# SCOPE OF ACCREDITATION

**Accredited conformity assessment body**

**RAFINERIJA NAFTE AD BELGRADE**

**LABORATORY**

**Belgrade-Palilula, Pančevački put 83**

**Standard**:

**SRPS ISO/IEC 17025:2017**

*(ISO/IEC 17025:2017)*

**Short description of the scope**

- *physical and chemical testing of petroleum products - lubricants, industrial oils and similar liquids, antifreeze, break fluids, grease*;
- *sampling of liquid petroleum products*.

## Detailed description of the scope

**Place testing:** Laboratory
**Area of testing:** Physical and chemical testing of petroleum products - lubricants, industrial oils and similar liquids, antifreeze, break fluids, grease

| No. | Field of testing | Type of testing | Range (where applicable) | Method |
|---|---|---|---|---|
| 1. | **Lubricants, industrial oils and similar liquids** | Method for Kinematic Viscosity of Transparent and Opaque Liquids (and Calculation of Dynamic Viscosity) | (0,2 – 300 000) $mm^2/s$ at all temperaturs | SRPS ISO 3104:2020 |
| | | | | ASTM D 445:2015a |
| | | Standard Practice for Calculating Viscosity Index from Kinematic Viscosity at 40 °C and 100 °C | | SRPS ISO 2909:2007 |
| | | | | ASTM D 2270:2016 |
| | | Method for Low-Temperature Viscosity of Lubricants Measured by Brookfield Viscometer | (500 – 1 000 000) mPa·s In range temper. +5° to –40°C | ASTM D 2983:2015 |
| | | Method for Density, Relative Density, or API Gravity of Crude Petroleum and Liquid Petroleum Products by Hydrometer Method | (700 – 1300) kg/m3 | SRPS EN ISO 3675:2007 |
| | | | | ASTM D 1298:2012b |
| | | Method for Pour Point of Petroleum Products | (0 – 69) °C | SRPS ISO 3016:2019 |
| | | | | ASTM D 97:2016 |
| | | Method for Measuring Apparent Viscosity at High-Temperature and High-Shear Rate by Multicell Capillary Viscometer | viscosity (2 – 5) mPas at 150°C | ASTM D 5481:2004 |
| | | Method for Foaming Characteristics of Lubricating Oils | | ASTM D 892:2013e[1] |
| | | Method for Distillation of Petroleum Products at Atmospheric Pressure | | ASTM D 86:2010a |
| | | Method for ASTM Color of Petroleum Products | (0 – 8) ASTM color | ASTM D 1500:2012 |
| | | Method for Water in Petroleum Products and Bituminous Materials by Distillation | (0 – 25) % | ASTM D 95:2005e[1] |
| | | Methods for Flash Point by Pensky-Martens Closed Cup Tester | (40 – 360) °C | SRPS EN ISO 2719:2017 |
| | | | | ASTM D 93:2016a |
| | | Method for Flash and Fire Points by Cleveland Open Cup Tester | (79 – 400) °C | ASTM D 92:2012 |
| | | Testing of mineral oils and other combustible liquids - Determination of flash point by the closed tester according to Abel-Pensky | (0 – 65) °C | SRPS B.H8.047:2012 |

**Place testing:** Laboratory
**Area of testing:** Physical and chemical testing of petroleum products - lubricants, industrial oils and similar liquids, antifreeze, break fluids, grease

| No. | Field of testing | Type of testing | Range (where applicable) | Method |
|---|---|---|---|---|
| 1. | **Lubricants, industrial oils and similar liquids** | Method for Apparent Viscosity of Engine Oils Between -5 and -35oC Using the Cold-Cranking Simulator | (500 – 25 000) mPas | ASTM D 5293:2020 |
| | | Method for Shear Stability of Polymer Containing Fluids Using a European Diesel Injector Apparatus at 30 and 90 Cycles1 | | ASTM D 7109:2004 (CEC-L14-78) |
| | | Petroleum and related products - Determination of the shear stability of polymer-containing oils using a diesel injector nozzle | | SRPS EN ISO 20844:2016 |
| | | Method for Evaporation Loss of Lubricating Oils by the Noack Method | Test A: with Woods metals | DIN 51581-1:2011-09 |
| | | | | ASTM D 5800:2015a |
| | | Method for Water Separability of Petroleum Oils and Synthetic Fluids | | SRPS ISO 6614:2003 |
| | | | | ASTM D 1401:2019 |
| | | Hydraulic fluid power - Fluids - Method for coding the level of contamination by solid particles | 6 / 14 μ | SRPS ISO 4406:2005 |
| | | Method for Shear Stability of Polymer Containing Fluids Using a European Diesel Injector Apparatus | | ASTM D 6278:2012e[1] |
| | | Standard Practice for Calculation of Permanent Shear Stability Index | | ASTM D 6022:2006 |
| | | Method for Pentane Insoluble by Membrane Filtration | | ASTM D 4055:2004 |
| | | Method for Conradson Carbon Residue of Petroleum Products | | ASTM 189:2006e[2] |
| | | Method for Base Number of Petroleum Products by Potentiometric Perchloric Acid Titration | ≤300 mg KOH/g | SRPS ISO 3771:2014 |
| | | | | ASTM D 2896:2015 |
| | | Method for Acid Number of Petroleum Products by Potentiometric Titration | to 150 mg KOH/g | SRPS ISO 6619:1994 |
| | | | | ASTM D 664: 2011a |
| | | Method for Acid and Base Number by Color-Indicator Titration | to 250 mg KOH/g | SRPS ISO 6618:2004 |
| | | | | ASTM D 974:2014e[2] |
| | | Methods for Saponification Number of Petroleum Products | to 400 mg KOH/g | DIN 51559 T-1:1978 |
| | | | | ASTM D 94:2007 |

**Place testing:** Laboratory
**Area of testing:** Physical and chemical testing of petroleum products - lubricants, industrial oils and similar liquids, antifreeze, break fluids, grease

| No. | Field of testing | Type of testing | Range (where applicable) | Method |
|---|---|---|---|---|
| 1. | **Lubricants, industrial oils and similar liquids** | Method for Determination of Water in Petroleum Products, Lubricating Oils, and Additives by Coulometric Karl Fisher Titration | (10 – 25 000) mg/kg | ASTM D 6304:2020 |
| | | Methods for Aniline Point and Mixed Aniline Point of Petroleum Products and Hydrocarbon Solvents | | ASTM D 611:2007 |
| | | Method for Sulfated Ash from Lubricating Oils and Additives | (0,005 – 0,02) mas% | SRPS ISO 3987:2014<br>ASTM D 874:2013a |
| | | Method for Ash from Petroleum Products | (0,001 - 0,180) mas% | ASTM D 482:2013 |
| | | Methods for Elemental Analysis of Lubricant and Additive Components-Barium, Calcium, Phosphorus, Sulfur, and Zinc by Wavelength-Dispersive X-Ray Fluorescence Spectroscopy | Ba (0,04 – 1) mas%<br>Ca (0,01 – 0,8) mas%<br>P (0,01 – 0,5) mas %<br>Zn (0,01 – 0,5) mas%<br>S (0,1 – 1, 5) mas% | ASTM D 4927:2015 |
| | | Methods for Elemental Analysis of Lubricant and Additive Components (Ca, Cl, Cu, Mg, P, Zn и S) by Wavelength-Dispersive X-Ray Fluorescence Spectroscopy | Ca (0,01 – 0,2) mas.%<br>Cl (0,001 – 0,2) mas%<br>Cu (0,001 – 0,05) mas%<br>Mg (0,003 – 0,2) mas%<br>P (0,001 – 0,25) mas%<br>Zn (0,001 – 0,25) mas%<br>S (0,03 – 1) mas % | ASTM D 6443:2014 |
| | | Method for Sulfur in Petroleum Products by Wavelength Dispersive X-ray Fluorescence Spectrometry | (0,002 – 5) mas% | ASTM D 2622:2008 |
| | | Method for Oxidation Stability of Steam Turbine Oils by Rotating Pressure Vessel | (30 – 1000) min | ASTM D 2272:2014a |
| | | Method for Oxidation Stability of Straight Mineral Oil | | IP 306:1979 |
| | | Method for Rust-Preventing Characteristics of Inhibited Mineral Oil in the Presence of Water | | SRPS ISO 7120:1994<br>ASTM D 665:2019 |
| | | Method for corrosiveness to copper from Petroleum products by Copper strip test | Klass 1 to 4 | SRPS EN ISO 2160:2011<br>ASTM D 130:2012 |

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| No. | Field of testing | Type of testing | Range (where applicable) | Method |
|---|---|---|---|---|
| 1. | **Lubricants, industrial oils and similar liquids** | Method for Measurement of Extreme-Pressure Properties of Lubricating Fluids (Four-Ball Method) | Max. 500 kgf (490 dN) | ASTM D 2783:2019 |
| | | Method for Wear Preventive Characteristics of Lubricating Fluid (Four-Ball Method) | | ASTM D 4172:1994 (reap. 2004) |
| 2. | **Antifreeze** | Method for Freezing Point of Aqueous Engine Coolants | 0 – 60 °C | SRPS H.Z.8.053:2018 |
| | | | | ASTM D 1177:2016 |
| | | Method for foaming tendencies of engine coolants in glassware | | SRPS H.Z8.057:2015 |
| | | | | ASTM D 1881:1997 (reap. 2009) |
| | | Method for Boiling Point of Engine Coolants | (100 – 200) °C | SRPS H.Z8.058:2015 |
| | | | | ASTM D 1120:2016 |
| | | Method for Density or Relative Density of Engine Coolant Concentrates and Engine Coolants by The Hydrometer | (1,000 – 1,1300) g/cm3 | ASTM D 1122:2016 |
| | | Method for Reserve Alkalinity of Engine Coolants and Antirust | | SRPS H.Z8.059:2018 |
| | | | | ASTM D 1121:2011 |
| | | Method for pH of Engine Coolants and Antirust | 0-14 pH unit | SRPS H.Z8.052:2018 |
| | | | | ASTM D 1287:1991 (2002) |
| | | Standard Test Method for Percent Ash Content of Engine Coolants | | SRPS H.Z8.055:2015 |
| | | | | ASTM D 1119:2005 (reap. 2009) |
| | | Standard Test Method for Corrosion Test for Engine Coolants in Glassware | | SRPS H.Z8.056:2018 |
| | | | | ASTM D 1384:2005 |
| | | Standard Test Methods for Water in Engine Coolant Concentrate by the Karl Fischer Reagent Method | (0,1 – 100) % | ASTM D 1123:1999 (reap. 2009) |
| 3. | **Brake fluid** | Specification of non-petroleum-base brake fluids for hydraulic systems - Method for Boiling Point of brake fluid | | SRPS ISO 4925:2020, clause 6.2 |
| | | Specification of non-petroleum-base brake fluids for hydraulic systems - Methods for Determination of wet equilibrium boiling point of brake fluid | | SRPS ISO 4925:2020, clause 6.2.6 |

**Place testing:** Laboratory
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| No. | Field of testing | Type of testing | Range (where applicable) | Method |
|---|---|---|---|---|
| 3. | **Brake fluid** | Specification of non-petroleum-base brake fluids for hydraulic systems - Method for Determination of fluidity at low temperatures of brake fluid | | SRPS ISO 4925:2020, clause 6.6 |
| | | Specification of non-petroleum-base brake fluids for hydraulic systems - Method for determination of stability at high temperature of brake fluid | | SRPS ISO 4925:2020, clause 6.4.1 |
| | | Specification of non-petroleum-base brake fluids for hydraulic systems - Method for pH of brake fluid | 0-14 pH unit | SRPS ISO 4925:2020, clause 6.3 |
| | | Specification of non-petroleum-base brake fluids for hydraulic systems - Method for determination of corrosion in the presence of brake fluid | | SRPS ISO 4925:2020, clause 6.5 |
| 4. | **Greases** | Method for Dropping Point of Lubricating Grease | < 220 °C | SRPS ISO 2176:2011<br>ASTM D 566:2002 (reap.2009) |
| | | Method for Detection of Copper Corrosion from Lubricating Grease | Klass 1 to 4 | ASTM D 4048:2002 (reap.2008) |
| | | Methods for Cone Penetration of Lubricating Grease Petroleum products and lubricants | 85 to 475 unit | SRPS ISO 2137:2014<br>ASTM D 217:2010 |
| | | Method for Roll Stability of Lubricating Grease | NLGI 1 -2 | ASTM D 1831:2000 (reap.2006) |
| | | Method for Wear Preventive Characteristics of Lubricating Grease (Four-Ball Method) | | ASTM D 2266:2001 (reap.2008) |
| | | Method for Measurement of Extreme-Pressure Properties of Lubricating Grease (Four-Ball Method) | Max. 500 kgf (490 dN) | ASTM D 2596:2015 |

| Sampling | | | |
|---|---|---|---|
| **No.** | **Sampling subject / material / product** | **Type of sampling** | **Method** |
| **1.** | **Liquid Petroleum Products** | Petroleum liquids - Manual sampling | SRPS EN ISO 3170:2008 |

This Scope of accreditation is valid only with Accreditation Certificate No **01-102**

Accreditation expiry date: 23.10.2025.

**Acting Director**

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