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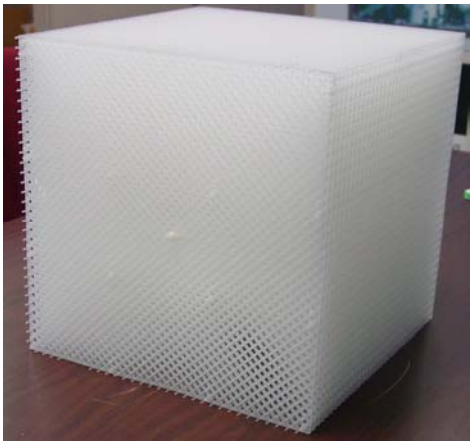
HD Q-PAC® Oil / Water Coalescing Media
How It Works

Thank you for your interest in HD Q-PAC® (U.S. Patent #5,458,817) supplied by Lantec Products. High Density Q-PAC® is increasingly recognized as the most efficient coalescing media yet developed for separation of oils from water containing suspended solids.

Oil / Water Separator containing HD Q-PAC®.



Standard module size 1 ft^3.

HD Q-PAC® has shown excellent performance in pilot-plant and industrial oil-water separators (OWS), easily passing the ***EPA Method 413.2*** test for removal of oil droplets 20 microns and larger. Testing at the Danish Institute of Technology confirmed that HD Q-PAC® actually exceeds the rigorous efficiency requirement of ***European Standard CEN EN 858-1*** for ≥ 99.9% of oil removal regardless of size.

While removing oil efficiently, HD Q-PAC® also shows superior resistance to plugging by sludge and iron deposits commonly found in oily water. The rounded rod design of HD Q-PAC® allows self cleaning of the media. As deposits form on the polypropylene surfaces, they quickly reach a critical mass that forces them to slough off the slick vertical rods and fall into the sludge compartment of the OWS.

HD Q-PAC® has allowed OWS units to function reliably in difficult services where other media quickly failed. (See www.lantecp.com/casestudy/cs38.pdf).

HD Q-PAC® differs from traditional Oil Water Separator media in several respects:

1. Surface Area

Media Type	Specific Surface Area
HD Q-PAC®	132 ft^2/ft^3 (433 m^2/m^3)
Corrugated Sheet Media PVC or PP, ¾" (19-mm) spacing	42 ft^2/ft^3 (138 m^2/m^3)
Corrugated Sheet Media PVC or PP, ½" (12-mm) spacing	68 ft^2/ft^3 (223 m^2/m^3)

2. Oil Droplet Rise Time

In corrugated-sheet media with ½-inch spacing, because the sheets are oriented vertically, the average distance an oil droplet has to travel between coalescing surfaces is approximately 1 inch, vs. 0.16" (4 mm) in HD Q-PAC®. As a result, when oily water flows through HD Q-PAC®, small droplets contact the oil-wettable surface sooner, and coalesce into larger ones.

The rate of rise of an oil droplet through water is given by Stoke's Law:

$$v = \frac{2\,g\,r^2(d_1 - d_2)}{9\,\mu}$$

where **v** is the velocity of rise of oil droplet, **g** the acceleration of gravity, $\mathbf{d_1}$ the density of water, $\mathbf{d_2}$ the density of oil, and **μ** the viscosity of water.

In an OWS using HD Q-PAC®, the value of **r** will increase as small droplets coalesce to form larger ones, yielding an ever-increasing value of **v**. The droplet rise time is therefore much shorter in an OWS using HD Q-PAC® than with conventional media.

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3. Uniform Spacing

Corrugated-sheet media have thousands of narrow spaces. Wherever adjacent sheets touch each other they form a pair of crevices where even small suspended solids can become trapped. Solids begin to accumulate in these narrow spots, and gradually build up until the openings in the media are fully bridged - forcing water to flow faster through the remaining unclogged openings. This impairs both flow capacity and oil separation efficiency.

HD Q-PAC® has no tight spots for solids to lodge in. All of its plastic elements intersect at 90° angles, and there are no openings less than 4 mm across.

4. Steeper than any other Angle of Repose

Corrugated sheet media have angled surfaces ranging from 45° to 60° from the tank centerline, which were intended to exceed the angle of repose of suspended solids that might settle on the media surface in an OWS. HD Q-PAC® contains thousands of rounded rods oriented ***90°*** from the horizontal. This is greater than the angle of repose of any sludge particles. Therefore heavy sludge particles easily fall into the OWS sludge compartment, is intended in the design of a typical OWS unit observed here.

OWS unit – note sludge compartment with outlet at bottom of unit.

5. No Need for Coalescing Pads

The oil removal efficiency of corrugated-sheet media can be improved by combining them with coalescing pads of fine plastic mesh. However, suspended solids can plug coalescing pads very quickly, so they have to be removed frequently for cleaning or replacement. The oil removal efficiency of HD Q-PAC® is high enough so that coalescing pads are unnecessary, and consequently the OWS requires much less maintenance.

Note: No performance warranty is either stated or implied in this discussion. Please contact Lantec Products to discuss your specific media requirement.