SECTION I. MATERIAL IDENTIFICATION
MATERIAL NAME: HYDROCHLORIC ACID
DESCRIPTION: This material is a water solution of hydrogen chloride gas.
OTHER DESIGNATIONS: Muratic Acid, Concentrated Hydrochloric Acid, GE Material D4A3,
CAS# 007 647 010, Aqueous Hydrochloric Acid
MANUFACTURER: Available from many suppliers.

SECTION II. INGREDIENTS AND HAZARDS
<table>
<thead>
<tr>
<th>Ingredient</th>
<th>%</th>
<th>HAZARD DATA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrogen Chloride (HCl)</td>
<td>&lt;38</td>
<td>8-hr TWI 5 ppm or 7 mg/m³ (C)*</td>
</tr>
<tr>
<td>Impurities (depends on acid grade)</td>
<td>Traces</td>
<td>Human, Inhalation LC50 1300ppm/30 M</td>
</tr>
<tr>
<td>Water</td>
<td>Balance</td>
<td>Rabbit, Oral LD50 900 mg/kg</td>
</tr>
<tr>
<td>*Current OSHA PEL and ACGIH (1983) TLV Ceiling Level.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SECTION III. PHYSICAL DATA
<table>
<thead>
<tr>
<th>18°Be'</th>
<th>20°Be'</th>
<th>22°Be'</th>
<th>23°Be'</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight % HCl</td>
<td>27.9</td>
<td>31.5</td>
<td>35.2</td>
</tr>
<tr>
<td>Boiling pt, 1 atm, deg F</td>
<td>208</td>
<td>182</td>
<td>144</td>
</tr>
<tr>
<td>Freezing point, deg F (approx)</td>
<td>-43</td>
<td>-63</td>
<td>-86</td>
</tr>
<tr>
<td>Specific gravity, 60/60 F</td>
<td>1.142</td>
<td>1.162</td>
<td>1.179</td>
</tr>
<tr>
<td>Vap. Press., 25°C, HCl/Total, mm Hg</td>
<td>~7/15</td>
<td>~25/33</td>
<td>~87/92</td>
</tr>
</tbody>
</table>

All materials are completely water soluble with ~100% volatiles and pH <1.
Appearance & Odor: Clear, colorless to Lt. yellow, fuming liquid with a pungent, irritating odor. 1.5 ppm HCl detected by smell; 5-10 ppm is disagreeable.

SECTION IV. FIRE AND EXPLOSION DATA

Extinguishing media: Select that suitable for surrounding fire. Use a water spray to cool fire exposed containers to prevent rupture.
Nonflammable, but acid can react with many metals, such as iron, to produce flammable hydrogen gas. (Flammable conc. may accumulate inside metal equipment.) Neutralize acid with limestone, slaked lime or soda ash to minimize formation of potentially explosive hydrogen gas.
Firefighters should use full protective clothing and self-contained breathing apparatus when this material is involved in a fire situation.

SECTION V. REACTIVITY DATA
This material is stable when properly contained and handled. It is a strong mineral acid and is, thus, highly reactive with materials such as metals, metal oxides, hydroxides, amines, carbonates and other alkaline materials. It is highly corrosive to many materials; it must have proper containment for handling and storage.
It liberates significant levels of HCl gas by vapor pressure at room temperature when concentrated and large amounts of HCl when heated.
Reaction with most metals will produce flammable hydrogen gas.
Incompatible with materials such as cyanides, sulfides, sulfites and formaldehyde (may release HCN, H₂S, SO₂, bischloromethyl ether, respectively).
SECTION VI. HEALTH HAZARD INFORMATION

Aqueous HCl and its vapors are strong irritants of the eyes, mucous membranes, and skin. Severity of eye injury from splashes depends on quantity, concentration, and duration of contact. Excessive acute exposure to HCl vapors/mists irritates the upper respiratory tract and can result in coughing, burning of the throat, choking sensation, and, if inhaled deeply, pulmonary edema. Prolonged or repeated low level exposure may cause teeth erosion. Skin exposure can cause burns; repeated or prolonged exposure to dilute solns. may cause dermatitis. Ingestion can cause severe burns and possible laryngeal spasm. FIRST AID:

Eye Contact: Contact physician! Immediately flush with running water for 15 min. including under eyelids.

Skin Contact: Flush affected area well with water. Remove grossly contaminated clothing under safety shower. Get medical help if large skin area contacted or if irritation persists.

Inhalation: Remove to fresh air. Restore and/or support breathing as needed. Use O2 for coughing, difficult breathing. Get medical help. Keep warm and at rest.

Ingestion: If victim is conscious, give 2-3 glasses of water, then milk of magnesia or lime water. Contact physician! Do not induce vomiting!

SECTION VII. SPILL, LEAK, AND DISPOSAL PROCEDURES

Report large spills to safety personnel. Evacuation may be needed; keep upwind. Remove sources of ignition if HCl is a hazard. Provide adequate ventilation. Those involved in clean-up or large spills must use full protective clothing, boots, and self-contained breathing apparatus.

Small spills and residues can be covered with excess of a mixture of soda ash and slaked lime to neutralize, and the slurry picked up for landfill burial or flushed with much water.

Contain large spills. Collect or flush with water to holding area for neutralization. Do not flush directly to sewer or surface waters.

DISPOSAL: Dispose of acid via licensed contractor or neutralize with limestone, soda ash, or slaked lime. Flushing to sewer depends on allowable neutral salt concentrations in effluent. Follow Federal, State, and Local Regulations. Consider use of waste acid to neutralize alkaline wastes. EPA (QRA) NO 15-3000-15. (40 CFR 177)

SECTION VIII. SPECIAL PROTECTION INFORMATION

Provide adequate exhaust ventilation to meet TLV requirements. Face velocity of hoods should exceed 100 fpm. Use approved respirator or self-contained breathing apparatus for emergency or non-routine conditions with full facepiece above 50 ppm.

Those handling hydrochloric acid should use protective clothing and equipment to prevent body contact with the liquid. Use rubber gloves or gauntlets, apron, boots, long sleeved shirt, body suit, etc. Use chemical safety goggles and/or face shield for eye protection against splashing of acid.

An eyewash station, washing facilities, and safety shower must be readily available to areas of use and handling.

SECTION IX. SPECIAL PRECAUTIONS AND COMMENTS

Store closed containers out of direct sunlight, in a clean, cool, open or well-ventilated area away from oxidizing agents, away from alkaline material, and sources of heat. Area should have acid resistant floor and approved drainage. Protect containers from physical damage. Use nonsparking tools in areas around tanks and pipes where hydrogen might be generated.

Use with good ventilation. Avoid inhalation of HCl vapors. Odor of HCl gives adequate warning for a prompt voluntary withdrawal from excessive exposure. Do not get in eyes or on skin or clothing. Wash thoroughly after handling.

Provide emergency neutralization materials and equipment near storage and use areas.

DOT Classification: CORROSIVE MATERIAL I.D. No. UN1789 Label: CORROSIVE

I.HO Class 8
DATA SOURCE(S) CODE: 1-12, 14-16, 27, 31, 34, 37, 38, 47-49

APPROVALS: MIS/CRD J. W. Miller INDUST. HYGIENE/SAFETY D. P. St. MEDICAL REVIEW: 15 June 1984