SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006
NALCO® 77211

Section: 1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1 Product identifier: NALCO® 77211
Substance type: CLP Mixture

1.2 Relevant identified uses of the substance or mixture and uses advised against:

Use of the Substance/Mixture: OXYGEN SCAVenger
Identified uses: Boiler treatment under 1T per day
Recommended restrictions on use: Reserved for industrial and professional use.

1.3 Details of the supplier of the safety data sheet:

COMPANY IDENTIFICATION
NALCO EUROPE B.V.
Postbus 627
2300 AP Leiden, The Netherlands
TEL: 0031 71 5241100

LOCAL COMPANY IDENTIFICATION
Nalco Ltd.
P.O. BOX 11, WINNINGTON AVENUE
NORTHWICH, CHESHIRE, U.K. CW8 4DX
TEL: +44 (0)1606 74488

For Product Safety information please contact: msdseame@nalco.com

1.4 Emergency telephone number: +32-(0)3-575-5555 Trans-European

Date of Compilation/Revision: 18.09.2017
Version Number: 1.6

Section: 2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

Classification (REGULATION (EC) No 1272/2008)

Acute toxicity, Category 4 H302

2.2 Label elements

Labelling (REGULATION (EC) No 1272/2008)

Hazard pictograms:

Signal Word: Warning

Hazard Statements: H302 Harmful if swallowed.
Supplemental Hazard Statements: EUH031 Contact with acids liberates toxic gas.
Precautionary Statements: Prevention:
P264 Wash skin thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
NALCO® 77211

P280
Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response:
P301+P310
IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.

P330
Rinse mouth.

Storage:
P405
Store locked up.

Hazardous components which must be listed on the label:
Sodium Bisulfite
Cobalt Sulfate

2.3 Other hazards
None known.

Section: 3. COMPOSITION/INFORMATION ON INGREDIENTS

3.2 Mixtures
Hazardous components

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS-No.</th>
<th>EC-No.</th>
<th>REACH No.</th>
<th>Classification (REGULATION (EC) No 1272/2008)</th>
<th>Concentration: [%]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium Bisulfite</td>
<td>7631-90-5</td>
<td>231-548-0</td>
<td>01-2119524563-42</td>
<td>Acute toxicity Category 4; Respiratory sensitization Category 1; Skin sensitization Category 1; Germ cell mutagenicity Category 2; Carcinogenicity Category 1B; Reproductive toxicity Category 1B; Acute aquatic toxicity Category 1; Chronic aquatic toxicity Category 1</td>
<td>30 - &lt; 50</td>
</tr>
<tr>
<td>Cobalt Sulfate</td>
<td>10124-43-3</td>
<td>233-334-2</td>
<td>01-2119517426-41</td>
<td>Note 1 Acute toxicity Category 4; H302 Respiratory sensitization Category 1; H334 Skin sensitization Category 1; H317 Germ cell mutagenicity Category 2; H341 Carcinogenicity Category 1B; H350 Reproductive toxicity Category 1B; H360F Acute aquatic toxicity Category 1; H400 Chronic aquatic toxicity Category 1; H410</td>
<td>0.01 - &lt; 0.1</td>
</tr>
</tbody>
</table>

For the full text of the H-Statements mentioned in this Section, see Section 16.

Section: 4. FIRST AID MEASURES

4.1 Description of first aid measures

If inhaled : Get medical attention if symptoms occur.
In case of skin contact : Wash off with soap and plenty of water. Get medical attention if symptoms occur.
In case of eye contact : Rinse with plenty of water. Get medical attention if symptoms occur.
If swallowed : Rinse mouth. Get medical attention if symptoms occur.
Protection of first-aiders : In event of emergency assess the danger before taking action. Do not put yourself at risk of injury. If in doubt, contact emergency responders. Use personal protective equipment as
required.

4.2 Most important symptoms and effects, both acute and delayed
See Section 11 for more detailed information on health effects and symptoms.

4.3 Indication of immediate medical attention and special treatment needed
Treatment : Treat symptomatically.

Section: 5. FIREFIGHTING MEASURES

5.1 Extinguishing media
Suitable extinguishing media : Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

5.2 Special hazards arising from the substance or mixture
Specific hazards during firefighting : Exposure to decomposition products may be a hazard to health.
Hazardous combustion products : Decomposition products may include the following materials:
- Carbon oxides
- Nitrogen oxides (NOx)
- Sulphur oxides
- Oxides of phosphorus

5.3 Advice for firefighters
Special protective equipment for firefighters : Use personal protective equipment.
Further information : Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations. In the event of fire and/or explosion do not breathe fumes.

Section: 6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Advice for non-emergency personnel : Ensure clean-up is conducted by trained personnel only. Refer to protective measures listed in sections 7 and 8.
Advice for emergency responders : If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials.

6.2 Environmental precautions
Environmental precautions : Do not allow contact with soil, surface or ground water.

6.3 Methods and materials for containment and cleaning up
Methods for cleaning up : Stop leak if safe to do so. Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13). Flush away traces with water.
For large spills, dike spilled material or otherwise contain material to ensure runoff does not reach a waterway.

6.4 Reference to other sections

See Section 1 for emergency contact information.
For personal protection see section 8.
See Section 13 for additional waste treatment information.

Section: 7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Advice on safe handling: Do not ingest. Wash hands thoroughly after handling. Use only with adequate ventilation.

Hygiene measures: Handle in accordance with good industrial hygiene and safety practice. Remove and wash contaminated clothing before re-use. Wash face, hands and any exposed skin thoroughly after handling.

7.2 Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers: Keep out of reach of children. Keep container tightly closed. Store in suitable labelled containers.

Suitable material: The following compatibility data is suggested based on similar product data and/or industry experience: Brass, EPDM, HDPE (high density polyethylene), Neoprene, Polyurethane, Plasite 4300, CPVC (rigid), Polypropylene (rigid), Polyethylene (rigid), Chlorosulfonated polyethylene rubber, Fluoroelastomer

Unsuitable material: The following compatibility data is suggested based on similar product data and/or industry experience: Buna-N, Plasite 7122, Stainless Steel 304, coated steel

7.3 Specific end uses

Specific use(s): OXYGEN SCAVENGER

Section: 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Value type (Form of exposure)</th>
<th>Control parameters</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium Bisulfite</td>
<td>7631-90-5</td>
<td>TWA</td>
<td>5 mg/m³</td>
<td>UKCOSSTD</td>
</tr>
<tr>
<td>Further information</td>
<td>2</td>
<td>Where no specific short-term exposure limit is listed, a figure three times the long-term exposure should be used</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cobalt Sulfate</td>
<td>10124-43-3</td>
<td>TWA</td>
<td>0.1 mg/m³ (Cobalt(Co))</td>
<td>UKCOSSTD</td>
</tr>
<tr>
<td>Further information</td>
<td>53+5</td>
<td>Substances that can cause occupational asthma (also known as asthmagens and respiratory sensitisers) can induce a state of specific airway hyper-responsiveness via an immunological, irritant or other mechanism. Once the airways have become hyper-responsive, further exposure to the substance, sometimes even to tiny quantities, may cause respiratory symptoms. These symptoms can range in severity from a runny nose to asthma. Not all workers who are exposed to a sensitiser will become hyper-responsive and it is impossible to identify in advance those who are likely to become hyper-</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Safety Data Sheet

**NALCO® 77211**

54 Substances that can cause occupational asthma should be distinguished from substances which may trigger the symptoms of asthma in people with pre-existing airway hyper-responsiveness, but which do not include the disease themselves. The latter substances are not classified as asthmagens or respiratory sensitisers.

55 Wherever it is reasonably practicable, exposure to substances that can cause occupational asthma should be prevented. Where this is not possible, the primary aim is to apply adequate standards of control to prevent workers from becoming hyper-responsive. For substances that can cause occupational asthma, COSHH requires that exposure be reduced as low as is reasonably practicable. Activities giving rise to short-term peak concentrations should receive particular attention when risk management is being considered. Health surveillance is appropriate for all employees exposed or liable to be exposed to a substance which may cause occupational asthma and there should be appropriate consultation with an occupational health professional over the degree of risk and level of surveillance.

**Sen**

Capable of causing occupational asthma. The identified substances are those which:

- are assigned the risk phrase ‘R42: May cause sensitisation by inhalation’; or ‘R42/43: May cause sensitisation by inhalation and skin contact’ or
- are listed in section C of HSE publication ‘Asthmagen? Critical assessments of the evidence for agents implicated in occupational asthma’ as updated from time to time, or any other substance which the risk assessment has shown to be a potential cause of occupational asthma.

**Carc**

Capable of causing cancer and/or heritable genetic damage. The identified substances include those which:

- are assigned the risk phrases ‘R45: May cause cancer’; ‘R46: may cause heritable genetic damage’; ‘R49: May cause cancer by inhalation’ or
- a substance or process listed in Schedule 1 of COSHH.

2 Where no specific short-term exposure limit is listed, a figure three times the long-term exposure should be used.

### DNEL

**Sodium Bisulfite**

<table>
<thead>
<tr>
<th>End Use: Workers</th>
<th>Inhalation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potential health effects: long term - systemic</td>
<td></td>
</tr>
<tr>
<td>Value: 246 mg/m3</td>
<td></td>
</tr>
</tbody>
</table>

### PNEC

**Sodium Bisulfite**

<table>
<thead>
<tr>
<th>Fresh water</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value: 1.09 mg/l</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Marine water</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value: 0.11 mg/l</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>STP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value: 82.5 mg/l</td>
</tr>
</tbody>
</table>

### 8.2 Exposure controls

**Appropriate engineering controls**

Effective exhaust ventilation system.

Maintain air concentrations below occupational exposure standards.

**Individual protection measures**

**Hygiene measures**

Handle in accordance with good industrial hygiene and safety practice. Remove and wash contaminated clothing before re-use. Wash face, hands and any exposed skin thoroughly after handling.
Eye/face protection (EN 166): Safety glasses

Hand protection (EN 374): Recommended preventive skin protection
- Gloves
  - Nitrile rubber
  - Butyl-rubber
- Breakthrough time: 1 – 4 hours
- Minimum thickness for butyl-rubber 0.3 mm for nitrile rubber 0.2 mm or equivalent (please refer to the gloves manufacturer/distributor for advise).
- Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough.

Skin and body protection (EN 14605): Wear suitable protective clothing.

Respiratory protection (EN 143, 14387): When respiratory risks cannot be avoided or sufficiently limited by technical means of collective protection or by measures, methods or procedures of work organization, consider the use of certified respiratory protection equipment meeting EU requirements (89/656/EEC, 89/686/EEC), or equivalent, with filter type P.

Environmental exposure controls
General advice: Consider the provision of containment around storage vessels.

Section: 9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

- Appearance: Liquid
- Colour: Amber
- Odour: Sulfurous
- Flash point: Does not flash
- pH: 3.0 - 5.0, 100 % (25 °C)
- Odour Threshold: No data available
- Melting point/freezing point: FREEZING POINT: -7 °C
- Initial boiling point and boiling range: 100 °C
- Evaporation rate: No data available
- Flammability (solid, gas): No data available
- Upper explosion limit: No data available
- Lower explosion limit: No data available
- Vapour pressure: 32 mm Hg (28 °C)
Relative vapour density : no data available
Relative density : 1.31 (25 °C)
Density : 1.29 g/cm³
Solubility(ies)
Water solubility : completely soluble
Solubility in other solvents : no data available
Partition coefficient: n-octanol/water : no data available
Auto-ignition temperature : no data available
Thermal decomposition : no data available
Viscosity
Viscosity, dynamic : 6 mPa.s (20 °C)
Viscosity, kinematic : no data available
Explosive properties : no data available
Oxidizing properties : no data available

9.2 Other information
no data available

Section: 10. STABILITY AND REACTIVITY

10.1 Reactivity
No dangerous reaction known under conditions of normal use.

10.2 Chemical stability
Stable under normal conditions.

10.3 Possibility of hazardous reactions
Hazardous reactions : No dangerous reaction known under conditions of normal use.

10.4 Conditions to avoid
Conditions to avoid : Extremes of temperature

10.5 Incompatible materials
Materials to avoid : Bases
Contact with strong alkalies (e.g. ammonia and its solutions, carbonates, sodium hydroxide (caustic), potassium hydroxide, calcium hydroxide (lime), cyanide, sulfide, hypochlorites, chlorites) may generate heat, splattering or boiling and toxic vapors.
Contact with strong acids (e.g. sulfuric, phosphoric, nitric, hydrochloric, chromic, sulfonic) may generate heat, splattering or boiling and toxic vapors.
Contains Sulfite.
SO2 may react with vapors from neutralizing amines and may produce a visible cloud of amine salt particles.
10.6 Hazardous decomposition products

Hazardous decomposition products: Decomposition products may include the following materials:
- Carbon oxides
- Nitrogen oxides (NOx)
- Sulphur oxides
- Oxides of phosphorus

Section: 11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Information on likely routes of exposure: Inhalation, Eye contact, Skin contact

Toxicity

Product

Acute oral toxicity: Acute toxicity estimate: > 2,000 mg/kg

Acute inhalation toxicity: There is no data available for this product.

Acute dermal toxicity: There is no data available for this product.

Skin corrosion/irritation: There is no data available for this product.

Serious eye damage/eye irritation: There is no data available for this product.

Respiratory or skin sensitization: There is no data available for this product.

Carcinogenicity: There is no data available for this product.

Reproductive effects: There is no data available for this product.

Germ cell mutagenicity: There is no data available for this product.

Teratogenicity: There is no data available for this product.

STOT - single exposure: Based on available data, the classification criteria are not met.

STOT - repeated exposure: There is no data available for this product.

Aspiration toxicity: No aspiration toxicity classification

Potential Health Effects

Eyes: Health injuries are not known or expected under normal use.

Skin: Health injuries are not known or expected under normal use.

Ingestion: Harmful if swallowed.

Inhalation: Health injuries are not known or expected under normal use.
Chronic Exposure: Health injuries are not known or expected under normal use.

Experience with human exposure:

Eye contact: No symptoms known or expected.
Skin contact: No symptoms known or expected.
Ingestion: No information available.
Inhalation: No symptoms known or expected.

Further information: no data available

Section: 12. ECOLOGICAL INFORMATION

12.1 Ecotoxicity

Product

<table>
<thead>
<tr>
<th>Environmental Effects</th>
<th>This product has no known ecotoxicological effects.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toxicity to fish</td>
<td>96 hrs LC50 Lepomis macrochirus (Bluegill sunfish): 100 - 1,000 mg/l</td>
</tr>
<tr>
<td></td>
<td>Test substance: Product</td>
</tr>
<tr>
<td></td>
<td>96 hrs LC50 Oncorhynchus mykiss (rainbow trout): 100 - 1,000 mg/l</td>
</tr>
<tr>
<td></td>
<td>Test substance: Product</td>
</tr>
<tr>
<td>Toxicity to daphnia and other aquatic invertebrates</td>
<td>no data available</td>
</tr>
<tr>
<td>Toxicity to algae</td>
<td>no data available</td>
</tr>
</tbody>
</table>

Components

| Toxicity to fish | Sodium Bisulfite |
|                 | 96 h LC50 Fish: 177.8 mg/l |

12.2 Persistence and degradability

Product

<table>
<thead>
<tr>
<th>Biodegradability</th>
<th>Greater than 95% of this product consists of inorganic substances for which a biodegradation value is not applicable.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical Oxygen Demand (COD)</td>
<td>75,000 mg/l</td>
</tr>
</tbody>
</table>

Components

<table>
<thead>
<tr>
<th>Biodegradability</th>
<th>Sodium Bisulfite</th>
</tr>
</thead>
<tbody>
<tr>
<td>Result</td>
<td>Not applicable - inorganic</td>
</tr>
<tr>
<td>Cobalt Sulfate</td>
<td></td>
</tr>
</tbody>
</table>
Result: Not applicable - inorganic

12.3 Bioaccumulative potential

Product

Bioaccumulation: This preparation or material is not expected to bioaccumulate.

12.4 Mobility in soil

Product

This substance is water soluble and is expected to remain primarily in water.

12.5 Results of PBT and vPvB assessment

Product

Assessment: This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

12.6 Other adverse effects

no data available

Section: 13. DISPOSAL CONSIDERATIONS

Dispose of in accordance with the European Directives on waste and hazardous waste. Waste codes should be assigned by the user, preferably in discussion with the waste disposal authorities.

13.1 Waste treatment methods

Product: Where possible recycling is preferred to disposal or incineration.

If recycling is not practicable, dispose of in compliance with local regulations.

Dispose of wastes in an approved waste disposal facility.

Contaminated packaging: Dispose of as unused product.

Empty containers should be taken to an approved waste handling site for recycling or disposal.

Do not re-use empty containers.

Guidance for Waste Code selection: Inorganic wastes containing dangerous substances. If this product is used in any further processes, the final user must redefine and assign the most appropriate European Waste Catalogue Code. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable European (EU Directive 2008/98/EC) and local regulations.

Section: 14. TRANSPORT INFORMATION
The shipper/consignor/sender is responsible to ensure that the packaging, labeling, and markings are in compliance with the selected mode of transport.

**Land transport (ADR/ADN/RID)**

14.1 UN number: UN 2693
14.2 UN proper shipping name: BISULPHITES, AQUEOUS SOLUTION, N.O.S. (Sodium Bisulfite)
14.3 Transport hazard class(es): 8
14.4 Packing group: III
14.5 Environmental hazards: No
14.6 Special precautions for user: Not applicable.

**Air transport (IATA)**

14.1 UN number: UN 2693
14.2 UN proper shipping name: BISULPHITES, AQUEOUS SOLUTION, N.O.S. (Sodium Bisulfite)
14.3 Transport hazard class(es): 8
14.4 Packing group: III
14.5 Environmental hazards: No
14.6 Special precautions for user: Not applicable.

**Sea transport (IMDG/IMO)**

14.1 UN number: UN 2693
14.2 UN proper shipping name: BISULPHITES, AQUEOUS SOLUTION, N.O.S. (Sodium Bisulfite)
14.3 Transport hazard class(es): 8
14.4 Packing group: III
14.5 Environmental hazards: No
14.6 Special precautions for user: No special precautions required.
14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code: Not applicable.

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**Section: 15. REGULATORY INFORMATION**

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

**INTERNATIONAL REGULATIONS**

FOOD AND DRUG ADMINISTRATION (FDA) Federal Food, Drug and Cosmetic Act

When use situations necessitate compliance with FDA regulations, this product is acceptable under: 21 CFR 173.310 Boiler Water Additives

Limitations: no more than required to produce intended technical effect. Steam produced may be used in contact with any food type, defined under 21 CFR 170.3, which includes milk or milk products.

KOSHER

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

NSF NON-FOOD COMPOUNDS REGISTRATION PROGRAM (former USDA List of Proprietary Substances & Non-Food Compounds):

NSF Registration number for this product is: 141486

This product is acceptable for treating boilers or steam lines where steam produced may contact edible products and/or cooling systems where the treated water may not contact edible products in and around food processing areas (G6).
INTERNATIONAL CHEMICAL CONTROL LAWS

CANADA
The substance(s) in this preparation are included in or exempted from the Domestic Substance List (DSL).

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

NATIONAL REGULATIONS GERMANY
Water contaminating class: WGK 1
(Germany) Classification according VwVwS, Annex 4.

FEDERAL INSTITUTE FOR RISK ASSESSMENT (BfR) RECOMMENDATION
Acceptable Sections. LFGB compliant

15.2 Chemical Safety Assessment:
A Chemical Safety Assessment has been carried out for the substance(s) that makes/make up this material or for the material itself.

Section: 16. OTHER INFORMATION

Procedure used to derive the classification according to REGULATION (EC) No 1272/2008

<table>
<thead>
<tr>
<th>Classification</th>
<th>Justification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute toxicity 4, H302</td>
<td>Calculation method</td>
</tr>
</tbody>
</table>

Full text of H-Statements

H302 Harmful if swallowed.
H317 May cause an allergic skin reaction.
H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H341 Suspected of causing genetic defects.
H350i May cause cancer by inhalation.
H360F May damage fertility.
H400 Very toxic to aquatic life.
H410 Very toxic to aquatic life with long lasting effects.

Full text of other abbreviations

ADN – European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways; ADR – European Agreement concerning the International Carriage of Dangerous Goods by Road; AICS – Australian Inventory of Chemical Substances; ASTM – American Society for the Testing of Materials; bw – Body weight; CLP – Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008; CMR – Carcinogen, Mutagen or Reproductive Toxicant; DIN – Standard of the German Institute for Standardisation; DSL – Domestic Substances List (Canada); ECHA – European Chemicals Agency; EC-Number – European Community number; ECx – Concentration associated with x% response; ELx – Loading rate associated with x% response; EmS – Emergency Schedule; ENCS – Existing and New Chemical Substances (Japan); ErCx – Concentration associated with x% growth rate response; GHS – Globally Harmonized System; GLP – Good Laboratory Practice; IARC – International Agency for Research on Cancer; IATA – International Air Transport Association; IBC – International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 – Half maximal inhibitory concentration; ICAO – International Civil Aviation Organization; IECSC – Inventory of Existing Chemical
Substances in China; IMDG – International Maritime Dangerous Goods; IMO – International Maritime Organization; ISHL – Industrial Safety and Health Law (Japan); ISO – International Organisation for Standardization; KECl – Korea Existing Chemicals Inventory; LC50 – Lethal Concentration to 50 % of a test population; LD50 – Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL – International Convention for the Prevention of Pollution from Ships; n.o.s. – Not Otherwise Specified; NO(A)EC – No Observed (Adverse) Effect Concentration; NO(A)EL – No Observed (Adverse) Effect Level; NOELR – No Observable Effect Loading Rate; NZIoC – New Zealand Inventory of Chemicals; OECD – Organization for Economic Co-operation and Development; OPPTS – Office of Chemical Safety and Pollution Prevention; PBT – Persistent, Bioaccumulative and Toxic substance; PICCS – Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR – (Quantitative) Structure Activity Relationship; REACH – Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RID – Regulations concerning the International Carriage of Dangerous Goods by Rail; SADT – Self-Accelerating Decomposition Temperature; SDS – Safety Data Sheet; TCSI – Taiwan Chemical Substance Inventory; TRGS – Technical Rule for Hazardous Substances; TSCA – Toxic Substances Control Act (United States); UN – United Nations; vPvB – Very Persistent and Very Bioaccumulative


The possible key literature references and data sources which may have been used in conjunction with the consideration of expert judgment to compile this Safety Data Sheet: European regulations/directives (including (EC) No. 1907/2006, (EC) No. 1272/2008), supplier data, internet, ESIS, IUCLID, ERicards, Non European official regulatory data and other data sources.

Prepared By: Regulatory Affairs

Numbers quoted in the MSDS are given in the format: 1,000,000 = 1 million and 1,000 = 1 thousand. 0.1 = 1 tenth and 0.001 = 1 thousandth

REVISED INFORMATION: Significant changes to regulatory or health information for this revision is indicated by a bar in the left-hand margin of the SDS.

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered 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 materials or in any process, unless specified in the text.

Annex: Exposure Scenarios

Exposure Scenario: Boiler treatment under 1T per day

Life Cycle Stage : Industrial uses: Uses of substances as such or in preparations at industrial sites

Sector of use : SU23 Electricity, steam, gas water supply and sewage treatment

Contributing scenario controlling environmental exposure for:

Environmental release category : ERC4 Industrial use of processing aids in processes and products,
Daily amount per site: 1000 kg
Type of Sewage Treatment Plant: none

**Contributing scenario controlling worker exposure for:**

**Process category:** PROC15 Use as laboratory reagent
**Exposure duration:** 60.00 min
**Operational conditions and risk management measures:** Indoor

Local Exhaust Ventilation with 90% efficiency is required

**General ventilation**
Ventilation rate per hour: 1

**Skin Protection:** Yes: See Section 8
**Respiratory Protection:** No

**Contributing scenario controlling worker exposure for:**

**Process category:** PROC1 Use in closed process, no likelihood of exposure
**Exposure duration:** 60 min
**Operational conditions and risk management measures:** Indoor

Local Exhaust Ventilation is not required

**General ventilation**
Ventilation rate per hour: 1

**Skin Protection:** Yes: See Section 8
**Respiratory Protection:** No

**Contributing scenario controlling worker exposure for:**

**Process category:** PROC8a Transfer of substance or preparation (charging/ discharging) from/to vessels/large containers at non-dedicated facilities
**Exposure duration:** 15 min
**Operational conditions and risk management measures:** Indoor

Local Exhaust Ventilation is not required

**General ventilation**
Ventilation rate per hour: 1

**Skin Protection:** Yes: See Section 8
**Respiratory Protection:** No
Contributing scenario controlling worker exposure for:

<table>
<thead>
<tr>
<th>Process category</th>
<th>PROC28</th>
<th>Manual maintenance (cleaning and repair) of machinery</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exposure duration</td>
<td>240 min</td>
<td></td>
</tr>
<tr>
<td>Operational conditions</td>
<td>Indoor</td>
<td></td>
</tr>
<tr>
<td>Local Exhaust Ventilation is not required</td>
<td></td>
<td></td>
</tr>
<tr>
<td>General ventilation</td>
<td>Ventilation rate per hour: 1</td>
<td></td>
</tr>
<tr>
<td>Skin Protection</td>
<td>Yes: See Section 8</td>
<td></td>
</tr>
<tr>
<td>Respiratory Protection</td>
<td>No</td>
<td></td>
</tr>
</tbody>
</table>