POLARIS Laboratories

Diesel Fuel Analysis

Biodiesel Composition Makes Fuel Analysis Imperative

Like petroleum-based diesel, biodiesel can contribute to fuel filter plugging if physical properties aren't monitored regularly to determine:

- **Biodiesel Content –** confirms that percentage of biodiesel complies with engine manufacturer's requirements
- **Suitability for use –** biodiesel's natural composition allows for a shelf life of only about six months
- **Degradation –** creates a natural breeding ground for biological growth

Fleet Protection You Can Count On

Because diesel fuel is one of a fleet manager's biggest operating expenses, fuel analysis is one of the most effective ways to minimize costs and at the same time, increase both equipment reliability and fleet productivity.

Diesel Fuel Test Packages

The six diesel fuel packages in the adjacent chart are designed to address common performance issues and recommend specific corrective actions.

	Test Packages
Contamination • Identifies contamination from external sources – oil, biological growth, water, sediment • Identifies contamination to be the result of a change in the fuel's physical properties – low thermal stability may require use of an asphaltene conditioner	• ICP • Flash Point-PM • Water & Sediment • Thermal Stability • Bacteria, Fungi & Mold
Smoking • Identifies low cetane index or water contamination – loss of power, white smoke • Identifies excessive sulfur content – black smoke	• Water & Sediment • Cetane Index • API Gravity • Distillation • Sulfur
Filter Plugging • Identifies contamination from external sources specific to filter plugging – high particle count, biological growth • Identifies contamination due to a change in the fuel's physical properties – low thermal stability or insufficient cold weather capability for operating environment	• Particle Count • Pour Point • Cloud Point • Thermal Stability • Bacteria, Fungi & Mold
Cleanliness • Identifies water contamination – can lead to smoking, biological growth and corrosion • Identifies particulate contamination – can result in extreme wear in high pressure fuel systems which may cause premature injector failure	• Water by Karl Fischer • Particle Count
Wear Prevention • Identifies cause of wear – water contamination, excessive particles or insufficient lubricity	• Water by Karl Fischer • Particle Count • Lubricity
Fuel Quality • Determines if fuel meets manufacturer and ASTM specifications	• ICP • Kinematic Viscosity • Flash Point-PM • Water & Sediment • Pour Point • Cloud Point • Thermal Stability • Bacteria, Fungi & Mold • Cetane Index • API Gravity • Distillation • Sulfur

For more information, please contact us: US and Canada: **1-877-808-3750**
International: **+1-317-808-3750** or email us at **sales@polarislabs.com**

Diesel Fuel Analysis

Detect failure at its earliest stages

Pass or fail indicates whether or not the sample meets ASTM specifications for the fuel type designated.

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Fuel Analysis Report

877-808-3750

PASS | X FAIL

Sample does not meet ASTM specifications for fuel type designated.

Account Information	Component Information	Sample Information
Account Number: 000000-0000-0000	Component ID: 0666077 DF	Tracking Number: 00000A00000
Company Name: ABC COMPANY	Secondary ID: FMC 3385	Lab Number: I-383629
Contact: JOHN SMITH	Fuel Type: ULTRA-LOW SULFUR DIESEL #2	Lab Location: Indianapolis
Address: 1234 MAIN STREET ANYTOWN, LA 11111 US	Manufacturer: Missing Information	Data Analyst: KMS
	Model: Missing Information	Sampled: 03-Oct-2011
	Application: POWER GENERATION	Received: 17-Oct-2011
	Tank Capacity: 0	Completed: 24-Oct-2011
Filter Information	**Miscellaneous Information**	
Filter Change: No	Miscellaneous:	
Filter Type: Missing Information		
Micron Rating: 0		

Comments: FUELS having THERMAL STABILITY values between 60%-80% are marginal fuels and could affect fuel filter life. SUGGEST the use of an ASPHALTINE CONDITIONER to improve THERMAL STABILITY. SULFUR content is HIGHER than the 15PPM MAXIMUM for ULTRA-LOW SULFUR DIESEL; NO EVIDENCE OF BACTERIA, FUNGI OR MOLD;

Comments and recommendations highlight test results of most importance and provide a suggested course of action when needed. These results indicate low thermal stability and the use of an asphaltine conditioner was the recommended course of action.

ASTM specifications are listed based on the fuel type designated. The maximum ppm for Ultra-Low Sulfur Diesel #2 is 15ppm.

Testing Information

	Result	Min	Max
Sulfur (ppm)	487		15
r and Sediment (%)	0		0.05
by Karl Fischer (%)	0.011		0.05
Karl Fischer (ppm)			
ic Bacteria (Counts)			
Bacteria (Counts)	0		
Fungi (Counts)	0		
Mold (Counts)	0		
hermal Stablity (%)	68.0	80	
Viscosity 40°C (cSt)	2.6	1.9	4.1
scosity 100 °C (cSt)			
lumber (mg KOH/g)			
Cloud Point (°C)	-13		
Pour Point (°C)	-30		
ilter Plug Point (°C)			
Pensky Marten Flash Point (°C)	63	52	
Distillation Initial Boiling Point (°C)	174.9		
Distillation 10% Recovered (°C)	210.6		
Distillation 50% Recovered (°C)	267.1		
Distillation 90% Recovered (°C)	320.0	282	338 / 343 for B6-20
Distillation Final Boiling Point (°C)	351.7		
Cetane Index	45.9	40	
API Gravity	34.2		
Density (g/mL)			
Specific Gravity			
BTU Per Gallon (BTU/gal)			
BTU Per Pound (BTU/lb)			
Lubricity (µm)			
Copper Corrosion			
Ash Content (mass %)			
Carbon Residue (%)			
% Biodiesel - FAME (%)			
Total Glycerin (%)			
Free Glycerin (%)			
Oxidation Stability (%)			
Gravimetric Solids (ppm)			

Elemental Analysis (ppm)	Result	Min	Max
Iron	0		
Chromium	0		
Nickel	0		
Aluminum	0		
Sodium	0		
Potassium	2		
Titanium	0		
Molybdenum	0		
Antimony	0		
Manganese	0		
Lithium	0		
Boron	1		
Magnesium	0		
Calcium	0		
Barium	0		
Phosphorous	3		
Zinc	3		

Particle Count (particles/mL)	Result	Min	Max
ISO Cleanliness Code			
> 4			
> 6			
> 10			
> 14			
> 21			
> 38			
> 70			
> 100			

Comments are advisory only and are based on the assumption that the sample and data submitted are valid. Missing fluid or component information limits the evaluation. No warranty is expressed or implied.