VIRENT BioForm® SAK Jet Fuel

Overview

The BioForming® process for producing BioForm® Synthesized Aromatic Kerosene (SAK) Jet Fuel converts plant-derived feedstocks into renewable jet range hydrocarbons. The product is a mixture of clean burning aromatics that are missing from other alternative jet fuels; blending with SAK eliminates low density and materials compatibility issues that limit the allowable blend levels of these alternatives. SAK can be combined with Virent BioForm Synthesized Kerosene (SK) or other alternative blendstocks to enable a 100% alternative jet fuel blend that meets all ASTM D7566 requirements.

Advantages

Feedstock Flexibility

A wide variety of cellulosic and conventional plant sugars can be converted in the BioForming process to produce consistent final products.

Drop-In Fuels

BioForm SAK Jet Fuel is fully fungible, containing the same hydrocarbon types as petroleum derived jet fuel. Other benefits include excellent freeze point, cleaner-burning aromatics, and compatibility with current infrastructure.

Key Properties

Aromatics and Naphthalenes

SAK can satisfy the minimum aromatic levels in jet fuel without naphthalenes, offering lower emissions and better combustion properties than conventional jet fuel.

Sulfur

The BioForming Process removes sulfur and other ash contaminants to below detectable levels, which reduces emissions and fuel systems wear.

Boiling Point Distribution

Flash point and end point are controlled by distillation, similar to conventional petroleum refinery processing. SAK blends have a broad boiling point range containing C_8-C_{16} hydrocarbons, comparable to conventional jet fuel.

Thermal Stability Breakpoint

A higher breakpoint than conventional jet fuel reduces fouling and deposit formation potential.

Freeze Point

A superior freeze point allows expanded operational boundaries on flight pattern and altitude.

Acid Number

A low acid number ensures reactive oxygenated species have been removed to prevent corrosion.

Density and Heating Value

Blending SAK with Virent SK or other alternative fuels provides an option to meet the minimum density spec while still providing good overall energy content.

Spec Test	ASTM D1655 Jet A	VIRENT (1)	HEFA(2)	Conventional Jet A(3)
Aromatics, V% **Naphthalenes**	<25 <3	**16.8** **<0.01**	<1 <0.01	18.8 1.2
Sulfur, Mass%	<0.30	**0.00**	0.00	0.08
Distillation, 10%V, °C	<205	**163**	160	182
Distillation, End Pt, °C	<300	**278**	275	265
Flash point, °C	≥38	**40**	>130	51
Thermal Stab Break Pt, °C	>260	**295**	>325	280
Freeze Point, °C	<-40	**<-80**	-59	-50
Acid #, mgKOH/g	<0.10	**0.010**	Not tested	Not tested
Density @ 15°C, kg/m³	775-840	**775**	756	804
LHV, MJ/kg	>42.8	**43.6**	Not tested	43.3

(1) 17% SAK/83% Hydroprocessed Esters and Fatty Acids (HEFA) blend
(2) Commercial Hydroprocessed Esters and Fatty Acids (HEFA) analyzed for comparison purposes
(3) Commercial Jet A analyzed for comparison purposes