



Product Bulletin

# NALCO<sup>®</sup> C-4710

## *Closed System Treatment*

### PRODUCT DESCRIPTION AND APPLICATION

NALCO C-4710 is a concentrated, dry powder, multifunctional chemical treatment used for the control of corrosion and fouling in closed cooling and chilled water systems.

NALCO C-4710 contains a combination of ferrous and non-ferrous corrosion inhibitors along with a borate buffer, and scale and deposit inhibitor.

### PHYSICAL & CHEMICAL PROPERTIES

These properties are typical. Refer to the Material Safety Data Sheet (MSDS), SECTION 9, for the most current data.

Color	Tan
Form	Powder
Odor	None
pH (1 % solution)	9
Flash Point (PMCC)	None
Solubility in Water	Complete

### ACTIVE CONSTITUENTS

Active	Function
Nitrite	Carbon Steel Corrosion Inhibitor
Mercaptobenzothiazole (MBT)	Copper Alloy Corrosion Inhibitor
Borate	Buffer
Anionic polymer	Scale/Deposit Control

### REGULATORY APPROVALS

NALCO C-4710 is intended for industrial use only. It should not be fed to potable water systems. Please refer to the Material Safety Data Sheet for the most recent approval information.

### MATERIALS OF COMPATIBILITY

Compatible
Buna-N
Nickel

Hypalon
Carbon Steel
Stainless Steel 304
Stainless Steel 316
Polyethylene
Polyvinyl chloride
Teflon
EDPM
Viton

## DOSAGE AND FEEDING

Consult your Nalco representative for complete dosage and feeding information.

**NALCO C-4710** should be fed neat via a closed feed system. A closed feed system is defined as a system in which fluid is moved from a closed storage vessel into a treated media without exposure to the atmosphere except through normal venting or pressure relief devices.

## ENVIRONMENTAL AND TOXICITY DATA

Biological Oxygen Demand (5-day BOD <sub>5</sub> )	Not Available
Chemical Oxygen Demand (COD)	Not Available
Total Organic Carbon (TOC)	Not Available

Refer to SECTIONS 11 and 12 of the Material Safety Data Sheet for all available mammalian and aquatic toxicity information.

## SAFETY AND HANDLING

**NALCO C-4710** is an alkaline product that may cause eye or skin irritation. Chemical-resistant gloves and safety goggles should be worn when handling **NALCO C-4710**. Read SECTION 8 of the Material Safety Data Sheet for specific personal protective equipment (PPE) and SECTION 3 for health effects information before handling **NALCO C-4710**.

## STORAGE

**NALCO C-4710** contains a reportable quantity substance (RQ). All storage vessels of **NALCO C-4710** should be in secondary containment if the storage capacity exceeds the RQ of 127 pounds (57.6 Kg). See SECTION 15 of the Material Safety Data Sheet for this information.

**NALCO C-4710** should be stored in a location where the product temperature can be kept between 35°F (2°C) and 120°F (49°C). To avoid caking, keep the container tightly closed when not in use, and store in a dry location.

**NALCO C-4710** contains an active that is NOT compatible with strong OXIDIZERS, such as chromates, peroxides, hypochlorites, bromine-based microbicides, and other oxidizing agents. **NALCO C-4710** should not be stored near these oxidizers, and should never come in contact with them.

Recommended in-plant storage limit is one year.

## REMARKS

If you need assistance or more information on this product, please call your nearest Nalco Representative. For more news about Nalco Company, visit our website at [www.nalco.com](http://www.nalco.com).

For **Medical and Transportation Emergencies** involving Nalco products, please see the Material Safety Data Sheet for the phone number.

## **ADDITIONAL INFORMATION**

NALCO is a registered trademark of Nalco Company (6/17/04)

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Nalco Company, 1601 West Diehl Road, Naperville, Illinois 60563-1198

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**MATERIAL SAFETY DATA SHEET**

PRODUCT

**NALCO C-4710**

EMERGENCY TELEPHONE NUMBER(S)

(800) 424-9300 (24 Hours) CHEMTREC

**1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION**PRODUCT NAME : **NALCO C-4710**COMPANY IDENTIFICATION :  
Nalco Company  
1601 W. Diehl Road  
Naperville, Illinois  
60563-1198

EMERGENCY TELEPHONE NUMBER(S) : (800) 424-9300 (24 Hours) CHEMTREC

NFPA 704M/HMIS RATING

HEALTH : 2 / 2 FLAMMABILITY : 1 / 1 INSTABILITY : 1 / 1 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 Nitrite	7632-00-0	60.0 - 100.0
Mercaptobenzothiazole	149-30-4	1.0 - 5.0

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

Contains sodium nitrite. May be harmful or fatal if swallowed. Substances in the product can lead to the formation of methemoglobin. Unborn children are particularly sensitive to methemoglobinemia. May cause skin and eye irritation. May cause sensitization by skin contact.

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. If swallowed, seek medical advice immediately and show this container or label. Wear suitable protective clothing, gloves and eye/face protection.

Not flammable or combustible. If product is allowed to dry, the sodium nitrite is an oxidizing agent and can initiate the combustion of other materials. May evolve oxides of carbon (COx) under fire conditions. May evolve oxides of nitrogen (NOx) under fire conditions.

PRIMARY ROUTES OF EXPOSURE :

Eye, Skin

HUMAN HEALTH HAZARDS - ACUTE :

EYE CONTACT :

Can cause mild to moderate irritation.

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**MATERIAL SAFETY DATA SHEET****PRODUCT****NALCO C-4710****EMERGENCY TELEPHONE NUMBER(S)****(800) 424-9300 (24 Hours) CHEMTREC****SKIN CONTACT :**

Can cause mild irritation. Repeated or prolonged contact may cause skin sensitization.

**INGESTION :**

Not a likely route of exposure. Large exposures may be fatal. Ingestion of sodium nitrite can cause methemoglobinemia which can lead to cyanosis and possible death. Pregnant women and their fetuses are particularly sensitive to the effects of methemoglobinemia.

**INHALATION :-**

Not a likely route of exposure. Aerosols or product mist may irritate the upper respiratory tract.

**SYMPTOMS OF EXPOSURE :****Acute :**

A review of available data does not identify any symptoms from exposure not previously mentioned.

**Chronic :**

A review of available data does not identify any symptoms from exposure not previously mentioned.

**AGGRAVATION OF EXISTING CONDITIONS :**

Sodium Nitrite. Pregnant women are particularly sensitive to methemoglobinemia.

**HUMAN HEALTH HAZARDS - CHRONIC :**

Repeated ingestion of small amounts of sodium nitrite causes drops in blood pressure, rapid pulse, headaches and visual disturbances. It may also react with organic amines in the body to form carcinogenic nitrosamines.

**4. FIRST AID MEASURES****EYE CONTACT :**

Immediately flush eye with water for at least 15 minutes while holding eyelids open. If irritation persists, repeat flushing. Get immediate medical attention.

**SKIN CONTACT :**

Immediately flush with plenty of water for at least 15 minutes. If symptoms persist, call a physician.

**INGESTION :**

Induce vomiting if the patient is fully conscious. If conscious, washout mouth and give water to drink. Get immediate medical attention.

**INHALATION :**

Remove to fresh air, treat symptomatically. Get medical attention.

**NOTE TO PHYSICIAN :**

Based on the individual reactions of the patient, the physician's judgement should be used to control symptoms and clinical condition. Measures against circulatory shock, respiratory depression and convulsions may be needed.

**5. FIRE FIGHTING MEASURES****FLASH POINT :**

None

**MATERIAL SAFETY DATA SHEET****PRODUCT****NALCO C-4710****EMERGENCY TELEPHONE NUMBER(S)****(800) 424-9300 (24 Hours) CHEMTREC****EXTINGUISHING MEDIA :**

Not expected to burn. Use extinguishing media appropriate for surrounding fire.

**FIRE AND EXPLOSION HAZARD :**

Not flammable or combustible. If product is allowed to dry, the sodium nitrite is an oxidizing agent and can initiate the combustion of other materials. May evolve oxides of carbon (COx) under fire conditions. May evolve oxides of nitrogen (NOx) 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. 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 :**

Sweep up and shovel. Reclaim into recovery or salvage drums. 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. Use with adequate ventilation. Avoid generating dusts. Have emergency equipment (for fires, spills, leaks, etc.) readily available.

**STORAGE CONDITIONS :**

Store the containers tightly closed. Store away from heat and sources of ignition. Store away from organic chemicals and other oxidizable materials, reducing agents, acids and alkalis. Keep in dry place.

**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)**

Respirable Nuisance TWA: 3 mg/m3

**Particulates**

Inhalable (Total) Nuisance TWA: 10 mg/m3

**Particulates**

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**MATERIAL SAFETY DATA SHEET****PRODUCT****NALCO C-4710****EMERGENCY TELEPHONE NUMBER(S)****(800) 424-9300 (24 Hours) CHEMTREC****OSHA/PEL :**

Substance(s)

Respirable Nuisance

TWA: 5 mg/m3

Particulates

Inhalable (Total)

TWA: 15 mg/m3 (total dust)

Nuisance Particulates

**ENGINEERING MEASURES :**

General ventilation is recommended.

**RESPIRATORY PROTECTION :**

Respiratory protection is not normally needed.

**HAND PROTECTION :**

Neoprene gloves, Nitrile gloves, Butyl gloves, PVC gloves

**SKIN PROTECTION :**

Wear standard protective clothing.

**EYE PROTECTION :**

Wear chemical splash goggles.

**HYGIENE RECOMMENDATIONS :**

If clothing is contaminated, remove clothing and thoroughly wash the affected area. Launder contaminated clothing before reuse. Keep an eye wash fountain available. Keep a safety shower available.

**HUMAN EXPOSURE CHARACTERIZATION :**

Based on our recommended product application and personal protective equipment, the potential human exposure is: Low

**9. PHYSICAL AND CHEMICAL PROPERTIES**

PHYSICAL STATE

Powder

APPEARANCE

Tan

ODOR

None

SOLUBILITY IN WATER

Complete

pH (1 %)

9

Note: These physical properties are typical values for this product and are subject to change.

**10. STABILITY AND REACTIVITY****STABILITY :**

Stable under normal conditions.



**MATERIAL SAFETY DATA SHEET****PRODUCT****NALCO C-4710****EMERGENCY TELEPHONE NUMBER(S)****(800) 424-9300 (24 Hours) CHEMTREC****HAZARDOUS POLYMERIZATION :**

Hazardous polymerization will not occur.

**CONDITIONS TO AVOID :**

Freezing temperatures.

**MATERIALS TO AVOID :**

Contact with reducing agents (e.g. hydrazine, sulfites, sulfide, aluminum or magnesium dust) may generate heat, fires, explosions and toxic vapors. Do not mix with amines. Sodium nitrite can react with certain amines to produce N-nitrosamines, many of which are cancer-causing agents to laboratory animals. Contact with organic materials (e.g. rags, sawdust, hydrocarbon oils or solvents) and avoid reducing agents (e.g. hydrazine, sulfites, sulfide, aluminum or magnesium dust) which can generate heat, fires, explosions and the release of toxic fumes.

**HAZARDOUS DECOMPOSITION PRODUCTS :**

Under fire conditions: Oxides of carbon, Oxides of nitrogen

**11. TOXICOLOGICAL INFORMATION**

No toxicity studies have been conducted on this product.

**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).

**TERATOGENICITY :**

Experimental animal studies with sodium nitrite have shown reproductive effects in the offspring of treated parents. These effects are not transmissible.

**HUMAN HAZARD CHARACTERIZATION :**

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

**12. ECOLOGICAL INFORMATION****ECOTOXICOLOGICAL EFFECTS :**

No toxicity studies have been conducted on this product.

**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: Low

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

**MATERIAL SAFETY DATA SHEET****PRODUCT****NALCO C-4710****EMERGENCY TELEPHONE NUMBER(S)****(800) 424-9300 (24 Hours) CHEMTREC****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: D001

Hazardous wastes must be transported by a licensed hazardous waste transporter and disposed of or treated in a properly licensed hazardous waste treatment, storage, disposal or recycling facility. Consult local, state, and federal regulations for specific requirements.

**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 as follows.

**LAND TRANSPORT :**

Proper Shipping Name :	OXIDIZING SOLID, N.O.S.
Technical Name(s) :	SODIUM NITRITE
UN/ID No :	UN 1479
Hazard Class - Primary :	5.1
Packing Group :	III

Flash Point :	None
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DOT Reportable Quantity (per package) :	127 lbs
DOT RQ Component :	SODIUM NITRITE

**AIR TRANSPORT (ICAO/IATA) :**

Proper Shipping Name :	OXIDIZING SOLID, N.O.S.
Technical Name(s) :	SODIUM NITRITE
UN/ID No :	UN 1479
Hazard Class - Primary :	5.1
Packing Group :	III
IATA Cargo Packing Instructions :	518
IATA Cargo Aircraft Limit :	100 KG (Max net quantity per package)

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

Proper Shipping Name :	OXIDIZING SOLID, N.O.S.
Technical Name(s) :	SODIUM NITRITE
UN/ID No :	UN 1479
Hazard Class - Primary :	5.1
Packing Group :	III

**MATERIAL SAFETY DATA SHEET****PRODUCT****NALCO C-4710****EMERGENCY TELEPHONE NUMBER(S)****(800) 424-9300 (24 Hours) CHEMTREC****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 Nitrite : Target Organ Effect - Kidney, Target Organ Effect - Nervous system, Target Organ Effect - Blood  
Mercaptobenzothiazole : Dermal Sensitizer, Corrosive

CERCLA/SUPERFUND, 40 CFR 117, 302 :

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

RQ Substance

Sodium Nitrite

RQ

127 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 indicated EPA hazard categories:

X	Immediate (Acute) Health Hazard
X	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 contains the following substance(s), (with CAS # and % range) which appear(s) on the List of Toxic Chemicals

Hazardous Substance(s)

Sodium Nitrite

Mercaptobenzothiazole

CAS NO

7632-00-0

149-30-4

% (w/w)

30.0 - 60.0

1.0 - 5.0

TOXIC SUBSTANCES CONTROL ACT (TSCA) :

The substances in this preparation are included on or exempted from the TSCA 8(b) Inventory (40 CFR 710)

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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 116.4 / formerly Sec. 311 :

This product contains the following substances listed in the regulation:

Substance(s)	Citations
• Sodium Nitrite	Sec. 311

CLEAN AIR ACT, 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 Nitrite

7632-00-0

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 :

C - Oxidizing Material, D2A - Materials Causing Other Toxic Effects - Very Toxic Material, D2B - Materials Causing Other Toxic Effects - Toxic Material

CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA) :

The substances in this preparation 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:

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\* 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.

**REFERENCES**

Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices, American Conference of Governmental Industrial Hygienists, OH., (Ariel Insight# CD-ROM Version), Ariel Research Corp., Bethesda, MD.

Hazardous Substances Data Bank, National Library of Medicine, Bethesda, Maryland (TOMES CPS# CD-ROM Version), Micromedex, Inc., Englewood, CO.

IARC Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Man, Geneva: World Health Organization, International Agency for Research on Cancer.

Integrated Risk Information System, U.S. Environmental Protection Agency, Washington, D.C. (TOMES CPS# CD-ROM Version), Micromedex, Inc., Englewood, CO.

Annual Report on Carcinogens, National Toxicology Program, U.S. Department of Health and Human Services, Public Health Service.

Title 29 Code of Federal Regulations, Part 1910, Subpart Z, Toxic and Hazardous Substances, Occupational Safety and Health Administration (OSHA), (Ariel Insight# CD-ROM Version), Ariel Research Corp., Bethesda, MD.

Registry of Toxic Effects of Chemical Substances, National Institute for Occupational Safety and Health, Cincinnati, OH, (TOMES CPS# CD-ROM Version), Micromedex, Inc., Englewood, CO.

Ariel Insight# (An integrated guide to industrial chemicals covered under major regulatory and advisory programs), North American Module, Western European Module, Chemical Inventories Module and the Generics Module (Ariel Insight# CD-ROM Version), Ariel Research Corp., Bethesda, MD.

The Teratogen Information System, University of Washington, Seattle, WA (TOMES CPS# CD-ROM Version), Micromedex, Inc., Englewood, CO.

Prepared By : Product Safety Department

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