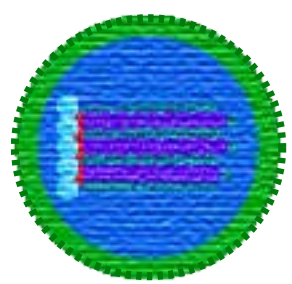




### ACID NUMBER

The acid number is a direct measure of free fatty acids (FFA), which can lead to corrosion and may be a symptom of water in the fuel.



### WATER AND SEDIMENT

Suspended water is a problem because it contributes to the corrosion of the close-fitting parts in the fuel injection system. Sediments may plug fuel filters and promote the formation of deposits on fuel injectors and other engine parts.



### SULFUR

Off-road fuel can have up to 500 parts per million (0.05%) sulfur and on-road fuel can only have 15 parts per million (0.0015%) of sulfur.



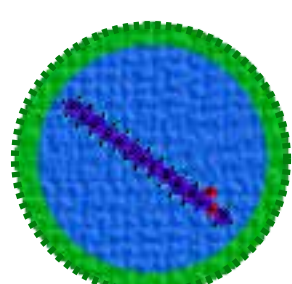
### COLD SOAK FILTRATION

ASTM required this test after reports that biodiesel could form precipitates above the cloud point which can clog filters.



### MONOGLYCERIDES

Monoglycerides are generally considered the most harmful in biodiesel and can adversely affect cold flow properties.



### CLOUD POINT

Of major concern in cold climates, the cloud point (CP) indicates the temperature above which an engine can operate without fear of plugging a filter and stranding the vehicle.



### OXIDATION STABILITY

All stored fuels are subject to degradation over time. This degradation may be due to microbial action, water intrusion, or oxidation.



### FREE & TOTAL GLYCERIN

Elevated total glycerin values are indicators of an incomplete reaction and predictors of excessive carbon deposits in the engine and could lead to filter plugging.



### METHANOL CONTENT

Methanol content of biodiesel fuel is an important factor in determining the tendency of the fuel to exhibit flammable characteristics.



### FLASH POINT

The flash point determines the flammability classification of material being tested.



# FIELD GUIDE

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# ASTM STANDARDS



### PHOSPHORUS

Phosphorus can come from incomplete refining of the phospholipids (or gums) from the vegetable oil and from bone and proteins encountered in the rendering process.



### SULFATED ASH

This test monitors the presence of acids in the fuel. The most likely source of a test failure would be excessive free fatty acids, which are determined in accordance with the acid number.



### CALCIUM AND MAGNESIUM

Small levels of calcium and magnesium may collect in exhaust particulate removal devices and act as abrasive solids or soluble metallic soaps.



### KINEMATIC VISCOSITY

Kinematic viscosity is the resistance to flow of a fluid under gravity and fuel injectors will not perform properly if it is too high.



### SODIUM AND POTASSIUM

Sodium and potassium, like calcium and magnesium, may be present in biodiesel as abrasive solids or soluble metallic soaps.



### CETANE NUMBER

The cetane number is a measure of how easily the fuel will ignite in the engine. All of the common fatty acid esters have cetane numbers near/above the minimum requirement.



### CARBON RESIDUE

The carbon residue is a measure of how much residual carbon remains after combustion. Carbon residues may decompose and pyrolyze to hard deposits and clog the fuel injectors.



### DISTILLATION

According to the standards, this specification was incorporated as an added precaution to ensure the fuel has not been contaminated with high boiling contaminants.



### COPPER STRIP CORROSION

This test monitors the presence of acids in the fuel. The most likely source of a test failure would be excessive free fatty acids, which are determined in accordance with the acid number.

