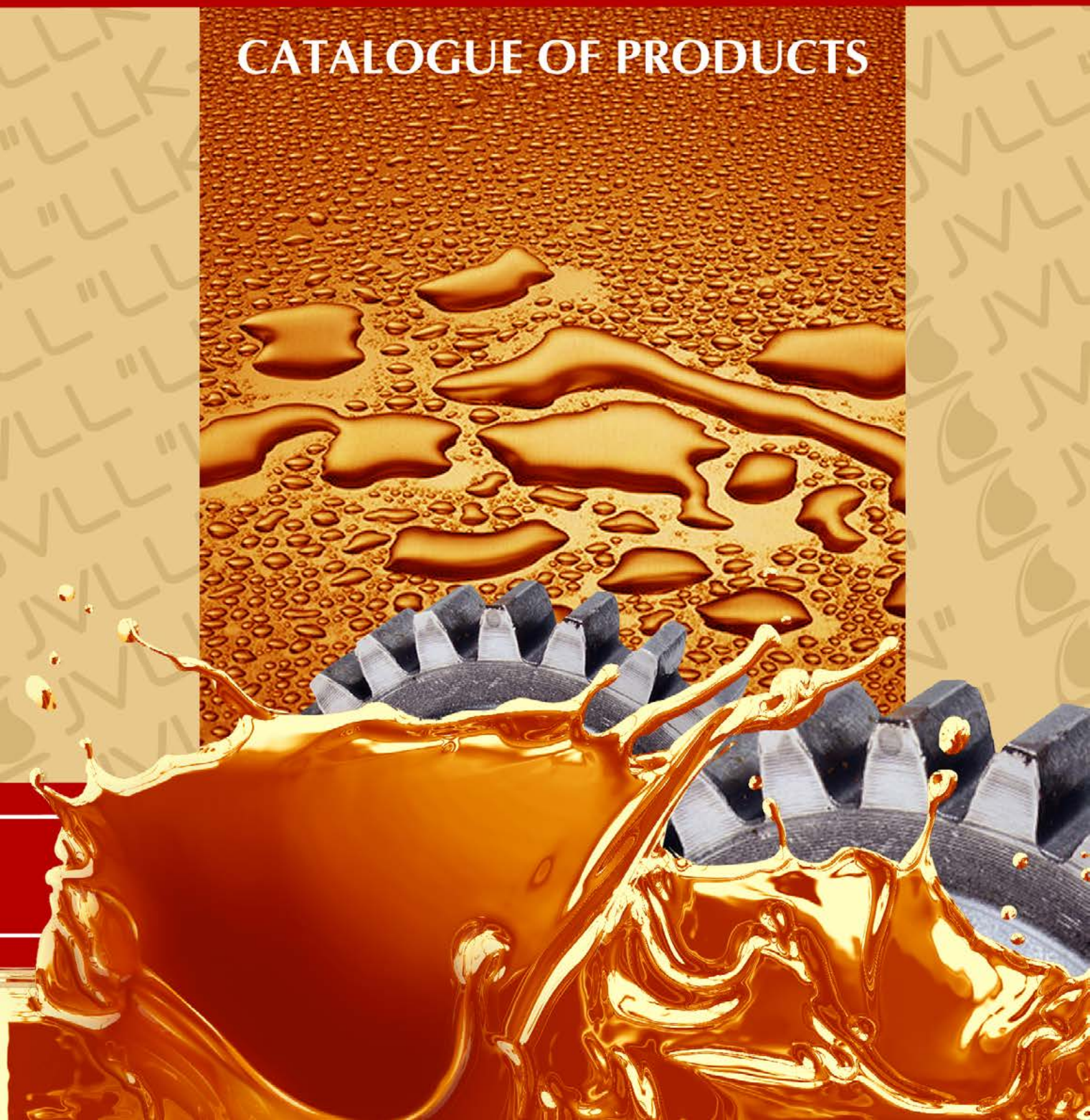
JVLL"LLK-NAFTAN"

CATALOGUE OF PRODUCTS



Joint venture with limited liability "LLK-NAFTAN" (JVLL"LLK-NAFTAN") was founded on the 28th of June 2006. The main founders are JSC "NAFTAN" (Republic of Belarus) and LLK INTERNATIONAL B.V. (the Netherlands, Daughter Company of JSC "LUKOIL", Russia). JVLL"LLK-NAFTAN" is the resident of the Republic of Belarus, it is the enterprise with foreign investments.

The main spheres of enterprise activity:

- introduction of high technologies for up-to-date additives production;
- production of integrated highly effective packages of additives for lubricating oils;
- production of a broad assortment of additives of different functional purposes;
- production of other products of petrochemical objective;
- priority in lubricant additives supply of JSC "LUKOIL" (Russian Federation) and JSC "NAFTAN"(Republic of Belarus) plants. The enterprise has the largest capacities for oil additives production on the territory of former Soviet Union states.

Range of produced additives and packages of additives for lubricating oils comprises products of various functional groups, enabling to provide a large number of up-to-date oils' service properties.

The main types of produced additives to lubricating oils: succinimides, dithiophosphates, sulfonates, phenolates, packages of additives and alkyl phenols.

Quality management and environment management systems of the producer are certified by "BUREAU VERITAS Certification"for the conformance to international standards ISO 9001:2008 and ISO 14001:2004. Labour protection system is certified by the national certification body for the conformance to STB 18001-2009.

Product	Type
ADDITIVE C-5A **Specification 38.101146-77**	Ash-free succinimide dispersant, produced on polyisobutylene basis with molecular mass 1000. It is used in combination with antioxidant and neutralizing additives in the process of oil manufacture for gasoline and diesel engines.
Designation	Improves dispersive and detergent properties of lubricating oils.

Physicochemical properties	**C-5A mark A**	**C-5A mark B**	**C-5A mark V**
		Typical values	
Kinematic viscosity at 100 °C, cSt	95	88	60
Density at 60 °C, kg/m^3	890	890	890
Flash point (COC), °C	220	220	220
TBN, mg KOH/g	32,3	29	23
Nitrogen content, % wt.	1,78	1,55	1,45
Color at dilution 15:85	4,0	4,0	3,5
Acid number, mg KOH/g	2,0	2,0	2,0
Mechanical impurities content	0,055	0,055	0,055
Water content, % wt.	0,06	0,06	0,06
Active material, % wt.	52	44	42

Safety requirements	Specified in material safety data sheet (MSDS) of the product
Package	Delivery in tanks, mobile and railway tanks, shipping containers, in drums with capacity of 216 liters, mounted on pallets.

Product	Type
ADDITIVE C-5AB **Specification 38.401-58-130-95**	Ash-free succinimide dispersant, produced on polyisobutylene basis with molecular mass 1000 and modified by boron. It is used in combination with antioxidant and neutralizing additives in the process of oil manufacture for gasoline and diesel engines.
Designation	Improves detergent, dispersive and anticorrosive properties of lubricating oils

Physicochemical properties	Minimum	Typical value	Maximum
Kinematic viscosity at 100 °C, cSt	-	80,0	200
Density at 60 °C, kg/m^3	-	895	-
Flash point (COC), °C	160	210	-
TBN, mg KOH/g	10,0	15,0	-
Nitrogen content, % wt.	1,0	1,25	-
Boron content, % wt.	0,3	0,4	0,8
Mechanical impurities content	-	0,055	0,06
Water content, % wt.	-	0,03	0,10

Safety requirements	Specified in material safety data sheet (MSDS) of the product
Package	Delivery in tanks, mobile and railway tanks, shipping containers, in drums with capacity of 216 liters, mounted on pallets.

Product	Type
ADDITIVE C-1500 **Specification** **BY 390401182.026-2010**	Ash-free succinimide dispersant, produced on polyisobutylene basis with molecular mass 1300. It is used in combination with antioxidant and neutralizing additives in the process of oil manufacture for gasoline and diesel engines.
Designation	Improves dispersive and detergent properties of lubricating oils.

Physicochemical properties	**Minimum**	**Typical value**	**Maximum**
Kinematic viscosity at 100 °C, cSt	-	230	400
Density at 60 °C, kg/m^3	-	900	-
Flash point (COC), °C	180	210	-
TBN, mg KOH/g	24,0	30,0	-
Nitrogen content, % wt.	1,4	1,5	-
Color at dilution 15:85	-	4,5	6,0
Acid number, mg KOH/g	-	2,3	4,0
Mechanical impurities content	-	0,055	0,06
Water content, % wt.	-	0,06	0,10
Active material, % wt.	50,0	54,0	-

Safety requirements	Specified in material safety data sheet (MSDS) of the product
Package	Delivery in tanks, mobile and railway tanks, shipping containers, in drums with capacity of 216 liters, mounted on pallets.

Product	Type
ADDITIVE C-1500B **Specification** **BY 390401182.026-2010**	Ash-free succinimide dispersant, produced on polyisobutylene basis with molecular mass 1300 and modified by boron. It is used in combination with antioxidant and neutralizing additives in the process of oil manufacture for gasoline and diesel engines.
Designation	Improves detergent, dispersive and anticorrosive properties of lubricating oils

Physicochemical properties	**Minimum**	**Typical value**	**Maximum**
Kinematic viscosity at 100 °C, cSt	-	180	400
Density at 60 °C, kg/m^3	-	900	-
Flash point (COC), °C	180	210	-
TBN, mg KOH/g	24,0	32,0	-
Nitrogen content, % wt.	1,4	1,5	-
Color at dilution 15:85	-	4,0	6,0
Boron content, % wt.	0,20	0,40	-
Mechanical impurities content	-	0,058	0,08
Water content, % wt.	-	0,03	0,10

Safety requirements	Specified in material safety data sheet (MSDS) of the product
Package	Delivery in tanks, mobile and railway tanks, shipping containers, in drums with capacity of 216 liters, mounted on pallets.

Product	Type
ADDITIVE C-2500 **Specification** **BY 390401182.026-2010**	Ash-free succinimide dispersant, produced on polyisobutylene basis with molecular mass 2300. It is used in combination with antioxidant and neutralizing additives in the process of oil manufacture for gasoline and diesel engines.
Designation	Improves dispersive and detergent properties of lubricating oils.

Physicochemical properties	Minimum	Typical value	Maximum
Kinematic viscosity at 100 °C, cSt	-	180	400
Density at 60 °C, kg/m^3	-	890	-
Flash point (COC), °C	180	210	-
TBN, mg KOH/g	18,0	22,0	-
Nitrogen content, % wt.	0,8	1,0	-
Color at dilution 15:85	-	3,0	6,0
Acid number, mg KOH/g	-	1,5	4,0
Mechanical impurities content	-	0,058	0,06
Water content, % wt.	-	0,03	0,10
Active material, % wt.	40,0	45,0	-

Safety requirements	Specified in material safety data sheet (MSDS) of the product
Package	Delivery in tanks, mobile and railway tanks, shipping containers, in drums with capacity of 216 liters, mounted on pallets.

Product	Type
ADDITIVE VNII NP-354 **Specification 38.101680-77**	Zinc dialkylphenyldithiophosphate in mineral oil. It is used in combination with dispersive and neutralizing additives in the process of oil manufacture for gasoline and diesel engines, and also for marine diesel engines.
Designation	Improves antioxidant, antiwear, anticorrosive properties of lubricating oils

Physicochemical properties	**Minimum**	**Typical value**	**Maximum**
Kinematic viscosity at 100 °C, cSt	-	20	25
Density at 60 °C, kg/m^3	-	960	-
Flash point (COC), °C	165	190	-
Zinc content, % wt.	2,4	2,60	-
Phosphorous content, % wt.	2,3	2,4	-
Sulfur content, % wt.	4,5	4,7	-
pH of additive solution, pH	2,7	2,8	-
Mechanical impurities content	-	0,08	0,10
Water content, % wt.	-	0,03	0,03

Safety requirements	Specified in material safety data sheet (MSDS) of the product
Package	Delivery in tanks, mobile and railway tanks, shipping containers, in drums with capacity of 216 liters, mounted on pallets.

Product	Type
ADDITIVE VNII NP-357 **Specification 38.401-58-314-2002**	Blend of zinc and amine salt of dialkylphenyldithiophosphoric acid solution in mineral oil. It is used in the process of oil manufacture for automobile and marine diesel engines.
Designation	Improves antioxidant and anticorrosive properties of lubricating oils

Physicochemical properties	Minimum	Typical value	Maximum
Kinematic viscosity at 100 °C, cSt	-	25	30
Density at 60 °C, kg/m^3	-	960	-
Flash point (COC), °C	165	184	-
Zinc content, % wt.	2,2	2,5	-
Phosphorous content, % wt.	2,2	2,4	-
Nitrogen content, % wt.	0,3	0,5	-
pH of additive solution, pH	4,0	4,2	-
Mechanical impurities content	-	0,08	0,10
Water content, % wt.	-	0,03	0,03

Safety requirements	Specified in material safety data sheet (MSDS) of the product
Package	Delivery in tanks, mobile and railway tanks, shipping containers, in drums with capacity of 216 liters, mounted on pallets.

Product	Type
ADDITIVE VNII NP -715 **Specification 38.1011226-89**	Amine salt of dialkylphenyldithiophosphoric acid solution in mineral oil. It is an ash-free antioxidant. It is used in the process of compressor and other low-ash oil manufacture.

Designation

Improves antioxidant and anticorrosive properties of lubricating oils

Physicochemical properties	Minimum	Typical value	Maximum
Kinematic viscosity at 100 °C, cSt	27	35	-
Density at 60 °C, kg/m^3	-	942	-
Flash point (COC), °C	160	190	-
Sulfur content, % wt.	2,8	3,0	-
Phosphorous content, % wt.	2,1	2,4	-
Nitrogen content, % wt.	1,9	2,1	-
Mechanical impurities content	-	0,08	0,10
Water content, % wt.	-	0,03	0,10

Safety requirements

Specified in material safety data sheet (MSDS) of the product

Package

Delivery in tanks, mobile and railway tanks, shipping containers, in drums with capacity of 216 liters, mounted on pallets.

Product	Type
ADDITIVE H-101 **Specification** **BY 390401182.024-2009**	Zinc dithiophosphate solution in mineral oil. It is used in combination with dispersive and neutralizing additives in the process of oil manufacture for gasoline and diesel engines.
Designation	Improves antioxidant and anticorrosive properties of lubricating oils

Physicochemical properties	Minimum	Typical value	Maximum
Kinematic viscosity at 100 °C, cSt	-	15	17
Density at 60 °C, kg/m^3	-	1160	-
Flash point (COC), °C	160	180	-
Zinc content, % wt.	10,5	10,8	-
pH of additive solution, pH	5,5	6,0	-
Mechanical impurities content	-	0,08	0,10
Water content, % wt.	-	0,06	0,10

Safety requirements	Specified in material safety data sheet (MSDS) of the product
Package	Delivery in tanks, mobile and railway tanks, shipping containers, in drums with capacity of 216 liters, mounted on pallets.

Product	Type
ADDITIVE DF-11 **Specification 38. 5901254 - 90**	Zinc dithiophosphate solution in mineral oil. It is used in combination with dispersive and neutralizing additives in the process of oil manufacture for gasoline and diesel engines.
Designation	Improves antioxidant, antiwear, anticorrosive properties of lubricating oils

Physicochemical properties	**Minimum**	**Typical value**	**Maximum**
Kinematic viscosity at 100 °C, cSt	5,0	8,0	10
Density at 60 °C, kg/m^3	-	995	-
Flash point (COC), °C	170	188	-
Zinc content, % wt.	5,0	5,3	5,6
Phosphorous content, % wt.	4,4	4,7	4,9
pH of additive solution, pH	5,5	6,5	-
Water content, % wt.	-	0,03	0,03
Color at dilution 15:85		1,0	3,5

Safety requirements	Specified in material safety data sheet (MSDS) of the product
Package	Delivery in tanks, mobile and railway tanks, shipping containers, in drums with capacity of 216 liters, mounted on pallets.

Product	Type
ADDITIVE LUKOIL DF-11K **Specification** **0257-005-00044434-99**	Zinc dithiophosphate solution in mineral oil. It is used in combination with dispersive and neutralizing additives in the process of oil manufacture for gasoline and diesel engines.
Designation	Improves antioxidant, antiwear, anticorrosive properties of lubricating oils

Physicochemical properties	**Minimum**	**Typical value**	**Maximum**
Kinematic viscosity at 100 °C, cSt	11,5	16,0	-
Density at 60 °C, kg/m^3	-	1131	-
Flash point (COC), °C	165	194	-
Zinc content, % wt.	8,8	9,2	9,6
Phosphorous content, % wt.	7,8	8,2	8,5
pH of additive solution, pH	5,5	6,1	-
Water content, % wt.	-	0,03	0,09
Color at dilution 15:85		1,5	3,5

Safety requirements	Specified in material safety data sheet (MSDS) of the product
Package	Delivery in tanks, mobile and railway tanks, shipping containers, in drums with capacity of 216 liters, mounted on pallets.

Product	Type
ADDITIVE C-150 **Specification 38.101685-84**	Average alkaline calcium sulfonate, produced on mineral raw material basis. It is used in combination with other detergents and retardants in the process of oil manufacture for gasoline and diesel engines.
Designation	Improves detergent and neutralizing properties of lubricating oils

Physicochemical properties	**C-150 mark A**			**C-150 mark «concentrate»**		
	Min	**Typical value**	**Max**	**Min**	**Typical value**	**Max**
Kinematic viscosity at 100 °C, cSt	-	40,0	-	-	70,0	-
Density at 60 °C, kg/m^3	-	980	-	-	1060	-
Flash point (COC), °C	180	210	-	180	210	-
TBN, mg KOH/g	120	145	150	230	250	-
Calcium sulfonate content, % wt.	28,0	30,0	-	-	-	-
Calcium content, % wt.	-	-	-	9,0	9,5	
Sulfate ash content, % wt.	17,0	22,0	24,0	-	32,0	35,0
Mechanical impurities content	-	0,08	0,08	-	0,08	0,10
Water content, % wt.	-	0,06	0,12	-	0,06	0,10

Safety requirements	Specified in material safety data sheet (MSDS) of the product
Package	Delivery in tanks, mobile and railway tanks, shipping containers, in drums with capacity of 216 liters, mounted on pallets.

Product	Type
ADDITIVE C-300 **Specification** **BY 390401182.023-2010**	High alkaline calcium sulfonate, produced on mineral raw material basis. It is used in combination with other detergents and retardants in the process of oil manufacture for gasoline and diesel engines.
Designation	Improves detergent and neutralizing properties of lubricating oils

Physicochemical properties	**Minimum**	**Typical value**	**Maximum**
Kinematic viscosity at 100 °C, cSt	-	130	300
Density at 60 °C, kg/m^3	-	1070	-
Flash point (COC), °C	180	220	-
TBN, mg KOH/g	275	300	-
Calcium content, % wt.	9,7	11,2	-
Sulfate ash content, % wt.	-	38,0	40,0
Mechanical impurities content	-	0,08	0,10
Water content, % wt.		0,06	0,10

Safety requirements	Specified in material safety data sheet (MSDS) of the product
Package	Delivery in tanks, mobile and railway tanks, shipping containers, in drums with capacity of 216 liters, mounted on pallets.

Product	Type
ADDITIVE HCCK-30 **Specification** **BY 390401182.022-2011**	Neutral calcium sulfonate, produced on synthetical dialkyl benzene sulphonic acid. It is used in combination with other detergents and retardants in the process of high quality oil manufacture of the highest performance groups for gasoline and diesel engines.
Designation	Improves detergent, neutralizing and dispersive properties of lubricating oils

Physicochemical properties	**Minimum**	**Typical value**	**Maximum**
Kinematic viscosity at 100 °C, cSt	-	30	80
Density at 60 °C, kg/m^3	-	940	-
Flash point (COC), °C	180	210	-
TBN, mg KOH/g	-	15,0	30,0
Calcium sulfonate content, % wt.	40,0	42,0	-
Calcium content, % wt.	1,8	2,5	-
Sulfate ash content, % wt.	-	8,5	10,0
Color at dilution 15:85	-	3,5	6,0
Mechanical impurities content	-	0,05	0,06
Water content, % wt.	-	0,03	0,15

Safety requirements	Specified in material safety data sheet (MSDS) of the product
Package	Delivery in tanks, mobile and railway tanks, shipping containers, in drums with capacity of 216 liters, mounted on pallets.

Product	Type
ADDITIVE CCK-300 **Specification** **BY 390401182.022-2011**	High alkaline calcium sulfonate, produced on alkyl benzene sulphonic acid.
ADDITIVE CCK-300D **Specification** **BY 390401182.022-2011**	High alkaline calcium sulfonate, produced on dialkyl benzene sulphonic acid. It is used in combination with other detergents and retardants in the process of high quality oil manufacture of the highest performance groups for gasoline and diesel engines.
Designation	Improves detergent, neutralizing and dispersive properties of lubricating oils

Physicochemical properties	**CCK-300**			**CCK-300D**		
	Min	**Typical value**	**Max**	**Min**	**Typical value**	**Max**
Kinematic viscosity at 100 °C, cSt	-	80,0	100	-	50,0	100
Density at 60 °C, kg/m^3	-	1110	-		1100	-
Flash point (COC), °C	180	196	-	180	210	-
TBN, mg KOH/g	300	315	350	300	315	350
Calcium sulfonate content, % wt.	28,0	29,0	-	28,0	29,0	-
Calcium content, % wt.	10,5	11,5	-	10,5	12,0	-
Sulfate ash content, % wt.	-	39,0	48,0	-	39,0	48,0
Mechanical impurities content	-	0,08	0,08	-	0,08	0,08
Water content, % wt.	-	0,06	0,15	-	0,06	0,15
Color at dilution 15:85	-	-	-	-	3,0	6,0

Safety requirements	Specified in material safety data sheet (MSDS) of the product
Package	Delivery in tanks, mobile and railway tanks, shipping containers, in drums with capacity of 216 liters, mounted on pallets.

Product	Type
ADDITIVE CCK-400 **Specification** **BY 390401182.022-2011**	High alkaline calcium sulfonate, produced on alkyl benzene sulphonic acid.
ADDITIVE CCK-400D **Specification** **BY 390401182.022-2011**	High alkaline calcium sulfonate, produced on dialkyl benzene sulphonic acid. It is used in combination with other detergents and retardants in the process of high quality oil manufacture of the highest performance groups for gasoline and diesel engines, and also for marine diesel engines.
Designation	Improves detergent, neutralizing and dispersive properties of lubricating oils

Physicochemical properties	**CCK-400**			**CCK-400D**		
	Min	**Typical value**	**Max**	**Min**	**Typical value**	**Max**
Kinematic viscosity at 100 °C, cSt	-	200,0	350,0	-	100,0	150,0
Density at 60 °C, kg/m^3	-	1200	-	-	1170	-
Flash point (COC), °C	180	196	-	180	210	-
TBN, mg KOH/g	380	405	430	300	395	430
Calcium sulfonate content, % wt.	25,0	28,0	-	25,0	28,0	-
Calcium content, % wt.	13,5	15,0	-	10,5	14,1	-
Sulfate ash content, % wt.	-	51,0	55,0	-	49,3	55,0
Mechanical impurities content	-	0,08	0,08	-	0,08	0,08
Water content, % wt.	-	0,06	0,20	-	0,09	0,20
Color at dilution 15:85	-	-	-	-	4,0	6,0

Safety requirements	Specified in material safety data sheet (MSDS) of the product
Package	Delivery in tanks, mobile and railway tanks, shipping containers, in drums with capacity of 216 liters, mounted on pallets.

Product	Type
ADDITIVE B-7120 **Specification** **0257-008-11246224-97**	Calcium high alkaline phenolate additive. It is used in combination with other detergents and retardants in the process of oil manufacture for gasoline and diesel engines.
Designation	Improves detergent, neutralizing and anticorrosive properties of lubricating oils

Physicochemical properties	**Min**	**Typical value**	**Max**
Kinematic viscosity at 100 °C, cSt	-	130,0	250
Density at 60 °C, kg/m^3	-	1050	-
Flash point (COC), °C	170	216	-
TBN, mg KOH/g	250	278	-
Sulfur content, % wt.	-	-	-
Sulfate ash content, % wt.	-	26,0	30,0
Mechanical impurities content	-	0,08	0,1
Water content, % wt.	-	0,03	0,1

Safety requirements	Specified in material safety data sheet (MSDS) of the product
Package	Delivery in tanks, mobile and railway tanks, shipping containers, in drums with capacity of 216 liters, mounted on pallets.

Product	Type
ADDITIVE B-7125 **Specification** **BY 390401182.031-2010**	Calcium high alkaline phenolate additive. It is used in combination with other detergents and retardants in the process of oil manufacture for gasoline and diesel engines.
Designation	Improves detergent, neutralizing and anticorrosive properties of lubricating oils

Physicochemical properties	**Min**	**Typical value**	**Max**
Kinematic viscosity at 100 °C, cSt	-	180,0	300
Density at 60 °C, kg/m^3	-	1120	-
Flash point (COC), °C	170	210	-
TBN, mg KOH/g	250	278	-
Sulfur content, % wt.	-	-	-
Sulfate ash content, % wt.	-	33,8	40,0
Mechanical impurities content	-	0,08	0,10
Water content, % wt.	-	0,06	0,10

Safety requirements	Specified in material safety data sheet (MSDS) of the product
Package	Delivery in tanks, mobile and railway tanks, shipping containers, in drums with capacity of 216 liters, mounted on pallets.

Product	Type
ADDITIVE B-7130D **Specification** **BY 390401182.027-2010**	Calcium high alkaline phenolate additive. It is used in combination with other detergents and retardants in the process of oil manufacture for gasoline and diesel engines.
Designation	Improves detergent, neutralizing and anticorrosive properties of lubricating oils

Physicochemical properties	**Minimum**	**Typical value**	**Maximum**
Kinematic viscosity at 100 °C, cSt	60,0	200,0	250,0
Density at 60 °C, kg/m^3	-	1078	-
Flash point (COC), °C	170	208	-
TBN, mg KOH/g	250	286	320
Sulfate ash content, % wt.	-	34,0	39,0
Mechanical impurities content	-	0,08	0,10
Water content, % wt.	-	0,06	0,10

Safety requirements	Specified in material safety data sheet (MSDS) of the product
Package	Delivery in tanks, mobile and railway tanks, shipping containers, in drums with capacity of 216 liters, mounted on pallets.

Product	Type
Package of additives LUKOIL LLK-2501 **Specification 0257-001-79345251-2006**	Package of additives (of sulfonated phenolate type) for automobile engine oils of CB, CC, CD groups according to API. It is used in combination with dithiophosphoric and succinimide additives, oil thickeners and depressants.
Designation	Improves antioxidant, anticorrosive, detergent, dispersive and neutralizing properties of lubricating oils
Use recommendations	Recommended oil dosage of LUKOIL LLK-2501
	- CB group– 1,35 % wt. in combination with additive LUKOI LDF-11к - 0,15 % wt.
	- CC group – 2,25 % wt. in combination with additive LUKOI LDF-11к - 0,55 % wt.
	- CD group – 3,15 % wt. in combination with additive LUKOI LDF-11к – 1,05 % wt.

Physicochemical properties	**LUKOIL LLK-2501**	**LUKOIL LLK-2501-1**	**LUKOIL LLK-2501-2**
	Typical values		
Kinematic viscosity at 100 °C, cSt	140,0	15,0	110,0
Density at 60 °C, kg/m^3	1070	960	1100
Flash point (COC), °C	not lower than 180	not lower than 180	not lower than 180
TBN, mg KOH/g	290	147	285
Calcium content, % wt.	10,0	5,5	10,5
Sulfate ash content, % wt.	37,0	18,0	37,0
Mechanical impurities content	0,08	0,08	0,08
Water content, % wt.	0,03	0,03	0,03

Safety requirements	Specified in material safety data sheet (MSDS) of the product
Package	Delivery in tanks, mobile and railway tanks, shipping containers, in drums with capacity of 216 liters, mounted on pallets.

Product	Type
Package of additives PA-2503-1 **Specification** **BY 390401182.028-2011**	Multifunctional package of additives for all-purpose engine oils for passenger cars and commercial motors production. It is used in combination with oil thickeners and depressants.
Designation	Engine oil production of group: SD/CB, SF/CC according to API.
Use recommendations	Recommended oil dosage: - SD/CB groups according to API– 3,3 % wt., in combination with additive LUKOI LDF-11к - 0,3 % wt., viscosity modifiers and depressants. - SF/CC groups according to API – 4,0 % wt., in combination with viscosity modifiers and depressants

Physicochemical properties	**Minimum**	**Typical value**	**Maximum**
Kinematic viscosity at 100 °C, cSt	-	67,0	150
Density at 60 °C, kg/m^3	-	1030	-
Flash point (COC), °C	170	206	-
Appearance		transparent brown liquid	
TBN, mg KOH/g	140	147	160
Calcium content, % wt.	4,8	5,1	5,3
Zinc content, % wt.	1,9	2,1	2,3
Nitrogen content, % wt.	0,45	0,55	-
Sulfate ash content, % wt.	-	20,5	22,0
Mechanical impurities content	-	0,083	0,100
Water content, % wt.	-	0,060	0,100

Safety requirements	Specified in material safety data sheet (MSDS) of the product
Package	Delivery in tanks, mobile and railway tanks, shipping containers, in drums with capacity of 216 liters, mounted on pallets.

Product	Type
Package of additives PA-2503-2 **Specification BY 390401182.028-2011**	Multifunctional package of additives for all-purpose engine oils for passenger cars and commercial motors production. It is used in combination with oil thickeners and depressants.
Designation	Engine oil production of SG/CD group according to API.
Use recommendations	Recommended oil dosage for oils of SG/CD groups– 6,2 % wt., in combination with viscosity modifiers and depressants.

Physicochemical properties	**Minimum**	**Typical value**	**Maximum**
Kinematic viscosity at 100 °C, cSt	-	60,0	150
Density at 60 °C, kg/m^3	-	1005	-
Flash point (COC), °C	170	210	-
Appearance	transparent brown liquid		
TBN, mg KOH/g	115	129	140
Calcium content, % wt.	4,10	4,48	5,00
Zinc content, % wt.	1,55	1,68	1,80
Nitrogen content, % wt.	0,55	0,62	-
Sulfate ash content, % wt.	-	17,8	21,0
Mechanical impurities content	-	0,084	0,100
Water content, % wt.	-	0,060	0,100

Safety requirements	Specified in material safety data sheet (MSDS) of the product
Package	Delivery in tanks, mobile and railway tanks, shipping containers, in drums with capacity of 216 liters, mounted on pallets.

Product	Type
Package of additives PA-2503-3 **Specification BY 390401182.028-2011**	Multifunctional package of additives for all-purpose engine oils for passenger cars and commercial motors production. It is used in combination with oil thickeners and depressants.
Designation	Engine oil production of CF-4/SG group according to API.
Use recommendations	Recommended oil dosage for oils of CF-4/SG group – 7,3 % wt., in combination with viscosity modifiers and depressants.

Physicochemical properties	**Minimum**	**Typical value**	**Maximum**
Kinematic viscosity at 100 °C, cSt	-	60,0	150
Density at 60 °C, kg/m^3	-	1020	-
Flash point (COC), °C	170	210	-
Appearance		transparent brown liquid	
TBN, mg KOH/g	135	140	150
Calcium content, % wt.	4,30	4,75	5,30
Zinc content, % wt.	1,55	1,65	1,75
Nitrogen content, % wt.	0,50	0,58	-
Sulfate ash content, % wt.	-	18,6	22,0
Mechanical impurities content	-	0,082	0,100
Water content, % wt.	-	0,060	0,100

Safety requirements	Specified in material safety data sheet (MSDS) of the product
Package	Delivery in tanks, mobile and railway tanks, shipping containers, in drums with capacity of 216 liters, mounted on pallets.

Product	Type
Package of additives PA-2503-4 **Specification BY 390401182.028-2011**	Multifunctional package of additives for diesel engine oils for commercial motors production.
Designation	Engine oil production of group: CB, CC, CD according to API
Use recommendations	Recommended oil dosage: CB group according to API – 1,85 % wt., in combination with additive LUKOIL DF-11k - 0,15 % wt.
	- CC group according to API – 2,9 % wt.
	- CD group according to API – 4,25 % wt.

Physicochemical properties	**Minimum**	**Typical value**	**Maximum**
Kinematic viscosity at 100 °C, cSt	-	70,0	150
Density at 60 °C, kg/m^3	-	1110	-
Flash point (COC), °C	170	210	-
Appearance	transparent brown liquid		
TBN, mg KOH/g	220	230	245
Calcium content, % wt.	8,0	8,2	9,0
Zinc content, % wt.	2,2	2,3	2,4
Sulfate ash content, % wt.	-	31,3	35,0
Mechanical impurities content	-	0,084	0,100
Water content, % wt.	-	0,060	0,100

Safety requirements	Specified in material safety data sheet (MSDS) of the product
Package	Delivery in tanks, mobile and railway tanks, shipping containers, in drums with capacity of 216 liters, mounted on pallets.

Product	Type		
Package of additives PA-4501 **Specification** **BY 390401182.025-2011**	Multifunctional package of additives for all-purpose engine oils for passenger cars production.		
Designation	Engine oil production of SL/CF, SJ/CF group according to API.		
Use recommendations	Recommended oil do for oils of SL/CF group – 11,1 % wt., in combination with viscosity modifiers and depressants, for oils of SJ/CF group – 4,0 % wt., in combination with PA-2503-1 – 3,7 % wt. and viscosity modifiers and depressants.		
Physicochemical properties	**Minimum**	**Typical value**	**Maximum**
Kinematic viscosity at 100 °C, cSt	-	50,0	120
Density at 60 °C, kg/m^3	-	960	-
Flash point (COC), °C	170	210	-
Appearance	transparent brown liquid		
TBN, mg KOH/g	70	85	-
Calcium content, % wt.	2,40	2,65	-
Zinc content, % wt.	0,90	0,97	-
Nitrogen content, % wt.	0,60	0,70	-
Sulfate ash content, % wt.	-	10,7	11,7
Mechanical impurities content	-	0,08	0,10
Water content, % wt.	-	0,06	0,10
Safety requirements	Specified in material safety data sheet (MSDS) of the product		
Package	Delivery in tanks, mobile and railway tanks, shipping containers, in drums with capacity of 216 liters, mounted on pallets.		

Product	Type
Package of additives PA-4502 **Specification BY 390401182.030-2010**	Multifunctional package of additives for all-purpose engine oils for passenger cars production.
Designation	Engine oil production of CG-4/CH-4/SJ, CI-4/SL group according to API.
Use recommendations	Recommended oil dosage for oils of CI-4/SL group – 13,6 % wt., for oils of CH-4/CG-4/SJ group – 11,9 % wt.,

Physicochemical properties	**Minimum**	**Typical value**	**Maximum**
Kinematic viscosity at 100 °C, cSt	-	80,0	120,0
Density at 60 °C, kg/m^3	-	980	-
Flash point (COC), °C	170	212	-
Appearance		transparent brown liquid	
TBN, mg KOH/g	72	83	-
Calcium content, % wt.	2,30	2,55	2,7
Zinc content, % wt.	0,85	0,92	0,96
Nitrogen content, % wt.	0,50	0,61	-
Sulfate ash content, % wt.	-	9,8	11,5
Mechanical impurities content	-	0,08	0,10
Water content, % wt.	-	0,09	0,12

Safety requirements	Specified in material safety data sheet (MSDS) of the product
Package	Delivery in tanks, mobile and railway tanks, shipping containers, in drums with capacity of 216 liters, mounted on pallets.

Product	Type
PA-2503 **PA-4501** **PA-4502**	Multifunctional package of additives for all-purpose engine oils for passenger cars and commercial motors production.

Dosage (% wt.)

Use recommendations		PA-2503-1	PA-2503-2	PA-2503-3	PA-2503-4	LUKOIL DF-11k	PA-4501	PA-4502
CB according to API		-	-	-	1,85±0,1	0,15±0,05	-	-
CC according to API		-	-	-	2,9±0,1		-	-
CD according to API		-	-	-	4,25±0,1		-	-
SD/CB according to API		3,3±0,1	-	-	-	0,3±0,05	-	-
SF/CC according to API		4,0±0,1	-	-	-		-	-
SG/CD according to API	variant №1	4,0 ±0,1	-	-	-	-	2,2±0,1	-
	variant №2	-	6,2±0,1	-	-	-	-	-
CF-4/SG according to API	variant №1	5,5±0,1	-	-	-	-	1,8±0,1	-
	variant №2	-	-	7,3±0,1	-	-	-	-
SJ/CF according to API		3,7 ±0,1	-	-	-	-	4,0±0,1	-
SL/CF according to API		-	-	-	-	-	11,1±0,1	-
CH-4/CG-4/SJ according to API		-	-	-	-	-	-	11,9±0,1
CI-4/SL according to API		-	-	-	-		-	13,6±0,1

Dissolving conditions

Recommended solution temperature of additive package in base oil is up to 70 °C. Any devices providing uniformity of stirring of additive package in base oil can be used for dissolving.

Physicochemical properties	PA-2503-1	PA-2503-2	PA-2503-3	PA-2503-4	PA-4501	PA-4502
Kinematic viscosity at 100 °C, cSt	67,0	60,0	60,0	70,0	50,0	80,0
Density at 60 °C, kg/m^3	1030	1005	1020	1110	960	980
Flash point (COC), °C	not lower than 170					
Appearance	transparent brown liquid					
TBN, mg KOH/g	147	129	140	230	85	83
Calcium content, % wt.	5,1	4,48	4,75	8,2	2,65	2,55
Zinc content, % wt.	2,1	1,68	1,65	2,3	0,97	0,92
Nitrogen content, % wt.	0,55	0,62	0,58	-	0,70	0,61
Sulfate ash content, % wt.	20,5	17,8	18,6	31,3	11,3	9,8
Mechanical impurities content	0,08					
Water content, % wt.	0,06					

Note:
*- the normalized value of the supplied products may slightly vary from the value represented in the table

Safety requirements — Specified in material safety data sheet (MSDS) of the product

Package — Delivery in tanks, mobile and railway tanks, shipping containers, in drums with capacity of 216 liters, mounted on pallets.

Product	Type
Package of additives PA-2600 PA-2610	Multifunctional package of additives for monograde and multigrade engine oils using appropriate Group I base stock. Package of additives provide safety protection for high-sulfur fueled engines in hot climate conditions.

Use recommendations	SAE Viscosity Grade	Dosage (% wt.) PA-2600	PA-2610	CCK-400 or CCK-400D
SB/CB	Multigrade	1,6	-	-
SB/CB	Monograde	1,85	-	-
SC/CC	Monograde	2,2	-	-
SD/CC	Monograde	2,5	-	-
SE/CC	Monograde	2,8	-	-
SE/CC	Multigrade	3,2	-	-
SF/CC	Monograde& Multigrade	3,8	-	-
SF/CD (10 TBN)	Monograde& Multigrade	3,8	-	0,8
CF (11 TBN)	Monograde	4,25	-	0,8
SG/CD	Monograde& Multigrade	3,6	1,6	-
SG/CF-4 (11 TBN)	Monograde& Multigrade	4,0	1,5	0,8
SJ/CF	Monograde& Multigrade	4,0	2,5	-

Dissolving conditions	Recommended solution temperature of additive package in base oil is up to 70 °C. Any devices providing uniformity of stirring of additive package in base oil can be used for dissolving.

Physicochemical properties	PA-2600	PA-2610
	Typical values*	
Kinematic viscosity at 100 °C, cSt	80	80
Density at 60 °C, kg/m^3	1060	930
Flash point (COC), °C	not lower than 170	
Appearance	transparent brown liquid	
TBN, mg KOH/g	189	30
Calcium content, % wt.	6,8	0,6
Zinc content, % wt.	2,4	0,6
Nitrogen content, % wt.	0,4	1,1
Sulfate ash content, % wt.	27,5	2,4
Mechanical impurities content	0,08	0,08

Note:
*- the normalized value of the supplied products may slightly vary from the value represented in the table

Safety requirements	Specified in material safety data sheet (MSDS) of the product
Package	Delivery in tanks, mobile and railway tanks, shipping containers, in drums with capacity of 216 liters, mounted on pallets.

Product	Type
ALKYLPHENOL **Specification** **BY 300220696.016-2003**	A product of phenol alkylation by trimers of propylene.
Designation	A component of raw material in production of additives for engine oils, tire and other rubber fabricated products manufacture.
Physicochemical properties	**Typical value**
Density at 20 °C, kg/m^3	935
Flash point (COC), °C	146
Phenol content, % wt.	is absent
Monoalkylphenols content, % wt.	94,8
Dialkylphenols content, % wt.	5,2
Water content, % wt.	traces
Safety requirements	Specified in material safety data sheet (MSDS) of the product
Package	Delivery in tanks, mobile and railway tanks, shipping containers, in drums with capacity of 216 liters, mounted on pallets.

Product	Type
DODECYLPHENOL **Specification** **BY 390401182.018-2009**	A product of phenol alkylation by tetramers of propylene.
Designation	A component of raw material in production of additives for engine oils, tire and other rubber fabricated products manufacture.
Physicochemical properties	**Typical value**
Density at 20 °C, kg/m^3	945
Flash point (COC), °C	154
Phenol content, % wt.	0,05
Monoalkylphenols content, % wt.	95,0
Dialkylphenols content, % wt.	4,95
Water content, % wt.	traces
Safety requirements	Specified in material safety data sheet (MSDS) of the product
Package	Delivery in tanks, mobile and railway tanks, shipping containers, in drums with capacity of 216 liters, mounted on pallets.

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