Testing Services – *Electric Vehicle Lubricants and Fluids*

Savant Labs

Driving Change
Electric Vehicle (EV) Lubricant and Fluid Testing Services

The transportation industry and its fluids and greases are evolving and Savant Labs is at the forefront of electric vehicle drivetrain fluids testing.

As leaders in lubrication testing and research, Savant Labs can help you prepare for the future as you develop fluids that meet the expanding EV industry requirements.

	Method	Test Description
•	ASTM D92	Flash and Fire Points by Cleveland Open Cup
•	ASTM D97	Pour Point
•	ASTM D130	Copper Strip Corrosion
	ASTM D217	Cone Penetration
•	ASTM D445	Kinematic Viscosity at 100°C
•	ASTM D664	Acid Number
	ASTM D665	Rust Prevention 4 and 24 Hours (Method A or B)
	ASTM D877	Dielectric Breakdown Voltage
•	ASTM D892	Foaming Characteristics of Lubricating Oils
	ASTM D924	Dissipation/Power Factor
	ASTM D1177	Freeze Point
	ASTM D1264	Water Washout (Single Temperature)
	ASTM D1331	Surface Tension
	ASTM D1478	Low-Temperature Torque - Grease
	ASTM D1742	Oil Separation, Storage of Greases
	ASTM D1831	Roll Stability of Grease
	ASTM D2265	Dropping Point
	ASTM D2266	Four Ball Wear (Grease)
•	ASTM D2270	Viscosity Index (Includes D445 at 40°C and 100°C)
	ASTM D2596	Four-Ball Extreme Pressure Up to 400 kg.
	ASTM D2596	Four-Ball Extreme Pressure Above 400 kg.
	ASTM D2624	Electrical Conductivity of Aviation and Distillate Fuels
	ASTM D2717	Thermal Conductivity - Single Temperature
•	ASTM D2983	Brookfield Viscosity, +20°C to -60°C (Per Temperature)
	ASTM D3336	High Temperature Bearing Performance Up to 600 Hours
	ASTM D3427	Air Release, Gas Bubble Separation
•	ASTM D4048	Copper Strip Corrosion, Grease
	ASTM D4052	Specific Gravity (Includes API Gravity)
	ASTM D4170	Fretting Wear, Grease
	ASTM D4289	Elastomer Compatibility NBR L and CR Grease
	ASTM D4289	Elastomer Compatibility NBR L or CR Grease
•	ASTM D4683	High Temperature High Shear / TBS Viscosity at 150°C
•	ASTM D4684	TP-1 MRV Viscosity, Single Temperature
	ASTM D4693	Low-Temperature Torque, Grease
•	ASTM D4951	Elemental Analysis by Inductively Coupled Plasma, Wear Metals
	ASTM D5182	FZG Gear Test - Up to 12 and 14 Stages
•	ASTM D5185	Elemental Analysis by Inductively Coupled Plasma (No S)
•	ASTM D5293	Cold Cranking Simulator, Single Temperature
	ASTM D5706	Extreme Pressure, High-Frequency, Linear Oscillation, SRV
•	ASTM D6082	Foaming, Sequence IV (Specify Option A if Required)
	ASTM D6138	Corrosion-Preventive, Dynamic Wet Conditions (Emcor Test)
	ASTM D6138	Corrosion-Preventive, Dynamic Wet Conditions (Emcor Test - 2 Bearings)
	ASTM D6184	Oil Separation from Lubricating Grease
•	ASTM D6304	Water by Karl Fischer
•	ASTM D6417	Simulated Distillation by Gas Chromatography
•	ASTM D6443	Chlorine by XRF
	ASTM D7594	Fretting Wear, High Hertzian Contact, High-Frequency, Linear-Oscillation, SRV
	ASTM D8544	Conductive Deposit Test (CDT), 150°C at 500 and 1000 Hours - Other test durations and temperatures up to 180°C available upon request
	ASTM E1269	Specific Heat Capacity by Differential Scanning Calorimetry
	CEC L-45-99 mod. & D445	KRL Shear 20 Hours + 1 Temperature pre & post shear KV
	CEC L-48	Oxidation Stability of Lubricating Oils by Artificial Aging
	SAVLAB EV-WCT	Wire Corrosion Test (WCT), 130ºC, 72 Hours, Other test durations and temperatures up to 180°C available upon request

• *Gold bullets indicate ISO/IEC 17025:2017 Accreditation*

WCT : Savant Labs, in partnership with Lubrizol, is exclusive test provider in North America.
CDT: Equipment developed and patented by Tannas Co.

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Testing Properties of EV Lubricants and Fluids

The electric vehicle (EV) powertrain has fewer moving parts, incorporates different materials, and operates under conditions that are, in many ways, different than those of ICE vehicles.

Developing and testing fluids engineered to meet the specific requirements for electric vehicles are critical to providing protection and assurance. The lubrication and cooling demands of electrical systems present new challenges to fluid formulations, primarily copper corrosion and the potential for conductive deposit formation in EV powertrains.

Savant Labs run a full slate of fluid property testing and can perform these crucial tests that have been uniquely developed to address these emerging concerns.

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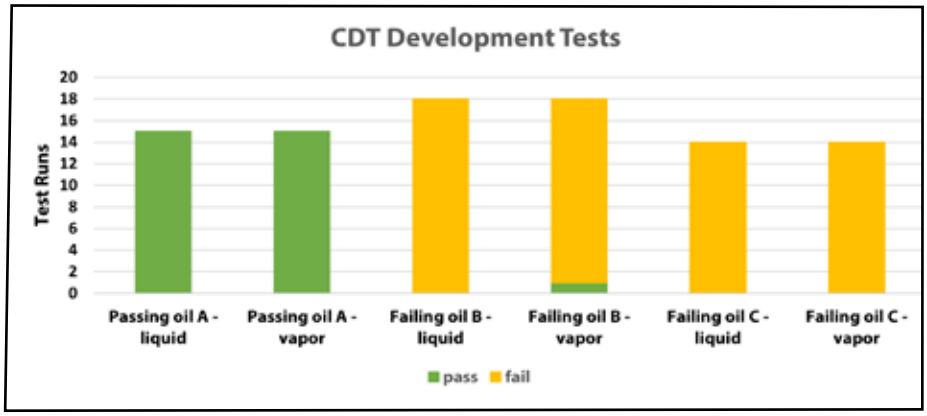
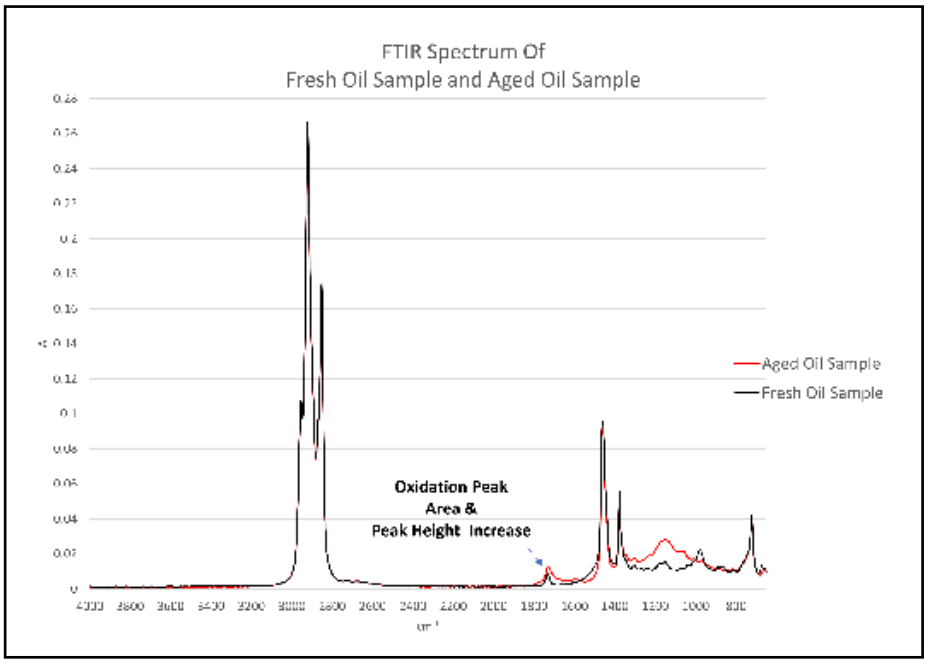
ASTM D8544 Conductive Deposit Test (CDT): Reveals destructive conductive deposits forming from the chemical reaction of the lubricating fluid and copper at elevated temperatures under low voltage, electrified conditions, both in the fluid and vapor state.



Wire Corrosion Test (WCT): Identifies the rate of corrosion and depletion of copper on the test wire in both fluid and vapor states.

CEC L-48 Oxidation Stability of Lubricating Oils by Artificial Aging: Assesses resistance of lubricants to high temperature oxidation and the ability to resist oil degradation and sludging.



The degree of oxidation is measured by FTIR in accordance with ASTM D7214 which quantifies the Peak Area Increase (PAI) in the carbonyl region.

Form No. 24-5