



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005

SOUTHWEST RESEARCH INSTITUTE  
Office of Automotive Engineering  
Fuels and Lubricants Research Division  
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CHEMICAL

Valid To: August 31, 2018

Certificate Number: 0702.04

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following types of tests on fuels, lubricants, and petroleum products:

- Spectroscopy:** Atomic absorption, Emission, Inductively Coupled Plasma, UV/Visible, Magnetic, X-ray Fluorescence
- Physical Properties:** Appearance, Combustion, Conductivity, Density, Flash Point, Foaming Characteristics, Freezing Point, Gum Formation, Particle Size, Vapor Pressure, Viscosity, Volatility
- Chromatography:** Gas Chromatography, Column Chromatography, Supercritical Fluid Chromatography, Mass Spectrometry
- Wet Chemistry Measurements:** Titrametric, Volumetric, Gravimetric
- Thermal Analysis:** DSC (Differential Scanning Calorimetry), Heat of Combustion, TGA (Thermogravimetric Analysis)
- Miscellaneous:** Compatibility, Filter Testing, Oxidation, Wear Testing, Elastomer Testing

Method

Method Name

**Chromatography**

**Column**

ASTM D 2007  
ASTM D 1319

Clay Gel  
FIA

**Gas Chromatography**

ASTM D 5580  
ASTM D 5769  
ASTM D 3606  
ASTM D 5501  
ASTM D 3524  
ASTM D 3525  
ASTM D 6417  
ASTM D 4815  
ASTM D 5599

Aromatics  
Aromatics by GC/MS  
Benzene  
Ethanol Content  
Fuel Dilution  
Fuel Dilution by GC  
Oil Volatility by GC  
Oxygenates  
Oxygenates by OFID

**Method**  
**Chromatography (cont'd)**

ASTM D 2887

**Supercritical Fluid Chromatography**

ASTM D 5186

**Miscellaneous**

**Compatibility**

ASTM D 611  
ASTM D 2711  
ASTM D 1401  
ASTM D 4682  
ASTM D 1094

**Oxidation**

ASTM D 130  
ASTM D 4340  
ASTM D 1384  
ASTM D 873  
ASTM D 2272  
ASTM D 665  
ASTM D 1748  
ASTM D 4742  
CEC L-48  
  
CEC L-85  
CEC L-105  
CEC L-109

**Wear Testing**

ASTM D 2783  
ASTM D 3233  
ASTM D 6079  
ASTM D 4172

**Elastomer Testing**

CEC L-39  
CEC L-112  
ASTM D471

**Physical Properties**

**Appearance**

ASTM D 156  
ASTM D 1500

**Engine Testing**

ASTM D 613  
ASTM D 2700  
ASTM D 2699

**Method Name**

Simulated Distillation

Aromatics by SFC

Aniline Point  
Demusibility of Oils  
Emulsion Characteristics  
Miscibility  
Water Reaction

Copper Corrosion  
Corrosion of Aluminum Alloy  
Corrosion Test  
Oxidation Stability of Jet Fuels  
RBOT  
Rust Prevention  
Rust Protection  
TFOUT  
Stability of Lubricating Oils used in Automotive  
Transmission by Artificial Aging  
Hot Surface Oxidation  
Low Temperature Pumpability  
Oxidation Test for Engine Oils Operating in the  
Presence of Biodiesel Fuels

Extreme Pressure Properties  
Falex  
HFRR  
Wear Preventative

The Evaluation of Oil – Elastomer Compatibility  
The Evaluation of Oil – Elastomer Compatibility  
Rubber Property – Effect of Liquids

Color Saybolt  
Color-ASTM

Cetane  
MON  
RON



<u>Method</u>	<u>Method Name</u>
<b><u>Physical Properties (cont'd)</u></b>	
<b>Combustion</b>	
ASTM D 1322	Smoke Point
<b>Conductivity</b>	
ASTM D 2624	Conductivity
<b>Density</b>	
ASTM D 1298	Density
ASTM D 287	Density
ASTM D 4052	Density
<b>Flash Point</b>	
ASTM D 92	Fire Point
ASTM D 93	Pensky Martens Flash
ASTM D 56	Tag Flash Point
<b>Foaming Characteristics</b>	
ASTM D 892	Foam
<b>Freezing Point</b>	
ASTM D 2500	Cloud Point
ASTM D 2386	Freeze Point
ASTM D 97	Pour Point
ASTM D 1177	Freezing Point of Antifreeze
<b>Gum Formation</b>	
ASTM D 381	Gum Content
<b>Particulate Contamination</b>	
ASTM D 2276-89	Particulate Contamination
<b>Vapor Pressure</b>	
ASTM D 5191	RVP
ASTM D 5188	V/L
<b>Viscosity</b>	
ASTM D 4684	Apparent Viscosity
ASTM D 2983	Brookfield
ASTM D 5293	Cold Crank
ASTM D 6371	Cold Filter Plugging Point
ASTM D 4683	TBS
ASTM D 445, VIT8	Viscosity
CEC L-36	High Shear High Temperature Viscosity Measurement



**Method****Physical Properties (cont'd)****Shear**

ASTM D 6278  
ASTM D 2603 / 5621  
CEC L-14  
  
CEC L-45

**Volatility**

ASTM D 86  
ASTM D 972  
ASTM D 5800  
CEC L-40

**Spectroscopy****Emission**

ASTM D 4629  
ASTM D 5453

**ICP**

ASTM D 5185

**Magnetic**

ASTM D 3701  
ASTM D 4808

**UV/Visible**

ASTM D 1840  
CEC L-82

**X-Ray Fluorescence**

ASTM D 2622  
ASTM D 4294

**Thermal Analysis****Heat of Combustion**

ASTM D 240  
ASTM D 4809

**TGA**

ASTM D 5967 Annex A4

**Method Name**

Shear Stability  
Sonic Shear  
Evaluation of Mechanical Shear Stability of  
Lubricating Oils  
Shear Stability of Transmission Lubricants

Distillation  
Evaporation Loss  
NOACK  
Evaporating Loss of Lubricating Oils

Nitrogen Chem.  
Sulfur by Antek

Wear Metals

Hydrogen by NMR  
Hydrogen by NMR

Naphthalene  
Spectrophotometric Detection of Soot in Used Engine  
Oil Samples

Sulfur  
Sulfur

Heat of Combustion  
Heat of Combustion

TGA Soot in Oils



**Method**

**Wet Chemistry (cont'd)**

**Gravimetric**

ASTM D 482  
ASTM D 874  
ASTM D 129  
ASTM D 189  
ASTM D 4530  
ASTM D 524  
ASTM D 808

**Titrametric**

ASTM D 974  
ASTM D 3339  
ASTM D 664  
ASTM D 2896  
ASTM D 4739  
ASTM D 3228  
ASTM D 6304

**Volumetric**

ASTM D 4176  
ASTM D 893  
ASTM D 1796  
ASTM D 2709

**Miscellaneous**

TIP 07C-002  
TIP 07C-003  
  
TIP 07C-006  
  
TIP 07C-009  
TIP 07C-012  
  
TIP 07C-020  
  
TIP 07C-022  
  
API/IP Specification 1581  
  
API/IP Specification 1583

**Method Name**

Ash  
Ash Sulfated  
Bomb Sulfur  
Carbon Residue  
Carbon Residue  
Carbon Residue  
Chlorine

Acid Base Number  
Acid Number  
Acid Number  
Base Number  
Base Number  
Nitrogen  
Water by Karl Fisher

Free Water  
Insolubles  
Water and Sediment  
Water and Sediment

Methane Quantitative Analysis  
Analysis of Sulfate in Exhaust by Ion  
Chromatography  
Analysis of Aldehydes and Ketones in Exhaust by  
High Performance Liquid Chromatography  
Organic Solvent Extractions of Particulate Filters  
Methanol and Ethanol Analysis by Capillary Column  
GC  
N<sub>2</sub>O Measurement by Gas Chromatography – Electron  
Capture Detector  
N<sub>2</sub>O Measurement by Fourier Transform Infrared  
(FTIR) Spectroscopy in Accordance with Part 1065  
Specifications and Qualification Procedures for  
Aviation Jet Fuel Filter/Separators  
Specifications and Qualification Procedures for  
Aviation Fuel Filter Monitors with Absorbent Type  
Elements





## *Accredited Laboratory*

A2LA has accredited

### **SOUTHWEST RESEARCH INSTITUTE**

*San Antonio, TX*

for technical competence in the field of

## Chemical Testing

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 *General requirements for the competence of testing and calibration laboratories*. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated April 2017).



Presented this 11<sup>th</sup> day of July 2016.

A handwritten signature in black ink, written over a horizontal line.

President and CEO  
For the Accreditation Council  
Certificate Number 0702.04  
Valid to August 31, 2018  
Revised May 18, 2018

*For the tests to which this accreditation applies, please refer to the laboratory's Chemical Scope of Accreditation.*