

FERRIC CHLORIDE

Wonder chemical for water purification



COCHIN MINERALS AND RUTILE LTD.

A 100% E.O.U: an ISO 9001:2008 Company



Purity, consistent quality and superior technology are hallmarks of CMRL's Ferric Chloride.

► From Nature ► With Nature ► Towards Nature



CMRL's Ferric Chloride- Features:

- High purity product from titanium industry.
- NSF and AWWA approved water purification material for drinking water.
- Direct additive used in the treatment of potable water.
- Conforms to ANSI/AWWA B 407 standards.
- FeCl_3 produced from Titanium Ore is of superior quality according to American Standards (AWWA Standards).
- One among the few NSF Certified FeCl_3 product in Asia.
- Largest supplier of FeCl_3 from titanium industry in India.
- Free from any contamination and of consistent quality.
- Uses pure Hydrochloric acid obtained from Membrane cell process.
- Manufacturing process is ISO 9001:2008 certified.
- High efficiency in removal of suspended solids and several toxic dissolved solids.
- Zero suspended solids in FeCl_3 .
- Copper content less than 10 which is substantially lower than most of the competitive products.
- Shows good turbidity removal properties and can sequester odor

CMRL Ferric Chloride - a perspective

Locational advantage due to nearness to Cochin Port, having ICTT and close proximity to International Shipping route

NSF specified dosage limit – maximum 500 mg/litre allowed

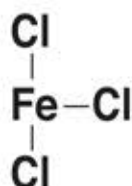
Only company in India producing FeCl_3 from Titanium ore

WHO accredited NSF International certified product

FeCl_2 and FeCl_3 produced from Titanium ore are of superior quality vis-à-vis other processes, as certified by American Water Works Association(AWWA)

Consistency in raw material quality

Ferric Chloride



Physical properties

Molecular Formula - FeCl_3

Molecular Weight - 162.5

Commercial forms

- I. Anhydrous Hexagonal Crystals.
- II. Hydrated crystals of varying (2-6) water of crystallization.
- III. Aqueous solution (40-45%)

Chemical properties

- Forms a number of adducts and substitution products.
- Is an oxidizing and chlorination agent.
- Hydrolyses in water at a pH of 2.3 and above.

Specification

CMRL supplies liquid ferric chloride with the following specification:

Specific gravity 22-25 °C (min)	1.40
Ferric chloride as FeCl_3 % (min)	40.00
Ferrous salt as FeCl_2 % (max)	0.50
Free acid as HCl % (max)	0.50

Solubility

Highly soluble in water; moderately soluble in organic solvents like alcohols, acetone, ethers, esters etc. Insoluble in glycerine, ethyl acetate etc.

Uses

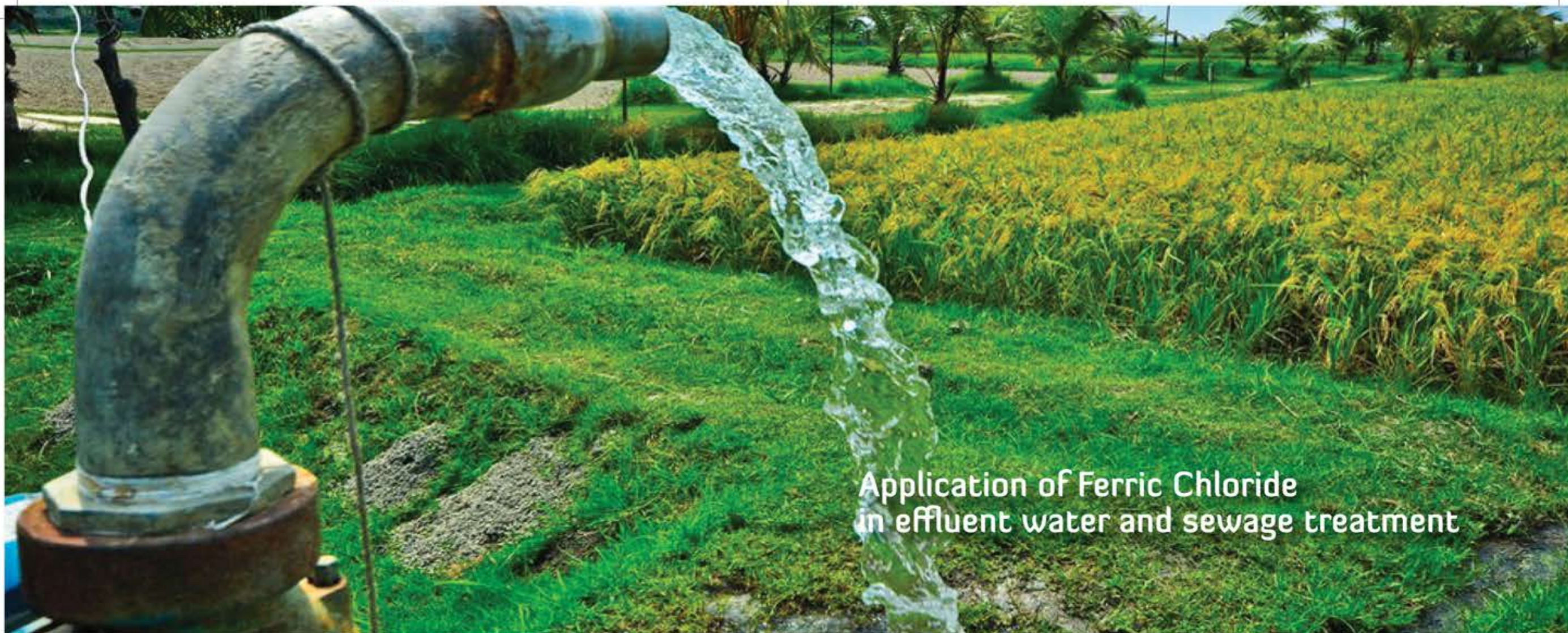
- Desalination of sea water for production of drinking water.
- Water & sewage treatment.
- Effluent treatment in Textile, Paper, Refineries and other Industries.
- Etching of Printed Circuit Board.
- Pickling of SS and High Nickel Alloys.
- Photo engraving.
- Inks and pigments.
- Manufacture of other iron compounds.
- Pharmaceutical preparations.
- Textile mordanting.
- ETP treatment in Petro chemical industries.

The single largest use of Ferric Chloride is in the form of commercial solution for water and sewage treatment. The consumption pattern of Ferric Chloride in developed countries indicates the use of 75 percent for sewage and waste water treatment, 18 percent for water treatment and only 7 percent for other purposes. In short, 93 percent of total Ferric Chloride is used for water treatment whether it be sewage, waste, potable or culinary water.

Ferric Chloride removes the suspended impurities in water. Heavy metals also get removed in the pH range 7.0-11.0. The voluminous hydroxide formed from ferric chloride adsorbs finely divided solids and colloids like clay and humic acid, making the water sparkling clear.

In the municipal and waste water treatment, Ferric Chloride is highly effective since it removes heavy metals, sulphides and contaminants like oils and polymers, which are difficult to degrade. Phosphate levels also get reduced to below 1 ppm. Sludge conditioning with Ferric Chloride improves the de-watering of filter-sludge so that drier sludge, better suited for disposal on incineration is obtained.

As a water treatment chemical, Ferric Chloride is eco friendly. The dosage requirement is very small to the tune of a few PPM and any excess gets eliminated at a pH above 2.3. pH of normal discharge is around 7.0 assuring complete elimination. The solid formed is eco friendly also. Preliminary treatment of sewage or waste water can improve the capacity of overloaded clarifier plants.



Application of Ferric Chloride in effluent water and sewage treatment

Manufacturing Process for FeCl₃ – A comparison

Process 1 - (CMRL Process)	Process 2	Process 3
Using Titanium ore and HCl	Using iron scrap/salt and HCl	Using iron scrap/salt and spent acid
<ul style="list-style-type: none"> ▷ Purity of FeCl₃ varies with the manufacturing process employed. High purity product can be manufactured by reacting Chlorine with FeCl₂, as done in CMRL. ▷ World's best quality ilmenite is CMRL's source of titanium ore. Pure HCl from membrane cell process is also employed. ▷ Ferric Chloride produced using consistent quality raw materials as per international standard process in highly sophisticated plant with stringent process parameters makes it superior quality product. 	<p>Iron scrap/salt may contain different metal alloys and impurities. Since it is contaminated with several elements associated with steel making, as the quality of scrap changes, the quality of FeCl₃ will change. If there is inconsistency in quality of FeCl₃, the product will not be good for water treatment.</p>	<p>As per guidelines of Central Pollution Control Board, Govt. of India and several international agencies, Ferric Chloride produced using spent acid is not suitable for water treatment, in view of the impurities in spent acid.</p>

In short, Ferric Chloride produced from Titanium Ore is a versatile chemical in water and waste water treatment. The main application of Ferric Chloride is in the form of solution. Hence CMRL supplies Ferric Chloride as a solution of minimum 40% strength.



Quality Advantage

CMRL Ferric Chloride	Remarks
Concentration more than 42%; guaranteed 40% min	Specific consumption will be less
As per WHO Standard for drinking water safety	Assures treated water quality always
Process as per American Water Works Association Standards(ANSI/AWWA B 407 – 12)	These standards instil greater customer confidence
Low impurity level	Provides higher life for the membrane used
Copper less than 10 ppm	Gives better quality water
Chromium, mercury, lead and barium level very low	Very low presence of these impurities give better quality water

SHELF LIFE
Two years

**TRANSPORTATION
AND CLASSIFICATION**

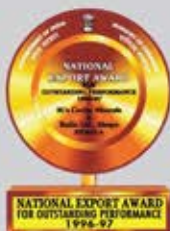
U.N.No. 2582
CAS No. 7705-08-0
IMCO Class 8
IMDG Code 8173
Packing Group 111

Employs superior quality HDPE Barrels, ISO Tanks and Containers for hassle - free transportation.

OTHER TAILOR MADE POLLUTION CONTROL APPLICATIONS

- Metro sewage treatment. • Textile process house effluent treatment.
- Pulp and paper industry effluent treatment. • Petroleum refinery treatment.
- Tannery effluent treatment. • Chemical industry effluent treatment.
- Can cater to the requirement of metal finishing industries.
- Pickling compounds for stainless industries. • Etching of Printed Circuit Boards.

- National Export Award for outstanding performance 1996-97
- KSIDC Excellence Award 1999
- Cochin Special Economic Zone Top Exporter Award 2000-01
- Cochin Special Economic Zone Export Excellence Award 2003-04
- Kerala State Pollution Control Award-First Prize-2006
- International Quality Crown Golden Award-2009 from BID, Spain
- Govt. of Kerala Safety Award-First PRIZE-2009
- Industry Safety Award 2011
- PCB Excellence Award consecutively for the 11th year in 2016
- India's Most Trusted Companies Award 2017





FeCl₃

(Produced from Titanium Ore)

CMRL



Cochin Minerals and Rutile Limited

(An ISO 9001:2008 company) | A model eco-friendly company

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