

Date: 12 February 2013

TECHNICAL SHEET

ALL SEASON UNIVERSAL ENGINE OILS LUKOIL AVANTGARDE, API CF-4/SG

- LUKOIL AVANTGARDE oils are obtained, as appropriate, from refined mineral base oils, isoparaffinic components with a very high viscosity index, synthetic oils or mixtures of these components and a package of specific multi-purpose additives, which provide the API CF-4/SG additivition levels.
- LUKOIL AVANTGARDE oils are used for the lubrication of high speed, naturally aspirated or supercharged, 4-stroke diesel engines. They can be also used in engines which require CF, CE, CD performance conditions or in gasoline engines from the SG category or a lower one.
- Approvals: KAMAZ (10W-40 and 15W-40 – for Euro 2 engines)
- Performance level: API CF-4/SG; ACEA E2-04; MTU Cat. 2 (15W-40);
- Quality conditions for the LUKOIL AVANTGARDE oils:

Item No.	CHARACTERISTICS	ADMISSIBILITY CONDITIONS				TEST METHOD
		AVANTGARDE SAE 10W-40, API CF-4/SG Synthetic	AVANTGARDE SAE 15W-40, API CF-4/SG Mineral	AVANTGARDE SAE 20W-40, API CF-4/SG Mineral	AVANTGARDE SAE 20W-50, API CF-4/SG Mineral	
1	Kinematic viscosity at 100°C, mm²s ⁻¹ (cSt)	12.5...16.3			16.3...21.9	SR EN ISO 3104/AC ASTM D 445 ASTM D 7042
2	Viscosity index, min.	120		110		SR ISO 2909 ASTM D 2270 ASTM D 7042
3	Base number, mg KOH/g, min.	6.5				SR ISO 3771 ASTM D 2896
4	Flash point, open cup, °C, min.	200	205	210		SR EN ISO 2592 ASTM D 92
5	* Apparent (dynamic) viscosity, determined using a Cold Cranking Simulator (CCS) at -25°C, cP, max. at -20°C, cP, max. at -15°C, cP, max.	7000 - -	- 7000 -	- - 9500	- - 9500	ASTM D 5293
6	* Apparent (dynamic) viscosity, determined using a Mini-Rotary Viscometer (MRV), at -30°C, cP, max. at -25°C, cP, max. at -20°C, cP, max.	60000 - -	- 60000 -	- - 60000	- - 60000	ASTM D 4684
7	*Sulphated ash, %, max.	1.6				ASTM D 874
8	Water content, %	nil				SR 13484 ASTM D 95
9	* Substances insoluble in organic solvents, %, max.	0.015				STAS 33
10	Pour point, °C, max.	-35	-30	-25	-25	SR 13552 ASTM D 97
11	*Noack volatility, %, max.	15				STAS 8465 ASTM D 5800
12	*Active element content: Calcium, %	To be reported				STAS 8428 STAS 7717
13	Zinc, %					
14	Density at 20°C, Kg/m³	To be reported				SR EN ISO 3675/C91 ASTM D 1298 ASTM D 7042
15	*Phosphorus content, %, max.	0.12				STAS 7330
16	Foaming properties, ml (tendency – stability), max. - at 24 °C - at 93.5 °C - at 24°C, after determination at 93.5°C	10 – 0 50 – 0 10 - 0				SR ISO 6247+C1 ASTM D 892

* This characteristic is warranted by means of the manufacturing technology / is determined in accordance with the technical specification in force.

- Accuracy evaluation of the test methods from this technical sheet should meet the requirements of Standard SR EN ISO 4259:2007 "Petroleum products – determining and applying the accuracy values regarding the test methods".
- Samples shall be taken in accordance with SR EN ISO 3170:2004/C91:2005 "Liquid petroleum products. Manual sampling".
- Packaging, marking, storage, transport and handling are performed according to the regulations in force (decisions, regulations, etc. specified in the product safety data sheet) and to LUKOIL LUBRICANTS EAST EUROPE S.R.L.'s instructions/internal procedures.
- For details, see the Safety Data Sheet (SDS).
- Storage life is of 5 years from the manufacture date.