SAFETY DATA SHEET

Issue Date 06-Jun-2016  Revision Date 06-Oct-2016  Version 2  Page 1 / 19

1. IDENTIFICATION

Product identifier
Product Name StabiCal® Formazin Standard 100 NTU

Other means of identification
Product Code(s) 2795401

Safety data sheet number M03412

Recommended use of the chemical and restrictions on use
Recommended Use Laboratory Use. Standard solution.
Uses advised against None.
Restrictions on use None.

Details of the supplier of the safety data sheet

Manufacturer Address
Hach Company
P.O. Box 389  Loveland, CO 80539 USA
(970) 669-3050

Emergency telephone number
(303) 623-5716 - 24 Hour Service  (515) 232-2533 - 8am - 4pm CST

2. HAZARDS IDENTIFICATION

Classification

Regulatory Status
This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Respiratory sensitization Category 1
Skin sensitization Category 1

Hazards not otherwise classified (HNOC)
Not applicable

Label elements

Signal word - Danger
Hazard statements
H334 - May cause allergy or asthma symptoms or breathing difficulties if inhaled
H317 - May cause an allergic skin reaction
EUH208 - May produce an allergic reaction
EUH208 - Contains (?). May produce an allergic reaction

Precautionary statements
P285 - In case of inadequate ventilation wear respiratory protection
P304 + P311 - IF INHALED: If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing
P342 + P311 - If experiencing respiratory symptoms: Call a POISON CENTER or doctor/physician
P261 - Avoid breathing dust/fume/gas/mist/vapors/spray
P272 - Contaminated work clothing should not be allowed out of the workplace
P280 - Wear protective gloves
P302 + P352 - IF ON SKIN: Wash with plenty of soap and water
P333 + P313 - IF skin irritation or rash occurs: Get medical advice/attention
P321 - Specific treatment (see supplemental first aid instructions on this label)
P363 - Wash contaminated clothing before reuse
P501 - Dispose of contents/container to an approved waste disposal plant

Other Information
Not applicable

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance
Not applicable

Mixture
Chemical Family
Mixture

Percent ranges are used where confidential product information is applicable.

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS No</th>
<th>Percent Range</th>
<th>HMRIC #</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,3,5,7-Tetraazatricyclo[3.3.1.1(3,7)]decane</td>
<td>100-97-0</td>
<td>5 - 10%</td>
<td>-</td>
</tr>
<tr>
<td>Formaldehyde</td>
<td>50-00-0</td>
<td>&lt;0.1%</td>
<td>-</td>
</tr>
</tbody>
</table>
4. FIRST AID MEASURES

Description of first aid measures

General advice
In case of accident or unwellness, seek medical advice immediately (show directions for use or safety data sheet if possible).

Eye contact
Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. If symptoms persist, call a physician.

Skin contact
Wash off immediately with plenty of water for at least 15 minutes. If skin irritation persists, call a physician. Wash off immediately with soap and plenty of water.

Inhalation
Remove to fresh air. If symptoms persist, call a physician.

Ingestion
Do NOT induce vomiting. Drink plenty of water. Immediate medical attention is not required. Rinse mouth.

Self-protection of the first aider
Use personal protective equipment as required.

Most important symptoms and effects, both acute and delayed

Symptoms
See Section 11: TOXICOLOGICAL INFORMATION.

Indication of any immediate medical attention and special treatment needed

Note to physicians
May cause sensitization in susceptible persons.

5. FIRE-FIGHTING MEASURES

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

Unsuitable extinguishing media
No information available.

Flammable properties
During a fire, this product decomposes to form toxic gases.

Specific hazards arising from the chemical
May react violently with. Strong acids. Strong oxidizers. Thermal decomposition can lead to release of irritating and toxic gases and vapors. In the event of fire and/or explosion do not breathe fumes. May cause sensitization in susceptible persons.

Hazardous combustion products
This material will not burn.

Protective equipment and precautions for firefighters
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

U.S. Notice
Only persons properly qualified to respond to an emergency involving hazardous substances may respond to a spill according to federal regulations (OSHA 29 CFR 1910.120(a)(v)) and per your company’s emergency response plan and guidelines/procedures. See Section 13, Special Instructions for disposal assistance.

Outside of the US, only persons properly qualified according to state or local regulations should respond to a spill involving chemicals.

EC Notice
Only persons properly qualified to respond to an emergency involving hazardous substances should respond to a spill involving chemicals. See Section 13, Special Instructions for disposal assistance.
WHMIS Notice

Only persons properly qualified to respond to an emergency involving hazardous substances should respond to a spill involving chemicals. See Section 13, Special Instructions for disposal assistance.

Personal precautions, protective equipment and emergency procedures

Personal precautions

Use personal protective equipment as required. Avoid contact with eyes and skin.

For emergency responders

Use personal protection recommended in Section 8.

Environmental precautions

Environmental precautions

Prevent entry into waterways, sewers, basements or confined areas. Do not flush into surface water or sanitary sewer system.

Methods and material for containment and cleaning up

Methods for containment

Prevent further leakage or spillage if safe to do so.

Methods for cleaning up

Soak up with inert absorbent material. Pick up and transfer to properly labeled containers. After cleaning, flush away traces with water. Prevent product from entering drains.

Emergency Response Guide Number

Not applicable

7. HANDLING AND STORAGE

Precautions for safe handling

Advice on safe handling

Ensure adequate ventilation, especially in confined areas. Use personal protective equipment as required.

Conditions for safe storage, including any incompatibilities

Storage Conditions

Keep out of the reach of children. Keep container tightly closed. Keep containers tightly closed in a cool, well-ventilated place.

Flammability class

Not applicable

Incompatible materials

Oxidizers. Acids.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure Guidelines

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>ACGIH TLV</th>
<th>OSHA PEL</th>
<th>NIOSH IDLH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formaldehyde</td>
<td>Ceiling: 0.3 ppm</td>
<td>TWA: 0.75 ppm (vacated) TWA: 3 ppm STEL: 10 ppm (vacated) Ceiling: 5 ppm STEL: 2 ppm</td>
<td>IDLH: 20 ppm Ceiling: 0.1 ppm 15 min TWA: 0.016 ppm</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Alberta OEL</th>
<th>British Columbia OEL</th>
<th>Manitoba OEL</th>
<th>New Brunswick OEL</th>
<th>New Foundland &amp; Labrador OEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formaldehyde</td>
<td>Ceiling: 1 ppm Ceiling: 1.3 mg/m³ TWA: 0.75 ppm TWA: 0.9 mg/m³</td>
<td>TWA: 0.3 ppm SKN+</td>
<td>Ceiling: 0.3 ppm TWA: 0.5 ppm STEL: 1.5 ppm</td>
<td>RSP+ Ceiling: 0.3 ppm SKN+</td>
<td></td>
</tr>
<tr>
<td>Chemical Name</td>
<td>Northwest Territories OEL</td>
<td>Nova Scotia OEL</td>
<td>Nunavut OEL</td>
<td>Ontario TWA</td>
<td>Prince Edward Island OEL</td>
</tr>
<tr>
<td>---------------</td>
<td>---------------------------</td>
<td>----------------</td>
<td>-------------</td>
<td>-------------</td>
<td>--------------------------</td>
</tr>
<tr>
<td>1,3,5,7-Tetraazatricyclo[3.3.1.1(3,7)]decane 5 - 10%</td>
<td>NDF</td>
<td>NDF</td>
<td>NDF</td>
<td>STEL: 0.35 ppm STEL: 2 mg/m³</td>
<td>NDF</td>
</tr>
<tr>
<td>Formaldehyde &lt;0.1%</td>
<td>Ceiling: 0.3 ppm SKN+</td>
<td></td>
<td>Ceiling: 0.3 ppm SKN+</td>
<td>Ceiling: 0.3 ppm Ceiling: 1.5 ppm</td>
<td>Ceiling: 0.3 ppm</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Quebec OEL</th>
<th>Saskatchewan OEL</th>
<th>Yukon OEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formaldehyde &lt;0.1%</td>
<td>Ceiling: 2 ppm Ceiling: 3 mg/m³</td>
<td>Ceiling: 0.3 ppm SKN+</td>
<td>Ceiling: 2 ppm Ceiling: 3 mg/m³</td>
</tr>
</tbody>
</table>

Other Information
Vacated limits revoked by the Court of Appeals decision in AFL-CIO v. OSHA, 965 F.2d 962 (11th Cir., 1992).

Legend
See section 16 for terms and abbreviations

Appropriate engineering controls
Minimize exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.

Individual protection measures, such as personal protective equipment

Eye/face protection
Tight sealing safety goggles.

Skin and body protection
Suitable protective clothing.

Respiratory protection
In case of insufficient ventilation, wear suitable respiratory equipment.

General Hygiene Considerations
When using do not eat, drink or smoke. Wash contaminated clothing before reuse.

Environmental exposure controls
Do not allow into any sewer, on the ground or into any body of water.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Physical state: Liquid

Gas Under Pressure: Not classified according to GHS criteria

Appearance: Turbid solution aqueous solution
Color: white

Odor: Odorless
Odor threshold: No data available

Property | Values | Remarks • Method |
----------|--------|-----------------|
Molecular weight | No data available | Estimation based on theoretical calculation |
P | No data available |
Melting point/freezing point | ~ 0 °C / 32 °F |
Boiling point / boiling range | ~ 100 °C / 212 °F | Estimation based on theoretical calculation |
Evaporation rate
1 (water = 1) Estimation based on theoretical calculation

Vapor pressure
17.477 mm Hg / 2.33 kPa at 20 °C / 68 °F Estimation based on theoretical calculation

Vapor density (air = 1)
0.62 (air = 1)

Specific gravity (water = 1 / air = 1)
1.02

Partition Coefficient (n-octanol/water)
Not applicable

Soil Organic Carbon-Water Partition Coefficient
Not applicable

Autoignition temperature
No data available

Decomposition temperature
No data available

Dynamic viscosity
No data available

Kinematic viscosity
No data available

Solubility(ies)
Water solubility

<table>
<thead>
<tr>
<th>Water solubility classification</th>
<th>Water solubility</th>
<th>Water Solubility Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soluble</td>
<td>&gt; 1000 mg/L</td>
<td>25 °C / 77 °F</td>
</tr>
</tbody>
</table>

Solubility in other solvents

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Solubility classification</th>
<th>Solubility</th>
<th>Solubility Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>None reported</td>
<td>No information available</td>
<td>No data available</td>
<td>No information available</td>
</tr>
</tbody>
</table>

Other Information

Metal Corrosivity
Not classified as corrosive to metal according to GHS criteria

Steel Corrosion Rate
No data available

Aluminum Corrosion Rate
No data available

Volatile Organic Compounds (VOC) Content
No information available.

Bulk density
Not applicable

Explosive properties
Not classified according to GHS criteria.

Explosion data

Upper explosion limit
No data available

Lower explosion limit
No data available

Flammable properties
During a fire, this product decomposes to form toxic gases.

Flammability Limit in Air

Upper flammability limit:
No data available
10. STABILITY AND REACTIVITY

Reactivity properties
Not classified as self-reactive, pyrophoric, self-heating or emitting flammable gases in contact with water according to GHS criteria.

Chemical stability
Stable under recommended storage conditions.

Special dangers of the product
No information available

Possibility of Hazardous Reactions
No information available.

Hazardous polymerization
Hazardous polymerization does not occur.

Conditions to avoid
Poor Ventilation. Extremes of temperature and direct sunlight.

Incompatible materials
Oxidizers. Acids.

Hazardous Decomposition Products

Explosive properties
Not classified according to GHS criteria.

Upper explosion limit
No data available

Lower explosion limit
No data available

Autoignition temperature
No data available

Sensitivity to Static Discharge
None reported

Sensitivity to Mechanical Impact
None reported

11. TOXICOLOGICAL INFORMATION

NIOSH (RTECS) Number
None reported
Product Code(s) 2795401
Issue Date 06-Jun-2016
Version 2

Product Name StabiCal® Formazin Standard 100 NTU
Revision Date 06-Oct-2016
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Information on Likely Routes of Exposure

Product Information
Product does not present an acute toxicity hazard based on known or supplied information.

Inhalation
No known effect based on information supplied.

Eye contact
No known effect based on information supplied.

Skin contact
No known effect based on information supplied.

Ingestion
No known effect based on information supplied.

Aggravated Medical Conditions
Allergies. Skin disorders. Respiratory disorders.

Toxicologically synergistic products
None known.

Toxicokinetics, metabolism and distribution
See ingredients information below.

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Toxicokinetics, metabolism and distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formaldehyde (&lt;0.1%) CAS: 50-00-0</td>
<td>Readily absorbed via the respiratory and gastrointestinal routes. Absorbed formaldehyde can be oxidized to formate and carbon dioxide. Half-life of formaldehyde is 1 min in rat plasma.</td>
</tr>
</tbody>
</table>

Product Acute Toxicity Data

Oral Exposure Route
No data available

Dermal Exposure Route
No data available

Inhalation (Dust/Mist) Exposure Route
No data available

Inhalation (Vapor) Exposure Route
No data available

Inhalation (Gas) Exposure Route
No data available

Unknown acute toxicity
0.16/1% of the mixture consists of ingredient(s) of unknown toxicity.

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

ATEmix (oral) 7,175.00 mg/kg

Ingredient Acute Toxicity Data

Oral Exposure Route

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Endpoint type</th>
<th>Reported dose</th>
<th>Exposure time</th>
<th>Toxicological effects</th>
<th>Key literature references and sources for data</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,3,5,7-Tetrazatricyclo[3.3.1.1(3,7)]decan e (5 - 10%) CAS#: 100-97-0</td>
<td>Rat LD₅₀</td>
<td>569 mg/kg</td>
<td>None reported</td>
<td>None reported</td>
<td>Vendor SDS</td>
</tr>
<tr>
<td>Formaldehyde (&lt;0.1%) CAS: 50-00-0</td>
<td>Rat LD₅₀</td>
<td>100 mg/kg</td>
<td>None reported</td>
<td>None reported</td>
<td>No information available</td>
</tr>
</tbody>
</table>

Chemical Name Endpoint type Reported dose Exposure time Toxicological effects Key literature references and sources for data

<table>
<thead>
<tr>
<th>Formaldehyde (&lt;0.1%) CAS: 50-00-0</th>
<th>Human LD₅₀</th>
<th>70 mg/kg</th>
<th>None reported</th>
<th>Kidney, Ureter, or Bladder Other changes Liver</th>
<th>RTECS (Registry of Toxic Effects of Chemical Substances)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formaldehyde (&lt;0.1%) CAS: 50-00-0</td>
<td>Human TD₅₀</td>
<td>643 mg/kg</td>
<td>None reported</td>
<td>Lungs, Thorax, or Respiration Respiratory obstruction</td>
<td>RTECS (Registry of Toxic Effects of Chemical Substances)</td>
</tr>
</tbody>
</table>

Dermal Exposure Route
### Chemical Name: Formaldehyde

- **Endpoint type:** Rabbit
- **Reported dose:** LD$_{50}$ 270 mg/kg
- **Exposure time:** None reported
- **Toxicological effects:** None reported
- **Key literature references and sources for data:** GESTIS (Information System on Hazardous Substances of the German Social Accident Insurance)

#### Inhalation (Dust/Mist) Exposure Route
No data available

#### Inhalation (Vapor) Exposure Route

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Endpoint type</th>
<th>Reported dose</th>
<th>Exposure time</th>
<th>Toxicological effects</th>
<th>Key literature references and sources for data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formaldehyde</td>
<td>Rat LC$_{50}$</td>
<td>250 mg/L</td>
<td>4 hours</td>
<td>None reported</td>
<td>RTECS (Registry of Toxic Effects of Chemical Substances)</td>
</tr>
</tbody>
</table>

#### Inhalation (Gas) Exposure Route
No data available

### Product Skin Corrosion/Irritation Data
No data available.

### Ingredient Skin Corrosion/Irritation Data

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Test method</th>
<th>Species</th>
<th>Reported dose</th>
<th>Exposure time</th>
<th>Results</th>
<th>Key literature references and sources for data</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,3,5,7-Tetraazatricycle[3.3.1.1(3,7)]decan-6 (5 - 10%)</td>
<td>Organization for Economic Co-operation and Development (OECD) - Test 404: Acute Dermal Corrosion/Irritation</td>
<td>Rabbit</td>
<td>500 mg</td>
<td>4 hours</td>
<td>Not corrosive or irritating to skin</td>
<td>ECHA (The European Chemicals Agency)</td>
</tr>
<tr>
<td>Formaldehyde (&lt;0.1%)</td>
<td>Standard Draize Test</td>
<td>Human</td>
<td>0.150 mg</td>
<td>72 hours</td>
<td>Corrosive to skin</td>
<td>RTECS (Registry of Toxic Effects of Chemical Substances)</td>
</tr>
</tbody>
</table>

### Product Serious Eye Damage/Eye Irritation Data
No data available.

### Ingredient Eye Damage/Eye Irritation Data

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Test method</th>
<th>Species</th>
<th>Reported dose</th>
<th>Exposure time</th>
<th>Results</th>
<th>Key literature references and sources for data</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,3,5,7-Tetraazatricycle[3.3.1.1(3,7)]decan-6 (5 - 10%)</td>
<td>Standard Draize Test</td>
<td>Rabbit</td>
<td>100 mg</td>
<td>None reported</td>
<td>Not corrosive or irritating to eyes</td>
<td>ECHA (The European Chemicals Agency)</td>
</tr>
<tr>
<td>Formaldehyde</td>
<td>Rinse Test</td>
<td>Human</td>
<td>1 ppm</td>
<td>6 minutes</td>
<td>Corrosive to eyes</td>
<td>RTECS (Registry of Toxic Effects of Chemical Substances)</td>
</tr>
</tbody>
</table>
### Toxic Effects of Chemical Substances

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Test method</th>
<th>Species</th>
<th>Reported dose</th>
<th>Exposure time</th>
<th>Results</th>
<th>Key literature references and sources for data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formaldehyde</td>
<td>Standard Draize Test</td>
<td>Rabbit</td>
<td>0.750 mg</td>
<td>24 hours</td>
<td>Corrosive to eyes</td>
<td>RTECS (Registry of Toxic Effects of Chemical Substances)</td>
</tr>
</tbody>
</table>

### Sensitization Information

#### Product Sensitization Data

**Skin Sensitization Exposure Route**

No data available.

**Respiratory Sensitization Exposure Route**

No data available.

#### Ingredient Sensitization Data

**Skin Sensitization Exposure Route**

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Test method</th>
<th>Species</th>
<th>Results</th>
<th>Key literature references and sources for data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formaldehyde</td>
<td>Patch test</td>
<td>Human</td>
<td>Confirmed to be a skin sensitizer</td>
<td>ERMA (New Zealands Environmental Risk Management Authority)</td>
</tr>
</tbody>
</table>

**Respiratory Sensitization Exposure Route**

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Test method</th>
<th>Species</th>
<th>Results</th>
<th>Key literature references and sources for data</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,3,5,7-Tetraazatricyclo(3.3.1.1(3,7))decane (5 - 10%) CAS#: 100-97-0</td>
<td>Based on human experience</td>
<td>Human</td>
<td>Confirmed to be a respiratory sensitizer</td>
<td>HSDB (Hazardous Substances Data Bank)</td>
</tr>
<tr>
<td>Formaldehyde</td>
<td>IgE Specific Immune Response Test</td>
<td>Guinea pig</td>
<td>Confirmed to be a respiratory sensitizer</td>
<td>CICAD (Concise International Chemical Assessment Documents)</td>
</tr>
</tbody>
</table>

### Chronic Toxicity Information

#### Product Repeat Dose Toxicity Data

**Oral Exposure Route**

No data available.

**Dermal Exposure Route**

No data available.

**Inhalation (Dust/Mist) Exposure Route**

No data available.

**Inhalation (Vapor) Exposure Route**

No data available.

**Inhalation (Gas) Exposure Route**

No data available.

#### Ingredient Repeat Dose Toxicity Data

**Oral Exposure Route**

No data available

**Dermal Exposure Route**

No data available

**Inhalation (Dust/Mist) Exposure Route**

Toxicological data for ingredients is not indicative of likely harm.

**Inhalation (Vapor) Exposure Route**

Toxicological data for ingredients is not indicative of likely harm.
<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Endpoint type</th>
<th>Reported dose</th>
<th>Exposure time</th>
<th>Toxicological effects</th>
<th>Key literature references and sources for data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formaldehyde  (&lt;0.1%)</td>
<td>Human TClO</td>
<td>0.017 mg/L</td>
<td>0.5 days</td>
<td>Eye&lt;br&gt; Lacrimation&lt;br&gt; Lungs, Thorax, or Respiration&lt;br&gt; Other changes</td>
<td>RTECS (Registry of Toxic Effects of Chemical Substances)</td>
</tr>
<tr>
<td>Formaldehyde  (&lt;0.1%)</td>
<td>Human TClO</td>
<td>2 mg/L</td>
<td>40 minutes</td>
<td>Lungs, Thorax, or Respiration&lt;br&gt; Other changes&lt;br&gt; Respiratory depression</td>
<td>RTECS (Registry of Toxic Effects of Chemical Substances)</td>
</tr>
</tbody>
</table>

**Inhalation (Gas) Exposure Route**
No data available

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS No</th>
<th>ACGIH</th>
<th>IARC</th>
<th>NTP</th>
<th>OSHA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,3,5,7-Tetraazatricyclo[3.3.1.1(3,7)]decane</td>
<td>100-97-0</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Formaldehyde</td>
<td>50-00-0</td>
<td>A2</td>
<td>Group 1</td>
<td>Known</td>
<td>X</td>
</tr>
</tbody>
</table>

**Legend**

- **ACGIH** (American Conference of Governmental Industrial Hygienists)
  A2 - Suspected Human Carcinogen
- **IARC** (International Agency for Research on Cancer)
  Group 1 - Carcinogenic to Humans
- **NTP** (National Toxicology Program)
  Known - Known Carcinogen
- **OSHA** (Occupational Safety and Health Administration of the US Department of Labor)
  X - Present

**Product Carcinogenicity Data**
No data available

**Oral Exposure Route**
No data available

**Dermal Exposure Route**
No data available

**Inhalation (Dust/Mist) Exposure Route**
No data available

**Inhalation (Vapor) Exposure Route**
No data available

**Ingredient Carcinogenicity Data**
No data available

**Oral Exposure Route**
No data available

**Dermal Exposure Route**
No data available

**Inhalation (Dust/Mist) Exposure Route**
No data available

**Inhalation (Vapor) Exposure Route**

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Endpoint type</th>
<th>Reported dose</th>
<th>Exposure time</th>
<th>Toxicological effects</th>
<th>Key literature references and sources for data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formaldehyde  (&lt;0.1%)</td>
<td>Rat</td>
<td>15 mg/L</td>
<td>78 weeks</td>
<td>Olfaction&lt;br&gt; Tumors</td>
<td>RTECS (Registry of Toxic Effects of Chemical Substances)</td>
</tr>
</tbody>
</table>

**Inhalation (Gas) Exposure Route**
No data available

**Product Germ Cell Mutagenicity invitro Data**
No data available.
### Ingredient Germ Cell Mutagenicity/invitroData

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Test</th>
<th>Cell Strain</th>
<th>Reported dose</th>
<th>Exposure time</th>
<th>Results</th>
<th>Key literature references and sources for data</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,3,5,7-Tetraazatricyclo[3.3.1.1(3,7)]decan e (5 - 10%) CAS#: 100-97-0</td>
<td>Cytogenetic analysis</td>
<td>Human HeLa Cell</td>
<td>1 mmol/L</td>
<td>None reported</td>
<td>Positive test result for mutagenicity</td>
<td>RTECS (Registry of Toxic Effects of Chemical Substances)</td>
</tr>
<tr>
<td>Chemical Name</td>
<td>Test</td>
<td>Cell Strain</td>
<td>Reported dose</td>
<td>Exposure time</td>
<td>Results</td>
<td>Key literature references and sources for data</td>
</tr>
<tr>
<td>1,3,5,7-Tetraazatricyclo[3.3.1.1(3,7)]decan e (5 - 10%) CAS#: 100-97-0</td>
<td>Morphological transformation</td>
<td>Hamster kidney</td>
<td>10 mg/L</td>
<td>None reported</td>
<td>Positive test result for mutagenicity</td>
<td>RTECS (Registry of Toxic Effects of Chemical Substances)</td>
</tr>
</tbody>
</table>

**Oral Exposure Route**
No data available

**Dermal Exposure Route**
No data available

**Inhalation (Dust/Mist) Exposure Route**
No data available

**Inhalation (Vapor) Exposure Route**
No data available

### Ingredient Germ Cell Mutagenicity/invivoData

**Oral Exposure Route**
No data available

**Dermal Exposure Route**
No data available

#### Inhalation (Dust/Mist) Exposure Route

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Test</th>
<th>Species</th>
<th>Reported dose</th>
<th>Exposure time</th>
<th>Results</th>
<th>Key literature references and sources for data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formaldehyde</td>
<td>DNA damage</td>
<td>Rat</td>
<td>0.000035 mg/L</td>
<td>8 weeks</td>
<td>Positive test result for mutagenicity</td>
<td>RTECS (Registry of Toxic Effects of Chemical Substances)</td>
</tr>
<tr>
<td>(&lt;0.1%)</td>
<td></td>
<td></td>
<td>CAS#: 50-00-0</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Inhalation (Vapor) Exposure Route

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Test</th>
<th>Species</th>
<th>Reported dose</th>
<th>Exposure time</th>
<th>Results</th>
<th>Key literature references and sources for data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formaldehyde</td>
<td>Micronucleus test</td>
<td>Human</td>
<td>0.00985 mg/L</td>
<td>8.5 years</td>
<td>Positive test result for mutagenicity</td>
<td>RTECS (Registry of Toxic Effects of Chemical Substances)</td>
</tr>
<tr>
<td>(&lt;0.1%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chemical Name</td>
<td>Test</td>
<td>Species</td>
<td>Reported dose</td>
<td>Exposure time</td>
<td>Results</td>
<td>Key literature references and sources for data</td>
</tr>
<tr>
<td>Formaldehyde</td>
<td>Micronucleus test</td>
<td>Human</td>
<td>2 mg/L</td>
<td>15 minutes</td>
<td>Positive test result for mutagenicity</td>
<td>RTECS (Registry of Toxic Effects of Chemical Substances)</td>
</tr>
<tr>
<td>(&lt;0.1%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Product Code(s) 2795401  
Issue Date 06-Jun-2016  
Version 2

Product Name StabCal®Formazin Standard 100 NTU  
Revision Date 06-Oct-2016  
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Inhalation (Gas) Exposure Route  
Oral Exposure Route  
Dermal Exposure Route  
Inhalation (Dust/Mist) Exposure Route  
Inhalation (Vapor) Exposure Route  
Inhalation (Gas) Exposure Route

Ingredient Reproductive Toxicity Data

Oral Exposure Route  
Dermal Exposure Route  
Inhalation (Dust/Mist) Exposure Route

Toxicological data for ingredients is not indicative of likely harm.

Inhalation (Vapor) Exposure Route

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Endpoint type</th>
<th>Reported dose</th>
<th>Exposure time</th>
<th>Toxicological effects</th>
<th>Key literature references and sources for data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formaldehyde</td>
<td>Rat TC50</td>
<td>40 mg/L</td>
<td>14 days</td>
<td>Effects on Embryo or Fetus Fetotoxicity (except death e.g. stunted fetus)</td>
<td>RTECS (Registry of Toxic Effects of Chemical Substances)</td>
</tr>
<tr>
<td>(&lt;0.1%) CAS#: 50-00-0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Formaldehyde</td>
<td>Rat TC50</td>
<td>.001 mg/L</td>
<td>24 weeks</td>
<td>Effects on Embryo or Fetus Cytological changes (including somatic cell genetic material)</td>
<td>RTECS (Registry of Toxic Effects of Chemical Substances)</td>
</tr>
<tr>
<td>(&lt;0.1%) CAS#: 50-00-0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Formaldehyde</td>
<td>Rat TC50</td>
<td>.0005 mg/L</td>
<td>19 days</td>
<td>Specific Development AbnormalitiesMusculoskeletal system</td>
<td>RTECS (Registry of Toxic Effects of Chemical Substances)</td>
</tr>
<tr>
<td>(&lt;0.1%) CAS#: 50-00-0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Inhalation (Gas) Exposure Route  
No data available

12. ECOLOGICAL INFORMATION

Ecotoxicity Based on the classification principles, not classified as hazardous to the environment.

Product Ecological Data

Aquatic toxicity

Fish  
No data available

Crustacea  
No data available

Algae  
No data available

Terrestrial toxicity

Soil  
No data available

Vertebrates  
No data available

Invertebrates  
No data available
## Ingredient Ecological Data

### Aquatic toxicity

#### Fish

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Exposure time</th>
<th>Species</th>
<th>Endpoint type</th>
<th>Reported dose</th>
<th>Key literature references and sources for data</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,3,5,7-Tetrazatricycl[3.3.1.1(3,7)]decane (5 - 10%) CAS#: 100-97-0</td>
<td>96 hours</td>
<td><em>Albumus alburnus</em></td>
<td>LC_{50}</td>
<td>&gt; 10000 mg/L</td>
<td>No information available</td>
</tr>
<tr>
<td>Formaldehyde (&lt;0.1%) CAS#: 50-00-0</td>
<td>96 hours</td>
<td><em>Morone saxatilis</em></td>
<td>LC_{50}</td>
<td>6.7 mg/L</td>
<td>PEEN (Pan European Ecological Network)</td>
</tr>
</tbody>
</table>

#### Crustacea

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Exposure time</th>
<th>Species</th>
<th>Endpoint type</th>
<th>Reported dose</th>
<th>Key literature references and sources for data</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,3,5,7-Tetrazatricycl[3.3.1.1(3,7)]decane (5 - 10%) CAS#: 100-97-0</td>
<td>48 Hours</td>
<td><em>Daphnia magna</em></td>
<td>EC_{50}</td>
<td>&gt; 36000 mg/L</td>
<td>EPA (United States Environmental Protection Agency)</td>
</tr>
<tr>
<td>Formaldehyde (&lt;0.1%) CAS#: 50-00-0</td>
<td>48 Hours</td>
<td><em>Daphnia pulex</em></td>
<td>EC_{50}</td>
<td>5.8 mg/L</td>
<td>PEEN (Pan European Ecological Network)</td>
</tr>
</tbody>
</table>

#### Algae

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Exposure time</th>
<th>Species</th>
<th>Endpoint type</th>
<th>Reported dose</th>
<th>Key literature references and sources for data</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,3,5,7-Tetrazatricycl[3.3.1.1(3,7)]decane (5 - 10%) CAS#: 100-97-0</td>
<td>72 hours</td>
<td><em>Selenastrum capricornutum</em></td>
<td>EC_{50}</td>
<td>&gt; 100 mg/L</td>
<td>CEPA (Canadian Environmental Protection Agency)</td>
</tr>
</tbody>
</table>

### Terrestrial toxicity

- **Soil**: No data available
- **Vertebrates**: No data available
- **Invertebrates**: No data available

### Other Information

**Canadian Environmental Protection Act (CEPA) - Domestic Substances List (DSL):**
### Environmentally Hazardous Substances Categorizations

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS No</th>
<th>Category</th>
<th>Persistent</th>
<th>Bioaccumulation</th>
<th>Inherently Toxic to Aquatic Organisms</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,3,5,7-Tetraazatricyclo[3.3.1.1(3,7)]decan</td>
<td>100-97-0</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Formaldehyde</td>
<td>50-00-0</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

### Persistence and degradability

None known.

### Product Biodegradability Data

If available, see ingredient data below.

#### Ingredient Biodegradability Data

Test data reported below

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Test method</th>
<th>Biodegradation</th>
<th>Exposure time</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,3,5,7-Tetraazatricyclo[3.3.1.1(3,7)]decan</td>
<td>None reported</td>
<td>70%</td>
<td>26 days</td>
<td>Readily biodegradable</td>
</tr>
</tbody>
</table>

### Bioaccumulation

If available, see ingredient data below.

### Product Bioaccumulation Data

If available, see ingredient data below.

#### Ingredient Bioaccumulation Data

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Test method</th>
<th>Exposure time</th>
<th>Species</th>
<th>Bioconcentration factor (BCF)</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formaldehyde</td>
<td>None reported</td>
<td>None reported</td>
<td>None reported</td>
<td>None reported</td>
<td>Does not have the potential to bioaccumulate</td>
</tr>
</tbody>
</table>

### Additional information

### Product Information

Partition Coefficient (n-octanol/water) Not applicable

### Ingredient Information

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Partition Coefficient (n-octanol/water)</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,3,5,7-Tetraazatricyclo[3.3.1.1(3,7)]decan</td>
<td>log ( K_{ow} = -2.13 )</td>
<td>No information available</td>
</tr>
<tr>
<td>Formaldehyde</td>
<td>log ( K_{ow} = 0.35 )</td>
<td>No information available</td>
</tr>
</tbody>
</table>

### Mobility
Mobility in soil: High mobility. If available, see ingredient data below.

Product Information

Soil Organic Carbon-Water Partition Coefficient
Not applicable

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Soil Organic Carbon-Water Partition Coefficient</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,3,5,7-Tetraazatricyclo[3.3.1.1(3,7)]decane (5 - 10%)&lt;br&gt;CAS#: 100-97-0</td>
<td>log $K_{oc}$ = 2.68</td>
<td>No information available</td>
</tr>
<tr>
<td>Formaldehyde (&lt;0.1%)&lt;br&gt;CAS#: 50-00-0</td>
<td>log $K_{oc}$ = 0.89</td>
<td>No information available</td>
</tr>
</tbody>
</table>

Additional information

Water solubility

<table>
<thead>
<tr>
<th>Water solubility classification</th>
<th>Water solubility</th>
<th>Water Solubility Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soluble</td>
<td>&gt; 1000 mg/L</td>
<td>25 °C / 77 °F</td>
</tr>
</tbody>
</table>

Other adverse effects
Contains a substance with an endocrine-disrupting potential.

13. DISPOSAL CONSIDERATIONS

Waste treatment methods

Disposal of wastes
Disposal should be in accordance with applicable regional, national, and local laws and regulations.

Contaminated packaging
Dispose of in accordance with federal, state and local regulations.

US EPA Waste Number
Not applicable, U122

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>RCRA</th>
<th>RCRA - Basis for Listing</th>
<th>RCRA - D Series Wastes</th>
<th>RCRA - U Series Wastes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formaldehyde 50-00-0</td>
<td>U122</td>
<td>Included in waste streams: K009, K010, K038, K040, K156, K157</td>
<td>-</td>
<td>U122</td>
</tr>
</tbody>
</table>
14. TRANSPORT INFORMATION

DOT
Special Provisions
Not regulated

TDG
Not regulated

IATA
Not regulated

IMDG
Not regulated

Note:
No special precautions necessary.

Additional information
There is a possibility that this product could be contained in a reagent set or kit composed of various compatible dangerous goods. If the item is not in a reagent set or kit, the classification given above applies.
If the item is part of a reagent set or kit the classification would change to the following:
UN3316 Chemical Kit, Hazard Class 9, Packing Group II or III.
If the item is not regulated, the Chemical Kit classification does not apply.

15. REGULATORY INFORMATION

National Inventories
TSCA
Complies

DSL/NDSL
Complies

TSCA- United States Toxic Substances Control Act Section 8(b) Inventory
DSL/NDSL- Canadian Domestic Substances List/Non-Domestic Substances List

International Inventories
EINECS/ELINCS
Complies

ENCS
Complies

IECSC
Complies

KECL
Complies

PICCS
Complies

TCSI
Complies

AICS
Complies

NZIoC
Complies

EINECS/ELINCS- European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances
ENCS- Japan Existing and New Chemical Substances
IECSC- China Inventory of Existing Chemical Substances
KECL- Korean Existing and Evaluated Chemical Substances
PICCS- Philippines Inventory of Chemicals and Chemical Substances
TCSI- Taiwan Chemical Substances Inventory
AICS- Australian Inventory of Chemical Substances
NZIoC- New Zealand Inventory of Chemicals

US 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

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>SARA 313 - Threshold Values %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formaldehyde (CAS #: 50-00-0)</td>
<td>0.1</td>
</tr>
</tbody>
</table>

SARA 311/312 Hazard Categories

Acute health hazard: Yes
Chronic Health Hazard: No
Fire hazard: No
Sudden release of pressure hazard
No

Reactive Hazard
No

CWA (Clean Water Act)
This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CWA - Reportable Quantities</th>
<th>CWA - Toxic Pollutants</th>
<th>CWA - Priority Pollutants</th>
<th>CWA - Hazardous Substances</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formaldehyde 50-00-0</td>
<td>100 lb</td>
<td>-</td>
<td>-</td>
<td>X</td>
</tr>
</tbody>
</table>

CERCLA
This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355). There may be specific reporting requirements at the local, regional, or state level pertaining to releases of this material.

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Hazardous Substances RQs</th>
<th>CERCLA/SARA RQ</th>
<th>Reportable Quantity (RQ)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formaldehyde 50-00-0</td>
<td>100 lb</td>
<td>100 lb</td>
<td>RQ 100 lb final RQ RQ 45.4 kg final RQ</td>
</tr>
</tbody>
</table>

U.S. - Department of Homeland Security - Chemical Facility Anti-Terrorism Standards (CFATS) - Security Issues

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>U.S. - Department of Homeland Security - Chemical Facility Anti-Terrorism Standards (CFATS) - Security Issues</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formaldehyde (&lt;0.1%) 50-00-0</td>
<td>Release - Toxic (solution)</td>
</tr>
</tbody>
</table>

US State Regulations

California Proposition 65
This product contains the following Proposition 65 chemicals

U.S. State Right-to-Know Regulations

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>New Jersey</th>
<th>Massachusetts</th>
<th>Pennsylvania</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,3,5,7-Tetraazatricyclo[3.3.1.1(3,7)]decane 100-97-0</td>
<td>X</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Formaldehyde 50-00-0</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

U.S. EPA Label Information
EPA Pesticide Registration Number Not applicable

16. OTHER INFORMATION, INCLUDING DATE OF PREPARATION OF THE LAST REVISION

NFPA and HMIS Classifications

<table>
<thead>
<tr>
<th>NFPA</th>
<th>Health hazards - 2</th>
<th>Flammability - 0</th>
<th>Instability - 0</th>
<th>Physical and Chemical Properties -</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Personal protection - X</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>- See section 8 for more information</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>HMIS</th>
<th>Health hazards - 2</th>
<th>Flammability - 0</th>
<th>Physical hazards - 0</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Key or legend to abbreviations and acronyms used in the safety data sheet

NIOSH IDLH  Immediately Dangerous to Life or Health
ACGIH  ACGIH (American Conference of Governmental Industrial Hygienists)
NDF  no data

Legend - Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

TWA  TWA (time-weighted average)
MAC  Maximum Allowable Concentration
X  Listed

STEL  STEL (Short Term Exposure Limit)
Ceiling  Ceiling Limit Value
Vacated

SKN*  Skin designation
RSP+  Respiratory sensitization
C  Carcinogen
M  mutagen

SKN+  Skin sensitization
"  Hazard Designation
R  Reproductive toxicant

Prepared By  Hach Product Compliance Department
Issue Date  06-Jun-2016
Revision Date  06-Oct-2016
Revision Note  None

Disclaimer

USER RESPONSIBILITY: Each user should read and understand this information and incorporate it in individual site safety programs in accordance with applicable hazard communication standards and regulations.

THE INFORMATION CONTAINED HEREIN IS BASED ON DATA CONSIDERED TO BE ACCURATE. HOWEVER, NO WARRANTY IS EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THESE DATA OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF.

HACH COMPANY ©2016

End of Safety Data Sheet