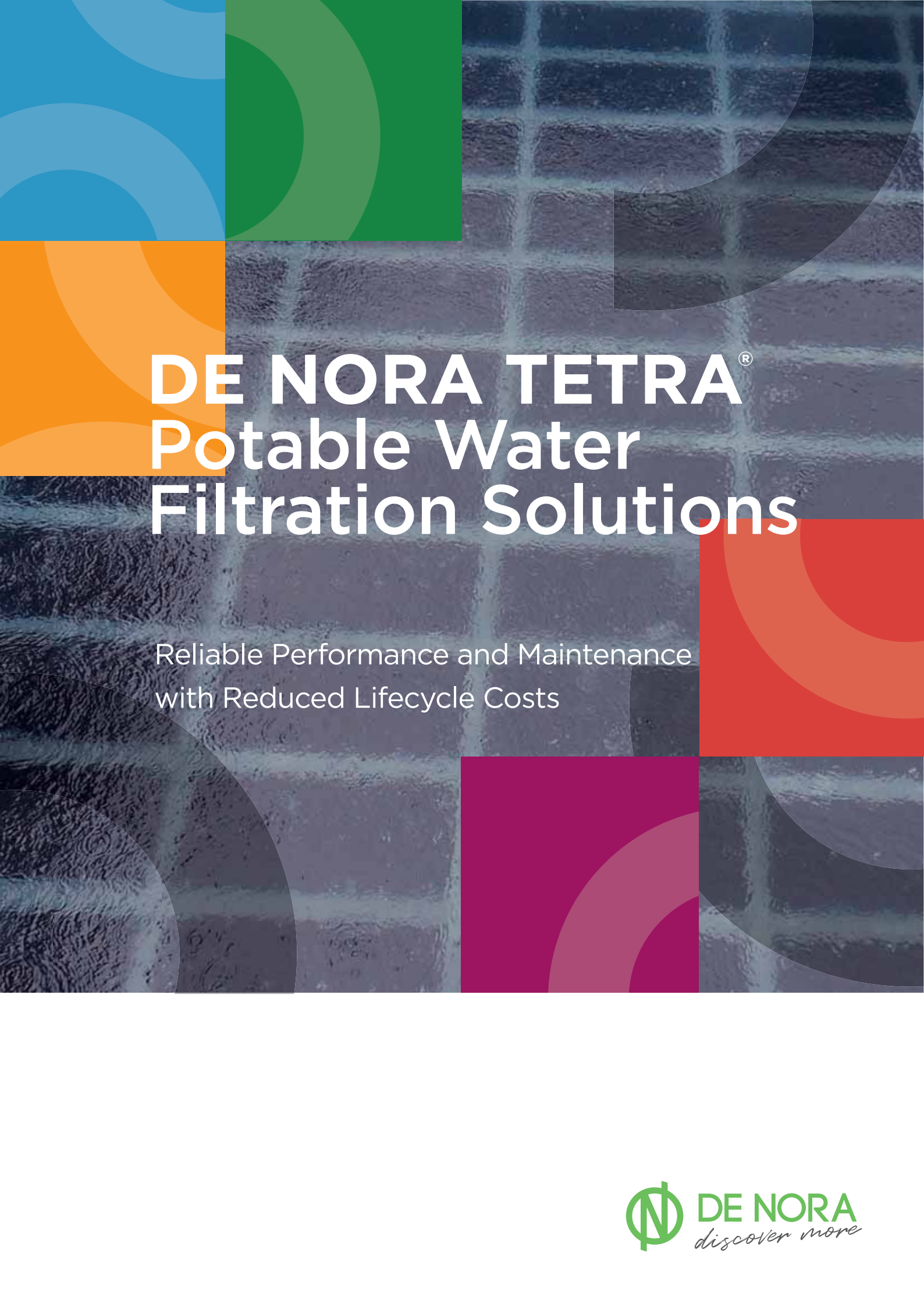




DE NORA TETRA[®] Potable Water Filtration Solutions

Reliable Performance and Maintenance
with Reduced Lifecycle Costs

With more than 50 years of experience and over 1,300 global installations providing media filtration solutions to both municipal and industrial markets, DE NORA TETRA offers proven underdrain options for superior filtration performance.

Why Choose De Nora?



**EXPERTISE AND
PROCESS KNOWLEDGE**



**LOGLIFE,
TROUBLE-FREE
OPERATION**



**1,300 INSTALLATIONS
OPERATING WITH
MINIMAL INTERVENTION**



**DESIGNED TO
REDUCE OPEX**



**MULTIPLE UNDERDRAIN
OPTIONS**



**MEETS REGULATORY
APPROVALS**



Municipal drinking water plants and pretreatment systems for desalination plants require rugged, robust, and cost-effective gravity filters to remove total suspended solids (TSS).

Effective media cleaning is essential for a filter to function efficiently under all loading conditions. The underdrain is one of the most important components contributing to overall filtration system performance and operation. Whether a new filter design or retrofitting an existing filter, DE NORA TETRA offers several proven dual parallel lateral underdrain designs which offer superior distribution, either sequentially or concurrently, of both backwash air and water.

Higher Efficiency

- Dual parallel design produces even air/water distribution and efficient bed cleaning without creating dead zones.

Simple Installation and Lower Maintenance

- Shorter installation time
- No moving parts or nozzles to clog
- No need to enter confined spaces
- Lower profile requires less concrete

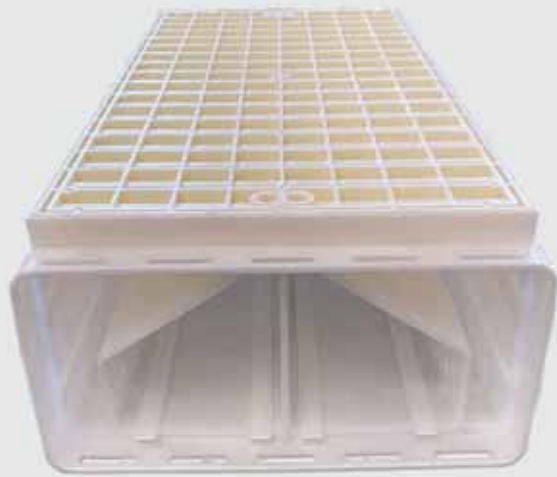
Reduced Lifecycle Cost

- Even air/water distribution for backwash reduces operating cost
- 20+ years longevity for lower lifecycle cost

Peace of Mind

- NSF/ANSI/CAN 61 Drinking Water Components
- DWI approved (UK Secretary of State)
- D.M. 174/2004 (Italy)
- Proven performance with more than 300 installations
- Global customer support
- Patented GroutGrip™ and Anchor-Rite® floor anchoring technology resist uplift

DE NORA TETRA UNDERDRAIN TECHNOLOGY



LP Block

Drinking Water Filter Floors

- Low profile (LP) design means less civil works and fewer blocks required
- 1/3 fewer laterals – fewer joints
- Anchor-Rite® for 3.75 times uplift resistance
- GroutGrip™ floor anchoring fastener
- 2,500 psf crush strength

DUAL PARALLEL LATERAL

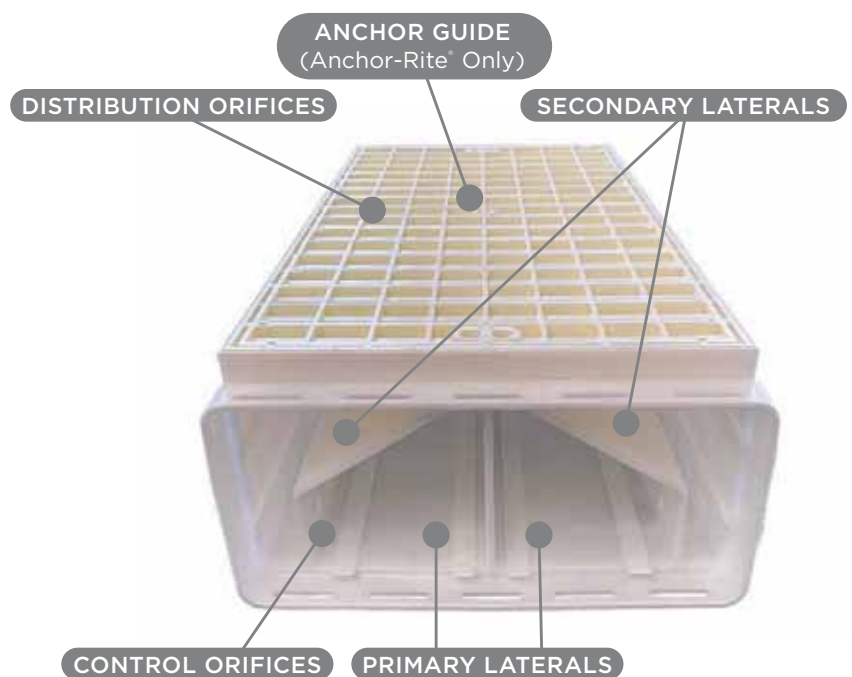
With dual parallel lateral designs, both air and/or water is distributed evenly across the entire filter bottom during the backwash cycle to effectively remove and release solids from the filter media.

Flow in the primary lateral creates forms a compensating pressure gradient, which puts the secondary lateral in a uniform hydraulic condition.

Backwash water enters the primary laterals and then passes through the control orifices into the secondary laterals.

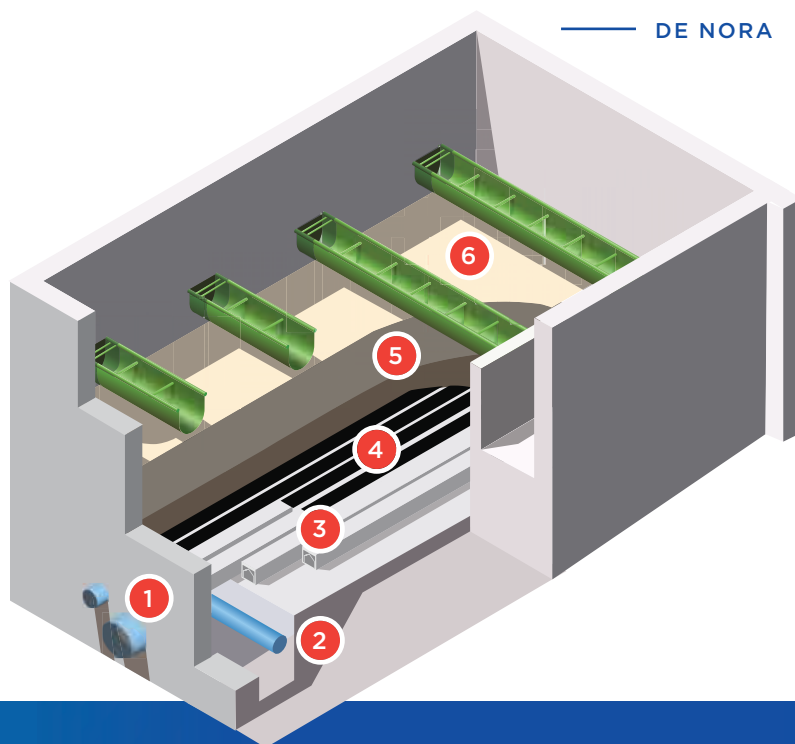
Backwash air is properly distributed by the careful design of the upper control orifices between the primary and secondary laterals, providing even air distributions.

The use of concurrent or sequential air and water significantly reduces the volume of water produced and drastically lowers operating costs through the uniform backwash process.



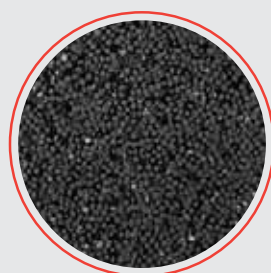
FILTRATION SYSTEM COMPONENTS

- 1 Clean Effluent/Backwash
- 2 Backwash Air Header
- 3 Block Underdrain
- 4 Media Retention Plate or Gravel
- 5 Filtration Media
- 6 Inlet Water Distribution Troughs



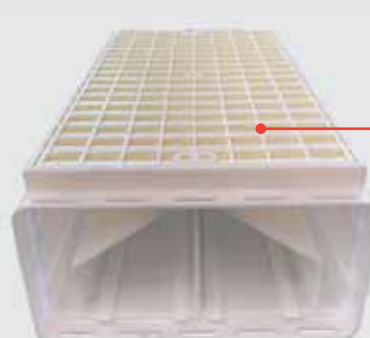
SYSTEM PERFORMANCE

- Easy to install or remove
- Designed for a minimum of 25 year operational life
- Backed by hundreds of installations with long-term operation
- Effective filtration of particulate as small as 10 micron (with proper media selection and operation)
- Excellent water distribution at wide range of backwash rates (5 – 25 gpm/ft²; 12 – 60 m/hr)
- Excellent air distribution, either air scour only, or concurrent air-water backwash styles
- Direct retention of media eliminates the requirement for gravel support layers
- Low profile block design allows the use of more filter media to improve filter performance, or
- Low profile block design allows for shorter filter box design, saving on construction cost and plant profile
- Blocks and plates manufactured using HDPE and ABS – 100% recyclable if decommissioned



S Plate

- Sintered bead porous plate
- 500 micron (+/- 25%) effective pore size
- Good general purpose retention plate



M Plate

- Molded ABS slotted Plate
- 200 micron nominal slot width
- Ideally suited for lime softening and biological filter applications



OVER 1,300 INSTALLATIONS WORLDWIDE

CASE STUDY

Asia Pacific - Hoa Khanh Tay Water Plant - Vietnam

BACKGROUND

The water plant uses surface water from Dau Tieng Lake as the water source.

PRODUCT

DE NORA TETRA LP Block Underdrain

CAPACITY OF WTP

40,000 m³/day filtration capacity

Value Delivered

- Reliable filtration performance provides local regulatory compliance
- Operator workload minimized with reduced maintenance



CASE STUDY

North America - New Britain - USA

BACKGROUND

Bringing drinking water treatment plant up to date from the original dating back to 1940. Combining biological treatment with ozone since 2004.

PRODUCT

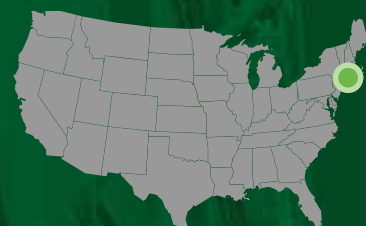
DE NORA TETRA LP Block Underdrain

CAPACITY OF WTP

14.5 mgd (55,000 cmd) filtration capacity

Value Delivered

- Low profile, low headless and easy installation
- Nozzle-less design ensures there are no blockages
- Superior distribution of both air and water ensures effective backwashing of filter media



CASE STUDY

EMEA - Al Khobar - KSA

BACKGROUND

The largest desalination plant in Saudi Arabia was installed in 2020 for the Saline Water Conversion Company (SWCC) and is upstream of Saudi Aramco facilities.

PRODUCT

DE NORA TETRA LP Block Underdrain

CAPACITY OF WTP

210,000 m³/day at completion

Value Delivered

- Robust underdrain block technology selected over nozzle-bottom filters
- Providing effective pre-treatment filtration, enabling seawater reverse osmosis (SWRO) desalination



CASE STUDY

LATAM - Los Berros

BACKGROUND

The plant had been experiencing poor backwash water distribution as well as frequent nozzle breakages causing significant loss of sand media.

PRODUCT

DE NORA TETRA LP Block Underdrain

CAPACITY

25,696 ft (7,834 m³) filtration capacity

Value Delivered

- Low profile, low headless and easy installation
- Nozzle-less design ensures there are no blockages
- Superior distribution of both air and water ensures effective backwashing of filter media
- GroutGrip design requires fewer blocks so less joints are created and less grout is needed





DE NORA TETRA[®]

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