifiable))

o-Toluidine (95-53-4)
ACGIH: A3 - Confirmed animal carcinogen with unknown relevance to humans
NIOSH: potential occupational carcinogen
NTP: Reasonably Anticipated To Be A Carcinogen (Possible Select Carcinogen)
IARC: Monograph 77, 2000 (Group 2A (probably carcenogenic to humans))

Hydrochloric acid (7647-01-0)
ACGIH: A4 - Not Classifiable as a Human Carcinogen
IARC: Monograph 54, 1992 (Group 3 (not classifiable))

Furfurol (98-01-1)
ACGIH: A3 - Confirmed animal carcinogen with unknown relevance to humans
IARC: Monograph 63, 1995 (Group 3 (not classifiable))

Formaldehyde (50-00-0)
ACGIH: A2 - Suspected Human Carcinogen
OSHA: 0.75 ppm TWA; 2 ppm STEL; 0.5 ppm Action Level (Irritant and potential cancer hazard - see 29 CFR 1910.1048)
NIOSH: potential occupational carcinogen
NTP: Reasonably Anticipated To Be A Carcinogen (Possible Select Carcinogen)
IARC: Monograph 88, 2004 (Group 1 (carcinogenic to humans))

o-Dianisidine (119-90-4)
NIOSH: potential occupational carcinogen
NTP: Reasonably Anticipated To Be A Carcinogen (Possible Select Carcinogen)
IARC: Supplement 7, 1987; Monograph 4, 1974 (Group 2B (possibly carcinogenic to humans))

Zirconium (7440-67-7)
ACGIH: A4 - Not Classifiable as a Human Carcinogen

Mutagenicity
Chromium VI compounds have been mutagenic in bacteria, caused chromosome aberrations in mammalian cells and have been associated with increased frequencies of chromosome aberrations in lymphocytes in chromate workers.

Teratogenicity
Chromium VI compounds have caused birth defects and affected fertility in laboratory animals.

*** Section 12 - Ecological Information ***

Ecotoxicity

A: General Product Information
Because of the low pH of this product, it would be expected to produce significant ecotoxicity upon exposure to aquatic organisms and aquatic systems.

B: Component Analysis - Ecotoxicity - Aquatic Toxicity

Pyridine (110-86-1)

Test & Species		Conditions
96 Hr LC50 fathead minnow	93.8 mg/L	flow-through
96 Hr LC50 carp	26.0 mg/L	
24 Hr EC50 freshwater algae (Tetrahymena pyriformis)	520 mg/L	
48 Hr LC50 water flea	520 mg/L	

Xylene (1330-20-7)

Test & Species		Conditions
96 Hr LC50 fathead minnow	13.4 mg/L	flow-through
96 Hr LC50 rainbow trout	8.05 mg/L	flow-through
96 Hr LC50 bluegill	16.1 mg/L	flow-through
24 hr EC50 Photobacterium phosphoreum	0.0084 mg/L	
48 Hr EC50 water flea	3.82 mg/L	

Acetic anhydride (108-24-7)

Test & Species		Conditions
48 Hr LC50 golden orfe	265 mg/L	
24 Hr EC50 water flea	55 mg/L	

o-Toluidine (95-53-4)

Test & Species		Conditions
30 min EC50 Photobacterium phosphoreum	13.2 mg/L	

Hydrochloric acid (7647-01-0)

Test & Species		Conditions
48 Hr LC50 bluegill	3.6 mg/L	

N,N-Diethylaniline (91-66-7)

Test & Species		Conditions
96 Hr LC50 fathead minnow	16.4 mg/L	flow-through
5 min EC50 Photobacterium phosphoreum	6.50 mg/L	
15 min EC50 Photobacterium phosphoreum	7.70 mg/L	

Potassium permanganate (7722-64-7)

Test & Species		Conditions
96 Hr LC50 goldfish	3.6 mg/L	
24 Hr LC50 striped bass	1.5 mg/L	Static

Furfurol (98-01-1)

Test & Species		Conditions
96 Hr LC50 fathead minnow	32 mg/L	
48 Hr LC50 harlequin fish	23 mg/L	
24 Hr EC50 water flea	36 mg/L	

Formaldehyde (50-00-0)

Test & Species		Conditions
96 Hr LC50 fathead minnow	24.1 mg/L	flow-through
96 Hr LC50 bluegill	0.10 mg/L	flow-through
5 min EC50 Photobacterium phosphoreum	9.0 mg/L	
15 min EC50 Photobacterium phosphoreum	7.26 mg/L	
25 min EC50 Photobacterium phosphoreum	6.81 mg/L	
96 Hr EC50 water flea	20 mg/L	

Environmental Fate

No information available for the product.

* * * Section 13 - Disposal Considerations * * *

US EPA Waste Number & Descriptions

A: General Product Information

If discarded, wastes may be classified as: D002, D003 (Corrosive, Reactive Waste)
Wastes must be tested using methods described in 40 CFR Part 261 to determine if it meets applicable definitions of hazardous wastes.

B: Component Waste Numbers

Pyridine (110-86-1)

RCRA: waste number U196
5.0 mg/L regulatory level

Xylene (1330-20-7)

RCRA: waste number U239 (Ignitable waste, Toxic waste)

o-Toluidine (95-53-4)

RCRA: waste number U328

Furfurol (98-01-1)
RCRA: waste number U125 (Ignitable waste)

Formaldehyde (50-00-0)
RCRA: waste number U122

o-Dianisidine (119-90-4)
RCRA: waste number U091

Disposal Instructions

Prior to disposal, carefully dilute tube contents with water. Add baking soda to neutralize acidity. Do not allow this material to drain into sewers/water supplies. Waste must be handled in accordance with all federal, state, provincial, and local regulations.

* * * Section 14 - Transportation Information * * *

International Transportation Regulations

This product is non-hazardous as defined by transport regulations.

* * * Section 15 - Regulatory Information * * *

US Federal Regulations

A: General Product Information

Components of this product have been checked against the non-confidential TSCA inventory by CAS Registry Number. Components not identified on this non-confidential inventory are exempt from listing (i.e. as polymers) or are listed on the confidential inventory as declared by the supplier.

B: Component Analysis

This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65) and/or CERCLA (40 CFR 302.4).

Sulfuric acid (7664-93-9)
SARA 302: 1000 lb TPQ
SARA 313: 1.0 % de minimis concentration (acid aerosols including mists, vapors, gas, fog, and other airborne forms of any particle size)
CERCLA: 1000 lb final RQ; 454 kg final RQ

Pyridine (110-86-1)
SARA 313: 1.0 % de minimis concentration
CERCLA: 1000 lb final RQ; 454 kg final RQ

Xylene (1330-20-7)
CERCLA: 100 lb final RQ; 45.4 kg final RQ

Acetic anhydride (108-24-7)
CERCLA: 5000 lb final RQ; 2270 kg final RQ

o-Toluidine (95-53-4)
SARA 313: 0.1 % de minimis concentration
CERCLA: 100 lb final RQ; 45.4 kg final RQ

Hydrochloric acid (7647-01-0)
SARA 302: 500 lb TPQ
CERCLA: 5000 lb final RQ; 2270 kg final RQ

N,N-Diethylaniline (91-66-7)
CERCLA: 1000 lb final RQ; 454 kg final RQ

Potassium permanganate (7722-64-7)
CERCLA: 100 lb final RQ; 45.4 kg final RQ

Furfurol (98-01-1)
CERCLA: 5000 lb final RQ; 2270 kg final RQ

Formaldehyde (50-00-0)
SARA 302: 500 lb TPQ
CERCLA: 100 lb final RQ; 45.4 kg final RQ

o-Dianisidine (119-90-4)
CERCLA: 100 lb final RQ; 45.4 kg final RQ

State Regulations

A: General Product Information

Other state regulations may apply. Check individual state requirements.

B: Component Analysis - State

The following components appear on one or more of the following state hazardous substances lists:

Component	CAS	CA	MA	MN	NJ	PA	RI
Hydrazine hydrate	7803-57-8	No	No	No	Yes	No	No
Sulfuric acid	7664-93-9	Yes	Yes	Yes	Yes	Yes	Yes
Pyridine	110-86-1	Yes	Yes	Yes	Yes	Yes	Yes
Iodine	7553-56-2	Yes	Yes	Yes	Yes	Yes	Yes
Xylene	1330-20-7	Yes	Yes	Yes	Yes	Yes	Yes
Acetic anhydride	108-24-7	Yes	Yes	Yes	Yes	Yes	Yes
o-Toluidine	95-53-4	Yes	Yes	Yes	Yes	Yes	Yes
Hydrochloric acid	7647-01-0	Yes	Yes	Yes	Yes	Yes	Yes
N,N-Diethylaniline	91-66-7	No	Yes	No	Yes	Yes	No
Potassium permanganate	7722-64-7	Yes	Yes	No	Yes	Yes	Yes
Furfurol	98-01-1	Yes	Yes	Yes	Yes	Yes	Yes
Formaldehyde	50-00-0	Yes	Yes	Yes	Yes	Yes	Yes
o-Dianisidine	119-90-4	Yes	Yes	Yes	Yes	Yes	Yes
Magnesium perchlorate	10034-81-8	No	Yes	No	Yes	Yes	Yes
Zirconium	7440-67-7	Yes	Yes	Yes	Yes	Yes	Yes

The following statement(s) are provided under the California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65):

WARNING! This product contains a chemical known to the state of California to cause cancer.

Component Analysis - WHMIS IDL

The following components are identified under the Canadian Hazardous Products Act Ingredient Disclosure List:

Component	CAS #	Minimum Concentration
Sulfuric acid	7664-93-9	1 % (English Item 1485, French Item 138)
Pyridine	110-86-1	1 % (English Item 1374, French Item 1459)
Iodine	7553-56-2	1 % (English Item 875, French Item 1020)
o-Toluidine	95-53-4	0.1 % (English Item 1589, French Item 1633)

Additional Regulatory Information

A: General Product Information

No additional information available.

B: Component Analysis - Inventory

Component	CAS #	TSCA	CAN	EEC
Hydrazine hydrate	7803-57-8	No	No	No
Sulfuric acid	7664-93-9	Yes	DSL	EINECS
Pyridine	110-86-1	Yes	DSL	EINECS
Iodine	7553-56-2	Yes	DSL	EINECS
Xylene	1330-20-7	Yes	DSL	EINECS
Acetic anhydride	108-24-7	Yes	DSL	EINECS
o-Toluidine	95-53-4	Yes	DSL	EINECS
Hydrochloric acid	7647-01-0	Yes	DSL	EINECS
N,N-Diethylaniline	91-66-7	Yes	DSL	EINECS
Potassium permanganate	7722-64-7	Yes	DSL	EINECS
Cerium sulfate	10294-42-5	No	No	No
Furfurol	98-01-1	Yes	DSL	EINECS
Formaldehyde	50-00-0	Yes	DSL	EINECS
2,4-Dinitrophenylhydrazine	119-26-6	Yes	DSL	EINECS
o-Dianisidine	119-90-4	Yes	DSL	EINECS
Iodine pentoxide	12029-98-0	Yes	DSL	EINECS
Magnesium perchlorate	10034-81-8	Yes	DSL	EINECS
Bariumchloroanilate	13435-46-6	Yes	DSL	EINECS
Pyridylpyridinium chloride	22752-98-3	No	No	EINECS
Butyrylcholiniodide	2494-56-6	Yes	NDSL	EINECS
Zirconium	7440-67-7	Yes	DSL	EINECS

* * * Section 16 - Other Information * * *

Other Information

Reasonable care has been taken in the preparation of this information, but the manufacturer makes no warranty of merchantability or any other warranty, expressed or implied, with respect to this information. The manufacturer makes no representations and assumes no liability for any direct, incidental or consequential damages resulting from its use.

Key/Legend

ACGIH = American Conference of Governmental Industrial Hygienists. CERCLA = Comprehensive Environmental Response, Compensation and Liability Act. CFR = Code of Federal Regulations. EINECS = European Inventory of Existing Commercial Chemical Substances. EPA = Environmental Protection Agency. HEPA = High Efficiency Particulate Air. HMIS = Hazardous Material Information System. IARC = International Agency for Research on Cancer. NFPA = National Fire Protection Association. NIOSH = National Institute of Occupational Safety and Health. NJTSR = New Jersey Trade Secret Registry. NTP = National Toxicology Program. OSHA = Occupational Safety and Health Administration. NA = Not available or Not Applicable. SARA = Superfund Amendments and Reauthorization Act. TLV = Threshold Limit Value. TSCA = Toxic Substance Control Act.

Contact: Product Manager

Contact Phone: 412-787-8383

This is the end of MSDS # 9030165