SULZER

Keep on moving with **lower carbon intensity**

BioFlux™ Hydrotreating process technology for renewable diesel and sustainable aviation production.

Feed flexibility is critical for operators to stay competitive and deliver high-quality products

But diversifying your feed can bring its own set of challenges - limited availability, unpredictable contaminants, or fluctuating prices.

It gets even trickier when working with renewable feedstocks from biological sources. These materials are highly olefinic and might be packed with heteroatom contaminants. To turn them into something valuable, you need a lot more hydrogen than you would for conventional petroleum hydrotreating. We're talking 1'700 to 2'500 scf/bbl - two to three times more than usual!

On top of that, the reactions involved in processing these feedstocks generate a lot of heat. That heat can cause catalyst coking, deactivation, and even runaway reactions.

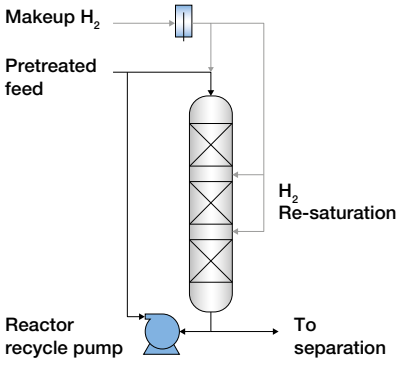
To overcome these challenges, you need innovative process technologies, that can quickly adapt your process to get the job done efficiently. Sulzer Chemtech offers the right tools to achieve your fuel flexibility goals and stay competitive.

Looking for a cutting-edge technology that delivers Sustainable Aviation Fuel and Renewable Diesel at a fraction of the cost of traditional processes?

BioFlux might be your solution. This liquid-full hydrotreating unit is designed to handle a variety of bio-based feedstock, making it a versatile choice for all your production needs, with lower cost of production and capital investment compared to other trickle bed reactor processes.

Novel features of BioFlux technology

- Hydrogen fully dissolved into the liquid feed, improving availability
- High volume flux, which eliminates mass transfer limits
- Liquid recycle; no gas recycle
- Novel reactor internals design for optimal H_2 dissolution into liquid
- Improved thermal management with lower utility consumption



Why BioFlux?

1

Lower capital expense

eliminates the need for vapor recycle gas loop and recycle gas compressor compared to conventional trickle bed systems

2

Lower operating expense

efficient hydrogen management with better liquid product yield

3

Lower propensity for

coking and over-cracking with minimal undesirable side reactions

4

Better exotherm management

High liquid flux in BioFlux manages heat of reaction better than conventional trickle bed

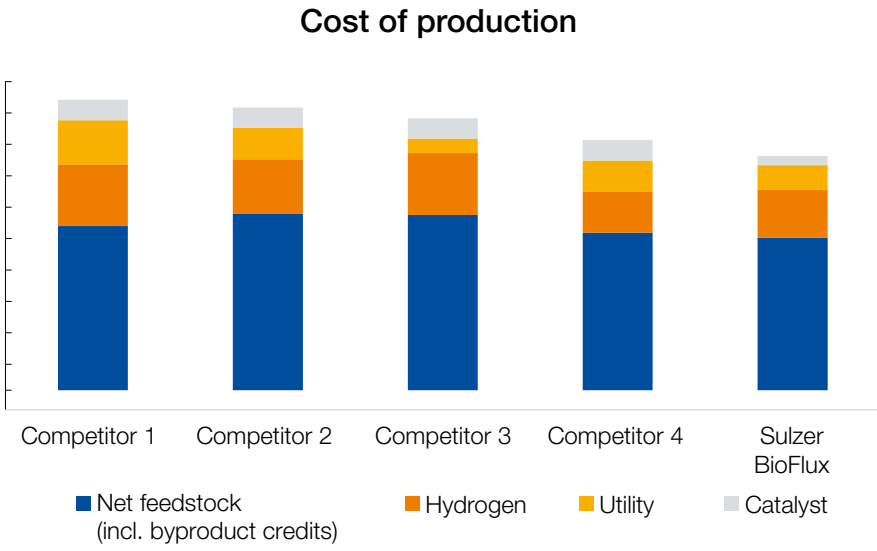
5

Meeting international product quality standards with reduced carbon intensity

The renewable diesel and sustainable aviation fuel produced from BioFlux process meets or exceeds relevant standards, such as ASTM D975 (US), EN15940 (Euro) and ASTM D7566-Annex A2. Renewable naphtha, or bio-propane can also be collected as a saleable product from a BioFlux unit.

Achieve competitive advantage

With the many benefits of BioFlux, you can produce renewable diesel and sustainable aviation fuel at much lower relative production costs than competing technology pathways. This cost advantage makes the difference in a competitive environment with changing feedstock and utility costs to produce a valuable product with the best return.



Proven commercialized technology

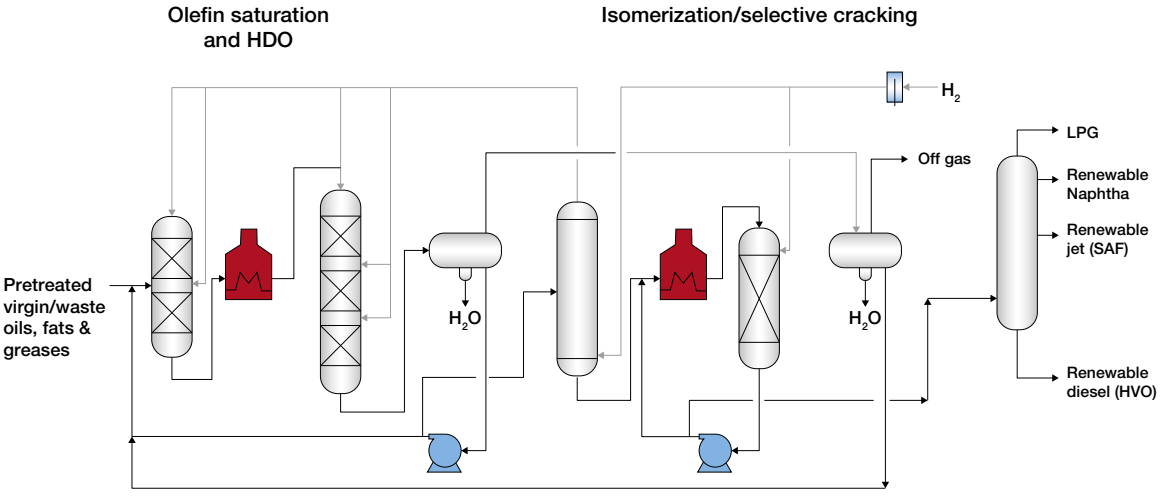
BioFlux technology has been commercially proven in an operating plant at Jaxon Energy LLC in the United States that produces renewable diesel using Distillers Corn Oil with a nameplate capacity of 60,000 gallons per day (70 kTA). In addition to this several other projects are under various stages of engineering execution with variety of renewable feedstock that have lower carbon intensity such as used cooking oil (UCO), animal tallow and palm oil mill effluent (POME).

Renewable Diesel Unit at Jaxon Energy LLC, Mississippi, United States

BioFlux is a real game-changer in the world of sustainable fuel production

So, how does it work?

What sets BioFlux Hydrotreating apart from other technologies, is its ability to completely dissolve hydrogen into the liquid feed. This ensures that your feed and hydrogen are perfectly mixed before they even come into contact with the catalyst bed, providing even distribution and optimal hydrogen availability. Plus, the high liquid flux mode of operation helps to manage reaction zone temperature and minimize byproducts, boosting your yield and lowering your hydrogen consumption.



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The Chemtech division is the global market leader in innovative mass transfer, static mixing and polymer solutions for petrochemicals, refining and LNG.

Chemtech is also leading the way in ecological solutions such as biopolymers as well as textile and plastic recycling, contributing to a circular economy. Our product offering ranges from technology licensing to process components all the way to complete separation process plants. Customer support ranges from engineering and field services to tray and packing installation, tower maintenance, welding and plant turnaround projects – ensuring minimal downtime.

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