

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

SOUTHWEST RESEARCH INSTITUTE Office of Automotive Engineering Fuels and Lubricants Research Division 6220 Culebra Road, P.O. Box 28510 San Antonio, TX 78228-0510 Paul Nemeth Phone: 210 522 5891

CHEMICAL

Valid To: May 31, 2026

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 tests on <u>fuels</u>, <u>lubricants</u>, <u>and petroleum products</u>:

Spectroscopy:	Atomic Absorption, Emission, Inductively Coupled Plasma (ICP), 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:	Differential Scanning Calorimetry (DSC), Heat of Combustion, Thermogravimetric Analysis (TGA)	
Miscellaneous:	Compatibility, Filter Testing, Oxidation, Wear Testing, Elastomer Testing	

Test(s):	Test Method(s):
Chromatography	
Column	
Clay Gel	ASTM D2007
FIA	ASTM D1319
Gas Chromatography	
Aromatics	ASTM D5580
Aromatics by GC/MS	ASTM D5769
Benzene	ASTM D3606

(A2LA Cert. No. 0702.04) 07/03/2024

Page 1 of 5

5202 Presidents Court, Suite 220 | Frederick, MD 21703-8398 | Phone: 301 644 3248 | Fax: 240 454 9449 | www.A2LA.org

Demusibility of OilsASTM D2711Emulsion CharacteristicsASTM D1401MiscibilityASTM D4682Water ReactionASTM D1094OxidationCopper CorrosionASTM D130Corrosion of Aluminum AlloyASTM D4340Corrosion TestASTM D1384Oxidation Stability of Jet FuelsASTM D1384Oxidation Stability of Jet FuelsASTM D272Rust PreventionASTM D665Rust ProtectionASTM D1748TFOUTASTM D4742Stability of Lubricating Oils Used in Automotive Transmission by Artificial AgingCEC L-48Hot Surface OxidationCEC L-105Oxidation Test for Engine Oils Operating in the Presence of Biodiesel FuelsCEC L-109Extreme Pressure PropertiesASTM D2783FalexASTM D233HFRRASTM D6079Wear PreventativeASTM D4172Elastomer TestingElastomer Testing	Test(s):	Test Method(s):
Gas Chromatography (cont'd)Ethanol ContentASTM D5501Fuel Dilution by GCASTM D3524Fuel Dilution by GCASTM D3525Oil Volatility by GCASTM D4815OxygenatesASTM D4815Oxygenates by OFIDASTM D5599Simulated DistillationASTM D5897Simulated DistillationASTM D5887Supercritical Fluid ChromatographyASTM D586Determination of Olefin Content of Gasolines by Supercritical Fluid ChromatographyASTM D6550WiscellaneousASTM D611, Method EOmpatibilityASTM D611, Method EDemusibility of OilsASTM D1401MiscibilityASTM D4682Water ReactionASTM D1094OxidationASTM D130Corrosion of Aluminum AlloyASTM D130Corrosion TestASTM D1344Oxidation Stability of Lubricating Oils Used in ASTM D2722ASTM D1748TFOUTASTM D655Rust ProtectionASTM D2742Rust ProtectionASTM D1748TFOUTASTM D2722Rust ProtectionASTM D2722Rust ProtectionASTM D2742Stability of Lubricating Oils Used in Atuomotive Transmission by Artificial AgingHot Surface OxidationCEC L-48Wear TestingEWear TestingASTM D2233HFRRASTM D2233HFRRASTM D2333HFRRASTM D4172Elastomer TestingASTM D4172	Chromatography (cont'd)	
Ethanol ContentASTM D5501Fuel DilutionASTM D3524Fuel Dilution by GCASTM D3525Oil Volatility by GCASTM D4815Oxygenates by OFIDASTM D5599Simulated DistillationASTM D5599Simulated DistillationASTM D5186Determination of Olefin Content of Gasolines by Supercritical Fluid ChromatographyASTM D5186Determination of Olefin Content of Gasolines by Supercritical Fluid ChromatographyASTM D611, Method FMiscellaneousASTM D611, Method FDemusibility of OilsASTM D1401MiscillationASTM D4812OxidationASTM D1401Miscillation CharacteristicsASTM D1401Miscillation CharacteristicsASTM D1401Miscillation CharacteristicsASTM D130Corrosion of Aluminum AlloyASTM D130Corrosion of Aluminum AlloyASTM D13440Corrosion f Aluminum AlloyASTM D873RBOTASTM D272Rust PreventionASTM D272Rust PreventionASTM D4542Vatiface OxidationCEC L-48Automotive Transmission by Artificial AgingHot Surface OxidationCEC L-105Oxidation Test for Engine Oils Operating in the Presence of Biodiesel FuelsCEC L-105Oxidation Test for Engine Oils Operating in the Presence of Biodiesel FuelsCEC L-105Wear TestingASTM D2233HFRRASTM D233HFRRASTM D6079Wear PreventativeASTM D233HFRRASTM D6079Wear Preventative <t< td=""><td></td><td></td></t<>		
Fuel Dilution by GCASTM D3525Oil Volatility by GCASTM D6417OxygenatesASTM D4815Oxygenates by OFIDASTM D4815Supercritical Fluid ChromatographyASTM D2887Aromatics by SFCASTM D5599Supercritical Fluid ChromatographyASTM D5186Determination of Olefin Content of Gasolines by Supercritical Fluid ChromatographyASTM D6550MiscellaneousASTM D611, Method EDemusibilityASTM D611, Method EDemusibility of OilsASTM D1401MiscibilityASTM D1401MiscibilityASTM D1401MiscibilityASTM D1401MiscibilityASTM D1401MiscibilityASTM D130Corrosion of Aluminum AlloyASTM D130Corrosion TestASTM D130Corrosion TestASTM D873RBOTASTM D873RBOTASTM D1748TFOUTASTM D1748TFOUTASTM D1748Automotive transmission by Artificial AgingHot Surface OxidationCEC L-48Automotive Transmission by Artificial AgingHot Surface OxidationCEC L-105Oxidation Test for Engine Oils Operating in the Presence of Biodiesel FuelsWear TestingASTM D2783FalexASTM D2783FalexASTM D2783FalexASTM D4172Elastomer TestingASTM D4172		ASTM D5501
Oil Volatility by GCASTM D6417OxygenatesASTM D4815Oxygenates by OFIDASTM D5599Simulated DistillationASTM D2887Supercritical Fluid ChromatographyASTM D5186Determination of Olefin Content of Gasolines by Supercritical Fluid ChromatographyASTM D5509MiscellaneousASTM D6550CompatibilityASTM D611, Method EAniline PointASTM D611, Method EDemusibility of OilsASTM D1401MiscibilityASTM D4682Water ReactionASTM D130Corrosion of Aluminum AlloyASTM D130Corrosion of Aluminum AlloyASTM D130Corrosion TestASTM D1344Oxidation Stability of Jet FuelsASTM D1344Oxidation Stability of Jet FuelsASTM D1748TFOUTASTM D1748TFOUTASTM D1748TFOUTASTM D1748TFOUTASTM D1748TFOUTASTM D2722Rust PreventionASTM D1748TFOUTASTM D2783Hot Surface Oxidation by Artificial AgingCEC L-48Low Temperature PumpabilityCEC L-105Oxidation Test for Engine Oils Operating in the Presence of Biodiesel FuelsCEC L-109Wear TestingExtreme Pressure PropertiesFaltexASTM D233HFRRASTM D6079Wear PreventativeASTM D4172Elastomer TestingASTM D4172	Fuel Dilution	ASTM D3524
OxygenatesASTM D4815Oxygenates by OFIDASTM D5599Simulated DistillationASTM D2887Supercritical Fluid ChromatographyASTM D5186Determination of Olefin Content of Gasolines by Supercritical Fluid ChromatographyASTM D6550MiscellaneousCompatibilityAniline PointASTM D611, Method EDemusibility of OilsASTM D1401MiscibilityASTM D482Water ReactionASTM D1401MiscibilityASTM D4682Water ReactionASTM D130Corrosion of Aluminum AlloyASTM D130Corrosion festASTM D272Rust PreventionASTM D272Rust PreventionASTM D272Rust PreventionASTM D272Rust PreventionASTM D4482Hot Surface OxidationCEC L-85Low Temperature PumpabilityCEC L-85Low Temperature PumpabilityCEC L-105Oxidation Test for Engine Oils Operating in the Presence of Biodiesel FuelsCEC L-105Wear TestingExtreme Pressure PropertiesHot Surface OxidationCEC L-105Oxidation Test for Engine Oils Operating in the Presence of Biodiesel FuelsASTM D2783FalexASTM D2783FalexASTM D2783FalexASTM D279Wear PreventativeASTM D2783FalexASTM D4172Elastomer TestingCEC L-105Oxidation Test for Engine Oils Operating in the PreventativeFalexASTM D2783FalexASTM D2783FalexAST	Fuel Dilution by GC	ASTM D3525
Oxygenates by OFIDASTM D5599Simulated DistillationASTM D2887Supercritical Fluid ChromatographyASTM D5186Determination of Olefin Content of Gasolines by Supercritical Fluid ChromatographyASTM D6550MiscellaneousCompatibilityCompatibilityASTM D611, Method EDemusibility of OilsASTM D2711Emulsion CharacteristicsASTM D1401MisceibilityASTM D4682Water ReactionASTM D1094OxidationCorrosion of Aluminum AlloyCorrosion of Aluminum AlloyASTM D130Corrosion TestASTM D1384Oxidation Stability of Jet FuelsASTM D272Rust PreventionASTM D272Rust ProtectionASTM D1748TFOUTASTM D1748TFOUTASTM D1748TFOUTCEC L-48Hot Surface OxidationCEC L-85Low Temperature PumpabilityCEC L-105Oxidation Test for Engine Oils Operating in the Presence of Biodiesel FuelsCEC L-109Presence of Biodiesel FuelsASTM D2733FalexASTM D2783FalexASTM D2783FalexASTM D2783FalexASTM D2783FalexASTM D2783FalexASTM D2783FalexASTM D2783FalexASTM D6079Wear PreventativeASTM D6079Wear PreventativeASTM D472	Oil Volatility by GC	ASTM D6417
Simulated DistillationASTM D2887Supercritical Fluid ChromatographyAromatics by SFCASTM D5186Determination of Olefin Content of Gasolines by Supercritical Fluid ChromatographyASTM D6550Miscellaneous	Oxygenates	ASTM D4815
Supercritical Fluid ChromatographyASTM D5186Aromatics by SFCASTM D5186Determination of Olefin Content of Gasolines by Supercritical Fluid ChromatographyASTM D6550MiscellaneousASTM D611, Method ECompatibilityASTM D2711Aniline PointASTM D2711Emulsion CharacteristicsASTM D1401MiscibilityASTM D4682Water ReactionASTM D1404OxidationASTM D1404Corper CorrosionASTM D1094OxidationASTM D130Corrosion of Aluminum AlloyASTM D1384Oxidation Stability of Jet FuelsASTM D1384Oxidation Stability of Jet FuelsASTM D2722Rust PreventionASTM D665Rust PreventionASTM D1748TFOUTASTM D1748TFOUTASTM D1748Automotive Transmission by Artificial AgingCEC L-105Oxidation Test for Engine Oils Operating in the Presence of Biodiesel FuelsCEC L-109Wear TestingExtreme PropertiesASTM D2733FalexASTM D2733FalexHFRRASTM D2733HFRRASTM D2733FalexASTM		ASTM D5599
Aromatics by SFCASTM D5186Determination of Olefin Content of Gasolines by Supercritical Fluid ChromatographyASTM D6550MiscellaneousCompatibilityASTM D611, Method EDemusibility of OilsASTM D2711Emulsion CharacteristicsASTM D1401MiscibilityASTM D4682Water ReactionASTM D1401MiscibilityASTM D4682Water ReactionASTM D1401OxidationASTM D130Corper Corrosion of Aluminum AlloyASTM D130Corrosion TestASTM D1384Oxidation Stability of Jet FuelsASTM D1384Oxidation Stability of Jet FuelsASTM D272Rust PreventionASTM D272Rust PreventionASTM D1748TFOUTASTM D1748TFOUTASTM D1748Automotive Transmission by Artificial AgingHot Surface OxidationCEC L-48Low Temperature PumpabilityCEC L-105Oxidation Test for Engine Oils Operating in the Presence of Biodiesel FuelsCEC L-109Presence of Biodiesel FuelsASTM D2783FalexASTM D2783FalexASTM D3233HFRRASTM D6079Wear PreventativeASTM D4172Elastomer TestingElastomer TestingElastomer Testing	Simulated Distillation	ASTM D2887
Aromatics by SFCASTM D5186Determination of Olefin Content of Gasolines by Supercritical Fluid ChromatographyASTM D6550MiscellaneousCompatibilityASTM D611, Method EDemusibility of OilsASTM D2711Emulsion CharacteristicsASTM D1401MiscibilityASTM D4682Water ReactionASTM D1401MiscibilityASTM D4682Water ReactionASTM D1401OxidationASTM D130Corrosion of Aluminum AlloyASTM D1340Corrosion TestASTM D1384Oxidation Stability of Jet FuelsASTM D1384Oxidation Stability of Jet FuelsASTM D272RBOTASTM D272Rust PreventionASTM D1748TFOUTASTM D1748TFOUTASTM D1748Automotive Transmission by Artificial AgingCEC L-85Low Temperature PumpabilityCEC L-105Oxidation Test for Engine Oils Operating in the Presence of Biodicesel FuelsCEC L-109Wear TestingExtreme Pressure PropertiesASTM D2783FalexASTM D2783FalexHFRRASTM D2783FalexASTM D4172Elastomer TestingKaSTM D4172		
Determination of Olefin Content of Gasolines by Supercritical Fluid ChromatographyASTM D6550MiscellaneousCompatibilityASTM D611, Method EDemusibility of OilsASTM D2711Emulsion CharacteristicsASTM D1401MiscibilityASTM D4682Water ReactionASTM D1094OxidationCorper CorrosionASTM D130Corrosion of Aluminum AlloyASTM D13440Corrosion TestASTM D1384Oxidation Stability of Jet FuelsASTM D1384Oxidation Stability of Jet FuelsASTM D1748TFOUTASTM D1748TFOUTASTM D1748TFOUTASTM D4742Stability of Lubricating Oils Used in Automotive Transmission by Artificial AgingHot Surface OxidationCEC L-85Low Temperature PumpabilityCEC L-105Oxidation Test for Engine Oils Operating in the Presence of Biodiesel FuelsCEC L-109Wear TestingExtreme Pressure PropertiesFalexASTM D2783FalexASTM D2783FalexASTM D472Elastomer TestingASTM D4172Elastomer TestingElastomer Testing		
Supercritical Fluid ChromatographyMiscellaneousCompatibilityAniline PointASTM D611, Method EDemusibility of OilsASTM D2711Emulsion CharacteristicsASTM D1401MiscibilityASTM D4682Water ReactionASTM D1094OxidationASTM D130Corper CorrosionASTM D130Corrosion of Aluminum AlloyASTM D1340Corrosion TestASTM D1384Oxidation Stability of Jet FuelsASTM D2722Rust PreventionASTM D2722Rust PreventionASTM D655Rust PreventionASTM D4742Stability of Lubricating Oils Used in Automotive Transmission by Artificial AgingCEC L-48Hot Surface OxidationCEC L-105Oxidation Test for Engine Oils Operating in the Presence of Biodiesel FuelsASTM D2733FalexASTM D2783ASTM D2783FalexASTM D2783FalexASTM D2783HFRRASTM D0079Wear PreventativeASTM D4172Elastomer TestingElastomer Testing		
CompatibilityASTM D611, Method EDemusibility of OilsASTM D2711Emulsion CharacteristicsASTM D1401MiscibilityASTM D4682Water ReactionASTM D1094OxidationCopper CorrosionASTM D130Corrosion of Aluminum AlloyASTM D13440Corrosion TestASTM D1384Oxidation Stability of Jet FuelsASTM D1384Oxidation Stability of Jet FuelsASTM D272Rust PreventionASTM D665Rust PreventionASTM D665Rust ProtectionASTM D1748TFOUTASTM D1748Hot Surface OxidationCEC L-48Low Temperature PumpabilityCEC L-105Oxidation Test for Engine Oils Operating in the Presence of Biodiesel FuelsCEC L-105Wear TestingExtreme Pressure PropertiesASTM D2783FalexASTM D2783FalexASTM D2783HFRRASTM D6079Wear PreventativeASTM D4172Elastomer TestingElastomer TestingElastomer Testing		ASTM D6550
Aniline PointASTM D611, Method EDemusibility of OilsASTM D2711Emulsion CharacteristicsASTM D1401MiscibilityASTM D4682Water ReactionASTM D1094OxidationCopper CorrosionASTM D130Corrosion of Aluminum AlloyASTM D1344Corrosion TestASTM D1384Oxidation Stability of Jet FuelsASTM D1384Oxidation Stability of Jet FuelsASTM D272Rust PreventionASTM D665Rust ProtectionASTM D1748TFOUTASTM D1748Stability of Lubricating Oils Used in Automotive Transmission by Artificial AgingCEC L-48Hot Surface OxidationCEC L-85Low Temperature PumpabilityCEC L-105Oxidation Test for Engine Oils Operating in the Presence of Biodiesel FuelsASTM D2783FalexASTM D2783FalexASTM D2783FalexASTM D4172Extreme Pressure PropertiesASTM D2783FalexASTM D4172Elastomer TestingElastomer Testing		
Demusibility of OilsASTM D2711Emulsion CharacteristicsASTM D1401MiscibilityASTM D4682Water ReactionASTM D1094OxidationCopper CorrosionASTM D130Corrosion of Aluminum AlloyASTM D4340Corrosion TestASTM D1384Oxidation Stability of Jet FuelsASTM D1384Oxidation Stability of Jet FuelsASTM D272Rust PreventionASTM D665Rust ProtectionASTM D1748TFOUTASTM D4742Stability of Lubricating Oils Used in Automotive Transmission by Artificial AgingHot Surface OxidationCEC L-48Low Temperature PumpabilityCEC L-105Oxidation Test for Engine Oils Operating in the Presence of Biodiesel FuelsCEC L-109Extreme Pressure PropertiesASTM D2783FalexASTM D2783HFRRASTM D6079Wear PreventativeASTM D4172Elastomer TestingElastomer Testing	Compatibility	
Emulsion CharacteristicsASTM D1401MiscibilityASTM D4682Water ReactionASTM D1094OxidationCopper CorrosionASTM D130Corrosion of Aluminum AlloyASTM D4340Corrosion TestASTM D1384Oxidation Stability of Jet FuelsASTM D873RBOTASTM D272Rust PreventionASTM D665Rust ProtectionASTM D1748TFOUTASTM D1748Stability of Lubricating Oils Used in Automotive Transmission by Artificial AgingCEC L-48Hot Surface OxidationCEC L-85Low Temperature PumpabilityCEC L-105Oxidation Test for Engine Oils Operating in the Presence of Biodiesel FuelsCEC L-109Wear TestingExtreme PropertiesASTM D2783FalexASTM D2333HFRRASTM D4172Elastomer TestingElastomer TestingElastomer Testing		ASTM D611, Method E
MiscibilityASTM D4682Water ReactionASTM D1094OxidationCopper CorrosionASTM D130Corrosion of Aluminum AlloyASTM D4340Corrosion TestASTM D1384Oxidation Stability of Jet FuelsASTM D1384Oxidation Stability of Jet FuelsASTM D272Rust PreventionASTM D665Rust ProtectionASTM D1748TFOUTASTM D4742Stability of Lubricating Oils Used in Automotive Transmission by Artificial AgingCEC L-48Hot Surface OxidationCEC L-85Low Temperature PumpabilityCEC L-105Oxidation Test for Engine Oils Operating in the Presence of Biodiesel FuelsCEC L-109Wear TestingASTM D2783FalexASTM D3233HFRRASTM D6079Wear PreventativeASTM D4172		ASTM D2711
Water ReactionASTM D1094Oxidation	Emulsion Characteristics	ASTM D1401
OxidationASTM D130Copper Corrosion of Aluminum AlloyASTM D4340Corrosion TestASTM D4340Corrosion TestASTM D1384Oxidation Stability of Jet FuelsASTM D873RBOTASTM D2272Rust PreventionASTM D665Rust ProtectionASTM D1748TFOUTASTM D4742Stability of Lubricating Oils Used in Automotive Transmission by Artificial AgingHot Surface OxidationCEC L-48Low Temperature PumpabilityCEC L-105Oxidation Test for Engine Oils Operating in the Presence of Biodiesel FuelsWear TestingExtreme Pressure PropertiesExtreme Pressure PropertiesASTM D2783FalexASTM D3233HFRRASTM D6079Wear PreventativeASTM D4172	Miscibility	ASTM D4682
Copper CorrosionASTM D130Corrosion of Aluminum AlloyASTM D4340Corrosion TestASTM D1384Oxidation Stability of Jet FuelsASTM D873RBOTASTM D2272Rust PreventionASTM D665Rust ProtectionASTM D1748TFOUTASTM D4742Stability of Lubricating Oils Used in Automotive Transmission by Artificial AgingCEC L-48Hot Surface OxidationCEC L-485Low Temperature PumpabilityCEC L-105Oxidation Test for Engine Oils Operating in the Presence of Biodiesel FuelsCEC L-109Wear TestingExtreme PropertiesASTM D2783FalexASTM D3233HFRRASTM D4172Elastomer TestingEastomer TestingEastomer Testing	Water Reaction	ASTM D1094
Corrosion of Aluminum AlloyASTM D4340Corrosion TestASTM D1384Oxidation Stability of Jet FuelsASTM D873RBOTASTM D2272Rust PreventionASTM D665Rust ProtectionASTM D1748TFOUTASTM D4742Stability of Lubricating Oils Used in Automotive Transmission by Artificial AgingCEC L-48Hot Surface OxidationCEC L-85Low Temperature PumpabilityCEC L-105Oxidation Test for Engine Oils Operating in the Presence of Biodiesel FuelsCEC L-109Wear TestingExtreme Pressure PropertiesFalexASTM D2783HFRRASTM D2333HFRRASTM D6079Wear PreventativeASTM D4172	Oxidation	
Corrosion TestASTM D1384Oxidation Stability of Jet FuelsASTM D873RBOTASTM D2272Rust PreventionASTM D655Rust ProtectionASTM D1748TFOUTASTM D4742Stability of Lubricating Oils Used in Automotive Transmission by Artificial AgingCEC L-48Hot Surface OxidationCEC L-85Low Temperature PumpabilityCEC L-105Oxidation Test for Engine Oils Operating in the Presence of Biodiesel FuelsCEC L-109Wear TestingExtreme PropertiesFalexASTM D2783HFRRASTM D6079Wear PreventativeASTM D4172Elastomer TestingElastomer Testing	Copper Corrosion	ASTM D130
Oxidation Stability of Jet FuelsASTM D873RBOTASTM D2272Rust PreventionASTM D2272Rust ProtectionASTM D665Rust ProtectionASTM D1748TFOUTASTM D4742Stability of Lubricating Oils Used in Automotive Transmission by Artificial AgingCEC L-48Hot Surface OxidationCEC L-85Low Temperature PumpabilityCEC L-105Oxidation Test for Engine Oils Operating in the Presence of Biodiesel FuelsCEC L-109Wear TestingExtreme Pressure PropertiesASTM D2783FalexASTM D3233HFRRASTM D6079Wear PreventativeASTM D4172Elastomer Testing	Corrosion of Aluminum Alloy	ASTM D4340
Oxidation Stability of Jet FuelsASTM D873RBOTASTM D2272Rust PreventionASTM D665Rust ProtectionASTM D1748TFOUTASTM D4742Stability of Lubricating Oils Used in Automotive Transmission by Artificial AgingCEC L-48Hot Surface OxidationCEC L-85Low Temperature PumpabilityCEC L-105Oxidation Test for Engine Oils Operating in the Presence of Biodiesel FuelsCEC L-109Wear TestingExtreme Pressure PropertiesASTM D2783FalexASTM D3233HFRRASTM D6079Wear PreventativeASTM D4172Elastomer Testing	Corrosion Test	ASTM D1384
RBOTASTM D2272Rust PreventionASTM D665Rust ProtectionASTM D1748TFOUTASTM D4742Stability of Lubricating Oils Used in Automotive Transmission by Artificial AgingCEC L-48Hot Surface OxidationCEC L-85Low Temperature PumpabilityCEC L-105Oxidation Test for Engine Oils Operating in the Presence of Biodiesel FuelsCEC L-109Wear TestingExtreme Pressure PropertiesASTM D2783FalexASTM D3233HFRRASTM D6079Wear PreventativeASTM D4172Elastomer Testing	Oxidation Stability of Jet Fuels	ASTM D873
Rust PreventionASTM D665Rust ProtectionASTM D1748TFOUTASTM D4742Stability of Lubricating Oils Used in Automotive Transmission by Artificial AgingCEC L-48Hot Surface OxidationCEC L-85Low Temperature PumpabilityCEC L-105Oxidation Test for Engine Oils Operating in the Presence of Biodiesel FuelsCEC L-109Wear TestingExtreme Pressure PropertiesASTM D2783FalexASTM D2783FalexHFRRASTM D6079Wear PreventativeASTM D4172Elastomer TestingI		
Rust ProtectionASTM D1748TFOUTASTM D4742Stability of Lubricating Oils Used in Automotive Transmission by Artificial AgingCEC L-48Hot Surface OxidationCEC L-85Low Temperature PumpabilityCEC L-105Oxidation Test for Engine Oils Operating in the Presence of Biodiesel FuelsCEC L-109Wear TestingExtreme Pressure PropertiesASTM D2783FalexASTM D2783ASTM D3233HFRRASTM D6079Wear PreventativeWear TestingEstime D4579FalexASTM D4172Elastomer TestingElastomer Testing	Rust Prevention	
TFOUTASTM D4742Stability of Lubricating Oils Used in Automotive Transmission by Artificial AgingCEC L-48Hot Surface OxidationCEC L-85Low Temperature PumpabilityCEC L-105Oxidation Test for Engine Oils Operating in the Presence of Biodiesel FuelsCEC L-109Wear TestingExtreme Pressure PropertiesASTM D2783FalexASTM D3233HFRRASTM D6079Wear PreventativeASTM D4172Elastomer Testing		
Stability of Lubricating Oils Used in Automotive Transmission by Artificial AgingCEC L-48Hot Surface OxidationCEC L-85Low Temperature PumpabilityCEC L-105Oxidation Test for Engine Oils Operating in the Presence of Biodiesel FuelsCEC L-109Wear TestingExtreme Pressure PropertiesASTM D2783FalexASTM D3233HFRRASTM D6079Wear PreventativeASTM D4172Elastomer Testing		
Automotive Transmission by Artificial AgingHot Surface OxidationCEC L-85Low Temperature PumpabilityCEC L-105Oxidation Test for Engine Oils Operating in the Presence of Biodiesel FuelsCEC L-109Wear TestingExtreme Pressure PropertiesASTM D2783FalexASTM D3233HFRRASTM D6079Wear PreventativeASTM D4172Elastomer Testing		
Hot Surface OxidationCEC L-85Low Temperature PumpabilityCEC L-105Oxidation Test for Engine Oils Operating in the Presence of Biodiesel FuelsCEC L-109Wear TestingImage: Cec L-109Extreme Pressure PropertiesASTM D2783FalexASTM D3233HFRRASTM D6079Wear PreventativeASTM D4172Elastomer TestingImage: Cec L-109		
Low Temperature PumpabilityCEC L-105Oxidation Test for Engine Oils Operating in the Presence of Biodiesel FuelsCEC L-109Wear TestingCEC L-109Extreme Pressure PropertiesASTM D2783FalexASTM D2783HFRRASTM D6079Wear PreventativeASTM D4172Elastomer TestingImage: Cec Leither Cec Leithe		CEC L-85
Oxidation Test for Engine Oils Operating in the Presence of Biodiesel FuelsCEC L-109Wear TestingImage: Cec L-109Extreme Pressure PropertiesASTM D2783FalexASTM D3233HFRRASTM D6079Wear PreventativeASTM D4172Elastomer Testing		
Presence of Biodiesel Fuels Wear Testing Extreme Pressure Properties ASTM D2783 Falex ASTM D3233 HFRR Wear Preventative Elastomer Testing		
Extreme Pressure PropertiesASTM D2783FalexASTM D3233HFRRASTM D6079Wear PreventativeASTM D4172Elastomer Testing		
Extreme Pressure PropertiesASTM D2783FalexASTM D3233HFRRASTM D6079Wear PreventativeASTM D4172Elastomer Testing	Wear Testing	
Falex ASTM D3233 HFRR ASTM D6079 Wear Preventative ASTM D4172 Elastomer Testing Image: Construction of the second s		ASTM D2783
HFRR ASTM D6079 Wear Preventative ASTM D4172	*	
Wear Preventative ASTM D4172 Elastomer Testing Image: Constraint of the second sec		
	Elastomer Testing	
The Evaluation of U_{II} – Elastomer Compatibility I_{II} (FC I = 117)	The Evaluation of Oil – Elastomer Compatibility	CEC L-112
Rubber Property – Effect of LiquidsASTM D471		

Test(s):	Test Method(s):
Miscellaneous (cont'd)	
Analysis of Aldehydes and Ketones in Exhaust by High	TIP 07C-006
Performance Liquid Chromatography	
Methanol and Ethanol Analysis by Capillary Column GC	TIP 07C-012
N ₂ O Measurement by Gas Chromatography –	TIP 07C-020
Electron Capture Detector	
N ₂ O Measurement by Fourier Transform Infrared (FTIR)	TIP 07C-022
Spectroscopy in Accordance with Part 1065	
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
Conductivity	
Conductivity	ASTM D2624
Density	
Density	ASTM D1298; ASTM D287; ASTM D4052
Flash Point	ASTIVI D+052
Flash and 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
Europing Doint	
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 D291
Ouin Content	ASTM D381

h

ASTM D2276-89 ASTM D6217 ASTM D5191 ASTM D5188 ASTM D4684 ASTM D2983 ASTM D5293 ASTM D6371 ASTM D4683 ASTM D4683 ASTM D445; ASTM D5967,
ASTM D6217 ASTM D5191 ASTM D5188 ASTM D4684 ASTM D2983 ASTM D5293 ASTM D6371 ASTM D4683
ASTM D6217 ASTM D5191 ASTM D5188 ASTM D4684 ASTM D2983 ASTM D5293 ASTM D6371 ASTM D4683
ASTM D5191 ASTM D5188 ASTM D4684 ASTM D2983 ASTM D5293 ASTM D6371 ASTM D4683
ASTM D5188 ASTM D4684 ASTM D2983 ASTM D5293 ASTM D6371 ASTM D4683
ASTM D5188 ASTM D4684 ASTM D2983 ASTM D5293 ASTM D6371 ASTM D4683
ASTM D5188 ASTM D4684 ASTM D2983 ASTM D5293 ASTM D6371 ASTM D4683
ASTM D4684 ASTM D2983 ASTM D5293 ASTM D6371 ASTM D4683
ASTM D2983 ASTM D5293 ASTM D6371 ASTM D4683
ASTM D2983 ASTM D5293 ASTM D6371 ASTM D4683
ASTM D5293 ASTM D6371 ASTM D4683
ASTM D6371 ASTM D4683
ASTM D4683
Annex A3 (VIT8)
CEC L-36
ASTM D6278
ASTM D2603; ASTM D5621
CEC L-14
CEC L-45
ASTM D86
ASTM D00 ASTM D972
ASTM D572
CEC L-40
<u>CEC L-40</u>
ASTM D4629
ASTM D5453
ASTM D5185
ASTM D3701; ASTM D4808
ASTIVI D3/01, ASTIVI D4000
ASTM D1840
CEC L-82
Page 4

Test(s):	Test Method(s):
<u>Spectroscopy</u> (cont'd)	
X-Ray Fluorescence	
Sulfur	ASTM D2622; ASTM D4294
FTIR	
Oxidation by FTIR	D7214
Thermal Analysis	
Heat of Combustion	
Heat of Combustion	
Heat of Combustion	ASTM D240; ASTM D4809
TGA	
TGA Soot in Oils	ASTM D5967, Annex A4
Wet Chemistry Measurements	
Gravemetric	
Ash	ASTM D482
Ash Sulfated	ASTM D874
Bomb Sulfur	ASTM D129
Carbon Residue	ASTM D189; ASTM D524
Chlorine	ASTM D808
Titrametric	
Acid Base Number	ASTM D974
Acid Number	ASTM D974 ASTM D3339; ASTM D664
Base Number	ASTM D5559; ASTM D664 ASTM D2896; ASTM D4739
Nitrogen	ASTM D2896; ASTM D4739 ASTM D3228
Water by Karl Fisher	ASTM D3228 ASTM D6304
water by Kall Fisher	AS1M D0304
Volumetric	
Free Water	ASTM D4176
Insolubles	ASTM D893
Water and Sediment	ASTM D1796; ASTM D2709

h





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 17025:2017 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 3rd day of July 2024.

Mr. Trace McInturff, Vice President, Accreditation Services For the Accreditation Council Certificate Number 0702.04 Valid to May 31, 2026