



*Environmental Stewardship Division*  
**WATER QUALITY & RCRA GROUP, ENV-RCRA**  
**FAX TRANSMITTAL SHEET**

**FAX #: (505) 665-9344****VERIFICATION #: (505) 665-0453**

DATE:	<u>12/22/2006</u>	LOG NO:	<u>WQH-FAX-06-</u>
FROM:	<u>Mark Haagenstad</u>	PHONE#:	<u>(505) 665-2014</u>
TO:	<u>Sonia Hall (Reference EPA Permit #: 0028355)</u>	ORG:	<u>EPA</u>
FAX #:	<u>(214) 665-2168</u>	PHONE #:	<u>(214) 665-7490</u>
TO:	<u>Richard Powell</u>	ORG:	<u>NMED-SWQB</u>
FAX #:	<u>(505) 827-0160</u>	PHONE #:	<u>(505) 827-2798</u>
TO:	<u>Chris Vick</u>	ORG:	<u>NMED-GWQB</u>
FAX #:	<u>(505) 827-2965</u>	PHONE #:	<u>(505) 827-2900</u>
TO:	<u>Steve Yanicak</u>	ORG:	<u>NMED/DOE-OB</u>
FAX #:	<u>(505) 672-0466</u>	PHONE #:	<u>(505) 672-0448</u>
TO:	<u>Steven Connolly</u>	ORG:	<u>NMED-HWB</u>
FAX #:	<u>(505) 476-6030</u>	PHONE #:	<u>(505) 476-6000</u>
TO:	<u>Erik Galloway</u>	ORG:	<u>NMED-OB</u>
FAX #:	<u>(505) 476-6030</u>	PHONE #:	<u>(505) 476-6000</u>
TO:	<u>Gene Turner</u>	ORG:	<u>DOE-LA-AO</u>
FAX #:	<u>(505) 667-5948</u>	PHONE #:	<u>(505) 667-5794</u>
TO:	<u>Andrew Erickson</u>	ORG:	<u>FME-IFCS</u>
FAX #:	<u>667-2630</u>	PHONE #:	<u>665-2272</u>
TO:	<u>Alva Sisneros</u>	ORG:	<u>QA-OA</u>

LANL TH-3 (3-036), Sandra Canyon

5835



FAX #:	<u>665-6977</u>	PHONE #:	<u>664-0666</u>
TO:	<u>Patrick Woerhly</u>	ORG:	<u>CGA-GAO</u>
FAX #:	<u>665-4919</u>	PHONE #:	<u>665-7778</u>
TO:	<u>Elmer Torres</u>	ORG:	<u>CGA-GAO</u>
FAX #:	<u>606-0598</u>	PHONE #:	<u>667-3194</u>

MESSAGE: Attached you will find the 7-Day and 15-Day Release / Discharge Notification for a fire suppression water release at TA-3-38 that occurred on 12/18/2006 at Los Alamos National Laboratory, NM. The 7-Day and 15-Day Release / Discharge Notification will be submitted as one report because the Laboratory will be closed from 12/23/2006 through 1/1/2006. Please contact Mark Haagenstad (665-2014 or 699-1733) if additional information would be helpful.

NUMBER OF PAGES TO FOLLOW: 8

Cy: WQH Fax File

## RELEASE / DISCHARGE NOTIFICATION

LOS ALAMOS NATIONAL LABORATORY LA-UR-06-8859

Permit Number: NM0028355

Calendar Year

2006

NPDES or Operational Spill/Release <input checked="" type="checkbox"/>	Indicate with "X" in appropriate box.	Release ID Number:
ER Spill/Release <input type="checkbox"/>		168
Other Spill/Release <input type="checkbox"/>		

Responsible Facility/User Group:	FME-JFCS		
Contact Person:	Andrew Erickson	Pager #:	864-5913
Phone #:	865-2272	Cell Phone #:	231-1430
Release/Discharge Location:	A dumpster transport worker drove through the south portal entrance of Technical Area 3, Building SM-33 and struck a sprinkler heads located overhead on the ceiling of the portal.		
TA:	3		
Building:	38		

If the release/discharge is associated with a NPDES Outfall, Potential Release Site (PRS) or Solid Waste Management Unit (SWMU), indicate the site/unit number and its relationship to the release/discharge:

NPDES Outfall: ☐ PRS: ☒ SWMU: ☒ PRS/SWMU Number: 3-013(a)-00

Indicate with "X" in appropriate box(es).

## Relationship of the Discharge to a SWMU or PRS:

The fire suppression water mixture and potable water flowed to SWMU 03-013(a)-00, which includes storm drains around the NSSB and TA-3 Administration Buildings and into the outfall area east of the new parking structure at TA-3-281 Otowi Complex near University House. Based on observations at the release site, the release did not appear to cause any erosion or movement of sediment within the boundaries of the SWMU.

Discharge Occurred:	12/18/2006 ~2:00 p.m.	Discharge Discovered:	12/18/2006 ~2:00 p.m.	Discharge Stopped:	12/18/2006 ~2:10 p.m.
	Date & Time		Date & Time		Date & Time
Cleanup Started:	12/18/2006 2:00 p.m.	Cleanup Completed:	12/18/2006 5:00 p.m.		
	Date & Time		Date & Time		

## Material(s) Released / Discharged:

Fire suppression water. The fire suppression water was composed of a mixture of 30% propylene glycol (see attached MSDS) and 70% potable water. The propylene glycol and potable water mixture released for a short period of time, while the majority of the material released was potable water. An estimated 30 gallons of propylene glycol and 600 gallons of potable water was released to the environment.

## Release/Discharge Mitigation Method:

None of the fire suppression water could be recovered because it flowed into a nearby storm drain.

## Weather Conditions:

Cold and clear.

Duration of Release/Discharge, in HOURS:	.17	Est. Volume Released/Discharged, in gallons.	630	Est. Volume Recovered, in gallons.	0
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## Corrective Actions Taken (ie, type of BMPs, etc):

ENV-RCRA personnel assessed the release site to identify potential impacts. There did not appear to be any erosion impacts. Facility representatives will implement BMPs to ensure vehicles are aware of clearance limits at TA-3-38 portal. The dumpster will be relocated to a location where dumpster pick-up vehicles will not need to drive under the portal for waste removal. The fire suppression system was repaired and re-activated at ~5:00 p.m. on 12/18/2006.

Nearest Watercourse (Canyon Name) Sandia Canyon

Release Number 188...3-013(a)...page 2 of 2.

If the release/discharge reached a watercourse, describe the estimated surface area affected, presence of release/discharge now in the watercourse, and the media the release/discharge was detected in:

The fire suppression water flowed to pavement, a storm drain, and ultimately into upper Sandia Canyon. Water was observed flowing slowly in the natural drainage of upper Sandia Canyon. No erosion impacts were observed in the drainage channels and watercourse.

Depth to Groundwater, in FT, if known: 1,200

Distance to Nearest Drinking Water Well, in FT, if known: 20,000

Well ID#

PM-5

<b>24-HOUR RELEASE / DISCHARGE NOTIFICATIONS</b>					
	Contact Person	Phone	Fax	Date & Time (or Comment)	
EPA:	Sonia Hall	214-885-490	214-885-2168	12/22/2006	7 and 15 Day Report
NMED/SWQB:	Richard Powell	827-2738	827-0160	12/18/2006	3:50 p.m. verbal
NMED/GWQB:	Chris Vick	827-0078	827-2965	12/18/2006	3:55 p.m. verbal
NMED/HRMB:	Steven Connely	476-6030	476-6030	12/18/2006	3:45 p.m. verbal
NMED/DOE-OB:	Steve Yanicak	672-0448	672-0466	12/22/2006	7 and 15 Day Report
ENV-RCRA:	Mark Haagenstad	665-2014	665-9344	12/22/2006	7 and 15 Day Report
DOE:	Gene Turner	667-5794	505-665-4872	12/22/2006	7 and 15 Day Report
OTHER:	Andrew Erickson	665-2272	667-2630	12/22/2006	7 and 15 Day Report
OTHER:	Alva Sisneros	664-0666	665-6977	12/22/2006	7 and 15 Day Report

Comments: On 12/18/2006, ENV-RCRA's Mark Haagenstad contacted the NMED-HWB Spill Hotline, NMED-SWQB's Rich Powell, and NMED-GWQB's Chris Vick of the release at 3:45 p.m., 3:50 p.m., and 3:55 p.m. respectively. Additionally, on 12/18/2006 at ~4:00 p.m., ENV-RCRA's Mark Haagenstad also notified Patrick Woehle (CGA-GAO) and Elmer Torres (CGA-GAO) of the release.

Form Completed By: Mark Haagenstad

<b>7 DAY RELEASE / DISCHARGE ACTIONS</b>		
7 Day Notice <input checked="" type="checkbox"/>	7 Day Notice Date: 12/25/2006	7 Day Notice By: Mark Haagenstad
Mark "X" when done.		
Comments: No further actions anticipated. The Laboratory will request administrative closure pursuant to 20.6.2.1203 NMAR of the NMWQCC Regulations.		

<b>15 DAY RELEASE / DISCHARGE ACTIONS</b>	
15 day Follow-up Due: 1/2/2007	15-day Follow-Up By: Mark Haagenstad
Comments: No further actions anticipated. The Laboratory will request administrative closure pursuant to 20.6.2.1203 NMAR of the NMWQCC Regulations.	

<b>NMED 30 DAY APPROVAL / DISAPPROVAL</b>	
NMED 30 Day Response Date: 1/17/2007	
Comments:	

Edwin Wilmot, Director  
Office of Los Alamos Site Operations  
Department of Energy  
Los Alamos, New Mexico 87544  
(505) 667-5105

Tori George, ENV Division Director  
Los Alamos National Security, LLC  
Los Alamos National Laboratory  
P.O. Box 1663, MS J978  
Los Alamos, New Mexico 87544  
(505) 667-2211


 CORNELL

**Material Safety  
Data Sheets**
**Division of Facilities Services**

## DOD Hazardous Material Information (ANSI Format) For Cornell University Convenience Only

### PROPYLENE GLYCOL

Section 1 - Product and Company Identification	Section 9 - Physical & Chemical Properties
Section 2 - Composition/Information on Ingredients	Section 10 - Stability & Reactivity Data
Section 3 - Hazards Identification Including Emergency Overview	Section 11 - Toxicological Information
Section 4 - First Aid Measures	Section 12 - Ecological Information
Section 5 - Fire Fighting Measures	Section 13 - Disposal Considerations
Section 6 - Accidental Release Measures	Section 14 - MSDS Transport Information
Section 7 - Handling and Storage	Section 15 - Regulatory Information
Section 8 - Exposure Controls & Personal Protection	Section 16 - Other Information

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Cornell University does not in any way warrant or imply the applicability, viability or use of this information to any person or for use in any situation.

### Section 1 - Product and Company Identification PROPYLENE GLYCOL

**Product Identification: PROPYLENE GLYCOL**
**Date of MSDS: 03/24/1993 Technical Review Date: 01/23/1996**
**FSC: 6505 NUN: 00-138-4150**
**Submitter: FBT**
**Status Code: C**
**MFN: 01**
**Article: N**
**Kit Part: N**

#### Manufacturer's Information

**Manufacturer's Name: SPECTRUM CHEMICAL MFG CORP**

Post Office Box: N/K  
Manufacturer's Address1: 14422 S SAN PEDRO STREET  
Manufacturer's Address2: GARDENA, CA 90248-9985  
Manufacturer's Country: US  
General Information Telephone: 310-516-8000  
Emergency Telephone: 310-516-8000  
Emergency Telephone: 310-516-8000  
MSDS Preparer's Name: N/P  
Proprietary: N  
Reviewed: Y  
Published: Y  
CAGE: 63415  
Special Project Code: N

#### Item Description

Item Name: PROPYLENE GLYCOL, USP  
Item Manager:  
Specification Number: NK  
Type/Grade/Class: NK  
Unit of Issue: BT  
Unit of Issue Quantity: 1  
Type of Container:

#### Preparer Information

Preparer's Name: SPECTRUM CHEMICAL MFG. CORP.  
Preparer's Address1: 14422 SOUTH SAN PEDRO STREET  
Preparer's Address2: GARDENA, CA 90248-2027  
Preparer's CAGE: 63415  
Assigned Individual: N

#### Contractor Information

Contractor's Name: SPECTRUM CHEMICAL MFG. CORP.  
Contractor's Address1: 14422 SOUTH SAN PEDRO STREET  
Contractor's Address2: GARDENA, CA 90248-2027  
Contractor's Telephone: 310-516-8000  
Contractor's CAGE: 63415

#### Section 2 - Composition/Information on Ingredients PROPYLENE GLYCOL

Ingredient Name: 1,2-PROPANEDIOL (PROPYLENE GLYCOL)  
Ingredient CAS Number: 57-55-6 Ingredient CAS Code: M  
RTECS Number: TY2000000 RTECS Code: M  
=WT: =WT Code:  
=Volume: =Volume Code:  
>WT: >WT Code:  
>Volume: >Volume Code:  
<WT: <WT Code:

<Volume: <Volume Code:  
% Low WT: % Low WT Code:  
% High WT: % High WT Code:  
% Low Volume: % Low Volume Code:  
% High Volume: % High Volume Code:  
% Text: 100  
% Environmental Weight:  
Other REC Limits: N/K  
OSHA PEL: N/K OSHA PEL Code: M  
OSHA STEL: OSHA STEL Code:  
ACGIH TLV: N/K ACGIH TLV Code: M  
ACGIH STEL: N/P ACGIH STEL Code:  
EPA Reporting Quantity:  
DOT Reporting Quantity:  
Ozone Depleting Chemical: N

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### Section 3 - Hazards Identification, Including Emergency Overview PROPYLENE GLYCOL

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**Health Hazards Acute & Chronic:** SKIN: MILD IRRITATION, DERMATITIS, ERYTHEMATOUS EDEMATOUS PLAQUES, CNS DEPRESSION. INGESTION: 60 ML WILL CAUSE REVERSIBLE CNS DEPRESSION. POISONING MAY AFFECT THE CNS & KIDNEYS.

**Signs & Symptoms of Overexposure:**  
HEADACHE, NAUSEA, DULLNESS, IRRITATION, REDNESS, ALLERGIC REACTIONS, STINGING, BRONCHOSPASM, LACRIMATION, MILD TRANSIENT CONJUNCTIVAL HYPEREMIA, ABDOMINAL SPASMS, VOMITING, UNCONSCIOUSNESS, STUPOR, TACHYPNEA, TACHYCARDIA, DIAPHORESIS, SEIZURES

**Medical Conditions Aggravated by Exposure:**  
N/K

**LD50 LC50 Mixture:** ORAL LD50(RAT): 20 GM/KG

**Route of Entry Indicators:**  
Inhalation: NO  
Skin: YES  
Ingestion: YES

**Carcinogenicity Indicators**  
NTP: NO  
IARC: NO  
OSHA: NO

**Carcinogenicity Explanation:** NONE

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### Section 4 - First Aid Measures PROPYLENE GLYCOL

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**First Aid:**

ec 21 06 02:39p  
PROPYLENE GLYCOL

p. 4

Page 4 of

INHALATION: REMOVE TO FRESH AIR. GIVE CPR AS NEEDED. KEEP WARM/AT REST. SKIN: WASH W/ SOAP/MILD DETERGENT/LARGE AMOUNTS OF WATER FOR 15-20 MINS. EYES: WASH W/LARGE AMOUNTS OF WATER/NORMAL SALINE FOR 15 -20 MINS. INGESTION: IF CONSCIOUS & NOT CONVULSING, REMOVE BY THOROUGH GASTRIC LAVAGE. IF IMMEDIATE GASTRIC LAVAGE CAN'T BE ACCOMPLISHED, INDUCE EMESIS W/SYRUP OF IPECAC. (SEE SUPP)

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### Section 5 - Fire Fighting Measures

#### PROPYLENE GLYCOL

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#### Fire Fighting Procedures:

WEAR SCBA W/FULL FACEPIECE & OPERATED IN PRESSURE DEMAND MODE/POSITIVE PRESSURE MODE.

#### Unusual Fire or Explosion Hazard:

MOVE CONTAINERS SAFELY. DON'T SCATTER SPILLED MATERIAL W/HIGH-PRESSURE WATER STREAMS. DIKE FIRE-CONTROL WATER FOR LATER DISPOSAL. AUTOIGNITION TEMP: 700F.

#### Extinguishing Media:

DRY CHEMICAL, CO2, WATER SPRAY/ALCOHOL-RESISTANT FOAM. LARGE FIRES: WATER SPRAY, FOG/ALCOHOL-RESISTANT FOAM.

Flash Point: Flash Point Text: 210F

#### Autoignition Temperature:

Autoignition Temperature Text: N/A

Lower Limit(s): 2.6

Upper Limit(s): 12.5

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### Section 6 - Accidental Release Measures

#### PROPYLENE GLYCOL

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#### Spill Release Procedures:

STOP LEAK W/O RISK. SMALL: TAKE UP W/SAND/OTHER ABSORBENT MATERIAL & PLACE INTO CLEAN, DRY CONTAINERS FOR LATER DISPOSAL. KEEP UNNECESSARY PEOPLE AWAY. ISOLATE HAZARD AREA & DENY ENTRY.

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### Section 7 - Handling and Storage

#### PROPYLENE GLYCOL

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#### Handling and Storage Precautions:

#### Other Precautions:

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### Section 8 - Exposure Controls & Personal Protection

#### PROPYLENE GLYCOL

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#### Respiratory Protection:

THE SPECIFIC RESPIRATOR SELECTED MUST BE BASED ON CONTAMINATION LEVELS FOUND IN WORK PLACE, IT MUSTN'T EXCEED WORKING LIMITS OF THE RESPIRATOR & MUST BE JOINTLY APPROVED BY NIOSH/MSHA. WEAR A SCBA W/FULL FACEPIECE IN POSITIVE PRESSURE MODE.

#### Ventilation:

LOCAL EXHAUST VENTILATION.

#### Protective Gloves:



**REQUIRED****Eye Protection:** SPLASH-PROOF/DUST RESISTANT GOGGLES**Other Protective Equipment:** EYE WASH FOUNTAIN, IMPERVIOUS PROTECTIVE CLOTHING & EQUIPMENT.**Work Hygienic Practices:** REMOVE/LAUNDER CONTAMINATED CLOTHING BEFORE REUSE.**Supplemental Health & Safety Information:** FIRST AID CONT'D: OBTAIN MEDICAL ATTENTION IN ALL CASES. NO SPECIFIC ANTIDOTE.

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

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**HCC:****NRC/State License Number:****Net Property Weight for Ammo:****Boiling Point:** Boiling Point Text: 370-372F**Melting/Freezing Point:** Melting/Freezing Text: -75F**Decomposition Point:** Decomposition Text: N/K**Vapor Pressure:** <0.1 Vapor Density: 2.62**Percent Volatile Organic Content:****Specific Gravity:** 1.0361**Volatile Organic Content Pounds per Gallon:****pH:** N/K**Volatile Organic Content Grams per Liter:****Viscosity:** N/P**Evaporation Weight and Reference:** (BU AC =1): 0.005**Solubility in Water:** COMPLETE**Appearance and Odor:** ODORLESS, CLEAR, COLORLESS, HYGROSCOPIC, VISCOUS LIQUID W/SLIGHTLY ACID TASTE**Percent Volatiles by Volume:** N/K**Corrosion Rate:** N/K

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**Section 10 - Stability & Reactivity Data**  
**PROPYLENE GLYCOL**

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**Stability Indicator:** YES**Materials to Avoid:****STRONG OXIDIZERS/CHLORIDES, CHLOROFORMATES, METALS, OXIDIZERS, PLASTICS, REDUCING AGENTS, DIETHYL ALUMINUM BROMIDE.****Stability Condition to Avoid:****HEAT, SPARKS, OPEN FLAME, MOISTURE****Hazardous Decomposition Products:****TOXIC OXIDES OF CARBON.****Hazardous Polymerization Indicator:** NO**Conditions to Avoid Polymerization:****N/K**

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**Section 11 - Toxicological Information**  
**PROPYLENE GLYCOL**

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**Toxicological Information:****N**

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**Section 12 - Ecological Information**  
**PROPYLENE GLYCOL**

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**Ecological Information:**

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**Section 13 - Disposal Considerations**  
**PROPYLENE GLYCOL**

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**Waste Disposal Methods:**  
DISPOSE OF IAW/FEDERAL, STATE & LOCAL REGULATIONS.

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**Section 14 - MSDS Transport Information**  
**PROPYLENE GLYCOL**

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**Transport Information:**  
N/P

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**Section 15 - Regulatory Information**  
**PROPYLENE GLYCOL**

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**SARA Title III Information:**  
N/P  
**Federal Regulatory Information:**  
N/P  
**State Regulatory Information:**  
N/P

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**Section 16 - Other Information**  
**PROPYLENE GLYCOL**

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**Other Information:**  
N/P

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**HAZCOM Label Information****Product Identification:** PROPYLENE GLYCOL  
**CAGE:** 63415  
**Assigned Individual:** N  
**Company Name:** SPECTRUM CHEMICAL MFG. CORP.  
**Company PO Box:**  
**Company Street Address1:** 14422 SOUTH SAN PEDRO STREET  
**Company Street Address2:** GARDENA, CA 90248-2027 US  
**Health Emergency Telephone:** 310-516-8000  
**Label Required Indicator:** Y  
**Date Label Reviewed:** 12/16/1998  
**Status Code:** C  
**Manufacturer's Label Number:**  
**Date of Label:** 12/16/1998  
**Year Procured:** N/K  
**Organization Code:** G  
**Chronic Hazard Indicator:** N/P  
**Eye Protection Indicator:** N/P  
**Skin Protection Indicator:** N/P

# ANNOUNCING THE NEW ALTERNATIVE IN CORROSION CONTROL FOR COOLING WATER SYSTEMS.

# DIANOCHIL™

Now you can get corrosion protection that is superior...  
and equally acceptable without sacrifice in performance.

Designed by Betz for use in open recirculating cooling  
water systems, Dianochil treatment is as effective as  
traditional chromate-based programs in controlling corrosion  
and scaling.

But because Dianochil does not use chromate, there are  
no operating or capital costs for chromate removal and  
subsequent sludge disposal.

And, unlike previously available nonchromate programs,  
there's no problem with fouling.

The effectiveness of Dianochil is thoroughly  
documented: field tests in more than 20 different systems  
were conducted in 1979 with consistently excellent results.

For details, write or call Betz Laboratories, Inc., 1100  
Pennsylvania, P.O. Box 190, (215) 355-3800.

## BETZ

Water Conditioning Division • 1979 • Dianochil

### Effluent Quality Is Prime Consideration Today

Nonchromates currently enjoy great appeal because their usual lower toxicity is acceptable within water quality standards for direct discharge of blowdown. But if regulations grow more stringent, even direct discharge of nonchromate treated blowdown may be restricted. Thus, in this new era of cooling water treatment, choice of treatment may be based solely on the demands or tolerances of the system. Cooling tower blowdown may then be properly processed for reuse within the plant or for discharge.

The best nonchromate programs are an equal match for chromates in performance, if not in economics. And the development of automated water treatment control systems gives significant reliability to nonchromate programs.

### Chromates Vs. Nonchromates—No Dilemma

Choosing between chromates and nonchromates need create no confusion. The required treatment for a system must be based on thorough investigation of its characteristics, present and future environmental criteria and available or proposed effluent treatment facilities. The water conditioning program must also be within an acceptable cost range and provide results within the design tolerances of the system. With increased demands being imposed upon cooling water treatments, a program compatible with all requirements must be engineered.

The effectiveness of conventional chromate and ultralow chromate treatments has already proven itself over the years. But in this new era of cooling water treatment, properly designed nonchromate programs, such as those offered by BETZ, are already doing an equivalent job in many industrial systems.

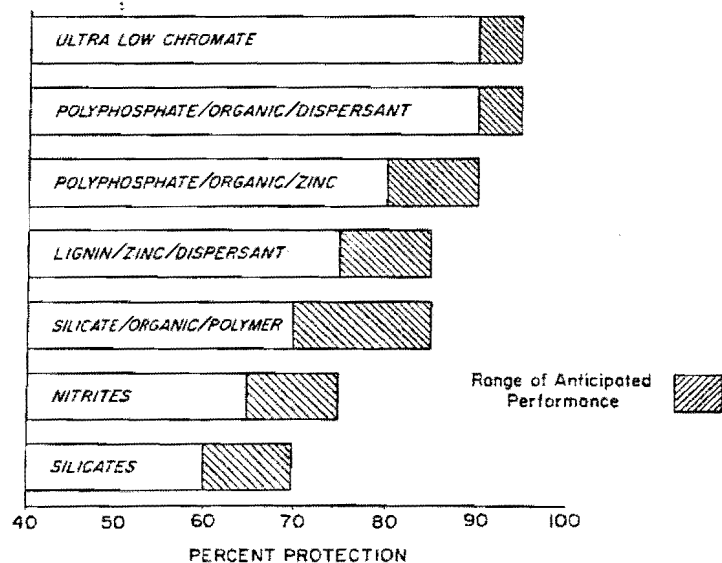


FIGURE 5—Performances of chromate and nonchromate water treatment programs are comparable provided they are properly planned and administered.

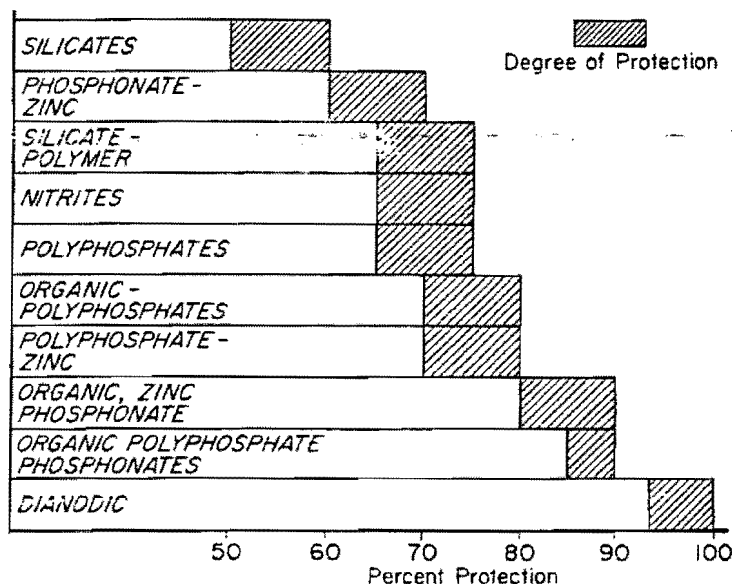


FIGURE 4—Degree of protection expected with various programs (pH 6.0-7.0).

#### Automated Control Yields Good Results

Such fluctuations can be solved with an automated water treatment control system. The unit monitors and controls the critical parameters: inhibitor level, pH, conductivity for blowdown control and corrosivity. It provides automatic straight line control, obtaining optimum results from the treatment program.

#### Modern Approach With Dispersants And High pH

Newly developed dispersing agents have as pronounced an effect on nonchromates as they have on chromates. A phosphonate dispersant for scale control and an organic/polyphosphate treatment (without zinc) in a pH range of 7.5-8.5 can provide good protection for steel. Corrosion rates of under 3 mpy may be expected.

Depending on makeup water characteristics, many systems can be treated in this manner without adding sulfuric acid. A correctly balanced treatment is the key to successful protection in the modern approach to nonchromate cooling water programs.

#### Other Nonchromates Improved With Dispersants

Performance by organics, such as ligno-sulfonates and modified tannins (the original nonchromate treatments), has also been upgraded by adding dispersants to the program. These organics had to be applied at fairly high concentration, and their natural breakdown and reactions with oxidizing agents often caused sludging. Adding a combination phosphonate/polymeric dispersant to the program makes it possible to use lower organic levels and higher pH values for good protection without fouling. One disadvantage of this type of organic is that it is readily oxidized by chlorine which is commonly used for biological control in large cooling systems.

(cont. from page 5)

By permitting the alkalinity of makeup water to cycle, pH values rise to 7.5-9.0, thus reducing the potential for corrosion. Yet so efficient are the phosphonates that although tests of the water reveal a positive value for Langelier's Saturation Index, scaling continues to be controlled.

While the corrosion potential is substantially reduced with the pH in an alkaline range, the cooling water still requires inhibition. At a pH of 8.5, the corrosion rate of mild steel may be 15 mils per year. And this would contribute too much fouling to heat-transfer surfaces, as well as have an adverse effect on equipment life and operating costs. But this corrosion potential is low enough for a sophisticated inhibitor system like ULC to give effective protection. Laboratory evaluations show that corrosion rates of 2 mpy may be expected with such treatment.

The efficiency of the phosphonate and polymeric dispersants is also demonstrated in nonchromate treatment.

#### Acceptable-to-Excellent Results With Nonchromates

The nonchromate approach to corrosion control has received increased emphasis with the greater attention given recently to water quality standards. Many proprietary nonchromate formulations are combinations of organics, polyphosphates, zinc and polymers. Some formulations also use nitrates.

#### Conventional Nonchromate Approach

One such inhibitor system uses an organic nitrogen compound with polyphosphate and zinc. Sulfuric acid controls the pH range at 6.5 to 7.0. The system makes possible a corrosion rate control at 3-5 mpy, but only with consistent control of treatment parameters. Manual control of such parameters usually results in variations of inhibitor level, pH and cycles. These in turn affect scale and corrosion inhibition in the system and, ultimately, heat transfer and equipment life.

For example, manual adjustment of sulfuric acid feed will provide pH values inside recommended limits only about half of the time. Such fluctuations impair protection, since low pH seriously accelerates corrosion and high pH causes deposition.

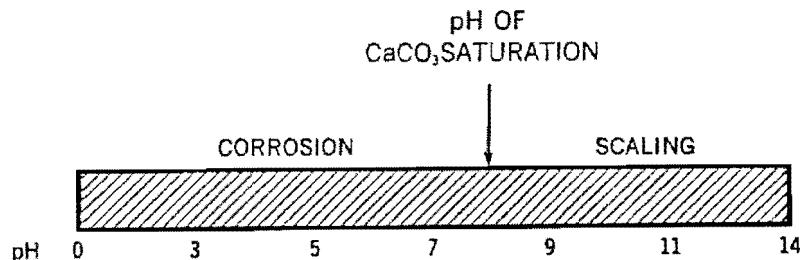


FIGURE 3—The pH of  $\text{CaCO}_3$  saturation affects scale and corrosion inhibition and ultimately, the life of the system.

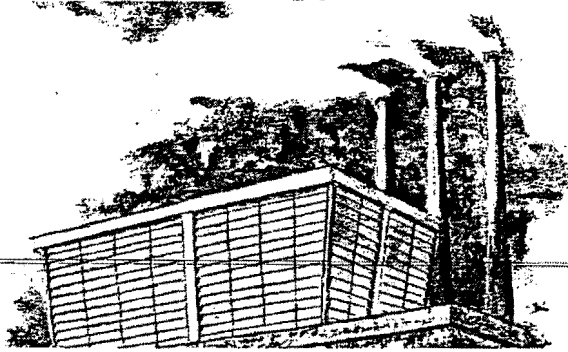
It worked!

Over a period of 10 years, the power plant cooling system has used an average of 121 million gallons of sewage effluent water per year. Projected over the past 22 years, this means that the use of sewage effluent water has saved 2.6 trillion gallons of fresh water. This fresh water, in addition to being needed for other uses, would have cost the government approximately \$1,450,000 at today's costs of production and delivery.

Other power plants in other locations have attempted to use sewage effluent water in power plant cooling systems. For one reason or another, few have been successful.

Zia, however, has continued to rack up savings of both fresh water and money.

That's where things stood when environmental-protection regulations were formulated to prohibit the emission of any but a minimum amount of chromates to the environment.



That's why it was planned to construct a chromate removal plant to extract chromate from the "blowdown" of the cooling system—so that the chromates would never reach the environment.

Zia's evaluation of a chromate removal plant had proved, however, that environmental regulations could not quite be met. A shade too much chromate would remain in the blowdown when it was discharged to the environment.

Once again, there had to be an answer.

Once again, Zia worked in conjunction with BETZ Laboratories to seek a solution. Any new chemical treatment of sewage effluent, of course, could not use chromates.

The new chemical treatment is thus a blend of various chemicals, none of which is currently considered environmentally polluting. During a 90-day trial period of the new chemical treatment, there has been a drop in the rate of corrosion attack on the metals in the power plant cooling system.

We're also able to run higher concentrations of solids in the cooling system than previously. Consequently, we're blowing down less effluent and thus using less fresh water than ever before. And the new treatment seems even less expensive than the chromate treatment.

We're convinced at this point that we're on the right track. It looks like we've got another winner.

*This article is reprinted from the Zia News (Vol. 24, No. 9,  
December 14, 1972) published by the Zia Company,  
Los Alamos, New Mexico, prime contractor to the  
U. S. Atomic Energy Commission.*

## Power Plant Cooling System Still Using Sewage Effluent

Achieving a cost improvement of \$125,000 by using existing facilities but a different material?

That's what happened at the power plant which is operated by utilities and engineering—but it took some doing!

Money was allocated for a chromate removal plant—because it appeared to be the most economical and the most feasible of the alternatives available.

The problem was that the discharge to the environment of waste water containing more than 0.01 milligrams per liter of hexavalent chromium had been prohibited by water pollution regulations.

And, there was another problem. Pilot plant experience indicated that even the proposed chromate removal plant would be unable to meet the rigid environmental regulations. During the operation of the pilot plant, serious consideration was also given to an alternative chemical treatment.

But you have to go back to the beginning of the power plant operation to understand the entire situation.

When the power plant went on the line 22 years ago fresh water was at a premium in Los Alamos, just as it is now. So, it was highly desirable to find another water source for the power plant cooling system.

The answer turned out to be the use of sewage effluent water in the cooling system of the power plant. The supply of sewage effluent water was sufficient to satisfy more than 75 per cent of the cooling system's water makeup requirements. Fresh water made up the balance.

But again, there was a problem.

Sewage effluent water must be carefully and correctly treated to avoid corrosion, scaling, and sludging to the cooling water system and its equipment.

Again, there had to be an answer.

In conjunction with BETZ Laboratories, Zia established a successful chemical treatment of the sewage effluent water to inhibit corrosion, and to prevent scaling and sludging to the cooling system components. The treatment was a specific blend of chromates, phosphate, zinc, and a small amount of chlorine used judiciously to fit our particular effluent water.





*ZIA REPORT  
ON NON-CRODINATE  
TREATMENT*

**THE BETZ®  
INDICATOR**

VOL. 42 NO. 3

JULY/AUGUST 1973

11/13/06

TO: KAY

FR: JOE ORTIZ - CELL 699-3751 / 667-4842

CHEMICALS USED @ TA-3 SM 22 POWER PLANT Cooling Tower  
INFO. YOU NEEDED. ON POWER PLANT CHEMICALS.

FROM DEC. 1980 TO 1993. - BETZ COMPANY

BETZ-2020 - Calcium phosphoric acid inhibitor

BETZ-562C - corrosion inhibitor, NaOH +

1-H-benzotriazole, methyl

FROM 1993 TO 2001 - GAERATT-CALLAHAN COMPANY

FORMULA 314-T - Biocide - Chlorine + bromine

(organic halogenation)

FORMULA 2010 - cooling water corrosion + scale control -

FORMULA 159 - 2-phosphono-1,2,4-butanetricarboxylic acid,  
Sodium molybdate, benzotriazole

Los Alamos feedwater oxygen scavenger, 2,2,6,6-tetramethylpiperidine-1-oxyl

FROM 2001 TO PRESENT NALCO CHEMICAL COMPANY

NALCO-STABREX ST20 - molybdate + phosphonate + benzotriazole

NALCO-7408 - Chlorine scavenger - bisulfite

NALCO-7384 - corrosion inhibitor - Phosphonates +  $Zn^{2+}$  (600-1000)

NALCO-TRASAR 23268 - cooling water treatment -

Acrylate polymers, organic compounds

(Chelates + Disinfectants)

LANL  
Site  
Support  
Services

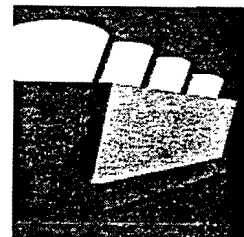


JOE V. ORTIZ  
WATER TREATMENT SPECIALIST  
UTILITIES DEPARTMENT

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LOS ALAMOS, NM 87544  
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FAX 505 667-9057  
PAGER 505 664-5555  
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# product facts



## DIANODIC II™ COOLING WATER TREATMENT BETZ® 2020

COOLING TOWERS

- Patented calcium phosphate scale inhibitor
- Permits proper phosphate concentration for complete corrosion inhibition of mild steel
- Compatible with chlorine

### DESCRIPTION AND USE

BETZ 2020 Inhibitor is a special organic deposit control agent designed to control calcium phosphate formation in open recirculating cooling water systems. The use of this product for the control of the formation and/or deposition of certain materials is covered by U.S. Patent 4,029,577.

### TYPICAL APPLICATIONS

BETZ 2020 Inhibitor represents a major breakthrough in non-heavy metal cooling water treatment. It is a patented calcium phosphate scale inhibitor, designed to be applied as one component of a Dianodic II program.

With BETZ 2020, phosphate concentrations in a Dianodic II program can be carried high enough to attain the de-

sired mild steel corrosion protection. This program promotes the formation of a passivating gamma iron oxide film, similar to that provided by conventional heavy metal programs.

The Dianodic II treatment approach can provide results comparable to traditional heavy metal programs. Dianodic II treatment offers the following advantages:

- Does not contain heavy metals, thereby allowing plants to comply with the majority of local water quality standards.
- Deposition control means better heat transfer rates, improved operating reliability, improved product recovery and reduced maintenance and cleaning expenditures.
- A program that can rapidly recover from most system upsets without requiring shutdown or cleaning.
- In some cases, Dianodic II enables operation at higher cycles, thereby reducing makeup water costs and waste treatment processing costs.

### TREATMENT AND FEEDING REQUIREMENTS

Proper treatment levels for BETZ 2020 Inhibitor depend on many factors particular to a given installation. Although normally the dosage ranges between 20 and 60 ppm of water contained in the system, this product should be used in accordance with control procedures BETZ establishes for a specific application.

BETZ 2020 may be applied neat or diluted with clean water to any convenient feeding strength. Mild steel tanks, pumps and piping should be avoided.

### GENERAL SPECIFICATIONS

Appearance	clear, light yellow liquid
Density (70F)	9.28 pounds/gallon
Flash Point (closed cup)	>200F
Freeze Point	22F
Pour Point (ASTM)	27F
pH (undiluted)	5.3
pH (5% solution)	5.9
Specific Gravity (70F)	1.114
Viscosity (70F)	7.1 cps
Viscosity (40F)	23.9 cps
Freeze/Thaw Recovery (3 cycles)	Stable

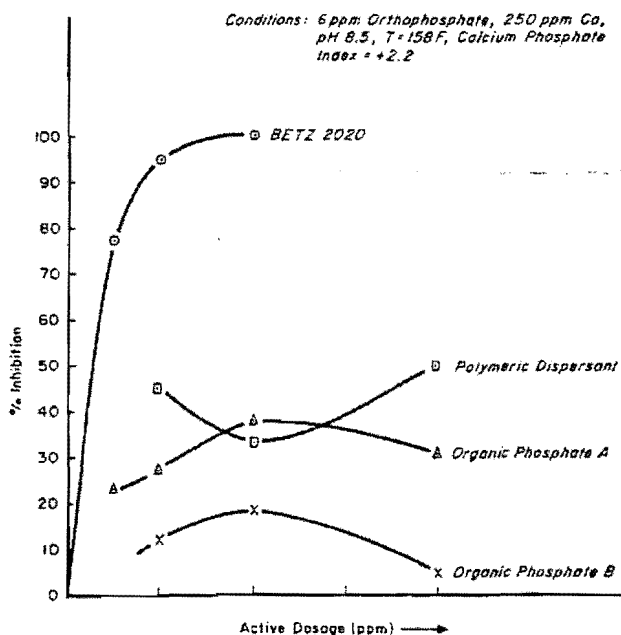


Figure 1 demonstrates the outstanding ability of BETZ 2020 to control orthophosphate deposition. At a calcium phosphate index of +2.2, BETZ 2020 provided 96 to 98% inhibition of calcium phosphate precipitation as compared to 13-43% by conventional cooling water dispersants.

BETZ LABORATORIES, INC.  
4636 SOMERSON ROAD TREVOSE, PA. 15047

BETZ MATERIAL SAFETY DATA SHEET

24 HOUR EMERGENCY TELEPHONE (HEALTH OR ACCIDENT) 215/355-3300

(PAGE 1 OF 3)  
EFFECTIVE DATE 2/85

PRODUCT: BETZ 2020

PRODUCT APPLICATION : WATER-BASED DEPOSIT CONTROL AGENT.

-----SECTION 1-----HAZARDOUS INGREDIENTS-----

INFORMATION ON PHYSICAL HAZARDS, HEALTH HAZARDS, PEL'S AND TLV'S FOR SPECIFIC PRODUCT INGREDIENTS AS REQUIRED BY THE OSHA HAZARD COMMUNICATIONS STANDARD ARE LISTED. REFER TO SECTION 4 (PAGE 2) FOR OUR ASSESSMENT OF THE POTENTIAL ACUTE AND CHRONIC HAZARDS OF THIS FORMULATION.

THIS PRODUCT CONTAINS NO HAZARDOUS INGREDIENTS BY OSHA REGULATIONS OR ANY STATE RIGHT-TO-KNOW REGULATIONS.

-----SECTION 2-----TYPICAL PHYSICAL DATA-----

PH: AS IS	(APPROX.) 5.3	ODOR: MILD
FL.PT.(DEG.F): >200	SETA(CC)	SP.GR.(70F)OR DENSITY: 1.123
VAPOR PRESSURE(MMHG): 20		VAPOR DENSITY(AIR=1): <1
VISC CPS70F: 19.5		%SOLUBILITY(WATER): 100
EVAP.RATE: <1	ETHER=1	APPEARANCE: LIGHT YELLOW
PHYSICAL STATE: LIQUID		FREEZE PCINT(DEG.F): 26

-----SECTION 3-----REACTIVITY DATA-----

STABLE

THERMAL DECOMPOSITION (DESTRUCTIVE FIRES) YIELDS ELEMENTAL OXIDES.

BETZ MATERIAL SAFETY DATA SHEET (PAGE 2 OF 3)

PRODUCT: BETZ 2020

-----SECTION 4-----HEALTH HAZARD EFFECTS-----

ACUTE SKIN EFFECTS \*\*\* PRIMARY ROUTE OF EXPOSURE

SLIGHTLY IRRITATING TO THE SKIN

ACUTE EYE EFFECTS \*\*\*

SLIGHTLY IRRITATING TO THE EYES

ACUTE RESPIRATORY EFFECTS \*\*\*

MISTS/AEROSOLS MAY CAUSE IRRITATION TO UPPER RESPIRATORY TRACT

CHRONIC EFFECTS OF OVEREXPOSURE\*\*\*

NO EVIDENCE OF POTENTIAL CHRONIC EFFECTS.

MEDICAL CONDITIONS AGGRAVATED \*\*\*

NOT KNOWN

SYMPTOMS OF EXPOSURE \*\*\*

MAY CAUSE REDNESS OR ITCHING OF SKIN, IRRITATION AND/OR TEARING OF EYES(DIRECT CONTACT).

-----SECTION 5-----FIRST AID INSTRUCTIONS-----

SKIN CONTACT\*\*\*

REMOVE CONTAMINATED CLOTHING. WASH EXPOSED AREA WITH A LARGE QUANTITY OF SOAP SOLUTION OR WATER FOR 15 MINUTES

EYE CONTACT\*\*\*

~~IMMEDIATELY FLUSH EYES WITH WATER FOR 15 MINUTES. IMMEDIATELY CONTACT A~~  
PHYSICIAN FOR ADDITIONAL TREATMENT

INHALATION EXPOSURE\*\*\*

REMOVE VICTIM FROM CONTAMINATED AREA TO FRESH AIR. APPLY APPROPRIATE FIRST AID TREATMENT AS NECESSARY

INGESTION\*\*\*

DO NOT FEED ANYTHING BY MOUTH TO AN UNCONSCIOUS OR CONVULSIVE VICTIM  
DILUTE CONTENTS OF STOMACH. INDUCE VOMITING BY ONE OF THE STANDARD METHODS. IMMEDIATELY CONTACT A PHYSICIAN

-----SECTION 6-----SPILL, DISPOSAL AND FIRE INSTRUCTIONS-----

SPILL INSTRUCTIONS\*\*\*

VENTILATE AREA, USE SPECIFIED PROTECTIVE EQUIPMENT. CONTAIN AND ABSORB ON ABSORBENT MATERIAL. PLACE IN WASTE DISPOSAL CONTAINER. THE WASTE CHARACTERISTICS OF THE ABSORBED MATERIAL, OR ANY CONTAMINATED SOIL, SHOULD BE DETERMINED IN ACCORDANCE WITH RCRA REGULATIONS.  
FLUSH AREA WITH WATER. WET AREA MAY BE SLIPPERY. IF SO, SPREAD SAND OR GRIT.

DISPOSAL INSTRUCTIONS\*\*\*

WATER CONTAMINATED WITH THIS PRODUCT MAY BE SENT TO A SANITARY SEWER TREATMENT FACILITY, IN ACCORDANCE WITH ANY LOCAL AGREEMENT, A PERMITTED WASTE TREATMENT FACILITY OR DISCHARGED UNDER A NPDES PERMIT PRODUCT(S IS)-

INCINERATE OR BURY IN APPROVED LANDFILL

FIRE EXTINGUISHING INSTRUCTIONS\*\*\*

FIREFIGHTERS SHOULD WEAR POSITIVE PRESSURE SELF-CONTAINED BREATHING APPARATUS(FULL FACE-PIECE TYPE).

DRY CHEMICAL, CARBON DIOXIDE, FOAM OR WATER. FOAM OR WATER CREATE A SLIPPERY CONDITION. SPREAD SAND OR GRIT

BETZ MATERIAL SAFETY DATA SHEET (PAGE 3 OF 3)

PRODUCT: BETZ 2020

-----SECTION 7-----SPECIAL PROTECTIVE EQUIPMENT-----

VENTILATION PROTECTION\*\*\*

ADEQUATE VENTILATION

RECOMMENDED RESPIRATORY PROTECTION\*\*\*

IF VENTILATION IS INADEQUATE OR SIGNIFICANT PRODUCT EXPOSURE IS LIKELY,  
USE A RESPIRATOR WITH DUST/MIST CARTRIDGES

RECOMMENDED SKIN PROTECTION\*\*\*

RUBBER GLOVES

REPLACE AS NECESSARY

RECOMMENDED EYE PROTECTION\*\*\*

SPLASH PROOF CHEMICAL GOGGLES

-----SECTION 8-----STORAGE AND HANDLING PRECAUTIONS-----

STORAGE INSTRUCTIONS\*\*\*

KEEP CONTAINER CLOSED

PROTECT FROM FREEZING

HANDLING INSTRUCTIONS\*\*\*

IMMEDIATELY REMOVE CONTAMINATED CLOTHING, WASH BEFORE REUSE

NORMAL CHEMICAL HANDLING

-----SECTION 9-----FEDERAL REGULATIONS-----

CSHA(29CFR)-FOR RESPIRATORY PROTECTION USE PROPERLY FITTED MSHA/NIOSH  
APPROVED RESPIRATORY EQUIPMENT WITHIN USE LIMITATIONS. OTHERWISE, USE SUPPLIED  
AIR APPARATUS.

CWA(40CFR)REPORTABLE QUANTITY: AS IS PRODUCT (HAZARDOUS SUBSTANCE)  
NCT APPLICABLE

RCRA(40CFR): IF DISCARDED, THIS MATERIAL BEARS HWI# NCT APPLICABLE

DOT(49CFR)CLASSIFICATION: NCT APPLICABLE

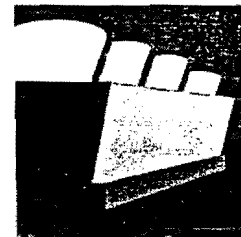
NFPA/HMIS : HEALTH - 1 ; FIRE - 0 ; REACTIVITY - 0 ; SPECIAL - NONE

\*\*\*\*\*

THIS DOCUMENT IS PROVIDED TO SUPPLY ALL THE INFORMATION NECESSARY TO COMPLY  
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WITH RESPECT THERETO AND DISCLAIMS ALL LIABILITY FROM RELIANCE THEREON.

HAROLD M. FERSH  
ENVIRONMENTAL INFORMATION COORDINATOR

# product facts



## BETZ® INHIBITOR 562C

- Inhibits corrosion of copper, admiralty brass, and other copper alloys
- Effectiveness is not impaired by chlorine
- Compatible with all other BETZ treatment programs

### DESCRIPTION AND USE

BETZ Inhibitor 562C is a specially formulated corrosion inhibitor which is designed to establish a protective film on copper and copper-alloy heat exchange surfaces. BETZ Inhibitor 562C effectively inhibits the corrosion of copper alloy surfaces. Indirectly, it also reduces the corrosion of steel surfaces within a given cooling system. This occurs if the steel corrosion is a result of a galvanic reaction between the steel surface and the products of copper corrosion which have been deposited on the steel. Figure 1 shows the reduction in corrosion rate for

both admiralty brass and mild steel in a West Coast power plant through use of 30 ppm Inhibitor 562C.

### TREATMENT AND FEEDING REQUIREMENTS

**Dosage**—Proper treatment levels of BETZ Inhibitor 562C depend on many factors, such as corrosion load and conditions particular to a given installation. The normal dosage is in the range of 7 to 80 parts per million in the water being treated. However, this product is to be used in accordance with control procedures BETZ establishes for a specific application.

**Feed Point**—BETZ Inhibitor 562C should be fed at a point in the cooling water system where turbulence, flow pattern, etc., will insure good mixing of the product with the water to be treated. For consistent corrosion control, continuous treatment of recirculating cooling systems is recommended.

**Dilution**—BETZ Inhibitor 562C may be fed from the shipping container directly, or may be diluted with good quality water to a convenient feeding strength.

**Feed Equipment**—Mild steel tanks, pumps, and piping are satisfactory for use with this product.

**Chlorine**—This product is chlorine stable. It will not be adversely affected by systems employing either intermittent or continuous chlorination for the control of micro-biological organisms.

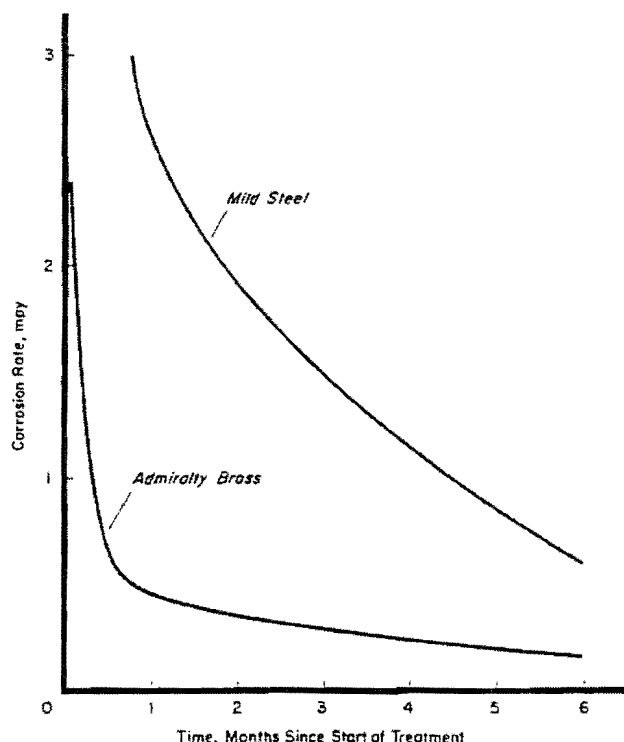


FIGURE 1—Effect of BETZ Inhibitor 562C on the Corrosion Rates of Admiralty Brass and of Mild Steel (latter caused by galvanic reaction between Admiralty corrosion products and the Mild Steel surface)

### GENERAL PROPERTIES

Appearance	clear, amber liquid
Flash Point (closed cup)	>200F
Freeze Point (ASTM)	18F
pH (undiluted)	12.8
pH (5% solution)	12.0
Pour Point (ASTM)	20F
Specific Gravity (70F)	1.077
Viscosity (40F)	5.6 cps
Viscosity (70F)	4.4cps

Protect from freezing. If this product is frozen during shipment or storage, slight mixing may be required to insure homogeneity.

BETZ LABORATORIES, INC.  
4636 SOMERTON ROAD TREVCOSE, PA. 19047

BETZ MATERIAL SAFETY DATA SHEET

24 HOUR EMERGENCY TELEPHONE (HEALTH OR ACCIDENT) 215/355-3300

(PAGE 1 OF 3)

EFFECTIVE DATE 10/85

PRODUCT: INHIBITOR 562C

PRODUCT APPLICATION : WATER-BASED CORROSION INHIBITOR.

-----SECTION 1-----HAZARDOUS INGREDIENTS-----

INFORMATION ON PHYSICAL HAZARDS, HEALTH HAZARDS, PEL'S AND TLV'S FOR SPECIFIC PRODUCT INGREDIENTS AS REQUIRED BY THE OSHA HAZARD COMMUNICATIONS STANDARD ARE LISTED. REFER TO SECTION 4 (PAGE 2) FOR OUR ASSESSMENT OF THE POTENTIAL ACUTE AND CHRONIC HAZARDS OF THIS FORMULATION.

SODIUM HYDROXIDE\*\*\* (CAUSTIC SODA); CAS#1310-73-2; CORROSIVE; TOXIC IF ORALLY INGESTED; PEL: 2.0MG/M3; TLV: 2.0MG/M3 (CEILING).

1-H-BENZOTRIAZOLE, METHYL\*\*\* (TOLYLTRIAZOLE; TTA); CAS#29385-43-1; IRRITANT (EYES); TOXIC BY INHALATION; PEL: NONE; TLV: NONE.

-----SECTION 2-----TYPICAL PHYSICAL DATA-----

PH: AS IS	(APPROX.) 12.6	ODOR: NONE
FL.PT. (DEG.F):	>200 SETA(CC)	SP.GR. (70F) OR DENSITY: 1.077
VAPOR PRESSURE (MMHG):	ND	VAPOR DENSITY (AIR=1): ND
VISC CPS70F:	5.6	% SOLUBILITY (WATER): 100
EVAP. RATE: ND	WATER=1	APPEARANCE: LIGHT AMBER
PHYSICAL STATE:	LIQUID	FREEZE POINT (DEG.F): 13

-----SECTION 3-----REACTIVITY DATA-----

STABLE

THERMAL DECOMPOSITION (DESTRUCTIVE FIRES) YIELDS ELEMENTAL OXIDES.



BETZ MATERIAL SAFETY DATA SHEET (PAGE 2 OF 3)

PRODUCT: INHIBITOR 562C

-----SECTION 4-----HEALTH HAZARD EFFECTS-----  
DUTE SKIN EFFECTS \*\*\* PRIMARY ROUTE OF EXPOSURE  
SLIGHTLY IRRITATING TO THE SKIN  
ACUTE EYE EFFECTS \*\*\*  
MODERATELY IRRITATING TO THE EYES  
ACUTE RESPIRATORY EFFECTS \*\*\*  
MISTS/AEROSOLS MAY CAUSE IRRITATION TO UPPER RESPIRATORY TRACT  
CHRONIC EFFECTS OF OVEREXPOSURE\*\*\*  
PROLONGED OR REPEATED CONTACT MAY CAUSE PRIMARY IRRITANT DERMATITIS.  
MEDICAL CONDITIONS AGGRAVATED \*\*\*  
NOT KNOWN

SYMPTOMS OF EXPOSURE \*\*\*  
MAY CAUSE REDNESS OR ITCHING OF SKIN.

PRECAUTIONARY STATEMENT BASED ON TESTING RESULTS \*\*\*  
MAY BE TOXIC IF ORALLY INGESTED.

-----SECTION 5-----FIRST AID INSTRUCTIONS-----  
SKIN CONTACT\*\*\*  
REMOVE CONTAMINATED CLOTHING. WASH EXPOSED AREA WITH A LARGE QUANTITY OF  
SOAP SOLUTION OR WATER FOR 15 MINUTES  
EYE CONTACT\*\*\*  
IMMEDIATELY FLUSH EYES WITH WATER FOR 15 MINUTES. IMMEDIATELY CONTACT A  
PHYSICIAN FOR ADDITIONAL TREATMENT  
INHALATION EXPOSURE\*\*\*  
REMOVE VICTIM FROM CONTAMINATED AREA TO FRESH AIR. APPLY APPROPRIATE  
FIRST AID TREATMENT AS NECESSARY  
INGESTION\*\*\*  
DO NOT FEED ANYTHING BY MOUTH TO AN UNCONSCIOUS OR CONVULSIVE VICTIM  
DO NOT INDUCE VOMITING. IMMEDIATELY CONTACT PHYSICIAN. DILUTE CONTENTS OF  
STOMACH USING 3-4 GLASSES MILK OR WATER

-----SECTION 6-----SPILL, DISPOSAL AND FIRE INSTRUCTIONS-----  
SPILL INSTRUCTIONS\*\*\*  
VENTILATE AREA, USE SPECIFIED PROTECTIVE EQUIPMENT. CONTAIN AND ABSORB  
ON ABSORBENT MATERIAL. PLACE IN WASTE DISPOSAL CONTAINER. THE WASTE  
CHARACTERISTICS OF THE ABSORBED MATERIAL, OR ANY CONTAMINATED SOIL,  
SHOULD BE DETERMINED IN ACCORDANCE WITH RCRA REGULATIONS.  
FLUSH AREA WITH WATER. WET AREA MAY BE SLIPPERY. IF SO, SPREAD  
SAND OR GRIT.  
DISPOSAL INSTRUCTIONS\*\*\*  
WATER CONTAMINATED WITH THIS PRODUCT MAY BE SENT TO A SANITARY  
SEWER TREATMENT FACILITY, IN ACCORDANCE WITH ANY LOCAL AGREEMENT, A  
PERMITTED WASTE TREATMENT FACILITY OR DISCHARGED UNDER A NPDES PERMIT  
PRODUCT (AS IS)-

INCINERATE OR BURY IN APPROVED LANDFILL  
FIRE EXTINGUISHING INSTRUCTIONS\*\*\*  
FIREFIGHTERS SHOULD WEAR POSITIVE PRESSURE SELF-CONTAINED BREATHING  
APPARATUS (FULL FACE-PIECE TYPE).  
DRY CHEMICAL, CARBON DIOXIDE, FOAM OR WATER. FOAM OR WATER CREATE A SLIPPERY  
CONDITION. SPREAD SAND OR GRIT

BETZ MATERIAL SAFETY DATA SHEET (PAGE 3 OF 3)

PRODUCT: INHIBITOR 562C

-----SECTION 7-----SPECIAL PROTECTIVE EQUIPMENT-----

VENTILATION PROTECTION\*\*\*

ADEQUATE VENTILATION TO MAINTAIN AIR CONTAMINANTS BELOW EXPOSURE LIMITS  
RECOMMENDED RESPIRATORY PROTECTION\*\*\*

IF VENTILATION IS INADEQUATE OR SIGNIFICANT PRODUCT EXPOSURE IS LIKELY,  
USE A RESPIRATOR WITH DUST/MIST CARTRIDGES.

RECOMMENDED SKIN PROTECTION\*\*\*

RUBBER GLOVES

REPLACE AS NECESSARY

RECOMMENDED EYE PROTECTION\*\*\*

SPLASH PROOF CHEMICAL GOGGLES

-----SECTION 8-----STORAGE AND HANDLING PRECAUTIONS-----

STORAGE INSTRUCTIONS\*\*\*

KEEP CONTAINER CLOSED

IF FROZEN, THAW COMPLETELY AND MIX THOROUGHLY PRIOR TO USE

HANDLING INSTRUCTIONS\*\*\*

IMMEDIATELY REMOVE CONTAMINATED CLOTHING, WASH BEFORE REUSE

ALKALINE. DO NOT MIX WITH ACIDIC MATERIAL.

-----SECTION 9-----FEDERAL REGULATIONS-----

OSHA(29CFR)-FOR RESPIRATORY PROTECTION USE PROPERLY FITTED MSHA/NIOSH  
APPROVED RESPIRATORY EQUIPMENT WITHIN USE LIMITATIONS. OTHERWISE, USE SUPPLIED  
AIR APPARATUS.

CWA(40CFR)REPORTABLE QUANTITY: AS IS PRODUCT (HAZARDOUS SUBSTANCE)

9,321 GAL (SODIUM HYDROXIDE)

RCRA(40CFR): IF DISCARDED, THIS MATERIAL BEARS HWI# 0002

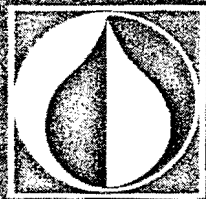
DOT(49CFR)CLASSIFICATION: NOT APPLICABLE

NFPA/HMIS : HEALTH - 2 ; FIRE - 0 ; REACTIVITY - 0 ; SPECIAL - ALK

\*\*\*\*\*

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WITH RESPECT THERETO AND DISCLAIMS ALL LIABILITY FROM RELIANCE THEREON.

HAROLD M. HERSH  
ENVIRONMENTAL INFORMATION COORDINATOR



# Garrett-Callahan Company

CHEMICAL PRODUCTS & SERVICES SINCE 1964

## Product Bulletin No. 3-314-T

### G. C. FORMULA 314-T

#### BIOCIDE

<b>USE</b>	Garratt-Callahan Formula 314-T is used for the control of algal, bacterial, and fungal slimes in recirculating industrial cooling water systems and once-through systems.
<b>DESCRIPTION</b>	Formula 314-T is a white solid in the form of short cylinders (tablets). These dissolve slowly in water to release chlorine and bromine, providing excellent control of micro-organisms. Formula 314-T is non-foaming.
<b>DIRECTIONS</b>	Formula 314-T is designed for controlled release of biocide. It should be placed in the system in an area of high water flow in order to dissolve properly. Two popular methods are to hang it in a plastic mesh bag or to use a plastic pot feeder on a recirculating line or sidestream. Consult label for dosages. Not for use in potable water.
<b>RECOMMENDATIONS</b>	It is strongly suggested that a system be manually cleaned prior to starting treatment with this product, and that yearly manual cleanings follow. Not only will this allow less biocide to do a better job, it will also decrease the possibility of dead growths sloughing off to foul the system. Consult your Garratt-Callahan Engineer if you have any questions concerning the use of this product.
<b>SAFETY &amp; HANDLING</b>	<p>Garratt-Callahan Formula 314-T is a toxicant and may cause skin or eye irritation. Do not inhale or take internally. Wear protective clothing, gloves and goggles when handling. Get medical attention if swallowed or splashed in eyes or if skin irritation persists. Formula 314-T is for industrial use only and should be kept out of the reach of children. A Material Safety Data Sheet is available to users of this product. Consult label for full handling data.</p> <p><b>FOR MEDICAL OR CHEMICAL EMERGENCIES</b> Call (415) 697-5811 (Garratt-Callahan Co.). If no answer call (303) 623-5716 (Rocky Mountain Poison Center, 24-hour number)</p> <p><b>FOR NON-EMERGENCY PRODUCT INFORMATION</b> Call (415) 697-5811 From 8am to 4:30pm Pacific Time</p>
<b>PACKAGING</b>	Formula 314-T is available in 50 lb. net plastic pails. Complete directions for use are on every drum.
<b>PRODUCT DATA</b>	<p>composition—an organic halogen donor</p> <p>weight—approximately 42 grams (1.5 oz.) per tablet</p> <p>solubility—approximately 12 lbs./1000 gals. of water @ 25°C</p> <p>EPA Reg. No.—5785-63-8540</p>
<b>STORAGE</b>	This product does not readily deteriorate under normal conditions. It is suggested, however, that drums not be kept in stock longer than one year. Keep product dry and close container when not in use. Store in a cool area.

One Eleven Rollins Road • Milbrae, CA 94030 • Telephone (415) 697-5811

REV 11/15/90

GARRATT-CALLAHAN COMPANY  
111 ROLLINS ROAD  
MILLBRAE, CALIFORNIA 94030

0918417  
FOR MEDICAL EMERGENCY CALL (415)  
697-5811; IF NO ANSWER CALL (303)  
623-5716 (ROCKY MTH POISON CENTER)  
24 HOUR NUMBER

FORMULA 314-T



CURRENT AS OF  
02/08/1993

**SECTION #1 - IDENTIFICATION (LA IDENTIFICACION)****FORMULA 314-T**

PRODUCT NAME: GC Formula 314-T  
PRODUCT USE: Microbicide for cooling water.  
SPECIAL WARNINGS/HAZARDS:  
May release chlorine or bromine gas  
when wet or heated.

HAZARD RATING  
HEALTH: 2  
FIRE: 1  
REACTIVITY: 1

SARA Hazard Class:  
Acute Health Hazard  
Reactivity Hazard

**SECTION #2 - HAZARDOUS COMPONENTS (LOS COMPONENTES PELIGROSOS)**

COMPONENT: 1-bromo-3-chloro-5,5-dimethylhydantoin  
CAS NUMBER: 126-06-7  
PERCENT IN MIXTURE: 96  
ACGIU TLV: 15mg/m3 as nuisance dust  
OSHA PEL: 10mg/m3 as nuisance dust  
TPQ: None  
None

NOTE: OSHA requires only that hazardous components be listed in this section.

**SECTION #3 - PHYSICAL DATA (LA INFORMACION FISICA)**

BOILING POINT: N/A  
VAPOR PRESSURE: N/A  
VAPOR DENSITY (AIR=1): N/A  
EVAPORATION RATE:

SPECIFIC GRAVITY:  
SOLUBILITY (H2O): MODERATE  
PERCENT VOLATILES: N/A

PH FACTOR OF: N/A  
APPEARANCE: WHITE TO OFF-WHITE PELLETS  
ODOR: CHLORINE

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0918417  
FOR MEDICAL EMERGENCY CALL (415)  
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623-5716 (ROCKY MTN POISON CENTER)  
24 HOUR NUMBER.

FORMULA 314-T

## SECTION #4 - FIRE & EXPLOSION DATA (LA INFORMACION DE FUEGO Y EXPLOSION)

Flash point: None  
Autoignition: Unknown  
Lower explosive limit: Unknown  
Upper explosive limit: Unknown

Extinguishing media:  
Any medium may be used except ammonium phosphate.

Fire and explosion hazards:  
May release hydrogen bromide or bromine.

Special Fire Fighting Instructions:  
Wear self-contained breathing apparatus and full protective gear.

## SECTION #5 - EXPOSURE & EFFECT (LA EXPOSICION Y EFECTOS)

Route of Exposure - Inhalation:  
DUST MAY CAUSE SEVERE RESPIRATORY PROBLEMS.

Route of Exposure - Eyes:  
WILL BURN OR SEVERELY IRRITATE EYES.

First Aid - Inhalation:  
Remove patient to fresh air. If dizziness, nausea, irritation, difficulty breathing, or other symptoms persist, call a physician.

First Aid - Eyes:  
Flood the eye with lukewarm (not hot) water from a large glass 2 or 3 inches from the eye, or use an eyewash fountain. Do this for 15 minutes. Have the patient blink as much as possible while flooding the eye. Do not force eyelid open. CALL A PHYSICIAN!

Route of Exposure - Skin  
MAY IRRITATE OR BURN SKIN

Route of Exposure - Ingestion  
MAY IRRITATE OR BURN MOUTH, THROAT, AND STOMACH. MAY CAUSE SERIOUS DAMAGE TO MOUTH, THROAT, AND STOMACH.

First Aid - Skin:  
Wash with water, consult physician if pain, irritation or other problems persist.

First Aid - Ingestion:  
Unless patient is unconscious, having convulsions, or cannot swallow, give milk or water immediately. Then call a physician to find out if you should make the patient vomit.

Health Conditions Aggravated by Exposure:  
No data found.

## SECTION #6 - REACTIVITY & POLYMERIZATION (LA REACTIVIDAD Y POLIMERIZACION)

Hazardous Polymerization:  
WILL NOT OCCUR.

Conditions to Avoid (stability):  
NONE

Compatible Materials:  
Organics and reducing materials.

Hazardous Decomposition Products:  
Chlorine gas and oxides of sulfur.

Conditions to avoid (polymerization):  
NONE

Stability: STABLE

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0918417  
FOR MEDICAL EMERGENCY CALL (415)  
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623-5716 (ROCKY MTH POISON CENTER)  
24 HOUR NUMBER.

FORMULA 314-T

## SECTION #7 - SPILL, LEAK & DISPOSAL PROCEDURES (LA ATILLA, GOTERA, & LOS PROCEDIMIENTOS DE ELIMACION)

Steps to be taken in case material is released or spilled:  
Sweep up. Shovel into dry container. If product is not  
contaminated it may be used in boiler or tower being treated.

Dispose of in waste management facility or in compliance  
with federal, state and local regulations. If spill is not  
contaminated you may be able to dispose of materials where normally  
used.

### Storage and Handling Conditions

Keep container covered and sealed when not in use. Store in a  
cool, dry area. Do not add water or any other material to drum of  
product or otherwise contaminate it.

## SECTION #8 - SPECIAL PROTECTIVE MEASURES (LAS MEDIDAS PROTECTORAS ESPECIALES)

Ventilation:  
Local exhaust recommended.

Skin Protection  
PLASTIC OR RUBBER GLOVES. ELBOW LENGTH SUGGESTED.

Other Protection:  
PLASTIC OR RUBBER APRON.

Eye Protection:  
CHEMICAL WORKER'S GOGGLES OR FACE MASK.

Respiratory Protection:  
NONE NEEDED UNDER NORMAL CONDITIONS OF USE.

Work/Hygienic Practices:  
Have eyewash and safety shower in work area. Remove contaminated  
clothing. Wash contaminated clothing before reuse. If liquid is  
absorbed into shoes or gloves, discard.

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TO THE ACCURACY OR COMPLETENESS OF THE INFORMATION CONTAINED  
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CONSEQUENCES OF ITS USE. EACH INDIVIDUAL SHOULD MAKE A  
DETERMINATION AS TO THE SUITABILITY OF THE INFORMATION FOR THEIR  
PARTICULAR PURPOSE.

THIS HAZARD RATING HAS BEEN DEVELOPED BY GARRATT-CALLAHAN COMPANY  
AND IS BASED ON NFPA AND HMIS HAZARD CODES. FOR ALL INTENTS AND  
PURPOSES THE GARRATT-CALLAHAN HAZARD RATING AND NFPA/HMIS HAZARD  
CODES CAN BE ASSUMED TO BE SIMILAR.

REV 03/30/94

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0804518  
FOR MEDICAL EMERGENCY CALL (415)  
697-5811, IF NO ANSWER CALL (303)  
623-5716 (ROCKY MTH POISON CENTER)  
24 HOUR NUMBER.

FORMULA 159  
FOR NON-EMERGENCY PRODUCT INFORMATION  
CALL (415) 697-5811 BETWEEN  
8AM AND 4PM PACIFIC TIME.



CURRENT AS OF  
11/14/1995

## SECTION #1 - IDENTIFICATION (LA IDENTIFICACION)

### FORMULA 159

PRODUCT NAME: GC Formula 159  
PRODUCT USE: Boiler feedwater  
oxygen scavenger.

HAZARD RATING:  
HEALTH: 2  
FIRE: 0  
REACTIVITY: 0

SARA Hazard Class: Acute Health Hazard

DOT PROPER SHIPPING NAME: Not Applicable

## SECTION #2 - HAZARDOUS COMPONENTS (LOS COMPONENTES PELIGROSOS)

COMPONENT: Sodium bisulfite  
CAS NUMBER: 7631-90-5  
PERCENT IN MIXTURE: <40  
ACGIH TLV: 5mg/m3  
OSHA PEL: 5mg/m3

OSHA Does not list sodium sulfite as hazardous, however  
some sensitive individuals may have allergic reactions.

Such individuals should be removed to fresh air if discomfort  
persists.

NOTE: OSHA requires only that hazardous components be listed in  
this section.

## SECTION #3 - PHYSICAL DATA (LA INFORMACION FISICA)

BOILING POINT: N/A  
VAPOR PRESSURE: N/A  
VAPOR DENSITY (AIR=1): N/A  
EVAPORATION RATE: N/A  
PH FACTOR OF: 6.0-8.5  
APPEARANCE: CLEAR LIQUID  
ODOR: SLIGHT

SPECIFIC GRAVITY: 1.3-1.4  
SOLUBILITY (H2O): HIGH  
PERCENT VOLATILES: 60

COLOR: LIGHT YELLOW/AMBER

MSDS-43

0804518

FORMULA 159

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MARIETTA, CALIFORNIA 94030

FOR MEDICAL EMERGENCY CALL (415)  
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623-5716 (ROCKY MTN POISON CENTER)  
24 HOUR NUMBER.

FOR NON-EMERGENCY PRODUCT INFORMATION  
CALL (415) 697-5811 BETWEEN  
8AM AND 4PM PACIFIC TIME.

## SECTION #4 - FIRE & EXPLOSION DATA (LA INFORMACION DE FUEGO Y EXPLOSION)

Flash Point: NONE  
Autoignition: NONE  
Flammability Class: NONE  
Lower explosive Limit (%): UNKNOWN  
Upper explosive Limit (%): UNKNOWN

Extinguishing Media:  
Use media appropriate for the surrounding fire.

Fire and Explosion Hazards:  
No Special Hazards

Special Fire Fighting Instructions:  
No Special Instructions

## SECTION #5 - EXPOSURE & EFFECT (LA EXPOSICION Y EFECTOS)

Routes of Exposure - Inhalation  
PRODUCT DOES NOT EMIT FUMES

Route of Exposure - Eyes:  
May irritate eyes.

First Aid - Inhalation  
NA

First Aid - Eyes:  
Flush immediately with large amounts of water for at least 15 minutes. Consult a physician if pain, irritation, or other problems persist.

Route of Exposure - Skin:  
MAY IRRITATE SKIN.

First Aid - Skin:  
Wash with water for at least 15 minutes; consult physician if pain, irritation or other problems persist.

Routes of Exposure - Ingestion:  
May cause severe allergic reaction (respiratory problems) if swallowed.

First Aid - Ingestion:  
Give water or milk. Induce vomiting. Call a physician.

Health Conditions Aggravated by Exposure:  
NONE KNOWN.

## SECTION #6 - REACTIVITY & POLYMERIZATION (LA REACTIVIDAD Y POLIMERIZACION)

Hazardous Polymerization:  
WILL NOT OCCUR.

Conditions to Avoid (stability):  
NONE

Incompatible Materials:  
Acids, Oxidizing agents.

Hazardous Decomposition Products:  
SO<sub>2</sub> (Sulfur Dioxide, Gas)

Conditions to avoid (polymerization):  
NONE

Stability: STABLE



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697-5811. IF NO ANSWER CALL (303)  
623-5716 (ROCKY MTH POISON CENTER)  
24 HOUR NUMBER.

FORMULA 159  
FOR NON-EMERGENCY PRODUCT INFORMATION  
CALL (415) 697-5811 BETWEEN  
8AM AND 4PM PACIFIC TIME.

## SECTION #7 - SPILL, LEAK & DISPOSAL PROCEDURES (LA ATILLA, GOTERA, & LOS PROCEDIMIENTOS DE ELIMACION)

Wear protective clothing. Small spills of one gallon or less may be flushed to drain with large amounts of water. For larger spills, contain with absorbent material. Place in plastic bag.

Dispose of in waste management facility or in compliance with federal, state and local regulations. If spill is not contained you may be able to dispose of materials where normally used.

### Storage and Handling Conditions

Keep container covered and sealed when not in use. Store in a cool, dry area. Do not add water or any other material to drum of product or otherwise contaminate it.

## SECTION #8 - SPECIAL PROTECTIVE MEASURES (LAS MEDIDAS PROTECTORAS ESPECIALES)

Ventilation  
NORMAL ROOM VENTILATION

Skin Protection  
PLASTIC OR RUBBER GLOVES. ELBOW LENGTH SUGGESTED.

Other Protection:  
PLASTIC OR RUBBER APRON.

Eye Protection:  
CHEMICAL WORKER'S GOGGLES OR FACE MASK.

Respiratory Protection:  
NONE NEEDED UNDER NORMAL CONDITIONS OF USE.

### Work/Hygienic Practices:

Have eyewash and safety shower, ANSI Z358.1-1990 certified, in work area. Remove contaminated clothing. Wash contaminated clothing before reuse. If liquid is absorbed into shoes or gloves, discard.

ALTHOUGH REASONABLE CARE HAS BEEN TAKEN IN THE PREPARATION OF THIS DOCUMENT, WE EXTEND NO WARRANTIES AND MAKE NO REPRESENTATIONS AS TO THE ACCURACY OR COMPLETENESS OF THE INFORMATION CONTAINED HEREIN, AND ASSUME NO RESPONSIBILITY REGARDING THE SUITABILITY OF THIS INFORMATION FOR THE USER'S INTENDED PURPOSE OR FOR THE CONSEQUENCES OF ITS USE. EACH INDIVIDUAL SHOULD MAKE A DETERMINATION AS TO THE SUITABILITY OF THE INFORMATION FOR THEIR PARTICULAR PURPOSE.

667-5861

SHRIMP & CRAB COMPANY  
111 ROLLINS ROAD  
HILLBRAE, CA 94030

REV 10/18/96

0827519

FORMULA 2010

IN A CHEMICAL EMERGENCY:  
FILL, LEAK, FIRE OR  
IDENT CALL CHEMTREC  
800-424-9300 24 HRS.

FOR MEDICAL EMERGENCY CALL (415)  
697-5811, IF NO ANSWER CALL (303)  
623-5716 (ROCKY MTN POISON CENTER)  
24 HRS.

FOR NON-EMERGENCY PRODUCT INFORMATION  
CALL (415) 697-5811 BETWEEN  
8AM AND 4PM PACIFIC TIME.



CURRENT AS OF  
05/22/1997

## SECTION #1 - IDENTIFICATION (LA IDENTIFICACION)

### FORMULA 2010

PRODUCT NAME: G-C Formula 2010  
PRODUCT USE: Cooling water  
distribution and scale control.

HAZARD RATING:  
HEALTH: 2  
FIRE: 0  
REACTIVITY: 0

SARA Hazard Class: Acute Health Hazard

PROPER SHIPPING NAME: Not Applicable, not regulated  
Hazard Classification: N/A  
Label Required: None

## SECTION #2 - HAZARDOUS COMPONENTS (LOS COMPONENTES PELIGROSOS)

COMPONENT: 2-phosphono-1,2,4-butane-  
carboxylic acid  
CAS NUMBER: 37971-36-1

COMPONENT: Sodium Molybdate  
CAS NUMBER: 7631-95-0  
ACGIH TLV-TWA: 5 mg/m<sup>3</sup> as Mo  
OSHA PEL-TWA: 5 mg/m<sup>3</sup> as Mo

COMPONENT: Benzotriazole  
CAS NUMBER: 95-14-7

Note: OSHA requires only that hazardous components be listed in this section.

## SECTION #3 - PHYSICAL DATA (LA INFORMACION FISICA)

BOILING POINT: 100 °C  
VAPOR PRESSURE: 17 mmHg  
VAPOR DENSITY (AIR=1): <1 AIR=1  
EVAPORATION RATE: <1 WHERE BUTYL ACETATE = 1  
PH FACTOR OF: 3.5-5.5  
APPEARANCE: CLEAR LIQUID  
ODOR: NONE

SPECIFIC GRAVITY: 1.0-1.1  
SOLUBILITY (H<sub>2</sub>O): COMPLETE  
PERCENT VOLATILES: 85%  
COLOR: BLUE-GREEN

0827519

FORMULA 2010

IN A CHEMICAL EMERGENCY:  
FILL, LEAK, FIRE OR  
ACCIDENT CALL CHEMTREC  
(800)424-9300 24 HRS.

FOR MEDICAL EMERGENCY CALL (415)  
697-5811, IF NO ANSWER CALL (303)  
623-5716 (ROCKY MTN POISON CENTER)  
24 HRS.

FOR NON-EMERGENCY PRODUCT INFORMATION  
CALL (415) 697-5811 BETWEEN  
8AM AND 4PM PACIFIC TIME.

---

## SECTION #4 - FIRE & EXPLOSION DATA (LA INFORMACION DE FUEGO Y EXPLOSION)

---

Flash Point: NONE  
Autoignition: NONE  
Flammability Class: NONE  
Lower explosive Limit (%): UNKNOWN  
Upper explosive Limit (%): UNKNOWN

Extinguishing Media:  
Use media appropriate for the surrounding fire.

Fire and Explosion Hazards:  
No Special Hazards

Special Fire Fighting Instructions:  
No Special Instructions

---

## SECTION #5 - EXPOSURE & EFFECT (LA EXPOSICION Y EFECTOS)

---

Routes of Exposure - Inhalation  
PRODUCT DOES NOT EMIT FUMES

Route of Exposure - Eyes:  
WILL BURN OR SEVERELY IRRITATE EYES.

First Aid - Inhalation  
N/A

First Aid - Eyes:  
FLUSH IMMEDIATELY WITH LARGE AMOUNTS OF WATER  
CONTINUOUSLY FOR AT LEAST 15 MINUTES. CONSULT A PHYSICIAN  
IMMEDIATELY.

Route of Exposure - Skin  
MAY IRRITATE OR BURN SKIN

First Aid - Skin:  
Flush with water and call a physician if irritation persists.

Route of Exposure - Ingestion  
MAY IRRITATE OR BURN MOUTH, THROAT, AND STOMACH. MAY  
CAUSE SERIOUS DAMAGE TO MOUTH, THROAT, AND STOMACH.

First Aid - Ingestion:  
DRINK WATER. INDUCE VOMITING. CALL PHYSICIAN.

Miscellaneous:  
THIS PRODUCT CONTAINS NO KNOWN CARCINOGENS.

Health Conditions Aggravated by Exposure:  
NONE KNOWN.

---

## SECTION #6 - REACTIVITY & POLYMERIZATION (LA REACTIVIDAD Y POLIMERIZACION)

---

Hazardous Polymerization:  
WILL NOT OCCUR.

Conditions to Avoid (stability):  
NONE

Incompatible Materials:  
None

Hazardous Decomposition Products:  
NONE

Conditions to avoid (polymerization):  
NONE

Stability: STABLE

IN A CHEMICAL EMERGENCY:  
SPILL, LEAK, FIRE OR  
ACCIDENT CALL CHEMTREC  
(800)424-9300 24 HRS.

0827519  
FOR MEDICAL EMERGENCY CALL (415)  
697-5811, IF NO ANSWER CALL (303)  
623-5716 (ROCKY MTN POISON CENTER)  
24 HRS.

FORMULA 2010  
FOR NON-EMERGENCY PRODUCT INFORMATION  
CALL (415) 697-5811 BETWEEN  
8AM AND 4PM PACIFIC TIME.

---

## SECTION #7 - SPILL, LEAK & DISPOSAL PROCEDURES (LA ATILLA, GOTERA, & LOS PROCEDIMIENTOS DE ELIMACION)

---

Contain with absorbent material and shovel into plastic bags.  
Pills of a gallon or less may be flushed to drain with large  
amounts of water.

Dispose of in waste management facility or in compliance  
with federal, state and local regulations. If spill is not  
contained you may be able to dispose of materials where normally  
used.

Storage and Handling Conditions  
Keep container covered and sealed when not in use. Store in a  
cool, dry area. Do not add water or any other material to drum  
of product or otherwise contaminate it.

---

## SECTION #8 - SPECIAL PROTECTIVE MEASURES (LAS MEDIDAS PROTECTORAS ESPECIALES)

---

Ventilation  
NORMAL ROOM VENTILATION

Skin Protection  
PLASTIC OR RUBBER GLOVES. ELBOW LENGTH SUGGESTED.

Other Protection:  
RUBBER APRON

Eye Protection:  
CHEMICAL WORKER'S GOGGLES OR FACE MASK.

Respiratory Protection:  
NIOSH/MSHA APPROVED DUST/MIST MASK, IF DUST IS A PROBLEM.

Work/Hygienic Practices:  
Have eyewash and safety shower - ANSI Z358.1-1990 certified,  
in work area. Remove contaminated clothing. Wash contaminated  
clothing before reuse. If liquid is absorbed into shoes or  
gloves, discard.

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## MATERIAL SAFETY DATA SHEET

## PRODUCT

TRASAR® 23268

## EMERGENCY TELEPHONE NUMBER

(800)462-5378 (24 Hours) (800) I-M-ALERT

## 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME : TRASAR® 23268

APPLICATION : COOLING WATER TREATMENT

CHEMICAL DESCRIPTION : Water, Tracer, Acrylate polymer(s), Organic compound

COMPANY IDENTIFICATION : Nalco Chemical Company  
One Nalco Center  
Naperville, Illinois  
60563-1198

EMERGENCY TELEPHONE NUMBER : (800)462-5378 (24 Hours) (800) I-M-ALERT

## NFPA 704M/HMIS RATING

HEALTH : 1/2 FLAMMABILITY : 1/1 REACTIVITY : 0/0 OTHER :

0 = Insignificant 1 = Slight 2 = Moderate 3 = High 4 = Extreme

## 2. COMPOSITION/INFORMATION ON INGREDIENTS

Our hazard evaluation has identified the following chemical substance(s) as hazardous. Consult Section 15 for the nature of the hazard(s).

Hazardous Substance(s)	CAS NO	% (w/w)
Sodium Tolytriazole	64665-57-2	1.0 - 5.0

## 3. HAZARDS IDENTIFICATION

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

## WARNING

Irritating to eyes.

Do not get in eyes, on skin, on clothing. Do not take internally. Keep container tightly closed. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. After contact with skin, wash immediately with plenty of water.

Wear suitable protective clothing, gloves and eye/face protection.

May evolve oxides of carbon (COx) under fire conditions. May evolve oxides of nitrogen (NOx) and sulfur (SOx) under fire conditions.

## PRIMARY ROUTES OF EXPOSURE :

Eye, Skin

## HUMAN HEALTH HAZARDS - ACUTE :

## EYE CONTACT :

Can cause moderate irritation.

**MATERIAL SAFETY DATA SHEET****PRODUCT****TRASAR® 23268****EMERGENCY TELEPHONE NUMBER****(800)462-5378 (24 Hours) (800) I-M-ALERT****FIRE AND EXPLOSION HAZARD :**

May evolve oxides of carbon (COx) under fire conditions. May evolve oxides of nitrogen (NOx) and sulfur (SOx) under fire conditions.

**SPECIAL PROTECTIVE EQUIPMENT FOR FIRE FIGHTING :**

In case of fire, wear a full face positive-pressure self contained breathing apparatus and protective suit.

**6. ACCIDENTAL RELEASE MEASURES****PERSONAL PRECAUTIONS :**

Restrict access to area as appropriate until clean-up operations are complete. Ensure clean-up is conducted by trained personnel only. Ventilate spill area if possible. Do not touch spilled material. Stop or reduce any leaks if it is safe to do so. Use personal protective equipment recommended in Section 8 (Exposure Controls/Personal Protection). Notify appropriate government, occupational health and safety and environmental authorities.

**METHODS FOR CLEANING UP :**

**SMALL SPILLS:** Soak up spill with absorbent material. Place residues in a suitable, covered, properly labeled container. Wash affected area. **LARGE SPILLS:** Contain liquid using absorbent material, by digging trenches or by dyking. Reclaim into recovery or salvage drums or tank truck for proper disposal. Wash site of spillage thoroughly with water. Contact an approved waste hauler for disposal of contaminated recovered material. Dispose of material in compliance with regulations indicated in Section 13 (Disposal Considerations).

**ENVIRONMENTAL PRECAUTIONS :**

Do not contaminate surface water.

**7. HANDLING AND STORAGE****HANDLING :**

Avoid eye and skin contact. Do not take internally. Do not get in eyes, on skin, on clothing. Have emergency equipment (for fires, spills, leaks, etc.) readily available. Ensure all containers are labelled. Keep the containers closed when not in use. Use with adequate ventilation.

**STORAGE CONDITIONS :**

Store the containers tightly closed. Store in suitable labelled containers.

**8. EXPOSURE CONTROLS/PERSONAL PROTECTION****OCCUPATIONAL EXPOSURE LIMITS :**

This product does not contain any substance that has an established exposure limit.

**ENGINEERING MEASURES :**

General ventilation is recommended.

**RESPIRATORY PROTECTION :**

Respiratory protection is not normally needed.

**HAND PROTECTION :**

Neoprene gloves, Nitrile gloves, Butyl gloves, PVC gloves



## MATERIAL SAFETY DATA SHEET

## PRODUCT

TRASAR® 23268

## EMERGENCY TELEPHONE NUMBER

(800)462-5378 (24 Hours) (800) I-M-ALERT

## HAZARDOUS DECOMPOSITION PRODUCTS :

Under fire conditions: Oxides of carbon, Oxides of sulfur, Oxides of nitrogen

**11. TOXICOLOGICAL INFORMATION**

The following results are for the product.

## ACUTE ORAL TOXICITY :

Species	LD50	Tested Substance
Rat	> 5,000 mg/kg	Product
Rating : Non-Hazardous		

## PRIMARY SKIN IRRITATION :

Draize Score	Tested Substance
1.3 / 8.0	Product
Rating : Slightly irritating	

## PRIMARY EYE IRRITATION :

Draize Score	Tested Substance
23 / 110.0	Product
Rating : Mildly irritating	

## CARCINOGENICITY :

None of the substances in this product are listed as carcinogens by the International Agency for Research on Cancer (IARC), the National Toxicology Program (NTP) or the American Conference of Governmental Industrial Hygienists (ACGIH).

## HUMAN HAZARD CHARACTERIZATION :

Based on our hazard characterization, the potential human hazard is: Moderate

**12. ECOLOGICAL INFORMATION**

## ECOTOXICOLOGICAL EFFECTS :

The following results are for the product.

## ACUTE FISH RESULTS :

Species	Exposure	LC50	Tested Substance
Fathead Minnow	96 hrs	418 mg/l	Product
Bluegill Sunfish	96 hrs	> 1,000 mg/l	Product
Rainbow Trout	96 hrs	710 mg/l	Product

Rating : Essentially non-toxic

## ACUTE INVERTEBRATE RESULTS :

Species	Exposure	LC50	EC50	Tested Substance
Ceriodaphnia dubia	48 hrs	> 1,000 mg/l		Product
Daphnia magna	48 hrs	> 1,000 mg/l		Product

Rating : Essentially non-toxic

**MATERIAL SAFETY DATA SHEET****PRODUCT****TRASAR® 23268****EMERGENCY TELEPHONE NUMBER****(800)462-5378 (24 Hours) (800) I-M-ALERT**

Packing Group : III  
IATA Cargo Packing Instructions : 820  
IATA Cargo Aircraft Limit : 60 L (Max net quantity per package)

**MARINE TRANSPORT (IMDG/IMO) :**

IMDG Page : 8147-1  
Proper Shipping Name : CORROSIVE LIQUID, BASIC, INORGANIC, N.O.S.  
Technical Name(s) : SODIUM HYDROXIDE, POTASSIUM HYDROXIDE  
UN/ID No : 3266  
Hazard Class - Primary : 8  
Packing Group : III

**15. REGULATORY INFORMATION****NATIONAL REGULATIONS, USA :****OSHA HAZARD COMMUNICATION RULE, 29 CFR 1910.1200 :**

Based on our hazard evaluation, the following substance(s) in this product is/are hazardous and the reason(s) is/are shown below.

Sodium Tolytriazole : Irritant

**CERCLA/SUPERFUND, 40 CFR 117, 302 :**

Notification of spills of this product is not required.

**SARA/SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 (TITLE III) - SECTIONS 302, 311, 312, AND 313 :****SECTION 302 - EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355) :**

This product does not contain substances listed in Appendix A and B as an Extremely Hazardous Substance.

**SECTIONS 311 AND 312 - MATERIAL SAFETY DATA SHEET REQUIREMENTS (40 CFR 370) :**

Our hazard evaluation has found this product to be hazardous. The product should be reported under the following EPA hazard categories:

- X Immediate (Acute) Health Hazard
- Delayed (Chronic) Health Hazard
- Fire Hazard
- Sudden Release of Pressure Hazard
- Reactive Hazard

Under SARA 311 and 312, the EPA has established threshold quantities for the reporting of hazardous chemicals. The current thresholds are: 500 pounds or the threshold planning quantity (TPQ), whichever is lower, for extremely hazardous substances and 10,000 pounds for all other hazardous chemicals.

**SECTION 313 - LIST OF TOXIC CHEMICALS (40 CFR 372) :**

This product does not contain substances on the List of Toxic Chemicals.



Attn:  
Joe Ortiz

## MATERIAL SAFETY DATA SHEET

PRODUCT

NALCO 7408

EMERGENCY TELEPHONE NUMBER

(800)462-5378 (24 Hours) (800) I-M-ALERT

## 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME : NALCO 7408

APPLICATION : CHLORINE SCAVENGER

CHEMICAL DESCRIPTION : Water, Bisulfite

COMPANY IDENTIFICATION : Nalco Chemical Company  
One Nalco Center  
Naperville, Illinois  
60563-1198

EMERGENCY TELEPHONE NUMBER : (800)462-5378 (24 Hours) (800) I-M-ALERT

## NFPA 704M/HMIS RATING

HEALTH : 1/2 FLAMMABILITY : 0/0 REACTIVITY : 0/0 OTHER :

0 = Insignificant 1 = Slight 2 = Moderate 3 = High 4 = Extreme

## 2. COMPOSITION/INFORMATION ON INGREDIENTS

Our hazard evaluation has identified the following chemical substance(s) as hazardous. Consult Section 15 for the nature of the hazard(s).

Hazardous Substance(s)	CAS NO	% (w/w)
Sodium Bisulfite	7631-90-5	30.0 - 60.0

## 3. HAZARDS IDENTIFICATION

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

## WARNING

Contains Sulfite. Irritating to respiratory system. May cause skin and eye irritation. Causes asthmatic signs and symptoms in hyper-reactive individuals.

Avoid breathing vapor. Use with adequate ventilation. Do not take internally. Keep container tightly closed. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. After contact with skin, wash immediately with plenty of water. Protect product from freezing.

Wear suitable protective clothing, gloves and eye/face protection.

May evolve oxides of sulfur (SOx) under fire conditions.

PRIMARY ROUTES OF EXPOSURE :

Skin, Eye, Inhalation

HUMAN HEALTH HAZARDS - ACUTE :

EYE CONTACT :

Can cause mild irritation.

**MATERIAL SAFETY DATA SHEET****PRODUCT****NALCO 7408****EMERGENCY TELEPHONE NUMBER****(800)462-5378 (24 Hours) (800) I-M-ALERT****EXTINGUISHING MEDIA :**

This product would not be expected to burn unless all the water is boiled away. The remaining organics may be ignitable. Keep containers cool by spraying with water. Use extinguishing media appropriate for surrounding fire.

**FIRE AND EXPLOSION HAZARD :**

May evolve oxides of sulfur (SOx) under fire conditions.

**SPECIAL PROTECTIVE EQUIPMENT FOR FIRE FIGHTING :**

In case of fire, wear a full face positive-pressure self contained breathing apparatus and protective suit.

**6. ACCIDENTAL RELEASE MEASURES****PERSONAL PRECAUTIONS :**

Restrict access to area as appropriate until clean-up operations are complete. Ensure clean-up is conducted by trained personnel only. Ensure adequate ventilation. Do not touch spilled material. Stop or reduce any leaks if it is safe to do so. Use personal protective equipment recommended in Section 8 (Exposure Controls/Personal Protection). Notify appropriate government, occupational health and safety and environmental authorities.

**METHODS FOR CLEANING UP :**

**SMALL SPILLS:** Soak up spill with absorbent material. Place residues in a suitable, covered, properly labeled container. Wash affected area. **LARGE SPILLS:** Contain liquid using absorbent material, by digging trenches or by diking. Reclaim into recovery or salvage drums or tank truck for proper disposal. Wash site of spillage thoroughly with water. Contact an approved waste hauler for disposal of contaminated recovered material. Dispose of material in compliance with regulations indicated in Section 13 (Disposal Considerations).

**ENVIRONMENTAL PRECAUTIONS :**

Do not contaminate surface water.

**7. HANDLING AND STORAGE****HANDLING :**

Avoid eye and skin contact. Do not take internally. Do not get in eyes, on skin, on clothing. Have emergency equipment (for fires, spills, leaks, etc.) readily available. Ensure all containers are labelled. Keep the containers closed when not in use. Use with adequate ventilation.

**STORAGE CONDITIONS :**

Store the containers tightly closed. Store in suitable labelled containers. Amine and sulfite products should not be stored within close proximity or resulting vapors may form visible airborne particles.

**8. EXPOSURE CONTROLS/PERSONAL PROTECTION****OCCUPATIONAL EXPOSURE LIMITS :**

Exposure guidelines have not been established for this product. Available exposure limits for the substance(s) are shown below. Exposure limits are listed for sulfur dioxide (SO<sub>2</sub>) since this product evolves SO<sub>2</sub> when open to the atmosphere.



## MATERIAL SAFETY DATA SHEET

## PRODUCT

NALCO 7408

## EMERGENCY TELEPHONE NUMBER

(800)462-5378 (24 Hours) (800) I-M-ALERT

SPECIFIC GRAVITY	1.37 @ 77 °F / 25 °C
DENSITY	11.4 lb/gal
SOLUBILITY IN WATER	Complete
pH (1 %)	4.1
VISCOSITY	2.8 cps @ 77 °F / 25 °C
FREEZING POINT	34 °F / 1.1 °C
BOILING POINT	219 °F / 104 °C
VAPOR PRESSURE	32 mm Hg, 76 mm Hg @ 77 °F, 99.9 °F / 25 °C, 37.7 °C
VAPOR DENSITY	2.2 (Air = 1)

## 10. STABILITY AND REACTIVITY

## STABILITY :

Stable under normal conditions.

## HAZARDOUS POLYMERIZATION :

Hazardous polymerization will not occur.

## CONDITIONS TO AVOID :

Freezing temperatures.

## MATERIALS TO AVOID :

Contact with strong oxidizers (e.g. chlorine, peroxides, chromates, nitric acid, perchlorate, concentrated oxygen, permanganate) may generate heat, fires, explosions and/or toxic vapors. Contact with strong acids (e.g. sulfuric, phosphoric, nitric, hydrochloric, chromic, sulfonic) may generate heat, splattering or boiling and toxic vapors. SO<sub>2</sub> may react with vapors from neutralizing amines and may produce a visible cloud of amine salt particles.

## HAZARDOUS DECOMPOSITION PRODUCTS :

Under fire conditions: Oxides of sulfur

## 11. TOXICOLOGICAL INFORMATION

The following results are for a similar product.

## ACUTE ORAL TOXICITY :

Species	LD50	Tested Substance
Rat	4.1 g/kg	Similar Product
Rating : Non-Hazardous		

## ACUTE DERMAL TOXICITY :

Species	LD50	Tested Substance
Rabbit	3 g/kg	Similar Product
Rating : Non-Hazardous		

## PRIMARY SKIN IRRITATION :

Draize Score	Tested Substance
1.0 / 8.0	Similar Product
Rating : Slightly irritating	



## MATERIAL SAFETY DATA SHEET

## PRODUCT

NALCO 7408

## EMERGENCY TELEPHONE NUMBER

(800)462-5378 (24 Hours) (800) I-M-ALERT

**14. TRANSPORT INFORMATION**

The information in this section is for reference only and should not take the place of a shipping paper (bill of lading) specific to an order. Please note that the proper Shipping Name / Hazard Class may vary by packaging, properties, and mode of transportation. Typical Proper Shipping Names for this product are:

## LAND TRANSPORT :

Proper Shipping Name :	BISULFITES, AQUEOUS SOLUTION, N.O.S.
Technical Name(s) :	SODIUM BISULFITE
UN/ID No :	2693
Hazard Class - Primary :	8
Packing Group :	III
Flash Point :	None
DOT Reportable Quantity (per package) :	12,000 lbs
DOT RQ Component :	SODIUM BISULFITE

## AIR TRANSPORT (ICAO/IATA) :

Proper Shipping Name :	BISULPHITES, AQUEOUS SOLUTION, N.O.S.
Technical Name(s) :	SODIUM BISULFITE
UN/ID No :	2693
Hazard Class - Primary :	8
Packing Group :	III
IATA Cargo Packing Instructions :	820
IATA Cargo Aircraft Limit :	60 L (Max net quantity per package)

## MARINE TRANSPORT (IMDG/IMO) :

IMDG Page :	8126
Proper Shipping Name :	BISULPHITES, AQUEOUS SOLUTION, N.O.S.
Technical Name(s) :	SODIUM BISULFITE
UN/ID No :	2693
Hazard Class - Primary :	8
Packing Group :	III

**15. REGULATORY INFORMATION**

## NATIONAL REGULATIONS, USA :

## OSHA HAZARD COMMUNICATION RULE, 29 CFR 1910.1200 :

Based on our hazard evaluation, the following substance(s) in this product is/are hazardous and the reason(s) is/are shown below.

Sodium Bisulfite : Respiratory irritant

**MATERIAL SAFETY DATA SHEET****PRODUCT****NALCO 7408****EMERGENCY TELEPHONE NUMBER****(800)462-5378 (24 Hours) (800) I-M-ALERT**

CLEAN AIR ACT, Sec. 111 (40 CFR 60, Volatile Organic Compounds), Sec. 112 (40 CFR 61, Hazardous Air Pollutants), Sec. 602 (40 CFR 82, Class I and II Ozone Depleting Substances) :  
None of the substances are specifically listed in the regulation.

**CALIFORNIA PROPOSITION 65 :**

This product does not contain substances which require warning under California Proposition 65.

**MICHIGAN CRITICAL MATERIALS :**

None of the substances are specifically listed in the regulation.

**STATE RIGHT TO KNOW LAWS :**

The following substances are disclosed for compliance with State Right to Know Laws:

Sodium Bisulfite  
Water

7631-90-5  
7732-18-5

**NATIONAL REGULATIONS, CANADA :****WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM (WHMIS) :**

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 CLASSIFICATION :**

E - Corrosive Material

**CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA) :**

All substances in this product are listed on the Domestic Substances List (DSL), are exempt, or have been reported in accordance with the New Substances Notification Regulations.

**16. OTHER INFORMATION**

Due to our commitment to Product Stewardship, we have evaluated the human and environmental hazards and exposures of this product. Based on our recommended use of this product, we have characterized the product's general risk. This information should provide assistance for your own risk management practices. We have evaluated our product's risk as follows:

\* The human risk is: Low

\* The environmental risk is: Low

Any use inconsistent with our recommendations may affect the risk characterization. Our sales representative will assist you to determine if your product application is consistent with our recommendations. Together we can implement an appropriate risk management process.

This product material safety data sheet provides health and safety information. The product is to be used in applications consistent with our product literature. Individuals handling this product should be informed of the recommended safety precautions and should have access to this information. For any other uses, exposures should be evaluated so that appropriate handling practices and training programs can be established to insure safe workplace operations. Please consult your local sales representative for any further information.



## MATERIAL SAFETY DATA SHEET

## PRODUCT

NALCO 7384

## EMERGENCY TELEPHONE NUMBER

(800)462-5378 (24 Hours) (800) I-M-ALERT

**1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION**

PRODUCT NAME : NALCO 7384  
APPLICATION : CORROSION INHIBITOR  
CHEMICAL DESCRIPTION : Water, Inorganic salt(s)  
COMPANY IDENTIFICATION : Nalco Chemical Company  
One Nalco Center  
Naperville, Illinois  
60563-1198  
EMERGENCY TELEPHONE NUMBER : (800)462-5378 (24 Hours) (800) I-M-ALERT

## NFPA 704M/HMIS RATING

HEALTH: 3/3 FLAMMABILITY: 0/0 REACTIVITY: 0/0 OTHER:  
0 = Insignificant 1 = Slight 2 = Moderate 3 = High 4 = Extreme

**2. COMPOSITION/INFORMATION ON INGREDIENTS**

Our hazard evaluation has identified the following chemical substance(s) as hazardous. Consult Section 15 for the nature of the hazard(s).

	Hazardous Substance(s)	CAS NO	% (w/w)
Zinc Chloride		7646-85-7	60.0 - 100.0

**3. HAZARDS IDENTIFICATION****\*\*EMERGENCY OVERVIEW\*\*****DANGER**

Corrosive. May cause tissue damage. Toxic to aquatic organisms.

Do not get in eyes, on skin, on clothing. Do not take internally. Use with adequate ventilation. Keep container tightly closed and in a well-ventilated place. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. After contact with skin, wash immediately with plenty of water.

Wear a face shield. Wear chemical resistant apron, chemical splash goggles, impervious gloves and boots.

May evolve HCl under fire conditions. May evolve zinc fumes under fire conditions.

## PRIMARY ROUTES OF EXPOSURE :

Eye, Skin

## HUMAN HEALTH HAZARDS - ACUTE :

## EYE CONTACT :

Corrosive. Will cause eye burns and permanent tissue damage.

**MATERIAL SAFETY DATA SHEET****PRODUCT****NALCO 7384****EMERGENCY TELEPHONE NUMBER****(800)462-5378 (24 Hours) (800) I-M-ALERT****FIRE AND EXPLOSION HAZARD :**

May evolve HCl under fire conditions. May evolve zinc fumes under fire conditions.

**SPECIAL PROTECTIVE EQUIPMENT FOR FIRE FIGHTING :**

In case of fire, wear a full face positive-pressure self contained breathing apparatus and protective suit.

**6. ACCIDENTAL RELEASE MEASURES****PERSONAL PRECAUTIONS :**

Restrict access to area as appropriate until clean-up operations are complete. Ensure clean-up is conducted by trained personnel only. Ventilate spill area if possible. Do not touch spilled material. Stop or reduce any leaks if it is safe to do so. Use personal protective equipment recommended in Section 8 (Exposure Controls/Personal Protection). Notify appropriate government, occupational health and safety and environmental authorities.

**METHODS FOR CLEANING UP :**

**SMALL SPILLS:** Soak up spill with absorbent material. Place residues in a suitable, covered, properly labeled container. Wash affected area. **LARGE SPILLS:** Contain liquid using absorbent material, by digging trenches or by dyking. Reclaim into recovery or salvage drums or tank truck for proper disposal. Wash site of spillage thoroughly with water. Contact an approved waste hauler for disposal of contaminated recovered material. Dispose of material in compliance with regulations indicated in Section 13 (Disposal Considerations).

**ENVIRONMENTAL PRECAUTIONS :**

This product is toxic to fish and other water organisms. Do not discharge directly into lakes, ponds, streams, waterways or public water supplies.

**7. HANDLING AND STORAGE****HANDLING :**

Do not get in eyes, on skin, on clothing. Do not take internally. Use with adequate ventilation. Avoid generating aerosols and mists. Keep the containers closed when not in use. Have emergency equipment (for fires, spills, leaks, etc.) readily available.

**STORAGE CONDITIONS :**

Store the containers tightly closed. Store separately from oxidizers. Store in suitable labelled containers.

**8. EXPOSURE CONTROLS/PERSONAL PROTECTION****OCCUPATIONAL EXPOSURE LIMITS :**

Exposure guidelines have not been established for this product. Available exposure limits for the substance(s) are shown below.

**ACGIH/TLV :****Substance(s)**

Zinc Chloride Fume

TWA: 1 mg/m<sup>3</sup>STEL: 2 mg/m<sup>3</sup>



## MATERIAL SAFETY DATA SHEET

## PRODUCT

NALCO 7384

## EMERGENCY TELEPHONE NUMBER

(800)462-5378 (24 Hours) (800) I-M-ALERT

**10. STABILITY AND REACTIVITY**

## STABILITY:

Stable under normal conditions.

## HAZARDOUS POLYMERIZATION:

Hazardous polymerization will not occur.

## CONDITIONS TO AVOID:

None known.

## MATERIALS TO AVOID:

Contact with strong acids (e.g. sulfuric, phosphoric, nitric, hydrochloric, chromic, sulfonic) may generate heat, splattering or boiling and toxic vapors.

## HAZARDOUS DECOMPOSITION PRODUCTS:

Under fire conditions: HCl

**11. TOXICOLOGICAL INFORMATION**

The following results are for the active substances.

## ACUTE ORAL TOXICITY:

Species	LD50
Rat	350 mg/kg

Tested Substance
Active Substance Zinc Chloride

## CARCINOGENICITY:

None of the substances in this product are listed as carcinogens by the International Agency for Research on Cancer (IARC), the National Toxicology Program (NTP) or the American Conference of Governmental Industrial Hygienists (ACGIH).

## HUMAN HAZARD CHARACTERIZATION:

Based on our hazard characterization, the potential human hazard is: High

**12. ECOLOGICAL INFORMATION**

## ECOTOXICOLOGICAL EFFECTS:

Results below (expressed as product) extrapolated from Ambient Quality Criteria Document for Zinc.

## ACUTE FISH RESULTS:

Species	Exposure	LC50	Tested Substance
Rainbow Trout	96 hrs	1.13 mg/l	Tested in Soft Water (40-48 mg/L as CaCO3)
Fathead Minnow	96 hrs	1.83 mg/l	Tested in Soft Water (40-48 mg/L as CaCO3)
Rainbow Trout	96 hrs	5.78 mg/l	Tested in Hard Water (160-180 mg/L as CaCO3)
Fathead Minnow	96 hrs	24.96 mg/l	Tested in Hard Water (160-180 mg/L as CaCO3)





## MATERIAL SAFETY DATA SHEET

## PRODUCT

NALCO 7384

## EMERGENCY TELEPHONE NUMBER

(800)462-5378 (24 Hours) (800) I-M-ALERT

## AIR TRANSPORT (ICAO/IATA):

Proper Shipping Name :	ZINC CHLORIDE, SOLUTION
Technical Name(s) :	
UN/ID No :	1840
Hazard Class - Primary :	8
Packing Group :	III
IATA Cargo Packing Instructions :	820
IATA Cargo Aircraft Limit:	60 L (Max net quantity per package)

## MARINE TRANSPORT (IMDG/IMO):

IMDG Page :	8247
Proper Shipping Name :	ZINC CHLORIDE, SOLUTION
Technical Name(s) :	
UN/ID No :	1840
Hazard Class - Primary :	8
Packing Group :	III

**15. REGULATORY INFORMATION**

## NATIONAL REGULATIONS, USA:

## OSHA HAZARD COMMUNICATION RULE, 29 CFR 1910.1200:

Based on our hazard evaluation, the following substance(s) in this product is/are hazardous and the reason(s) is/are shown below.

Zinc Chloride ; Corrosive

## CERCLA/SUPERFUND, 40 CFR 117, 302:

This product contains the following Reportable Quantity (RQ) Substance. Also listed is the RQ for the product.

<u>RQ Substance</u>	<u>RQ</u>
Zinc Chloride	1,450 lbs

SARA/SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 (TITLE III) - SECTIONS 302, 311, 312, AND 313:

## SECTION 302 - EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355):

This product does not contain substances listed in Appendix A and B as an Extremely Hazardous Substance.

## SECTIONS 311 AND 312 - MATERIAL SAFETY DATA SHEET REQUIREMENTS (40 CFR 370):

Our hazard evaluation has found this product to be hazardous. The product should be reported under the following EPA hazard categories:

X	Immediate (Acute) Health Hazard
-	Delayed (Chronic) Health Hazard
-	Fire Hazard



## MATERIAL SAFETY DATA SHEET

## PRODUCT

NALCO 7384

## EMERGENCY TELEPHONE NUMBER

(800)462-5378 (24 Hours) (800) I-M-ALERT

Sudden Release of Pressure Hazard  
Reactive Hazard

Under SARA 311 and 312, the EPA has established threshold quantities for the reporting of hazardous chemicals. The current thresholds are: 500 pounds or the threshold planning quantity (TPQ), whichever is lower, for extremely hazardous substances and 10,000 pounds for all other hazardous chemicals.

## SECTION 313 - LIST OF TOXIC CHEMICALS (40 CFR 372):

This product contains the following substance(s), (with CAS # and % range) which appear(s) on the List of Toxic Chemicals

<u>Hazardous Substance(s)</u>	<u>CAS NO</u>	<u>% (w/w)</u>
Zinc Chloride	7646-85-7	60.0 - 100.0

## TOXIC SUBSTANCES CONTROL ACT (TSCA):

The chemical substances in this product are on the TSCA 8(b) Inventory (40 CFR 710).

This product has been certified as KOSHER/PAREVE for year-round use INCLUDING THE PASSOVER SEASON by the CHICAGO RABBINICAL COUNCIL.

## NATIONAL SANITATION FOUNDATION (ANSI/NSF STANDARD 60):

This product has received NSF/International certification under ANSI/NSF Standard 60 in the corrosion and scale control category. The official name is "Zinc Chloride." Maximum product application dosage is : 6.2 mg/l. Only product manufactured at Plants 1, 6 and 9 USA and whose container label bears the ANSI/NSF Mark may be used in potable water treatment applications.

## FEDERAL WATER POLLUTION CONTROL ACT, CLEAN WATER ACT, 40 CFR 401.15 / formerly Sec. 307, 40 CFR / formerly Sec. 311:

This product contains the following substances listed in the regulation:

<u>Substance(s)</u>	<u>Citations</u>
Zinc Chloride :	Sec. 307, Sec. 311

CLEAN AIR ACT, Sec. 111 (40 CFR 60, Volatile Organic Compounds), Sec. 112 (40 CFR 61, Hazardous Air Pollutants), Sec. 602 (40 CFR 82, Class I and II Ozone Depleting Substances):  
None of the substances are specifically listed in the regulation.

## CALIFORNIA PROPOSITION 65:

This product does not contain substances which require warning under California Proposition 65.

## MICHIGAN CRITICAL MATERIALS:

This product contains the following substances listed in the regulation:

Zinc Compound

## STATE RIGHT TO KNOW LAWS:

The following substances are disclosed for compliance with State Right to Know Laws:

Zinc Chloride	7646-85-7
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## MATERIAL SAFETY DATA SHEET

## PRODUCT

STABREX® ST20

## EMERGENCY TELEPHONE NUMBER

(800)462-5378 (24 Hours) (800) I-M-ALERT

## 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME : STABREX® ST20

APPLICATION : MICROORGANISM CONTROL CHEMICAL

CHEMICAL DESCRIPTION : Alkaline liquid bromine antimicrobial, in aqueous solution

COMPANY IDENTIFICATION : Nalco Chemical Company  
One Nalco Center  
Naperville, Illinois  
60563-1198

EMERGENCY TELEPHONE NUMBER : (800)462-5378 (24 Hours) (800) I-M-ALERT

## NFPA 704M/HMIS RATING

HEALTH: 3/3 FLAMMABILITY: 0/0 REACTIVITY: 0/0 OTHER:

0 = Insignificant 1 = Slight 2 = Moderate 3 = High 4 = Extreme

## 2. COMPOSITION/INFORMATION ON INGREDIENTS

Our hazard evaluation has identified the following chemical substance(s) as hazardous. Consult Section 15 for the nature of the hazard(s).

Hazardous Substance(s)	CAS NO	% (w/w)
Sodium Hydroxide	1310-73-2	1.0 - 5.0

## 3. HAZARDS IDENTIFICATION

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

## DANGER

CORROSIVE. CAUSES SEVERE EYE AND SKIN INJURY. HARMFUL IF INHALED. HARMFUL IF SWALLOWED.

Do not get in eyes, on skin or on clothing. Wear goggles or face shield and rubber gloves when handling. Remove and wash contaminated clothing before reuse. Wash thoroughly after handling.

May evolve hydrogen bromide and bromine under fire conditions. May evolve HCl under fire conditions. May evolve chlorine under fire conditions. May evolve oxides of nitrogen (NOx) under fire conditions. Contact with reactive metals (e.g. aluminum) may result in the generation of flammable hydrogen gas.

## PRIMARY ROUTES OF EXPOSURE :

Eye, Skin

## HUMAN HEALTH HAZARDS - ACUTE :

## EYE CONTACT :

Corrosive. Will cause eye burns and permanent tissue damage.

**MATERIAL SAFETY DATA SHEET****PRODUCT****STABREX® ST20****EMERGENCY TELEPHONE NUMBER****(800)462-5378 (24 Hours) (800) I-M-ALERT****SPECIAL PROTECTIVE EQUIPMENT FOR FIRE FIGHTING :**

In case of fire, wear a full face positive-pressure self contained breathing apparatus and protective suit.

**6. ACCIDENTAL RELEASE MEASURES****PERSONAL PRECAUTIONS :**

Restrict access to area as appropriate until clean-up operations are complete. Ensure clean-up is conducted by trained personnel only. Ventilate spill area if possible. Do not touch spilled material. Stop or reduce any leaks if it is safe to do so. Use personal protective equipment recommended in Section 8 (Exposure Controls/Personal Protection). Notify appropriate government, occupational health and safety and environmental authorities.

**METHODS FOR CLEANING UP :**

**SMALL SPILLS:** Contain and absorb with sand or vermiculite and mix well. Collect up and remove to a safe place until disposal. Wash site of spillage thoroughly with water. Assistance can be obtained from waste disposal companies. **LARGE SPILLS:** Dike to prevent further movement. Recover by pumping or by using a suitable absorbent. Reclaim into recovery or salvage drums. Wash site of spillage thoroughly with water. Contact an approved waste hauler for disposal of contaminated recovered material. Dispose of material in compliance with regulations indicated in Section 13 (Disposal Considerations).

**ENVIRONMENTAL PRECAUTIONS :**

This pesticide is toxic to fish and aquatic organisms. Do not discharge effluent containing this product into lakes, streams, ponds, estuaries, oceans or other waters, unless in accordance with the requirements of a National Pollutant Discharge Elimination System (NPDES) permit and the permitting authority has been notified in writing prior to discharge. Do not discharge effluent containing this product to sewer systems without previously notifying the local sewage treatment plant authority. For guidance contact your State Water Board or Regional Office of the EPA. Apply this pesticide only as specified on the label.

**7. HANDLING AND STORAGE****HANDLING :**

Do not get in eyes, on skin, on clothing. Do not take internally. Use with adequate ventilation. Avoid generating aerosols and mists. Keep the containers closed when not in use. Have emergency equipment (for fires, spills, leaks, etc.) readily available.

**STORAGE CONDITIONS :**

Store the containers tightly closed. Store away from incompatible materials. Store in suitable labelled containers.

**8. EXPOSURE CONTROLS/PERSONAL PROTECTION****OCCUPATIONAL EXPOSURE LIMITS :**

Exposure guidelines have not been established for this product. Available exposure limits for the substance(s) are shown below.

**ACGIH/TLV :**

Substance(s)

Sodium Hydroxide

CEILING: 2 mg/m3

**MATERIAL SAFETY DATA SHEET****PRODUCT****STABREX® ST20****EMERGENCY TELEPHONE NUMBER****(800)462-5378 (24 Hours) (800) I-M-ALERT****12. ECOLOGICAL INFORMATION****ECOTOXICOLOGICAL EFFECTS :**

The following results are for the product.

**ACUTE FISH RESULTS :**

Species	Exposure	LC50	Tested Substance
Rainbow Trout	96 hrs	4.5 mg/l	Product
Sheepshead Minnow	96 hrs	16 mg/l	Product
Fathead Minnow	96 hrs	8.3 mg/l	Product

Rating : Toxic

**ACUTE INVERTEBRATE RESULTS :**

Species	Exposure	LC50	EC50	Tested Substance
Daphnia magna	48 hrs		4.2 mg/l	Product
Mysid Shrimp (A. bahia)	96 hrs	27 mg/l		Product
Ceriodaphnia dubia	48 hrs	1.6 mg/l		Product

Rating : Toxic

**CHRONIC INVERTEBRATE RESULTS :**

Species	Test Type	IC25	End Point	Tested Substance
Ceriodaphnia dubia	3 Brood	15.6 mg/l	Survival	Product

**PERSISTENCY AND DEGRADATION :**

Biological Oxygen Demand (BOD) : This material is an oxidizing biocide and is not expected to persist in the environment.

**ENVIRONMENTAL HAZARD AND EXPOSURE CHARACTERIZATION**

Based on our hazard characterization, the potential environmental hazard is: Moderate

Based on our recommended product application and the product's characteristics, the potential environmental exposure is: Moderate

If released into the environment, see CERCLA/SUPERFUND in Section 15.

**13. DISPOSAL CONSIDERATIONS**

If this product becomes a waste, it could meet the criteria of a hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA) 40 CFR 261. Before disposal, it should be determined if the waste meets the criteria of a hazardous waste.

Hazardous Waste: D002

Pesticide wastes are acutely hazardous. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of Federal law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste Representative at the nearest EPA Regional Office for guidance.



## MATERIAL SAFETY DATA SHEET

## PRODUCT

STABREX® ST20

## EMERGENCY TELEPHONE NUMBER

(800)462-5378 (24 Hours) (800) I-M-ALERT

METAL CONTAINERS: Triple rinse (or equivalent). Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or by other procedures approved by state and local authorities. PLASTIC CONTAINERS: Do not reuse empty container. Triple rinse (or equivalent). Then puncture and dispose of in a sanitary landfill, or, if allowed by state and local authorities, by burning. If burned, stay out of smoke.

## 14. TRANSPORT INFORMATION

The information in this section is for reference only and should not take the place of a shipping paper (bill of lading) specific to an order. Please note that the proper Shipping Name / Hazard Class may vary by packaging, properties, and mode of transportation. Typical Proper Shipping Names for this product are:

## LAND TRANSPORT :

Proper Shipping Name :	CORROSIVE LIQUID, BASIC, INORGANIC, N.O.S.
Technical Name(s) :	SODIUM HYDROXIDE, ALKALINE LIQUID BROMINE
	ANTIMICROBIAL
UN/ID No :	3266
Hazard Class - Primary :	8
Packing Group :	II
Flash Point :	None.
DOT Reportable Quantity (per package) :	35,000 lbs
DOT RQ Component :	SODIUM HYDROXIDE

## AIR TRANSPORT (ICAO/IATA) :

Proper Shipping Name :	CORROSIVE LIQUID, BASIC, INORGANIC, N.O.S.
Technical Name(s) :	SODIUM HYDROXIDE, ALKALINE LIQUID BROMINE
	ANTIMICROBIAL
UN/ID No :	3266
Hazard Class - Primary :	8
Packing Group :	II
IATA Cargo Packing Instructions :	812
IATA Cargo Aircraft Limit :	30 L (Max net quantity per package)

## MARINE TRANSPORT (IMDG/IMO) :

IMDG Page :	8147-1
Proper Shipping Name :	CORROSIVE LIQUID, BASIC, INORGANIC, N.O.S.
Technical Name(s) :	SODIUM HYDROXIDE, ALKALINE LIQUID BROMINE
	ANTIMICROBIAL
UN/ID No :	3266
Hazard Class - Primary :	8
Packing Group :	II

**MATERIAL SAFETY DATA SHEET****PRODUCT****STABREX® ST20****EMERGENCY TELEPHONE NUMBER****(800)462-5378 (24 Hours) (800) I-M-ALERT****FEDERAL INSECTICIDE, FUNGICIDE AND RODENTICIDE ACT (FIFRA) :**

EPA Reg. No. 1706-178, 1706-179

This product is registered for use as a microorganism control chemical used in: Pulp and Papermill Systems, Brewery Pasteurizers, Air Washer Systems, Heat transfer systems. The active ingredients in this formulation (sodium hypochlorite and sodium bromide), react in situ to form a stabilized alkaline bromine antimicrobial.

In all cases follow instructions on the product label.

This product has been certified as KOSHER/PAREVE for year-round use INCLUDING THE PASSOVER SEASON by the CHICAGO RABBINICAL COUNCIL.

**FEDERAL WATER POLLUTION CONTROL ACT, CLEAN WATER ACT, 40 CFR 401.15 / formerly Sec. 307, 40 CFR / formerly Sec. 311 :**

This product contains the following substances listed in the regulation:

Substance(s)

Sodium Hydroxide :

Citations

Sec. 311

**CLEAN AIR ACT, Sec. 111 (40 CFR 60, Volatile Organic Compounds), Sec. 112 (40 CFR 61, Hazardous Air Pollutants), Sec. 602 (40 CFR 82, Class I and II Ozone Depleting Substances) :**

None of the substances are specifically listed in the regulation.

**CALIFORNIA PROPOSITION 65 :**

This product does not contain substances which require warning under California Proposition 65.

**MICHIGAN CRITICAL MATERIALS :**

None of the substances are specifically listed in the regulation.

**STATE RIGHT TO KNOW LAWS :**

This product is a registered biocide and is exempt from State Right to Know Labelling Laws.

**NATIONAL REGULATIONS, CANADA :****WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM (WHMIS) :****WHMIS CLASSIFICATION :**

Pesticide controlled products are not regulated under WHMIS.

**CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA) :**

All substances in this product are listed on the Domestic Substances List (DSL), are exempt, or have been reported in accordance with the New Substances Notification Regulations.

**16. OTHER INFORMATION**

Nalco: EHS2818, F105047/104688

Due to our commitment to Product Stewardship, we have evaluated the human and environmental hazards and exposures of this product. Based on our recommended use of this product, we have characterized the product's