SAFETY DATA SHEET
CONTINUUM* AT4505

1. Product and Company Identification

Material name: CONTINUUM AT4505
Version #: 2.0
Revision date: Dec-08-2014
Supersedes date: Sep-20-2013
Chemical description: Aqueous alkaline solution of organic and inorganic salts
CAS #: Mixture
Product application: Corrosion inhibitor

Company/undertaking identification
GE Betz, Inc.
4636 Somerton Road
Trevose, PA  19053
T 215 355 3300, F 215 953 5524

Emergency telephone
(800) 877 1940

2. Hazards Identification

Emergency overview
Corrosive to skin. Corrosive to the eyes. Irritating to respiratory system. May be corrosive to metals.

Potential health effects
Eyes
Corrosive to the eyes and may cause severe damage including blindness.
Skin
Causes severe skin burns.
Inhalation
Inhalation of vapor or mist may cause severe nose, throat, and respiratory tract irritation.
Ingestion
May cause gastrointestinal irritation and abdominal pain. In solution, material may become corrosive to tissues.

Medical conditions aggravated by exposure
None known.

3. Composition / Information on Ingredients

<table>
<thead>
<tr>
<th>Hazardous components</th>
<th>CAS #</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tetrasodium (1-hydroxyethylidene)bisphosphonate</td>
<td>3794-83-0</td>
<td>10 - 20</td>
</tr>
<tr>
<td>Chlorotolyltriazole sodium salt</td>
<td>202420-04-0</td>
<td>1 - 2.5</td>
</tr>
<tr>
<td>Sodium hydroxide</td>
<td>1310-73-2</td>
<td>1 - 2.5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Non-hazardous components</th>
<th>CAS #</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water</td>
<td>7732-18-5</td>
</tr>
</tbody>
</table>

2-Propenoic acid, polymer with 2-hydroxy-3-[2-propenylxoyl]-1-propanesulfonic acid monosodium salt and a-sulfo-w-[2-propenylxoyl]poly(oxy-1,2-ethanediyl) ammonium salt, sodium salt | 903573-39-7 |
4. First Aid Measures

First aid procedures

Eye contact
Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Keep eyelids apart. Get medical attention immediately.

Skin contact
Wash off with soap and water. Get medical attention immediately. Take off contaminated clothing and wash before reuse.

Inhalation
Move to fresh air. If breathing stops, provide artificial respiration. For breathing difficulties, oxygen may be necessary. Get medical attention immediately.

Ingestion
Do NOT induce vomiting! Rinse mouth with water. Never give anything by mouth to a victim who is unconscious or is having convulsions. Dilute contents of stomach using 2-8 fluid ounces (60-240ml) of milk or water. Call a physician or poison control center immediately.

Notes to physician
Corrosive material. It may not be advisable to induce vomiting. Possible mucosal damage may contraindicate the use of gastric lavage.

5. Fire Fighting Measures

Extinguishing media

Suitable extinguishing media
Dry chemical, CO2, water spray or regular foam.

Protection of firefighters

Wear full protective clothing, including helmet, self-contained positive pressure or pressure demand breathing apparatus, protective clothing and face mask.

Fire fighting equipment/instructions
In case of fire and/or explosion do not breathe fumes. Use standard firefighting procedures and consider the hazards of other involved materials. Move containers from fire area if you can do so without risk. Cool containers / tanks with water spray.

6. Accidental Release Measures

Personal precautions

Wear appropriate protective equipment and clothing during clean-up. Avoid contact with spilled material. See Section 8 of the MSDS for Personal Protective Equipment.

Environmental precautions

Avoid discharge into drains, water courses or onto the ground. Water contaminated with this product may be sent to a sanitary sewer treatment facility, or a permitted waste treatment facility, in accordance with any local agreements.

Methods for cleaning up

Ventilate the area. Flush with plenty of water. Absorb with earth, sand or other non-combustible material and transfer to containers for later disposal. Wet area may be slippery. Spread sand/grit.

7. Handling and Storage

Handling

Alkaline. Do not mix with acidic material.

Storage

Keep container tightly closed in a dry and well-ventilated place. Do not freeze. Avoid moisture contamination. Avoid atmospheric exposure. Avoid high temperatures.

8. Exposure Controls / Personal Protection

Occupational exposure limits

US. ACGIH Threshold Limit Values

<table>
<thead>
<tr>
<th>Components</th>
<th>Type</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium hydroxide (CAS 1310-73-2)</td>
<td>Ceiling</td>
<td>2 mg/m³</td>
</tr>
</tbody>
</table>

US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

<table>
<thead>
<tr>
<th>Components</th>
<th>Type</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium hydroxide (CAS 1310-73-2)</td>
<td>PEL</td>
<td>2 mg/m³</td>
</tr>
</tbody>
</table>

Biological limit values

No biological exposure limits noted for the ingredient(s).

Engineering controls

Explosion-proof general and local exhaust ventilation. Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.

Personal protective equipment

Eye / face protection
Wear safety glasses with side shields [or goggles] and a face shield.
Skin protection

Wear suitable protective clothing. Chemical resistant gloves. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace. Chemical resistant apron. Glove selection must take into account any solvents and other hazards present.

Respiratory protection

A RESPIRATORY PROTECTION PROGRAM THAT MEETS OSHA'S 29 CFR 1910.134 AND ANSI Z88.2 REQUIREMENTS MUST BE FOLLOWED WHENEVER WORKPLACE CONDITIONS WARRANT A RESPIRATOR'S USE. If air-purifying respirator use is appropriate, use organic vapor cartridges and any of the following particulate respirators: R95, R99, R100, P95, P99 or P100.

9. Physical & Chemical Properties

Appearance

- Physical state: Liquid
- Color: Amber
- Odor: Slight ammonia
- Odor threshold: Not available.
- pH (concentrated product): 13.3
- pH in aqueous solution: 12.1 (5% SOL.)
- Vapor pressure: 18 mm Hg
- Vapor pressure temp.: 70 °F (21 °C)
- Vapor density: < 1 (Air = 1)
- Boiling point: 220 °F (104 °C)
- Melting point/Freezing point: 23 °F (-5 °C)
- Solubility (water): 100 %
- Specific gravity (70°F, 21°C): 1.2
- Flash point: Not applicable.
- Flammability limits in air, upper, % by volume: Not available.
- Flammability limits in air, lower, % by volume: Not available.
- Auto-ignition temperature: Not available.
- Evaporation rate: < 1 (Ether = 1)
- Viscosity: 38 cps
- Viscosity temperature: 70 °F (21 °C)
- Percent volatile: 0 (Estimated)
- Pour point: 28 °F (-2 °C)

10. Chemical Stability & Reactivity Information

Chemical stability

Material is stable under normal conditions.

Conditions to avoid

Protect from freezing.

Incompatible materials

Avoid contact with strong acids and oxidisers.

Hazardous decomposition products


Possibility of hazardous reactions

Hazardous polymerization does not occur.

11. Toxicological Information

Toxicological data

<table>
<thead>
<tr>
<th>Product</th>
<th>Species</th>
<th>Test Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONTINUUM AT4505 (CAS Mixture)</td>
<td>Acute</td>
<td></td>
</tr>
<tr>
<td>Dermal</td>
<td>Rabbit</td>
<td></td>
</tr>
<tr>
<td>LD50</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt; 5000 mg/kg, (Calculated according to GHS additivity formula)</td>
</tr>
</tbody>
</table>
### Test Results

**Product** | **Species** | **Test Results**
--- | --- | ---
Oral | Rat | > 5000 mg/kg, (Calculated according to GHS additivity formula)

**Components**

| Chlorotolyltriazole sodium salt (CAS 202420-04-0) |
| --- | --- | --- |
**Acute** | **Species** | **Test Results**
Dermal | LD50 | Rat | > 5000 mg/kg
Oral | LD50 | Rat | 3100 mg/kg

**Sodium hydroxide (CAS 1310-73-2)**

| Acute | **Species** | **Test Results**
Dermal | LD50 | Rabbit | 1350 mg/kg
Oral | LD50 | Rabbit | > 500 mg/kg

**Tetrasodium (1-hydroxyethylidene)bisphosphonate (CAS 3794-83-0)**

| Acute | **Species** | **Test Results**
Dermal | LD50 | Rabbit | > 5000 mg/kg
Oral | LD50 | Rat | 990 mg/kg

### Carcinogenicity

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not listed.

### 12. Ecological Information

#### Ecotoxicity

| **Product** | **Species** | **Test Results**
--- | --- | ---
CONTINUUM AT4505 (CAS Mixture) | LC50 | Ceriodaphnia | 1167 mg/L, Acute Toxicity, 48 hour, (Estimated)
Fathead Minnow | 426 mg/L, Acute Toxicity, 96 hour, (Estimated)
NOEL | Fathead Minnow | 185 mg/L, Acute Toxicity, 96 hour, (Estimated)
Crustacea | LC50 | Daphnia magna | 1231 mg/L, Acute Toxicity, 48 hour, (Estimated)
NOEL | Daphnia magna | 775 mg/L, Acute Toxicity, 48 hour, (Estimated)

**Components**

| Chlorotolyltriazole sodium salt (CAS 202420-04-0) |
| --- | --- | --- |
**Components** | **Species** | **Test Results**
Algae | EbC50 | Algae | 6.84 mg/l
ErC50 | Algae | 18.6 mg/l

* Estimates for product may be based on additional component data not shown.

#### Persistence and degradability

- COD (mgO2/g) | 233 (calculated data)
- BOD 5 (mgO2/g) | 7 (calculated data)
- BOD 28 (mgO2/g) | 17 (calculated data)
13. Disposal Considerations

**Waste codes**
The complete waste code should be assigned in discussion with the waste disposal company.

**Waste from residues / unused products**
Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner.

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

14. Transport Information

**DOT**
- **UN number**: UN3266
- **UN proper shipping name**: CORROSIVE LIQUID, BASIC, INORGANIC, N.O.S. (Sodium hydroxide, HALOGENATED AROMATIC HETEROCYCLE SODIUM SALT)
- **Transport hazard classes**
  - **Class**: 8
  - **Subsidiary risk**: -
  - **Packing group**: III
  - **Special precautions for user**: Not available.
  - **ERG number**: 154
- Some containers may be DOT exempt, please check BOL for exact container classification.

**IATA**
- **UN number**: UN3266
- **UN proper shipping name**: CORROSIVE LIQUID, BASIC, INORGANIC, N.O.S. (Sodium hydroxide, HALOGENATED AROMATIC HETEROCYCLE SODIUM SALT)
- **Transport hazard classes**
  - **Class**: 8
  - **Subsidiary risk**: -
  - **Packing group**: III
  - **Environmental hazards**: No.
  - **ERG Code**: 154
  - **Special precautions for user**: Not available.

**IMDG**
- **UN number**: UN3266
- **UN proper shipping name**: CORROSIVE LIQUID, BASIC, INORGANIC, N.O.S. (Sodium hydroxide, HALOGENATED AROMATIC HETEROCYCLE SODIUM SALT)
- **Transport hazard classes**
  - **Class**: 8
  - **Subsidiary risk**: -
  - **Packing group**: III
  - **Environmental hazards**: No.
  - **EmS**: Not available.
  - **Special precautions for user**: Not available.

**TDG**
- **UN number**: UN3266
- **UN proper shipping name**: CORROSIVE LIQUID, BASIC, INORGANIC, N.O.S. (Sodium hydroxide, HALOGENATED AROMATIC HETEROCYCLE SODIUM SALT)
- **Hazard class**: 8
- **Packing group**: III
- **ERG code**: 154
15. Regulatory Information

US federal regulations

**US EPCRA (SARA Title III) Section 313 - Toxic Chemical: Listed substance**
None listed.

**TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)**
Not regulated.

**CERCLA (Superfund) reportable quantity, lbs**
Sodium hydroxide: 1000 lbs

**Superfund Amendments and Reauthorization Act of 1986 (SARA)**

<table>
<thead>
<tr>
<th>Hazard categories</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Immediate Hazard</td>
<td>Yes</td>
</tr>
<tr>
<td>Delayed Hazard</td>
<td>Yes</td>
</tr>
<tr>
<td>Fire Hazard</td>
<td>No</td>
</tr>
<tr>
<td>Pressure Hazard</td>
<td>No</td>
</tr>
<tr>
<td>Reactivity Hazard</td>
<td>No</td>
</tr>
</tbody>
</table>

**SARA 302 Extremely hazardous substance**
Not listed.

**SARA 311/312 Hazardous chemical**
No

**Inventory status**

<table>
<thead>
<tr>
<th>Country(s) or region</th>
<th>Inventory name</th>
<th>On inventory (yes/no)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canada</td>
<td>Domestic Substances List (DSL)</td>
<td>Yes</td>
</tr>
<tr>
<td>Canada</td>
<td>Non-Domestic Substances List (NDSL)</td>
<td>No</td>
</tr>
<tr>
<td>United States &amp; Puerto Rico</td>
<td>Toxic Substances Control Act (TSCA) Inventory</td>
<td>Yes</td>
</tr>
</tbody>
</table>

*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)
A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

**State regulations**

**US - California Proposition 65 - CRT: Listed date/Carcinogenic substance**

1,4-DIOXANE (CAS 123-91-1) Listed: January 1, 1988 Carcinogenic.

**US - California Proposition 65 - CRT: Listed date/Developmental toxin**
No ingredient listed.

**US - California Proposition 65 - CRT: Listed date/Female reproductive toxin**
No ingredient listed.

**US - California Proposition 65 - CRT: Listed date/Male reproductive toxin**
No ingredient listed.

**US - Massachusetts RTK - Substance List**
Sodium hydroxide (CAS 1310-73-2)
16. Other Information

List of abbreviations

CAS: Chemical Abstract Service Registration Number
TWA: Time Weighted Average
STEL: Short Term Exposure Limit
LD50: Lethal Dose, 50%
LC50: Lethal Concentration, 50%
NOEL: No Observed Effect Level
COD: Chemical Oxygen Demand
BOD: Biochemical Oxygen Demand
TOC: Total Organic Carbon
IATA: International Air Transport Association
IMDG: International Maritime Dangerous Goods Code
NFPA: National Fire Protection Association
ACGIH: American Conference of Governmental Industrial Hygienists
TSRN indicates a Trade Secret Registry Number is used in place of the CAS number.

HMIS® ratings

Health: 3
Flammability: 1
Physical hazard: 0
Personal protection: B

NFPA ratings

Health: 3
Flammability: 1
Instability: 0
Special hazards: ALK

Disclaimer

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.

This data sheet contains changes from the previous version in section(s):

Composition / Information on Ingredients: Disclosure Overrides
Transport Information: Material Transportation Information
Material Attributes & Uses; Experimental Data: Experimental Data
GHS: Classification

Prepared by

This MSDS has been prepared by GE Water & Process Technologies Regulatory Department (1-215-355-3300).

* Trademark of General Electric Company. May be registered in one or more countries.