

Material Safety Data Sheet (MSDS)

-----Tsurumi Soda Co., Ltd. — Hydrochloric acid (hydrogen chloride) 1/5-----

1. Chemical substance and company information

Product name: Liquid hydrogen chloride, synthetic hydrogen chloride, pure synthetic hydrochloric acid (hydrogen chloride)

Company: Tsurumi Soda Co., Ltd.

Address: 1-7 Suehiro-cho, Tsurumi-ku, Yokohama

Responsible department: Tsurumi Soda Co., Ltd. sales department

Address: Tanaka-Tamuracho Bldg., 2-12-15 Shimbashi, Minato-ku, Tokyo

Phone: 03-3503-0856; Fax: 03-3503-4595

Emergency contact: Factory headquarters, Tel: 045-503-7326

Reference number: L-A-03

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2. Composition and constituents

Chemical name: Hydrochloric acid

Constituents and quantities: Hydrogen chloride $\geq 35.0\%$ (hydrochloric acid, synthetic hydrochloric acid)

Hydrogen chloride $\geq 38.0\%$ (pure synthetic hydrochloric acid)

Chemical formula or structural formula: HCl

Reference number in Japanese gazette: JCSCCL existing chemical substance 1-215;
Not listed in ISHL

TSCA: Listed

EINECS: 231-595-7

CAS No.: 7647-01-0

PRTR Law: Not applicable

3. Summary of hazards and toxicity

Classification names: Acutely toxic substances. corrosive substances

Hazards: Has a violent exothermic reaction on contact with alkalis. Highly corrosive, and penetrates through various metals, releasing hydrogen gas which can mix with air to form a flammable explosive mixture.

Toxicity: Causes inflammation on contact with eyes or skin. Irritating to mucous membranes such as nose and throat, resulting in coughing. Inhalation of large quantities causes fatal pulmonary edema.

4. First aid measures

Contact with eyes: Immediately flush eyes with large amounts of tap water (running water) for at least 15 minutes (rinsing under the eyelids thoroughly), and seek prompt attention from an ophthalmologist.

Contact with skin: Remove contaminated clothing and immediately wash skin with large amounts of water. If irritation persists, seek medical attention.

Inhalation: Make the patient rest in a place of fresh air and seek medical attention.

Ingestion: Make the patient drink large quantities of water if conscious. Seek immediate medical attention.

5. Fire procedure (in the event of a fire in the vicinity)

Fire extinguishing method: Not flammable

(If there is a fire in the vicinity): Immediately move the container to a safe place. If this is not possible, spray the container and its surrounding area with water to keep it cool and prevent the container from rupturing.

6. Leakage procedure

Evacuate the downwind area. If necessary, cover the mouth and nose with a damp tea towel or the like. Cordon off the location of the leak to prevent people from entering. Ensure that protective gear is worn when carrying out work. Refrain from working in the downwind area.

(If the leak is small): Either use earth and sand or the like to absorb and mop up the leaked liquid, or gradually dilute the leaked liquid with water to a certain degree and then neutralize with slaked lime, soda ash or the like and wash away with large amounts of water.

(If the leak is large): Either use earth and sand or the like to stop the escaped liquid flowing and mop it up, or guide the escaped liquid to a safe place and gradually dilute it by pouring in water while maintaining a safe distance and then neutralize with slaked lime, soda ash or the like and wash away with large amounts of water. The gases that are given off should be absorbed by applying a water mist. In such cases, take care to ensure that concentrated run-off is not discharged into waterways.

7. Handling and storage precautions

Handling: Avoid contact with flammable substances. Avoid contact with metals. This substance should preferably be handled while wearing protective eyewear, rubber gloves and respiratory protective gear.

Storage: Keep away from combustible materials and reducing agents, strong oxidizing agents, strongly bases, strong acids, and metals. Store in a well ventilated place.

(Inlet): Connection with lorry hoses and the like should be made with a flange connection or screw connection or the like. Provide face-washing and hand-washing facilities close to places where the material is stored and used.

8. Explosion prevention and protective measures

Permitted concentration: Japan Association of Industrial Health (2005 edition): 5 ppm (maximum value); ACGIH (2004 edition): TLV-STEL C 2 ppm (ceiling value)

Facility measures: Ventilation, local exhaust

Protective gear

Protective breathing gear: Acid vapor gas mask or air fed mask

Protective eyewear: Goggles

Protective gloves: Rubber gloves

Protective clothing: Rubber boots, protective clothing

9. Physical and chemical properties

Appearance: Colorless solution that gives off pronounced pungent fumes in damp air.

Boiling point: Boiling point (hydrochloric acid is azeotropic) 108.584°C (20.222 wt% HCl)

Specific gravity: 1.185 (20°C)

10. Stability and reactivity

Flash point: None

Ignition point: None

Explosion limit: Upper limit: none; lower limit: none

Combustible: No (self-combustible, reacts with water)

Oxidative: No

Self-reactive/explosive: No

Dust explosive: No

Stability/reactivity: Penetrates through metals, releasing hydrogen which can mix with air to form an explosive combination. Strongly corrosive, able to penetrate through most metals.

11. Toxicity information (including information on human cases and epidemiology)

Caustic action on skin: Strongly acidic and highly caustic

Irritation (skin, eyes): Highly irritating to eyes and mucous membranes of respiratory system. Brief exposure to 35 ppm causes sore throat, coughing, breathlessness and tight chest.

Acute toxicity (including 50% lethal concentration):

Inhalation (human):	LDL ₀ (minimum lethal concentration)
	1,300 ppm/30 minutes
Inhalation (rat):	LC ₅₀ (50% lethal concentration)
	3,124 ppm/60 minutes
Inhalation (mouse):	LC ₅₀ (50% lethal concentration)
	2,142 ppm/60 minutes
Transoral (rabbit):	LD ₅₀ (50% lethal dose) 900 mg/kg
Intraperitoneal (mouse):	LD ₅₀ (50% lethal dose) 40 mg/kg

12. Environmental effects

Aquatic toxicity: No particular reports

Cumulative: No particular reports

13. Disposal precautions

Neutralize by gradually adding a solution such as milk of lime while stirring, then treat by diluting with large amounts of water.

14. Transportation precautions

UN hazard class: 8 (corrosive substance)

UN identification number: 1789

The container must comply with the standards for containers used for transportation of poisonous and deleterious substances stipulated by the Poisonous and Deleterious Substances Control Law. The container must be labeled “Not for medical use”, “Hazardous (red characters on a white background)”, and must indicate the names and quantities of each constituent (and if the substance is to be sold in this container, it must also show the manufacturers’ name and address).

According to the Regulations for the Carriage and Storage of Dangerous Goods in Ships, it is the responsibility of the consignor when transporting hydrochloric acid by ship or the responsibility of the storage consignor when storing hydrochloric acid on a storage ship to affix and display a regular diamond-shaped label with sides of length 10 cm to the container packaging bearing the words “腐食性物質 Corrosive” with the Japanese on top and the English below.

Hydrochloric acid for use as a food additive must be clearly labeled with the following items on the container and packaging:

- 1) The characters “塩酸” (hydrochloric acid)
- 2) The place of manufacture and the name of the manufacturer (importer) (or official title in the case of a corporate body)
- 3) Methods of use that conform with the usage standards (Japanese Standards for Food Additives)
- 4) The characters “食品添加物” (food additive)

15. Applicable laws and ordinances

1	Industrial Safety and Health Law	Specified chemical substance, type 3 substance (Ordinance on Prevention of Hazard Due to Specified Chemical Substances article 2, paragraph 1, no. 6) (3: hydrogen chloride)	Except when it constitutes 1 wt% or less of the formulation (Annex table no. 2-3 of the Ordinance on Prevention of Hazard Due to Specified Chemical Substances)
2		Hazardous material requiring notification (Law article 57-2, enforcement ordinance article 18-2, annex table no. 9) (99: hydrogen chloride)	In formulations and other products with a content of more than 1 wt% (Regulations annex table 9, no. 632, article 34-2-2)
3		Corrosive liquid (Industrial safety and health regulations, articles 326 & 327) (hydrochloric acid)	
4	Poisonous and Deleterious Substances Control Law	Deleterious substance (Law article 2, annex table no. 2) (8: hydrogen chloride)	Raw material (pure substance for industrial use)
5		Deleterious substance (specific order article 2) (16: hydrogen chloride)	Preparations, except those with a content of 10% or less
6	Fire Prevention and Extinction Law	Substance requiring notification of storage, etc. (Law article 9-3, ordinance relating to the regulation of dangerous goods, Article 1-10, 6, annex table 2) (2: hydrogen chloride)	Preparations containing this substance, except those with a content of 36% or less (1989 ordinance no. 2, article 2 (12))
7	Civil Aeronautics Law	Transportation prohibited (enforcement regulations, article 194) (hydrogen chloride)	Liquid under deep refrigeration
8		Transportation prohibited (enforcement regulation, article 194) (hydrogen chloride)	Anhydride
9		Corrosive substance (enforcement regulations, article 194, dangerous substances bulletin, annex table 1) (8: hydrochloric acid)	
10	Ship Safety Law	Corrosive substance (Regulations for the Carriage and Storage of Dangerous Goods in Ships, articles 2 & 3, dangerous substances bulletin annex table 1) (UN identification number: 1789 hydrochloric acid)	
11	Air Pollution Control Law	Regulated pollutant (hazardous substance) (Law article 2, paragraph 1-3, ordinance article 1) (2: Chlorine and hydrogen chloride)	Exhaust gas
12		Specified substance (Law article 17, paragraph 1, ordinance article 10) (9: hydrogen chloride)	Exhaust gas
13	Law Relating to the Prevention of Marine Pollution and Maritime Disaster	Hazardous liquid substance (type D substance) (enforcement ordinance annex table no. 1) (50: hydrochloric acid)	
14	Port Regulations Law	Dangerous substance / corrosive substance (Law article 21-2, regulations article 12, 1979 bulletin 547, annex table (iv)(ii)) (hydrochloric acid)	Except for critical regulations / packing group 3

15	Road Law	Vehicle passage restrictions (enforcement ordinance article 19-13, Japan Highway Public Corporation notice) (Annex table 2-3, hydrochloric acid)	Preparations (except those containing 10% or less), liquids
16	Foreign Exchange and Foreign Trade Control Law	Import Trade Control Order article 4, paragraph 1, no. 3 (hydrochloric acid)	over 10%, over 20 kg
17		Export Trade Control Order annex table no. 2 (export authorization) (21-3-(9) aqueous solutions of hydrogen chloride)	over 10%, total value over ¥300,000
18	Narcotics and Psychotropics Control Law	Raw materials for narcotics and psychotropic substances (Law annex table no. 4 (9), specific order article 4) (3: hydrochloric acid)	Materials with a hydrogen chloride content of over 10% (Law annex table 4(10), regulations annex table 3)
19	Labor Standards Law	Disease-inducing chemical substance (law article 75, paragraph 2, enforcement regulations article 35 / annex table no. 1-2, no. 4-1 / 1978 labor report no. 36) (hydrochloric acid (including hydrogen chloride))	
20	Food Sanitation Law	Enforcement regulations article 3, chemical synthetic products that present no danger to health (annex table no. 2)	

16. Other information (contact for further information, cited sources, etc.)

Contact for further information: Tsurumi Soda Co., Ltd. sales department

Tel: 03-3503-0856; Fax: 03-3503-4595

Cited sources:

- 1) RTECS (2002)
- 2) 13599 chemical products, The Chemical Daily (1999)
- 3) Hydrochloric acid material safety data sheet, Japan Soda Industry Association (1998)
- 4) Report on poisonous and hazardous substances, Yakumukohosha (1991)
- 5) Safety and Health Handbook, Japan Soda Industry Association (2006)

Note:

This document is based on materials, information and data available at the time of preparation, but the accuracy or safety of this information cannot be guaranteed. The precautions in this document relate to normal handling conditions. Additional safety measures should be drawn up and implemented for special handling situations and for new applications and modes of use.

Date of revision	Reason for revision
31 July 2006	Review of all pages
4 January 2007	Elimination of repetition in applicable laws and ordinances
13 April 2007	Added "5. Food Sanitation Law" to applicable legislation