



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: May 31, 2020

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

Test(s):

Test Method(s):

Chromatography

Column

Clay Gel
FIA

ASTM D2007
ASTM D1319

Gas Chromatography

Aromatics
Aromatics by GC/MS
Benzene
Ethanol Content
Fuel Dilution

ASTM D5580
ASTM D5769
ASTM D3606
ASTM D5501
ASTM D3524

Test(s):

Test Method(s):

Gas Chromatography (cont'd)

Fuel Dilution by GC	ASTM D3525
Oil Volatility by GC	ASTM D6417
Oxygenates	ASTM D4815
Oxygenates by OFID	ASTM D5599
Simulated Distillation	ASTM D2887

Supercritical Fluid Chromatography

Aromatics by SFC	ASTM D5186
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Miscellaneous

Compatibility

Aniline Point	ASTM D611
Demulsibility of Oils	ASTM D2711
Emulsion Characteristics	ASTM D1401
Miscibility	ASTM D4682
Water Reaction	ASTM D1094

Oxidation

Copper Corrosion	ASTM D130
Corrosion of Aluminum Alloy	ASTM D4340
Corrosion Test	ASTM D1384
Oxidation Stability of Jet Fuels	ASTM D873
RBOT	ASTM D2272
Rust Prevention	ASTM D665
Rust Protection	ASTM D1748
TFOUT	ASTM D4742
Stability of Lubricating Oils Used in Automotive Transmission by Artificial Aging	CEC L-48
Hot Surface Oxidation	CEC L-85
Low Temperature Pumpability	CEC L-105
Oxidation Test for Engine Oils Operating in the Presence of Biodiesel Fuels	CEC L-109

Wear Testing

Extreme Pressure Properties	ASTM D2783
Falex	ASTM D3233
HFRR	ASTM D6079
Wear Preventative	ASTM D4172

Elastomer Testing

The Evaluation of Oil – Elastomer Compatibility	CEC L-39, CEC L-112
Rubber Property – Effect of Liquids	ASTM D471

Miscellaneous

Analysis of Sulfate in Exhaust by Ion Chromatography	TIP 07C-003
Analysis of Aldehydes and Ketones in Exhaust by High Performance Liquid Chromatography	TIP 07C-006



Test(s):**Test Method(s):****Miscellaneous (cont'd)**

Methanol and Ethanol Analysis by Capillary Column GC	TIP 07C-012
N ₂ O Measurement by Gas Chromatography – Electron Capture Detector	TIP 07C-020
N ₂ O Measurement by Fourier Transform Infrared (FTIR) Spectroscopy in Accordance with Part 1065	TIP 07C-022
Specifications and Qualification Procedures for Aviation Jet Fuel Filter/Separators	API/IP Specification 1581
Specifications and Qualification Procedures for Aviation Fuel Filter Monitors with Absorbent Type Elements	API/IP Specification 1583

Physical Properties**Appearance**

Color Saybolt	ASTM D156
Color-ASTM	ASTM D1500

Engine Testing

Cetane	ASTM D613
MON	ASTM D2700
RON	ASTM D2699

Combustion

Smoke Point	ASTM D1322
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Conductivity

Conductivity	ASTM D2624
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Density

Density	ASTM D1298, ASTM D287, ASTM D4052
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Flash Point

Fire Point	ASTM D92
Pensky Martens Flash	ASTM D93
Tag Flash Point	ASTM D56
Autoignition Temperature of Chemicals	ASTM E659

Foaming Characteristics

Foam	ASTM D892
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Freezing Point

Cloud Point	ASTM D2500
Freeze Point	ASTM D2386
Pour Point	ASTM D97
Freezing Point of Antifreeze	ASTM D1177

Gum Formation

Gum Content	ASTM D381
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Test(s):

Test Method(s):

Particulate Contamination

Particulate Contamination

ASTM D2276-89 (*inactive 1989*)¹

Shear

Shear Stability

ASTM D6278

Sonic Shear

ASTM D2603, ASTM D5621

Evaluation of Mechanical Shear Stability of Lubricating Oils

CEC L-14

Shear Stability of Transmission Lubricants

CEC L-45

Vapor Pressure

RVP

ASTM D5191

V/L

ASTM D5188

Viscosity

Apparent Viscosity

ASTM D4684

Brookfield

ASTM D2983

Cold Crank

ASTM D5293

Cold Filter Plugging Point

ASTM D6371

TBS

ASTM D4683

Viscosity

ASTM D445; VIT8

High Shear High Temperature Viscosity Measurement

CEC L-36

Volatility

Distillation

ASTM D86

Evaporation Loss

ASTM D972

NOACK

ASTM D5800

Evaporating Loss of Lubricating Oils

CEC L-40

Spectroscopy

Emission

Nitrogen Chem.

ASTM D4629

Sulfur by Antek

ASTM D5453

ICP

Wear Metals

ASTM D5185

Magnetic

Hydrogen by NMR

ASTM D3701, ASTM D4808

UV/Visible

Naphthalene

ASTM D1840

Spectrophotometric Detection of Soot in Used Engine Oil Samples

CEC L-82

X-Ray Fluorescence

Sulfur

ASTM D2622, ASTM D4294

Test(s):

Test Method(s):

Thermal Analysis

Heat of Combustion

Heat of Combustion

ASTM D240, ASTM D4809

TGA

TGA Soot in Oils

ASTM D5967 Annex A4

Gravimetric

Ash

ASTM D482

Ash Sulfated

ASTM D874

Bomb Sulfur

ASTM D129

Carbon Residue

ASTM D189, ASTM D4530, ASTM D524

Chlorine

ASTM D808

Titrametric

Acid Base Number

ASTM D974

Acid Number

ASTM D3339, ASTM D664

Base Number

ASTM D2896, ASTM D4739

Nitrogen

ASTM D3228

Water by Karl Fisher

ASTM D6304

Volumetric

Free Water

ASTM D4176

Insolubles

ASTM D893

Water and Sediment

ASTM D1796, ASTM D2709

¹NOTE: This laboratory's scope contains withdrawn or superseded methods. As a clarifier, this indicates that the applicable method itself has been withdrawn or is now considered "historical" and not that the laboratory's accreditation for the method has been withdrawn.



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 28th day of August 2018.

A handwritten signature in black ink, appearing to read "L. Sen", written over a horizontal line.

President and CEO
For the Accreditation Council
Certificate Number 0702.04
Valid to May 31, 2020

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