

New EFT Upgrading Technology - Better Yields, Better Products

Since the publication of our white paper "Optimizing Fischer Tropsch Products" (Sept. 2020), EFT has developed an improved process (patent pending) for the production of middle distillate fuels that delivers a higher yield of the desired products when compared to classic hydroprocessing strategies. The highly isomerized nature of these products dramatically improves cold properties of both diesel and jet. The process was optimized for use with the syncrude made by EFT's high alpha Fischer Tropsch (FT) catalyst.

Jet Mode - In the Jet mode EFT can now increase jet yields to near 80% jet with 20% naphtha.

Selected ASTM D-7566 analyses were completed on the jet sample by the EFT Laboratory. The EFT Laboratory results are incorporated into a EFT SPK Jet Specification Sheet attached. A key feature of the jet product is the very low freeze point while utilizing the full distillation range allowed.

Diesel Mode - EFT's new hydroprocessing technology produces diesel yields up to 85% diesel with 15% naphtha. At 85% yield the product has a minimum flashpoint of 60°C, well above the 52°C minimum required by the D975 specification.

Some additional benefits of this upgrading process:

- The higher flashpoint changes the material from a DOT regulated "flammable liquid" designation (for shipping purposes) to a non-regulated combustible liquid. This higher flashpoint is also a feature of the comparable military F-76 product.
- This diesel product has a freeze/cloud point well below - 50°C making it meet any winter grade specification without lowering the flashpoint. This is very different from classic FT fuel products where cold properties are very sensitive to the carbon range of the product and is driven by the highly isomerized nature of the product.

Although this technology is optimized for syncrude from EFT's high alpha FT catalyst it will provide similar improvements with any FT syncrude feedstock.

Call us anytime to discuss...

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Preliminary Product Specification

Fischer-Tropsch Hydroprocessed Synthesized Paraffinic Kerosene (SPK)				
Fischer-Tropsch aviation fuel blend SPK is a highly paraffinic synthetic product that meets all requirements of the ASTM DF75866 Anex 1 specifications. EFT SPK is sulfur and aromatics free, non-toxic and biodegradable.				
Typical Physical Characteristics	Units	Test Method	Specification Value	Sample Properties
Annex 1 Table A1.1				
Acidity	Total KOH/g	D3242	Max 0.015	<0.015
Distillation 10% Off	°C	D86	Max 205	175.3
Distillation FBP	°C	D96	Max 300	274
Residue	%	D86	Max 1.5	1.4
% Loss	%	D86	Max 1.5	1
Flashpoint	°C	D3282	Min 38	49
Density @ 15°C	kg/m ³	D1298	Min 73	763
			Max 770	763
Freeze Point Jet	°C	-40	D2386 (1)	-73
Freeze Point Jet A	°C	-47	D2383 (1)	-73
Thermal Stability Temp	°C	Min 325	D3241	Pass
Thermal Pressure Drop	mm Hg	Max 25	D3241	Pass
Tube Deposit	Rating	< 3	D3241	Pass
Annex 1 Table A1.2				
Hydrocarbon Composition				
Cycloparaffins	Max %	D4245	15	Pass
Aromatics	Mass %	D4245	0.5	Pass
Paraffins	Mass %	D4245	Report	Pass
Carbon and Hydrogen min	Mass%	D5291	99.5	Pass
Non-hydrocarbon Composition				
Nitrogen max	mg/Kg	D4629	2	Pass
Water max	mg/Kg	D6304	75	Pass
Sulfur max	mg/Kg	D5453	15	Pass
Metals max	mg/kKg	UOP 389	0.1/metal	Pass
Halogen Max	mg/kg	D7359	1	Pass

Preliminary Product Specification

Emerging Fuels Technology Fischer-Tropsch Diesel					
Fischer-Tropsch diesel fuel is a highly paraffinic synthetic product that meets all requirements of ASTM D975 D-2 Diesel Fuel Oil when properly additized. It can also be blended with conventional diesel fuel in all proportions. F-T diesel fuel is sulfur and aromatics free, is non-toxic and biodegradable. It reduces engine exhaust emissions and is compatible with all emission control devices.					
Typical Physical Characteristics	Units	Test Method	Specification Value	Typical Value	Sample Properties
Flash Point	°C, min	D93	52	55	60
Water and Sediment	% vol, max	D2709	0.05	0.01	<0.01
Distillation Temperature, 90% vol recovered	°C, min	D86	282	282	325
	°C, max		338	338	326
Kinematic Viscosity @ 40°C	mm ² /S, min	D445	1.9	2.1	1.96
	mm ² /S, max		4.1		
Ash	% max	D482	0.01	<0.01	<0.01
Sulfur	ppm, max	D5453	15	<15	<15
Copper Strip Corrosion Rating	max	D130	No. 1	No. 1	No.1
Cetane Number	min	D613	40	65	70.1
Cetane Index	min	D976 ^b	40	65	69
Aromaticity	vol %, max	D1319	35	<5	<5
Cloud Point	°C, max	D2500	Region specific	-5	-72
LTFT/CFPP	°C, max	D4539/D6371	Region Specific	-5	ND(2)
Ramsbottom carbon residue on 10% distillation residue	% mass, max	D524	0.35	<0.01	<0.01
Lubricity, HFRR @ 60°C	micron, max	D6079/D7688	520	ND(1)	ND(1)
Conductivity	pS/m, min	D2624/D4308	25	>25	>25

(1) No data available for this material. Fischer-Tropsch diesel products routinely require a lubricity additive.

(2) No data available for this material.

About Us:

Emerging Fuels Technology (EFT) is a technology company focused on methods for producing synthetic fuels and specialty products from a variety of feedstocks such as natural gas, biogas, biomass, municipal solid waste (MSW), sources of CO₂ and bio-derived oils. EFT is one of the world's foremost authorities on Fischer-Tropsch (FT) and related synthesis, licensing the core technologies and upgrade packages for projects from 50 to 10,000 barrels per day. www.emergingfuels.com

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