Quality People. Building Solutions.

Comfort Systems USA (Arkansas), Inc.
P.O. Box 16620
Little Rock, AR 72231
Phone 501-834-3320
Fax 501-834-5416

Date: 10/10/2023
Return Request: 10/16/2023
Project: ASU Mid-South RC & UC Chiller Replacement
Supplier: Chem-Aqua
Manufacturer: Various
Submittal: Hydronic Water Treatment
Submittal Number: 23 25 00-01
Drawing # and Installation: Mechanical Drawings

ARCHITECT
Witsell Evans Rasco
901 W. Third Street
Little Rock, AR 72201
501-374-5300

ENGINEER
Pettit & Pettit
201 E. Markham St. #400
Little Rock, AR 72201
501-374-3731

GENERAL CONTRACTOR
Baldwin & Shell
3725 Champion Hills Driver, Suite 1300
Memphis, TN 38125
901-755-2952

MECHANICAL SUBCONTRACTOR
Comfort Systems USA (Arkansas), Inc.
9924 Landers Rd.
N. Little Rock, AR 72117
501-834-3320

Notes:

CSUSA PROJECT NO.
23-1024
jon@comfortar.com

August 21, 2023

Chemical Feed Equipment and Treatment Submittal Data For:

ASU Mid-South Reynolds Center & University Center Chiller Replacement
West Memphis, AR

Table of Contents

Submitted To:
Attn: Jon Davis
Comfort Systems USA
Arkansas

Area Technical Consultant:
Tommy English
870-219-9143

Please note that we do not provide any required wiring, piping, or labor for installation or interconnection

CHEM-AQUA 51720

Closed System Inhibitor

Description

CHEM-AQUA 51720 is a liquid nitrite-based inhibitor formulated to provide effective multi-metal corrosion control in recirculating closed heating and cooling water systems. CHEM-AQUA 51720 is a highly buffered product designed to maintain an alkaline pH and may not be suitable for systems containing aluminum. It contains a scale inhibitor to control deposits on heat exchange surfaces. CHEM-AQUA 51720 contains no molybdate or heavy metals and is compatible with alcohol and glycol based antifreezes.

Features

- Excellent multi-metal corrosion control
- Prevents corrosion and deposits in heat exchangers, zone valves and system piping
- Extends equipment life and reduces maintenance costs
- Concentrated, easy-to-use liquid formulation
- Product feed rate is easily monitored

Physical Properties

Physical State:	Liquid
Appearance:	Odorless
Color:	Light yellow
Odor:	Odorless
pH:	13.5
Specific Gravity:	1.3
Density:	10.84 lbs./gal.

Consult the label for complete directions and precautions before using this product.

Chem-Aqua, Inc. • P.O. Box 152170 • Irving, Texas 75015 • 1-866-209-3373 • www.chemaqua.com
Irving, TX • Monmouth, NJ • Jacksonville, FL • Indianapolis, IN • Macon, GA • Las Vegas, NV • San Jose, CA • Brampton, ON

Safety Data Sheet CHEM-AQUA 51720

Supercedes Date 07/22/2013 **Issuing Date** 04/05/2017

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name CHEM-AQUA 51720
Recommended use Water treatment chemical
Information on Manufacturer
CHEM-AQUA, INC
BOX 152170
IRVING, TEXAS 75015

Product Code 80TZ
Chemical nature Aqueous solution Alkaline
Emergency Telephone Number
CHEMTREC® 800-424-9300
Telephone inquiry
972-579-2477

2. HAZARD IDENTIFICATION

Color Light yellow **Physical state** Liquid **Odor** Odorless

GHS Classification

Physical Hazards

Corrosive to Metals	Category 1

Health Hazard

Acute Oral Toxicity	Category 3
Skin Corrosion/Irritation	Category 1
Serious Eye Damage/Eye Irritation	Category 1
Reproductive Toxicity	Category 2

Other hazards
None

Labeling
Signal Word
DANGER

Hazard statements
H314 - Causes severe skin burns and eye damage
H301 - Toxic if swallowed
H361 - Suspected of damaging fertility or the unborn child
H290 - May be corrosive to metals

Precautionary Statements
P202 - Do not handle until all safety precautions have been read and understood
P280 - Wear protective gloves, protective clothing, eye protection and face protection.
P264 - Wash face, hands and any exposed skin thoroughly after handling.
P260 - Do not breathe mist
P270 - Do not eat, drink or smoke when using this product.
P303 + P361 + P353 - IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower.
P332 + P313 - If skin irritation occurs, get medical attention.
P363 - Wash contaminated clothing before reuse.
P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310 - Immediately call a physician.
P304 + P340 - IF INHALED: Remove person to fresh air and keep at rest in a position comfortable for breathing.
P342 + P311 - If experiencing respiratory symptoms, call a physician.
P301+ P330 + P331 - IF SWALLOWED: Rinse mouth. DO NOT induce vomiting. Call a physician if unwell.
P390 - Absorb spillage to prevent damage.
P406 - Store in a corrosion-resistant container.
P501 - Dispose of contents and container in accordance with applicable local regulations.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Component	CAS No.	Weight %
Sodium nitrite	7632-00-0	15-40

Sodium tetraborate	1330-43-4	1-5
Sodium hydroxide	1310-73-2	0.1-1

*The exact percentage (concentration) of composition has been withheld as a trade secret

4. FIRST AID MEASURES

General advice Do not get in eyes, on skin or on clothing. Do not breathe mist.

Eye Contact Immediately flush with plenty of water. After initial flushing, remove any contact lenses and continue flushing for at least 15 minutes. Get medical attention immediately.

Skin Contact Remove immediately all contaminated clothing. Wash off immediately with plenty of water for at least 15 minutes. Get medical attention immediately.

Inhalation Move to fresh air. In case of shortness of breath, give oxygen. If not breathing, give artificial respiration. Get medical attention immediately.

Ingestion Drink 1 or 2 glasses of water. Do NOT induce vomiting. Get medical attention immediately. Never give anything by mouth to an unconscious person. Rinse mouth.

Notes to physician The product causes burns of eyes, skin and mucous membranes. Control of circulatory system, shock therapy if needed. Since reversion of methemoglobin to hemoglobin occurs spontaneously after termination of exposure, moderate degrees of cyanosis need to be treated only by supportive measures.

5. FIRE-FIGHTING MEASURES

Flash Point Does not flash **Method** No data available

Flammability Limits in Air %: Hydrogen, by reaction with metals. **Upper:** 75 **Lower:** 4

Suitable Extinguishing Media

Foam. Alcohol-resistant foam. Carbon dioxide (CO2). Dry chemical. Water spray. Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Specific hazards arising from the chemical

Material can create slippery conditions. Contact with metals liberates flammable hydrogen gas.

Protective Equipment and Precautions for Firefighters

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

NFPA **Health** 3 **Flammability** 0 **Instability** 0

HMIS **Health** 3 **Flammability** 0 **Instability** 0

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions Use personal protective equipment. Ensure adequate ventilation. Prevent further leakage or spillage if safe to do so. Material can create slippery conditions.

Environmental Precautions Prevent further leakage or spillage if safe to do so. Do not flush into surface water or sanitary sewer system. Local authorities should be advised if significant spillages cannot be contained.

Methods for Containment Contain spillage, soak up with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and transfer to a container for disposal according to local / national regulations (see section 13).

Methods for Cleaning Up Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust).

Neutralizing Agent Acetic acid, diluted.

7. HANDLING AND STORAGE

Handling Do not get in eyes, on skin or on clothing. Do not breathe mist.

Storage Store in original container. Keep containers tightly closed in a dry, cool and well-ventilated place. Metal containers must be lined. Freezing will affect the physical condition but will not damage the material. Thaw and mix before using.

Storage Temperature **Minimum** 35 °F / 2 °C **Maximum** 120 °F / 49 °C

Storage Conditions **Indoor** X **Outdoor** **Heated** **Refrigerated**

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure Guidelines

Component	ACGIH TLV	OSHA PEL	NIOSH
Sodium tetraborate	TWA: 2 mg/m^3 inhalable fraction STEL: 6 mg/m^3	No data available	TWA: 1 mg/m^3
Sodium hydroxide	Ceiling: 2 mg/m^3	TWA: 2 mg/m^3	10 mg/m^3 Ceiling: 2 mg/m^3

Engineering Measures Where reasonably practicable this should be achieved by the use of local exhaust ventilation and good general extraction. Ensure adequate ventilation, especially in confined areas.

Personal Protective Equipment

Eye/Face Protection	Tightly fitting safety goggles. Face-shield.
Skin Protection	Wear suitable protective clothing, Impervious gloves.
Respiratory Protection	In case of inadequate ventilation wear respiratory protection. When workers are facing concentrations above the exposure limit they must use appropriate certified respirators.
General Hygiene Considerations	Ensure that eyewash stations and safety showers are close to the workstation location. Remove and wash contaminated clothing before re-use.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state	Liquid	**Viscosity**	Non viscous
Color	Light yellow	**Odor**	Odorless
Odor Threshold	Not applicable	**Appearance**	Transparent - Hazy
pH	13.5	**Specific Gravity**	1.3
Evaporation Rate	0.37 (Butyl acetate=1)	**Percent Volatile (Volume)**	76.1
VOC Content (%)	0	**VOC Content (g/L)**	0
Vapor Pressure	11.5 mmHg @ 70°F	**Vapor Density**	0.6 (Air = 1.0)
Solubility	Completely soluble	**n-Octanol/Water Partition**	No data available
Melting Point/Range	No data available	**Decomposition Temperature**	No data available
Boiling Point/Range	225 °F / 107 °C	**Flammability (solid, gas)**	No data available
Flash Point	Does not flash	**Method**	No data available
Autoignition Temperature	No information available.		
Flammability Limits in Air %:	Hydrogen, by reaction with metals	**Upper:** 75 **Lower:** 4	

10. STABILITY AND REACTIVITY

Chemical Stability	Stable. Hazardous polymerization does not occur.
Conditions to Avoid	None known.
Incompatible Products	Strong oxidizing agents, Reducing agents, Acids, Strong bases, Amines, Ammonium salts, Cyanides, Aldehydes, Halogenated hydrocarbon, Alkali metals, Contact with metals liberates hydrogen gas.
Decomposition Temperature	No data available
Hazardous Decomposition Products	Carbon oxides, Nitrogen oxides (NOx), Oxides of phosphorus, Phosphorus compounds, Sodium oxides, Hydrogen, by reaction with metals.
Possibility of Hazardous Reactions	None under normal processing.

11. TOXICOLOGICAL INFORMATION

Product Information — No information available.

The following values are calculated based on chapter 3.1 of the GHS document

Oral LD50	No information available
Dermal LD50	No information available
Inhalation LC50	
Gas	No information available
Mist	No information available
Vapor	No information available

Principle Route of Exposure	Skin contact, Eye contact, Inhalation.
Primary Routes of Entry	Ingestion.
Acute Effects:	
Eyes	Corrosive to the eyes and may cause severe damage including blindness.
Skin	Causes skin burns.
Inhalation	Harmful by inhalation. Causes burns.
Ingestion	If ingested, severe burns of the mouth and throat, as well as a danger of perforation of the esophagus and the stomach. Blood disorder may occur after ingestion. Toxic if swallowed. Components of the product create formation of methemoglobin. Lowered blood pressure.
Chronic Toxicity	Inhaled corrosive substances can lead to a toxic edema of the lungs. Contains a known or suspected reproductive toxin.
Target Organ Effects	Respiratory system, Eyes, Skin.
Aggravated Medical Conditions	Skin disorders, Respiratory disorders.

Component Information

Acute Toxicity

Component	Oral LD50	Dermal LD50	Inhalation LC50	Draize Test	Other
Sodium nitrite 7632-00-0	= 85 mg/kg (Rat)	no data available	= 5.5 mg/L (Rat) 4 h	No data available	No data available
Sodium tetraborate	= 2660 mg/kg (Rat)	> 2000 mg/kg (Rabbit)	No data available	No data available	No data available

1330-43-4					
Sodium hydroxide 1310-73-2	No data available	= 1350 mg/kg (Rabbit)	No data available	No data available	No data available

Chronic Toxicity

Component	Mutagenicity	Sensitization	Developmental Toxicity	Reproductive Toxicity	Target Organ Effects
Sodium tetraborate 1330-43-4	No data available	No data available	No data available	X	Skin; Eyes; Respiratory system
Sodium hydroxide 1310-73-2	No data available	No data available	No data available	No data available	Skin; Eyes; Respiratory system

Carcinogenicity There are no known carcinogenic chemicals in this product.

12. ECOLOGICAL INFORMATION

Product Information No information available.

Component Information

Component	Toxicity to Algae	Toxicity to Fish	Microtox	Crustacea	Partition coefficien
Sodium nitrite	No information available.	LC50 = 0.19 mg/L Oncorhynchus mykiss 96 h LC50 0.092 - 0.13 mg/L Oncorhynchus mykiss 96 h LC50 0.4 - 0.6 mg/L Oncorhynchus mykiss 96 h LC50 0.65 - 1 mg/L Oncorhynchus mykiss 96 h LC50 = 2.3 mg/L Pimephales promelas 96 h LC50 = 20 mg/L Pimephales promelas 96 h	No information available	No information available.	-3.7
Sodium tetraborate	EC50 = 158 mg/L Desmodesmus subspicatus 96 h EC50 2.6 - 21.8 mg/L Pseudokirchneriella subcapitata 96 h	LC50 = 340 mg/L Limanda limanda 96 h	No information available	1085 - 1402: 48 h Daphnia magna mg/L LC50	N/A
Sodium hydroxide	No information available.	LC50 = 45.4 mg/L Oncorhynchus mykiss 96 h	No information available	No information available.	N/A

Persistence and Degradability No information available.
Bioaccumulation No information available.
Mobility No information available.

13. DISPOSAL CONSIDERATIONS

Product Disposal Dispose of in accordance with local regulations.
Container Disposal Empty containers should be taken for local recycling, recovery, or waste disposal.

14. TRANSPORT INFORMATION

DOT

Proper Shipping Name Corrosive liquids, n.o.s.
Hazard Class 8
UN-No UN1760
Packing Group II
Reportable Quantity (RQ) Sodium nitrite, RQ kg = 122.70
Description UN1760,Corrosive liquids, n.o.s.(Sodium Hydroxide, Sodium nitrite), 8, PG II

TDG

Proper shipping name Corrosive liquids, n.o.s.
Hazard Class 8
UN-No UN1760
Packing Group II
Description UN1760, Corrosive Liquids, N.O.S.,(Sodium Hydroxide, Sodium Nitrite),8,PG II

ICAO

UN-No UN1760
Proper Shipping Name Corrosive liquids, n.o.s.

Hazard Class 8
Packing Group II
Shipping Description UN1760, Corrosive liquids, n.o.s.,(Sodium Hydroxide, Sodium Nitrite),8, PG II

IATA
UN-No UN1760
Proper Shipping Name Corrosive liquids, n.o.s.
Hazard Class 8
Packing Group II
Shipping Description UN1760, Corrosive liquids, n.o.s.,(Sodium Hydroxide, Sodium Nitrite),8, PG II

IMDG/IMO
Proper Shipping Name Corrosive liquids, n.o.s.
Hazard Class 8
UN-No UN1760
Packing Group II
EmS No. F-A, S-B
Description UN1760, Corrosive liquids, n.o.s.,(Sodium Hydroxide, Sodium Nitrite),8,PG II

15. REGULATORY INFORMATION

Inventories
TSCA Complies
DSL Complies
U.S. Federal Regulations

SARA 313
Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product contains a chemical or chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372:

Component	CAS No.	Weight %	SARA 313 - Threshold Values
Sodium nitrite	7632-00-0	15-40	1.0

SARA 311/312 Hazardous Categorization

Acute Health Hazard	Chronic Health Hazard	Fire Hazard	Sudden Release of Pressure Hazard	Reactive Hazard
Yes	Yes	No	No	No

CERCLA

Component	Hazardous Substances RQs	CERCLA EHS RQs
Sodium nitrite	100 lb	Not applicable
Sodium hydroxide	1000 lb	Not applicable

16. OTHER INFORMATION

Prepared By Adrienne McKee
Supercedes Date 07/22/2013
Issuing Date 04/05/2017
Reason for Revision No information available.
Glossary No information available.
List of References. No information available.

CHEM-AQUA, INCassumes no responsibility for personal injury or property damage caused by the use, storage, or disposal of the product in a manner not recommended on the product label. Users assume all risks associated with such unrecommended use, storage or disposal of the product. The information provided on this document is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guide for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered as a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other material or in any process, unless specified in the text.

Item 2

CHEM-AQUA 61503

Closed Loop Cleaner

Description

CHEM-AQUA 61503 is a non-acid blend of sequestering, dispersing, and surface active agents for the removal of oil coatings, grease, mill scale, metallic oxides, and organic debris from closed new systems. Use of CHEM-AQUA 61503 in new systems institutes system cleanliness as well as protection as the first step toward process efficiency and equipment preservation. This product is especially designed for pre-commission cleaning of new systems.

With the use of Chem-Aqua 61503 treatment, improved corrosion inhibitor performance is achieved due to reduced interference from oil and grease coatings, metallic oxides, and organic debris. It also minimizes the potential for MB induced corrosion by reducing and removing the oil and greased based organic deposits, nutrient sources for bacteria, and other conditions for an anaerobic environment. Unlike acid or chelant based cleaners this product does not dissolve base metals. CHEM-AQUA 61503 can also be used to clean piping and auxiliary equipment in new industrial water systems. To avoid excessive foaming, make sure air bleed vents are operating correctly. Antifoam may be required. CHEM-AQUA 61503 solutions are not recommended for contact with galvanized or aluminum metallurgy. The product should be used in accordance with the cleaning procedure that CHEM-AQUA established for pre-operational cleaning.

Features

- Removes oil based coatings, organic debris, mill scale, and metallic oxides
- Sequesters and disperses iron, will sequester loosely bound iron, and facilitates the removal of iron from the system
- Penetrates, disperses, and cleans oily and grease coatings
- Increases equipment life and operating efficiency
- Minimizes down time and decreases maintenance cost
- Product residual can be monitored
- Concentrated, easy-to-use liquid formulation

Physical Properties

Physical State:	Liquid
Appearance:	Transparent-Cloudy
Color:	Colorless to Light yellow
Odor:	Mild
pH:	11.9
Specific Gravity:	1.033
Density:	8.62 lbs. /gal.

Consult the label for complete directions and precautions before using this product.

Safety Data Sheet: CHEM-AQUA 61503, 45 LB, NAC CA

Supercedes Date: Not applicable **Issuing Date:** 12/22/2020

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: CHEM-AQUA 61503, 45 LB, NAC CA
Recommended use Cleaning agent
Information on Manufacturer
CHEM-AQUA, INC

BOX 152170
IRVING, TEXAS 75015

Product Code: 2C85
Chemical nature Aqueous solution of alkali salts
Emergency Telephone
CHEMTREC® 800-424-9300
Telephone inquiry
972-579-2477

2. HAZARD IDENTIFICATION

Color Colorless to Light yellow **Physical state** Liquid **Odor** Mild

GHS Classification

Physical Hazards

Corrosive to Metals	Category 1

Health Hazard

Skin Corrosion/Irritation	Category 1
Serious Eye Damage/Eye Irritation	Category 1

Other hazards
None

Labeling
Signal Word
DANGER

Hazard statements
H314 - Causes severe skin burns and eye damage
H290 - May be corrosive to metals

Precautionary Statements
P280 - Wear protective gloves, protective clothing, eye protection and face protection.
P264 - Wash face, hands and any exposed skin thoroughly after handling.
P260 - Do not breathe mist.
P303 + P361 + P353 - IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower.
P332 + P313 - If skin irritation occurs, get medical attention.
P363 - Wash contaminated clothing before reuse
P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P304 + P340 - IF INHALED: Remove person to fresh air and keep comfortable for breathing
P342 + P311 - If experiencing respiratory symptoms, call a physician.
P301+ P330 + P331 - IF SWALLOWED: Rinse mouth. DO NOT induce vomiting. Call a physician if unwell.
P390 - Absorb spillage to prevent damage.
P406 - Store in corrosion resistant container with a resistant inner liner
P501 - Dispose of contents and container in accordance with applicable regulations

3. COMPOSITION / INFORMATION ON INGREDIENTS

Chemical name	CAS No.	Weight-%
Alcohols, C9-11, ethoxylated	68439-46-3	3-7
Sodium hydroxide	1310-73-2	1-5

*The exact percentage (concentration) of composition has been withheld as a trade secret

4. FIRST AID MEASURES

General advice Do not get in eyes, on skin or on clothing. Do not breathe mist.

Eye Contact Immediately flush with plenty of water. After initial flushing, remove any contact lenses and continue flushing for at least 15 minutes. Get medical attention immediately.

Skin Contact Remove immediately all contaminated clothing. Wash off immediately with plenty of water for at least least 15 minutes. Get medical attention immediately.

Inhalation Move to fresh air. In case of shortness of breath, give oxygen. If breathing has stopped, apply artificial artificial respiration. Get medical attention immediately.

Ingestion Drink 1 or 2 glasses of water. Do NOT induce vomiting. Get medical attention immediately. Never give anything by mouth to an unconscious person.

Notes to physician Treat symptomatically. The product causes burns of eyes, skin and mucous membranes. Control of circulatory system, shock therapy if needed.

5. FIRE-FIGHTING MEASURES

Flash Point Does not flash **Method** No data available

Flammability Limits in Air %: Hydrogen, by reaction with metals. **Upper:** 75 **Lower:** 4

Suitable Extinguishing Media

Carbon dioxide (CO2). Dry chemical. Water spray. Foam. Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Specific hazards arising from the chemical

Contact with metals may evolve flammable hydrogen gas. Material can create slippery conditions.

Protective Equipment and Precautions for Firefighters

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

NFPA	**Health** 3	**Flammability** 0	**Instability** 0
HMIS -	**Health** 3	**Flammability** 0	**Physical Hazard** 0

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions Use personal protective equipment. Prevent further leakage or spillage if safe to do so. Material can create slippery conditions.

Environmental precautions Do not flush into surface water or sanitary sewer system.

Methods for Containment Contain spillage, soak up with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and transfer to a container for disposal according to local / national regulations (see section 13).

Methods for Cleaning Up Pick up and transfer to properly labeled containers.

Neutralizing Agent Acetic acid, diluted.

7. HANDLING AND STORAGE

Handling Do not get in eyes, on skin or on clothing. Do not breathe mist.

Storage Store in original container. Keep containers tightly closed in a dry, cool and well-ventilated place. Metal containers must be lined. Freezing will affect the physical condition but will not damage the material. Thaw and mix before using.

Storage Temperature **Minimum** 32 °F / 0 °C **Maximum** 122 °F / 50 °C

Storage Conditions **Indoor** X **Outdoor** **Heated** **Refrigerated**

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure Guidelines

Chemical name	ACGIH TLV	OSHA PEL	NIOSH
Sodium hydroxide	Ceiling: 2 mg/m^3	TWA: 2 mg/m^3	10 mg/m^3 Ceiling: 2 mg/m^3

Engineering Measures Ensure adequate ventilation, especially in confined areas. Where reasonably practicable this should should be achieved by the use of local exhaust ventilation and good general extraction.

Personal Protective Equipment

Eye/Face Protection Tightly fitting safety goggles. Face-shield.

Skin Protection Wear suitable protective clothing, Impervious gloves.

Respiratory Protection In case of inadequate ventilation wear respiratory protection. When workers are facing concentrations above the exposure limit they must use appropriate certified respirators.

General Hygiene Considerations Wear protective gloves/clothing. Ensure that eyewash stations and safety showers are close to the workstation location. Remove and wash contaminated clothing before re-use.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state	Liquid	**Viscosity**	Non viscous
Color	Colorless to Light yellow	**Odor**	Mild

Odor Threshold	Not applicable	**Appearance**	Transparent - Cloudy
pH	11.9	**Specific Gravity**	1.033
Evaporation Rate	No information available	**Percent Volatile (Volume)**	0
VOC Content (%)	0	**VOC Content (g/L)**	0
Vapor pressure	15.78 mmHg @ 70°F	**Vapor Density**	No information available
Solubility	Soluble	**n-Octanol/Water Partition**	No data available
Melting Point/Range	No data available	**Decomposition Temperature**	No data available
Boiling Point/Range	Not applicable	**Flammability (solid, gas)**	No data available
Flash Point	Does not flash	**Method**	No data available
Autoignition Temperature	No information available.		
Flammability Limits in Air %:	Hydrogen, by reaction with metals	**Upper:** 75 **Lower:** 4	

10. STABILITY AND REACTIVITY

Chemical Stability	Stable. Hazardous polymerization does not occur.
Conditions to Avoid	Keep away from open flames, hot surfaces, and sources of ignition, Extremes of temperature and direct sunlight.
Incompatible Products	Strong oxidizing agents, Contact with metals liberates hydrogen gas.
Decomposition Temperature	No data available
Hazardous Decomposition Products	Carbon oxides, Oxides of phosphorus, Sodium oxides, Hydrogen, by reaction with metals.
Possibility of Hazardous Reactions	None under normal processing.

11. TOXICOLOGICAL INFORMATION

Product Information — No information available.

The following values are calculated based on chapter 3.1 of the GHS document

Oral LD50	No information available
Dermal LD50	No information available
Inhalation LC50	
Gas	No information available
Mist	No information available
Vapor	No information available

Principle Route of Exposure	Skin contact, Eye contact, Inhalation.
Primary Routes of Entry	Ingestion.
Acute Effects:	
Eyes	Corrosive to the eyes and may cause severe damage including blindness.
Skin	Causes skin burns.
Inhalation	Harmful by inhalation. Causes burns.
Ingestion	If ingested, severe burns of the mouth and throat, as well as a danger of perforation of the esophagus and the stomach.
Chronic Toxicity	Inhaled corrosive substances can lead to a toxic edema of the lungs.
Target Organ Effects:	Respiratory system, Skin, Eyes.
Aggravated Medical Conditions	Skin disorders, Respiratory disorders.

Component Information

Acute Toxicity

Chemical name	Oral LD50	Dermal LD50	Inhalation LC50	Draize Test	Other
Alcohols, C9-11, ethoxylated 68439-46-3	1400 mg/kg (Rat)	> 2000 mg/kg (Rabbit)	No data available	No data available	No data available
Sodium hydroxide 1310-73-2	= 325 mg/kg (Rat)	= 1350 mg/kg (Rabbit)	No data available	No data available	No data available

Chronic Toxicity

Chemical name	Mutagenicity	Sensitization	Developmental Toxicity	Reproductive Toxicity	Target Organ Effects
Sodium hydroxide 1310-73-2	No data available	No data available	No data available	No data available	Skin; Eyes; Respiratory system

Carcinogenicity — There are no known carcinogenic substances in this product.

12. ECOLOGICAL INFORMATION

Product Information — No information available.

Additional Ecological Information: No information available

Component Information

Chemical name	Toxicity to Algae	Toxicity to Fish	Microtox	Crustacea	Partition coefficient
Sodium hydroxide	No information available.	LC50 = 45.4 mg/L Oncorhynchus mykiss 96 h	No information available	No information available.	N/A

Persistence and Degradability No information available.
Bioaccumulation No information available.
Mobility No information available.

13. DISPOSAL CONSIDERATIONS

Product Disposal Dispose of in accordance with local regulations.
Container Disposal Empty containers should be taken for local recycling, recovery, or waste disposal. Do not re-use empty containers.

14. TRANSPORT INFORMATION

DOT
- **Proper Shipping Name** CORROSIVE LIQUID, BASIC, INORGANIC, N.O.S.,(SODIUM HYDROXIDE)
- **Hazard Class** 8
- **UN-No** UN3266
- **Packing Group** II
- **Description** UN3266, CORROSIVE LIQUID, BASIC, INORGANIC, N.O.S.,(SODIUM HYDROXIDE), 8, PG II

TDG
- **Proper shipping name** CORROSIVE LIQUID, BASIC, INORGANIC, N.O.S.,(SODIUM HYDROXIDE)
- **Hazard Class** 8
- **UN-No** UN3266
- **Packing Group** II
- **Description** UN3266, CORROSIVE LIQUID, BASIC, INORGANIC, N.O.S.,(SODIUM HYDROXIDE), 8, PG II

ICAO
- **UN-No** UN3266
- **Proper Shipping Name** CORROSIVE LIQUID, BASIC, INORGANIC, N.O.S.,(SODIUM HYDROXIDE)
- **Hazard Class** 8
- **Packing Group** II
- **Shipping Description** UN3266, CORROSIVE LIQUID, BASIC, INORGANIC, N.O.S.,(SODIUM HYDROXIDE), 8, PG II

IATA
- **UN-No** CORROSIVE LIQUID, BASIC, INORGANIC, N.O.S.,(SODIUM HYDROXIDE)
- **Proper Shipping Name** UN3266
- **Hazard Class** 8
- **Packing Group** II
- **Shipping Description** UN3266, CORROSIVE LIQUID, BASIC, INORGANIC, N.O.S.,(SODIUM HYDROXIDE), 8, PG II

IMDG/IMO
- **UN proper shipping name** CORROSIVE LIQUID, BASIC, INORGANIC, N.O.S.,(SODIUM HYDROXIDE)
- **Hazard Class** 8
- **UN Number** UN3266
- **Packing Group** II
- **Description** UN3266, CORROSIVE LIQUID, BASIC, INORGANIC, N.O.S.,(SODIUM HYDROXIDE), 8, PG II

15. REGULATORY INFORMATION

Inventories
TSCA Complies
DSL Complies
U.S. Federal Regulations

SARA 313
Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372.

SARA 311/312 Hazardous Categorization
See Section 2

CERCLA

Chemical name	Hazardous Substances RQs	CERCLA EHS RQs

Sodium hydroxide	1000 lb	Not applicable

16. OTHER INFORMATION

Prepared By Pamela Starkey
Supercedes Date: Not applicable
Issuing Date: 12/22/2020
Reason for Revision No information available.
Glossary No information available.
List of References. No information available.

CHEM-AQUA, INCassumes no responsibility for personal injury or property damage caused by the use, storage, or disposal of the product in a manner not recommended on the product label. Users assume all risks associated with such unrecommended use, storage or disposal of the product. The information provided on this document is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guide for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered as a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other material or in any process, unless specified in the text.

Pre-Operational Cleaning Procedure
New Closed Loop Systems (CHEM-AQUA 61503)

Technical Bulletin 3-007
Closed Systems

The Importance of Pre-Operational Cleaning

Pre-operational cleaning is an important part of the water treatment program for closed heating and cooling water loops. New closed loop piping must be cleaned to remove cutting oils, soldering fluxes, pipe sealants, welding slag, mill scale, and other construction debris before being placed into service. The immediate addition of an effective closed loop inhibitor to the cleaned system is necessary to keep corrosion and other waterside problems under control.

Safety Precautions

Carefully read the labels and Safety Data Sheets (SDS) on all treatment products involved before starting any cleaning procedure. Follow all safety precautions when handling these products, and wear appropriate protective gear. An eye wash station and safety shower with a supply of potable water should always be close at hand and tested for proper operation.

Pre-Operational Cleaning Procedure

1. Follow any manufacturer or contractor specifications on the cleaning procedure chemicals, time, and use of system recirculating pumps. Configure control valves to ensure all system piping and equipment to be cleaned receives good circulation during cleaning, flushing, and corrosion inhibitor additions.

2. Open the high point vent(s) and fill the system completely with clean water. Circulate with all primary and booster pumps running. Maintain a minimum flow velocity of 3 ft./sec through all piping and equipment to be cleaned. Periodically flush low point drains, strainers, expansion tanks, air/sediment separators, control valves, etc. while circulating to help remove any debris that has been dislodged.

3. If the system water is dirty, flush with circulation until the water is clear.

4. **WARNING:** Identify and bypass any equipment containing aluminum, galvanized steel, or any other metallurgy that is not compatible with alkaline cleaning solutions to avoid permanent damage.

5. Add 2.5 gallons CHEM-AQUA 61503 (alkaline cleaner) per 1,000 gallons system volume. For systems with heavy oil or dirt contamination, add 5 gallons CHEM-AQUA 61503 per 1,000 gallons. For passivation, Chem-Aqua 655T (phosphate) can be added at 1 to 2 quarts per 1,000 gallons. Do not mix concentrated chemicals in the bypass feeder.

6. Heavy foaming may occur based on dosage, system design, and operating conditions. Add an antifoam such as FC 101 at 4-16 fluid ounces per 1,000 gallons system volume as necessary or with the other chemicals.

7. Circulate cleaning solution through all piping and equipment to be cleaned for 4 to 24 hours. Circulation less than 8 hours may require higher chemical additions. Extended circulation times up to 72 hours may be acceptable. Water temperature should be monitored to ensure system design temperatures are not exceeded.

8. When the cleaning step is complete, drain the system, refill with fresh water, and circulate to ensure good mixing. Then initiate a heavy bleed to flush the system until the water is clear and free of foam OR repeatedly drain and refill the system until the water is clear. When flushing is complete, the conductivity of the system water should be approximately equal to the makeup water. **Avoid long flushing times (days) which can result in flash corrosion and red water problems.** If extended flushing times are required, the addition of Chem-Aqua 655T at 1 to 2 pints per 1000 gallons prior to flushing can reduce the potential for red water problems.

CHEM-AQUA®

9. If the system recirculating pumps are used, strainers should be removed and cleaned after the cleaning solution is drained. It may be necessary to manually clean control valves to remove any insoluble debris loosened by the cleaning process.

10. Immediately after flushing is completed, add the closed loop corrosion inhibitor at the maximum target dosage to quickly establish a protective film on metal surfaces. Failure to add corrosion inhibitor immediately after flushing can result in corrosion and red water problems.

Notes

- Ensure all chemicals and procedures comply with any applicable Local, State and Federal EPA regulations for discharge.
- Bag, cartridge, or media (HPF Filter) filtration is highly recommended for all closed loop systems to remove suspended matter that can interfere with corrosion protection and cause deposit problems.
- At 2500-5000 ppm feed rate, CHEM-AQUA 61503 solution will contribute the following: Phosphate 70 - 140 ppm as PO_4, BOD 82-185 ppm, pH 11-11.5, and Conductivity 530 - 992 µS.

Updated: SEP 24, 2021

Chem-Aqua
580 Joe Tamplin Ind Blvd Ste 300 Macon, GA 31217
Phone (478) 803-6100 Fax (478) 803-6170

Important Information About The Water Treatment Program

For
ASU Mid-South Reynolds Center & University Center Chiller Replacement
West Memphis, AR
August 21, 2023

We need your assistance to help prevent system damage from occurring due to any of the following problems that may occur during the startup of a new cooling tower, boiler, or closed system. The success of the water treatment program will be dramatically affected by these procedures. Please contact the local Technical Service Representative listed below or Jeff Coleman in the Macon office for any required supervision or assistance. To prevent corrosion and scale from occurring, systems should not be started up and operated without CHEM-AQUA first being contacted.

1. To prevent corrosion and scale from occurring, chemical feed and control equipment must be installed before systems are started up and operated.

2. To prevent corrosion and scale from occurring, water treatment chemicals must be added before the systems are started up and operated.

3. To prevent corrosion from occurring, untreated water from pressure/leak testing cannot be left sitting in system piping.

4. To prevent corrosion and deposition from occurring, dirt/mud must not be allowed to accumulate in the cooling tower system. Good circulation through all portions of system piping must be established and maintained during startup and subsequent operation. Stagnant water (dead legs) cannot be effectively treated and must be avoided.

5. Someone should contact CHEM-AQUA between visits if the chemical drums run empty.

6. Someone on site must take responsibility for testing/checking the water treatment program especially prior to turning the building over to the owner.

We will work with everyone involved to help insure a smooth and successful startup of new systems. However, we cannot be held responsible for any damage that may occur due to any of the above factors or others which are beyond our control. By working together, we can provide the type of successful water treatment program necessary to insure years of trouble free operation.

Area Technical Service Representative
Tommy English
870-219-9143