



## Automation, Inc.

1035 Old Georges Road, North Brunswick, NJ 08902

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**The following tests are performed with each “standard” fuel oil analysis by ISP Automation, Inc.**

### **THERMAL STABILITY**

**Thermal Stability** is a percentage range assigned to a fuel based on its tendency to produce asphaltenes at high temperatures. Asphaltenes are tar-like, resinous substances most often responsible for clogging fuel filters. Fuel with a Thermal Stability of 80% or greater should not cause filter clogging. Fuels between 60% and 80% could have a marginal affect and values less than 60% will significantly reduce filter life.

### **ELEMENTAL ANALYSIS (24 METALS BY ICP)**

**Elemental Analysis by ICP** (inductively-coupled plasma) detects up to 24 metals, measuring less than 5 microns in size, that can be present in used oil due to wear, contamination or additives. **Wear Metals** include iron, chromium, nickel, aluminum, copper, lead, tin, cadmium, silver, titanium and vanadium. **Contaminant Metals** include silicon, sodium, potassium, molybdenum, antimony, manganese, lithium and boron. **Additive Metals** include magnesium, calcium, barium, phosphorous and zinc. Elemental Analysis is instrumental in determining the type and severity of wear occurring within a unit. Consult the POLARIS [Wear Metals Guide](#) for quick reference to possible wear metal sources.

### **PENSKY MARTENS FLASH POINT**

**Flash Point** is the lowest temperature at which the vapors of a combustible liquid will ignite momentarily in air. Low diesel fuel flash points indicate contamination by more volatile fuels such as gasoline. For Flash Point by Pensky Martens and Flash Point by Cleveland Open Cup, refer to [ASTM Guidelines](#) for minimum flash point requirements.

### **WATER & SEDIMENT**

**Water & Sediment** in fuel can cause corrosion, wear, bacterial growth and premature fuel filter clogging. The amount of water in fuel should not exceed 500 ppm (0.05%). Sediment should be no greater than 100 ppm (0.01%).

### **BACTERIA, FUNGI, AND MOLD**

**Bacteria, Fungi and Mold** are indications that fuel storage tanks have not be properly maintained. Water can build up at the bottom of storage tanks and create an excellent breeding ground for biological growth.

### **AEROBIC BACTERIA**

**Aerobic Bacteria** testing determines the presence of bacteria and how many colonies there are.

### **SULFUR (OPTIONAL)**

**Sulfur** content will affect SOx emissions and can have adverse effects on many NOx and PM emission reduction devices. The amount of sulfur allowed in diesel fuel is regulated by the government. Bulk delivery of diesel fuel should be tested to include sulfur levels.