**Material Safety Data Sheet**

**Product and Company Information**

- **Product Name:** HYDROCHLORIC ACID 32% (AS = 0.00005%)
- **Brand:** Fluka Chemical
- **Company:** Sigma-Aldrich
- **Address:** 3030 Spruce Street
- **City, State, Zip, Country:** SAINT LOUIS MO 63103 US
- **Technical Phone:** 800-325-6532
- **Emergency Phone:** 314-776-9555

**Composition/Information on Ingredient**

<table>
<thead>
<tr>
<th>Substance Name</th>
<th>CAS #</th>
<th>SARA 311</th>
<th>EC #</th>
<th>Annex 1 Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>HYDROCHLORIC ACID &gt;=32%</td>
<td>7647-01-0</td>
<td>No</td>
<td>231-998-7</td>
<td>017-002-01-X</td>
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</table>

<table>
<thead>
<tr>
<th>Ingredient Name</th>
<th>CAS #</th>
<th>Percent</th>
<th>SARA 311</th>
</tr>
</thead>
<tbody>
<tr>
<td>HYDROCHLORIC ACID</td>
<td>7647-01-0</td>
<td>&gt; 25.00%</td>
<td></td>
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<tr>
<td>WATER</td>
<td>7732-18-5</td>
<td>&lt;= 75.00%</td>
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</tbody>
</table>

**Hazard Identification**

- **Emergency Overview:**
  - **Toxic:** toxicity by inhalation. Causes burns. Initiating to respiratory system.

- **HMIS Rating:**
  - Health: 3
  - Flammability: 0
  - Reactivity: 1

- **NFPA Rating:**
  - Health: 3
  - Flammability: 0
  - Reactivity: 1

For additional information on toxicity, please refer to Section 11.

**First Aid Measures**

- **Oral Exposure:**
  - If swallowed, wash out mouth with water provided person is conscious. Call a physician.

- **Inhalation Exposure:**
  - If inhaled, remove to fresh air. If breathing becomes difficult, call a physician.

**Fire Fighting Measures**

- **Autoignition Temp:** N/A
- **Firefighting:**
  - **Protective Equipment:** Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.
  - **Specific Hazard(s):** Emits toxic fumes under fire conditions.
  - **Specific Method(s) of Fire Fighting:** For small (inexpensive) fire extinguishing, use a portable fire extinguisher rated for flammable liquid fires. For large fires, fixed fire suppression systems, such as a sprinkler system, should be capable of extinguishing a flammable liquid fire.

**Accidental Release Measures**

- **Procedure to be Followed in Case of Leak or Spill:** Evacuate area.
- **Procedure(s) of Personal Protection(s):** Wear self-contained breathing apparatus, rubber boots, and heavy rubber gloves.
- **Methods for Cleaning Up:** Absorb on sand or vermiculite and place in closed containers for disposal. Ventilate area and wash spill site after material pickup is complete.

**Handling and Storage**

- **Handling:**
  - User Exposure: Do not breathe vapor. Do not get in eyes, on skin, on clothing.
  - Special Requirements: May develop pressure. Open carefully.

**Exposure Controls / PPE**

- **Engineering Controls:**
  - Safety shower and eye bath. Use only in a chemical fume hood.

- **Personal Protective Equipment:**
  - **Respiratory:** Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU). Where risk assessment shows air-purifying respirators are appropriate, use a fullface respirator with multipurpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a fullface supplied air respirator.
  - **Hand:** Chemical-resistant gloves.
  - **Eye:** Chemical safety goggles.
### Other

Face shield (5 inch minimum).

### General Hygiene Measures

Wash thoroughly after handling. Discard contaminated shoes. Wash contaminated clothing before reuse.

#### Exposure Limits

<table>
<thead>
<tr>
<th>Country</th>
<th>Type</th>
<th>Value</th>
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<tbody>
<tr>
<td>Poland</td>
<td>NDS</td>
<td>5 MG/M3</td>
</tr>
<tr>
<td>Poland</td>
<td>NSCh</td>
<td>10</td>
</tr>
<tr>
<td>Poland</td>
<td>NSDP</td>
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#### Exposure Limits, RTECS

<table>
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<tr>
<th>Country</th>
<th>Source</th>
<th>Type</th>
<th>Value</th>
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</thead>
<tbody>
<tr>
<td>USA</td>
<td>ACGIH</td>
<td>Ceiling concentration</td>
<td>2 PPM (7 MG/M3)</td>
</tr>
<tr>
<td>USA</td>
<td>MSHA Standard</td>
<td>Ceiling concentration</td>
<td>5 PPM (7 MG/M3)</td>
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<tr>
<td>USA</td>
<td>OSHA</td>
<td>PEL</td>
<td>CL 8 PPM (7 MG/M3)</td>
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<tr>
<td>New Zealand</td>
<td>OEL</td>
<td>Ceiling concentration</td>
<td>5 PPM</td>
</tr>
<tr>
<td>USA</td>
<td>NIOSH</td>
<td>Ceiling concentration</td>
<td>5 PPM</td>
</tr>
</tbody>
</table>

**Remarks:** check ACGIH TLV

### Section 9 - Physical/Chemical Properties

**Appearance**
- Physical State: Liquid
- Color: Faintly yellow
- Odor: Pungent

**Molecular Weight:** 35.46 AMU

**pH:** N/A

**BP/TP Range:** 110 °C

**MP/FP Range:** -14.2 °C

**Freezing Point:** -24.4 °C

**Vapor Pressure:** 136.691 mmHg at 21.1 °C

**Vapor Density:** 1.3 g/L

**Saturated Vapor Conc.:** N/A

**SG/Density:** 1.2 g/cm³

**Bulk Density:** N/A

**Odor Threshold:** N/A

**Volatile:** N/A

**VOC Content:** N/A

**Water Content:** N/A

**Solvent Content:** N/A

**Evaporation Rate:** N/A

**Viscosity:** N/A

**Partition Coefficient:** N/A

**Decomposition Temp.:** N/A

**Flash Point: °F:** N/A

**Flash Point: °C:** N/A

**Explosion Limits:** N/A

**Flammability:** N/A

**Autoignition Temp.:** N/A

### Section 10 - Stability and Reactivity

**Stability:** Stable

**Materials to Avoid:** Bases, Amines, Alkal metals, Metals, Potassium permanganate, Fluorine, concentrated sulfuric acid, Hexafluoride diisocyanate, Metal acrylates or carbides.

**Hazardous Decomposition Products:** Hydrogen chloride gas

**Hazardous Polymerization:** Will not occur.

### Section 11 - Toxicological Information

**Route of Exposure**
- **Skin Contact:** Causes burns
- **Skin Absorption:** May be harmful if absorbed through the skin.
- **Eye Contact:** Causes burns
- **Inhalation:** Material is extremely destructive to the tissue of the mucous membranes and upper respiratory tract (may be harmful if inhaled). Ingestion: May be harmful if swallowed.

**Signs and Symptoms of Exposure:** Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin. Inhalation may result in spasm, inflammation and edema of the larynx and bronchi, chemical pneumonitis, and pulmonary edema. Symptoms of exposure may include burning sensation, coughing, wheezing, laryngitis, shortness of breath, headache, nausea, and vomiting.

**RTECS Number:** MN4028500

**Toxicity Data**
- Oral - Man: 2.857 mg/kg (LD50)
- Remarks: Vascular seizure not charaterized in anatomic section
- Lungs, Thorax, or Respiratory Depression.
- Gastrointestinal Changes in structure of function of esophagus.

- Oral - Woman: 400 U/L/KG (LD50)
- Remarks: Behavioral Excitement.
- Cardio-Pulse rate.
- Kidney, Ureter, Bladder, Hematuria.
- Inhalation - Human: 1.300 ppm (LC50)
- Inhalation - Human: 3.000 ppm (LC50)
- Remarks: Sense Organs and Special Senses (Nose, Eye, Ear, and Taste); Other changes; Other changes; Sense Organs and Special Senses (Nose, Eye, Ear, and Taste); Eye Irritation
- Inhalation - Mouse: 1.108 ppm (LC50)
- Remarks: Sense Organs and Special Senses (Nose, Eye, Ear, and Taste); Eye Irritation
- Lungs, Thorax, or Respiratory Depression.
- Skin and Appendages: Skin After systemic exposure, Dermatitis, other.
Section 15 - Regulatory Information

EU Directive Classification
Symbol of Danger: C
Indication of Danger: Corrosive
Risk Statements: R 34 37
Causes burns. Initiating to respiratory system.
Safety Statements: S 26 36/37/39 45
In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Wear suitable protective clothing, gloves, and eye/face protection. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

US Classification and Label Text
Indication of Danger: Toxic
Risk Statements: Toxic by Inhalation. Causes burns. Initiating to respiratory system.
Safety Statements: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

Section 12 - Ecological Information

No data available.

Section 13 - Disposal Considerations

Appropriate Method of Disposal of Substance or Preparation
Contact a licensed professional waste disposal service to dispose of this material. Observe all federal, state, and local environmental regulations.

Section 14 - Transport Information

DOT
Proper Shipping Name: Hydrochloric acid
UN No.: 1789
Class: 8
Packing Group: Packing Group II
Hazard Label: Corrosive
PHN: Not PHN

IATA
Proper Shipping Name: Hydrochloric acid
IATA UN Number: 1789
Hazard Class: 8
Packing Group: II

Intraperitoneal - Mouse: 4042 UG/KG (LD50)
Oral - Rabbit: 900 mg/kg (LD50)

Irritation Data
Eyes - Rabbit: 5 mg 30S
Remarks: Rened

Chronic Exposure - Carcinogen
Result: This product is or contains a component that is not classifiable as to its carcinogenicity based on its IARC, ACGIH, NTP, or EPA classification.

IARC Carcinogen List
Group 3

Chronic Exposure - Teratogen
Species: Rat
Route of Application: Inhalation
Exposure Time: (1 D PDE)
Result: Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).
Specific Developmental Abnormalities: Homeostasis

Chronic Exposure - Mutagen
Species: Rat
Dose: 450 MG/M3/1H
Cell Type: Lung
Mutation Test: Cytogenetic analysis

Hamster
Dose: 8 MMOL/L
Ovary
Cytogenetic analysis