1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

Product Name: Hydrochloric acid solution, 0.5M - 2.0M (0.5N - 2.0N)
Synonyms: No information available.
Recommended Use: Laboratory chemicals

Company: Fisher Scientific UK
Bishop Meadow Rd
Loughborough, Leicestershire,
Great Britain LE115RG
Tel: 01509 231166

Emergency Telephone Number: Chemtrec US: (800) 424-9300
Chemtrec EU: (202) 483-7616

2. HAZARDS IDENTIFICATION

R-phrase(s): none

3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight %</th>
<th>EC No.</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrochloric acid</td>
<td>1.825 - 7.2</td>
<td>231-595-7</td>
<td>C; R34</td>
</tr>
<tr>
<td>7647-01-0</td>
<td></td>
<td></td>
<td>XI; R37</td>
</tr>
<tr>
<td>Water</td>
<td>92.8 - 98.175</td>
<td>EEC No. 231-791-2</td>
<td>-</td>
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<tr>
<td>7732-18-5</td>
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</tr>
</tbody>
</table>

For the full text of the R phrases mentioned in this Section, see Section 16
4. FIRST AID MEASURES

Eye Contact
Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Obtain medical attention.

Skin Contact
Wash off immediately with plenty of water for at least 15 minutes. Get medical attention immediately if symptoms occur.

Ingestion
Do not induce vomiting. Obtain medical attention.

Inhalation
Move to fresh air. If breathing is difficult, give oxygen. Get medical attention immediately if symptoms occur.

Notes to Physician
Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media
Substance is nonflammable; use agent most appropriate to extinguish surrounding fire.

Extinguishing media which must not be used for safety reasons
No information available.

Specific Hazards Arising from the Chemical
Thermal decomposition can lead to release of irritating gases and vapors.

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.

Flash Point
Not applicable

Method
No information available.

Autoignition Temperature
No information available.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions
Use personal protective equipment. Ensure adequate ventilation. Do not get in eyes, on skin, or on clothing.

Environmental Precautions
Should not be released into the environment.

Methods for Containment and Clean Up
Soak up with inert absorbent material. Keep in suitable and closed containers for disposal.
7. HANDLING AND STORAGE

Handling
Wear personal protective equipment. Ensure adequate ventilation. Do not get in eyes, on skin, or on clothing. Do not breathe vapors or spray mist.

Storage
Keep containers tightly closed in a dry, cool and well-ventilated place. Do not store in metal containers. Corrosives area.

Specific use(s)
No information available.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure limits

<table>
<thead>
<tr>
<th>Component</th>
<th>European Union</th>
<th>The United Kingdom</th>
<th>France</th>
<th>Spain</th>
<th>Germany</th>
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</thead>
<tbody>
<tr>
<td>Hydrochloric acid</td>
<td>STEL: 5 ppm</td>
<td>STEL: 8 mg/m³</td>
<td>VLCT: 5 ppm</td>
<td>VLA-EC: 10 ppm</td>
<td>MAK: 2 ppm</td>
</tr>
<tr>
<td></td>
<td>TWA: 8 mg/m³</td>
<td>Ceiling: 2 ppm</td>
<td>TWA: 8 mg/m³</td>
<td>VLA-EC: 15 mg/m³</td>
<td>MAK: 3.0 mg/m³</td>
</tr>
<tr>
<td></td>
<td>STEL: 10 ppm</td>
<td>Ceiling: 5 ppm</td>
<td>TWA: 7 mg/m³</td>
<td>VLA-EC: 15 mg/m³</td>
<td>Peak: 4 ppm</td>
</tr>
<tr>
<td></td>
<td>NDS: 5 mg/m³</td>
<td>Ceiling: 7 mg/m³</td>
<td>TWA: 10 ppm</td>
<td>VLA-EC: 15 mg/m³</td>
<td>Peak: 6 mg/m³</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Component</th>
<th>Italy</th>
<th>Portugal</th>
<th>The Netherlands</th>
<th>Finland</th>
<th>Austria</th>
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</thead>
<tbody>
<tr>
<td>Hydrochloric acid</td>
<td>TWA: 8 mg/m³</td>
<td>Ceiling: 2 ppm</td>
<td>Ceiling: 5 ppm</td>
<td>STEL: 5 ppm</td>
<td>STEL: 15 mg/m³</td>
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<tr>
<td></td>
<td>TWA: 5 ppm</td>
<td>TWA: 8 mg/m³</td>
<td>TWA: 8 mg/m³</td>
<td>STEL: 7.6 mg/m³</td>
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<td>Ceiling: 2 ppm</td>
<td>Ceiling: 5 ppm</td>
<td>MAK: 5 ppm</td>
<td>MAK: 8 mg/m³</td>
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<tr>
<th>Component</th>
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<th>Poland</th>
<th>Norway</th>
<th>Ireland</th>
<th>Denmark</th>
<th>Australia</th>
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<tbody>
<tr>
<td>Hydrochloric acid</td>
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<td>NDSCh: 10 mg/m³</td>
<td>Ceiling: 5 ppm</td>
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<td>Ceiling: 7 mg/m³</td>
<td>Ceiling: 5 ppm</td>
</tr>
<tr>
<td></td>
<td>STEL: 4 ppm</td>
<td>NDS: 5 mg/m³</td>
<td>Ceiling: 7 mg/m³</td>
<td>Ceiling: 10 ppm</td>
<td>Ceiling: 14 mg/m³</td>
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<tr>
<td></td>
<td>MAK: 3.0 mg/m³</td>
<td>NDS: 5 mg/m³</td>
<td>Ceiling: 7 mg/m³</td>
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<tr>
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<td>MAK: 2 ppm</td>
<td>Ceiling: 7 mg/m³</td>
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<td>Ceiling: 10 ppm</td>
<td>Ceiling: 14 mg/m³</td>
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</tbody>
</table>

Occupational exposure controls

Engineering Measures
Ensure adequate ventilation, especially in confined areas. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal Protective Equipment

Respiratory Protection
Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Eye Protection
Tightly fitting safety goggles

Skin and body protection
Wear appropriate protective gloves and clothing to prevent skin exposure.

Hand Protection
Protective gloves

Hygiene Measures
Handle in accordance with good industrial hygiene and safety practice.

Environmental exposure controls
No information available.
9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State: Liquid
Appearance: Clear, Colorless - Light yellow
Odor: odorless - strong, pungent
pH: 2.02 (0.01M)
Vapor Pressure: 6.7 mmHg @ 0°C
Vapor Density: 1.26
Boiling Point/Range: 81.5 - 110°C / 178.7 - 230°F
Melting Point/Range: -74°C / -101.2°F
Flash Point: Not applicable
Evaporation Rate: > 1 (Butyl acetate = 1.0)
Specific Gravity: 1.0 - 1.2
Molecular Formula: HCl
Molecular Weight: 36.46

10. STABILITY AND REACTIVITY

Stability: Stable under normal conditions.
Conditions to Avoid: Incompatible products. Excess heat.
Incompatible Materials: Metals, Oxidizing agents, Reducing agents, Acids, Bases, Aldehydes
Hazardous Decomposition Products: Hydrogen chloride gas, Carbon monoxide (CO), Carbon dioxide (CO₂)
Hazardous Polymerization: Hazardous polymerization does not occur
Hazardous Reactions: None under normal processing.

11. TOXICOLOGICAL INFORMATION

Acute Toxicity

Component Information

<table>
<thead>
<tr>
<th>Component</th>
<th>LD₅₀ Oral ( Rat )</th>
<th>LD₅₀ Dermal ( Rabbit )</th>
<th>LC₅₀ Inhalation ( Rat ) 1 h</th>
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<tbody>
<tr>
<td>Hydrochloric acid</td>
<td>700 mg/kg</td>
<td>5010 mg/kg</td>
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<td>Water</td>
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Chronic Toxicity

Carcinogenicity

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<th>Component</th>
<th>IARC</th>
<th>UK</th>
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</table>

According to EC Directive 1907/2006/EC
Component | IARC | UK
--- | --- | ---
Hydrochloric acid | group 3 |

IARC: (International Agency for Research on Cancer)
Group 1 - Carcinogenic to Humans
Group 2A - Probably Carcinogenic to Humans
Group 2B - Possibly Carcinogenic to Humans

Sensitization
No information available.

Neurological Effects
No information available.

Mutagenic Effects
Mutagenic effects have occurred in experimental animals.

Reproductive Effects
Experiments have shown reproductive toxicity effects on laboratory animals.

Developmental Effects
Developmental effects have occurred in experimental animals.

Teratogenicity
Teratogenic effects have occurred in experimental animals.

Target Organs
Skin, Liver, Kidney, Blood.

Other Adverse Effects
The toxicological properties have not been fully investigated. See actual entry in RTECS for complete information.

12. ECOLOGICAL INFORMATION

Ecotoxicity
Do not empty into drains.

Persistence and Degradability
No information available.

Bioaccumulative Potential
No information available.

Mobility
No information available.

13. DISPOSAL CONSIDERATIONS

Waste from Residues / Unused Products
Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations to ensure complete and accurate classification.

Contaminated Packaging
Empty containers should be taken for local recycling, recovery or waste disposal.
14. TRANSPORT INFORMATION

IMDG/IMO

<table>
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<tr>
<th>UN-No</th>
<th>UN1789</th>
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<tr>
<td>Hazard Class</td>
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ADR

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IATA

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<td>III</td>
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<tr>
<td>Proper Shipping Name</td>
<td>HYDROCHLORIC ACID</td>
</tr>
</tbody>
</table>

15. REGULATORY INFORMATION

Labelling

R -phrase(s)
none

S -phrase(s)
S24/25 - Avoid contact with skin and eyes

International Inventories

All of the components in the product are on the following Inventory lists:

<table>
<thead>
<tr>
<th>Component</th>
<th>EINECS</th>
<th>ELINCS</th>
<th>NLP</th>
<th>TSCA</th>
<th>DSL</th>
<th>NDSL</th>
<th>PICCS</th>
<th>ENCS</th>
<th>CHINA</th>
<th>AICS</th>
<th>KECL</th>
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<tbody>
<tr>
<td>Hydrochloric acid</td>
<td>231-595-7</td>
<td>-</td>
<td>NLP</td>
<td>T</td>
<td>X</td>
<td>-</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>KE-20189 X</td>
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<tr>
<td>Water</td>
<td>231-791-2</td>
<td>-</td>
<td>X</td>
<td>X</td>
<td>-</td>
<td>X</td>
<td>-</td>
<td>X</td>
<td>X</td>
<td>KE-35400 X</td>
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</tbody>
</table>
16. OTHER INFORMATION

Text of R phrases mentioned in Section 2-3
R34 - Causes burns
R37 - Irritating to respiratory system

Prepared By  Regulatory Affairs
Creation Date  01-Sep-2009
Revision Date  01-Sep-2009
Revision Summary  "***", and red text indicates revision
Restrictions on use  No information available.
Training advice  No information available.
Literary reference  No information available.

Disclaimer
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End of Safety Data Sheet