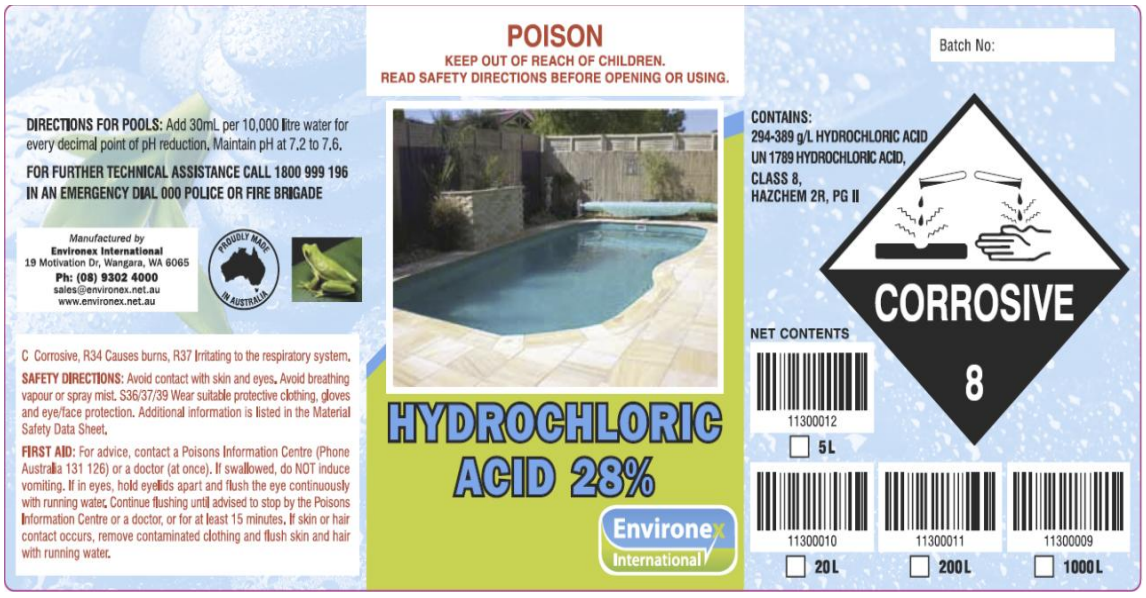
TECHNICAL BULLETIN

19 Motivation Dve Wangara, WA, 6065 AUSTRALIA
T +61 8 9302 4000 **| FREE** 1800 999 196 **| F** +61 8 9302 5000

HYDROCHLORIC ACID

A NON-OXIDIZING ACID



MATERIAL & FUNCTION

HYDROCHLORIC ACID is a clear, colourless, fuming, poisonous, highly acidic aqueous solution of hydrogen chloride (chemical symbol **HCl**). It is used as a chemical intermediate and in petroleum production, ore reduction, food processing,

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pickling, and metal cleaning. It is found in the stomach in dilute form.
Synonyms: *muriatic acid; chlorohydric acid; hydrochloride; spirits of salts*

Chemical properties:
HYDROCHLORIC ACID is one of the most corrosive of the non-oxidizing acids in contact with copper alloys and is handled in dilute solutions. Contact with metals produces hydrogen gas which creates the chance of an explosion. It produces poisonous gas, including chlorine, in a fire. It is soluble in benzene, alcohol and ether It is insoluble in hydrocarbons and incompatible or reactive with metals, hydroxides, amines and alkalis. **HYDROCHLORIC ACID'S** fumes have an acid, penetrating odour. Aqueous solutions of **HYDROCHLORIC ACID** attack and corrode nearly all metals, except mercury, silver, gold, platinum, tantalum, and certain alloys. It may be coloured yellow by traces of iron, chlorine and organic matter.

The physical properties of **HYDROCHLORIC ACID**, such as boiling and melting points, density and pH depend on the concentration or molarity of **HCl** in the acid solution. They can range from those of water at 0% **HCl** to values for fuming **HYDROCHLORIC ACID** at over 40% **HCl**. **HYDROCHLORIC ACID** as the binary (two-component) mixture of **HCl** and H_2O has a constant-boiling azeotrope at 20.2% **HCl** and 108.6°C

Conc. (w/w) %	Conc. (w/v) g/L	Density kg/l	Molarity M	pH	Viscosity mPa·s	Vapor pressure PHCl : Pa	Boiling point b.p.	Melting point m.p.
10%	104.80	1.048	2.87 M	-0.5	1.16	0.527	103 °C	-18 °C
20%	219.60	1.098	6.02 M	-0.8	1.37	27.3	108 °C	-59 °C
30%	344.70	1.149	9.45 M	-1.0	1.70	1,410	90 °C	-52 °C
32%	370.88	1.159	10.17 M	-1.0	1.80	3,130	84 °C	-43 °C
34%	397.46	1.169	10.90 M	-1.0	1.90	6,733	71 °C	-36 °C

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36%	424.44	1.179	11.64 M	-1.1	1.99	14,100	61 °C	-30 °C
38%	451.82	1.189	12.39 M	-1.1	2.10	28,000	48 °C	-26 °C

APPLICATIONS

Pickling of steel. Pickling is an essential step in metal surface treatment, to remove rust or iron oxide scale from iron or steel before subsequent processing, such as extrusion, rolling, galvanizing and other techniques. Technical-quality **HCl** at typically 18% concentration is the most commonly-used pickling agent for the pickling of carbon steel grades.
HYDROCHLORIC with ACID INHIBITOR added may be used to minimize corrosion

Swimming Pools: **HYDROCHLORIC ACID** is used to adjust the pH of swimming pools. Australian Standard 3633 defines the pH operating range as 7.0 to 7.8 and the recommended range of 7.2 to 7.6 (SPASA recommend 7.0 to 7.2 for fibreglass pools).

DIRECTION FOR USE
Brick Cleaning.
Saturate the area of brickwork to be cleaned and all adjacent areas below with water. Use the correct ratio of **HYDROCHLORIC ACID** and water. - Light coloured bricks: 1 part **HYDROCHLORIC ACID** to 20 parts water - Dark coloured bricks: 1 part **HYDROCHLORIC ACID** to 10 parts water Warning: Under no circumstances should more than 1 part **HYDROCHLORIC ACID** to 10 parts water be used. It is better to scrub more vigorously than use more acid.
When cleaning, try not to work in direct sunlight.
Always begin at the highest point and work down the wall.
Only clean small areas at a time - e.g. one square metre - so as to allow adequate time to wash off the cleaning solution and ensure no staining occurs.
Allow solution to remain on wall for 3-6 minutes before scrubbing. Be sure not to scrub the joints.
Rinse thoroughly, making sure all cleaning solution has been removed.
All brickwork washed with acid should be neutralized with **REFRESH** and then rinsed with fresh water. Light coloured bricks are more susceptible to vanadium and acid burning, and so must be neutralized with **REFRESH and then rinsed with fresh**

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water.
This should be done within an hour of the acid wash

Safety and Risks
CAUTION: *Avoid contact with skin and eyes and avoid breathing vapour or spray mist.*
R: 34 Causes burns.
R: 37 Irritating to the respiratory system.
S: 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S: 36 Wear suitable protective clothing.
S: 45 In case of accident or if you feel unwell, seek medical advice immediately (show label where possible).

PACKAGING
HYDROCHLORIC ACID 10%: 1000 Litre container
HYDROCHLORIC ACID 20%: 200 Litre container
HYDROCHLORIC ACID 28%: 5 Litre, 20 Litre , 200 Litre & 1000 Litre containers
HYDROCHLORIC ACID 32%: 5 Litre, 20 Litre , 200 Litre & 1000 Litre containers

IMPORTANT NOTICE TO CUSTOMER

Since the use of this product is beyond the control of either seller or manufacturer, their only obligation shall be to replace any quantity of product which is proven defective. They cannot assume any risk or liability in excess of the purchase price of the product itself, which does not include labour or any consequential damages resulting from the use of this product. Determining the suitability of this product for any intended use shall be solely the responsibility of the user. **ALWAYS TEST FIRST.**