Amafilter® - Jonell Systems®

BIOFUEL FILTRATION

amafilter® Filtration Group®

JONELL SYSTEMS™ Filtration Group®

Amafilter® - Jonell Systems®

Amafilter® is part of Filtration Group, specializing in the design, engineering, manufacture and delivery of systems that maximize the efficiency of our customers' plant filtration processes. Our expertise is built from over 90 years' experience of providing filtration solutions across the world in various market sectors including the biodiesel industry. Our aim is to develop products which deliver cutting-edge filtration solutions that have a direct impact on your process applications and which enable your operations to run more efficiently.

Amafilter® design liquid filtration solutions for the production of biodiesel which deliver a high purity end product, improve operational efficiencies and lower the total cost of ownership.

Our extensive product range includes filtration systems such as our renowned Cricketfilter®, horizontal & vertical pressure leaf filter systems, cartridge filter housings, bag filter housings, single and multi bag filter housings.

We use our expertise and work closely with customers to develop specific biodiesel liquid filtration solutions to improve your system's operation. Our team of engineers and our laboratory experts will assist in formulating the perfect technical solution for your requirements, including design, testing, commissioning and servicing.

Jonell Systems, a Filtration Group brand, partners with oil, gas, refining, chemical and power companies worldwide to address end to end filtration challenges to improve process safety, reliability, productivity and ultimately business profitability. We manufacture complete systems, vessels and a wide range of cartridges to optimize your filtration processes. This coupled with our technical expertise, allows us to solve even the most challenging filtration applications.

Jonell Systems has a long history of developing innovative cartridges for the oil & gas industry including the two piece Twist-LOK™ cartridge for gas coalescing which allows customers to be able to change only half of the cartridge as needed thus reducing the total cost of ownership for the solution.

Jonell Systems also introduced SentinelTL™, a horizontal gas coalescer with 10X greater solid capacity, 35X greater liquid capacity to deliver up to 40% cost savings for customers.

The latest innovation is TRI-SHiELD, an engineered blend of Tri-Lobal and cylindrical fibers to deliver gas and liquid depth filtration cartridges, for gas and liquid applications, with larger effective surface area per media volume and less flow resistance.

Filtration Group®

We understand our customers rely on our knowledge, expertise and experience for innovative filtration solutions.
Customers depend on us – we deliver.

Experts in biofuel applications

As the industry moves towards renewable hydrocarbon biofuels produced from various biomass sources, Amafilter® and Jonell Systems have come together to manufacture and deliver feed pre-filtration and post filtration for a wide range of biofuel feedstocks and processes.

Biodiesel is an advanced biofuel that is renewable and biodegradable. It is a cleaner-burning, drop-in replacement to petroleum diesel fuel and can be used in vehicles and heating systems.

Biodiesel is primarily produced from animal fats, edible oil, UCO (Used cooking oil) and non-edible crude vegetable oil. Amafilter® and Jonell Systems have designed biodiesel filtration processes that deliver optimal efficiencies to biodiesel plants around the world, working closely with customers to design processes that meet their specific applications.

Animal fats

Animal fats are attractive feedstocks for biodiesel because their cost is substantially lower than the cost of vegetable oil, and animal fat feedstocks can be made into high-quality biodiesel that meets the ASTM specifications.

Waste fat from animal carcasses are removed and then made into an oil using a rendering process. Rendering consists of grinding the animal by-products to a fine consistency and cooking them until the liquid fat separates and pathogens are destroyed.

Solid bone meal contaminants, phospholipids, gums and other contaminants need to be removed to provide clean feedstock for the hydrotreater. This is a high temperature sensitive process which makes achieving this a challenge.

Non-edible crude vegetable oil and Used Cooking Oil (UCO)

Impurities must be removed from edible oil and cooking oil before it can be converted into biodiesel. They must be freed of all pesticides and any other chemicals or contaminants they are subject to before the process initiates.

The filtration process initiates with the filter system removing fine particles returning the oil to its pure form and ready for transesterification. This phase of the process requires the use of alcohol (like methanol) to come into contact with triglyceride oils contained in vegetable oils creating biodiesel, (fatty acid methyl esther known as FAME).

The filtration process includes many refining steps such as: degumming, winterization, bleaching and deodorization, in order to remove or to reduce the contaminants present in the feedstocks.

Filtration is also used to remove sterols and haze after the production of biodiesel reducing and removing impurities lowers the amount of reactants, increasing the quality of the produced biodiesel.

Benefits of using Amafilter® and Jonell Systems® Equipment for the Filtration of Biofuel

Filtration technologies have a crucial role to play in the production of biofuels and ensure the final product meets the required international standards. Contaminants and other impurities must be removed to deliver that perfect end product.

Amafilter® and Jonell Systems have an extensive product range that can deliver an efficient, reliable and cost effective filtration process that will:

- Reduce the amount of energy required to operate the plant.
- Reduce the number of maintenance interventions.
- Improve productivity efficiencies.
- Reduce operational costs.
- Deliver optimal product quality.
- Minimise blockages, hence reducing product wastage.
- Achieve high efficiency polishing filtration solutions by ensuring clean feedstock for the hydrotreater.
- Produce a high quality biodiesel end product free of contaminants and impurities.

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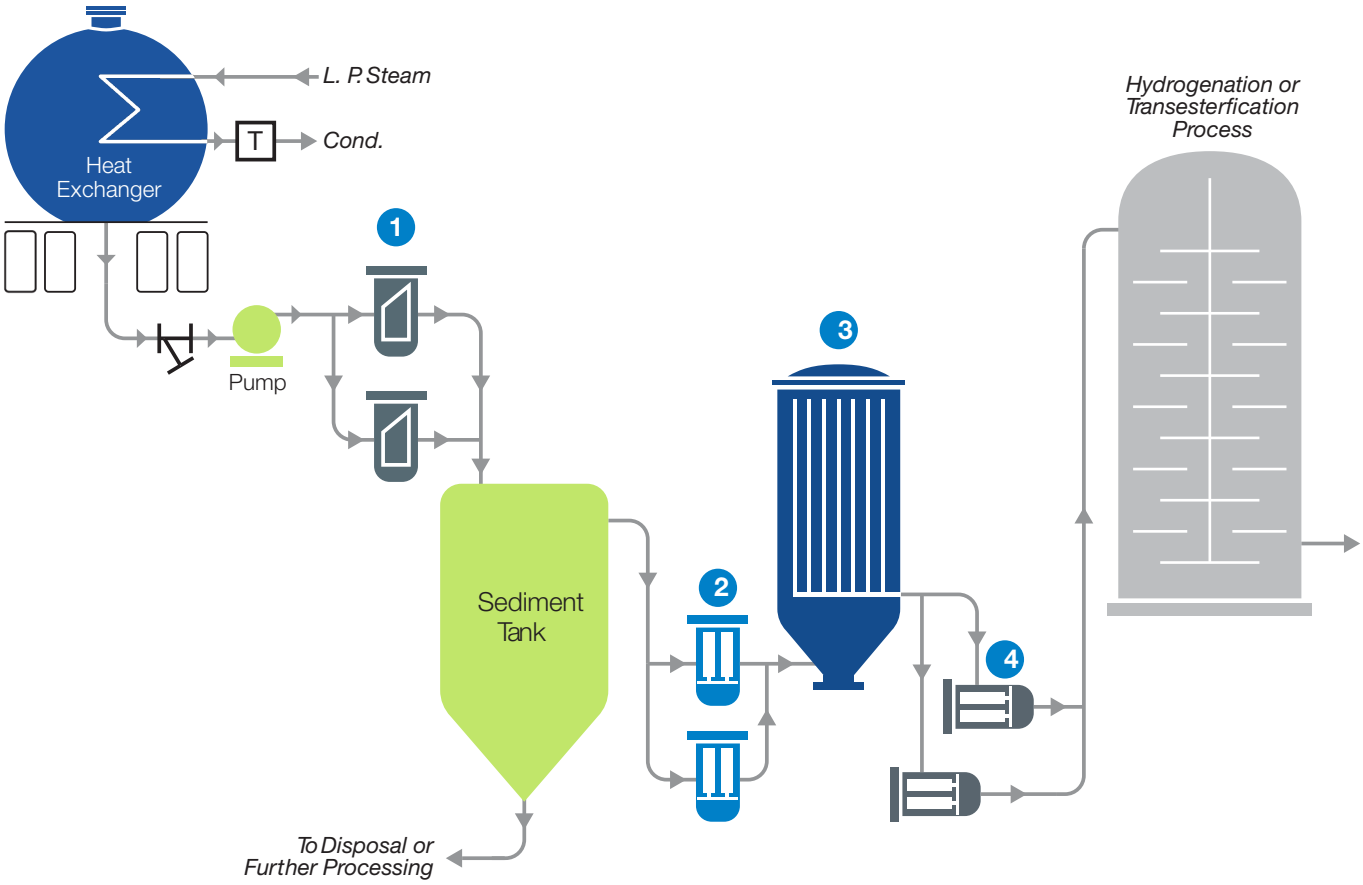
Pre-Treatment Flow Diagram with Amafilter® and Jonell Systems® Equipment

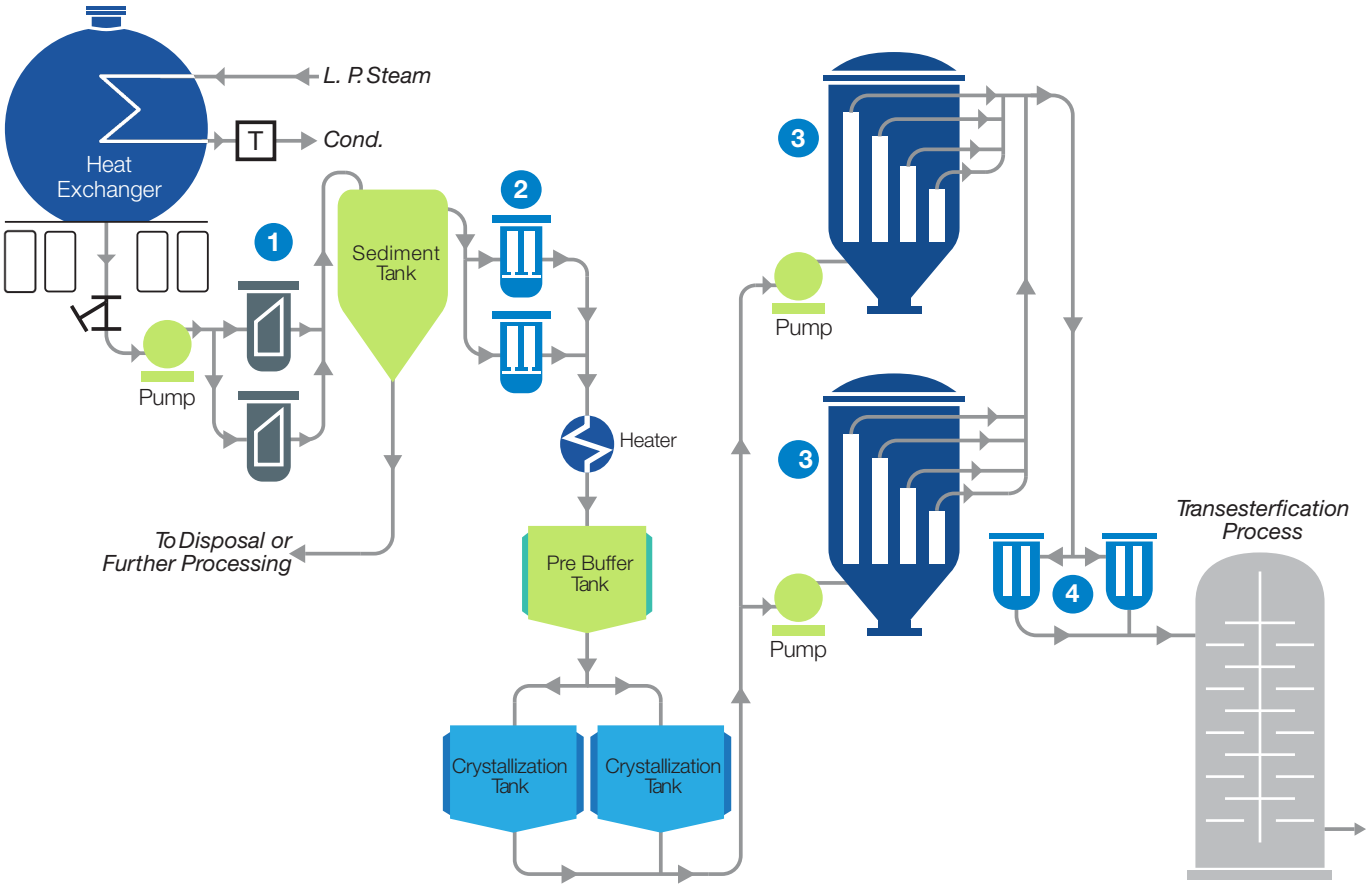
Non-edible crude vegetable oil, UCO (used cooking oil) and animal fat pre-treatment process



	Filter solution	Filter purpose	Filter benefit
1	Jonell Systems® and amafilter® basket strainers	Removal of large bone meal particulate	Easily remove the large particles from the rendering process
2	Jonell Systems® and amafilter® high flow vessels with pleated bag filters housings	Removal of suspended particulates down to 25 micron after selling	Bag filters efficiently and cost effectively remove the next level of particulates
3	Amafilter® pressure leaf filters or the Cricketfilter® system	Removal of solid fat & lipids, deodorization and bleaching	The particles collect as cake on the filter and can be removed efficiently
4	Jonell Systems® High flow vessels with cartridge based filters	Removing fine particulates down to 10 micron	High flow, high efficiency polishing filtration solution to ensure clean feedstock for the hydrotreater

Pre-Treatment Flow Diagram with Amafilter ® Equipment

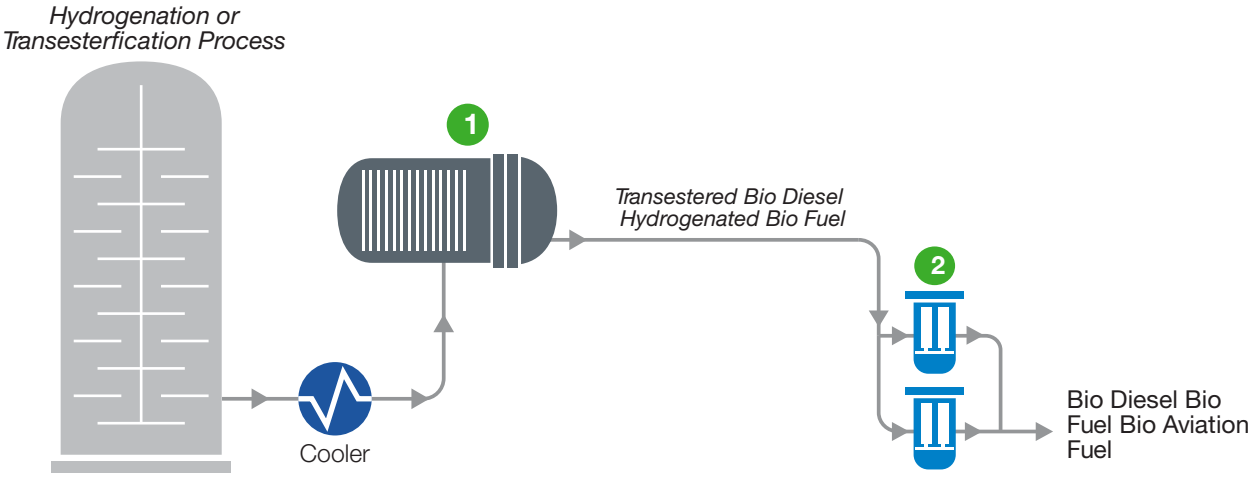
Removal of plastics (PE) from animal fat



	Filter solution	Filter purpose	Filter benefit
1	Jonell Systems® and amafilter® basket strainers	Removal of large bone meal particulate	Easily remove the large particles from the rendering process
2	Jonell Systems® and amafilter® high flow vessels with pleated bag filters housings	Removal of suspended particulates down to 25 micron after selling	Bag filters efficiently and cost effectively remove the next level of particulates
3	Amafilter® Cricketfilter® system	Removal of Polyethylene	The particles collect as cake on the filter and can be removed efficiently
4	Jonell Systems® and amafilter® bag filters	Polish/safety filters	Bag filters efficiently and cost effectively remove the next level of particulates

After Treatment Flow Diagram with Amafilter® and Jonell Systems® Equipment

Non-edible crude vegetable oil, UCO (used cooking oil) and animal fat after treatment process



	Filter solution	Filter purpose	Filter benefit
1	Amafilter® Pressure Leaf Filter System	Haze/sterol removal	The particles collect as cake on the filter and can be removed efficiently
2	Jonell Systems® and amafilter® bag filters	Polish/safety filters	Bag filters efficiently and cost effectively remove the next level of particulates

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Amafilter® equipment for biofuel applications

Amafilter® Cricketfilter®

The Cricketfilter® is a well-established pressure filter developed to combine the advantages of pressure leaf filters and candle filters whilst avoiding their drawbacks.

To achieve this, a filter element was designed with a unique shape, which provides benefits over and above the traditional round-shaped filter elements, and delivers a more efficient filter area/volume ratio and for a wide range of filtration areas from 1 up to 200 m^2 to suit the required flow rate.

The Cricketfilter® is suitable for the removal of particles from animal fat and polyethylene from biodiesel.

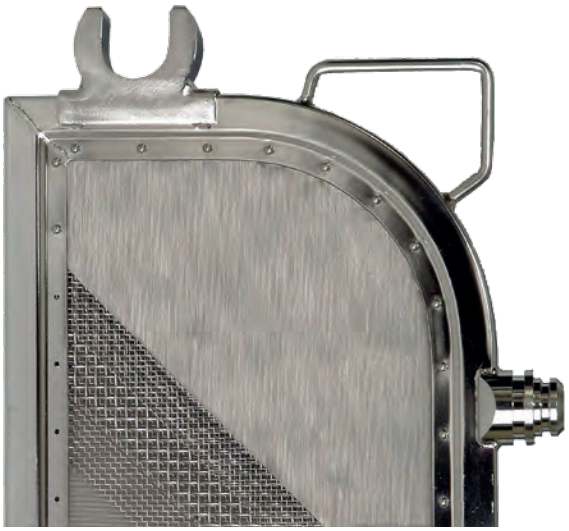
Amafilter® bag filter housings

We supply a wide range of bag filter housings in 304 or 316 stainless steel for use in the filtration of liquids containing higher concentrations of coarse solids.

These bag filter housings are suitable for biodiesel applications.

They are robust, corrosion free, have a high-flow capacity and provide consistent and reliable performance in solid liquid filtration applications.

Amafilter® equipment for biofuel applications



Versis® Pressure Leaf Filter Systems

The Amafilter® Versis® vertical pressure leaf filter system has been designed to provide a large filtration area which is delivered by the specific shape of its pressure filter leaf elements. The Versis® pressure leaf filter system produces high filtrate clarity after the clarification run. Different types of filter aids can be used in our pressure leaf filter systems to improve filtrate quality.

The Versis® pressure leaf filter is a closed filtration system which ensures safety of use yet providing easy access to the filter leaves for removal of the cake. It is fully automated with no rotating parts, making it safer and requiring limited maintenance.

The regeneration time between the filtration cycles is short, lowering operating costs as the filter can filtrate for longer periods without disruptions. This also delivers greater production capacity.

Pressure filter leaf elements

The Versis® vertical pressure leaf systems include an extensive range of filter leaf element designs and sizes which are perfectly suited for the biodiesel application process. The quality and condition of pressure filter leaves can have a significant impact, not only on the productivity of the filtration system but also on its ability to achieve a high performance standard.

Amafilter® pressure filter leaves consist of five layers (ply) of stainless steel wire mesh and are measured to a high degree of accuracy, which increases system productivity and filtration efficiency.

They are available in stainless steel 304(L), 316(L), 904L or super duplex, making them highly resistant to stress corrosion, variances in temperature and extreme pressure changes. Amafilter® pressure filter leaves deliver high filtration efficiency, filtrate quality and flux rates.

Jonell Systems® equipment for biofuel applications

Jonell Systems® high flow housings with pleated bag filters

Our high flow single and multiple cartridge filter housings have been designed specifically for high output while occupying only a small footprint area. The standard horizontal configuration of this housing minimizes pressure drop and makes filter change-out much easier. Our high efficiency, "inside-to-outside" flow, pleated liquid filtration bags are designed for applications with high flow requirements. By significantly increasing the surface area in original baskets, incorporating multiple layers of media, and adding a true gasket seal; our unique pleated bag design improves efficiency, delivers longer life, and has superior dirt holding capacity compared to a standard bag design. This solution is typically used for removing larger size contaminants for animal fat feeds.

Jonell Systems® high flow housings with cartridge filters

High flow cartridges are offered with a standard pleat configuration as well as a W-pleat configuration for increased filtration surface area. Increased surface area and larger throughput creates smaller housing footprints utilizing fewer cartridges. Utilizing a toolless O-ring design ensures a fast, hassle free, positive seal during each changeout. One six-inch diameter cartridge (60" and 80" long) can handle up to 500 gpm based on 1 cP viscosity. The Jonell Systems high flow solution can be customized with a wide range of cartridge configurations available in various grades of absolute rated high performance media with hardware customizable to suit your specific applications like filtering fine particulates from tallow/animal fat. The large surface area pleated media cartridges are designed to provide the optimum combination of particle removal efficiency and contaminant holding capability.

Jonell Systems® basket strainers

Our fabricated, in-line, basket strainers effectively remove dirt, pipe scale, and other contaminants from process liquids such as water, chemical and tallow feeds. The standard housings contain stainless steel baskets which have many customizable features such as material of construction, closure style, pressure rating, connection style and size, and support legs.

Services

Amafilter®'s reputation in liquid filtration has been built over decades of dedicated commitment to deliver efficient filtration solutions with products that are manufactured to meet the highest quality and the international standards.

We are committed to service

Our specialists work closely with customers to understand their filtration process requirements and use their expertise to find solutions that optimize the filtration process, reduce maintenance costs and improve productivity.

From our manufacturing facility laboratory located in Lochem, Holland, we provide testing services using the most up to date filtration diagnostic equipment. We carry out sample screening tests to provide you with a better understanding of how your fluid will perform using one of our filtration technologies.

For on-site testing, we have a range of mobile filter systems that can be rented and installed at a customer's site in order to carry out filtration tests directly at the location, exposing the process to the exact same conditions the final installation will be exposed to.

Our services extend beyond testing, with on-site support during the commissioning stage of your pressure filter system ensuring your plant delivers an optimal filtration process from the outset.

Once your system is installed, we provide technical assistance on and off site and have a number of maintenance programmes to suit different customer requirements including:

CONDITION-BASED MAINTENANCE:

Remote access, control and monitoring can be provided should your filtration systems fail.

PREVENTIVE MAINTENANCE:

Proactive maintenance carried out on filtration systems to increase reliability, prevent damage and reduce downtime.

CORRECTIVE MAINTENANCE:

Provide effective filtration remedies to resolve and repair systems problems or malfunctions.

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