CED

Capacitive Electro Desalination

Small in Size- Smart in Performance

Efficient | Reliable | Compact

"Effortless Desalination, Absolute Efficiency"

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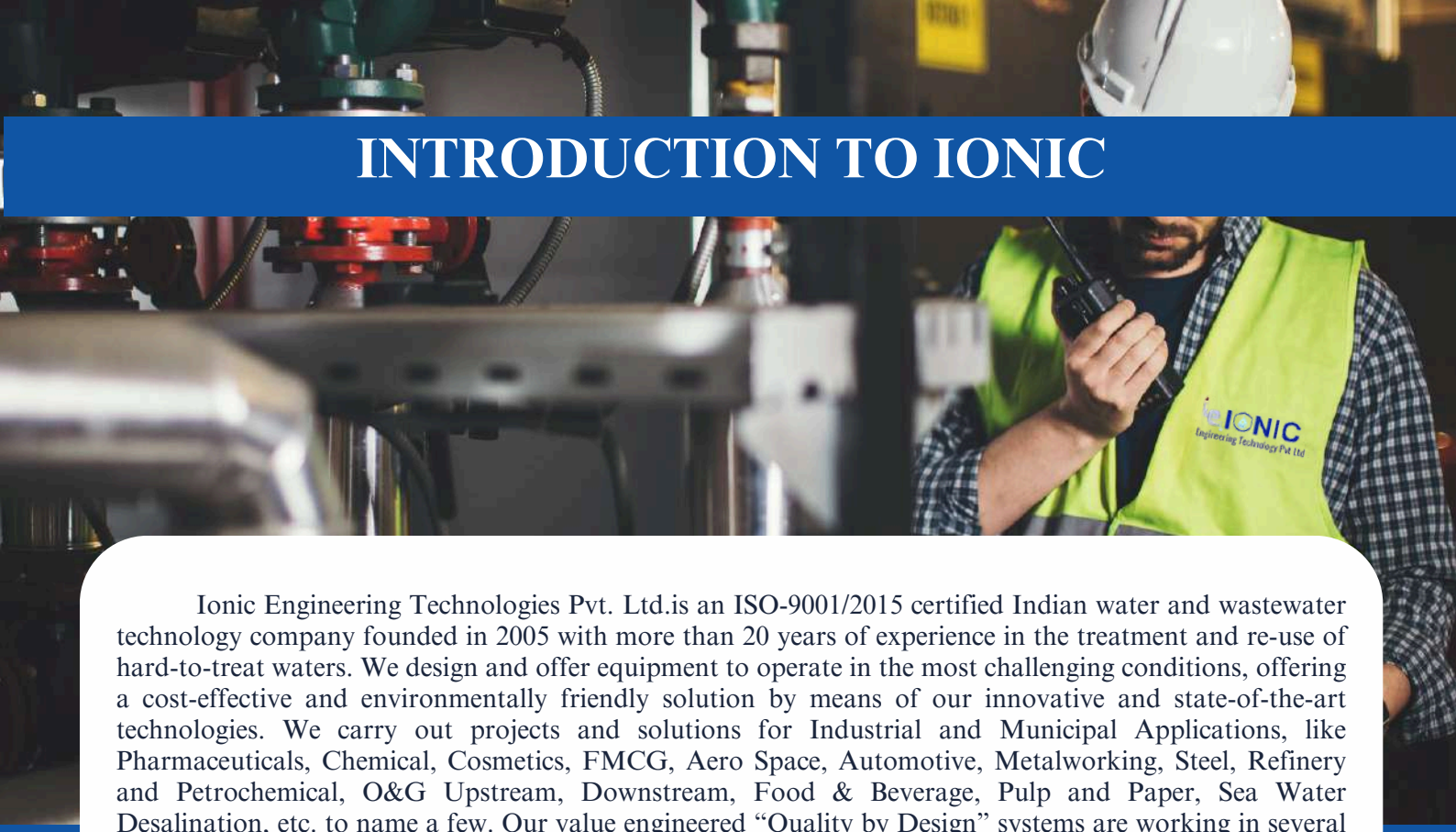
IONIC
Engineering Technology Pvt Ltd



INTRODUCTION TO IONIC

Ionic Engineering Technologies Pvt. Ltd.is an ISO-9001/2015 certified Indian water and wastewater technology company founded in 2005 with more than 20 years of experience in the treatment and re-use of hard-to-treat waters. We design and offer equipment to operate in the most challenging conditions, offering a cost-effective and environmentally friendly solution by means of our innovative and state-of-the-art technologies. We carry out projects and solutions for Industrial and Municipal Applications, like Pharmaceuticals, Chemical, Cosmetics, FMCG, Aero Space, Automotive, Metalworking, Steel, Refinery and Petrochemical, O&G Upstream, Downstream, Food & Beverage, Pulp and Paper, Sea Water Desalination, etc. to name a few. Our value engineered "Quality by Design" systems are working in several diverse industries for many years and is helping our customers move towards "Cleaner Production"

Motivation & Vision: Our main goal is to create value and make a difference for our clients and partners as well as deliver tailored-made solutions to satisfy the requirements of our clients, respecting the environment. At Ionic Engineering Technologies we believe that making water and wastewater reuse an affordable and sustainable water source is essential to the future development of mankind in terms of economy, environment, and society. All our systems are designed and engineered based on sound engineering practice and offer value for money and bring "Peace of Mind" to our customers.

Why Ionic? Good advice is half the battle won. Ionic Engineering is a technology neutral company and focused on providing "Quality by Design" engineered systems. We have technology associates based in Europe and USA for some of the cutting-edge disruptive technologies.The first step to the perfect water treatment solution: Understanding your wastewater analysis. We design the plant based on the water analysis sent by our customer.

We are dedicated to using our professional expertise accumulated over many years, to providing the solution you want, when you want it. We also take great pride in ensuring that every client is satisfied with the operating efficiency of the systems we design and the overall level of service that we provide, whether during the initial contract phase or later, throughout the life of the plant.

- Providing expert advice, tailored to meet your requirements.
- Supplying high quality, good value-for-money systems, and equipment.
- Supporting all our clients for the lifetime of their water & wastewater treatment systems.
- Developing and deploying the best, most economic solutions for your needs
- Listen to our customers as well as our suppliers on products and technologies feedback and updates.
- Continuous improvement in all that we do!

Find the best solution for your processes: Let our competent team from the application technology team advise you now! We look forward to hearing from you.

Customers: We have many reputed Multinational companies such as Unilever, Coca-Cola, Loreal, John Deere, Tata Hitachi, Bajaj, Tata Motors, Century rayon, GACL to name a few as our customers

CED | An innovative non chemical electrical driven, simple, efficient and reliable way (the right way) to treat the water.

Capacitive
Electro
Desalination

The Future of Water Reuse: CED Technology

As the global population continues to grow, with projections estimating an increase of 2.5 billion people by 2050, the demand for water is escalating rapidly. This growth places unprecedented pressure on our water resources, highlighting the urgent need for efficient and cost-effective water reuse technologies. IONIC's **Capacitive Electro Desalination (CED)** technology presents a promising solution to this challenge by enabling water treatment and reuse at ambient temperatures with unmatched efficiency and minimal environmental impact.

Water reuse is crucial not only for conserving natural resources but also for reducing costs in various industries. In sectors like boiler feed systems, cooling towers, electroplating, textile processing, commercial laundries, and manufacturing, which consume significant amounts of water, CED technology offers a sustainable alternative to conventional methods.

Why Water Reuse is Essential

With the increasing global population, water scarcity has become a critical concern. By 2050, the demand for water is expected to outpace supply, making water conservation and reuse a priority across all sectors. In industries that use vast amounts of water for processes like cooling, cleaning, or manufacturing, the need for affordable and efficient water treatment technologies is more urgent than ever. CED technology provides a solution that meets the needs of industries by enabling cost-effective and high-efficiency water reuse, while also helping to mitigate the negative environmental impacts of water usage.

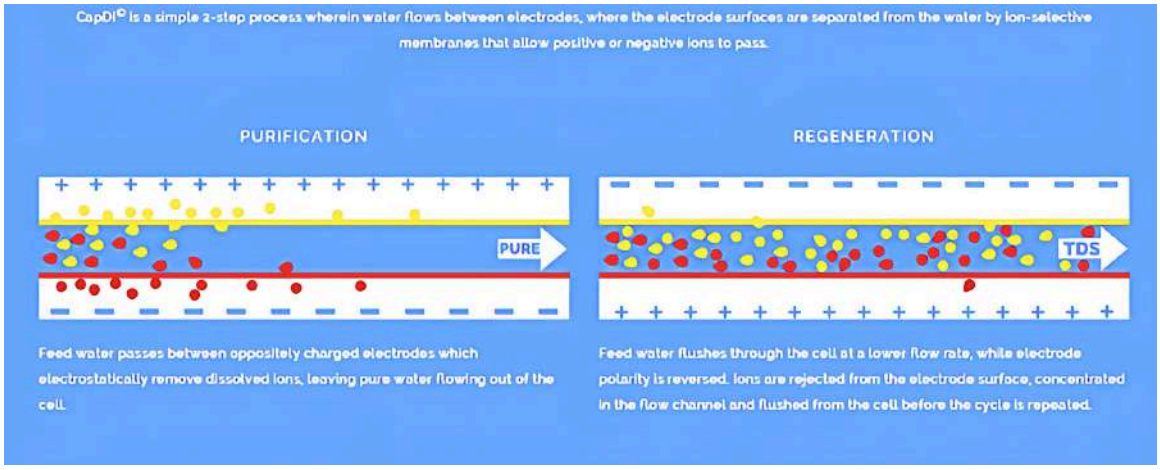
IONIC's Capacitive Electro Desalination (CED) Technology

CED is an innovative water treatment solution that uses an electrostatic process to remove Total Dissolved Solids (TDS) and other dissolved ions (such as salts) from water. Unlike traditional desalination technologies like reverse osmosis (RO), CED operates at ambient temperatures and achieves higher water recovery rates at significantly lower energy costs.

Key Process Overview:

1. **Purification Step:** Water passes through two electrodes with opposite charges. The electrodes create an electrostatic field that attracts dissolved ions, such as salts, from the water, leaving purified water to flow out of the system. The process is energy-efficient and works at ambient temperatures, reducing the need for energy-intensive heating or pressurization.
2. **Regeneration Step:** After purification, the water flow is slowed, and the polarity of the electrodes is reversed. This allows the ions that have accumulated on the electrode surfaces to be released and flushed away, thus regenerating the system for the next cycle. This step ensures that the system is continuously able to handle variations in feed water quality and adjust TDS removal accordingly.

The dynamic control of this process means the technology can be tailored to remove specific ions as needed, providing flexibility to meet varying water quality conditions.

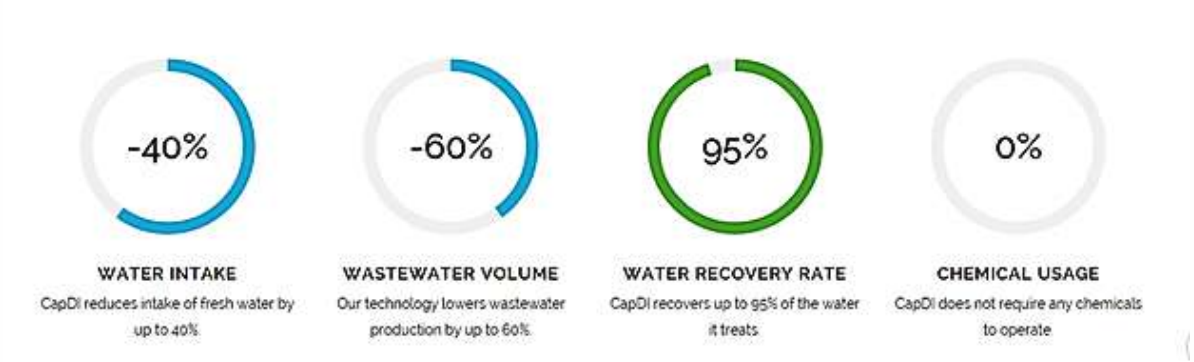


User Benefits :-

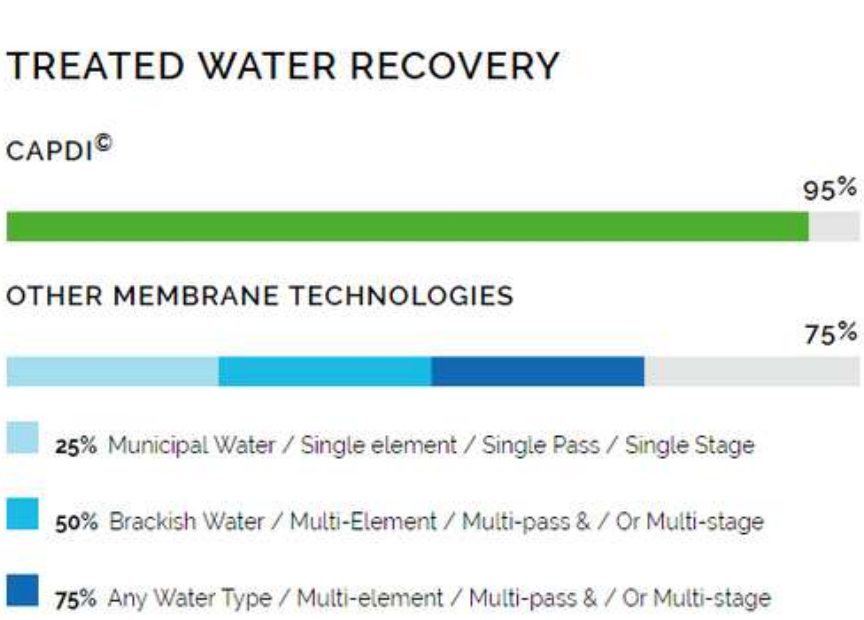
- Salt-Free Water Softening
- Tunable Deionization – Select your preferred level of removal
- High Water Recovery – Up to 95%
- Built-in Remote Monitoring and Control
- No Chemicals Required
- Environmentally Friendly – No need for additional discharge permits
- Low Energy Consumption – Less than 0.5 kWh/m³
- Low Fouling Potential
- Automated Clean-In-Place – Minimal maintenance required
- Effective Removal at High and Low Temperatures – Ranging from 1°C to 60°C (34°F to 140°F)
- Unaffected by Silica

What makes capacitive electro desalination (CED) special?

CED is special in more ways than one, starting with and most importantly that it removes TDS at ambient as well as high temperatures up to 60 deg C.(with high temperature modules).



No other technology, globally, has the ability to do so. CED is also environmentally friendly in that there are no chemicals used for treatment, which ensures that any unrecovered water flows back into the ecosystem safely. Unlike RO systems that can waste more than 60% of treated water, CED can recover up to 90% of the water it treats, resulting in long-term water conservation. Also unlike RO systems, CED is tunable, meaning that the extent of which salts and other ions are removed can be customized to the consumer's needs, depending on the application and raw water characteristics. It is important in certain applications like drinking water that not all of the dissolved salts and other minerals are fully removed because their presence in low concentrations is necessary for certain types of usage. This is where the tunable removal feature of CED differentiates itself.



Scalable

CED technology treats water types ranging from residential consumer appliances to large-scale industrial plants. Our systems are modular, allowing easy expansion to meet any increased water demands.

Tunable

CED is tunable, allowing adjustable TDS reduction between 25 – 95% depending on customer needs, eliminating the requirement for blending to achieve a specific water quality. The customer sets their desired reduction rate and CED maintains this level, continually adjusting itself to account for any fluctuations in feed water characteristics.

Perhaps most interesting feature is its ability to "set it and forget it". Once the unit is tuned to meet a desired product water conductivity, it will continue to deliver the desired water quality, regardless of fluctuations in feed water quality. And, it will automatically adjust the amount of electricity that it requires to meet the water quality goal.

"Traditional RO or thermal desal systems often remove far more salt than is required, whereas CED has the ability to tune the amount of TDS removed. Besides the obvious energy savings, this is important for some applications, such as producing optimal beverage quality, drinking water, process water.

The right treatment approach

a. Besides the Capital costs, there are many other parameters that goes in determining the economics of operating a water and waste treatment plant
b. Energy Consumption– what does it take to operate a treatment plant can it be run using alternate energy sources?
c. Reducing water consumption / wastage – How much input water do we need
d. To treat? - Can we reduce the wastage given that water is so scarce?
e. What kind of consumables are required to operate the plant daily.
f. Does the water treatment plant require skilled personnel to operate it
g. How dependable is the water treatment plant to produce the yield
h. Consistently - can it run smoothly for a long duration of time

What else can "CED" do?

In recent years, regulations have become stricter regarding the quality of effluent discharged from wastewater treatment plants into rivers or the sea. This regulatory environment makes wastewater reuse for agricultural purposes an attractive option for farmers, wastewater treatment plant operators, and companies providing wastewater reuse solutions.

In manufacturing processes CED can work as a standalone unit to desalinate the water and make it suitable for drinking, boiler feed, cooling tower make, rinse water in paint shops, water jet cutting machines, machine coolant make up, and be part of the RO pretreatment and post treatment, be part of demineralization system pretreatment so that the size of the system can be reduced, chemical consumption and waste water disposal problem can be reduced. In industrial applications, cooling towers use large quantities of water and chemicals. A cooling tower carries away heat through the evaporation of water. This water contains natural salts such as calcium, bicarbonate, chloride, and sulfate. The salts do not evaporate and build up over time, thus causing corrosion and scaling. To prevent this, chemicals are added to the cooling water. Eventually this water is discharged, and the cooling tower is refilled with clean water.

In cooling towers, the CED system treats water before it enters the cooling tower, reducing salts from the incoming water stream by 80%. The cooling tower does not need to be adapted since CED is placed before the cooling tower, treating only the incoming water, because the composition of the recirculating water remains unchanged. This allows the water to remain in the cooling tower up to five times longer, resulting in lower overall water consumption and wastewater production. Fewer scale and corrosion inhibitors are required to treat the water because of the decreased water consumption. For cooling systems that face existing problems with corrosion and scaling, CED can also be used to reduce the scaling and corrosion potential of cooling tower water. Once installed, CED is essentially risk-free since it does not change the chemical treatment program, the conductivity levels, or the settings of the cooling tower.

The easy-to-implement CED systems improve cooling tower efficiency by reducing water and chemical usage for both industrial and institutional systems. Installing CED in the cooling tower make-up enables make-up water savings of up to 40%, blow-down water savings of up to 60%, scaling and corrosion inhibitor chemical savings of 50%, plus overall improved performance. Lower water usage and lower chemical discharge make CED an exceptional environmentally friendly water reuse leader for industrial facilities that rely on cooling towers. The amount of water that cooling towers use annually, about 30,000 m3 for a small cooling tower, is enough to supply over 200 households with water for an entire year. CED would make a monumental difference in water usage around the world, and set an incredible precedent of how to jump-start other efforts towards solving global water challenges.

What factors you must consider before investing on a water treatment system?

1.Is the water treatment system simple and less complicated?
2.Did the system meet treated water quality targets?
3.Can the system handle fluctuating feed/raw water characteristics?
4.Does it have dynamic process control to automatically adjust operating parameters to maintain treated water quality?
5.How reliable the performance will be?
6.How consistent and reliable the performance will be?
7.How easy to operate?
8.How easy to monitor and trouble shoot?
9.Does it have a Real time remote Monitoring process control?
10.How easy to maintain and clean? Does it have automatic cleaning system in place?
11.How much water can be recovered?
12.How much water goes to waste?
13.What is the specific energy (Kwh/m3 of treated water) consumption?
14.What is the true cost of water?

Conclusion:

Fresh water availability is a big problem. Even if water is available the fresh water cost is high and quality is not good. Cost of treatment of poor quality water is more. Disposal of waste water is difficult and high. Need of the hours is to embrace better water treatment technology that will provide “Peace of Mind” and not a “Piece of Equipment”.
For further information contact us with complete raw water analysis and your specific requirement.

IONIC
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GET
IN TOUCH

WITH
IONIC ENGINEERING TECHNOLOGY PVT. LTD.

We're here to help you with all your water and wastewater treatment needs. Whether you're looking for customized solutions, technical support, or just want to explore how our services can benefit your business, feel free to reach out to us.

Our team of experts is ready to provide personalized assistance and ensure that you get the most effective and innovative solutions tailored to your requirements. You can contact us via phone, email, or through our website. We value every opportunity to collaborate and are committed to delivering excellence in every interaction.

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