

# PHOTOGRAPHERS' FORMULARY

## FORMULARY FILM DEVELOPER 50

### CATALOG NUMBER 01-0112 TO MAKE 4 LITERS

Formulary Film Developer 50 is a moderately fast developer for commercial and sheet sizes of Plus-x, Pan professional films. The developer produces negatives with normal contrast, average to slightly higher than average graininess. May use with or without dilution.

Undiluted developer can process 5- 8X10's per 1 liter of Formulary 50 without replenishment. Diluted developer 1:1 can process 10- 8X10's per liter.

The chemicals in this kit are used to make a working solution with a shelf life of 6 months, in a full-capped container. A 2-month shelf can be expected on a half full container.

#### CHEMICALS CONTAINED IN THIS KIT

Chemical	1 Liter
Metol	10 Grams
Sodium Sulfite	120 Grams
Hydroquinone	10 Grams
Sodium Metaborate	40 Grams
Potassium Bromide	2 Grams

#### FOR YOUR CHEMICAL SAFETY

All chemicals are dangerous and must be treated with respect. Please read the warning label on each chemical package.

Only one chemical used in the kit, metol, needs special attention. Some individuals become sensitized to metol. If this should occur, discontinue use and see a physician.

The user assumes all risks upon accepting these chemicals. IF FOR ANY REASON YOU DO NOT WANT TO ASSUME ALL RISKS, PLEASE RETURN THE CHEMICALS WITHIN 30 DAYS FOR A FULL REFUND.

**Please consult with local sewer and water authorities regarding the proper disposal of darkroom chemicals in your area.**

#### MIXING THE DEVELOPER WORKING SOLUTION

You will need a brown bottle with a capacity of one liter, and a mixing container.

We recommend you wear rubber gloves, splash goggles, dust mask and a vinyl apron whenever mixing dry chemicals.



# TCI AMERICA

## SAFETY DATA SHEET

Revision number: 2  
Revision date: 10/06/2014

### 1. IDENTIFICATION

**Product name:** 4-(Methylamino)phenol Sulfate  
**Product code:** M0145

**Product use:** For laboratory research purposes.  
**Restrictions on use:** Not for drug or household use.

**Company:**  
TCI America  
9211 N. Harborside Street  
Portland, OR 97203 U.S.A.  
**Telephone:**  
+1-800-423-8616 / +1-503-283-1681  
**Fax:**  
+1-888-520-1075 / +1-503-283-1987  
**e-mail:**  
sales-US@TCIchemicals.com  
www.TCIchemicals.com

**Emergency telephone number:**  
**Chemical Emergencies:**  
TCI America (8:00am - 5:00pm) PST  
+1-503-286-7624  
**Transportation Emergencies:**  
Chemtrec 24-Hour  
+1-800-424-9300 (U.S.A.)  
+1-703-527-3887 (International)  
**Responsible department:**  
TCI America  
Environmental Health Safety and Security  
+1- 503-286-7624

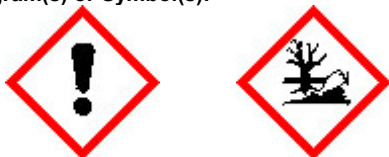
### 2. HAZARD(S) IDENTIFICATION

**OSHA Haz Com: CFR 1910.1200:** Acute Toxicity - Oral [Category 4]  
Sensitization - Skin [Category 1]  
Aquatic Hazard (Acute) [Category 1]  
Aquatic Hazard (Long-Term) [Category 1]

**Signal word:** Warning!

**Hazard Statement(s):** Harmful if swallowed  
May cause an allergic skin reaction  
Very toxic to aquatic life  
Very toxic to aquatic life with long lasting effects

**Pictogram(s) or Symbol(s):**



**Precautionary Statement(s):**

**Prevention**

Do not eat, drink or smoke when using this product. Wash hands and face thoroughly after handling. Avoid breathing dusts or mists. Contaminated work clothing must not be allowed out of the workplace. Wear protective gloves.

**Response**

If swallowed: Immediately call a poison center or doctor. Rinse mouth. If on skin: Wash with plenty of water. If skin irritation occurs: Get medical advice/attention. Wash contaminated clothing before reuse.

**Storage**

None

**Disposal**

Dispose of contents and container in accordance with US EPA guidelines for the classification and determination of hazardous waste listed in 40 CFR 261.3. (See Section 13)

### 3. COMPOSITION/INFORMATION ON INGREDIENTS

**Substance/Mixture:** Substance  
**Components:** 4-(Methylamino)phenol Sulfate

**3. COMPOSITION/INFORMATION ON INGREDIENTS**

Percent:	>98.0%(HPLC)(N)
CAS Number:	55-55-0
Molecular Weight:	344.38
Chemical Formula:	C <sub>14</sub> H <sub>18</sub> N <sub>2</sub> O <sub>2</sub> ·H <sub>2</sub> SO <sub>4</sub>

**4. FIRST-AID MEASURES**

<b>Inhalation:</b>	May cause coughing, difficult breathing and nausea. Call emergency medical service. Effects of exposure (inhalation) to substance may be delayed. Inhalation of vapors or contact with substance will result in contamination and potential harmful effects. Move victim to fresh air. Give artificial respiration if victim is not breathing. Administer oxygen if breathing is difficult. Keep victim warm and quiet. Treat symptomatically and supportively. Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
<b>Skin contact:</b>	Call a poison center or doctor if you feel unwell. Effects of exposure (skin contact) to substance may be delayed. Remove and wash contaminated clothing before re-use. Remove and isolate contaminated clothing and shoes. In case of contact with substance, immediately flush skin with running water for at least 20 minutes. Treat symptomatically and supportively. Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
<b>Eye contact:</b>	If this chemical contacts the eyes, immediately wash (irrigate) the eyes with large amounts of water, occasionally lifting the lower and upper eyelids. If eye irritation persists get medical advice/attention. Move victim to fresh air. Check for and remove any contact lenses. Keep victim warm and quiet. Treat symptomatically and supportively. Effects of exposure to substance may be delayed. Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
<b>Ingestion:</b>	Harmful if swallowed. Effects of exposure (ingestion) to substance may be delayed. If swallowed, seek medical advice immediately and show the container or label. Do not use mouth-to-mouth method if victim ingested the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Loosen tight clothing such as a collar, tie, belt or waistband. If a person vomits place them in the recovery position so that vomit will not reenter the mouth and throat. Rinse mouth. Keep victim warm and quiet. Treat symptomatically and supportively. Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.

**Symptoms/effects:**

<b>Acute:</b>	No data available
<b>Delayed:</b>	May cause skin sensitization.

**Immediate medical attention:**

WARNING: It might be hazardous to the person providing aid to give mouth-to-mouth respiration, because the inhaled material is harmful. CAUTION: Victim may be a source of contamination. If breathing has stopped, perform artificial respiration. Use first aid treatment according to the nature of the injury. Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.

**5. FIRE-FIGHTING MEASURES**

**Suitable extinguishing media:** Dry chemical, CO<sub>2</sub>, water spray, or alcohol-resistant foam. Consult with local fire authorities before attempting large scale fire fighting operations.

**Specific hazards arising from the chemical**

**Hazardous combustion products:** These products include: Carbon oxides Nitrogen oxides Silicates

**Other specific hazards:** Closed containers may explode from heat of a fire.

**Special precautions for fire-fighters:**

Use water spray or fog; do not use straight streams. Dike fire-control water for later disposal; do not scatter the material. Containers may explode when heated. Move containers from fire area if you can do it without risk.

**Special protective equipment for fire-fighters:**

Wear positive pressure self-contained breathing apparatus (SCBA). Structural fire fighters' protective clothing provides limited protection in fire situations ONLY; it may not be effective in spill situations. Wear chemical protective clothing which is specifically recommended by the manufacturer. It may provide little or no thermal protection.

**6. ACCIDENTAL RELEASE MEASURES**

**Personal precautions:** Avoid contact with skin, eyes, and clothing. Keep people away from and upwind of spill/leak. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing (Section 8). Warn unnecessary personnel to move away. Stop leak if you can do it without risk. Ensure adequate ventilation. Isolate the hazard area and deny entry to unnecessary and unprotected personnel.

**Personal protective equipment:** Safety glasses. Wear protective clothing (chemical resistant suit and chemical resistant boots). Dust respirator. Be sure to use a MSHA/NIOSH approved respirator or equivalent. Wear protective gloves (nitrile).

**6. ACCIDENTAL RELEASE MEASURES**

**Emergency procedures:** Prevent dust cloud. In case of a spill and/or a leak, always shut off any sources of ignition, ventilate the area, and exercise caution. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Warn personnel to move away. Prevent entry into sewers, basements or confined areas; dike if needed.

**Methods and materials for containment and cleaning up:**

ELIMINATE all ignition sources (no smoking, flares, sparks, or flames in immediate area). Stop leak if without risk. Absorb with an inert material and put the spilled material in an appropriate waste disposal container. Use clean non-sparking tools to collect absorbed material. Dike far ahead of spill; use dry sand to contain the flow of material. Ventilate the area.

**Environmental precautions:**

Keep away from living quarters. Environmental hazard. Do not let product enter drains. Prevent further leakage or spillage if safe to do so. Water runoff can cause environmental damage. Prevent entry into sewers, basements or confined areas; dike if needed.

**7. HANDLING AND STORAGE**

**Precautions for safe handling:** Avoid inhalation of vapor or mist. Do not ingest. Avoid contact with skin and eyes. Good general ventilation should be sufficient to control airborne levels. Keep container dry. Handle and open container with care. Wear suitable protective clothing, gloves and eye/face protection. When using do not eat, drink, or smoke. Keep away from sources of ignition.

**Conditions for safe storage:** Keep only in the original container in a cool well-ventilated place. Keep away from incompatibles. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Avoid prolonged storage periods.

**Storage incompatibilities:** Store away from oxidizing agents

**8. EXPOSURE CONTROLS / PERSONAL PROTECTION**

**Exposure limits:** No data available

**Appropriate engineering controls:**

Good general ventilation should be sufficient to control airborne levels. Ventilation is normally required when handling or using this product. Eyewash fountains should be provided in areas where there is any possibility that workers could be exposed to the substance. Follow safe industrial engineering/laboratory practices when handling any chemical.

**Personal protective equipment**

**Respiratory protection:** Dust respirator. Be sure to use a MSHA/NIOSH approved respirator or equivalent.

**Hand protection:** Wear protective gloves.

**Eye protection:** Safety glasses.

**Skin and body protection:** Lab coat.

**9. PHYSICAL AND CHEMICAL PROPERTIES**

**Physical state (20°C):** Solid

**Form:** Crystal - Powder

**Color:** White - Deep green

**Odor:** No data available

**Odor threshold:** No data available

<b>Melting point/freezing point:</b>	260°C (dec.) (500°F)	<b>pH:</b>	No data available
<b>Boiling point/range:</b>	No data available	<b>Vapor pressure:</b>	No data available
<b>Decomposition temperature:</b>	No data available	<b>Vapor density:</b>	No data available
<b>Relative density:</b>	No data available	<b>Dynamic Viscosity:</b>	No data available
<b>Kinematic Viscosity:</b>	No data available		
<b>Partition coefficient: n-octanol/water (log P<sub>ow</sub>)</b>	No data available	<b>Evaporation rate: (Butyl Acetate = 1)</b>	No data available
<b>Flash point:</b>	No data available	<b>Autoignition temperature:</b>	531°C (988°F)
<b>Flammability (solid, gas):</b>	No data available	<b>Flammability or explosive limits:</b>	
		<b>Lower:</b>	No data available
		<b>Upper:</b>	No data available

**Solubility(ies):**

**Water:** Soluble (4.7g/100mL, 15°C)

**Slightly soluble:** Alcohols

**Insoluble:** Ether

**10. STABILITY AND REACTIVITY**

<b>Reactivity:</b>	Not Available.
<b>Chemical Stability:</b>	Moisture sensitive. Light sensitive.
<b>Possibility of Hazardous Reactions:</b>	No hazardous reactivity has been reported.
<b>Conditions to avoid:</b>	Exposure to light. Exposure to moisture. Moisture sensitive.
<b>Incompatible materials:</b>	Oxidizing agents
<b>Hazardous Decomposition Products:</b>	No data available

**11. TOXICOLOGICAL INFORMATION**

RTECS Number: SL8650000

**Acute Toxicity:**

ipr-rat LDLo:50 mg/kg

orl-mus LD50:565 mg/kg

orl-rat LDLo:200 mg/kg

skn-gpg LD50:&gt;1 g/kg

**Skin corrosion/irritation:**

skn-hmn 1 %/48H

**Serious eye damage/irritation:**

No data available

**Respiratory or skin sensitization:**

No data available

**Germ cell mutagenicity:**

mmo-sat 167 ug/plate (-S9)

**Carcinogenicity:**

No data available

**IARC:** No data available**NTP:** No data available**OSHA:** No data available**Reproductive toxicity:**

No data available

**Routes of Exposure:**

Inhalation, Eye contact, Ingestion, Skin contact.

**Symptoms related to exposure:**

Overexposure may result in serious illness or death. Skin contact may result in sensitization. Readily absorbed through skin.

**Potential Health Effects:**

No specific information available; skin and eye contact may result in irritation. May be harmful if inhaled or ingested.

**Target organ(s):**

No data available

**12. ECOLOGICAL INFORMATION****Ecotoxicity****Fish:**

No data available

**Crustacea:**

No data available

**Algae:**

No data available

**Persistence and degradability:**

No data available

**Bioaccumulative potential (BCF):**

No data available

**Mobility in soil:**

No data available

**Partition coefficient:**

No data available

**n-octanol/water (log P<sub>ow</sub>)****Soil adsorption (K<sub>oc</sub>):**

No data available

**Henry's Law:**

No data available

**constant (PaM<sup>3</sup>/mol)**

**13. DISPOSAL CONSIDERATIONS**

<b>Disposal of product:</b>	Recycle to process if possible. It is the generator's responsibility to comply with Federal, State and Local rules and regulations. You may be able to dissolve or mix material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber system. This section is intended to provide assistance but does not replace these laws, nor does compliance in accordance with this section ensure regulatory compliance according to the law. US EPA guidelines for Identification and Listing of Hazardous Waste are listed in 40 CFR Parts 261. The product should not be allowed to enter the environment, drains, water ways, or the soil.
<b>Disposal of container:</b>	Dispose of as unused product. Do not re-use empty containers.
<b>Other considerations:</b>	Observe all federal, state and local regulations when disposing of the substance.

**14. TRANSPORT INFORMATION**

<b>DOT (US)</b>	Non-hazardous for transportation.
<b>IATA</b>	Non-hazardous for transportation.
<b>IMDG</b>	Non-hazardous for transportation.

**15. REGULATORY INFORMATION****Toxic Substance Control Act (TSCA 8b.):**

This product is ON the EPA Toxic Substances Control Act (TSCA) inventory.

**US Federal Regulations****CERCLA Hazardous substance and Reportable Quantity:**

<b>SARA 313:</b>	Not Listed
<b>SARA 302:</b>	Not Listed

**State Regulations****State Right-to-Know**

<b>Massachusetts</b>	Not Listed
<b>New Jersey</b>	Not Listed
<b>Pennsylvania</b>	Not Listed
<b>California Proposition 65:</b>	Not Listed

**Other Information****NFPA Rating:**

<b>Health:</b>	2
<b>Flammability:</b>	0
<b>Instability:</b>	0

**HMIS Classification:**

<b>Health:</b>	2
<b>Flammability:</b>	0
<b>Physical:</b>	0

**International Inventories**

<b>WHMIS hazard class:</b>	D2A: Materials causing other toxic effects. (Very Toxic) D2B: Materials causing other toxic effects. (Toxic)
<b>EC-No:</b>	200-237-1

**16. OTHER INFORMATION**

**Revision date:** 10/06/2014

**Revision number:** 2

TCI chemicals are for research purposes only and are NOT intended for use as drugs, food additives, households, or pesticides. The information herein is believed to be correct, but does not claim to be all inclusive and should be used only as a guide. Neither the above named supplier nor any of its affiliates or subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All chemical reagents must be handled with the recognition that their chemical, physiological, toxicological, and hazardous properties have not been fully investigated or determined. All chemical reagents should be handled only by individuals who are familiar with their potential hazards and who have been fully trained in proper safety, laboratory, and chemical handling procedures. Although certain hazards are described herein, we can not guarantee that these are the only hazards which exist. Our SDS are based only on data available at the time of shipping and are subject to change without notice as new information is obtained. Avoid long storage periods since the product is subject to degradation with age and may become more dangerous or hazardous. It is the responsibility of the user to request updated SDS for products that are stored for extended periods. Disposal of unused product must be undertaken by qualified personnel who are knowledgeable in all applicable regulations and follow all pertinent safety precautions including the use of appropriate protective equipment (e.g. protective goggles, protective clothing, breathing equipment, face mask, fume hood). For proper handling and disposal, always comply with federal, state and local regulations.



## Material Safety Data Sheet

Creation Date 20-Jan-2010

Revision Date 20-Jan-2010

Revision Number 1

### 1. PRODUCT AND COMPANY IDENTIFICATION

**Product Name** Sodium sulfite anhydrous

**Cat No.** BP355-500 □ S430-3 □ S430-10 □ S430-500 □ S447-3 □ S447-500

**Synonyms** Disodium sulfite; Sulfurous acid, disodium salt (Crystalline/Powder/Certified ACS/Low Phosphate)

**Recommended Use** Laboratory chemicals

**Company** Fisher Scientific  
One Reagent Lane  
Fair Lawn, NJ 07410  
Tel: (201) 796-7100

**Emergency Telephone Number**  
CHEMTREC®, Inside the USA: 800-424-9300  
CHEMTREC®, Outside the USA: 703-527-3887

### 2. HAZARDS IDENTIFICATION

#### WARNING!

#### Emergency Overview

Contact with acids liberates toxic gas. May cause eye, skin, and respiratory tract irritation . May cause central nervous system effects.

**Appearance** Off-white

**Physical State** Solid

**odor** odorless

**Target Organs** Central nervous system (CNS)

#### Potential Health Effects

##### Acute Effects

##### Principle Routes of Exposure

###### Eyes

May cause irritation.

###### Skin

May cause irritation. May be harmful in contact with skin.

###### Inhalation

May cause irritation of respiratory tract. May be harmful if inhaled.

###### Ingestion

May be harmful if swallowed. May cause central nervous system effects. Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea.

##### Chronic Effects

Mutagenic effects have occurred in experimental animals..

See Section 11 for additional Toxicological information.

**Aggravated Medical Conditions** No information available.

### 3. COMPOSITION/INFORMATION ON INGREDIENTS

#### Haz/Non-haz

Component	CAS-No	Weight %
Sodium sulfite	7757-83-7	97

### 4. FIRST AID MEASURES

<b>Eye Contact</b>	Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Obtain medical attention.
<b>Skin Contact</b>	Wash off immediately with plenty of water for at least 15 minutes. Get medical attention immediately if symptoms occur.
<b>Inhalation</b>	Move to fresh air. If breathing is difficult, give oxygen. Get medical attention immediately if symptoms occur.
<b>Ingestion</b>	Do not induce vomiting. Obtain medical attention.
<b>Notes to Physician</b>	Treat symptomatically.

### 5. FIRE-FIGHTING MEASURES

<b>Flash Point</b>	No information available.
<b>Method</b>	No information available.
<b>Autoignition Temperature</b>	No information available.
<b>Explosion Limits</b>	
<b>Upper</b>	No data available
<b>Lower</b>	No data available
<b>Suitable Extinguishing Media</b>	Substance is nonflammable; use agent most appropriate to extinguish surrounding fire..
<b>Unsuitable Extinguishing Media</b>	No information available.
<b>Hazardous Combustion Products</b>	No information available.
<b>Sensitivity to mechanical impact</b>	No information available.
<b>Sensitivity to static discharge</b>	No information available.

#### Specific Hazards Arising from the Chemical

Thermal decomposition can lead to release of irritating gases and vapors.

#### Protective Equipment and Precautions for Firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear

**NFPA**                      **Health** 1                      **Flammability** 0                      **Instability** 1                      **Physical hazards** N/A



## 6. ACCIDENTAL RELEASE MEASURES

<b>Personal Precautions</b>	Use personal protective equipment. Ensure adequate ventilation. Avoid dust formation. Avoid contact with skin, eyes and clothing.
<b>Environmental Precautions</b>	Should not be released into the environment.
<b>Methods for Containment and Clean Up</b>	Avoid dust formation. Sweep up or vacuum up spillage and collect in suitable container for disposal.

## 7. HANDLING AND STORAGE

<b>Handling</b>	Wear personal protective equipment. Ensure adequate ventilation. Avoid dust formation. Do not breathe dust. Avoid contact with skin, eyes and clothing. Keep away from acids.
<b>Storage</b>	Keep containers tightly closed in a dry, cool and well-ventilated place. Do not store near acids.

## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

<b>Engineering Measures</b>	Ensure adequate ventilation, especially in confined areas. Ensure that eyewash stations and safety showers are close to the workstation location.
<b>Exposure Guidelines</b>	This product does not contain any hazardous materials with occupational exposure limits established by the region specific regulatory bodies.

*NIOSH IDLH: Immediately Dangerous to Life or Health*

### Personal Protective Equipment

#### **Eye/face Protection**

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 and body protection**

Wear appropriate protective gloves and clothing to prevent skin exposure

#### **Respiratory Protection**

Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced

## 9. PHYSICAL AND CHEMICAL PROPERTIES

<b>Physical State</b>	Solid
<b>Appearance</b>	Off-white
<b>odor</b>	odorless
<b>Odor Threshold</b>	No information available.
<b>pH</b>	8.5-10 5% aq.sol.
<b>Vapor Pressure</b>	No information available.
<b>Vapor Density</b>	No information available.
<b>Viscosity</b>	No information available.
<b>Boiling Point/Range</b>	No information available.
<b>Melting Point/Range</b>	>500°C / 932°F
<b>Decomposition temperature</b> <input type="checkbox"/> C	500
<b>Flash Point</b>	No information available.
<b>Evaporation Rate</b>	No information available.
<b>Specific Gravity</b>	2.630
<b>Solubility</b>	Partly soluble in water
<b>log Pow</b>	No data available

## 9. PHYSICAL AND CHEMICAL PROPERTIES

**Molecular Weight** 126.04  
**Molecular Formula** Na<sub>2</sub>SO<sub>3</sub>

## 10. STABILITY AND REACTIVITY

**Stability** Air sensitive. Moisture sensitive.

**Conditions to Avoid** Incompatible products. Excess heat. Exposure to air. Exposure to moisture.

**Incompatible Materials** Strong oxidizing agents, Acids

**Hazardous Decomposition Products** Sulfur oxides, Sodium oxides

**Hazardous Polymerization** Hazardous polymerization does not occur

**Hazardous Reactions .** Contact with acids liberates toxic gas.

## 11. TOXICOLOGICAL INFORMATION

### Acute Toxicity

#### Component Information

Component	LD50 Oral	LD50 Dermal	LC50 Inhalation
Sodium sulfite	820 mg/kg ( Rat )	Not listed	22 mg/L ( Rat ) 1 h 5.5 mg/L ( Rat ) 4 h

**Irritation** No information available.

**Toxicologically Synergistic Products** No information available.

### Chronic Toxicity

**Carcinogenicity** There are no known carcinogenic chemicals in this product

**Sensitization** No information available.

**Mutagenic Effects** Mutagenic effects have occurred in experimental animals.

**Reproductive Effects** No information available.

**Developmental Effects** No information available.

**Teratogenicity** No information available.

**Other Adverse Effects** See actual entry in RTECS for complete information.

**Endocrine Disruptor Information** No information available

## 12. ECOLOGICAL INFORMATION

### Ecotoxicity

Component	Freshwater Algae	Freshwater Fish	Microtox	Water Flea
Sodium sulfite	Not listed	Not listed	EC50 = 770 mg/L 17 h	LC50 24 h 330 mg/L

**Persistence and Degradability** No information available

**Bioaccumulation/ Accumulation** No information available

### Mobility

Component	log Pow
Sodium sulfite	-4

## 13. DISPOSAL CONSIDERATIONS

**Waste Disposal Methods** Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations to ensure complete and accurate classification

## 14. TRANSPORT INFORMATION

**DOT** Not regulated

**TDG** Not regulated

**IATA** Not regulated

**IMDG/IMO** Not regulated

## 15. REGULATORY INFORMATION

### International Inventories

Component	TSCA	DSL	NDSL	EINECS	ELINCS	NLP	PICCS	ENCS	AICS	CHINA	KECL
Sodium sulfite	X	X	-	231-821-4	-		X	X	X	X	KE-31612 X

**Legend:****X - Listed****E - Indicates a substance that is the subject of a Section 5(e) Consent order under TSCA.****F - Indicates a substance that is the subject of a Section 5(f) Rule under TSCA.****N - Indicates a polymeric substance containing no free-radical initiator in its inventory name but is considered to cover the designated polymer made with any free-radical initiator regardless of the amount used.****P - Indicates a commenced PMN substance****R - Indicates a substance that is the subject of a Section 6 risk management rule under TSCA.****S - Indicates a substance that is identified in a proposed or final Significant New Use Rule****T - Indicates a substance that is the subject of a Section 4 test rule under TSCA.****XU - Indicates a substance exempt from reporting under the Inventory Update Rule, i.e. Partial Updating of the TSCA Inventory Data Base Production and Site Reports (40 CFR 710(B)).****Y1 - Indicates an exempt polymer that has a number-average molecular weight of 1,000 or greater.****Y2 - Indicates an exempt polymer that is a polyester and is made only from reactants included in a specified list of low concern reactants that comprises one of the eligibility criteria for the exemption rule.****U.S. Federal Regulations****TSCA 12(b)** Not applicable**SARA 313**

Not applicable

**SARA 311/312 Hazardous Categorization**

<b>Acute Health Hazard</b>	No
<b>Chronic Health Hazard</b>	No
<b>Fire Hazard</b>	No
<b>Sudden Release of Pressure Hazard</b>	No
<b>Reactive Hazard</b>	No

**Clean Water Act**

Not applicable

**Clean Air Act**

Not applicable

**OSHA**

Not applicable

**CERCLA**

Not Applicable

**California Proposition 65**

This product does not contain any Proposition 65 chemicals.

**State Right-to-Know**

Not applicable

**U.S. Department of Transportation**

Reportable Quantity (RQ):	N
DOT Marine Pollutant	N
DOT Severe Marine Pollutant	N

**U.S. Department of Homeland Security**

This product does not contain any DHS chemicals.

**Other International Regulations**

**Mexico - Grade** No information available

**Canada**

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

**WHMIS Hazard Class**

Non-controlled

## 16. OTHER INFORMATION

**Prepared By** Regulatory Affairs  
Thermo Fisher Scientific  
Tel: (412) 490-8929

**Creation Date** 20-Jan-2010

**Print Date** 20-Jan-2010

**Revision Summary** "\*\*\*\*", and red text indicates revision

**Disclaimer**

The information provided on this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guide for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered as a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other material or in any process, unless specified in the text.

**End of MSDS**

# SAFETY DATA SHEET

## SECTION 1: Identification of the substance/mixture and of the company/undertaking

### Product identifier

**Product name:** Eastman(TM) Hydroquinone, European Pharma Grade

**Product No.:** EAN 978227. 08992-0E, P08992E1, P08992E2, P08992E3

**Synonyms, Trade Names:** 08992-0E

### Additional identification

**Chemical name:** 1,4-benzenediol  
**CAS-No.:** 123-31-9

### Relevant identified uses of the substance or mixture and uses advised against

**Identified uses:** Chemical Intermediate, Inhibitor, Photographic processing chemical.

**Uses advised against:** None known.

### Details of the supplier of the safety data sheet

#### Manufacturer / Supplier

Eastman Chemical Company  
200 South Wilcox Drive  
Kingsport, TN 37660-5280 US  
+14232292000

Visit our website at [www.EASTMAN.com](http://www.EASTMAN.com) or email [emnmsds@eastman.com](mailto:emnmsds@eastman.com)

### Emergency telephone number:

For emergency health, safety, and environmental information, call 1-423-229-4511 or 1-423-229-2000.

For emergency transportation information, in the United States: call CHEMTREC at 800-424-9300 or call 423-229-2000.

## SECTION 2: Hazards identification

### Hazard Classification:

#### Health Hazards

Acute toxicity (Oral)	Category 4
Serious eye damage	Category 1
Skin sensitizer	Category 1
Germ Cell Mutagenicity	Category 2
Specific Target Organ Toxicity - Single Exposure (Dermal)	Category 2

### OSHA Specified Hazards:

Combustible dust	If converted to small particles during further processing, handling or by other means may form combustible dust concentrations in air.
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### Warning label items including precautionary statement:

**Pictogram:****Signal Words:**

DANGER!

**Hazard Statement(s):**

H302: Harmful if swallowed.  
H318: Causes serious eye damage.  
H317: May cause an allergic skin reaction.  
H341: Suspected of causing genetic defects.  
H371: May cause damage to organs.  
If converted to small particles during further processing, handling or by other means may form combustible dust concentrations in air.

**Precautionary Statement:****Prevention:**

P201: Obtain special instructions before use.  
P202: Do not handle until all safety precautions have been read and understood.  
P281: Use personal protective equipment as required.  
P264: Wash hands thoroughly after handling.  
P270: Do not eat, drink or smoke when using this product.  
P260: Do not breathe dust/fume/gas/mist/vapors/spray.  
P280: Wear protective gloves/protective clothing/eye protection/face protection.  
P272: Contaminated work clothing should not be allowed out of the workplace.

**Response:**

P309+P311: IF exposed or if you feel unwell: Call a POISON CENTER or doctor/physician.  
P301+P312: IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.  
P330: Rinse mouth.  
P302+P352: IF ON SKIN: Wash with plenty of soap and water.  
P333+P313: If skin irritation or rash occurs: Get medical advice/attention.  
P363: Wash contaminated clothing before reuse.  
P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.  
P310: Immediately call a POISON CENTER or doctor/physician.

**Storage:**

P405: Store locked up.

**Disposal:**

P501: Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.

**Hazard(s) not otherwise classified (HNOC):**

None known.

**SECTION 3: Composition/information on ingredients****Substances / Mixtures****General information:**

Chemical name	Concentration	Additional identification	Notes
hydroquinone	100%	CAS-No.: 123-31-9	#

\* All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

# This substance has workplace exposure limit(s).

**SECTION 4: First aid measures****Description of first aid measures**

**Inhalation:** Move to fresh air. Treat symptomatically. Get medical attention if symptoms persist.

**Eye contact:** Immediately flush with plenty of water for at least 15 minutes. If easy to do, remove contact lenses. Get medical attention. In case of irritation from airborne exposure, move to fresh air. Get medical attention if symptoms persist.

**Skin contact:** Immediately remove contaminated clothing and shoes and wash skin with soap and plenty of water. If skin irritation or an allergic skin reaction develops, get medical attention. Wash contaminated clothing before reuse. Destroy or thoroughly clean contaminated shoes.

**Ingestion:** Call a physician or poison control center immediately. Only induce vomiting at the instruction of medical personnel. Never give anything by mouth to an unconscious person.

**Most important symptoms and effects, both acute and delayed:** May irritate and cause redness and pain. Symptoms may be delayed.

**Indication of any immediate medical attention and special treatment needed**

**Hazards:** None known.

**Treatment:** Treat symptomatically.

**SECTION 5: Firefighting measures**

**General Fire Hazards:** Material can accumulate static charges which may cause an electrical spark (ignition source). Use proper bonding and/or grounding procedures.

**Extinguishing media**

**Suitable extinguishing media:** Water spray. Dry chemical. Carbon Dioxide. Water spray. Carbon Dioxide. Dry chemical.

**Unsuitable extinguishing media:** None known. None known.

**Special hazards arising from the substance or mixture:** Powdered material may form explosive dust-air mixtures.



**Advice for firefighters**

**Special fire fighting procedures:** Minimize dust generation and accumulation.

**Special protective equipment for fire-fighters:** Self-contained breathing apparatus and full protective clothing must be worn in case of fire.

**SECTION 6: Accidental release measures**

**Personal precautions, protective equipment and emergency procedures:** Wear appropriate personal protective equipment.

**Environmental Precautions:** Do not release into the environment.

**Methods and material for containment and cleaning up:** Sweep up and place in a clearly labeled container for chemical waste. Large Spillages: Flush spill area with water spray. Prevent runoff from entering drains, sewers, or streams. Dike for later disposal.

**Notification Procedures:** In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable regulations.

**SECTION 7: Handling and storage:**

**Precautions for safe handling:** Avoid breathing dust. Avoid contact with eyes, skin, and clothing. Do not taste or swallow. Use only with adequate ventilation. Wash thoroughly after handling.

**Conditions for safe storage, including any incompatibilities:** Keep container closed. Keep away from food, drink and animal feeding stuffs.

**Specific end use(s):** Inhibitor Chemical Intermediate Photographic processing chemical.

**SECTION 8: Exposure controls/personal protection**

**Control Parameters**

**Occupational Exposure Limits**

Country specific exposure limits have not been established or are not applicable unless listed below.

Chemical name	type	Exposure Limit Values	Source
hydroquinone	TWA	1 mg/m3	US. ACGIH Threshold Limit Values (01 2010)
	PEL	2 mg/m3	US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) (02 2006)
	ST ESL	20 µg/m3	US. Texas. Effects Screening Levels (Texas Commission on Environmental Quality) (03 2014)
	AN ESL	2 µg/m3	US. Texas. Effects Screening Levels (Texas Commission on Environmental Quality) (03 2014)

**Exposure controls**

**Appropriate engineering controls:** Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.

**Individual protection measures, such as personal protective equipment**

**General information:** Eye bath. Washing facilities. Safety shower.

**Eye/face protection:** Chemical goggles and face shield are recommended. Wear a full-face respirator, if needed.

**Skin protection**

**Hand Protection:** Wear chemical-resistant gloves, footwear, and protective clothing appropriate for the risk of exposure. Contact health and safety professional or manufacturer for specific information. Wash hands after contact.

**Other:** No data available.

**Respiratory Protection:** If engineering controls do not maintain airborne concentrations below recommended exposure limits (where applicable) or to an acceptable level (in countries where exposure limits have not been established), an approved respirator must be worn. In the United States of America, if respirators are used, a program should be instituted to assure compliance with OSHA Standard 63 FR 1152, January 8, 1998. Respirator type: Air-purifying respirator with an appropriate, government approved (where applicable), air-purifying filter, cartridge or canister. Contact health and safety professional or manufacturer for specific information.

**Hygiene measures:** Observe good industrial hygiene practices.

**Environmental Controls:** No data available.

**SECTION 9: Physical and chemical properties**

**Information on basic physical and chemical properties**

**Appearance**

<b>Physical state:</b>	solid
<b>Form:</b>	solid (crystal)
<b>Color:</b>	white
<b>Odor:</b>	Odorless
<b>Odor Threshold:</b>	No data available.
<b>pH:</b>	No data available.
<b>Melting Point</b>	172.3 °C
<b>Boiling Point:</b>	287 °C
<b>Flash Point:</b>	165 °C (closed cup)
<b>Evaporation Rate:</b>	No data available.
<b>Flammability (solid, gas):</b>	not applicable
<b>Flammability Limit - Upper (%)-:</b>	No data available.
<b>Flammability Limit - Lower (%)-:</b>	No data available.

<b>Vapor pressure:</b>	0.000032 hPa (25 °C)
<b>Vapor density (air=1):</b>	3.8
<b>Specific Gravity:</b>	1.33 (15 °C)
<b>Solubility(ies)</b>	
<b>Solubility in Water:</b>	72 g/l (25 °C)
<b>Solubility (other):</b>	No data available.
<b>Partition coefficient (n-octanol/water):</b>	log Pow: 0.59
<b>Autoignition Temperature:</b>	515 °C
<b>Decomposition Temperature:</b>	Thermal stability not tested. Low stability hazard expected at normal operating temperatures.
<b>Dynamic viscosity:</b>	not applicable
<b>Kinematic viscosity:</b>	not applicable
<b>Explosive properties:</b>	Not classified.
<b>Oxidizing properties:</b>	Not classified.

## SECTION 10: Stability and reactivity

<b>Reactivity:</b>	None known.
<b>Chemical Stability:</b>	Stable
<b>Possibility of Hazardous Reactions:</b>	None known.
<b>Conditions to Avoid:</b>	Heat, sparks, flames. Light.
<b>Incompatible Materials:</b>	Strong oxidizing agents. Strong alkalis.
<b>Hazardous Decomposition Products:</b>	Carbon Dioxide. Carbon Monoxide.

## SECTION 11: Toxicological information

### Information on likely routes of exposure

<b>Inhalation:</b>	None known.
<b>Ingestion:</b>	Harmful if swallowed.
<b>Skin contact:</b>	May cause an allergic skin reaction. May cause skin depigmentation.
<b>Eye contact:</b>	Causes serious eye damage.

### Information on toxicological effects

#### Oral

<b>Product:</b>	No data available.
<b>Specified substance(s):</b>	
hydroquinone	Oral LD-50: (Rat): > 375 mg/kg

#### Dermal

<b>Product:</b>	No data available.
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**In vivo****Product:** No data available.**Specified substance(s):**

hydroquinone

Chromosomal aberration intraperitoneal injection (Mouse): positive  
Chromosomal aberration oral: gavage (Rat): negative**Specific Target Organ Toxicity - Single Exposure****Product:** No data available.**Specific Target Organ Toxicity - Repeated Exposure****Product:** No data available.**Aspiration Hazard****Product:** No data available.**Other effects:** No data available.**SECTION 12: Ecological information****Ecotoxicity:****Acute hazards to the aquatic environment:****Fish****Product:** No data available.**Specified substance(s):**

hydroquinone

LC-50 (Fish, 96 h): 0.638 mg/l

**Aquatic Invertebrates****Product:** No data available.**Specified substance(s):**

hydroquinone

EC-50 (daphnid, 48 h): 0.134 mg/l

**Chronic hazards to the aquatic environment:****Fish****Product:** No data available.**Aquatic Invertebrates****Product:** No data available.**Specified substance(s):**

hydroquinone

NOEC: (daphnid, 21 d): 0.0057 mg/l

**Toxicity to Aquatic Plants****Product:** No data available.**Specified substance(s):**

hydroquinone

EC-50 (Alga, 72 h): 0.33 mg/l  
NOEC: (Alga, 72 h): 0.019 mg/l**Persistence and Degradability****Biodegradation**

**Product:** No data available.

**Specified substance(s):**  
hydroquinone 70 % (14 d, Ready Biodegradability: Modified MITI Test (I)) Readily biodegradable

**BOD/COD Ratio**  
**Product:** No data available.

#### Bioaccumulative Potential

**Bioconcentration Factor (BCF)**  
**Product:** No data available.

**Partition Coefficient n-octanol / water (log Kow)**  
**Product:** Log Kow: 0.59 20 °C

**Mobility in Soil:** No data available.

**Known or predicted distribution to environmental compartments**  
hydroquinone Log Koc: 0.97 - 1.7 (QSAR model)

**Other Adverse Effects:** No data available.

### SECTION 13: Disposal considerations

#### Waste treatment methods

**General information:** No data available.

**Disposal methods:** Dispose of waste and residues in accordance with local authority requirements. Incinerate. Since emptied containers retain product residue, follow label warnings even after container is emptied.

### SECTION 14: Transport information

*Important Note: Shipping descriptions may vary based on mode of transport, quantities, package size, and/or origin and destination. Consult your company's Hazardous Materials/Dangerous Goods expert for information specific to your situation.*

#### DOT

Class 9, Packing Group III when material is shipped in quantities in one package at or above the Reportable Quantity and when no other hazard class applies; otherwise, not regulated.

Reportable Quantity: 45.4 kg (hydroquinone)

Marine pollutant.: hydroquinone

Possible Shipping Description(s):

UN 3077 Environmentally hazardous substances, solid, n.o.s. (hydroquinone) 9 III

#### IMDG - International Maritime Dangerous Goods Code

Marine pollutant.: (hydroquinone)

Possible Shipping Description(s):

UN 3077 ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S.  
(hydroquinone) 9 III

#### IATA

Possible Shipping Description(s):

UN 3077 Environmentally hazardous substance, solid, n.o.s. (hydroquinone) 9 III

### SECTION 15: Regulatory information

**Safety, health and environmental regulations/legislation specific for the substance or mixture.:**

**This product has been classified in accordance with hazard criteria of the Controlled Products Regulations and the SDS contains all the information required by the Controlled Products Regulations.**

**WHMIS (Canada) Status:** controlled

**WHMIS (Canada) Hazard Classification:** D/1/B, D/2/B

**SARA 311-312 Hazard Classification(s):**

immediate (acute) health hazard

delayed (chronic) health hazard

**US EPCRA (SARA Title III) Section 313 - Toxic Chemical List**

HYDROQUINONE

**OSHA:** hazardous

**TSCA (US Toxic Substances Control Act):** This product is listed on the TSCA inventory. Any impurities present in this product are exempt from listing.

**DSL (Canadian Domestic Substances List) and CEPA (Canadian Environmental Protection Act):** This product is listed on the DSL or otherwise complies with CEPA new substance notification requirements.

**AICS / NICNAS (Australian Inventory of Chemical Substances and National Industrial Chemicals Notification and Assessment Scheme):** This product is listed on AICS or otherwise complies with NICNAS.

**MITI (Japanese Handbook of Existing and New Chemical Substances):** This product is listed in the Handbook or has been approved in Japan by new substance notification.

**ECL (Korean Toxic Substances Control Act):** This product is listed on the Korean inventory or otherwise complies with the Korean Toxic Substances Control Act.

### SECTION 16: Other information

**HMIS® Hazard Ratings:** Health - 2\*, Flammability - 1, Chemical Reactivity - 0

*HMIS® rating involves data interpretations that may vary from company to company. They are intended only for rapid, general identification of the magnitude of the specific hazard. To deal adequately with the safe handling of this material, all the information contained in this MSDS must be considered.*

**Revision Information:** New SDS

**Key literature references and sources for data:** No data available.

**Training information:** No data available.

**Issue Date:** 05/16/2015

**SDS No.:**

**Disclaimer:** This information is provided without warranty. The information is believed to be correct. This information should be used to make an independent determination of the methods to safeguard workers and the environment.





## SAFETY DATA SHEET

Creation Date 22-Sep-2009

Revision Date 30-Apr-2015

Revision Number 2

### 1. Identification

**Product Name** Sodium metaborate tetrahydrate

**Cat No. :** AC211630000 □ AC211630025 □ AC211630250 □ AC211635000

**Synonyms** None.

**Recommended Use** Laboratory chemicals.

**Uses advised against** No Information available

**Details of the supplier of the safety data sheet**

**Company**  
Fisher Scientific  
One Reagent Lane  
Fair Lawn, NJ 07410  
Tel: (201) 796-7100

**Entity / Business Name**  
Acros Organics  
One Reagent Lane  
Fair Lawn, NJ 07410

**Emergency Telephone Number**  
For information **US** call: 001-800-ACROS-01  
/ **Europe** call: +32 14 57 52 11  
Emergency Number **US**:001-201-796-7100 /  
**Europe**: +32 14 57 52 99  
**CHEMTREC** Tel. No.**US**:001-800-424-9300 /  
**Europe**:001-703-527-3887

### 2. Hazard(s) identification

#### **Classification**

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Skin Corrosion/irritation	Category 2
Serious Eye Damage/Eye Irritation	Category 2
Reproductive Toxicity	Category 2
Specific target organ toxicity (single exposure)	Category 3
Target Organs - Respiratory system.	

#### **Label Elements**

#### **Signal Word**

Warning

#### **Hazard Statements**

Causes skin irritation  
Causes serious eye irritation  
May cause respiratory irritation  
Suspected of damaging fertility. Suspected of damaging the unborn child



**Precautionary Statements****Prevention**

Obtain special instructions before use  
 Do not handle until all safety precautions have been read and understood  
 Wear protective gloves/protective clothing/eye protection/face protection  
 Wash face, hands and any exposed skin thoroughly after handling  
 Avoid breathing dust/fume/gas/mist/vapors/spray  
 Use only outdoors or in a well-ventilated area

**Response**

IF exposed or concerned: Get medical attention/advice

**Inhalation**

IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing

**Skin**

IF ON SKIN: Wash with plenty of soap and water  
 If skin irritation occurs: Get medical advice/attention  
 Take off contaminated clothing and wash before reuse

**Eyes**

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing  
 If eye irritation persists: Get medical advice/attention

**Storage**

Store locked up  
 Store in a well-ventilated place. Keep container tightly closed

**Disposal**

Dispose of contents/container to an approved waste disposal plant

**Hazards not otherwise classified (HNOC)**

None identified

### 3. Composition / information on ingredients

Component	CAS-No	Weight %
Boric acid (HBO <sub>2</sub> ), sodium salt, tetrahydrate	10555-76-7	>95
Sodium metaborate	7775-19-1	-

### 4. First-aid measures

<b>Eye Contact</b>	Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Obtain medical attention.
<b>Skin Contact</b>	Wash off immediately with plenty of water for at least 15 minutes. Obtain medical attention.
<b>Inhalation</b>	Move to fresh air. If breathing is difficult, give oxygen. Obtain medical attention.
<b>Ingestion</b>	Do not induce vomiting. Obtain medical attention.
<b>Most important symptoms/effects</b>	No information available.
<b>Notes to Physician</b>	Treat symptomatically

### 5. Fire-fighting measures

<b>Suitable Extinguishing Media</b>	Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.
<b>Unsuitable Extinguishing Media</b>	No information available
<b>Flash Point</b>	No information available
<b>Method -</b>	No information available
<b>Autoignition Temperature</b>	No information available

**Explosion Limits**

<b>Upper</b>	No data available
<b>Lower</b>	No data available
<b>Sensitivity to Mechanical Impact</b>	No information available
<b>Sensitivity to Static Discharge</b>	No information available

**Specific Hazards Arising from the Chemical**

Keep product and empty container away from heat and sources of ignition.

**Hazardous Combustion Products**

Oxides of boron

**Protective Equipment and Precautions for Firefighters**

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear. Thermal decomposition can lead to release of irritating gases and vapors.

**NFPA**

<b>Health</b>	<b>Flammability</b>	<b>Instability</b>	<b>Physical hazards</b>
2	1	0	N/A

**6. Accidental release measures**

<b>Personal Precautions</b>	Ensure adequate ventilation. Use personal protective equipment. Avoid dust formation.
<b>Environmental Precautions</b>	Should not be released into the environment. See Section 12 for additional ecological information.

<b>Methods for Containment and Clean Up</b>	Sweep up or vacuum up spillage and collect in suitable container for disposal. Avoid dust formation.
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**7. Handling and storage**

<b>Handling</b>	Wear personal protective equipment. Ensure adequate ventilation. Do not get in eyes, on skin, or on clothing. Avoid ingestion and inhalation. Avoid dust formation.
<b>Storage</b>	Keep containers tightly closed in a dry, cool and well-ventilated place.

**8. Exposure controls / personal protection****Exposure Guidelines**

Component	ACGIH TLV	OSHA PEL	NIOSH IDLH
Boric acid (HBO <sub>2</sub> ), sodium salt, tetrahydrate	TWA: 2 mg/m <sup>3</sup> STEL: 6 mg/m <sup>3</sup>		
Sodium metaborate	TWA: 2 mg/m <sup>3</sup> STEL: 6 mg/m <sup>3</sup>		

**Legend**

ACGIH - American Conference of Governmental Industrial Hygienists

<b>Engineering Measures</b>	Ensure that eyewash stations and safety showers are close to the workstation location. Ensure adequate ventilation, especially in confined areas.
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**Personal Protective Equipment**

<b>Eye/face Protection</b>	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.
<b>Skin and body protection</b>	Wear appropriate protective gloves and clothing to prevent skin exposure.
<b>Respiratory Protection</b>	Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if

exposure limits are exceeded or if irritation or other symptoms are experienced.

**Hygiene Measures**

Handle in accordance with good industrial hygiene and safety practice.

## 9. Physical and chemical properties

<b>Physical State</b>	Solid
<b>Appearance</b>	White
<b>Odor</b>	Odorless
<b>Odor Threshold</b>	No information available
<b>pH</b>	11.4 (4.0 %)
<b>Melting Point/Range</b>	57 °C / 134.6 °F
<b>Boiling Point/Range</b>	No information available
<b>Flash Point</b>	No information available
<b>Evaporation Rate</b>	No information available
<b>Flammability (solid,gas)</b>	No information available
<b>Flammability or explosive limits</b>	
<b>Upper</b>	No data available
<b>Lower</b>	No data available
<b>Vapor Pressure</b>	No information available
<b>Vapor Density</b>	No information available
<b>Relative Density</b>	No information available
<b>Solubility</b>	No information available
<b>Partition coefficient n-octanol/water</b>	No data available
<b>Autoignition Temperature</b>	No information available
<b>Decomposition Temperature</b>	No information available
<b>Viscosity</b>	No information available
<b>Molecular Formula</b>	B Na O <sub>2</sub> . 4 H <sub>2</sub> O
<b>Molecular Weight</b>	137.86

## 10. Stability and reactivity

<b>Reactive Hazard</b>	None known, based on information available
<b>Stability</b>	Stable under normal conditions.
<b>Conditions to Avoid</b>	Incompatible products. Excess heat. Avoid dust formation.
<b>Incompatible Materials</b>	Strong oxidizing agents, Strong acids, Metals
<b>Hazardous Decomposition Products</b>	Oxides of boron
<b>Hazardous Polymerization</b>	Hazardous polymerization does not occur.
<b>Hazardous Reactions</b>	None under normal processing.

## 11. Toxicological information

**Acute Toxicity**

**Product Information** No acute toxicity information is available for this product

**Component Information**

Component	LD50 Oral	LD50 Dermal	LC50 Inhalation
Sodium metaborate	2330 mg/kg ( Rat )	Not listed	Not listed

**Toxicologically Synergistic Products** No information available

### Delayed and immediate effects as well as chronic effects from short and long-term exposure

**Irritation** Irritating to eyes, respiratory system and skin

**Sensitization** No information available

**Carcinogenicity**

The table below indicates whether each agency has listed any ingredient as a carcinogen.

Component	CAS-No	IARC	NTP	ACGIH	OSHA	Mexico
Boric acid (HBO <sub>2</sub> ), sodium salt, tetrahydrate	10555-76-7	Not listed	Not listed	Not listed	Not listed	Not listed
Sodium metaborate	7775-19-1	Not listed	Not listed	Not listed	Not listed	Not listed

**Mutagenic Effects**

No information available

**Reproductive Effects**

Experiments have shown reproductive toxicity effects on laboratory animals.

**Developmental Effects**

No information available.

**Teratogenicity**

No information available.

**STOT - single exposure  
STOT - repeated exposure**

Respiratory system

None known

**Aspiration hazard**

No information available

**Symptoms / effects, both acute and delayed**

No information available

**Endocrine Disruptor Information**

No information available

**Other Adverse Effects**

The toxicological properties have not been fully investigated.

## 12. Ecological information

**Ecotoxicity**

Do not empty into drains.

**Persistence and Degradability  
Bioaccumulation/ Accumulation**

No information available

No information available.

**Mobility**

No information available.

## 13. Disposal considerations

**Waste Disposal Methods**

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations to ensure complete and accurate classification.

## 14. Transport information

**DOT**

Not regulated

**TDG**

Not regulated

**IATA**

Not regulated

**IMDG/IMO**

Not regulated

## 15. Regulatory information

**International Inventories**

Component	TSCA	DSL	NDSL	EINECS	ELINCS	NLP	PICCS	ENCS	AICS	IECSC	KECL
Boric acid (HBO <sub>2</sub> ), sodium salt, tetrahydrate	-	-	-	-	-		X	X	X	X	-
Sodium metaborate	X	X	-	231-891-6	-		X	X	X	X	X

**Legend:**

X - Listed

E - Indicates a substance that is the subject of a Section 5(e) Consent order under TSCA.

F - Indicates a substance that is the subject of a Section 5(f) Rule under TSCA.

N - Indicates a polymeric substance containing no free-radical initiator in its inventory name but is considered to cover the designated

polymer made with any free-radical initiator regardless of the amount used.

P - Indicates a commenced PMN substance

R - Indicates a substance that is the subject of a Section 6 risk management rule under TSCA.

S - Indicates a substance that is identified in a proposed or final Significant New Use Rule

T - Indicates a substance that is the subject of a Section 4 test rule under TSCA.

XU - Indicates a substance exempt from reporting under the Inventory Update Rule, i.e. Partial Updating of the TSCA Inventory Data Base Production and Site Reports (40 CFR 710(B)).

Y1 - Indicates an exempt polymer that has a number-average molecular weight of 1,000 or greater.

Y2 - Indicates an exempt polymer that is a polyester and is made only from reactants included in a specified list of low concern reactants that comprises one of the eligibility criteria for the exemption rule.

### U.S. Federal Regulations

**TSCA 12(b)** Not applicable

**SARA 313** Not applicable

#### **SARA 311/312 Hazardous Categorization**

<b>Acute Health Hazard</b>	Yes
<b>Chronic Health Hazard</b>	Yes
<b>Fire Hazard</b>	No
<b>Sudden Release of Pressure Hazard</b>	No
<b>Reactive Hazard</b>	No

**Clean Water Act** Not applicable

**Clean Air Act** Not applicable

**OSHA** Occupational Safety and Health Administration  
Not applicable

**CERCLA**  
Not applicable

**California Proposition 65** This product does not contain any Proposition 65 chemicals

**State Right-to-Know** Not applicable

### **U.S. Department of Transportation**

Reportable Quantity (RQ): N

DOT Marine Pollutant N

DOT Severe Marine Pollutant N

### **U.S. Department of Homeland Security**

This product does not contain any DHS chemicals.

### Other International Regulations

**Mexico - Grade** No information available

#### **Canada**

**This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR**

**WHMIS Hazard Class** D2A Very toxic materials  
D2B Toxic materials



## 16. Other information

<b>Prepared By</b>	Regulatory Affairs Thermo Fisher Scientific Email: EMSDS.RA@thermofisher.com
<b>Creation Date</b>	22-Sep-2009
<b>Revision Date</b>	30-Apr-2015
<b>Print Date</b>	30-Apr-2015
<b>Revision Summary</b>	This document has been updated to comply with the US OSHA HazCom 2012 Standard replacing the current legislation under 29 CFR 1910.1200 to align with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS)

### Disclaimer

The information provided on this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guide for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered as a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other material or in any process, unless specified in the text.

**End of SDS**

## Potassium Bromide, Crystal Purified/Photo

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### 1. PRODUCT AND COMPANY IDENTIFICATION

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**Product Name:** Potassium Bromide, Crystal Purified/Photo

**Synonyms/Generic Names:** Bromide salt of Potassium; Tripotassium tribromide

**Product Number:** 4195

**Product Use:** Industrial, Manufacturing or Laboratory use

**Manufacturer:** Columbus Chemical Industries, Inc.  
N4335 Temkin Rd.  
Columbus, WI. 53925

**For More Information Call:** 920-623-2140 (Monday-Friday 8:00-4:30)

**In Case of Emergency Call:** CHEMTREC - 800-424-9300 or 703-527-3887 (24 Hours/Day, 7 Days/Week)

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### 2. HAZARDS IDENTIFICATION

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**OSHA Hazards:** Target Organ Effect, Irritant, Mutagen

**Target Organs:** Central nervous system, Eyes

**Signal Word:** Warning

**Pictograms:**



**GHS Classification:**

Acute toxicity, Oral	Category 5
Skin irritation	Category 2
Eye irritation	Category 2A
Specific target organ toxicity - single exposure	Category 3
Acute aquatic toxicity	Category 3



## GHS Label Elements, including precautionary statements:

### Hazard Statements:

H303	May be harmful if swallowed.
H315	Causes skin irritation.
H319	Causes serious eye irritation.
H335	May cause respiratory irritation.
H402	Harmful to aquatic life.

### Precautionary Statements:

P261	Avoid breathing dust/ fume/ gas/ mist/ vapors/ spray.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

### Potential Health Effects

<b>Eyes</b>	Causes eye irritation.
<b>Inhalation</b>	May be harmful if inhaled. Causes respiratory tract irritation.
<b>Skin</b>	May be harmful if absorbed through skin. Causes skin irritation.
<b>Ingestion</b>	May be harmful if swallowed.

### NFPA Ratings

<b>Health</b>	1
<b>Flammability</b>	0
<b>Reactivity</b>	0
<b>Specific hazard</b>	Not Available

### HMIS Ratings

<b>Health</b>	1
<b>Fire</b>	0
<b>Reactivity</b>	0
<b>Personal</b>	E

## 3. COMPOSITION/INFORMATION ON INGREDIENTS

Component	Weight %	CAS □	EINECS□/ ELINCS□	Formula	Molecular Weight
Potassium Bromide	100	7758-02-3	231830-3	KBr	119.00 g/mol

## 4. FIRST-AID MEASURES

<b>Eyes</b>	In case of eye contact, rinse with plenty of water and seek medical attention.
<b>Inhalation</b>	Move casualty to fresh air and keep at rest. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Get medical attention.
<b>Skin</b>	Immediately flush with plenty of water for at least 15 minutes while removing contaminated clothing and wash using soap. Get medical attention.
<b>Ingestion</b>	<b>Do Not Induce Vomiting!</b> Never give anything by mouth to an unconscious person. If conscious, wash out mouth with water. Get medical attention.

## 5. FIRE-FIGHTING MEASURES

<b>Suitable (and unsuitable) extinguishing media</b>	Product is not flammable. Use appropriate media for adjacent fire. Cool containers with water.
<b>Special protective equipment and precautions for firefighters</b>	Wear self-contained, approved breathing apparatus and full protective clothing, including eye protection and boots.
<b>Specific hazards arising from the chemical</b>	Emits toxic fumes (hydrogen bromide gas, potassium oxides) under fire conditions. (See also Stability and Reactivity section).

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## 6. ACCIDENTAL RELEASE MEASURES

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<b>Personal precautions, protective equipment and emergency procedures</b>	See section 8 for recommendations on the use of personal protective equipment.
<b>Environmental precautions</b>	Prevent spillage from entering drains. Any release to the environment may be subject to federal/national or local reporting requirements.
<b>Methods and materials for containment and cleaning up</b>	Prevent spillage from entering drains. Pick up and arrange disposal without creating dust. Sweep up and place in suitable, closed containers for disposal. Clean surfaces thoroughly with water to remove residual contamination. Dispose of all waste and cleanup materials in accordance with regulations.

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## 7. HANDLING AND STORAGE

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### Precautions for safe handling

See section 8 for recommendations on the use of personal protective equipment. Use with adequate ventilation. Wash thoroughly after using. Keep container closed when not in use. Avoid formation of dusts.

### Conditions for safe storage, including any incompatibilities

Store in cool, dry well ventilated area. Keep away from incompatible materials (see section 10 for incompatibilities).

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## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

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**Occupational exposure controls:** Contains no substances with occupational exposure limit values.

### Personal Protection

<b>Eyes</b>	Wear chemical safety glasses or goggles.
<b>Inhalation</b>	Provide local exhaust, preferably mechanical. If exposure levels are excessive, use an approved respirator.
<b>Skin</b>	Wear nitrile or rubber gloves, apron or lab coat.
<b>Other</b>	Not Available

### Other Recommendations

Provide eyewash stations, quick-drench showers and washing facilities accessible to areas of use and handling.

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## 9. PHYSICAL AND CHEMICAL PROPERTIES

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Appearance (physical state, color, etc.)	White crystalline solid.
Odor	Odorless.
Odor threshold	Not Available
pH	Not Available
Melting point/freezing point	730°C (1346°F)
Initial boiling point and boiling range	1435°C (2615°F)
Flash point	Not Flammable
Evaporation rate	Not Available
Flammability (solid, gas)	Not Flammable
Upper/lower flammability or explosive limit	Not Explosive
Vapor pressure	Not Available

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Vapor density	Not Available
Density	2.75 (Water = 1)
Solubility (ies)	Easily soluble in cold water, hot water. Slightly soluble in diethyl ether. Insoluble in acetate.
Partition coefficient: n-octanol/water	Not Available
Auto-ignition temperature	Not Available
Decomposition temperature	Not Available

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## 10. STABILITY AND REACTIVITY

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<b>Chemical Stability</b>	Stable
<b>Possibility of Hazardous Reactions</b>	Will not occur.
<b>Conditions to Avoid</b>	Moisture.
<b>Incompatible Materials</b>	Strong oxidizing agents, strong acids, heavy metal salts, aluminum, potassium.
<b>Hazardous Decomposition Products</b>	Hydrogen bromide gas, potassium oxides.

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## 11. TOXICOLOGICAL INFORMATION

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### Acute Toxicity

<b>Skin</b>	Not Available
<b>Eyes</b>	Not Available
<b>Respiratory</b>	Not Available
<b>Ingestion</b>	LD50 Oral - rat - 3,070 mg/kg

### Carcinogenicity

<b>IARC</b>	No components of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
<b>ACGIH</b>	No components of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.
<b>NTP</b>	No components of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
<b>OSHA</b>	No components of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

### Signs □ Symptoms of Exposure

<b>Skin</b>	Irritation, redness, itchiness.
<b>Eyes</b>	Irritation, redness, watering eyes, itchiness, enlarge pupils with subnormal reaction to light, miosis, diplopia.
<b>Respiratory</b>	Irritation, coughing, wheezing.
<b>Ingestion</b>	Irritation, nausea, vomiting, diarrhea.

<b>Chronic Toxicity</b>	Not Available
<b>Teratogenicity</b>	Not Available
<b>Mutagenicity</b>	May affect genetic material.
<b>Embryotoxicity</b>	Not Available
<b>Specific Target Organ Toxicity</b>	Not Available
<b>Reproductive Toxicity</b>	Not Available
<b>Respiratory/Skin Sensitization</b>	Not Available

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## 12. ECOLOGICAL INFORMATION

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### Ecotoxicity

<b>Aquatic Vertebrate</b>	LC50 - Pimephales promelas (fathead minnow) - > 30 mg/l - 96 h
<b>Aquatic Invertebrate</b>	Not Available
<b>Terrestrial</b>	Not Available

<b>Persistence and Degradability</b>	Not Available
<b>Bioaccumulative Potential</b>	Not Available
<b>Mobility in Soil</b>	Not Available
<b>PBT and vPvB Assessment</b>	Not Available
<b>Other Adverse Effects</b>	Harmful to aquatic life.

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## 13. DISPOSAL CONSIDERATIONS

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<b>Waste Residues</b>	Users should review their operations in terms of the applicable federal/national or local regulations and consult with appropriate regulatory agencies if necessary before disposing of waste product container.
<b>Product Containers</b>	Users should review their operations in terms of the applicable federal/national or local regulations and consult with appropriate regulatory agencies if necessary before disposing of waste product container.

The information offered in section 13 is for the product as shipped. Use and/or alterations to the product may significantly change the characteristics of the material and alter the waste classification and proper disposal methods.

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## 14. TRANSPORTATION INFORMATION

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US DOT	Not Dangerous Goods
TDG	Not Dangerous Goods
IMDG	Not Dangerous Goods
Marine Pollutant	No
IATA/ICAO	Not Dangerous Goods

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## 15. REGULATORY INFORMATION

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TSCA Inventory Status	All ingredients are listed on the TSCA inventory.
DSCL (EEC)	All ingredients are listed on the DSCL inventory.
California Proposition 65	Not Listed
SARA 302	Not Listed
SARA 304	Not Listed
SARA 311	Potassium bromide
SARA 312	Potassium bromide
SARA 313	Not Listed
WHMIS Canada	CLASS D-2B: Material causing other toxic effects (TOXIC).

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## 16. OTHER INFORMATION

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Revision	Date
Revision 1	08-06-2012

Disclaimer: Columbus Chemical Industries, Inc. ("Columbus") believes that the information herein is factual but is not intended to be all inclusive. The information relates only to the specific material designated and does not relate to its use in combination with other materials or its use as to any particular process. Because safety standards and regulations are subject to change and because Columbus has no continuing control over the material, those handling, storing or using the material should satisfy themselves that they have current information regarding the particular way the material is handled, stored or used and that the same is done in accordance with federal, state and local law. COLUMBUS MAKES NO WARRANTY, EXPRESS OR IMPLIED, INCLUDING (WITHOUT LIMITATION) WARRANTIES WITH RESPECT TO THE COMPLETENESS OR CONTINUING ACCURACY OF THE INFORMATION CONTAINED HEREIN OR WITH RESPECT TO FITNESS FOR ANY PARTICULAR USE.

# PHOTOGRAPHERS' FORMULARY

## FORMULARY FILM DEVELOPER 50

### CATALOG NUMBER 01-0112 TO MAKE 4 LITERS

Formulary Film Developer 50 is a moderately fast developer for commercial and sheet sizes of Plus-x, Pan professional films. The developer produces negatives with normal contrast, average to slightly higher than average graininess. May use with or without dilution.

Undiluted developer can process 5- 8X10's per 1 liter of Formulary 50 without replenishment. Diluted developer 1:1 can process 10- 8X10's per liter.

The chemicals in this kit are used to make a working solution with a shelf life of 6 months, in a full-capped container. A 2-month shelf can be expected on a half full container.

#### CHEMICALS CONTAINED IN THIS KIT

Chemical	1 Liter
Metol	10 Grams
Sodium Sulfite	120 Grams
Hydroquinone	10 Grams
Sodium Metaborate	40 Grams
Potassium Bromide	2 Grams

#### FOR YOUR CHEMICAL SAFETY

All chemicals are dangerous and must be treated with respect. Please read the warning label on each chemical package.

Only one chemical used in the kit, metol, needs special attention. Some individuals become sensitized to metol. If this should occur, discontinue use and see a physician.

The user assumes all risks upon accepting these chemicals. IF FOR ANY REASON YOU DO NOT WANT TO ASSUME ALL RISKS, PLEASE RETURN THE CHEMICALS WITHIN 30 DAYS FOR A FULL REFUND.

**Please consult with local sewer and water authorities regarding the proper disposal of darkroom chemicals in your area.**

#### MIXING THE DEVELOPER WORKING SOLUTION

You will need a brown bottle with a capacity of one liter, and a mixing container.

We recommend you wear rubber gloves, splash goggles, dust mask and a vinyl apron whenever mixing dry chemicals.