

Water Solutions



**Possibility
flows with us**



Global leaders in clean water solutions

Our purpose is to solve global challenges in purification, separation, conservation, and reuse.

For over 70 years, we've worked to make water safer and cleaner for homes and communities. Globally, industries and markets seek our help to operate efficiently and sustainably.

We collaborate closely with our customers and apply in-depth industry knowledge to address real application needs. Our extensive range of solutions integrate ultrafiltration, nanofiltration, reverse osmosis, ion exchange, and membrane bioreactor systems. We drive sustainable water management through innovations, such as the world's first spiral wound membranes.

Businesses and communities across the world are stronger and more resilient because of DuPont's pioneering water technologies.

Solving water scarcity challenges across the globe—that is our commitment.

Technology and applications

Technology in service of humanity

Addressing a broad range of applications for water filtration, separation, and more, our technologies are here to solve the world's water-treatment challenges.



1. Membrane Aerated Biofilm Reactor (MABR) MABR habitats create an ideal environment to support resilient biofilm by absorbing carbon and nitrogen-based pollutants. However, unlike conventional fixed-film/biofilm systems, MABR is energy efficient.

MABR technology transforms overloaded, inefficient, and even obsolete wastewater treatment plants into high-efficiency facilities. In a matter of weeks, these facilities are capable of handling larger loads.

Without any added infrastructure, implementation of MABR can result in:

- 50 per cent increase in biological treatment capacity
- 75 per cent less energy consumption on additional capacity
- 50 per cent reduction in waste sludge

Case study

MABR trial by Severn Trent Water (STW), UK

Severn Trent Water had stringent water quality needs but was also keen to reduce energy consumption. In 2013, STW and DuPont collaborated to demonstrate MABR's capability in achieving both.

The result

- Good effluent quality
- High rates of COD removal
- Low sludge yield
- Simultaneous nitrification/denitrification



2. Membrane Bioreactor Systems (MBR) MBR combines biological waste oxidation and membrane filtration. The technology uses a fully automated process for separating liquids and solids. Using MBR eliminates the need for secondary clarification, making it more efficient compared to conventional methods.

With more than 30 years of experience in MBR, DuPont's technology:

- Saves footprint on sites with limited space
- Improves effluent quality, allowing water reuse
- Allows for plant expansions in the same footprint
- Uses a smaller biological process

Case study

MBR Wastewater Treatment Plant, Santa Giustina, Italy

Challenge for Hera S.p.A. the plant operators was to build a new MBR line while the wastewater treatment plant remained operational. DuPont overcame this challenge by using existing structures and facilities where possible giving priority to flexibility and automation.

The result

- Increased plant operational capacity from 220,000 PE to 560,000 PE
- Plant upgraded without added real estate acquisition or development
- Reduced operational costs while keeping a low footprint and extremely high effluent quality



3. Ultrafiltration (UF) is a pressure-driven purification process. UF separates particulate matter from soluble compounds using ultrafine membrane media. Along with highly efficient UF modules, DuPont's range offers cost-effective, space-saving rack designs, through products such as DuPont™ IntegraPac™ and T-Rack®, for water treatment plants.

The expansive UF portfolio includes both Polyethersulfone (PES) and Polyvinylidene fluoride (PVDF) membranes for pressurised and submerged configurations. The technologies are available as stand-alone, pre-packaged units or as components for large projects.

Benefits of UF for water treatment:

- Reliable removal of microorganisms, viruses, and pathogens
- Consistently high-level filtrate quality
- Maximum stability, zero fibre breakage
- Long service life and high availability
- High performance with low operating costs

Case study

Seawater treatment in Jamnagar, Gujarat

The Jamnagar seawater treatment plant required stability and sustainable performance, especially during the monsoon. Ultrafiltration modules met the challenging demands while minimising the footprint, energy, and chemical needs. Since commissioning, the plant supplies consistently superb filtrate water quality, no matter the feed water conditions.

The result

- 95 per cent water recovery
- 450,000 cubic meters of pretreated water per day delivered to one of the country's largest oil refineries

Technology and applications



4. Ion exchange resins (IER) allow the reversible interchange of ions between a solid and a liquid. Ion exchange resins remove harmful contaminants from liquids, replacing them with beneficial, desired ions. Water treatment facilities use IER for applications such as industrial demineralisation, condensate polishing, ultrapure water production, and wastewater treatment.

Over the last 80 years, DuPont's IER portfolio has evolved to become one of the most comprehensive in the industry with products such as DuPont™ AmberLite™ and DuPont™ AmberLyst™.

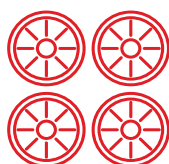
Case study

National Thermal Power Corporation (NTPC), India

Spent steam from thermal power plants condensate and pick up impurities from pipes and turbine equipment. The impurities need to be removed before the condensate is recycled and reused for further steam generation. DuPont™ Amberlite™ high-performance resins are used in thermal power stations worldwide, including NTPC, for high-pressure condensate polishing and stator cooling applications.

The result

- Improve plant reliability and protection of critical equipment
- Optimise performance for treated condensate purity
- Superior osmotic, mechanical stability, and high oxidation resistance for long-lasting resin life
- Wide product range with uniform and semi-uniform particle size gives flexibility to avoid channeling, reduce pressure drop, and assist in better fluidization and kinetic performance



5. Reverse osmosis (RO) and Nanofiltration (NF) is a pressure-driven separation process that employs a semipermeable membrane and the principles of crossflow filtration. The RO membrane acts as a barrier to all salts and inorganic molecules, as well as many organic molecules. NF provides high rejection of multivalent ions such as calcium and low rejection of monovalent ions such as chloride. The FilmTec™ and DuPont™ TapTec™ portfolio offers separation-technology products that are highly effective in industrial, municipal, commercial, and consumer water applications.

The combination of these technologies offers unique benefits:

- Two to three times more high-quality water
- Filters out a higher percentage of dissolved solids
- Removes up to 99 per cent of impurities from water
- Reduces operating costs and lower energy use
- Longer membrane life due to antifouling and easy maintenance

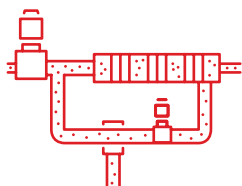
Case study

Koyambedu Tertiary Treatment Reverse Osmosis (TTRO) plant, Chennai, Tamil Nadu

Drinking water is becoming increasingly scarce with booming populations and rapid urbanization. To ensure a sustainable and dependable water source for industrial purposes, Chennai wants to implement 100 per cent reuse of treated wastewater. The TTRO plant uses a multi-stage treatment scheme that includes ultrafiltration, reverse osmosis, rapid gravity sand filters, and ozonation.

The result

- 75 per cent water recovery rate through UF and RO membranes
- Ultra-low specific power requirement of 1.88kWh/m³, expected to contribute significant savings over time
- Incremental income of nearly INR 30 lakhs per day from supplying treated water to nearby industries



6. Closed Circuit Reverse Osmosis (CCRO)

RO systems are typically designed to meet specific conditions, but most deal with temperature variations, feed concentration, consumption flow rates, and fouling and scaling conditions. CCROs adapt to such changes with flexible and independent control over recovery, crossflow, and flux. With data-driven intelligence, CCRO systems can operate from 42 per cent to 98 per cent recovery on a wide variety of water sources and applications.

Benefits of using CCRO technology:

- Autonomous adjustment to a wide range of conditions
- Significant reduction in maintenance and downtime
- 50–90 per cent less water waste
- Lower energy consumptions

Case study

Coca-Cola bottling plant, Central Asia

Coca-Cola requires purified ingredient water for their beverages. To achieve the corporate water replenishment goals, a treatment method with maximum water use and minimum wastewater generation was necessary.

Coca-Cola installed two ReFlex Reverse Osmosis systems at the facility. The output is far greater than what would have been possible with traditional multi-stage RO systems.

The result

- Met the highest quality standards for use in Coca-Cola products
- Delivered over 93 percent recovery driving reliability while reducing waste handling costs
- Reached the plant's water-neutral sustainability goal

"As a global leader in innovative water technologies, we are continually expanding our technology portfolio of high-quality solutions to help our customers purify, conserve, and reuse water"

- **HP Nanda, Global Vice President and General Manager, DuPont Water Solutions**



Sectors and industries

Reversing the tide

Though water covers 70 per cent of the planet, water for drinking, bathing, irrigation, and energy is a rare commodity. Only three per cent of water in the world is freshwater, and of that, two-thirds are frozen glaciers.¹

1.1bn

people worldwide lack sufficient water access

2.7bn

face water scarcity for at least one month in a year

2.4bn

people are exposed to water-borne diseases, such as cholera and typhoid fever, due to inadequate sanitation

2025

the year when as many as two-thirds of the world's population could face severe water shortages

DuPont empowers industries and markets with water-treatment innovations and specialty process separations that help make people's lives safer, healthier, and better.

Desalination

Desalination is quickly becoming a safer investment for securing water supply. Advancements in membrane technology have made seawater desalination economically viable. The cost of desalination has dropped by more than half. Now, more than 300 million people globally get their water from desalination plants.

Power Generation

Whether driven by nuclear energy or fossil fuels, power plants need purified water to prolong equipment life, prevent corrosion, and enable uninterrupted operation.

We offer world-class innovation by working closely with local utilities, service providers, and equipment manufacturers to supply effective solutions.

Food & Beverages

F&B manufacturers look to protect the quality and consistency of their products, such as dairy items, sweeteners, juices, and wines. Our comprehensive product line, technical ability, and global reach allow for a more dependable set of food and beverage characteristics, such as taste, colour, and texture.

Residential

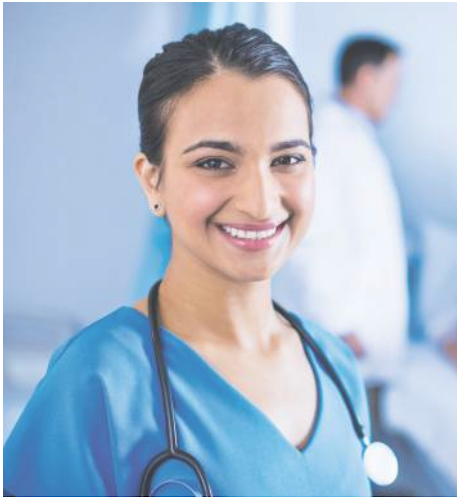
We offer a range of solutions for home water purifiers removing contaminants that lead to health risks, with improved performance and lower membrane costs.



Municipal
We innovate municipal water treatment solutions to help localities use varied water sources—rivers, lakes, groundwater and even the sea.



Healthcare & Bioprocessing
As a global market leader in adsorbents and IER, we have a broad range of products ideal for bioprocessing.



Commercial
Our range of water treatment technologies help commercial facilities operate efficiently and offer quality products to their customers.



Chemical & Petrochemical
We have been the premier supplier of polymeric IER. They are used to produce, purify, and recover some of the most commercially important elements in the world.



Mining & Hydrometallurgy
Through the development of metal-selective applications and IER technologies, we assist in the recovery of valuable metals in the most efficient and environmentally sustainable way possible.



Textiles
We can help reduce problematic solids, clean wastewater, and facilitate the recovery or removal of dyes and salts.

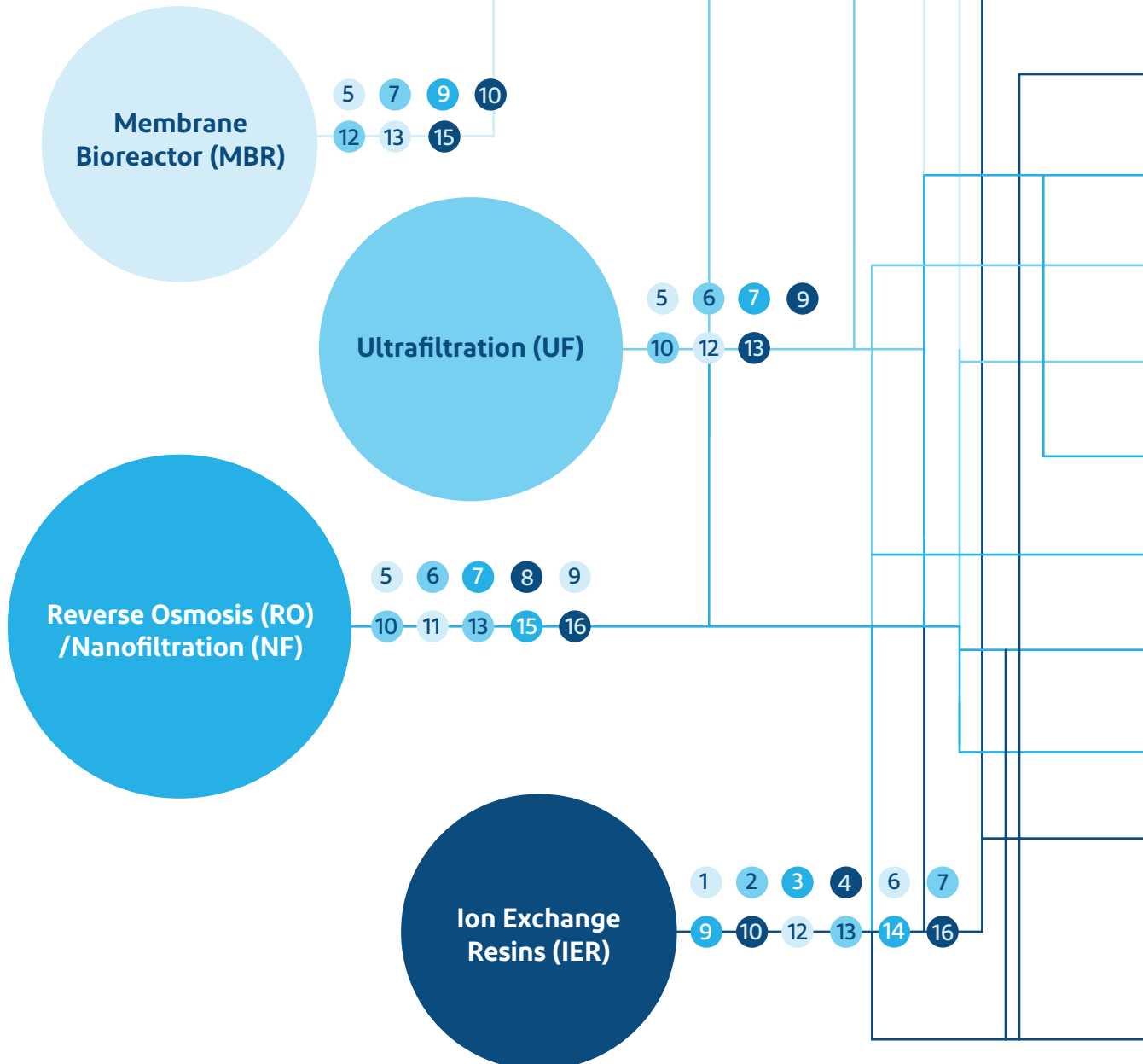
Solutions map

The world runs on water. We make sure it is optimised.

Rising population, industries, pollution, and climate change have mounted pressure on our water supply. Despite the challenges, a clear path exists, giving 7.8 billion people access to safe, clean drinking water daily—a future where not a drop is wasted.

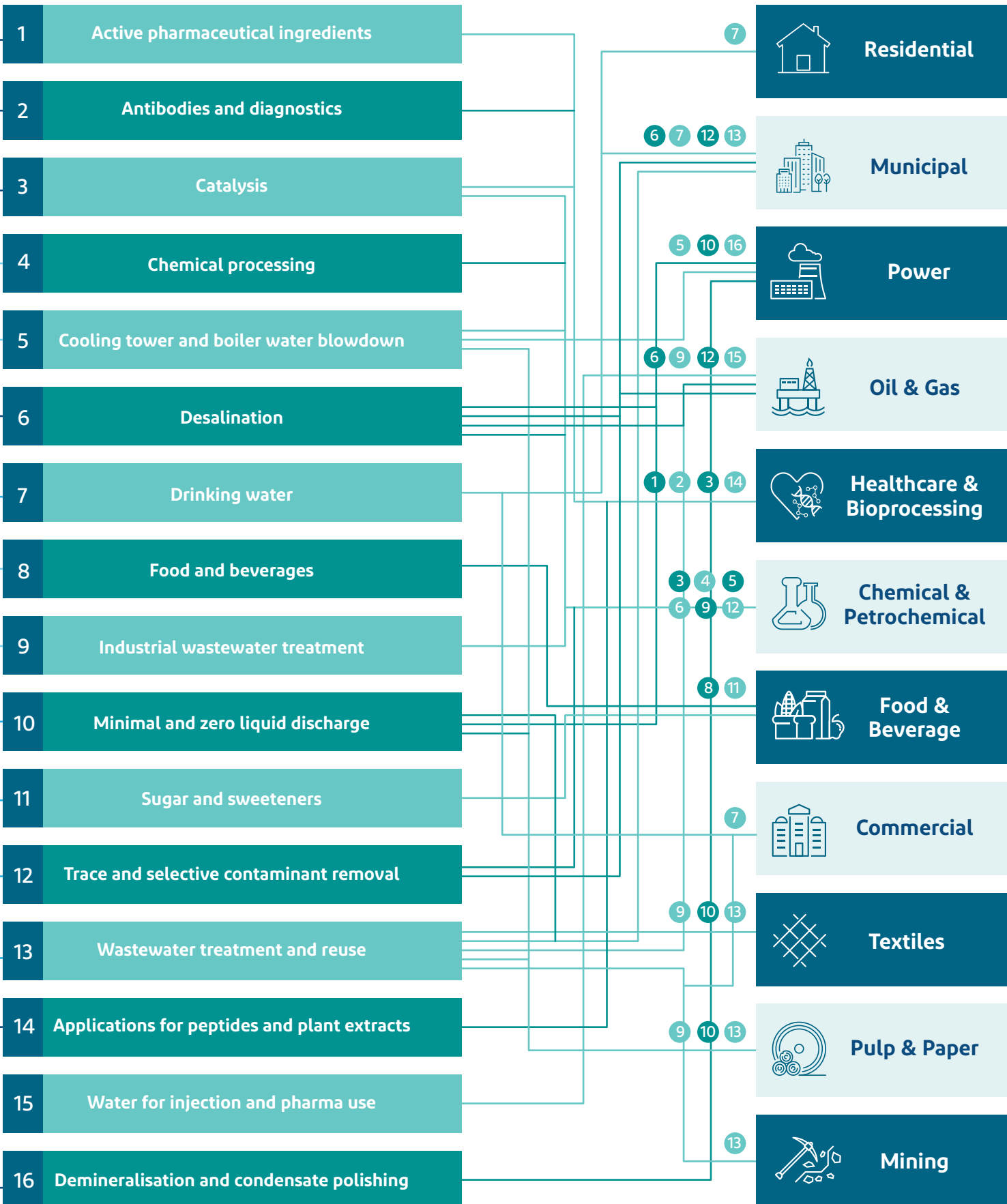
We call this a Water Optimised World.

DuPont technologies



Applications

Industries



Testimonials and facts

Helping customers make an impact.

FilmTec™ supports high-recovery RO helping brand owners with their **Drinking water** purifiers

"We have been using DuPont™ AmberLite™ HPR grade resins for the treatment of condensate water at the Anpara Thermal Power Plant for more than fifteen years. We chose resins from the Amber series, as they are the most trusted ion exchange resin in the industry. We are thrilled with their performance."

- **Anpara Thermal Power Station**

"We have been using FilmTec™ RO membrane sheets in our water purifiers for the past 20 years. Thanks to their deep commitment to innovation and quality, FilmTec™ is our trusted technology partner. The RO membranes meet our technology requirements and cater to the growing needs and demands of our customers. We are delighted with DuPont's performance."

- **Yogesh Chandra, Vice President, Kent RO System**

Advanced filtration technology has helped an oilfield operator in Colorado recycle nearly

100 per cent of its produced water.

DuPont IER enables **pharma** companies such as Biocon with drug purification.

“Water, a most precious resource, needs to be preserved and utilised judiciously. Thermax and DuPont Water Solutions have had a strong partnership working towards providing sustainable solutions to our end customers. DuPont's pioneering membrane technologies have helped Thermax cater to the varied needs of our customers, and conserve and reuse water resources.”

- Vishal Mehra, Business Unit Head, Thermax Ltd

“DuPont's IER is used extensively across the country in a wide array of water treatment, condensate, purification, and catalysis applications. Thus far, all our customers' feedback has been that the quality and consistency are excellent. DuPont offers the best technical and application support in the industry. As a result, we have been able to develop and support a satisfied customer base.”

- Rajnish Virmani, MD, Virmani Brothers Pvt Ltd

DuPont UF membranes were used for **pretreatment** in Chennai's municipal wastewater recycle plant.

DuPont partnered with the local municipal water boards and water companies to implement a wastewater recycling program that uses every litre of water **three times** instead of once.

About DuPont

Local expertise. Global markets.

DuPont continuously pursues pioneering innovation and reliable solutions. We collaborate with customers across continents to create a cleaner world together. Our expertise in applications development, and experience in local communities and industries help customers unlock success.

2,200
Colleagues

11
Manufacturing sites

12
Technology and
innovation centres

Enabling a thriving world



DuPont's solutions feature in Brave Blue World — a documentary that aims to 'paint an alternative, optimistic water future by mapping out ways to get there.'



90+

Countries served

30+

Industries served

2,000+

Products



dupont.com/water

1. World Wildlife Fund
2. Picture credit Shutterstock, iStock and Gettyimages.

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