Deutsche Akkreditierungsstelle

Annex to the Partial Accreditation Certificate D-PL-18436-01-01 according to DIN EN ISO/IEC 17025:2018

Valid from: **09.03.2023**

Date of issue: 09.03.2023

This annex is a part of the accreditation certificate D-PL-18436-01-00.

Holder of partial accreditation certificate:

ISP Salzbergen GmbH & Co. KG
Neuenkirchener Straße 7, 48499 Salzbergen

The testing laboratory meets the requirements of DIN EN ISO/IEC 17025:2018 to carry out the conformity assessment activities listed in this annex. The testing laboratory meets additional legal and normative requirements, if applicable, including those in relevant sectoral schemes, provided that these are explicitly confirmed below.

The management system requirements of DIN EN ISO/IEC 17025 are written in the language relevant to the operations of testing laboratories and confirm generally with the principles of DIN EN ISO 9001.

Tests in the fields:

chemical and physical-chemical testing of mineral oil and related products; fuels, lubricating oils e.g. used and fresh automotive engine oils (automotive oil, automotive gear oil), grease K; engine test methods, exhaust emission measurement

Within the given test fields the testing laboratory is permitted, without being required to inform and obtain prior approval from DAkkS, the following: usage of different versions of standard test methods granted here.
The testing laboratory maintains a current list of all testing methods within the flexible scope of accreditation.

Abbreviations used: see last page

1. Lubricating Oils, Fresh and Used Automotive Engine Oils

1.1 Automotive Oils

Test Method	Title	Process-Matrix-Number[+)]
	Kinematic Viscosity	**5.1.54**
DIN 51562-1 1999-01 Corrigendum 1 2018-11	Viscometry - Measurement of kinematic viscosity by means of the Ubbelohde viscometer - Part 1: Viscometer specification and measurement procedure	
ASTM D445 2019	Standard Test Method for Kinematic Viscosity of Transparent and Opaque Liquids (the Calculation of Dynamic Viscosity)	
ASTM D446 2012	Standard Specifications and Operating Instructions for Glass Capillary Viscometers	
DIN EN ISO 3104 1999-12	Petroleum products - Transparent and opaque liquids - Determination of kinematic viscosity and calculation of dynamic viscosity	**5.1.54**
ISO 3104 2020-09	Petroleum products - Transparent and opaque liquids - Determination of kinematic viscosity and calculation of dynamic viscosity	
ISO 3105 1994-12	Glass capillary kinematic viscometers - Specifications and operating instructions	**5.1.54**
DIN 51659-1 2017-02	Lubricants - Test methods - Part 1: Determination of the kinematic viscosity of used lubricating oils by glass capillary viscometer	
	Dynamic Viscosity	
ASTM D7042 2021	Standard Test Method for Dynamic Viscosity and Density of Liquids by Stabinger Viscometer (and the Calculation of Kinematic Viscosity)	
DIN 51659-2 2017-02	Lubricants - Test methods - Part 2: Determination of the kinematic viscosity of used lubricating oils by Stabinger viscometer	

Test Method	Title	Process-Matrix-Number[+)]
	Apparent Viscosity	**5.1.173**
DIN 51377 2003-10	Testing of lubricants - Determination of the apparent viscosity of motor oils at low temperature from -5 °C to -35 °C - Using the cold-cranking simulator *(withdrawn standard)*	
SAE J300 2015-01	Engine oil viscosity classification	
ASTM D5293 2017a	Standard Test Method for Apparent Viscosity of Engine Oils between -5 °C and -30 °C using the Cold Cranking Simulator	**5.1.173**
	HTHS-Viscosity	**5.1.142**
CEC L-36-90 2015-04	Measurement of Lubricant Dynamic Viscosity under Conditions of High Shear (HTHS / 150 °C)	**5.1.142**
ASTM D4741 2018	Standard Test Method for Measuring Viscosity at High Temperature and High Shear Rate by Tapered-Plug Viscometer	
ASTM D4683 2017	Standard Test Method for Measuring Viscosity of New and Used Engine Oils at High Shear Rate and High Temperature by Tapered Bearing Simulator Viscometer at 150 °C	
	Shear Stability	**5.1.128**
CEC L-14-93 2019-07	Evaluation of the Mechanical Shear Stability of Lubricating Oils containing Polymers (Fuel Injection Pump)	**5.1.128**
ASTM D7109 2018	Standard Test Method for Shear Stability of Polymer Containing Fluids Using a European Diesel Injector Apparatus at 30 and 90 Cycles	
	Viscosity Index	**5.1.171**
DIN ISO 2909 2004-08 Corrigendum 1 2005-01	Petroleum products - Calculation of viscosity index from kinematic viscosity	**5.1.171**

Test Method	Title	Process-Matrix-Number[+)]
ASTM D2270 2010	Standard Practice for Calculating Viscosity Index from Kinematic Viscosity at 40 °C and 100 °C	
	Evaporation Loss	**5.1.141**
DIN 51581-1 2011-09	Testing of petroleum products - Determination of evaporation loss - Part 1: Noack test	**5.1.141**
CEC L-40-93 2016-10	Evaporation Loss of Lubricating Oils using the Noack Evaporative Tester	**5.1.141**
ASTM D5800 2018a	Standard Test Method for Evaporation Loss of Lubricating Oil by the Noack Method	
	Pour Point	**5.1.79**
DIN EN ISO 3016 2019-09	Petroleum products - Determination of pour point	**5.1.79**
ISO 3016 2019-04	Petroleum products - Determination of pour point	
ASTM D97 2017b	Standard Test Method for Pour Point of Petroleum Products	**5.1.79**
	Flash Point (COC)	**5.1.28**
DIN EN ISO 2592 2018-01	Petroleum products - Determination of flash and fire points - Cleveland open cup method	**5.1.28**
ASTM D92 2018	Standard Test Method for Flash and Fire Points by Cleveland Open Cup	**5.1.28**
	Total Base Number	**5.1.70**
DIN ISO 3771 1985-04	Petroleum products - total base number - perchloric acid potentiometric titration method *(withdrawn standard)*	**5.1.70**

Test Method	Title	Process-Matrix-Number[+)]
ISO 3771 2011-09	Petroleum products - Determination of base number - Perchloric acid potentiometric titration method	
ASTM D2896 2015	Standard Test Method for Base Number of Petroleum Products by Potentiometric Perchloric Acid Titration	
DIN 51639-1 2014-11	Testing of lubricants - Test methods - Part 1: Determination of total base number	
	Neutralization number	
DIN ISO 6618 2015-07	Petroleum products and lubricants - Determination of acid or base number - Colour-indicator titration method	
ISO 6618 1997-02	Petroleum products and lubricants - Determination of acid or base number - Coulour-indicator titration method	
	Colour	**5.1.26**
DIN ISO 2049 2001-06	Petroleum products - Determination of colour (ASTM scale)	
ASTM D1500 2012	Standard Test Method for ASTM Colour of Petroleum Products (ASTM Colour Scale)	
	Density	**5.1.110**
DIN 51757 2011-01	Testing of mineral oils and related materials - Determination of density- Method 3	**5.1.110**
DIN EN ISO 12185 1997-11	Crude petroleum and petroleum products - Determination of density - Oscillating U-tube method	
ASTM D4052 2018a	Standard Test Method for Density and Relative Density of Liquids by Digital Density Meter	

Test Method	Title	Process-Matrix-Number[+)]
	Additive Elements	
DIN 51391-3 2004-12	Testing of lubricants - Determination of the content of additive elements - Part 3: Direct determination of Ca, Mg, Zn and Ba by optical emission spectral analysis with inductively coupled plasma (ICP OES) (withdrawn)	**5.1.161**
DIN 51399-1 2017-02	Testing of lubricants - Determination of elements content in additives, wear and other contaminations - Part 1: Direct determination by optical emission spectral analysis with inductively coupled plasma (ICP OES)	
DIN 51399-2 2010-01	Testing of lubricants - Determination of elements content of additives, wear and other contaminations - Part 2: Wavelength dispersive X-ray fluorescence spectrometry (XRF)	
ASTM D4951 2014	Standard Test Method for Determination of Additive Elements in Lubricating Oil by Inductively Coupled Plasma Atomic Emission Spectrometry	
ASTM D5185 2018	Standard Test Method for Determination of Additive Elements, Wear Metals, and Contaminants in Used Lubricating Oil and Determination of Selected Elements in Base Oils by Inductively Coupled Plasma Atomic Emission Spectrometry (ICP-AES)	
	Phosphorus Content	**5.1.156**
DIN 51363-3 2008-08	Testing of petroleum products - Determination of phosphorus content of lubricating oils and additives - Part 3: Direct determination by optical emission spectral analysis with inductively coupled plasma (ICP OES)	**5.1.156**
DIN 51399-1 2017-02	Testing of lubricants - Determination of elements content in additives, wear and other contaminations - Part 1: Direct determination by optical emission spectral analysis with inductively coupled plasma (ICP OES)	

Test Method	Title	Process-Matrix-Number[+)]
ASTM D4951 2014	Standard Test Method for Determination of Additive Elements in Lubricating Oil by Inductively Coupled Plasma Atomic Emission Spectrometry	
ASTM D5185 2018	Standard Test Method for Determination of Additive Elements, Wear Metals, and Contaminants in Used Lubricating Oil and Determination of Selected Elements in Base Oils by Inductively Coupled Plasma Atomic Emission Spectrometry (ICP-AES)	
	Chlorine and Bromine Content	**5.1.180**
DIN ISO 15597 2006-01	Petroleum and related products - Determination of chlorine and bromine content - Wavelength-dispersive X-ray fluorescence spectrometry	
	IR-Spectrum	**5.1.166**
DIN 51451 2004-09	Testing of petroleum products and related products - Analysis by infrared spectrometry - General working principles	**5.1.166**
	Nitrogen Determination	
ASTM D4629 2017	Standard Test Method for Trace Nitrogen in Liquid Hydrocarbons by Syringe/Inlet Oxidative Combustion and Chemiluminescence Detection	
ASTM D5762 2018a	Standard Test Method for Nitrogen in Liquid Hydrocarbons, Petroleum and Petroleum Products by Boat-Inlet Chemiluminescence	
	Sulfated Ash	**5.1.93**
DIN 51575 2016-06	Testing of mineral oils - Determination of sulfated ash	**5.1.93**
ASTM D874 2013a	Standard Test Method for Sulfated Ash from Lubricating Oils and Additives	
ISO 3987 2010-11	Petroleum products - Determination of sulfated ash in lubricating oils and additives	

Test Method	Title	Process-Matrix-Number[+)]
	Foaming Characteristics	**5.1.124**
ASTM D892 2018	Standard Test Method for Foaming Characteristics of Lubricating Oils	**5.1.124**
ISO 6247 1998-06 Corrigedum 1 1999-09	Petroleum products - Determination of foaming characteristics of lubricating oils	
	Carbon Residue	
DIN EN ISO 10370 2015-03	Petroleum products - Determination of carbon residue - Micro method	**5.1.57**
ASTM D4530 2015	Standard Test Method for Determination of Carbon Residue (Micro Method)	
	MRV	**5.1.120**
ASTM D4684 2018	Standard Test Method for Determination of Yield Stress and Apparent Viscosity of Engine Oils at Low Temperature	**5.1.120**
	Water Content	
DIN ISO 3733 2003-02	Petroleum products and bituminous materials - Determination of water - Distillation method	**5.1.106**
DIN EN ISO 12937 2002-03	Petroleum products - Determination of water - Coulometric Karl Fischer titration method	**5.1.106**
	Fuel Content	**5.1.160**
DIN 51380 2019-04	Testing of lubricants - test for fuel diluent in used automotive engine oils - gas chromatography method	**5.1.160**

Test Method	Title	Process-Matrix-Number[+)]
ASTM D2887 2019	Standard Test Method for Boiling Range Distribution of Petroleum Fractions by Gas Chromatography	
DIN 51435 2010-03	Testing of petroleum products - Determination of boiling range distribution - Gas chromatography method	
	Wear Elements	**5.1.161**
DIN 51396-1 2005-08	Testing of lubricants - Determination of wear elements - Part 1: Direct determination by inductively coupled plasma optical emission spectroscopy (ICP-OES) (*withdrawn)*	**5.1.161**
ASTM D5185 2018	Standard Test Method for Determination of Additive Elements, Wear Metals, and Contaminants in Used Lubricating Oil and Determination of Selected Elements in Base Oils by Inductively Coupled Plasma Atomic Emission Spectrometry (ICP-AES)	
DIN 51399-1 2017-02	Testing of lubricants - Determination of elements content in additives, wear and other contaminations - Part 1: Direct determination by optical emission spectral analysis with inductively coupled plasma (ICP OES)	
DIN 51399-2 2010-01	Testing of lubricants - Determination of elements content of additives, wear and other contaminations - Part 2: Wavelength dispersive X-ray fluorescence spectrometry (XRF)	
	Elastomer Compatibility	**5.1.219/ 5.1.253**
CEC L-112-16 2018-06	The Evaluation of Oil - Elastomer Compatibility	**5.1.253**
	Foaming characteristics at high Temperature (Seq. IV)	**5.1.179**
ASTM D6082 2012	Standard Test Method for High Temperature Foaming Characteristics of Lubricating Oils	**5.1.179**

Test Method	Title	Process-Matrix-Number[+)]
	Acid Number	**-.-.-**
ASTM D664 2018e2	Standard Test Method for Acid Number of Petroleum Products by Potentiometric Titration	
ISO 6619 1988-12	Petroleum products and lubricants - neutralization number - potentiometric titration method	
	Base Number	**5.1.370**
ASTM D4739 2017	Standard Test Method for Base Number Determination by Potentiometric Titration	**5.1.370**
ASTM D6594 2014	Standard Test Method for Evaluation of Corrosiveness of Diesel Engine Oil at 135 °C	**5.1.106**
	Soot Content	**-.-.-**
DIN 51452 1994-01	Testing of lubricants - determination of the soot content in used Diesel engine oils - infrared spectrometry	
CEC L-82-97 2018-04	Spectrometric Determination of Soot in used Engine Oil	
	Oxidation Resistance	**-.-.-**
GFC LU-43-A-11-ind2 2014-12	Diesel motor oils ageing by oxidation in the presence of (bio) fuel	
CEC L-105-12 2019-07	Low Temperature Pumpability	
CEC L-109-14 2019-08	Oxidation Test For Engine Oils Operating In The Presence Of Biodiesel Fuel	

Test Method	Title	Process-Matrix-Number[+)]
	Oxidation / Nitration (IR)	-.-.-
DIN 51453 2004-10	Testing of lubricants - Determination of oxidation and nitration of used motor oils - Infrared spectrometric method	
	FAME and Vegetable Oil content / Simulated Distillation	-.-.-
DIN-51454 2015-10	Testing of lubricants - Determination of low boiling components in used engine oils - Capillary gas chromatography	
	Durability Test	-.-.-
VDA 675 301 1992-12	Elastomere - components in motor vehicles - Durability test method - exposure to test oils	
DIN 53504 2017-03	Testing of rubber and eleastomeres - determination of tensile strength at break, tensile stress at yield, elongation at break and stress values in a tensile test	
ASTM D412 2016	Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers - Tension	
DIN ISO 1817 2016-11	Rubber, vulcanized or thermoplastic - Determination of the effect of liquids	
ISO 1817 2015-02	Rubber, vulcanized or thermoplastic - Determination of the effect of liquids	
DIN EN ISO 868 2003-10	Plastics and ebonite - Determination of indentation hardness by means of a durometer (Shore hardness)	
ASTM D2240 2015	Standard Test Method for Rubber Property - Durometer Hardness	
DIN ISO 48-2 2021-02	Rubber, vulcanized or thermoplastic - Determination of hardness - Part 2: Hardness between 10 IRHD and 100 IRHD	
ISO 48-2 2018-08	Rubber, vulcanized or thermoplastic - Determination of hardness - Part 2: Hardness between 10 IRHD and 100 IRHD	

Test Method	Title	Process-Matrix-Number[+)]
DIN ISO 48-4 2021-02	Rubber, vulcanized or thermoplastic - Determination of hardness - Part 4: Indentation hardness by durometer method (Shore hardness)	
ISO 48-4 2018-08	Rubber, vulcanized or thermoplastic - Determination of hardness - Part 4: Indentation hardness by durometer method (Shore hardness)	
ASTM D7216 2018	Standard Test Method for Determining Automotive Engine Oil Compatibility with Typical Seal Elastomers	
	Kinematic Viscosity	**-.-.-**
CEC L-83-97 2018-04	Measurement of Kinematic Viscosity at 100 °C of Soot containing Engine Oils	
	Dynamic Viscosity	
ASTM D5133 2015	Standard Test Method for Low Temperature, Low Shear Rate, Viscosity/Temperature Dependence of Lubricating Oils Using a Temperature-Scanning Technique	
	Element contents in oils and greases Sulfur (XRF)	
DIN EN ISO 14596 2007-12	Petroleum products - Determination of sulfur content - Wavelength-dispersive X-ray fluorescence spectrometry	
	Deposits	**-.-.-**
DIN 51535 2013-10	Testing of petroleum products - Determination of deposition forming tendency in exhaust turbochargers and intercoolers of supercharged diesel engines	
ASTM D7097 2016a	Standard Test Method for Determination of Moderately High Temperature Piston Deposits by Thermo-Oxidation Engine Oil Simulation Test-TEOST MHT	
CEC L-85-99 2019-05	Hot Surface Oxidation Test (PDSC)	

1.2 Automotive Gear Oils

Test Method	Title	Process-Matrix-Number[+)]
	Kinematic Viscosity	**5.2.54**
DIN 51562-1 1999-01 Corrigendum 1 2018-11	Viscometry - Measurement of kinematic viscosity by means of the Ubbelohde viscometer - Part 1: Viscometer specification and measurement procedure	**5.2.54**
ASTM D445 2019	Standard Test Method for Kinematic Viscosity of Transparent and Opaque Liquids (the Calculation of Dynamic Viscosity)	**5.2.54**
ASTM D446 2012	Standard Specifications and Operating Instructions for Glass Capillary Viscometers	
DIN 51659-1 2017-02	Lubricants - Test methods - Part 1: Determination of the kinematic viscosity of used lubricating oils by glass capillary viscometer	
DIN EN ISO 3104 1999-12	Petroleum products - Transparent and opaque liquids - Determination of kinematic viscosity and calculation of dynamic viscosity	
ISO 3104 2020-09	Petroleum products - Transparent and opaque liquids - Determination of kinematic viscosity and calculation of dynamic viscosity	
ISO 3105 1994-12	Glass capillary kinematic viscometers - Specifications and operating instructions	
	Dynamic Viscosity	
ASTM D7042 2021	Standard Test Method for Dynamic Viscosity and Density of Liquids by Stabinger Viscometer (and the Calculation of Kinematic Viscosity)	
DIN 51659-2 2017-02	Lubricants - Test methods - Part 2: Determination of the kinematic viscosity of used lubricating oils by Stabinger viscometer	

Test Method	Title	Process-Matrix-Number[+)]
	Apparent Viscosity	**5.2.103**
ASTM D2983 2019	Standard Test Method for Low-Temperature Viscosity of Lubricants Measured by Brookfield Viscometer	**5.2.229**
DIN 51398 1983-07	Testing of lubricants; procedure for measurement of low temperature apparent viscosity by means of the Brookfield viscometer (liquid bath method)	**5.2.103**
	Viscosity Index	**5.2.171**
DIN ISO 2909 2004-08 Corrigendum 1 2005-01	Petroleum products - Calculation of viscosity index from kinematic viscosity	5.2.171
ASTM D2270 2010	Standard Practice for Calculating Viscosity Index from Kinematic Viscosity at 40 °C and 100 °C	
	Pour Point	**5.2.79**
DIN EN ISO 3016 2019-09	Petroleum products - Determination of pour point	**5.2.79**
ISO 3016 2019-04	Petroleum products - Determination of pour point	
ASTM D97 2017b	Standard Test Method for Pour Point of Petroleum Products	**5.2.79**
	Flash Point	
DIN EN ISO 2592 2018-01	Petroleum products - Determination of flash and fire points - Cleveland open cup method	**5.2.28**
ASTM D 92 2018	Standard Test Method for Flash and Fire Points by Cleveland Open Cup	**5.2.28**
	Colour	**5.2.26**
DIN ISO 2049 2001-06	Petroleum products - Determination of colour (ASTM scale)	**5.2.26**

Test Method	Title	Process-Matrix-Number[+)]
ASTM D 1500 2012	Standard Test Method for ASTM Color of Petroleum Products (ASTM Color Scale)	**5.2.26**
	Density	**5.2.110**
DIN 51757 2011-01	Testing of mineral oils and related materials - Determination of density- Method 3	**5.2.22**
DIN EN ISO 12185 1997-11	Crude petroleum and petroleum products - Determination of density - Oscillating U-tube method	**5.2.22**
ASTM D 4052 2018a	Standard Test Method for Density and Relative Density of Liquids by Digital Density Meter	
	Foaming Characteristics	
ASTM D892 2018	Standard Test Method for Foaming Characteristics of Lubricating Oils	5.2.124
ISO 6247 1998-06 Corrigendum 1 1999-09	Petroleum products - Determination of foaming characteristics of lubricating oils	
	Neutralization Number	
DIN 51558-1 1979-07	Testing of Mineral Oils; Determination of the Neutralization Number, Colour-indicator titration	**5.2.70**
DIN ISO 6618 2015-07	Petroleum products and lubricants - Determination of acid or base number - Colour-indicator titration method	
ISO 6618 1997-02	Petroleum products and lubricants - Determination of acid or base number - Coulour-indicator titration method	
	Sulfur (XRF)	**5.2.89**
DIN EN ISO 14596 2007-12	Petroleum products - Determination of sulfur content - Wavelength-dispersive X-ray fluorescence spectrometry	**5.2.89**

Test Method	Title	Process-Matrix-Number[+)]
	Element contents in oils and greases	
DIN ISO 15597 2006-01	Petroleum and related products - Determination of chlorine and bromine content - Wavelength-dispersive X-ray fluorescence spectrometry	**-.-.-**
	Nitrogen Determination	
ASTM D4629 2017	Standard Test Method for Trace Nitrogen in Liquid Hydrocarbons by Syringe/Inlet Oxidative Combustion and Chemiluminescence Detection	
ASTM D5762 2018a	Standard Test Method for Nitrogen in Liquid Hydrocarbons, Petroleum and Petroleum Products by Boat-Inlet Chemiluminescence	
	Sulfated Ash	**5.2.93**
DIN 51575 2016-06	Testing of mineral oils - Determination of sulfated ash	**5.2.93**
ASTM D874 2013a	Standard Test Method for Sulfated Ash from Lubricating Oils and Additives	
ISO 3987 2010-11	Petroleum products - Determination of sulfated ash in lubricating oils and additives	**5.2.93**
	Additive Elements	
DIN 51391-3 2004-12	Testing of lubricants - Determination of the content of additive elements - Part 3: Direct determination of Ca, Mg, Zn and Ba by optical emission spectral analysis with inductively coupled plasma (ICP OES) (withdrawn)	**5.2.161**
DIN 51399-1 2017-02	Testing of lubricants - Determination of elements content in additives, wear and other contaminations - Part 1: Direct determination by optical emission spectral analysis with inductively coupled plasma (ICP OES)	**5.2.161**

Test Method	Title	Process-Matrix-Number[+)]
DIN 51399-2 2010-01	Testing of lubricants - Determination of elements content of additives, wear and other contaminations - Part 2: Wavelength dispersive X-ray fluorescence spectrometry (XRF)	
ASTM D4951 2014	Standard Test Method for Determination of Additive Elements in Lubricating Oil by Inductively Coupled Plasma Atomic Emission Spectrometry	
ASTM D5185 2018	Standard Test Method for Determination of Additive Elements, Wear Metals, and Contaminants in Used Lubricating Oil and Determination of Selected Elements in Base Oils by Inductively Coupled Plasma Atomic Emission Spectrometry (ICP-AES)	
	Water Content	**5.2.106**
DIN ISO 3733 2003-02	Petroleum products and bituminous materials - Determination of water - Distillation method	5.2.106
DIN EN ISO 12937 2002-03	Petroleum products - Determination of water - Coulometric Karl Fischer titration method	5.2.106
	Steel Corrosion	**5.2.174**
DIN ISO 7120 2000-05 Corrigendum 1 2007-06	Petroleum products and lubricants - Petroleum oils and other fluids - Determination of rust-preventing characteristics in the presence of water	5.2.174
ASTM D665 2014	Standard Test Method for Rust-Preventing Characteristics of Inhibited Mineral Oil in the Presence of Water	
	Corrosion Test	**5.2.60**
DIN EN ISO 2160 1999-04	Petroleum products - Corrosiveness to copper - Copper strip test	5.2.60
ASTM D130 2019	Standard Test Method for Corrosiveness to Copper from Petroleum Products by Copper Strip Test	

Test Method	Title	Process-Matrix-Number[+)]
	Shear Stability	**5.2.136**
CEC L-45-99 2019-04	Viscosity Shear Stability of Transmission Lubricants (Taper Roller Bearing Rig)	
	Total Base Number	**5.2.70**
DIN ISO 3771 1985-04	Petroleum products; total base number - perchloric acid potentiometric titration method (withdrawn standard)	**5.2.70**
ISO 3771 2011-09	Petroleum products - Determination of base number - Perchloric acid potentiometric titration method	**5.2.70**
ASTM D2896 2015	Standard Test Method for Base Number of Petroleum Products by Potentiometric Perchloric Acid Titration	**5.2.70**
DIN 51639-1 2014-11	Testing of lubricants - Test methods - Part 1: Determination of total base number	
	i-pH-Wert	
ASTM D7946 2019	Standard Test Method for Initial pH (i-pH)-Value of Petroleum Products	
	Phosphorus Content	**5.2.156**
DIN 51363-3 2008-08	Testing of petroleum products - Determination of phosphorus content of lubricating oils and additives - Part 3: Direct determination by optical emission spectral analysis with inductively coupled plasma (ICP OES)	**5.2.156**
DIN 51399-1 2017-02	Testing of lubricants - Determination of elements content in additives, wear and other contaminations - Part 1: Direct determination by optical emission spectral analysis with inductively coupled plasma (ICP OES)	
ASTM D4951 2014	Standard Test Method for Determination of Additive Elements in Lubricating Oil by Inductively Coupled Plasma Atomic Emission Spectrometry	

Test Method	Title	Process-Matrix-Number[+)]
ASTM D5185 2018	Standard Test Method for Determination of Additive Elements, Wear Metals, and Contaminants in Used Lubricating Oil and Determination of Selected Elements in Base Oils by Inductively Coupled Plasma Atomic Emission Spectrometry (ICP-AES)	
	Boron Content	
DIN 51443-2 2012-01	Testing of lubricants - Determination of the boron content - Part 2: Direct determination by optical emission spectral analysis with inductively coupled plasma (ICP OES)	**5.2.162**
	Oxidation Stability	**5.2.221**
CEC L-48-A-00 2018-06	Oxidation Stability of Lubricating Oils used in Automotive Transmissions by Artificial Ageing	**5.2.221**
	FZG-Tests	
DIN ISO 14635-1 2006-05 Corrigendum 1 2007-03	Gears - FZG test procedures - Part 1: FZG test method A/8,3/90 for relative scuffing load-carrying capacity of oils	**5.2.172**
CEC L-07-95 2014-09	Load Carrying Capacity Test for Transmission Lubricants (FZG Gear Machine)	**5.2.128**
CEC L-84-02 2018-04	FZG Scuffing Load Carrying Capacity Test for High EP Oils	
	Wear Elements	**5.2.161**
DIN 51399-1 2017-02	Testing of lubricants - Determination of elements content in additives, wear and other contaminations - Part 1: Direct determination by optical emission spectral analysis with inductively coupled plasma (ICP OES)	
DIN 51399-2 2010-01	Testing of lubricants - Determination of elements content of additives, wear and other contaminations - Part 2: Wavelength dispersive X-ray fluorescence spectrometry (XRF)	

Test Method	Title	Process-Matrix-Number[+)]
ASTM D5185 2018	Standard Test Method for Determination of Additive Elements, Wear Metals, and Contaminants in Used Lubricating Oil and Determination of Selected Elements in Base Oils by Inductively Coupled Plasma Atomic Emission Spectrometry (ICP-AES)	
	Acid Number	**5.2.70**
ASTM D664 2018e2	Standard Test Method for Acid Number of Petroleum Products by Potentiometric Titration	**5.2.70**
ISO 6619 1988-12	Petroleum products and lubricants - neutralization number - potentiometric titration method	
	Infrared Spectrometric Analysis	**-.-.-**
DIN 51451 2004-09	Testing of petroleum products and related products - Analysis by infrared spectrometry - General working principles	
ASTM D4739 2017	**TBN** Standard Test Method for Base Number Determination by Potentiometric Titration	**-.-.-**
	Filterability	**-.-.-**
DIN ISO 13357-1 2009-04	Petroleum products - Determination of the filterability of lubricating oils - Part 1: Procedure for oils in the presence of water	
ISO 13357-1 2017-05	Petroleum products - Determination of the filterability of lubricating oils - Part 1: Procedure for oils in the presence of water	
DIN ISO 13357-2 2008-09	Petroleum products - Determination of the filterability of lubricating oils - Part 2: Procedure for dry oils	
ISO 13357-2 2017-05	Petroleum products - Determination of the filterability of lubricating oils - Part 2: Procedure for dry oils	
	Flender foam Test Procedure	**-.-.-**
ISO 12152 2012-08	Lubricants, industrial oils and related products - Determination of the foaming and air release properties of industrial gear oils using a spur gear test rig - Flender foam test procedure	

Test Method	Title	Process-Matrix-Number[+)]
	PAI	**-.-.-**
ASTM D7214 2007a	Standard Test Method for Determination of the Oxidation of Used Lubricants by FT-IR Using Peak Area Increase Calculation	
	TOST	**-.-.-**
DIN EN ISO 4263-1 2005-03	Petroleum and related products - Determination of the ageing behaviour of inhibited oils and fluids - TOST test - Part 1: Procedure for mineral oils	

2. Lubricating Grease K

Test Method	Title	Process-Matrix-Number[+)]
	Cone Penetration	**6.18.1**
DIN ISO 2137 2016-12	Petroleum products - Lubricating grease and petrolatum Determination of cone penetration (Point 7: measurement of worked-penetration)	
	Water Behaviour	**-.-.-.-**
DIN 51807-1 1979-04	Testing of lubricants - Test of the behaviour of lubricating greases in the presence of water - Static test	
	FAG FE9	**-.-.-**
DIN 51821-1 2016-07	Testing of lubricants - test using the FAG roller bearing grease testing apparatus FE9 - part 1: general working principles	
DIN 51821-2 2016-07	Testing of lubricants - test using the FAG roller bearing grease testing apparatus FE9 - part 2: test method A/1500/6000	
	Oxidation Stability	**-.-.-**
DIN 51808 2018-02	Testing of lubricants - determination of oxidation stability of greases, oxygen method	
	Corrosion Test	
DIN 51802 2017-10	Testing lubricating greases for their corrosion-inhibiting properties by the SKF Emcor method	**6.18.174**
ISO 11007 1997-06	Petroleum products and lubricants - Determination of rust-prevention characteristics of lubricating greases	**6.18.174**
	Copper Corrosion	
DIN 51811 2017-05	Testing of lubricants - testing of corrosiveness to copper of greases - copper strip tarnish test (Point 7: measurement of worked-penetration)	**6.18.60**
	Water Content	
DIN ISO 3733 2003-02	Petroleum products and bituminous materials – Determination of water - Distillation method	**6.18.106**

Test Method	Title	Process-Matrix-Number[+)]
	Oil Separation	
DIN 51817 2014-08	Testing of lubricants - Determination of oil separation from greases under static conditions	**6.18.206**
	Dropping Point	
DIN ISO 2176 1997-05	Petroleum products - Lubricating grease - Determination of dropping point	**6.18.175**
	Elastomer Testing	
DIN ISO 1817 2016-11	Rubber, vulcanized or thermoplastic - Determination of the effect of liquids	**-.-.-**
ISO 1817 2015-02	Rubber, vulcanized or thermoplastic - Determination of the effect of liquids	
DIN EN ISO 868 2003-10	Plastics and ebonite - Determination of indentation hardness by means of a durometer (Shore hardness)	**-.-.-**
	VKA - Wear Chracterisitic of Grease	
DIN 51350-1 2015-03	Testing of lubricants - Testing in the four-ball tester - Part 1: General working principles	
DIN 51350-5 2015-03	Testing of lubricants - Testing in the four-ball tester - Part 5: Determination of wearing characteristics for consistent lubricants	**6.18.137**
	Determination of solid matter content of lubricating greases	
DIN 51813 2016-03	Testing of lubricants - Determination of solid matter content of lubricating greases (particle sizes above 25 µm)	6.18.201
	NLGI-Grades	**-.-.-**
DIN 51818 1981-12	Lubricants - consistency classification of lubricating greases - NLGI grades	
	VKA - Welding Load Consistent of Lubricants	**-.-.-**
DIN 51350-4 2015-03	Testing of lubricants - Testing in the four-ball tester - Part 4: Determination of welding load of consistent lubricants	

Test Method	Title	Process-Matrix-Number[+)]

3. Engine test methods

CEC L-54-96 2018-12	Fuel Economy Effects of Engine Lubricants
CEC-L-99-08 2019-03	The evaluation of engine crankcase lubricants with respect to low temperature lubricant thickening and wear under severe operating conditions (OM 646 LA)
CEC L-104-14 2019-06	Engine Oil Performance Test to Measure the Effects of Biodiesel, using the DC OM646 DE 22 LA
CEC-L-118-21 2022-06	Evaluation of engine oils in a heavy duty application with respect to piston cleanliness - OM471 FE1
CEC-TDG-L-114 2019-06 (Draft)	Toyota Diesel Turbocharger Compressor Deposit test
CEC-TDG-L-107 2019-04 (Draft)	M271 Evo Sludge Test
JASO M366 2019-01	Automobile Gasoline Engine Oils Firing Fuel Economy Test Procedure

4. Any other analysis

	FE 8
DIN 51819-1 2016-12	Testing of lubricants - Mechanical-dynamic testing in the roller bearing test apparatus FE8 - Part 1: General working principles
DIN 51819-3 2016-12	Testing of lubricants - Mechanical-dynamic testing in the roller bearing test apparatus FE8 - Part 3: Test method for lubricating oils, axial cylinder roller bearing
	VKA - Lubricants
DIN 51350-1 2015-03	Testing of lubricants - Testing in the four-ball tester - Part 1: General working principles
DIN 51350-2 2015-03	Testing of lubricants - Testing in the four-ball tester - Part 2: Determination of welding load of liquid lubricants
DIN 51350-3 2015-03	Testing of lubricants - Testing in the four-ball tester - Part 3: Determination of wearing characteristics of liquid lubricants
	Air-release properties
DIN ISO 9120 2005-08	Petroleum and related products - Determination of air-release properties of steam turbine and other oils - Impinger method
	Elements - Middle Distillates
ASTM D7111 2016	Determination of Trace Elements in Middle Distillate Fuels by Inductively Coupled Plasma Atomic Emission Spectrometry (ICP-AES)
	Oxidation Stability (Rancimat) - FAME
DIN EN 14112 2016-12	Fat and oil derivatives - Fatty acid methylesters (FAME) - Determination of oxidation stability (accelerated oxidation test)
DIN EN 15751 2014-06	Automotive fuels - Fatty acid methyl ester (FAME) fuel and blends with diesel fuel - Determination of oxidation stability by accelerated oxidation method

5. Exhaust emission measurement

ECE-R-83 Type approval 1 Revision 5 2015-07	Regulation No 83 of the Economic Commission for Europe of the United Nations (UNECE) - Uniform provisions concerning the approval of vehicles with regard to the emission of pollutants according to engine fuel requirements [2015/1038], L 172/1, 03.07.2015
Regulation 2017/1151/EG 2017-06 Annex XXI Type 1 emissions test procedures	Commission Regulation (EU) 2017/1151 of 1. June 2017 supplementing Regulation (EC) No 715/2007 of the European Parliament and of the Council on type-approval of motor vehicles with respect to emissions from light passenger and commercial vehicles (Euro 5 and Euro 6) and on access to vehicle repair and maintenance information, amending Directive 2007/46/EC of the European Parliament and of the Council, Commission Regulation (EC) No 692/2008 and Commission Regulation (EU) No 1230/2012 and repealing Commission Regulation (EC) No 692/2008
Regulation 2018/1832/EG 2018-11 Annex IX Type 1 emissions test procedures	Commission Regulation (EU) 2018/1832 of 5 November 2018 amending Directive 2007/46/EC of the European Parliament and of the Council, Commission Regulation (EC) No 692/2008 and Commission Regulation (EU) 2017/1151 for the purpose of improving the emission type approval tests and procedures for light passenger and commercial vehicles, including those for in-service conformity and real-driving emissions and introducing devices for monitoring the consumption of fuel and electric energy Note: Amending 2017/1151/EG, Annex XXI according to Annex IX to this Regulation.

Abbreviations used:

ASTM	American Society for Testing and Materials
CEC	Coordinating European Council
DIN	Deutsches Institut für Normung e.V.
EN	European Standard (Europäische Norm)
FAME	fatty acid methyl ester (Fettsäuremethylester)
ISO	International Organization for Standardization
SAE J	Society of Automotive Engineers of Japan, Inc.
TDG	Test Development Group within CEC
Verfahrens-matrixnummer[+)]	Number of the characteristics within the Process-Matrix for Mineral Oel (FO-Antrag GB_Mineralöl, Vers. 1.1, 23.03.2022)