

# GLOSSARY OF BIOFUELS

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Making the world safer, healthier  
and more productive.

# 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.

**Our service teams deliver world-class service and support across the globe, using their technical know-how to optimize your filtration process.**

## Mission

We are committed to a better tomorrow and our mission is to make the world safer, healthier and more productive.

Our mission comes alive through the markets we serve, the solutions we provide and how we interact with our teams and customers.



# GLOSSARY OF BIOFUELS

## ALGAE

Algae are primitive plants, usually aquatic, capable of synthesizing their own food by photosynthesis. Algae is currently being investigated as a possible feedstock for producing biodiesel.



## BIOMASS

Biomass is biological material, including corn, switchgrass, and oilseed crops, that can be converted into fuel.



## B100

B100 is another name for pure biodiesel.

## BIOBUTANOL

Biobutanol is an advantaged biofuel that offers a number of benefits over conventional biofuels. For example, biobutanol has an energy content closer to that of petroleum so consumers face less of a compromise on fuel economy. It can easily be added to conventional petrol due to low vapour pressure and can be blended at higher concentrations than bioethanol for use in standard vehicle engines. DuPont and BP are working together on a major project to produce biobutanol.

## BIODIESEL

Biodiesel is a biofuel produced from various feedstocks including vegetable oils (such as oilseed, rapeseed and soya bean), animal fats or algae. Biodiesel can be blended with diesel for use in diesel engine vehicles.

## BIOFUEL

The term biofuel applies to any solid, liquid, or gaseous fuel produced from organic (once-living) matter. The word biofuel covers a wide range of products, some of which are commercially available today, and some of which are still in research and development.

## BIOREACTOR

A bioreactor is a vessel in which a chemical process occurs. This usually involves organisms or biochemically active substances derived from such organisms.

## BTL

BTL, or biomass-to-liquid, is a multi-step process which converts biomass into liquid biofuels. BTL is also referred to as second generation biodiesel production. There are many different methods of BTL, but many processes include Fischer-Tropsch, hydrogenation or pyrolysis.

## BY-PRODUCT

A by-product is a substance, other than the principal product, generated as a consequence of creating a biofuel. For example, a by-product of biodiesel production is glycerine and a by-product of bioethanol production is DDGS.

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## CATALYST

A catalyst is a substance that increases the rate of a chemical reaction, without being consumed or produced by the reaction. Enzymes are catalysts for many biochemical reactions.



## CETANE NUMBER

The cetane number is a measure of biodiesel's combustion quality.

## CONCENTRATED ACID HYDROLYSIS

Concentrated acid hydrolysis is a method of converting biomass into cellulosic ethanol.

## CONVENTIONAL BIOFUELS

Conventional biofuels such as bioethanol and biodiesel are typically made from corn, sugarcane and beet, wheat or oilseed crops such as soy and rape.



## DDGS

DDGS, or dried distillers grain with solubles is a by-product of dry mill ethanol production that is fed to livestock.

## EMISSIONS

Emissions are classed as any waste substances released into the air or water.

## ENZYME

An enzyme is a protein or protein-based molecule that speeds up chemical reactions occurring in living things. Enzymes act as catalysts for a single reaction, converting a specific set of reactants into specific products.

## FAME

FAME, or fatty acid methyl ester can be created by a catalysed reaction between fatty acids and methanol. The molecules in biodiesel are primarily FAMEs, usually obtained from vegetable oils by transesterification.

## FATTY ACID

A fatty acid is a carboxylic acid (an acid with a -COOH group) with long hydrocarbon side chains. Feedstocks are first converted to fatty acids and then to biodiesel.

## FEEDSTOCK

A feedstock is any biomass resource destined for conversion to energy or biofuel. For example, corn is a feedstock for ethanol production, soybean oil may be a feedstock for biodiesel and cellulosic biomass has the potential to be a significant feedstock source for biofuels.



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## FISCHER-TROPSCH

Fischer-Tropsch is one method of producing biodiesel, from natural gas or syngas from gasified coal or biomass.

## FUEL

A fuel is described as any material with one type of energy that can be converted to another usable energy.

## GLYCERINE

Glycerine is a liquid by-product of biodiesel production. Glycerine is used in the manufacture of dynamite, cosmetics, liquid soaps, inks, and lubricants.



## GTL

GTL, or gas to liquid, is a refinery process which converts natural gas into longer-chain hydrocarbons. Gas can be converted to liquid fuels via a direct conversion or using a process such as Fischer-Tropsch.

## IODINE VALUE

An iodine value is a measure of the number of unsaturated carbon-carbon double bonds in a vegetable oil molecule. In liquid biofuel applications this gives a lower cold filter plugging point (CFPP) or cloud point. While this makes it good for use in cooler temperatures, double bonds can allow polymerisation, leading to the formation of lacquers and possibly blockage and damage to engine or fuel train components.

## JATROPHA

Jatropha is a non-edible evergreen shrub found in Asia, Africa and the West Indies. Its seeds contain a high proportion of oil which can be used for making biodiesel.

## METHANOL

Methanol is an alcohol containing one carbon atom per molecule, generally made from natural gas, with about half the energy density of petroleum. Methanol is used as a component in the transesterification of triglycerides to give a form of biodiesel.

## MTBE

MTBE, or methyl tertiary-butyl ether, is created from methanol and can increase octane and decrease the volatility of petroleum. It is often used as a petroleum additive because it raises the oxygen content of the fuel.

## NITROGEN OXIDES

Nitrogen Oxides (NOx) are a product of photochemical reactions of nitric oxide in ambient air, and are one type of emission produced from fuels.

## OCTANE NUMBER

The octane rating of a fuel is indicated on the pump. The higher the number, the slower the fuel burns. Bioethanol typically adds two to three octane numbers when blended with ordinary petroleum – making it a cost-effective octane-enhancer.

## PALM OIL

Palm oil is a form of vegetable oil obtained from the fruit of the oil palm tree. It is a widely used feedstock. The palm oil and palm kernel oil are composed of fatty acids, esterified with glycerol just like any ordinary fat. Palm oil is a widely used feedstock for traditional biodiesel production.



## PETROLEUM

Petroleum refers to any petroleum-based substance comprising of a complex blend of hydrocarbons derived from crude oil through the process of separation, conversion, upgrading, and finishing, including motor fuel, jet oil, lubricants, petroleum solvents, and used oil.

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## PYROLYSIS

Pyrolysis is one method of converting biomass into biodiesel, using heat.

## PYROLYSIS OIL

Pyrolysis oil is a bio-oil produced by fast pyrolysis of biomass. It is a dark brown, mobile liquid containing much of the energy content of the original biomass, with a heating value about half that of conventional fuel oil. Conversion of raw biomass to pyrolysis oil represents a considerable increase in energy density and it can thus represent a more efficient form in which to transport it.

## RAPESEED

Rapeseed (*Brassica napus*), also known as rape, oilseed rape or (one particular artificial variety) canola, is a bright yellow flowering member of the family Brassicaceae (mustard or cabbage family). Rapeseed is a tradition feedstock used for biodiesel production.

## RTFO

RTFO, or the Renewable Transport Fuels Obligation, is a UK policy that places an obligation on fuel suppliers to ensure that a certain percentage of their aggregate sales is made up of biofuels. The effect of this will be to require 5% of all UK fuel sold on UK forecourts to come from a renewable source by 2010.

## SECOND GENERATION BIOFUELS

Although definitions vary, second generation biofuels are usually considered to be biofuels produced from biomass or non-edible feedstocks.



## SYNGAS

Syngas is a mixture of carbon monoxide (CO) and hydrogen (H<sub>2</sub>) which is the product of high temperature gasification of organic material such as biomass. Following clean-up to remove any impurities such as tars, synthesis gas (syngas) can be used to synthesise organic molecules such as synthetic natural gas (SNG – methane (CH<sub>4</sub>)) or liquid biofuels such as synthetic diesel (via Fischer-Tropsch synthesis).

## SWITCHGRASS

Switchgrass is native to the US and known for its hardiness and rapid growth. It is often cited as a potentially abundant second generation feedstock for ethanol.

## TALLOW

Tallow is another name for animal fat, which can be used as a feedstock for biodiesel production.



## TRANSESTERIFICATION

The name biodiesel has been given to transesterified vegetable oil to describe its use as a diesel fuel. The transesterification process involves mixing at room temperature methanol (50% excess) with NaOH (100% excess), then mixing vigorously with vegetable oil and letting the glycerol settle (about 15% of the biodiesel mix). The supernatant is biodiesel and contains a mixture of methylated fatty acids and methanol.

## VOC

VOCs, or volatile organic compounds, are air pollutants found in engine exhaust. Bioethanol helps reduce VOC emissions.

## YEAST

Yeast is any of various single-cell fungi capable of fermenting carbohydrates. Bioethanol is produced by fermenting sugars with yeast.



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.



SCAN QR CODE TO FIND OUR LOCATIONS



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