



THE FUTURE IS NOW

Secure your competitive advantage with Crown's Liquids Pilot Plant

Renewable Fuels | Oils & Fats | Oleochemicals





Your goals. Our technologies, facilities and expertise.

Crown offers you an opportunity like no other with the first-of-its-kind continuous process Liquids Pilot Plant. Located in the Global Innovation Center, the Liquids Pilot Plant can fully process feedstocks for simple and effective feasibility testing for premium end products.

Partnering with Crown allows access to a continuous process for testing, validating, scaling and commercializing **renewable fuels**, including renewable diesel/HVO, SAF and biodiesel; **edible oils** and **oleochemicals**.

The Liquids Pilot Plant has everything needed to conduct testing in a confidential, risk-free environment.

Our expert engineers will adapt our advanced, durable and precision-controlled equipment to accommodate your specific needs in end-to-end liquids processing. Crown's process engineering is backed by a full suite of analytical lab testing, product development, R&D and employee training.

Join the world's most renowned companies who rely on Crown to help them develop innovative technologies, products and applications. Crown's depth of understanding, knowledge, technologies, and unparalleled industry experience will empower you to lead in the liquids processing industry.

GAIN THE COMPETITIVE ADVANTAGE WITH CROWN

- **Proprietary process development:** Engineer unique, better processes for your operation
- **Proof of concept:** Explore new feedstocks and blends – including emerging oilseed crops – and improve go/no-go decision making
- **Rapid prototyping:** Full-scale 3D modeling saves time and money
- **Validation:** Ensure maximum contaminant removal and the cleanest feedstock possible
- **Analytical testing:** Generate data to support process guarantees and optimize expected adsorbent consumption
- **Full R&D and Skunkworks:** Develop disruptive industry solutions
- **Scalability:** Transition from pilot testing to commercialization with confidence
- **Process optimization:** Reduce downtime and increase efficiencies
- **Risk reduction:** Get the data needed to evaluate the Total Cost of Ownership and make future investments with confidence
- **Training:** Expand employee skills with classroom and hands-on education in a real-world environment
- **Dedicated, responsive team:** Solve challenges and seize opportunities with our collaborative design and process experts
- **Full life cycle approach:** We deliver innovation, superior equipment and extensive process engineering expertise across the manufacturing spectrum

Innovate

Develop and test new product concepts

Optimize

Improve processes and speed to market

Educate

Increase your workforce capability

Collaborate

Work shoulder-to-shoulder with Crown experts



Maximize production while protecting your investment

Meeting the global demand for renewable fuels requires the right combination of technology, equipment and expertise.

Our Liquids Pilot Plant provides a full suite of analytical lab testing to demonstrate measurable conformance to the most stringent quality specifications, as well as R&D, training and the ability to conduct real-world testing in a confidential, risk-free environment.

The Liquids Pilot Plant offers renewable fuels companies:

- **Proof of concept:** The ability to explore new feedstocks and blends, including emerging oilseed crops
- **Validation:** Maximum contaminant removal and the cleanest feedstocks
- **Analytical testing:** Data to support process guarantees and hone in on expected consumption of adsorbents
- **Scalability:** Support to take you from pilot to commercialization with confidence
- **Optimized processes:** Downtime reduction and increased efficiencies



Maximum contaminant removal to extend hydrotreater catalyst life

Crown's design delivers the cleanest possible feedstock to your hydrotreater, which can **extend catalyst life up to 2 times and drastically improve plant uptime**. Pretreated products are guaranteed to meet specs for all common contaminants. Crown's **RD Ready™** Pretreatment System protects your investment now and in the future.

Advantages of partnering with Crown:

- Proprietary database of contaminants delivers maximum contaminant removal for the cleanest end products based on your market specs and needs
- Full guarantee of product quality and contaminant removal to spec
- Guaranteed lowest level of phosphorus and polyethylene, along with metals, chlorides and other key contaminants
- Proven to reduce phosphorus to <1ppm for vegetable oil feedstocks and tallows
- Highest yield of pretreated product
- Proprietary database of feedstock specs and pretreatment results exclusive to renewable diesel
- Doubles hydrotreater catalyst life and drastically reduces downtime associated with catalyst changeover
- Mechanically rugged enough to handle all feedstock contaminants
- Easily adaptable to accommodate industry and regulatory changes
- Optimized to meet renewable diesel industry standards; can be built to API standards
- Dedicated, responsive global team
- Backed by proven expertise with industry leading, proprietary systems:
 - 70+ years of oilseed extraction and refining
 - 50 biodiesel plants built
 - 6 renewable diesel plants designed and under construction

Crown's Pretreatment Process



Innovate and lead in emerging oilseed markets

The Liquids Pilot Plant offers complete end-to-end degumming/neutralizing, bleaching and deodorizing. Depend on Crown's systems to run optimally year after year while producing the highest quality outputs.



Advantages of partnering with Crown:

Enzymatic Degumming/Neutralizing

- Designed for optimum quality output and maximum yield, with minimum energy consumption
- Adjustable operating conditions match quality and process requirements
- Flexible system design accommodates a variety of degumming and neutralizing processes
- Water washing and special sorbents reduce residual gums in degummed oils

Bleaching

- Double Pass bleaching process improves yield and minimizes bleaching clay consumption
- Bleaching clay is mixed with oil in an atmospheric slurry to maximize performance in bleacher
- Special sorbents can eliminate water washing step from single-stage enhanced degumming or neutralizing processes
- Filter pre-coating extends filter cycle times, improves filter cake release and minimizes filter maintenance
- Silica adsorption reduces effluent treatment, water consumption and bleaching earth consumption

Deodorizing

- Industry-proven continuous and semi-continuous deodorizer uses minimum energy
- Continuous deodorizer accommodates six daily stock changes
- Semi-continuous tray deodorizer allows frequent stock changes and has minimal installed cost



Solutions to help you lead the oleochemical market.

Since the 1920s, Crown has created oleochemical technology for distillation, splitting, fractionation, methyl ester processing and glycerin production. Crown offers a complete line of glycerin recovery equipment capable of producing 99.7% or higher USP glycerin. Our glycerin recovery systems are known worldwide for providing the highest quality solutions for the lowest operating costs.

Advantages of partnering with Crown:

Fat Splitting

- Long retention time in the splitting column
- Efficient internal heat exchange to maximize thermal efficiency
- No catalyst required
- Splitting can be accomplished in a single column for efficient operation
- Generously sized equipment allows for variation in feedstock quality
- Automatic control of level, pressure and temperature process parameters
- Split fatty acids can be concentrated and purified through fatty acid distillation
- Sweetwater can be concentrated and purified through glycerin refining and other processes

Glycerin

- Produce USP- and BP-grade products from a variety of crude feedstocks
- Energy-saving techniques like heat economization reduce electrical and steam consumption
- Crude still design assures intimate steam/glycerin contact
- Unique deodorizer produces a higher yield and superior concentration of purified products
- Fixed-bed carbon adsorber produces products with a very low APHA color score
- Patented Sub-Zero scrubber system and other energy-saving vacuum system alternatives available
- Options to upgrade recovery equipment for a higher yield and lower volume of residue
- Process glycerin byproducts from biodiesel plants in an integrated solution





Working together for a better world.

From risk management to environmental management, Crown applies a global lens to your operations. Count on our problem-solving expertise to help fulfill your sustainability commitments.

Partner with Crown on your key initiatives:

- Carbon footprint reductions
- Clean manufacturing
- Emissions & energy reductions
- Operational performance
- Regenerative agriculture
- Renewable resources
- Social responsibility
- Supply chain resiliency
- Sustainability
- Zero waste targets

Whether you're new to the oils and fats market or looking to diversify your portfolio, gain the competitive advantage with Crown's expertise, equipment and world-class Global Innovation Center and Liquids Pilot Plant.



Renewable Diesel/HVO | SAF | Biodiesel | Oils & Fats | Oleochemicals

Contact CPM and Crown today

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