Water and Wastewater Treatment Technologies Made Easy
About Us

De Nora, a multinational company with global headquarters in Italy, provides its customers with safe, innovative and sustainable energy saving technologies on a worldwide basis.

De Nora’s products, systems and technologies, boosted by continuous investments in R&D, are used across multiple industries and applications including municipal water and wastewater, oil and gas, power generation and marine sectors.

The De Nora Water Technologies division has more than 50 years’ experience in the development and supply of water and wastewater treatment filtration and disinfection solutions for municipal, energy and marine applications.

Our brands are recognised worldwide and include Capital Controls®, De Nora TETRA™, ClorTec®, BALPURE®, OMNIPURE™, SANILEC®, SEACLOR®, MicroChem®, UAT™ and ADVANCE™.
Our Experience

Water Purification Capability
We have the experience of more than 50 years across every continent and the satisfaction of tens of thousands of utility, industrial, commercial and government customers. Our localized field and factory service personnel are well trained to support De Nora Water Technologies’ disinfection, instrumentation, and filtration products.

Disinfection
- A leading supplier and pioneer of gas disinfection systems with more than 50 years’ experience including the invention of the all vacuum gas feed technology
- Capital Controls® gas feed disinfection solutions were the first to obtain ISO:9001 certification
- De Nora EST™ scrubbers are the only supplier with both wet and dry systems
- EST™ venturi packed tower scrubbers offer true emergency two stage designs
- More than 1,200 ozone installations and AOP (Advanced Oxidation Process) over 45 years

Filtration
- TETRA™ filters are one of the market leaders globally for deep bed filtration
- TETRA™ DeepBed™ tertiary filters now treat over 2,000,000 m³/d in Europe
- More than 70% of the water treated for denitrification in the Chesapeake Bay area employs a TETRA™ Denite® filter including the three largest WWTPs. The Patapsco WWTP, Back River WWTP, and Arlington, VA WPCP treat an average of > 300 MGD via TETRA™ Denite filtration systems
- More than 70 percent of US steel manufacturers requiring filtration employ TETRA™ DeepBed™ Pressure Filters
- Manufacturing UAT™ desalination systems for high salinity applications for more than 20 years
- Installing filtration systems for pre-treatment at desalination plants in Europe and the Middle East including some of the largest works in the world

Electrochlorination
- Installed more than 6,000 electrochlorination systems including over 2,000 in marine, offshore, power and desalination applications
- De Nora is the market leader in the design, manufacture and supply of electrolysers, electrodes, coatings and and technologies to serve electrochemical processes in diversified markets
- Offers the original marine sewage treatment systems to oxidize sewage in the electrochemical cell
- OMNIPURE™ Series 64 is one of a limited number of systems to be certified to meet MEPC.227 (64)
- BALPURE® ballast water treatment system is patented and Type-Approved, providing an effective and economical solution to the threat of aquatic invasive species
At De Nora Water Technologies we make water and wastewater treatment easy. We provide innovative filtration and disinfection solutions to meet your specific needs.
We build long-term relationships by understanding our customers’ needs, delivering value and behaving with integrity in everything we do.
Drinking Water Filtration and Desalination Pre-treatment Made Easy

De Nora Water Technologies has more than 50 years of experience providing filtration treatment solutions to municipal, industrial and commercial markets.
Drinking Water Underdrains

In gravity filters, the underdrain is one of the most important components contributing to overall system performance and operation—whether a new filter design or retrofitting of an existing filter. De Nora Water Technologies offers TETRA™ LP Blocks™ and TETRA™ U Blocks™ dual parallel lateral underdrains for drinking water and desalination pre-treatment applications.

- Effective removal of solids
- Equal distribution of backwash air/water
- Low headloss
- Exceptional installation strength, integrity and maintenance-free life with no moving or wearing parts
- Reduced backwash water volume lowers operating costs
- GroutGrip™ and Anchor-Rite® designs resist uplift from the filter floor and eliminate uncertainty from grout installation
- Wide, low-profile design reduces installation cost
- Suitable for high salinity water applications
- Easy assembly

TETRA™ LP Block™ dual parallel lateral underdrain

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Resists 1.75 more uplift force than U Block™

Resists 3.75 more uplift force than U Block™
Membrane Filtration Made Easy

De Nora Water Technologies offers membrane filtration systems to meet any tap, brackish or seawater application need. Using high quality components, the systems are engineered to effectively produce treated water, free of particulate matter or contaminants.
Membrane Filtration Systems
De Nora Water Technologies offers the UAT™ Reverse Osmosis (RO), Ultrafiltration (UF), Nanofiltration and Electrodeionization (EDI) systems for a variety of municipal, commercial and industrial applications.

- UAT™ RO membrane filtration systems range in standard output capacities up to 10 mgd
- UAT™ UF systems range up to 10 mgd
- UAT™ EDI systems are available with a maximum permeate flow rate of 2.2 m³/h–104 m³/h (10 gpm–460 gpm)
Contaminant Removal Made Easy

Contaminants in drinking water affect public health. As a result, they should be treated, limited or removed from drinking water supplies. De Nora Water Technologies has a variety of proven treatment solutions.
Arsenic Removal Systems

The SORB 33® arsenic removal process is proven to effectively and economically reduce arsenic below 4 ppb. The system works in conjunction with a robust and proprietary ferric oxide media.

- Simple installation and operation
- Pre-engineered Arsenic Removal System (ARS) range from 1.1 – 2.1 m (3’-6” - 7’-0”) diameter pressure vessels and treat 17 – 136m³/hr (75 – 600 gpm).
- Engineered Arsenic System (EAS) range from 2.4 – 4.3 m (8’-0” – 14’-0”) diameter and treat 68 – 557 m³/hr (300 – 2,450 gpm)
- Cost-effective treatment solution for arsenic removal

Arsenic Removal Media

Granular ferric oxide media has been successfully removing arsenic from drinking water treatment systems since 1999.

- Removes As (III) and As (V) to <4 ppb
- High capacity for arsenic
- Long media life under continuous operation
- Very low residual (backwash) effluents: <0.1% of water treated
- No chemicals for regeneration
- Small footprint
- Dry media, NSF Standard 61 approved

Fluoride Removal

De Nora Water Technologies offers the SORB 09™ fluoride removal system, a fixed-bed adsorption process for the removal of fluoride onto solid activated alumina.

Iron & Manganese Removal

The Omni-SORB™ filter system is designed for iron and manganese removal applications and for combined arsenic/iron/manganese removal where iron levels are high enough to affect arsenic removal.

- Lower water losses — <50% than greensand systems
- Reduces operational and maintenance expenses
- Ensures removal of contaminants
- No need to use permanganate for oxidation
- Pre-engineered systems range from 1.1–2.1 m (3.5–7 ft) diameter to treat 19–240 m³/hr (85–1,050 gpm)

Nitrate Removal

The SORB 07™ nitrate removal system is an ideal solution to treat nitrate contamination in ground water supplies.

- Capacity ranges from 100 to 3000 gpm
- Small footprint
- Regenerative process extends resin life

Ion Exchange Systems

TETRA™ Higgin’s Loop™ ion exchange system is a continuous countercurrent ion exchange contactor for liquid phase separations of ionic components using solid exchange resins. The TETRA™ Higgin’s Loop ion exchange system is a great enhancement for ion exchange applications when compared with fixed bed and fluid bed systems. The Higgin’s Loop system efficiently utilizes the resin capacity, uses less regenerant and less fresh water, generates consistent product quality and minimizes wastewater volumes.

pH Adjustment

The TETRApHix™ advanced CO₂ pH adjustment system is ideal for use in drinking water applications requiring CO₂ addition for lime softening or recarbonization or the control of pH.

- Increases gas efficiency
- Low maintenance and reduced operational costs
- Smaller footprint compared to conventional carbon dioxide pH adjustment systems

Other contaminants

De Nora Water Technologies also offers solutions for Nitrite oxidation and leachate treatment.
Biological Wastewater Treatment Made Easy

For biological treatment and tertiary wastewater treatment, De Nora Water Technologies has it covered. The proven TETRA™ design is used for applications that require treatment including removal of BOD, ammonia, suspended solids, phosphorus and nitrate-nitrogen.
Biological Wastewater Treatment Systems

De Nora Water Technologies offers TETRA™ biological aerated filter systems for the removal of contaminants from municipal and industrial wastewater

**TETRA™ Submerged Aerated Filters (SAF)**

A simple process for the biological oxidation of ammonia-nitrogen (NH₃-N) and BOD for both municipal and industrial wastewaters.

- Effluent qualities of 5 BOD and 1 NH₃-N (mg/L)
- Effluent NH₃-N of less than 0.5 mg/L can be achieved
- Exceptional performance and flexibility
- Low operating and maintenance costs
- Small footprint
- Can be used for either secondary treatment (SAF/cSAF) or as a tertiary (nitrification) stage (NSAF)

**TETRA™ CoLOX™**

TETRA™ CoLOX™ is an advanced aerobic biological treatment system which combines a solids removal and biological treatment process with innovative design features to achieve superior performance.

- Nitrifies ammonia nitrogen
- Achieves superior BOD removal
- Removes suspended solids
- Offers greater efficiency and operational reliability than other aerobic biological treatment processes

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**TETRA™ Amphidrome™**

The TETRA™ Amphidrome™ process is a biological fixed film sequencing batch filter that provides simultaneous removal of BOD, ammonia, suspended solids, phosphorus, and nitrate-nitrogen. The performance of the deep bed Amphidrome is guaranteed to produce an effluent which meets or surpasses regulatory standards.

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**TETRA™ Wastewater Filter Construction**

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**TETRA™ CoLOX™ at East Greenwich**

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Tertiary Wastewater Treatment Made Easy

De Nora Water Technologies’ Tertiary and Advanced Wastewater Treatment technologies produce cost effective wastewater effluent that is safe for direct discharge or reuse.
Tertiary and Wastewater Treatment Systems

De Nora Water Technologies’ TETRA™ filters produce high quality advanced wastewater treatment plant effluent. The complete product line includes application-specific engineered gravity, pressure and modular filters and pre-assembled gravity deep bed filters.

TETRA™ SNAP T® Block

The TETRA™ SNAP T® Block underdrain is a proven design of filter underdrain.

- Combined with layered gravels to offer superior distribution of both backwash air and water, concurrently
- High loading capacity
- Ensures improved backwashing distribution
- Used in >10% of the world’s water reuse capacity

TETRA™ DeepBed™

The TETRA™ DeepBed™ tertiary gravity filtration system is an economical solution for the removal of total suspended solids (TSS).

- Superior total phosphorus (TP) removal to below 0.2 mg/L
- No moving parts to clog or wear
- <4% backwater water return (1-3% typical)
- Easily converted into denitrification mode

Industrial Pressure Filters

TETRA DeepBed pressure filters combine a nozzleless filter bottom and spherical monomedia for industrial markets. Systems offer automatic filtration and backwashing cycles, with the filter as a standalone operation. These systems are fully automated and provide excellent removal of TSS, oil and grease.

TETRA™ Denite®

De Nora Water Technologies offers the TETRA™ Denite® system that combines the denitrification and filtration process for the removal of nitrate-nitrogen (NO₃-N) and suspended solids in a single treatment step.

- Fixed-film biological denitrification process
- Integrates with other processes for superior total nitrogen (TN) and phosphorus removal
- Reduces NO₃-N to low levels (<1.0 mg/L)
- Effluent total phosphorous concentrations <0.2 mg/L are consistently achieved
- Can easily meet <2 NTU or <5 mg/L TSS (<2 mg/L TSS typical)
- Capable of denitrifying to low NO₃-N concentrations at low wastewater temperatures
- TETRAPace® automatic dosing control saves up to 30 percent in carbon consumption
- SpeedBump® operation removes accumulated gas without removing the reactor from service

Systems are available as bespoke designs or in TETRA™ Modular DeepBed™ filter package plants.
Gas Feed Disinfection Made Easy

De Nora Water Technologies offers a range of world-leading gas feed disinfection systems, instrumentation and associated safety systems.
Gas Feed Systems

The Capital Controls® line of gas feed disinfection equipment includes chlorination, dechlorination/sulfonation, ammoniation and recarbonation equipment. The new Series 4100, 4200 and 5200, compact and full-size cabinets were launched in 2017.

- Vacuum Gas Feeders (Manual/Automatic) up to 200 kg/h (10,000 lb/day)
- Pressure Gas Feeders (Manual/Automatic) up to 20 kg/h (1,000 lb/day)
- Automatic Gas Control Valves
- Vaporizers up to 200 kg/h (10,000 lb/day)
- Custom Engineered Systems
- Accessories and mixing systems

Scrubbers

EST™ municipal and industrial scrubbing systems include both wet and dry scrubbers for emergency gas abatement, odor scrubbers and particulate scrubbers.

Vent Exhaust Gas Arrestor

The Capital Controls® Type VEGA™ is a disposable chlorinator vacuum regulator vent gas arrestor designed to treat occasional chlorine gas vent releases that normally accompany chlorine container changeovers.
Gas Feed Disinfection Made Easy

Capital Controls® MicroChem® 3 Analysis

MicroChem®3 is a new innovation, based on the expertise gained through decades of chlorine management and analysis. It combines the best features of our respected analyzers and controllers to come up with an innovative solution you can tailor to your own water analysis and control needs.

- Used as an analyzer, controller, or both at the same time for multiple parameters to minimize the number of instruments required
- Chlorine, chlorine dioxide, pH, ORP, conductivity and 4-20mA e.g. flow
- USB connectivity offers the flexibility to change setup and measurement parameters
- Multiple proven wet end measurement options
- Data management options help manage and understand your plant operations. This includes email transmissions and data log downloads to USB
- Intuitive touch screen user interface
- Includes six different language options

Water Quality Controllers

The Capital Controls® CAPTROL Series 1450 and 1451 controllers can read a chlorine residual signal, a flow signal, or both for smooth and responsive control of chlorine dosing. Additionally, “before and after” chlorine analyzers can be used in conjunction with a flow input for precise control of the chlorination process.

Gas Detectors

De Nora Water’s gas and leak detectors provide continuous detection of chlorine gas and sulfur dioxide gas in a normally clean air environment in up to eight distinct locations, protecting personnel and property wherever chlorine is unloaded, stored or used. Highly sensitive, the detectors monitor gas levels below U.S. OSHA requirements.
Ultraviolet Disinfection Made Easy

De Nora Water Technologies offers UltraDynamics® ultraviolet disinfection systems for use in a complete spectrum of applications.

Ultraviolet Disinfection Systems

UltraDynamics® UV Disinfection Systems

UltraDynamics® ultraviolet disinfection systems are available in closed vessel horizontal configurations for drinking water applications.

- Drinking water systems are designed to treat up to 315 m³/hr or 2 mgd per system
- Wastewater systems designed to treat up to 4 mgd or 631 m³/hr per system
Chlorine Dioxide Generation Made Easy

De Nora Water Technologies’ chlorine dioxide is a versatile disinfection treatment chemical that aids in the prevention of trihalomethane formation, a chlorinated organic by-product, by oxidizing the precursors that cause THMs.

**Chlorine Dioxide Generation Systems**

De Nora Water Technologies offers the Capital Controls® chlorine dioxide generators to produce the disinfectant chemical using reagents in either commercially available or diluted concentrations.

- Efficient gas production
- Precise solution feeding
- Low maintenance
- Dependable operation
- Ranges from up to 2 g/day to 10 kg/hr (up to 529 lb/day)
- Consistent product yield greater than 95%
Ozone Disinfection Made Easy

Ozone Applications and Systems

MCP-XTL, TPF-XTL, DTPF-XTL Ozone generators series

Through the acquisition of Ozono Elettronica Internazionale, De Nora Water Technologies offers a complete range of ozone solutions and Advance Oxidation Processes (AOP) systems, for water and wastewater applications developed through more than 45 years of experience and 1,200 installations.

Ozone is produced either from: ambient air, LOX and PSA VSA installation generating a powerful disinfection media. Systems can be on skid or containerized and provided as stand alone plants therefore requires only power supply and eventually cooling water.

- Ozone production:
  - MCP-XTL up to 1.4 kg/h
  - TPF-XTL up to 37.5 kg/h
  - DTPF-XTL up to 75 kg/h

- Low power consumption
- Low maintenance costs
- Control and monitoring systems ensure safe operation
- Available as individual generators or complete systems
Electrochlorination Systems Made Easy

De Nora is a world leader in the supply of seawater and brine water electrochlorination with 6,000+ installations in more than 60 countries. Electrochlorination is a proven, cost-effective, reliable and safe method for generating sodium hypochlorite on-site.
**CECHLO Brine Electrochlorination**

The CECHLO electrochlorination systems for the on-site production of sodium hypochlorite is a safe and economical solution. Developed 40 years ago by Chlorine Engineers, CECHLO is a well-established product line in Japan.

There are four types of CECHLO systems, depending on the concentration of sodium hypochlorite:

- **CECHLO-MS** (Membrane Technology): 5-12% as Cl₂
- **CECHLO-IS** (Membrane Technology): 5% as Cl₂
- **CECHLO-NS**: 0.8% as Cl₂
- **CECHLO-M**: 100-2,500ppm (0.01-0.25%) as Cl₂

Additionally, De Nora also offers the CECHLO® 3 compartment cell electrolyzer - a cost effective and efficient answer for industrial purposes requiring innovative solutions in fast growing niche markets, such as acid and caustic recovery through salt.

The CECHLO® 3 compartment cell electrolyzer is derived from the well-established CECHLO® -MS technology for sodium hypochlorite generation, with the additional installation of a middle chamber between the anionic and cationic separation membranes.

**ClorTec® Brine Electrochlorination**

The latest generation of brine electrochlorination technology, the ClorTec® DN range, offers simple operation and maintenance as well as unrivalled performance and safety advantages.

Systems generate a 0.8% sodium hypochlorite using three common consumables: water, salt and power.

- **The most efficient salt and power usage** at 3.0lb (3kg) of salt and 2.0kWh (4.4kWh) per lb (kg) equivalent of Chlorine produced
- **Individual hydrogen venting on each cell delivers safety advantages over competing designs**
- **Simplified piping, open access, reducing maintenance and operational issues**
- **Less complex system with fewer instruments and simplified controls which means easy operation**
- **New remote “Smart Monitoring” system** monitors the system performance via the internet. This tool allows system optimisation and remote maintenance and troubleshooting.
Electrolytic Disinfection Made Easy

SANILEC® and SEACLOR® seawater electrochlorination systems are the preferred choice for biofouling control in power, oil and gas applications.
**Seawater Electrochlorination**

**SANILEC® Seawater Electrochlorination Systems**

SANILEC® systems are the standard and preferred electrochlorination system for biofouling control in offshore and marine as well as power and coastal applications.

- Systems range in capacity from 2.8–47,620 lb/day (1.2–21,600 kg/day), per train
- Minimal operation and maintenance requirements
- Once-through flow design eliminating recycle requirements
- Use of corrosion-resistant materials of construction
- Low power consumption

**SEACLOR® Seawater Electrochlorination Systems**

SEACLOR® systems are used for biofouling control in power plants, cooling towers, liquefied natural gas (LNG) terminals and desalination facilities, as well as coastal installations using seawater for cooling or other process needs all over the world.

- Designed for continuous and unattended operation and require only periodic monitoring
- Eliminates storage, handling and purchase of hazardous chemicals
- Supplied pre-assembled or pre-fabricated to the maximum possible extent
- System capacities from 500–50,000 lb/day (10–900 kg/hr), per train
Marine Disinfection Made Easy

De Nora has distinguished itself as the market leader for the design and manufacture of electrolytic disinfection systems for seawater and marine applications.
Ballast Water Treatment

The Type-Approved and patented BALPURE® ballast water treatment system is a simple, reliable and flexible electrolytic disinfection treatment solution to meet the most stringent ballast water discharge requirements. The BALPURE® system can be remotely mounted away from the ballast lines and split into small sub-assemblies to minimize other equipment relocation and additional engineering/ship re-designs.

- Two stage process: filtration and electrochlorination
- Patented high efficiency slip stream electrochlorination
- Suitable and IMO Type Approved for all water conditions (seawater, brackish and fresh water)
- Available for ballast water flow rates from 400 to 12,500 m³/h with one unit
- Ideal for both retrofits and new builds
- Compact design offers small footprint and flexible installation options
- Based on De Nora’s 90+ years’ of electrochlorination experience
- Self-Cleaning electrode design
- Fully automatic and intelligent controls enable simple, safe and effective operation
- USCG Type Approval process underway

Marine Sewage Treatment

OMNIPURE™ MARINER Series M55

The compact, MARINER OMNIPURE® sewage treatment system features a bulkhead mounted arrangement that maintains the use of your vessel’s installed sewage and seawater pumps and in-place collection/holding tanks. The systems accommodate crew complements up to 25 persons (black and gray water).

- BV Certification to IMO Resolution MEPC.159(55)
- Easy to install, start up, operate and service
- Eliminates storage, handling and purchase of hazardous chemicals
- No pre-treatment of raw inlet sewage stream
- Small footprint and weight

OMNIPURE™ Series 64

De Nora is the patent holder of the original electrolytic treatment process where marine wastewater is oxidized within the cell at the same time as producing sodium hypochlorite for the disinfection of marine sewage streams. The new OMNIPURE™ Series 64 sewage treatment systems can accommodate treatment capacities up to 197 persons (black and gray water).

- BV Certification to IMO Resolution MEPC.227(64)
- New design offers considerably smaller footprint and even greater flexibility compared to other systems
- Easy to install, operate and service
- Lightweight package
- Minimal maintenance
- No additional tanks or filtration equipment required
- Operates on-demand, instantaneous on-off operation
- Operator-safe solids handling system
- Small equipment footprint
Aftersales Solutions Made Easy

De Nora offers a highly differentiated local service and spare parts support to our worldwide customers to ensure the design specified performance at the lowest life-cycle operating costs.

After Sales and Service Solutions

At De Nora Water Technologies, we are strongly committed to providing aftersales service and support for our entire product portfolio and accessories. We understand your equipment has different service needs depending on factors such as age, maintenance, application and duty cycle through our flexible service offering framework.

Our “Peace of Mind” service offering framework takes away all equipment related performance risks for you. You experience a predictable high uptime on our entire equipment operating consistently. Both on-demand and planned service support gets sporadically downed equipment up and running promptly.

Our global offerings include:

• 24/7 Call Center
• Installation, commissioning and warranty (and extended warranty) support
• On-Demand spare parts and service support
• Planned Service Agreements
• Inspection and auditing support
• Equipment refurbishment, factory repair and technology upgrades
• Customer training and remote support
• Retrofit and service solutions for non-De Nora equipment
• Rental and leasing options

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