



HD Q-PAC® Bio-media Eliminates Odors at Mt. Dora, Florida Water Reclamation Plant. System Very Responsive to H₂S Surges*

The water reclamation plant at Mt. Dora, Florida had an odor problem at the headworks collection well. Several pump stations in the community send their water to this location. The discharge of the various lines is random. At times one line may be discharging water while other lines are idle. At other times multiple lines are discharging. There are periods of no water discharge at various times during the day. As a consequence, hydrogen sulfide (H₂S) levels vary greatly from hour to hour and even from minute to minute.

The Mt. Dora WWTP needed a reliable, inexpensive, easy-to-operate odor control system. Like other municipal wastewater treatment authorities, Mt. Dora preferred a biological odor-control system to a chemical wet scrubber. Chemical scrubbers can react instantly to changes in the H₂S loading. Biological systems, though much less expensive to operate over time due to zero chemical demand, have a reputation for reacting slowly to changes in sulfide loading. Mt. Dora therefore accepted a full-scale biotrickling odor-control system from a consortium of companies, on the condition that no purchase order would be issued until such time as the system proved itself to be capable of eliminating odors and providing quick response to frequent changes in malodorous gas loadings.

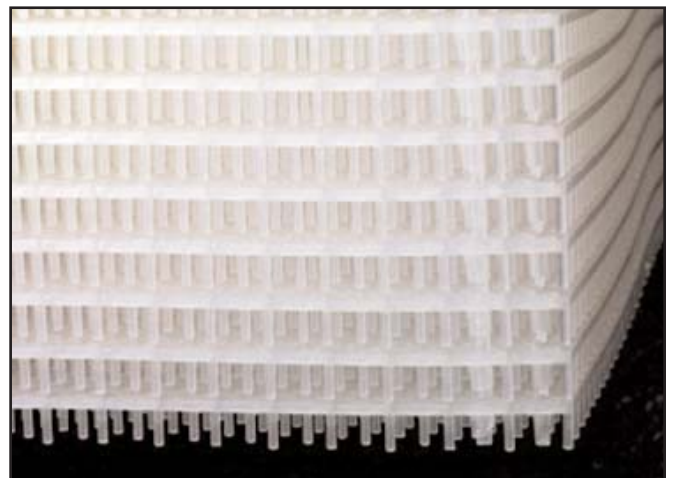
The plant not only needed a system that would work; it also needed to continue its good-neighbor policy of no odors beyond the property line. Operators also had their own professional reputations to protect. The Mt. Dora WWTP was chosen in 2004 as the "Most Efficiently Operated Medium Sized WWTP in the State of Florida" by the Rural Water Association of Florida. John Wyker, the Chief Operator at Mt. Dora, was recognized as the "Best WWTP Operator" in 2004 (1).

The odor control system supplied was filled with HD Q-PAC® media supplied by Lantec Products. The basic process design was also supplied by Lantec. The system itself, rated to treat up to 1,000 scfm of air containing 200 ppmv H₂S, was fabricated by



"The biological system is removing all of the odors. Clearly, H₂S is being reduced to below the odor threshold in the stack outlet. Additionally, it has proven to be very nimble to changes in H₂S loadings. When inlet concentration rises within a minute from 10 to 30 ppmv, only a small blip in the outlet concentration is noticed. This blip is not enough to result in an odor breakout. The system quickly adjusts..."

John Wyker
Chief Operator, Mt. Dora WWTP



HD Q-PAC®: US Patent #5,458,817

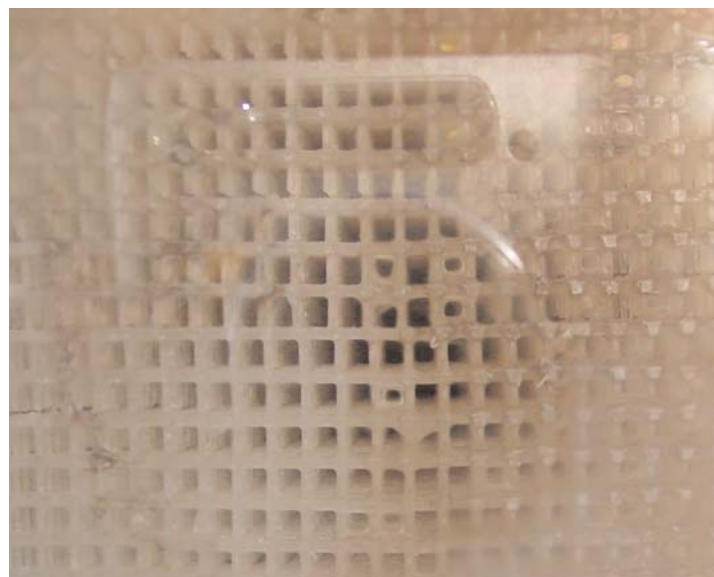
Macrotek, Ltd. (2). On-site installation was supervised by Peterson Associates, Inc. (3) with assistance from Macrotek, Lantec, and Riverbend Laboratories (4). The system was installed in October 2005. Besides the typical daily fluctuations, Monday mornings routinely see a spike to 50 ppmv H₂S in the air. Yet the "biological scrubber" has responded quickly, and no odors have been noted during any of these loading surges.

HD Q-PAC® has proven to be an effective substrate for growth of Thiobacillus thiooxidans and other sulfide-consuming microbes. Its uniformly spaced grid-and-rod structure provides ideal support for the autotrophic bacteria. Autotrophs utilize inorganic carbon to build cell structures. They typically don't secrete slime, but bloom to form extremely thin biofilms. When covered with a full bloom of Thiobacillus t. bacteria, the effective surface area of the biomass is up to 300 ft²/ft² (980 m²/m³).

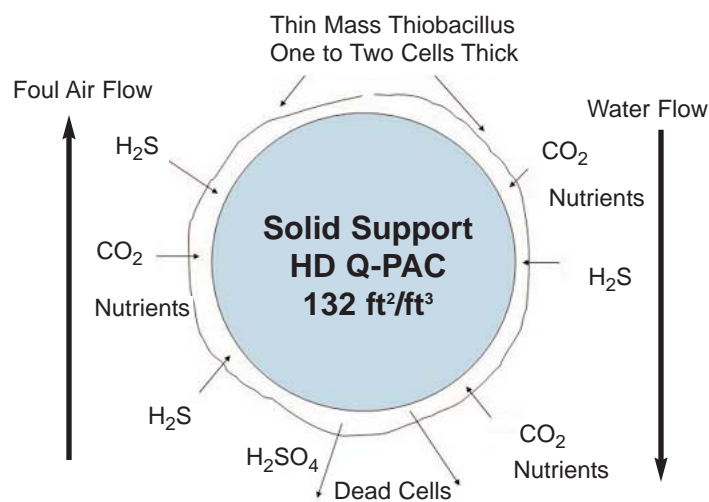
Thanks to this unique structure, HD Q-PAC® operates with very low pressure drop that does not creep up over time because the media has a self cleaning design. This has been demonstrated at the Saco, Maine WWTP (5) in 8 years of using HD Q-PAC® in biofilters for H₂S removal. The bio-scrubber system at Mt. Dora operates with a head loss of < 0.5 in WC (1.2 mbar).

Due in part to this innovative odor-control solution, the Mt. Dora water reclamation plant was awarded the "2005 Earl B. Phelps Award for Outstanding Wastewater Operations in the State of Florida" by PBS&J, Inc., consulting engineers (6).

*Update - due to seasonal variations and operational changes, H₂S levels at the Mt. Dora WWTP fell dramatically in August of 2006. As a result, the biotrickling odor control system described in this paper was idled. With unit idle, and with no odor complaints from abutters such as the shopping mall across the street from the WWTP, the unit has been moved to another site for the purpose of demonstrating the feasibility of destruction of H₂S odors biologically at that location.



HD Q-PAC® media with biofilm growth



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HD Q-PAC® Media for Biotrickling Filters

Advantages of Biotrickling Odor Control Systems Utilizing HD Q-PAC®

High removal efficiency; no odors
Eight years of successful operation in multiple systems
Excellent water and air distribution.
Huge effective surface ~ 300 ft²/ft³ (980 m²/m³). Entire surface:
* available to microbes.
* exposed to H₂S, nutrients, etc.
* biofilm is self renewing to maintain active growth phase.
* is self cleaning - no fouling, no pressure drop increase.
Extremely low pressure drop across HD Q-PAC®.
Low capital cost
Low operating expense
Small footprint - easy to install
Low profile - maintain good sightline
No hazardous chemicals required; green solution to odor control
No requirement to clean HD Q-PAC®.
Polypropylene HD Q-PAC® is impervious to sulfuric acid.
No requirement to replace HD Q-PAC®



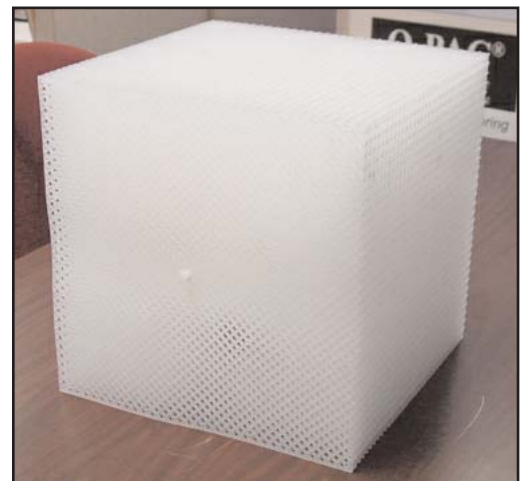
Mt. Dora WWTP Biotrickling Filter using HD Q-PAC®

HD Q-PAC® Physical Characteristics

Material:	Polypropylene	
Surface Area:	132 ft ² /ft ³	432 m ² /m ³
Effective Surface Area*:	up to 300 ft ² /ft ³	up to 981 m ² /m ³
Bulk Density:	7.5 lb/ft ³	120 kg/m ³
Void Fraction:	87%	87%
Smallest Grid Opening	0.16" x 0.16"	1.6 mm x 1.6 mm
Standard Module Size:	12" x 12" x 12"	305 x 305 x 305 mm

Lantec Products provides free bed designs for:

Wet scrubbers (acid gases, amines, SO₂, etc.)
Biological odor control systems
Regenerative thermal oxidizers
Oil water separators
CO₂ air strippers
Gas cooling towers
TCE, BETX and other types of air strippers



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