



Eco<sub>2</sub>pure<sup>™</sup>

Biodiesel Purification Technology





## The future of drywash technology

HALF the price of Ion Exchange Resins and TWICE as fast!\*\*

Eco<sub>2</sub>Pure™ is a unique cellulose based, natural and sustainable Composition of adsorbent technologies, specifically formulated For biodiesel purification from any feedstock. Eco<sub>2</sub>Pure™'s Composition is designed to optimize purification efficiency and contamination removal, combined with increased flow enhancement characteristics. Eco<sub>2</sub>Pure™ is designed to be a filter-free wash process with no consumables in the wash stage. Each kilogram of Eco<sub>2</sub>Pure™ is capable of purifying between 93-180 gallons of biodiesel\*, making it the lowest cost drywash biodiesel purification method in existence today.



Eco<sub>2</sub>Pure™ removes soaps, catalyst traces, residual methanol, moisture and other production residues from biodiesel, thereby assisting in the attainment of EN14214 & ASTM-D6751 quality standards.

Eco<sub>2</sub>Pure™ outperforms existing Ion Exchange Resin (IOX) technologies in terms of fuel quality, purification speed as well as price, boasting the lowest purification costs on the market today.

Eco<sub>2</sub>Pure™ can be used to replace or compliment your existing purification system whilst allowing for a reduction in overall purification costs.

The frequency of re-bedding (replacing the spent media) will depend on the level of impurities in your biodiesel, the amount of biodiesel treated and the size of the Treatment Tower.

So a single 10kg Treatment Tower could only require re-bedding on average every 1500 gallons.

Loading is fast and simple and once Eco<sub>2</sub>Pure™ is loaded, no other intervention is required. Once the Eco<sub>2</sub>Pure™ is bedded in the Treatment Tower, it automatically purifies the biodiesel in a single passage of flow.

Eco<sub>2</sub>Pure™ is available in 10 kg tubs for easy storage and transportation for the smaller producer and available in bulk quantity for larger producers. For price breaks and details, please contact us for more details.

A U.S. Freedom Bio Fuels representative will work with you to determine the optimum utilization for your plant and to select the precise amount of Eco<sub>2</sub>Pure™ required, according to your process conditions.

\*Eco<sub>2</sub> Pure™ life performance is determined by the initial starting quality of the crude bio-diesel, base feed stocks etc.

\*\* Based on speed and price comparison of average resin prices on UK/USA mainland.



## Advantages of Eco<sub>2</sub>Pure™

- Continuous or batch process, fully compatible with automated process
- Sustainably sourced
- Enables the achievement of ASTM D-6751 and EN 14214 Quality standards
- Save time: 2 x faster than Ion Exchange Resins
- Saves money: HALF the price of Ion Exchange resins
- Completely dry process
- Specifically formulated for biodiesel purification
- Improves plant productivity and throughput
- High adsorption capability
- Simple, low energy process
- No risk of emulsions
- Improved oxidative stability
- Minimal yield loss
- Excellent pH neutralization capability
- Filterless wash process. Long life final polishing filters advisable
- No effluent water disposal issue
- Works at all temperatures
- No pressure drop or clogging
- Simple to use-lowest labor requirement and operating cost
- Easy to integrate into existing plant
- Spent Eco<sub>2</sub>Pure™ has alternative uses

Eco<sub>2</sub>Pure™ Treatment Towers can be configured to suit all production volumes. Available with 10, 50, 100 and 200 kg Eco<sub>2</sub>Pure™ holding capacity, our systems are scalable to allow for increased volume production, allowing for continuous production and reduced purification times.

As the unwashed biodiesel enters the Eco<sub>2</sub>Pure™ treatment tower, it passes through a fixed bed of Eco<sub>2</sub>Pure™ purification media, ensuring the fuel is purified in a single pass removing production residues, fuel contaminants and soaps. Flow rates need to be governed accordingly in order to ensure maximum removal of production residues and soap.

With each Kilogram of Eco<sub>2</sub>Pure™ capable of purifying between 93-186 gallons of biodiesel, the frequency of media replacement is kept to a minimum.

One tower capacity	Flow			
Capacity kg	l/min	l/hr	1 2hr day	24 hr day
10	3	180	2160	4320

### Advantages of Filtertechnik Eco<sub>2</sub>Pure™ Systems:

- Easily retrofitted to your existing production process
- Low capital investment costs
- Filterless wash process-no consumables
- Can be configured for continuous flow applications
- Can replace or compliment your existing purification system
- Single pass process
- Save time... 2 x faster than Ion Exchange Resins
- Saves Energy- no drying required
- Save capital..no expensive centrifuges, dryers
- Completely dry, waterless process
- Traceability with PC9000 particle counter fitted

## Flow Comparison Chart: Eco<sub>2</sub>Pure™ vs. Ion exchange Resins

Purification Speed based a on SINGLE vessel *				
Eco <sub>2</sub> Pure™ Speed			Liters	Liters
Capacity kg	l/min	l/hr	1 2hr day	24 hr day
10	3	180	2160	4320
50	7.5	450	5400	10800
100	15	900	10800	21600
200	25	1500	18000	36000

Ion Exchange Resins Speed			Liters	Liters
Capacity kg	l/min	3l/hr/kg	1 2hr day	24 hr day
10	0.5	30	360	720
50	2.5	150	1800	3600
100	5	300	3600	7200
200	10	600	7200	14400

What makes Eco<sub>2</sub>Pure™ so unique?

Eco<sub>2</sub>Pure™ is a natural and sustainable biodiesel purification media, which boasts one of the lowest purification costs per liter/gallon on the market today. Eco<sub>2</sub>Pure™ is proven to assist in the attainment of EN/ASTM quality standards.

Is Eco<sub>2</sub>Pure™ similar to Ion Exchange Resin?

No, unlike Ion Exchange systems, Eco<sub>2</sub>Pure™ is an adsorbent technology, which allows for removal of soaps, production residues, residual methanol and moisture from biodiesel.

Are the Eco<sub>2</sub>Pure™ Treatment Towers available loose?

Eco<sub>2</sub>Pure™ Treatment Towers are available loose for producers to configure as they like or as part of an Eco<sub>2</sub>Pure™ System.

What is an Eco<sub>2</sub>Pure™ System?

We do all the work for you. Pumps, control panels, safety features are all configured to achieve maximum media life, production throughput and fuel quality.

How do you know when the Eco<sub>2</sub>Pure™ is exhausted?

There are several ways to monitor remaining life:

- a) Pressure indication
- b) Flow measurement
- c) Particle counts

How much biodiesel will each kilogram of Eco<sub>2</sub>Pure™ purify?

Each kilogram will purify between 93-186 gallons of biodiesel.

Can I increase my purification rate if I need to upscale?

By adding extra Eco<sub>2</sub>Pure™ Treatment Towers, you can increase your throughput. Treatment Towers are available in various sizes to suit all production volumes.

Can you still offer traceability with the Eco<sub>2</sub>Pure™ system?

Yes, a particle counter can be fitted to our systems to monitor fuel quality in real time.

How does the price of Eco<sub>2</sub>Pure™ compare to other wash methods?

Eco<sub>2</sub>Pure™ is one of the most competitively priced systems on the market today. Not only in terms of start-up costs, but also in terms of the cents per gallon cost.