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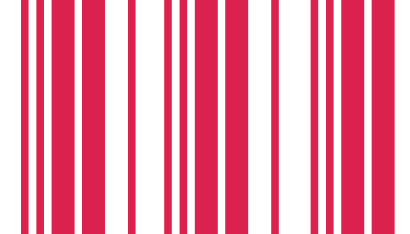
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ISO 9001 - 2008

Titanium Tantalum Products Limited

HIGH STRENGTH HYPOCHLORITE-BLEACH SYSTEMS

SINCE 1981



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SAFELY PRODUCE **SODIUM HYPO** USING ADVANCED MEMBRANE TECHNOLOGY



Due to the hazardous nature of the liquid or gaseous chlorine, engineering and management controls are employed to minimize risks associated with its handling and use. Using aqueous sodium hypo-chlorite for disinfection or bleaching eliminates the inherent risks associated with storing and handling liquid or gaseous chlorine.

As an alternative to using liquid or gas chlorine, chlorine as aqueous sodium hypochlorite an inherently safer form makes modern bleach or disinfectant consumer industries to heavily rely on sodium hypochlorite. Sodium Hypochlorite solutions have attained wide-spread usage in bleaching operations and as disinfectants, both in the home and in industry. The most common method for on-site production of Sodium hypochlorite (NaOCl) is by reacting chlorine with sodium hydroxide solution, an environmentally compatible process leaving less waste and recycles the most through out the process.

TiTaN in the field of electrochemical technology for three decades has developed comprehensive line of exceptionally efficient products for the compelling specific requirements; technically designed and developed RT HYPOFORTE specially for hypochlorite consuming industries with the in-house-built RT AME advanced membrane electrolyzer technology.

RT AME, the membrane electrolysis technology generates chlorine and caustic formed by separation of sodium-chloride ions with purified water at ion-exchange membranes. TiTaN's RT HYPOFORTE technology produces membrane grade sodium hypochlorite bleach of high quality at required concentration with the only feed in purified salt and water, operating the plant at a minimum cost and maximum safety compared to other existing commercial processes.

TiTaN's RT HYPO FORTE, the membrane electrolysis technology provides safe and cost effective production of high purity, commercial-strength sodium hypochlorite solution with the simple, less expensive and easy source raw materials; purified salt (brine), water and electricity. RT HYPO FORTE produces pure bleach at the required concentrations either for own internal use on-site or alternatively distribution and consumer sale.

The RT HYPO FORTE electrochemical technology, a specific design for continuous production of commercial hypochlorite on-site, economically and harmless alternative to a disinfection with chlorine gas, chlorine bleaching or other compounds of chlorine. RT HYPO FORTE, the safe, zero-polluting and multi-configurable system produces bleach at required concentrations, ranging from 5 % to 15% of trade grade hypochlorite.



01. MEMBRANE ELECTROLYZER 02. BRINE SECTION 03. ION-EXCHANGE COLUMNS
04. UTILITY SECTION 05. PRODUCTION FLOOR

TYPE	MODEL	HYPO PRODUCTION CAPACITY	ANODE AREA
Mini Plant	RT HYPO FORTE 100	900 Kg/day	0.8 m ²
	RT HYPO FORTE 250	2500 Kg/day	2.0 m ²
	RT HYPO FORTE 500	5000 Kg/day	4.0 m ²
Production Plant	RT HYPO FORTE 1000	10000 Kg/day	8.0 m ²
	RT HYPO FORTE 2000	20000 Kg/day	16.0 m ²
	RT HYPO FORTE 3000	30000 Kg/day	24.0 m ²
	RT HYPO FORTE 4000	40000 Kg/day	32.0 m ²
	RT HYPO FORTE 5000	50000 Kg/day	40.0 m ²

AVOID RISK HANDLING HAZARDOUS CHLORINE



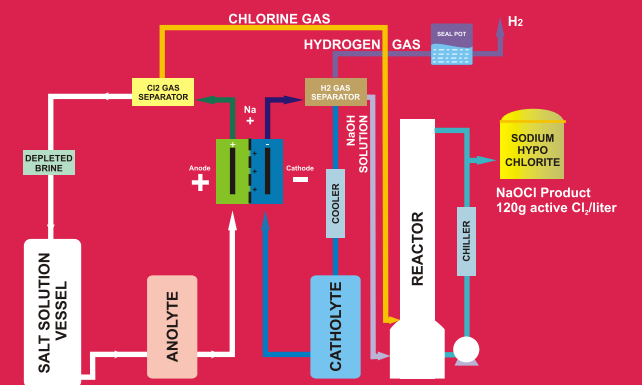
Advanced Membrane Electrolyzer

RT HYPOFORTE uses advanced monopolar ion exchange membrane electrolyzers, a proven alternate or superior to mercury and diaphragm production cells, concern to energy efficiency and environmental compatibility. The advanced cell module design increases the internal convection, decreases ohmic losses and increases current density with the quality effective membranes. The membrane cell with highly durable and long lasting electrodes of precious metal (rare earth oxides, platinum or noble metals, or oxides) coated titanium anode, activated nickel metal cathode and high quality membrane provides the cleanest and the most energy efficient process.

RT AME monopolar membrane cell with modular design adds number of advantages including low power consumption, at-time plant expansion, increase in production capacity and easy maintenance. These cells with high energy efficiency, increased membrane life and the highly durable modular design can be combined to get the desired output with fewer modules covering a small footprint. Thus forms the plant size smaller with fewer inventories, less maintained and reduces the overall capital cost.

RT HYPOFORTE Process

RT HYPO FORTE produces sodium hypochlorite using the raw materials purified salt, water and electricity through the simple and proven electro-chemical membrane process. Purified salt or brine is fed to the electrolytic cells in parallel and with the DC current passed through the cells the NaCl splits up into its constituent components.



In the membrane cell the anode and the cathode are separated by an ion-exchange membrane, where only sodium ions and a little water can pass through. The membrane passes Na⁺ ions and oxidises chloride ions to chlorine gas at the anode. Hydrogen and hydroxide ions are formed at the cathode, thereby forming sodium hydroxide (Caustic Soda) with sodium ions passed by the ion-selective membrane with hydroxide ions. The chlorine and the hydrogen gas produced in the electrochemical process leave the cell. The chlorine gas and caustic soda are then immediately processed to produce sodium hypochlorite. The Hydrogen gas is safely vented to the atmosphere.



Advantages

- Purchase salt and electricity (easy sourceable) instead of chlorine and caustic soda.
- Eliminate handling, storage and distribution of liquid chlorine
- On-site production with minimum waste discharge due to maximum recycle.
- Expandable design by adding additional electrolyzer modules
- Economic and high efficient process requires less power and forms less waste .
- Low maintenance cost by using highly durable electrode materials and membranes.
- Safe and easy operation produces HYPOCHLORITE with less impurities.
- Low Bromate and Chlorate formation.

Storing and Handling

The highly reactive nature of sodium hypochlorite restricts few materials of construction to withstand whilst storing and handling . Improper selection of those materials may result in damage to the handling system and contamination of the product.

TiTaN has an extensive knowledge base for the chloralkali industry - chlorine / caustic soda production plants, chlorine derivatives and intermediate plants. With a team of highly qualified and experienced consultants and engineers, many of whom are specialists in the chlor-alkali industry with backgrounds in operations, selects the best material to withstand the process at various stages. As a special metal fabricator, manufacturing chemical process equipments from the year 1981, TiTaNs are well equipped to deliver the best solution in terms of materials for this chemical sector. TiTaN offers optimum designs and delivers transfer and storage systems, utilizing cutting-edge technology, resources and materials for this critical application.

Eliminate storing
hazardous chemicals
**BUY ONLY
SALT &
POWER**

PRODUCE
**HYPO BLEACH
ONSITE, SAFELY**

LIQUID
BLEACH
NO CHLORINE HAZARDS



Chemical
Resistant
Pumps

ΠΟΤΟΚ®
EXOTIC METAL VALVES & FITTINGS

Chemical
Resistant
Pipes & Fittings