

PHILADELPHIA ELECTRIC COMPANY

NUCLEAR GROUP HEADQUARTERS

955-65 CHESTERBROOK BLVD.

WAYNE, PA 19087-5691

(215) 640-6000

January 4, 1991

Locket Nos. 50-352
50-353

License Nos. NPF-39
NPF-85

NPDES Permit No. PA0051927

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

Subject: Limerick Generating Station, Units 1 and 2
Proposed Changes to the National Pollutant
Discharge Elimination System Permit

Gentlemen:

The Limerick Generating Station (LGS), Units 1 and 2, Environmental Protection Plan (EPP), Section 3.2, stipulates that the Nuclear Regulatory Commission (NRC) shall receive a copy of any proposed change to the LGS National Pollutant Discharge Elimination System (NPDES) permit at the same time the proposed change is submitted to the permitting agency.

By letter dated September 10, 1990 to the Pennsylvania Department of Environmental Resources (PA DER), Philadelphia Electric Company (PECo) requested a change to the LGS NPDES Permit No. PA0051927 which would allow for the use of Nalco 1360T in the cooling water system at LGS. However, when the September 10, 1990 letter was submitted to the PA DER we inadvertently neglected to provide a copy to the NRC.

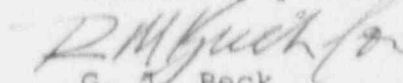
9101110324 910104
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Therefore, in accordance with the LGS EPP Section 3.2, a copy of the September 10, 1990 letter (including attachments) addressed to the PA DER requesting a change to the LGS NPDES permit is enclosed.

If you have any questions, please do not hesitate to contact us.

Sincerely yours,



G. J. Beck
Manager
Licensing Section
Nuclear Engineering and Services

Enclosure

cc: T. T. Martin, Administrator, Region I, USNRC (w/enclosure)
T. J. Kenny, USNRC Senior Resident Inspector, LGS
(w/enclosure)

CCD 90-16013

File

PHILADELPHIA ELECTRIC COMPANY

RECEIVED
R. M. KRICK

2301 MARKET STREET

P.O. BOX 8699

PHILADELPHIA, PA. 19101

(215) 841-4000

DEC 19 1990

REF. TO

September 10, 1990

Mr. J. Newbold
Chief, Permits Section
Bureau of Water Quality Management
Department of Environmental Resources
1875 New Hope Street
Norristown, PA 19401

RE: Limerick Generating Station, NPDES Permit PA0051927

Dear Mr. Newbold:

In accordance with Chapter 92.7 "Reporting of New or Increased Discharges", of the Department's Rules and Regulations, we hereby request approval to use Nalco 1360T (Nalco 1360 with fluorescent dye) in the cooling water system at Limerick Generating Station as described in the attached letter concerning "Proposed Test of Automatic Cooling Tower Chemical Addition". Nalco 1360 is currently approved for use in our cooling water system at Limerick. As indicated in the attached, the Nalco 1360T is the same material as Nalco 1360 with fluorescent dye added. The dye will serve as an indicator of concentration for control of the currently-approved chemicals Nalco 1360 and Nalco 1372 in an automatic chemical feed system.

Attached for your information is a letter and Material Safety Data Sheets from Nalco describing Nalco 1360T as having the same aquatic toxicity as Nalco 1360. If there are any questions, please call David Mobraaten at 215-841-5679.

Very truly yours,

George M. Morley

George M. Morley
Director
Environmental Affairs

DWM/lth
Attachment

bcc: J. S. Kemper w/o attachment
M. J. McCormick w attachment
R. W. Dubiel w/attachment
CCD w/attachment

R M Krick w/a H



NALCO CHEMICAL COMPANY

13801 VILLAGE MILL DRIVE D SUITE 205U D MIDLOTHIAN, VIRGINIA 23113 D AREA 804-379-0566

13 June 1990

PHILADELPHIA ELECTRIC COMPANY
Limerick Generating Station
P. O. Box A - Sanatoga Branch
Pottstown, PA 19464

Attention: Mr. Steve Dietch

SUBJECT: AQUATIC TOXICITY DATA FOR 1360T

Dear Mr. Dietch:

The aquatic toxicity data listed under Section 14 of the MSDS for 1360T is based on data from 1360. This is because 1360 and 1360T are exactly the same product except for the tracer material.

The aquatic toxicity of the 1360 was determined previously by an outside laboratory. The 1360 product contains a polymer and zinc material. The toxicity of the polymer has been determined independently in its most concentrated form as PR-4344. This is reported in Section 14 of the MSDS for PR-4344. It is essentially a non-toxic material. Since 1360 is a more toxic material, the toxicity can be assumed to come from the zinc portion of the product.

The tracer is incorporated into Dynacool 1328 at the same level as 1360T. Dynacool 1328 is essentially a non-toxic material as determined by an outside laboratory. This is shown in Section 14 of the MSDS. Consequently, the tracer material must also be essentially non-toxic.

The aquatic toxicity data reported in Section 14 of the MSDS for 1360T is a combination of the above data. Super-Zinc 1360T will exhibit essentially the same toxicity as 1360 due to the zinc contained in the formulation.

NALCO CHEMICAL COMPANY

-2-

PHILADELPHIA ELECTRIC COMPANY
Limerick Generating Station
Pottstown, PA 19464

13 June 1990

Please do not hesitate to contact Wally Schaefer, Scott Metcalfe
or me if you need any further information.

Sincerely,

NALCO CHEMICAL COMPANY

Sandy Koeplin-Gall
Sandy Koeplin-Gall, Ph.D.
Product Manager
Utility Chemicals Group

SKG:ds

Enclosure: MSDS - 1360, 1360T, 1328, PR-4344



MATERIAL SAFETY DATA SHEET

PRODUCT NALCO 1328 LIQUID

Emergency Telephone Number
Medical (708) 920-1510 (24 hours)

SECTION 1 PRODUCT IDENTIFICATION

TRADE NAME: NALCO 1328 LIQUID

DESCRIPTION: An aqueous solution of an acrylic polymer and a sulfonated carboxylated polymer

NFPA 704M/HMIS RATING: 0/0 HEALTH 1/1 FLAMMABILITY 0/0 REACTIVITY 0 OTHER
0=Insignificant 1=Slight 2=Moderate 3=High 4=Extreme

SECTION 2 HAZARDOUS INGREDIENTS

Our hazard evaluation of the ingredient(s) under OSHA's Hazard Communication Rule, 29 CFR 1910.1200 has found none of the ingredient(s) hazardous.

SECTION 3 PRECAUTIONARY LABEL INFORMATION

CAUTION: May cause irritation to skin and eyes. Avoid contact with skin, eyes and clothing. Do not take internally.

Empty containers may contain residual product. Do not reuse container unless properly reconditioned.

SECTION 4 FIRST AID INFORMATION

EYES: Flush with water for 15 minutes. Call a physician.
SKIN: Flush with water for 15 minutes.
INGESTION: Induce vomiting. Give water. Call a physician.

NOTE TO PHYSICIAN: No specific antidote is known. Based on the individual reactions of the patient, the physician's judgment should be used to control symptoms and clinical condition.

CAUTION: If unconscious, having trouble breathing or in convulsions, do not induce vomiting or give water.

SECTION 5 HEALTH EFFECTS INFORMATION

PRIMARY ROUTE(S) OF EXPOSURE: Eye, Skin

EYE CONTACT: May cause irritation with prolonged contact.
SKIN CONTACT: May cause irritation with prolonged contact.

SYMPTOMS OF EXPOSURE: A review of available data does not identify any symptoms from exposure.

AGGRAVATION OF EXISTING CONDITIONS: A review of available data does



MATERIAL SAFETY DATA SHEET

PRODUCT NALCO 1328 LIQUID

Emergency Telephone Number
Medical (708) 920-1510 (24 hours)

SECTION 5 HEALTH EFFECTS INFORMATION

(CONTINUED)

not identify any worsening of existing conditions.

SECTION 6 TOXICOLOGY INFORMATION

ACUTE TOXICITY STUDIES: No toxicity studies have been conducted on this product.

SECTION 7 PHYSICAL AND CHEMICAL PROPERTIES

COLOR:	Clear pale yellow	FORM:	Liquid
DENSITY:	9.8 lbs/gal.		
SOLUBILITY IN WATER:	Completely		
SPECIFIC GRAVITY:	1.17 @ 71 Degrees F		ASTIM D-1298
pH (NEAT) =	5.8		ASTIM E-70
FREEZE POINT:	25 Degrees F		ASTIM D-1177
VISCOSITY:	10 cps @ 71 Degrees F		ASTIM D-2983
BOILING POINT:	212 Degrees F @ 760 mm Hg		ASTIM D-86
FLASH POINT:	Greater than 200 Degrees F (FMCC)		ASTIM D-93

NOTE: These physical properties are typical values for this product.

SECTION 8 FIRE AND EXPLOSION INFORMATION

FLASH POINT: Greater than 200 Degrees F (FMCC) ASTIM D-93

EXTINGUISHING MEDIA: This product would not be expected to burn unless all the water is boiled away. The remaining organics may be ignitable. Use water to cool containers exposed to fire.

UNUSUAL FIRE AND EXPLOSION HAZARD: May evolve NOx or SOx under fire conditions.

SECTION 9 REACTIVITY INFORMATION

INCOMPATIBILITY: Avoid contact with strong oxidizers (eg. chlorine, peroxides, chromates, nitric acid, perchlorates, concentrated oxygen, permanganates) which can generate heat, fires, explosions and the release of toxic fumes.

THERMAL DECOMPOSITION PRODUCTS: In the event of combustion CO, CO2, NOx, SOx may be formed. Do not breathe smoke or fumes. Wear suitable protective equipment.



MATERIAL SAFETY DATA SHEET

PRODUCT NALCO 1328 LIQUID

Emergency Telephone Number
Medical (708) 920-1510 (24 hours)

SECTION 10 PERSONAL PROTECTION EQUIPMENT

RESPIRATORY PROTECTION: Respiratory protection is not normally needed since the volatility and toxicity are low.

For large spills, entry into large tanks, vessels or enclosed small spaces with inadequate ventilation, a pressure-demand, self-contained breathing apparatus is recommended.

VENTILATION: General ventilation is recommended.

PROTECTIVE EQUIPMENT: Use impermeable gloves and chemical splash goggles (ANSI Z 87.1 requirements and selection of gloves, goggles, shoes, etc.) when attaching feeding equipment or performing maintenance.

If clothing is contaminated, remove clothing and thoroughly wash the affected area. Launder contaminated clothing before reuse.

SECTION 11 SPILL AND DISPOSAL INFORMATION

IN CASE OF TRANSPORTATION ACCIDENTS, CALL THE FOLLOWING 24-HOUR TELEPHONE NUMBER (708-920-1510)

SPILL CONTROL AND RECOVERY:

Small liquid spills: Contain with absorbent material, such as clay, soil or any commercially available absorbent. Shovel reclaimed liquid and absorbent into recovery or salvage drums for disposal. Refer to CERCLA in Section 14.

Large liquid spills: Dike to prevent further movement and reclaim into recovery or salvage drums or tank truck for disposal. Refer to CERCLA in Section 14.

DISPOSAL: If this product becomes a waste, it does not meet the criteria of a hazardous waste as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR 261, since it does not have the characteristics of Subpart C, (i.e. D001 through D017) nor is it listed under Subpart D.

As a non-hazardous liquid waste, it should be solidified with stabilizing agents (such as sand, fly ash, or cement) so that no free liquid remains before disposal to an industrial waste landfill. A non-hazardous liquid waste can also be incinerated in accordance with local, state, and federal regulations.



MATERIAL SAFETY DATA SHEET

PRODUCT NALCO 1328 LIQUID

Emergency Telephone Number
Medical (708) 920-1510 (24 hours)

SECTION 12 ENVIRONMENTAL INFORMATION

BIOLOGICAL OXYGEN DEMAND (5-day BOD): 4,200 ppm

AQUATIC DATA:

96 hour static acute LC50 to Bluegill Sunfish = Greater than 1,000 mg/L

96 hour no observed effect concentration is 1,000 mg/L based on no mortality or abnormal effects.

TOXICITY RATING: Essentially non-toxic

96 hour static acute LC50 to Rainbow Trout = Greater than 1,000 mg/L

96 hour no observed effect concentration is 1,000 mg/L based on no mortality or abnormal effects.

TOXICITY RATING: Essentially non-toxic

96 hour static acute LC50 to Fathead Minnow = Greater than 1,000 mg/L

96 hour no observed effect concentration is 1,000 mg/L based on no mortality or abnormal effects.

TOXICITY RATING: Essentially non-toxic

48 hour static acute LC50 to Daphnia Magna = Greater than 1,000 mg/L

48 hour no observed effect concentration is 1,000 mg/L based on no mortality or abnormal effects.

TOXICITY RATING: Essentially non-toxic

If released into the environment, see CERCLA in Section 14.

SECTION 13 TRANSPORTATION INFORMATION

DOT PROPER SHIPPING NAME/HAZARD CODE - PRODUCT IS NOT REGULATED
DURING TRANSPORTATION

SECTION 14 REGULATORY INFORMATION

The following regulations apply to this product.

FEDERAL REGULATIONS:



MATERIAL SAFETY DATA SHEET

PRODUCT NALCO 1328 LIQUID

Emergency Telephone Number

Medical (708) 920-1510 (24 hours)

SECTION 14 REGULATORY INFORMATION

(CONTINUED)

OSHA'S HAZARD COMMUNICATION RULE, 29 CFR 1910.1200:

Based on our hazard evaluation, none of the ingredients in this product are hazardous.

CERCLA, 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 ingredients 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 that this product is not hazardous under 29 CFR 1910.1200.

Under Section 311, submittal of MSDS's or a list of product names to the local emergency planning commission, state emergency response commission and local fire department is required after October 17, 1987 if you have:

- 10,000 pounds or more of a hazardous substance, or
- 500 pounds or the threshold planning quantity, whichever is less, of an extremely hazardous substance.

After October 17, 1989, MSDS(s), or a list of product names for all hazardous substances between zero (0) and 10,000 pounds, not previously reported, must be submitted.

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

This product does not contain ingredients (at a level of 1% or greater) on the List of Toxic Chemicals.

TOXIC SUBSTANCES CONTROL ACT (TSCA):

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

RESOURCE CONSERVATION AND RECOVERY ACT (RCRA), 40 CFR 261 SUBPART C AND D:

If this product becomes a waste, it does not meet the criteria of a hazardous waste.



MATERIAL SAFETY DATA SHEET

PRODUCT NALCO 1328 LIQUID

Emergency Telephone Number
Medical (708) 920-1510 (24 hours)

SECTION 14 REGULATORY INFORMATION

(CONTINUED)

FEDERAL WATER POLLUTION CONTROL ACT, CLEAN WATER ACT, 40 CFR 401.15
(formerly Sec. 307), 40 CFR 116 (formerly Sec. 311):
None of the ingredients are specifically listed.

CLEAN AIR ACT, 40 CFR 60, SECTION 111, 40 CFR 61, SECTION 112:
This product does not contain ingredients covered by the Clean Air Act.

STATE REGULATIONS:

CALIFORNIA PROPOSITION 65:
None of the chemicals on the current Proposition 65 list are known to be present in this product.

MICHIGAN CRITICAL MATERIALS:
This product does not contain ingredients listed on the Michigan Critical Materials Register.

STATE RIGHT TO KNOW LAWS:
This product does not contain ingredients listed by State Right To Know Laws.

INTERNATIONAL REGULATIONS:

This is not a WHMIS controlled product under The House of Commons of Canada Bill C-70.

SECTION 15 ADDITIONAL INFORMATION

None

SECTION 16 USER'S RESPONSIBILITY

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 ensure safe workplace operations. Please consult your local sales representative for any further information.

SECTION 17 BIBLIOGRAPHY

ANNUAL REPORT ON CARCINOGENS, U.S. Department of Health and Human Services,



MATERIAL SAFETY DATA SHEET

PRODUCT NALCO 1328 LIQUID

Emergency Telephone Number
Medical (708) 920-1510 (24 hours)

SECTION 17 BIBLIOGRAPHY

(CONTINUED)

Public Health Service, PB 33-135855, 1983.

CASARETT AND DOULL'S TOXICOLOGY, THE BASIC SCIENCE OF POISONS, Doull, J., Klaassen, C. D., and Admar, M. O., eds., Macmillian Publishing Company, Inc., N. Y., 2nd edition, 1980.

CHEMICAL HAZARDS OF THE WORKPLACE, Proctor, N. H., and Hughes, J. P., eds., J. P. Lipincott Company, N.Y., 1981.

DANGEROUS PROPERTIES OF INDUSTRIAL MATERIALS, Sax, N. Irving, ed., Van Nostrand Reinhold Company, N.Y., 6th edition, 1984.

IARC MONOGRAPHS ON THE EVALUATION OF THE CARCINOGENIC RISK OF CHEMICALS TO MAN, Geneva: World Health Organization, International Agency for Research on Cancer, 1972-1977.

PATTY'S INDUSTRIAL HYGIENE AND TOXICOLOGY, Clayton, G. D., Clayton, F. E., eds., John Wiley and Sons, N. Y., 3rd edition, Vol. 2 A-C, 1981.

REGISTRY OF TOXIC EFFECTS ON CHEMICAL SUBSTANCES, U.S. Department of Health and Human Services, Public Health Service, Center for Disease Control, National Institute for Occupational Safety and Health, 1983 supplement of 1981-1982 edition, Vol. 1-3, OH, 1984.

Title 29 Code of Federal Regulations Part 1910, Subpart Z, Toxic and Hazardous Substances, Occupational Safety and Health Administration (OSHA).

THRESHOLD LIMIT VALUES FOR CHEMICAL SUBSTANCES AND PHYSICAL AGENTS IN THE WORKROOM ENVIRONMENT WITH INTENDED CHANGES, American Conference of Governmental Industrial Hygienists, OH.

PREPARED BY: Ricky A. Stackhouse Ph.D., Toxicologist

DATE CHANGED: 08/14/89

DATE PRINTED: 06/12/90



MATERIAL SAFETY DATA SHEET

PRODUCT

NALCO PR-4344 INTERMEDIATE

Emergency Telephone Number

Medical (708) 920-1510 (24 hours)

SECTION 1 PRODUCT IDENTIFICATION

TRADE NAME: NALCO PR-4344 INTERMEDIATE

DESCRIPTION: A sulfonated polyacrylate

NFPA 704M/HMIS RATING: 1/1 HEALTH 1/1 FLAMMABILITY 0/0 REACTIVITY 0 OTHER
0=Insignificant 1=Slight 2=Moderate 3=High 4=Extreme

SECTION 2 HAZARDOUS INGREDIENTS

Our hazard evaluation of the ingredient(s) under OSHA's Hazard Communication Rule, 29 CFR 1910.1200 has found none of the ingredient(s) hazardous.

SECTION 3 PRECAUTIONARY LABEL INFORMATION

CAUTION: May cause irritation to skin and eyes. Avoid contact with skin, eyes and clothing. Do not take internally.

Empty containers may contain residual product. Do not reuse container unless properly reconditioned.

SECTION 4 FIRST AID INFORMATION

EYES: Flush with water for 15 minutes. Call a physician.
SKIN: Flush with water for 15 minutes.
INGESTION: Do not induce vomiting. Give water. Call a physician.

NOTE TO PHYSICIAN: No specific antidote is known. Based on the individual reactions of the patient, the physician's judgment should be used to control symptoms and clinical condition.

CAUTION: If unconscious, having trouble breathing or in convulsions, do not induce vomiting or give water.

SECTION 5 HEALTH EFFECTS INFORMATION

PRIMARY ROUTE(S) OF EXPOSURE: Eye, Skin

EYE CONTACT: May cause irritation with prolonged contact.
SKIN CONTACT: May cause irritation with prolonged contact.

SYMPTOMS OF EXPOSURE: A review of available data does not identify any symptoms from exposure.

AGGRAVATION OF EXISTING CONDITIONS: A review of available data does not identify any worsening of existing conditions.



MATERIAL SAFETY DATA SHEET

PRODUCT

NALCO FR-4344 INTERMEDIATE

Emergency Telephone Number

Medical (708) 920-1510 (24 hours)

SECTION 6 TOXICOLOGY INFORMATION

ACUTE TOXICITY STUDIES: Acute toxicity studies have been conducted on this product. The results are shown below.

ACUTE ORAL TOXICITY (ALBINO RATS): LD50 = Greater than 5,000 mg/kg
Toxicity Rating: No appreciable toxicity

PRIMARY SKIN IRRITATION TEST (ALBINO RABBITS):
SKIN IRRITATION INDEX DRAIZE RATING: 0.0/8.0 Non-irritating

PRIMARY EYE IRRITATION TEST (ALBINO RABBITS):
EYE IRRITATION INDEX DRAIZE RATING: 4.7/110.0 Minimally irritating
COMMENTS: Slight conjunctivitis was apparent one hour.

SECTION 7 PHYSICAL AND CHEMICAL PROPERTIES

COLOR:	Yellow	FORM:	Liquid	
SPECIFIC GRAVITY:	1.27 @ 71 Degrees F			ASTIM D-1298
pH (NEAT) =	6			ASTIM E-70
VISCOSITY:	570 cps @ 71 Degrees F			ASTIM D-2983
FREEZE POINT:	13 Degrees F			ASTIM D-1177
POUR POINT:	15 Degrees F			ASTIM D-97
BOILING POINT:	212 Degrees F @ 760 mm Hg			ASTIM D-86
FLASH POINT:	None (FMCC)			ASTIM D-93

NOTE: These physical properties are typical values for this product.

SECTION 8 FIRE AND EXPLOSION INFORMATION

FLASH POINT: None (FMCC) ASTM D-93

EXTINGUISHING MEDIA: This product would not be expected to burn unless all the water is boiled away. The remaining organics may be ignitable. Use water to cool containers exposed to fire.

UNUSUAL FIRE AND EXPLOSION HAZARD: May evolve NOx or SOx under fire conditions.

SECTION 9 REACTIVITY INFORMATION

INCOMPATIBILITY: None known

THERMAL DECOMPOSITION PRODUCTS: In the event of combustion CO, CO2, NOx, SOx may be formed. Do not breathe smoke or fumes. Wear suitable protective equipment.



MATERIAL SAFETY DATA SHEET

PRODUCT

NALCO FR-4344 INTERMEDIATE

Emergency Telephone Number

Medical (708) 920-1510 (24 hours)

SECTION 10 PERSONAL PROTECTION EQUIPMENT

RESPIRATORY PROTECTION: Respiratory protection is not normally needed. If significant mists or aerosols are generated, wear a NIOSH approved or equivalent respirator, (ANSI Z 88.2, 1980 for requirements and selection).

For large spills, entry into large tanks, vessels or enclosed small spaces with inadequate ventilation, a pressure-demand, self-contained breathing apparatus is recommended.

VENTILATION: General ventilation is recommended.

PROTECTIVE EQUIPMENT: Use impermeable gloves and chemical splash goggles (ANSI Z 87.1 requirements and selection of gloves, goggles, shoes, etc.) when attaching feeding equipment, doing maintenance or handling product.

If clothing is contaminated, remove clothing and thoroughly wash the affected area. Launder contaminated clothing before reuse.

SECTION 11 SPILL AND DISPOSAL INFORMATION

IN CASE OF TRANSPORTATION ACCIDENTS, CALL THE FOLLOWING 24-HOUR TELEPHONE NUMBER (708-920-1510)

SPILL CONTROL AND RECOVERY:

Small liquid spills: Contain with absorbent material, such as clay, soil or any commercially available absorbent. Shovel reclaimed liquid and absorbent into recovery or salvage drums for disposal. Refer to CERCLA in Section 14.

Large liquid spills: Dike to prevent further movement and reclaim into recovery or salvage drums or tank truck for disposal. Refer to CERCLA in Section 14.

DISPOSAL: If this product becomes a waste, it does not meet the criteria of a hazardous waste as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR 261, since it does not have the characteristics of Subpart C, (i.e. D001 through D017) nor is it listed under Subpart D.

As a non-hazardous liquid waste, it should be solidified with stabilizing agents (such as sand, fly ash, or cement) so that no free liquid remains before disposal to an industrial waste landfill. A non-hazardous liquid waste can also be incinerated in accordance with local, state and federal regulations.



MATERIAL SAFETY DATA SHEET

PRODUCT

NALCO PR-4344 INTERMEDIATE

Emergency Telephone Number

Medical (708) 920-1510 (24 hours)

SECTION 12 ENVIRONMENTAL INFORMATION

AQUATIC DATA:

96 hour static acute LC50 to Bluegill Sunfish = Greater than 1,000 ppm
48 hour static acute LC50 to Bluegill Sunfish = Greater than 1,000 ppm
24 hour static acute LC50 to Bluegill Sunfish = Greater than 1,000 ppm

96 hour no observed effect concentration is 1000 ppm based on no mortality or abnormal effects.

TOXICITY RATING: No appreciable toxicity

96 hour static acute LC50 to Rainbow Trout = Greater than 1,000 ppm
48 hour static acute LC50 to Rainbow Trout = Greater than 1,000 ppm
24 hour static acute LC50 to Rainbow Trout = Greater than 1,000 ppm

96 hour no observed effect concentration is 560 ppm based on no mortality or abnormal effects.

TOXICITY RATING: No appreciable toxicity

OTHER STUDIES:

48 hour static acute LC50 to Daphnia Magna = Greater than 1,000 ppm
24 hour static acute LC50 to Daphnia Magna = Greater than 1,000 ppm

48 hour no observed effect concentration is 180 ppm based on no mortality or abnormal effects.

TOXICITY RATING: No appreciable toxicity

If released into the environment, see CERCLA in Section 14.

SECTION 13 TRANSPORTATION INFORMATION

DOT PROPER SHIPPING NAME/HAZARD CODE - PRODUCT IS NOT REGULATED
DURING TRANSPORTATION

SECTION 14 REGULATORY INFORMATION

The following regulations apply to this product.

FEDERAL REGULATIONS:

OSHA HAZARD COMMUNICATION RULE, 29 CFR 1910.1200:
Based on our hazard evaluation, none of the ingredients in this product



MATERIAL SAFETY DATA SHEET

PRODUCT

NALCO FR-4344 INTERMEDIATE

Emergency Telephone Number

Medical (708) 920-1510 (24 hours)

SECTION 14 REGULATORY INFORMATION

(CONTINUED)

are hazardous.

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 ingredients 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 that this product is not hazardous under 29 CFR 1910.1200.

Under Section 311, submittal of MSDS's or a list of product names to the local emergency planning commission, state emergency response commission and local fire department is required after October 17, 1987 if you have:

- 10,000 pounds or more of a hazardous substance, or
- 500 pounds or the threshold planning quantity, whichever is less, of an extremely hazardous substance.

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

This product does not contain ingredients (at a level of 1% or greater) on the List of Toxic Chemicals.

TOXIC SUBSTANCES CONTROL ACT (TSCA):

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

RESOURCE CONSERVATION AND RECOVERY ACT (RCRA), 40 CFR 261 SUBPART C & D:
If this product becomes a waste, it does not meet the criteria of a hazardous waste.

FEDERAL WATER POLLUTION CONTROL ACT, CLEAN WATER ACT, 40 CFR 401.15/
formerly Sec. 307, 40 CFR 116/formerly Sec. 311:
None of the ingredients are specifically listed.

CLEAN AIR ACT, 40 CFR 60, SECTION 111, 40 CFR 61, SECTION 112:

This product does not contain ingredients covered by the Clean Air Act.



MATERIAL SAFETY DATA SHEET

PRODUCT

NALCO FR-4344 INTERMEDIATE

Emergency Telephone Number

Medical (708) 920-1510 (24 hours)

SECTION 14 REGULATORY INFORMATION

(CONTINUED)

STATE REGULATIONS:

CALIFORNIA PROPOSITION 65:

None of the chemicals on the current Proposition 65 list are known to be present in this product.

MICHIGAN CRITICAL MATERIALS:

This product does not contain ingredients listed on the Michigan Critical Materials Register.

STATE RIGHT TO KNOW LAWS:

The following ingredient(s) are disclosed for compliance with State Right To Know Laws:

Acrylic polymer	Trade Secret
Water	7732-18-5

INTERNATIONAL REGULATIONS:

This is not a WHMIS controlled product under The House of Commons of Canada Bill C-70.

SECTION 15 ADDITIONAL INFORMATION

None

SECTION 16 USER'S RESPONSIBILITY

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 ensure safe workplace operations. Please consult your local sales representative for any further information.

SECTION 17 BIBLIOGRAPHY

ANNUAL REPORT ON CARCINOGENS, U.S. Department of Health and Human Services, Public Health Service, PB 33-135855, 1983.

CASARETT AND DOULL'S TOXICOLOGY, THE BASIC SCIENCE OF POISONS, Doull, J., Klaassen, C. D., and Adam, M. O., eds., Macmillan Publishing Company, Inc.,



MATERIAL SAFETY DATA SHEET

PRODUCT

NALCO PR-4344 INTERMEDIATE

Emergency Telephone Number

Medical (708) 920-1510 (24 hours)

SECTION 17 BIBLIOGRAPHY

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DANGEROUS PROPERTIES OF INDUSTRIAL MATERIALS, Sax, N. Irving, ed., Van Nostrand Reinhold Company, N.Y., 6th edition, 1984.

IARC MONOGRAPHS ON THE EVALUATION OF THE CARCINOGENIC RISK OF CHEMICALS TO MAN, Geneva: World Health Organization, International Agency for Research on Cancer, 1972-1977.

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REGISTRY OF TOXIC EFFECTS ON CHEMICAL SUBSTANCES, U.S. Department of Health and Human Services, Public Health Service, Center for Disease Control, National Institute for Occupational Safety and Health, 1983 supplement of 1981-1982 edition, Vol. 1-3, OH, 1984.

Title 29 Code of Federal Regulations Part 1910, Subpart Z, Toxic and Hazardous Substances, Occupational Safety and Health Administration (OSHA).

THRESHOLD LIMIT VALUES FOR CHEMICAL SUBSTANCES AND PHYSICAL AGENTS IN THE WORKROOM ENVIRONMENT WITH INTENDED CHANGES, American Conference of Governmental Industrial Hygienists, OH.

PREPARED BY: Ricky A. Stackhouse PhD., Toxicologist

DATE CHANGED: 04/03/90

DATE PRINTED: 06/13/90



MATERIAL SAFETY DATA SHEET

PRODUCT SUPER-ZINC 1360T INHIBITOR

Emergency Telephone Number

Medical (708) 920-1510 (24 hours)

SECTION 1 PRODUCT IDENTIFICATION

TRADE NAME: SUPER-ZINC 1360T INHIBITOR

DESCRIPTION: An aqueous solution of zinc chloride and an acrylic polymer with a tracer

NFPA 704M/HMIS RATING: 1/1 HEALTH 1/1 FLAMMABILITY 0/0 REACTIVITY 0 OTHER
0=Insignificant 1=Slight 2=Moderate 3=High 4=Extreme

SECTION 2 HAZARDOUS INGREDIENTS

Our hazard evaluation has identified the following chemical ingredient(s) as hazardous under OSHA's Hazard Communication Rule, 29 CFR 1910.1200. Consult Section 14 for the nature of the hazard(s).

INGREDIENT(S)	CAS #	APPROX. %
Zinc chloride	7646-85-7	10-20

SECTION 3 PRECAUTIONARY LABEL INFORMATION

CAUTION: May cause eye irritation. Avoid contact with eyes. Avoid prolonged or repeated contact with skin. Do not take internally.

Empty containers may contain residual product. Do not reuse container unless properly reconditioned.

SECTION 4 FIRST AID INFORMATION

EYES: Immediately flush for at least 15 minutes while holding eyelids open. Call a physician at once.
SKIN: Flush with water for 15 minutes.
INGESTION: Do not induce vomiting. Give water. Call a physician.
INHALATION: Remove to fresh air. Treat symptoms. Call a physician.

NOTE TO PHYSICIAN: No specific antidote is known. Based on the individual reactions of the patient, the physician's judgment should be used to control symptoms and clinical condition.

CAUTION: If unconscious, having trouble breathing or in convulsions, do not induce vomiting or give water.

SECTION 5 HEALTH EFFECTS INFORMATION

PRIMARY ROUTE(S) OF EXPOSURE: Eye, Skin



MATERIAL SAFETY DATA SHEET

PRODUCT SUPER-ZINC 1360T INHIBITOR

Emergency Telephone Number
Medical (708) 920-1510 (24 hours)

SECTION 5 HEALTH EFFECTS INFORMATION

(CONTINUED)

EYE CONTACT: May cause moderate irritation.
SKIN CONTACT: Non-irritating.

SYMPTOMS OF EXPOSURE: A review of available data does not identify any symptoms from exposure.

AGGRAVATION OF EXISTING CONDITIONS: A review of available data does not identify any worsening of existing conditions.

SECTION 6 TOXICOLOGY INFORMATION

TOXICITY STUDIES: Toxicity studies not have been conducted on this product, but acute studies have been conducted on a similar product. The results are shown below.

ACUTE ORAL TOXICITY (ALBINO RATS): LD50 = Greater than 5,000 mg/kg

ACUTE DERMAL TOXICITY (ALBINO RABBITS): LD50 = Greater than 2,000 mg/kg

PRIMARY SKIN IRRITATION TEST (ALBINO RABBITS):
SKIN IRRITATION INDEX DRAIZE RATING: 0.0/8.0 Non-irritating

COMMENTS: Application of 0.5 ml of product to intact sites on the shaven back of each of six albino rabbits (4-hour occluded contact) failed to elicit any reaction.

PRIMARY EYE IRRITATION TEST (ALBINO RABBITS):
EYE IRRITATION INDEX DRAIZE RATING: 12.0/110.0 (1-hour) Moderate irritant

COMMENTS: 0.1 ml of product into the conjunctival sac of six albino rabbits produced slight to moderate conjunctival redness and discharge at one-hour after treatment. Additionally, blisters and swelling of the conjunctiva was observed in all animals. The eyes were normal four days after treatment. No corneal or iridial involvement was observed during the test.

SECTION 7 PHYSICAL AND CHEMICAL PROPERTIES

COLOR: Clear gold FORM: Liquid
DENSITY: 9.8 lbs/gal.
SOLUBILITY IN WATER: Completely
SPECIFIC GRAVITY: 1.18 @ 74 Degrees F ASIM D-1298
pH (NEAT) = 3.7 ASTM E-70
VISCOSITY: 10 cps @ 74 Degrees F ASTM D-2983
FREEZE POINT: 18 Degrees F ASTM D-1177



MATERIAL SAFETY DATA SHEET

PRODUCT SUPER-ZINC 1360T INHIBITOR

Emergency Telephone Number
Medical (708) 920-1510 (24 hours)

SECTION 7 PHYSICAL AND CHEMICAL PROPERTIES

(CONTINUED)

FLASH POINT: None (FMCC) ASTM D-93

NOTE: These physical properties are typical values for this product.

SECTION 8 FIRE AND EXPLOSION INFORMATION

FLASH POINT: None (FMCC) ASTM D-93

EXTINGUISHING MEDIA: Not applicable

UNUSUAL FIRE AND EXPLOSION HAZARD: Treat like an acid fire.

SECTION 9 REACTIVITY INFORMATION

INCOMPATIBILITY: Avoid alkaline materials (eg. ammonia and its solutions, carbonates, sodium hydroxide (caustic), potassium hydroxide, calcium hydroxide (lime), cyanides, sulfides, hypochlorites, chlorites) which can generate heat with splattering or boiling and the release of toxic fumes.

THERMAL DECOMPOSITION PRODUCTS: In the event of combustion CO, CO₂, HCl may be formed. Do not breathe smoke or fumes. Wear suitable protective equipment.

SECTION 10 PERSONAL PROTECTION EQUIPMENT

RESPIRATORY PROTECTION: Respiratory protection is not normally needed since the volatility and toxicity are low. If significant vapors, mists or aerosols are generated, wear a NIOSH approved or equivalent respirator.

For large spills, entry into large tanks, vessels or enclosed small spaces with inadequate ventilation, a pressure-demand, self-contained breathing apparatus is recommended.

VENTILATION: General ventilation is recommended.

PROTECTIVE EQUIPMENT: Use impermeable gloves and chemical splash goggles when attaching feeding equipment, doing maintenance or handling product.

If clothing is contaminated, remove clothing and thoroughly wash the affected area. Launder contaminated clothing before reuse.

SECTION 11 SPILL AND DISPOSAL INFORMATION

IN CASE OF TRANSPORTATION ACCIDENTS, CALL THE FOLLOWING 24-HOUR TELEPHONE NUMBER (708-920-1510)



MATERIAL SAFETY DATA SHEET

PRODUCT SUPER-ZINC 1360T INHIBITOR

Emergency Telephone Number

Medical (708) 920-1510 (24 hours)

SECTION 11 SPILL AND DISPOSAL INFORMATION

(CONTINUED)

SPILL CONTROL AND RECOVERY:

Small liquid spills: Contain with absorbent material, such as clay, soil or any commercially available absorbent. Shovel reclaimed liquid and absorbent into recovery or salvage drums for disposal. Refer to CERCLA in Section 14.

Large liquid spills: Dike to prevent further movement and reclaim into recovery or salvage drums or tank truck for disposal. Refer to CERCLA in Section 14.

DISPOSAL: If this product becomes a waste, it does not meet the criteria of a hazardous waste as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR 261, since it does not have the characteristics of Subpart C, (i.e. D001 through D017) nor is it listed under Subpart D.

As a non-hazardous liquid waste, it should be solidified with stabilizing agents (such as sand, fly ash, or cement) so that no free liquid remains before disposal to an industrial waste landfill. A non-hazardous liquid waste can also be deep-well injected in accordance with local, state, and federal regulations.

SECTION 12 ENVIRONMENTAL INFORMATION

AQUATIC DATA: Results below based on a similar product.

Soft Water (40-45 ppm as CaCO₃) Data:

96 hour static acute LC50 to Rainbow Trout = 5.2 ppm
95% Confidence Limit of 96 hour LC50 = 3.9-7.0 ppm

Very Hard Water (325-375 ppm as CaCO₃) Data:

96 hour static acute LC50 to Rainbow Trout = 61 ppm
95% Confidence Limit of 96 hour LC50 = 43-79 ppm

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

Soft Water (40-48 ppm as CaCO₃) Data:

96 hour flow-through acute LC50 to Fathead Minnow = 12.42 ppm
48 hour static acute LC50 to Daphnia magna = 5.80 ppm



MATERIAL SAFETY DATA SHEET

PRODUCT SUPER-ZINC 1360T INHIBITOR

Emergency Telephone Number
Medical (708) 920-1510 (24 hours)

SECTION 12 ENVIRONMENTAL INFORMATION

(CONTINUED)

Hard Water (160-180 ppm as CaCO₃) Data:

96 hour flow-through acute LC50 to Fathead Minnow = 169.78 ppm
48 hour flow-through acute LC50 to Daphnia magna = 16.56 ppm

If released into the environment, see CERCLA in Section 14.

SECTION 13 TRANSPORTATION INFORMATION

DOT PROPER SHIPPING NAME/HAZARD CODE - HAZARDOUS SUBSTANCE, LIQUID, N.O.S.
ORM-E NA 9188
CONTAINS - ZINC CHLORIDE

SECTION 14 REGULATORY INFORMATION

The following regulations apply to this product.

FEDERAL REGULATIONS:

OSHA'S HAZARD COMMUNICATION RULE, 29 CFR 1910.1200:
Based on our hazard evaluation, the following ingredient in this product is hazardous and the reason is shown below.

Zinc chloride - Eye irritant

Zinc chloride (fume) = TWA 1 mg/m³, STEL 2 mg/m³ ACGIH/TLV

Zinc chloride (fume) = TWA 1 mg/m³, STEL 2 mg/m³ OSHA/PEL

(Applies to ZnCl at elevated temperatures/heating)

CERCLA/SUPERFUND, 40 CFR 117, 302:

This product contains zinc chloride, a Reportable Quantity (RQ) substance and if 9,900 pounds of product are released, it requires notification to the NATIONAL RESPONSE CENTER, WASHINGTON, D. C. (1-800-424-8802).

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 ingredients listed in Appendix A and B as an Extremely Hazardous Substance.

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



MATERIAL SAFETY DATA SHEET

PRODUCT SUPER-ZINC 1360T INHIBITOR

Emergency Telephone Number

Medical (708) 920-1510 (24 hours)

SECTION 14 REGULATORY INFORMATION

(CONTINUED)

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

- XX Immediate (acute) health hazard
- Delayed (chronic) health hazard
- Fire hazard
- Sudden release of pressure hazard
- Reactive hazard

Under Section 311, submittal of MSDS's or a list of product names to the local emergency planning commission, state emergency response commission and local fire department is required after October 17, 1987 if you have:

- 10,000 pounds or more of a hazardous substance, or
- 500 pounds or the threshold planning quantity, whichever is less, of an extremely hazardous substance.

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

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

Zinc chloride	7646-85-7	10-20
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TOXIC SUBSTANCES CONTROL ACT (TSCA):

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

RESOURCE CONSERVATION AND RECOVERY ACT (RCRA), 40 CFR 261 SUBPART C & D:

If this product becomes a waste, it does not meet the criteria of a hazardous waste.

FEDERAL WATER POLLUTION CONTROL ACT, CLEAN WATER ACT, 40 CFR 401.15

(formerly Sec. 307), 40 CFR 116 (formerly Sec. 311):

This product contains the following ingredient covered by the Clean Water Act:

Zinc chloride - Section 307, 311

CLEAN AIR ACT, 40 CFR 60, SECTION 111, 40 CFR 61, SECTION 112:

This product does not contain ingredients covered by the Clean Air Act.

STATE REGULATIONS:

CALIFORNIA PROPOSITION 65:



MATERIAL SAFETY DATA SHEET

PRODUCT SUPER-ZINC 1360T INHIBITOR

Emergency Telephone Number

Medical (708) 920-1510 (24 hours)

SECTION 14 REGULATORY INFORMATION

(CONTINUED)

None of the chemicals on the current Proposition 65 list are known to be present in this product.

MICHIGAN CRITICAL MATERIALS:

This product contains the following substance identified on the Michigan Critical Materials Register:

Zinc chloride

STATE RIGHT TO KNOW LAWS:

Regulated in those states using the TLV for zinc chloride (fume) as a criteria for listing.

INTERNATIONAL REGULATIONS:

This is a WHMIS controlled product under The House of Commons of Canada Bill C-70. The product contains the following substance(s), from the Ingredient Disclosure List or has been evaluated based on its toxicological properties, to contain the following hazardous ingredient(s):

Chemical Name	CAS #	% Concentration Range
Zinc chloride	7646-85-7	10-20

SECTION 15 ADDITIONAL INFORMATION

None

SECTION 16 USER'S RESPONSIBILITY

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 ensure safe workplace operations. Please consult your local sales representative for any further information.

SECTION 17 BIBLIOGRAPHY

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MATERIAL SAFETY DATA SHEET

PRODUCT SUPER-ZINC 1360T INHIBITOR

Emergency Telephone Number
Medical (708) 920-1510 (24 hours)

SECTION 17 BIBLIOGRAPHY

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IARC MONOGRAPHS ON THE EVALUATION OF THE CARCINOGENIC RISK OF CHEMICALS TO MAN, Geneva: World Health Organization, International Agency for Research on Cancer, 1972-1977.

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REGISTRY OF TOXIC EFFECTS ON CHEMICAL SUBSTANCES, U.S. Department of Health and Human Services, Public Health Service, Center for Disease Control, National Institute for Occupational Safety and Health, 1983 supplement of 1981-1982 edition, Vol. 1-3, OH, 1984.

Title 29 Code of Federal Regulations Part 1910, Subpart Z, Toxic and Hazardous Substances, Occupational Safety and Health Administration (OSHA).

THRESHOLD LIMIT VALUES FOR CHEMICAL SUBSTANCES AND PHYSICAL AGENTS IN THE WORKROOM ENVIRONMENT WITH INTENDED CHANGES, American Conference of Governmental Industrial Hygienists, OH.

PREPARED BY: Wicky A. Stackhouse PhD., Toxicologist

DATE CHANGED: 05/30/90

DATE PRINTED: 06/13/90



MATERIAL SAFETY DATA SHEET

PRODUCT SUPER-ZINC 1360 INHIBITOR

Emergency Telephone Number
Medical (708) 920-1510 (24 hours)

SECTION 1 PRODUCT IDENTIFICATION

TRADE NAME: SUPER-ZINC 1360 INHIBITOR
DESCRIPTION: An aqueous solution of zinc chloride and an acrylic polymer

NFPA 704M/HMIS RATING: 1/1 HEALTH 1/1 FLAMMABILITY 0/0 REACTIVITY 0 OTHER
0=Insignificant 1=Slight 2=Moderate 3=High 4=Extreme

SECTION 2 HAZARDOUS INGREDIENTS

Our hazard evaluation has identified the following chemical ingredient(s) as hazardous under OSHA's Hazard Communication Rule, 29 CFR 1910.1200. Consult Section 14 for the nature of the hazard(s).

INGREDIENT(S)	CAS #	APPROX.%
Zinc chloride	7646-85-7	10-20

SECTION 3 PRECAUTIONARY LABEL INFORMATION

CAUTION: May cause eye irritation. Avoid contact with eyes. Avoid prolonged or repeated contact with skin. Do not take internally.

Empty containers may contain residual product. Do not reuse container unless properly reconditioned.

SECTION 4 FIRST AID INFORMATION

EYES: Immediately flush for at least 15 minutes while holding eyelids open. Call a physician at once.
SKIN: Flush with water for 15 minutes.
INGESTION: Do not induce vomiting. Give water. Call a physician.
INHALATION: Remove to fresh air. Treat symptoms. Call a physician.

NOTE TO PHYSICIAN: No specific antidote is known. Based on the individual reactions of the patient, the physician's judgment should be used to control symptoms and clinical condition.

CAUTION: If unconscious, having trouble breathing or in convulsions, do not induce vomiting or give water.

SECTION 5 HEALTH EFFECTS INFORMATION

PRIMARY ROUTE(S) OF EXPOSURE: Eye, Skin

EYE CONTACT: May cause moderate irritation.



MATERIAL SAFETY DATA SHEET

PRODUCT SUPER-ZINC 1360 INHIBITOR

Emergency Telephone Number
Medical (708) 920-1510 (24 hours)

SECTION 5 HEALTH EFFECTS INFORMATION

(CONTINUED)

SKIN CONTACT: Non-irritating.

SYMPTOMS OF EXPOSURE: A review of available data does not identify any symptoms from exposure.

AGGRAVATION OF EXISTING CONDITIONS: A review of available data does not identify any worsening of existing conditions.

SECTION 6 TOXICOLOGY INFORMATION

ACUTE TOXICITY STUDIES: Acute toxicity studies have been conducted on this product. The results are shown below.

ACUTE ORAL TOXICITY (ALBINO RATS): LD50 = Greater than 5,000 mg/kg

ACUTE DERMAL TOXICITY (ALBINO RABBITS): LD50 = Greater than 2,000 mg/kg

PRIMARY SKIN IRRITATION TEST (ALBINO RABBITS):

SKIN IRRITATION INDEX DRAIZE RATING: 0.0/8.0 Non-irritating

COMMENTS: Application of 0.5 ml of product to intact sites on the shaven back of each of six albino rabbits (4-hour occluded contact) failed to elicit any reaction.

PRIMARY EYE IRRITATION TEST (ALBINO RABBITS):

EYE IRRITATION INDEX DRAIZE RATING: 12.0/110.0 (1-hour) Moderate irritant

COMMENTS: 0.1 ml of product into the conjunctival sac of six albino rabbits produced slight to moderate conjunctival redness and discharge at one-hour after treatment. Additionally, blisters and swelling of the conjunctiva was observed in all animals. The eyes were normal four days after treatment. No corneal or iridial involvement was observed during the test.

SECTION 7 PHYSICAL AND CHEMICAL PROPERTIES

COLOR: Clear colorless	FORM: Liquid	ODOR: Slight
DENSITY:	10 lbs/gal.	
SOLUBILITY IN WATER:	Completely	
SPECIFIC GRAVITY:	1.24 @ 60 Degrees F	ASTM D-1298
pH (NEAT) =	3.5	ASTM E-70
FREEZE POINT:	22 Degrees F	ASTM D-1177
BOILING POINT:	Greater than 212 Degrees F @ 760 mm Hg	ASTM D-86
FLASH POINT:	None (FMCC)	ASTM D-93



PRODUCT SUPER-ZINC 1360 INHIBITOR

Emergency Telephone Number

Medical (708) 920-1510 (24 hours)

SECTION 7 PHYSICAL AND CHEMICAL PROPERTIES

(CONTINUED)

NOTE: These physical properties are typical values for this product.

SECTION 8 FIRE AND EXPLOSION INFORMATION

FLASH POINT: None (FMCC) ASTM D-93

EXTINGUISHING MEDIA: Not applicable

UNUSUAL FIRE AND EXPLOSION HAZARD: Treat like an acid fire.

SECTION 9 REACTIVITY INFORMATION

INCOMPATIBILITY: Avoid alkaline materials (eg. ammonia and its solutions, carbonates, sodium hydroxide (caustic), potassium hydroxide, calcium hydroxide (lime), cyanides, sulfides, hypochlorites, chlorites) which can generate heat with splattering or boiling and the release of toxic fumes.

THERMAL DECOMPOSITION PRODUCTS: In the event of combustion CO, CO₂, HCl may be formed. Do not breathe smoke or fumes. Wear suitable protective equipment.

SECTION 10 PERSONAL PROTECTION EQUIPMENT

RESPIRATORY PROTECTION: Respiratory protection is not normally needed since the volatility and toxicity are low. If significant vapors, mists or aerosols are generated, wear a NIOSH approved or equivalent respirator, (ANSI Z 88.2, 1980 for requirements and selection).

For large spills, entry into large tanks, vessels or enclosed small spaces with inadequate ventilation, a pressure-demand, self-contained breathing apparatus is recommended.

VENTILATION: General ventilation is recommended.

PROTECTIVE EQUIPMENT: Use impermeable gloves and chemical splash goggles (ANSI Z 87.1 requirements and selection of gloves, goggles, shoes, etc.) when attaching feeding equipment, doing maintenance or handling product.

If clothing is contaminated, remove clothing and thoroughly wash the affected area. Launder contaminated clothing before reuse.

SECTION 11 SPILL AND DISPOSAL INFORMATION

IN CASE OF TRANSPORTATION ACCIDENTS, CALL THE FOLLOWING 24-HOUR



PRODUCT SUPER-ZINC 1360 INHIBITOR

Emergency Telephone Number

Medical (708) 920-1510 (24 hours)

SECTION 11 SPILL AND DISPOSAL INFORMATION

(CONTINUED)

TELEPHONE NUMBER (708-920-1510)

SPILL CONTROL AND RECOVERY:

Small liquid spills: Contain with absorbent material, such as clay, soil or any commercially available absorbent. Shovel reclaimed liquid and absorbent into recovery or salvage drums for disposal. Refer to CERCLA in Section 14.

Large liquid spills: Dike to prevent further movement and reclaim into recovery or salvage drums or tank truck for disposal. Refer to CERCLA in Section 14.

DISPOSAL: If this product becomes a waste, it does not meet the criteria of a hazardous waste as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR 261, since it does not have the characteristics of Subpart C, (i.e. D001 through D017) nor is it listed under Subpart D.

As a non-hazardous liquid waste, it should be solidified with stabilizing agents (such as sand, fly ash, or cement) so that no free liquid remains before disposal to an industrial waste landfill. A non-hazardous liquid waste can also be deep-well injected in accordance with local, state, and federal regulations.

SECTION 12 ENVIRONMENTAL INFORMATION

AQUATIC DATA: Results below based on actual product testing.

Soft Water (40-45 ppm as CaCO₃) Data:

96 hour static acute LC50 to Rainbow Trout = 5.2 ppm

95% Confidence Limit of 96 hour LC50 = 3.9-7.0 ppm

Very Hard Water¹ (325-375 ppm as CaCO₃) Data:

96 hour static acute LC50 to Rainbow Trout = 61 ppm

95% Confidence Limit of 96 hour LC50 = 43-79 ppm

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

Soft Water (40-48 ppm as CaCO₃) Data:

96 hour flow-through acute LC50 to Fathead Minnow = 12.42 ppm

48 hour static acute LC50 to Daphnia magna = 5.80 ppm



MATERIAL SAFETY DATA SHEET

PRODUCT SUPER-ZINC 1360 INHIBITOR

Emergency Telephone Number

Medical (708) 920-1510 (24 hours)

SECTION 12 ENVIRONMENTAL INFORMATION

(CONTINUED)

Hard Water (160-180 ppm as CaCO₃) Data:

96 hour flow-through acute LC50 to Fathead Minnow = 169.78 ppm

48 hour flow-through acute LC50 to Daphnia magna = 16.56 ppm

If released into the environment, see CERCLA in Section 14.

SECTION 13 TRANSPORTATION INFORMATION

DOT PROPER SHIPPING NAME/HAZARD CODE - HAZARDOUS SUBSTANCE, LIQUID, N.O.S.

ORM-E NA 9188

CONTAINS

- ZINC CHLORIDE

SECTION 14 REGULATORY INFORMATION

The following regulations apply to this product.

FEDERAL REGULATIONS:

OSHA'S HAZARD COMMUNICATION RULE, 29 CFR 1910.1200:

Based on our hazard evaluation, the following ingredient in this product is hazardous and the reason is shown below.

Zinc chloride - Eye irritant

Zinc chloride (fume) = TWA 1 mg/m³, STEL 2 mg/m³ ACGIH/TLV

Zinc chloride (fume) = TWA 1 mg/m³, STEL 2 mg/m³ OSHA/PEL

(Applies to ZnCl at elevated temperatures/heating)

CERCLA/SUPERFUND, 40 CFR 117, 302:

This product contains zinc chloride, a Reportable Quantity (RQ) substance and if 9,900 pounds of product are released, it requires notification to the NATIONAL RESPONSE CENTER, WASHINGTON, D. C. (1-800-424-8802).

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 ingredients listed in Appendix A and B as an Extremely Hazardous Substance.



MATERIAL SAFETY DATA SHEET

PRODUCT SUPER-ZINC 1360 INHIBITOR

Emergency Telephone Number
Medical (708) 920-1510 (24 hours)

SECTION 14 REGULATORY INFORMATION

(CONTINUED)

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:

- XX Immediate (acute) health hazard
- Delayed (chronic) health hazard
- Fire hazard
- Sudden release of pressure hazard
- Reactive hazard

Under Section 311, submittal of MSDS's or a list of product names to the local emergency planning commission, state emergency response commission and local fire department is required after October 17, 1987 if you have:

- 10,000 pounds or more of a hazardous substance, or
- 500 pounds or the threshold planning quantity, whichever is less, of an extremely hazardous substance.

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

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

Zinc chloride 7646-85-7 10-20

TOXIC SUBSTANCES CONTROL ACT (TSCA):

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

RESOURCE CONSERVATION AND RECOVERY ACT (RCRA), 40 CFR 261 SUBPART C & D:

If this product becomes a waste, it does not meet the criteria of a hazardous waste.

FEDERAL WATER POLLUTION CONTROL ACT, CLEAN WATER ACT, 40 CFR 401.15 (formerly Sec. 307), 40 CFR 116 (formerly Sec. 311):

This product contains the following ingredient covered by the Clean Water Act:

Zinc chloride - Section 307, 311

CLEAN AIR ACT, 40 CFR 60, SECTION 111, 40 CFR 61, SECTION 112:

This product does not contain ingredients covered by the Clean Air Act.

STATE REGULATIONS:



MATERIAL SAFETY DATA SHEET

PRODUCT SUPER-ZINC 1360 INHIBITOR

Emergency Telephone Number

Medical (708) 920-1510 (24 hours)

SECTION 14 REGULATORY INFORMATION

(CONTINUED)

CALIFORNIA PROPOSITION 65:

None of the chemicals on the current Proposition 65 list are known to be present in this product.

MICHIGAN CRITICAL MATERIALS:

This product contains the following substance identified on the Michigan Critical Materials Register:

Zinc chloride

STATE RIGHT TO KNOW LAWS:

Regulated in those states using the TLV for zinc chloride (fume) as a criteria for listing.

INTERNATIONAL REGULATIONS:

This is a WHMIS controlled product under The House of Commons of Canada Bill C-70. The product contains the following substance(s), from the Ingredient Disclosure List or has been evaluated based on its toxicological properties, to contain the following hazardous ingredient(s):

Chemical Name	CAS #	% Concentration Range
Zinc chloride	7646-85-7	10-20

SECTION 15 ADDITIONAL INFORMATION

None

SECTION 16 USER'S RESPONSIBILITY

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 ensure safe workplace operations. Please consult your local sales representative for any further information.

SECTION 17 BIBLIOGRAPHY

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MATERIAL SAFETY DATA SHEET

PRODUCT SUPER-ZINC 1360 INHIBITOR

Emergency Telephone Number

Medical (708) 920-1510 (24 hours)

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