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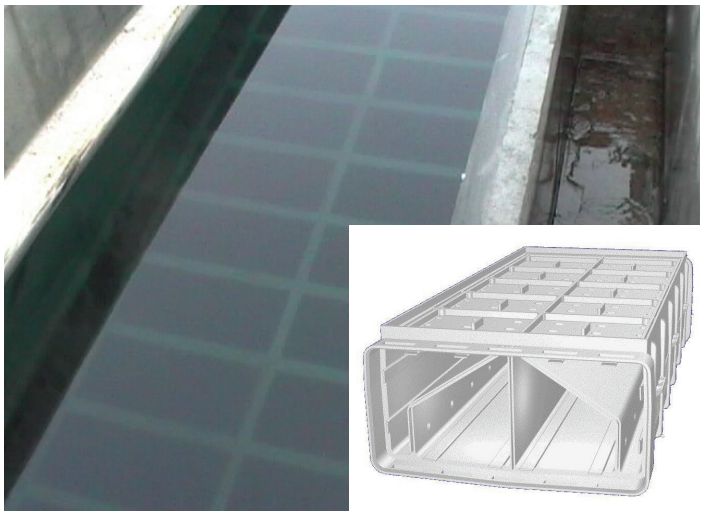
Dual Parallel Lateral Underdrain DE NORA TETRA™ LP Block™

Efficient and Effective Drinking Water Filter Floors

DE NORA TETRA™ LP Block™ Drinking Water Dual Parallel Lateral Underdrain

In municipal drinking water applications or pretreatment for desalination plants using gravity filters, the filter underdrain is one of the most important components contributing to overall system performance and operation — whether a new filter design or retrofitting an existing filter.



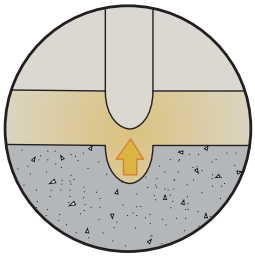
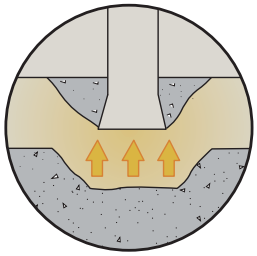
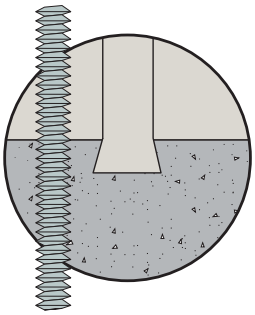
DE NORA TETRA™ LP Block™
Dual Parallel Lateral Underdrain

The DE NORA TETRA™ LP Block™ dual parallel lateral underdrain is a proven design of filter underdrain offering superior distribution of both backwash air and water, either sequentially or concurrently. The system is NSF61 and UK Secretary of State approved and also has certification for use with drinking water applications in other countries.

Effective media cleaning is the key requirement for a filter to function efficiently under all loading conditions. Backwashing gravity filters is necessary to remove the solids collected by the media during the filtration run. In the DE NORA TETRA™ LP Block™ underdrain, 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. The use of concurrent or sequential air and water significantly reduces the volume of dirty backwash water produced and drastically lowers operating costs through the uniform backwash process.

The DE NORA TETRA™ LP Block™ underdrain ensures lower operating costs and effective backwash distribution that can improve run times.

The DE NORA TETRA™ LP Block™ underdrain features the unique and patented (U.S. Patent Number 8,343,343) Anchor-Rite® and (U.S. Patent Number 6,110,366) GroutGrip™ design. The GroutGrip increases resistance to uplift from the filter floor and the Anchor-Rite® fastens the block to the floor. The LP Block™ with GroutGrip includes six rows of integrally molded dovetail wedges that become embedded in the floor grout, offering 1.75 times the pullout strength of a conventional underdrain block. The LP Block™ with Anchor-Rite® is bolted to the filter floor to prevent buoyancy. GroutGrip is integral to the block; the Anchor-Rite® is optional.

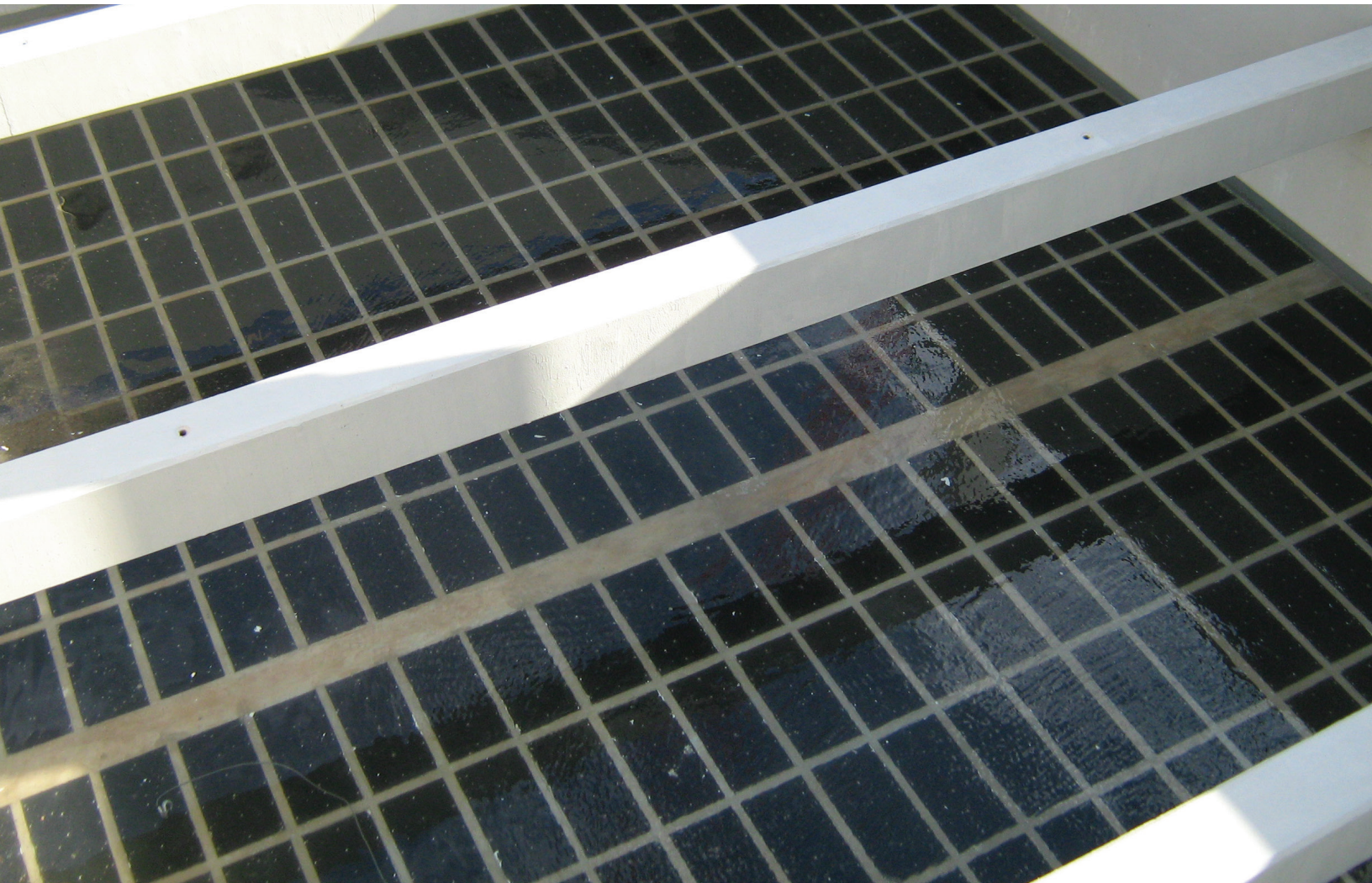
U BLOCK™	CURRENT LP BLOCK™	ANCHOR-RITE® LP BLOCK™
		
	Resists 1.75 more uplift force than U Block™	Resists 3.75 more uplift force than U Block™

Features

- Lightweight and robust design
- No moving or wearing part
- Low profile
- GroutGrip™ design
- Anchor-Rite® design
- Media retention plate

Benefits

- Excellent distribution of backwash air/water – more efficient bed cleaning and reduced filter operating costs
- Wide profile design means approximately 1/3 less laterals and thus fewer joints and grout are required and reduced installation costs
- Easy maintenance, long life and simple installation
- Easy retrofit of existing shallow filters with air/water backwash and/or greater media depth
- GroutGrip design offers increased adhesion to filter floor
- Anchor-Rite® designs offer buoyancy prevention
- Easy to install in retrofit applications
- Dual air/water backwash uses significantly less water than water alone
- Media retention plate prevents media from entering the block, and also simplifies media replacement
- Low profile reduces the filter box depth for added savings on new construction



Principle of Operation

The DE NORA TETRA™ LP Block™ underdrain provides an improved distribution of backwash water to the filter media through the use of dual compensating laterals. 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 distribution.

Media retention plates maximize the available filter tank depth. Careful quality control and testing during the plate manufacturing process is used to ensure that the media retention plates prohibit media pass through and provide proper flow characteristics. DE NORA should be consulted on the use of media retention plates when lime softening or alum coagulant are used upstream as these are known to potentially plug the plates.

Technical Data

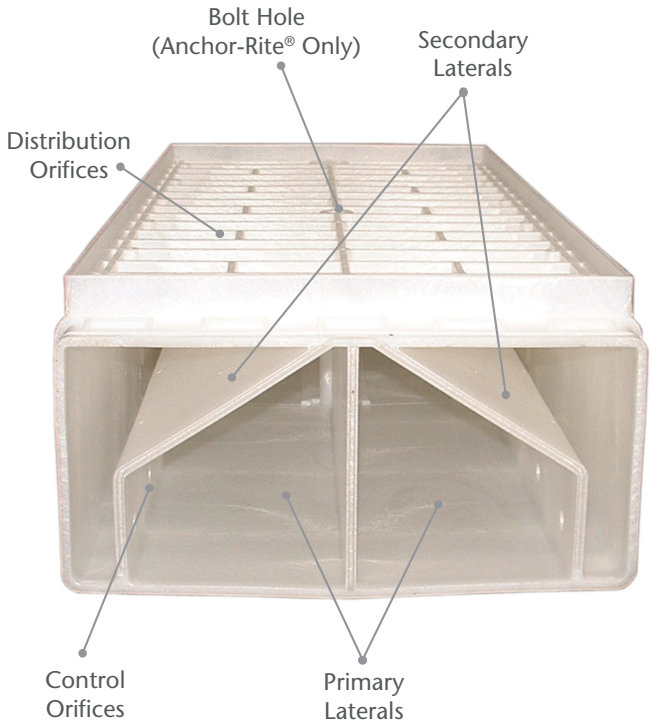
Product Specification - DE NORA TETRA™ LP Block™			
Length	Width	Height	Weight
95.7 cm (37 11/16")	41.9 cm (16 1/2")	20.3 cm (8")	11.2 kg (24.7 lb)

Approvals

- UK Secretary of State and NSF61 certification for use with drinking water treatment
- Local approval

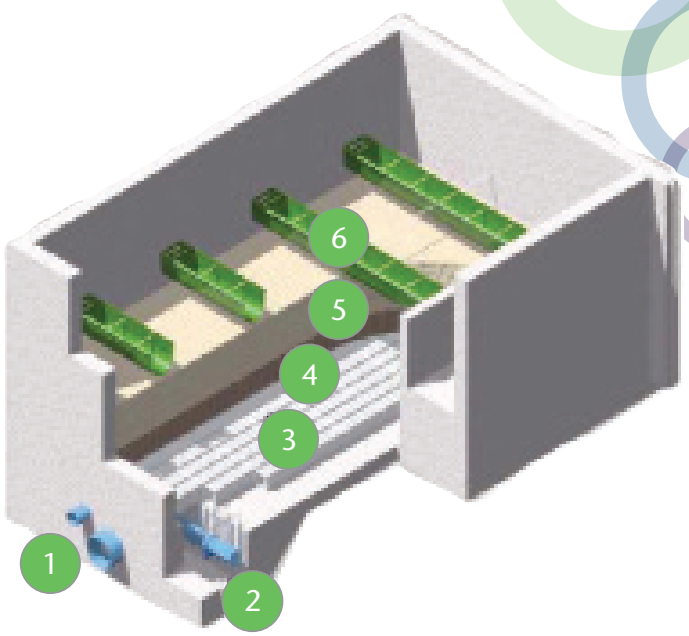
Materials

- Constructed of HDPE



LP Block™ System Components

1. **Clean Effluent/Backwash Inlet**
2. **Air Header**
3. **DE NORA TETRA™ U Block™, LP Block™ or Anchor-Rite® Underdrain**
4. **DE NORA TETRA™ Media Retention Plate – S Plate™**
5. **Dual Filter Media – Coal & Sand**
6. **Inlet Water Distribution Troughs**



Filter Construction

1. A flume or trough is formed in the bottom of the filter cell. The backwash air header is installed within this trough or, if required, can also be mounted above the filter TWL. Steel reinforcing bars are used over the flume area to anchor the flume blocks down.

2. The DE NORA TETRA™ LP Blocks™ with retention plate fitted are pre-assembled into rows and then installed onto a bed of grout on the filter floor. Bridging strips prevent the grout falling into the flume.

3. Once the floor is set, grout is placed between the DE NORA TETRA™ LP Block™ to the top of the retention plate to provide a totally level and sealed floor.

4. The floor is air pattern tested prior to installation of the filter media.

Media Retention Plates

DE NORA TETRA™ LP Block™ underdrains are available with media retention plates to prevent media loss through the filter floor and also increase the available filter headroom. The media retention plate replaces conventional graded gravel layers.

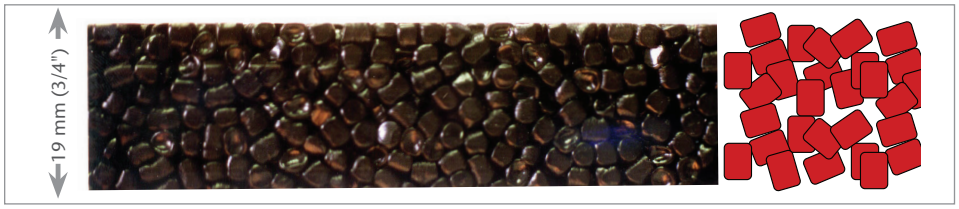
The S Plate is manufactured of precisely sized and carefully sintered HDPE beads that ensure even distribution of backwash air and water for increased run times and lower operating costs.

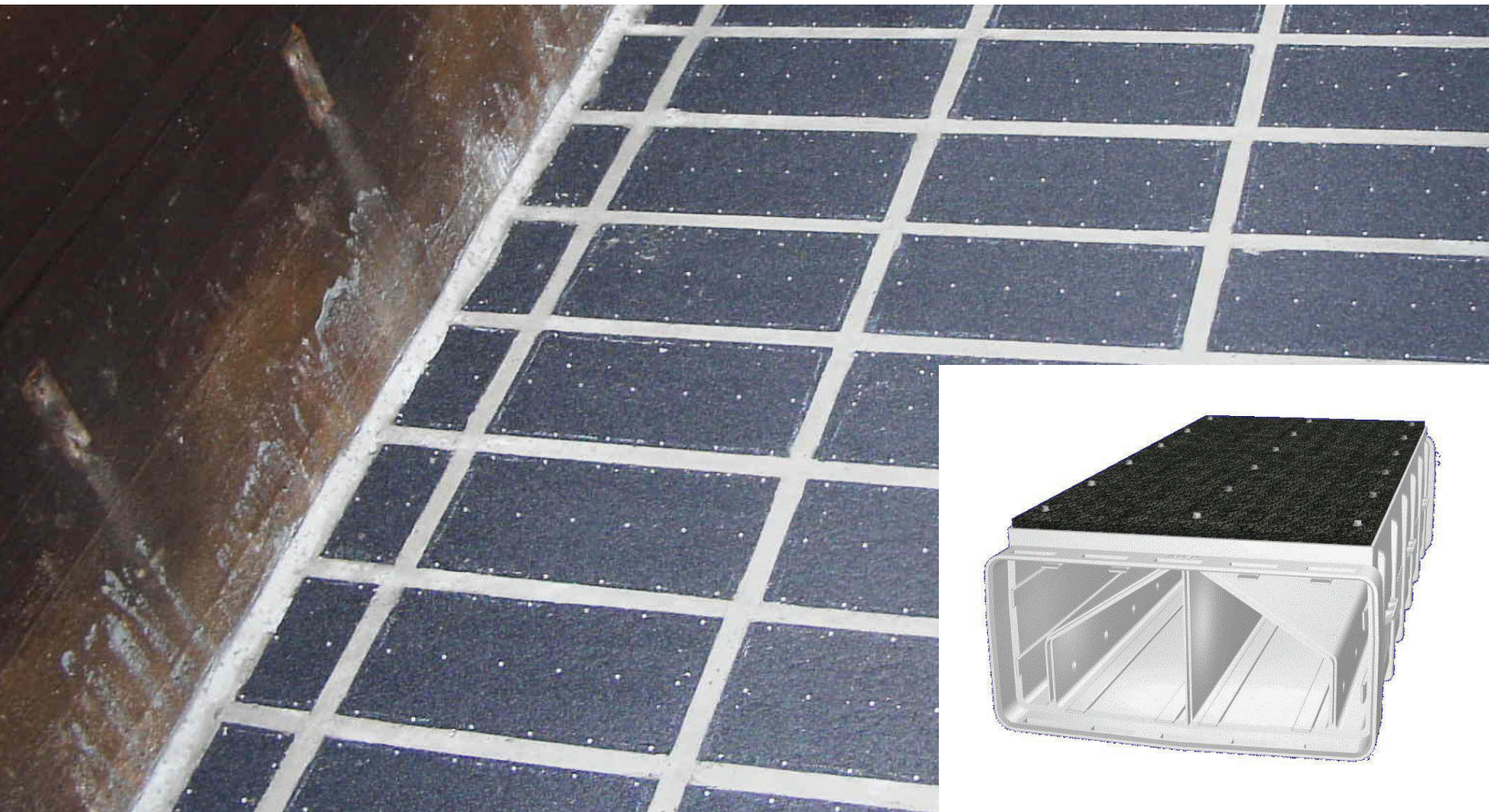
Features

- Lightweight and robust design
- 19 mm (3/4") plate replaces 300 mm (12") typical gravel depth
- Compatible with Water Treatment Chemicals
- Factory tested (<125 mm wg loss @ 70 m/h) (5" WC loss @ 41 cfm/sf), sealed and mounted

Benefits

- Easy to install and removable
- Reduces depth requirement for media, which is particularly beneficial for shallow filters
- Provides uniform flow distribution at a headloss similar to 300 mm (12") gravel depth
- Retains media down to 450 micron (0.45 mm) particle size
- Does not leach chemicals into the drinking water supply
- Media retention plate prevents media loss through the filter, and also simplifies media replacement





WATER MADE EASY

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