

I. Packages of additives

Product

Type

Package of additives

PA-4502

Specification

BY 390401182.030-2012

Heavy duty diesel engine oil package of additives.

Main benefits

Excellent protection against wear due to corrosion of bearing and cylinder liners. Excellent protection of engine valve train components. The highest level of prevention against damaging deposits common in high temperature modern diesel engines. Excellent control of soot.

| Use recommendations | Treat rate* |
|---------------------|-------------|
| CI-4/SL | 13.6 % wt. |
| CH-4/CG-4/SJ | 11.9 % wt. |
| CG-4/SJ | 10.5 % wt. |

* - in combination with viscosity improver & pour point depressant

Some physical & chemical properties

| Characteristics | Minimum | Typical value | Maximum |
|------------------------------------|---------|---------------|---------|
| Kinematic viscosity at 100 °C, cSt | - | 75.0 | 120.0 |
| Flash point (COC), °C | 170 | 212 | - |
| TBN, mg KOH/g | 72 | 85 | - |
| Calcium content, % wt. | 2.30 | 2.63 | 2.90 |
| Zinc content, % wt. | 0.85 | 0.91 | 0.96 |
| Nitrogen content, % wt. | 0.50 | 0.65 | - |
| Sulfate ash content, % wt. | - | 10.3 | 11.5 |

Conditions of usage

Recommended solution temperature of package of additives in base oil is up to 70 °C. Any devices providing uniformity of stirring of package of additives in base oil can be used for dissolving. Shelf life at ambient temperature – 12 months.

Safety requirements

Before usage the product please read material safety data sheet (MSDS) of the product.

Product**Type****Package of additives****PA-4501**

Specification

BY 390401182.025-2011

Top tier a multipurpose cascade package of additives for crankcase oils.**Main benefits**

Excellent protection against wear of bearing and cylinder liners. Excellent protection of engine valve train components. The highest level of prevention against damaging deposits on engine elements.

| Use recommendations | Treat rate[*] |
|----------------------------|------------------------------------------------|
| SL/CF | 11.1% wt. |
| SJ/CF | 4.0 % wt. + 3,7 % wt. PA-2503-1 |
| SG/CD | 2.2 % wt. + 4.0 % wt. PA-2503-1 ^{**} |
| CF-4/SG | 1.8 % wt. + 5.5 % wt. PA-2503-1 ^{***} |

* - in combination with viscosity improver & pour point depressant

**- equivalent 6.2% wt. PA-2503-2

***- equivalent 7.3% wt. PA-2503-3

Some physical & chemical properties

| Characteristics | Minimum | Typical value | Maximum |
|------------------------------------|----------------|----------------------|----------------|
| Kinematic viscosity at 100 °C, cSt | - | 45.0 | - |
| Flash point (COC), °C | 170 | 210 | - |
| TBN, mg KOH/g | 70 | 85 | - |
| Calcium content, % wt. | 2.40 | 2.75 | - |
| Zinc content, % wt. | 0.90 | 0.97 | - |
| Nitrogen content, % wt. | 0.60 | 0.70 | - |
| Sulfate ash content, % wt. | - | 10.8 | 11.7 |

Conditions of usage

Recommended solution temperature of package of additives in base oil is up to 70 °C. Any devices providing uniformity of stirring of package of additives in base oil can be used for dissolving. Shelf life at ambient temperature – 12 months.

Safety requirements

Before usage the product please read material safety data sheet (MSDS) of the product.

Product**Type****Package of additives
PA-2503-1**

Specification
BY 390401182.028-2011

A multipurpose cascade package of additives for passenger car and heavy diesel crankcase oils.

Main benefits

The package of additives provides requirements for passenger car and heavy diesel engines, protection of engine valve train components. Good protection against wear of bearing and cylinder liners.

| Use recommendations | Treat rate * |
|---------------------|------------------------------------|
| SF/CC | 4.2 % wt. |
| SF/CD | 4.5 % wt. |
| SG/CD | 4.0 % wt. + 2.2 % wt. PA-4501 ** |
| SJ/CF | 3.7 % wt. + 4.0 % wt. PA-4501 |
| CF-4/SG | 5.5 % wt. + 1.8 % wt. PA-4501 *** |
| SD/CB | 3.3 % wt. +0,3 % wt. LUKOI LDF-11κ |

* - in combination with viscosity improver & pour point depressant

** - equivalent 6.2% wt. PA-2503-2

*** - equivalent 7.3% wt. PA-2503-3

Some physical & chemical properties

| Characteristics | Minimum | Typical value | Maximum |
|------------------------------------|---------|---------------|---------|
| Kinematic viscosity at 100 °C, cSt | - | 53.0 | 150 |
| Flash point (COC), °C | 170 | 214 | - |
| TBN, mg KOH/g | 140 | 147 | - |
| Calcium content, % wt. | 4.8 | 5.1 | - |
| Zinc content, % wt. | 1.9 | 2.1 | - |
| Nitrogen content, % wt. | 0.45 | 0.55 | - |
| Sulfate ash content, % wt. | - | 20.5 | 22.0 |

Conditions of usage

Recommended solution temperature of package of additives in base oil is up to 70 °C. Any devices providing uniformity of stirring of package of additives in base oil can be used for dissolving. Shelf life at ambient temperature – 12 months.

Safety requirements

Before usage the product please read material safety data sheet (MSDS) of the product.

Product**Type****Package of additives****PA-2503-2**

Specification

BY 390401182.028-2011

Top tier passenger car motor oils package of additives.**Main benefits**

Good level of prevention against damaging deposits on engine elements. Good protection against wear of bearing and cylinder liners.

Use recommendations**Treat rate*****SG/CD**

6.2 % wt.

* - in combination with viscosity improver & pour point depressant

Some physical & chemical properties

| Characteristics | Minimum | Typical value | Maximum |
|------------------------------------|---------|---------------|---------|
| Kinematic viscosity at 100 °C, cSt | - | 49.0 | 150 |
| Flash point (COC), °C | 170 | 214 | - |
| TBN, mg KOH/g | 115 | 129 | - |
| Calcium content, % wt. | 4.10 | 4.48 | - |
| Zinc content, % wt. | 1.55 | 1.68 | - |
| Nitrogen content, % wt. | 0.55 | 0.62 | - |
| Sulfate ash content, % wt. | - | 17.8 | 21.0 |

Conditions of usage

Recommended solution temperature of package of additives in base oil is up to 70 °C. Any devices providing uniformity of stirring of package of additives in base oil can be used for dissolving. Shelf life at ambient temperature – 12 months.

Safety requirements

Before usage the product please read material safety data sheet (MSDS) of the product.

Product**Type****Package of additives****PA-2503-3**

Specification

BY 390401182.028-2011

Heavy duty diesel engine oil package of additives.**Main benefits**

Excellent protection of engine valve train components. Good level of prevention against damaging deposits on engine elements. Good protection against wear of bearing and cylinder liners.

Use recommendations**Treat rate *****CF-4/SG**

7.3 % wt.

* - in combination with viscosity improver & pour point depressant

Some physical & chemical properties

| Characteristics | Minimum | Typical value | Maximum |
|------------------------------------|----------------|----------------------|----------------|
| Kinematic viscosity at 100 °C, cSt | - | 50.0 | 150 |
| Flash point (COC), °C | 170 | 210 | - |
| TBN, mg KOH/g | 135 | 141 | - |
| Calcium content, % wt. | 4.30 | 4.75 | - |
| Zinc content, % wt. | 1.55 | 1.65 | - |
| Nitrogen content, % wt. | 0.50 | 0.58 | - |
| Sulfate ash content, % wt. | - | 18.6 | 22.0 |

Conditions of usage

Recommended solution temperature of package of additives in base oil is up to 70 °C. Any devices providing uniformity of stirring of package of additives in base oil can be used for dissolving. Shelf life at ambient temperature – 12 months.

Safety requirements

Before usage the product please read material safety data sheet (MSDS) of the product.

Product**Type****Package of additives****PA-2503-4**

Specification

BY 390401182.028-2011

Diesel engine oil package of additives

| Use recommendations | Treat rate * |
|----------------------------|--------------------------------------|
| CB | 1.85 % wt.+ 0.15 % wt. LUKOIL DF-11k |
| CC | 2.8 % wt. |
| CD | 4.2 % wt. |

* - in combination with viscosity improver & pour point depressant

Some physical & chemical properties

| Characteristics | Minimum | Typical value | Maximum |
|-------------------------------------|----------------|----------------------|----------------|
| Kinematic viscosity at 100 °C, cSt | - | 47.0 | 150 |
| Density at 60 °C, kg/m ³ | - | 1061 | - |
| Flash point (COC), °C | 170 | 214 | - |
| TBN, mg KOH/g | 220 | 230 | - |
| Calcium content, % wt. | 8.0 | 8.5 | - |
| Zinc content, % wt. | 2.2 | 2.3 | - |
| Sulfate ash content, % wt. | - | 31.3 | 35.0 |

Conditions of usage

Recommended solution temperature of package of additives in base oil is up to 70 °C. Any devices providing uniformity of stirring of package of additives in base oil can be used for dissolving. Shelf life at ambient temperature – 12 months.

Safety requirements

Before usage the product please read material safety data sheet (MSDS) of the product.

| Product | Type |
|-------------------------------------|----------------------------------------------------------------------------------------------------------------------------|
| Package of additives PA-2600 | Multifunctional package of additives for monograde and multigrade engine oils using appropriate Group I base stock. |

Main benefits

Package of additives provide safety protection for high-sulfur fueled engines in hot climate conditions. The package of additives provides requirements for passenger car and heavy diesel engines, protection of engine valve train components.

| Use recommendations | SAE Viscosity Grade | Treat rate* |
|-----------------------------|------------------------|----------------------------------------------------------------|
| SL/CF/CF-4 (8,5 TBN) | Monograde & Multigrade | 4.1% wt. + 3.4% wt. PA-2620 ⁴ |
| SJ/CF/CF-4 (8 TBN) | Monograde & Multigrade | 4.0 % wt. + 2.5 % wt. PA-2610 ³ |
| CF-4/SG (11 TBN) | Monograde & Multigrade | 4.0 % wt. + 1,5% wt. PA-2610 + 0,8 % wt. CCK-400D ² |
| SG/CD (7 TBN) | Monograde & Multigrade | 3.6 % wt. + 1.6% wt. PA-2610 ¹ |
| CF/SF (10 TBN) | Monograde & Multigrade | 4.25 % wt. + 0.6 % wt. CCK-400D |
| SF/CD, CD (12 TBN) | Monograde & Multigrade | 3.8 % wt. + 1.3% wt. CCK-400D |
| SF/CD, CD (10 TBN) | Monograde & Multigrade | 3.8 %wt. + 0.8 % wt. CCK-400D |
| SF/CC/CD (7 TBN) | Monograde & Multigrade | 3.8 % wt. |
| SE/CC (6 TBN) | Multigrade | 3.2 % wt. |
| SE/CC (5 TBN) | Monograde | 2.8 % wt. |
| CC (7 TBN) | Monograde & Multigrade | 2.2 % wt. + 0.75 % wt. CCK-400D |
| SC/CC (4 TBN) | Monograde | 2.2 % wt. |
| SB/CB (3,5 TBN) | Multigrade | 1.85 % wt. |
| SB/CB (3 TBN) | Monograde | 1.6 % wt. |

* - in combination with viscosity improver & pour point depressant

1- equivalent 5.2% wt. PA-2615 3- equivalent 6.5% wt. PA-2635

2- equivalent 6.3% wt. PA-2625 4- equivalent 7.5% wt. PA-2645

Some physical & chemical properties

| Characteristics | Minimum | Typical value | Maximum |
|------------------------------------|---------|---------------|---------|
| Kinematic viscosity at 100 °C, cSt | - | 50.0 | 120 |
| Flash point (COC), °C | 170 | 220 | - |
| TBN, mg KOH/g | 180 | 189 | 200 |
| Calcium content, % wt. | 6.0 | 6.5 | 7.3 |
| Zinc content, % wt. | 2.3 | 2.4 | 2.5 |
| Nitrogen content, % wt. | - | 0.4 | - |
| Sulfate ash content, % wt. | - | 26.7 | 29.0 |

Conditions of usage

Recommended solution temperature of package of additives in base oil is up to 70 °C. Any devices providing uniformity of stirring of package of additives in base oil can be used for dissolving. Shelf life at ambient temperature – 12 months.

Safety requirements

Before usage the product please read material safety data sheet (MSDS) of the product.

| Product | Type |
|---------|------|
|---------|------|

| | |
|------------------------------------------|------------------------------------------------------------------------------|
| Package of additives PA- 2610 | Passenger car motor oil additive. A performance additive booster. |
|------------------------------------------|------------------------------------------------------------------------------|

| Use recommendations | Treat rate * |
|---------------------------|--------------------------------------------------------------------------------|
| SJ/CF/CF-4 (8 TBN) | 2.5 % wt. + 4.0 % wt. PA-2600³ |
| CF-4/SG (11 TBN) | 1.5 % wt.+ 4.0 % wt. PA-2600² + 0.8 % wt. CCK-400D |
| SG/CD (7 TBN) | 1.6 % wt.+ 3.6 % wt. PA-2600¹ |

* - in combination with viscosity improver & pour point depressant
 1- equivalent 5.2% wt. PA-2615 3- equivalent 6.5% wt. PA-2635
 2- equivalent 6.3% wt. PA-2625

Some physical & chemical properties

| Characteristics | Minimum | Typical value | Maximum |
|------------------------------------|---------|---------------|---------|
| Kinematic viscosity at 100 °C, cSt | - | 51 | 180 |
| Flash point (COC), °C | 170 | 210 | - |
| TBN, mg KOH/g | 20 | 35 | 45 |
| Nitrogen content, % wt. | - | 1.1 | - |
| Zinc content, % wt. | 0.50 | 0.60 | 0.8 |
| Sulfate ash content, % wt. | - | 2.4 | 5.0 |

Conditions of usage

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

Safety requirements

Before usage the product please read material safety data sheet (MSDS) of the product.

Product**Type**

Package of additives
PA- 2620

Passenger car motor oil additive.
A performance additive booster.

Use recommendations**Treat rate*****SL/CF/CF-4 (8.5 TBN)**3.4 % wt. + 4.1 % wt. **PA-2600**¹

* - in combination with viscosity improver & pour point depressant

1- equivalent 7.5% wt. PA-2645

Some physical & chemical properties

| Characteristics | Minimum | Typical value | Maximum |
|------------------------------------|----------------|----------------------|----------------|
| Kinematic viscosity at 100 °C, cSt | - | 45 | 200 |
| Flash point (COC), °C | 170 | 208 | - |
| TBN, mg KOH/g | 20 | 30 | 45 |
| Nitrogen content, % wt. | - | 1.4 | - |
| Zinc content, % wt. | 0.50 | 0.55 | 0.70 |
| Sulfate ash content, % wt. | - | 2.4 | 4.5 |

Conditions of usage

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

Safety requirements

Before usage the product please read material safety data sheet (MSDS) of the product.

II. Succinimide additives

| 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. | | |
| Characteristics | C-5A mark A | C-5A mark B Typical values | C-5A mark V |
| Kinematic viscosity at 100 °C, cSt | 95 | 88 | 60 |
| Flash point (COC), °C | 220 | 220 | 220 |
| TBN, mg KOH/g | 32.3 | 29 | 23 |
| Nitrogen content, % wt. | 1.78 | 1.55 | 1.45 |
| Acid number, mg KOH/g | 2.0 | 2.0 | 2.0 |
| Active material, % wt. | 52 | 44 | 42 |
| Conditions of usage | Recommended solution temperature of additive in base oil is up to 80 °C. Any devices providing uniformity of stirring of package of additives in base oil can be used for dissolving. | | |
| Safety requirements | Before usage the product please read material safety data sheet (MSDS) of the product. | | |

| 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. | | |
| Characteristics | Minimum | Typical value | Maximum |
| Kinematic viscosity at 100 °C, cSt | - | 80,0 | 200 |
| 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 |
| Conditions of usage | Recommended solution temperature of additive in base oil is up to 80 °C. Any devices providing uniformity of stirring of package of additives in base oil can be used for dissolving. | | |
| Safety requirements | Before usage the product please read material safety data sheet (MSDS) of the product. | | |

| Product | Type |
|--------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ADDITIVE C-1000 Specification BY 390401182.026-2012 | Succinimide ashless dispersant . Additive C-1000 is generally used with oxidation inhibitor and acid neutralizing additives in gasoline and diesel engine oils. It provides excellent low temperature sludge and varnish control in gasoline and effective dispersancy in diesel engine. |

| Characteristics | Minimum | Typical value | Maximum |
|------------------------------------|---------|---------------|---------|
| Kinematic viscosity at 100 °C, cSt | - | 80 | 400 |
| Flash point (COC), °C | 180 | 210 | - |
| TBN, mg KOH/g | 15.0 | 18.0 | - |
| Acid number, mg KOH/g | - | 2.4 | 4.0 |
| Nitrogen content, % wt. | 1.1 | 1,2 | - |
| Active material, % wt. | 50.0 | 52.0 | - |

Conditions of usage Recommended solution temperature of additive in base oil is up to 80 °C. Any devices providing uniformity of stirring of package of additives in base oil can be used for dissolving.

Safety requirements Before usage the product please read material safety data sheet (MSDS) of the product.

| Product | Type |
|--------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ADDITIVE C-1500 Specification BY 390401182.026-2012 | 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. |

| Characteristics | Minimum | Typical value | Maximum |
|------------------------------------|---------|---------------|---------|
| Kinematic viscosity at 100 °C, cSt | - | 230 | 400 |
| Flash point (COC), °C | 180 | 210 | - |
| TBN, mg KOH/g | 24.0 | 30.0 | - |
| Nitrogen content, % wt. | 1.4 | 1.5 | - |
| Acid number, mg KOH/g | - | 2.3 | 4.0 |
| Active material, % wt. | 50.0 | 54.0 | - |

Conditions of usage Recommended solution temperature of additive in base oil is up to 80 °C. Any devices providing uniformity of stirring of package of additives in base oil can be used for dissolving.

Safety requirements Before usage the product please read material safety data sheet (MSDS) of the product.

| Product | | Type | |
|-------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| ADDITIVE C-1500B Specification BY 390401182.026-2012 | | 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 heavy duty diesel engines. | |
| Characteristics | Minimum | Typical value | Maximum |
| Kinematic viscosity at 100 °C, cSt | - | 230 | 400 |
| Flash point (COC), °C | 180 | 210 | - |
| TBN, mg KOH/g | 24.0 | 32.0 | - |
| Nitrogen content, % wt. | 1.4 | 1.5 | - |
| Boron content, % wt. | 0.20 | 1.10 | - |
| Conditions of usage | Recommended solution temperature of additive in base oil is up to 80 °C. Any devices providing uniformity of stirring of package of additives in base oil can be used for dissolving. | | |
| Safety requirements | Before usage the product please read material safety data sheet (MSDS) of the product. | | |

| Product | | Type | |
|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| ADDITIVE C-2500 Specification BY 390401182.026-2012 | | 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 heavy duty diesel engines. | |
| Characteristics | Minimum | Typical value | Maximum |
| Kinematic viscosity at 100 °C, cSt | - | 180 | 400 |
| Flash point (COC), °C | 180 | 210 | - |
| TBN, mg KOH/g | 18.0 | 22.0 | - |
| Nitrogen content, % wt. | 0.8 | 1.0 | - |
| Acid number, mg KOH/g | - | 1.5 | 4.0 |
| Active material, % wt. | 40.0 | 45.0 | - |
| Conditions of usage | Recommended solution temperature of additive in base oil is up to 80 °C. Any devices providing uniformity of stirring of package of additives in base oil can be used for dissolving. | | |
| Safety requirements | Before usage the product please read material safety data sheet (MSDS) of the product. | | |

III. Zinc dialkyldithiophosphate additives

| Product | Type | | |
|-----------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|---------|
| ADDITIVE VNII NP-354 Specification 38.101680-77 | Zinc dialkylphenyldithiophosphate in mineral oil. An inhibitor and antiwear additive for crankcase, marine and industrial oils. | | |
| Characteristics | Minimum | Typical value | Maximum |
| Kinematic viscosity at 100 °C, cSt | - | 20 | 25 |
| Flash point (COC), °C | 165 | 190 | - |
| Zinc content, % wt. | 2.4 | 2.6 | - |
| Phosphorous content, % wt. | 2.3 | 2.4 | - |
| Sulfur content, % wt. | 4.5 | 4.7 | - |
| pH of additive solution, pH | 2.7 | 2.8 | - |
| Conditions of usage | Recommended solution temperature of additive in base oil is up to 80 °C. Any devices providing uniformity of stirring of package of additives in base oil can be used for dissolving. | | |
| Safety requirements | Before usage the product please read material safety data sheet (MSDS) of the product. | | |

| Product | Type | | |
|-----------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|---------|
| ADDITIVE H-101 Specification BY 390401182.024-2011 | Zinc dialkyldithiophosphate solution in mineral oil. An antiwear additive for gear and industrial oils. | | |
| Characteristics | Minimum | Typical value | Maximum |
| Kinematic viscosity at 100 °C, cSt | - | 13 | 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 | - |
| Conditions of usage | Recommended solution temperature of additive in base oil is up to 40 °C. Any devices providing uniformity of stirring of package of additives in base oil can be used for dissolving. | | |
| Safety requirements | Before usage the product please read material safety data sheet (MSDS) of the product. | | |

Product**Type****ADDITIVE H-102**

Zinc dialkyldithiophosphate solution in mineral oil. An inhibitor and antiwear additive for crankcase, industrial, hydraulic oils and greases.

| Characteristics | Minimum | Typical value | Maximum |
|-------------------------------------|----------------|----------------------|----------------|
| Kinematic viscosity at 40 °C, cSt | - | 150,0 | 200 |
| Density at 20 °C, kg/m ³ | - | 1060 | - |
| Flash point (COC), °C | 150 | 194 | - |
| Zinc content, % wt. | 7.5 | 8.0 | - |
| Phosphorous content, % wt. | 7.0 | 7.5 | - |
| Sulfur content, % wt. | - | 15 | - |

Conditions of usage Recommended solution temperature of additive in base oil is up to 50 °C. Any devices providing uniformity of stirring of package of additives in base oil can be used for dissolving.

Safety requirements Before usage the product please read material safety data sheet (MSDS) of the product.

Product**Type****ADDITIVE
LUKOIL DF-11K**

Specification
0257-005-00044434-99

Zinc dialkyldithiophosphate solution in mineral oil. An inhibitor and antiwear additive for crankcase and industrial, hydraulic oils.

| Characteristics | Minimum | Typical value | Maximum |
|-------------------------------------|----------------|----------------------|----------------|
| Kinematic viscosity at 100 °C, cSt | 11.5 | 15.0 | - |
| 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 | - |

Conditions of usage Recommended solution temperature of additive in base oil is up to 50 °C. Any devices providing uniformity of stirring of package of additives in base oil can be used for dissolving.

Safety requirements Before usage the product please read material safety data sheet (MSDS) of the product.

IV. Ashless dialkyldithiophosphates

| 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. | | |
| Characteristics | 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 | - |
| Conditions of usage | Recommended solution temperature of additive in base oil is up to 70 °C. Any devices providing uniformity of stirring of package of additives in base oil can be used for dissolving. | | |
| Safety requirements | Before usage the product please read material safety data sheet (MSDS) of the product. | | |

V. Natural sulfonate additives

| Product | Type | | |
|-----------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|---------|
| ADDITIVE C-150 Specification 38.101685-84 | Average alkaline calcium sulfonate, produced on mineral raw material basis. | | |
| Characteristics | Minimum | Typical value | Maximum |
| Kinematic viscosity at 100 °C, cSt | - | 70.0 | - |
| Flash point (COC), °C | 180 | 210 | - |
| TBN, mg KOH/g | 230 | 250 | - |
| Calcium content, % wt. | 9.0 | 9.5 | |
| Sulfate ash content, % wt. | - | 32.0 | 35.0 |
| Conditions of usage | Recommended solution temperature of additive in base oil is up to 70 °C. Any devices providing uniformity of stirring of package of additives in base oil can be used for dissolving. | | |
| Safety requirements | Before usage the product please read material safety data sheet (MSDS) of the product. | | |

Product**Type****ADDITIVE C-300**

Specification
BY 390401182.023-2010

High alkaline calcium sulfonate, produced on mineral raw material basis.

| Characteristics | Minimum | Typical value | Maximum |
|------------------------------------|---------|---------------|---------|
| Kinematic viscosity at 100 °C, cSt | - | 130 | 300 |
| Flash point (COC), °C | 180 | 220 | - |
| TBN, mg KOH/g | 280 | 300 | - |
| Calcium content, % wt. | 10.5 | 11.2 | - |
| Sulfate ash content, % wt. | - | 38.0 | 40.0 |

Conditions of usage

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

Safety requirements

Before usage the product please read material safety data sheet (MSDS) of the product.

VI. Synthetic sulfonate additives**Product****Type****ADDITIVE HCCK-30**

Specification
BY 390401182.022-2011

Neutral calcium sulfonate, produced on synthetical dialkyl benzene sulfonic acid.

| Characteristics | Minimum | Typical value | Maximum |
|------------------------------------|---------|---------------|---------|
| Kinematic viscosity at 100 °C, cSt | - | 30 | 80 |
| 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 |

Conditions of usage

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

Safety requirements

Before usage the product please read material safety data sheet (MSDS) of the product.

| Product | | Type | |
|-------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|---------|
| ADDITIVE CCK-300 Specification BY 390401182.022-2011 | | High alkaline calcium sulfonate, produced on alkyl benzene sulfonic acid. | |
| Characteristics | Minimum | Typical value | Maximum |
| Kinematic viscosity at 100 °C, cSt | - | 80.0 | 100 |
| Flash point (COC), °C | 180 | 214 | - |
| TBN, mg KOH/g | 300 | 315 | 350 |
| Calcium sulfonate content, % wt. | 28,0 | 29.0 | - |
| Calcium content, % wt. | 10.5 | 11.5 | - |
| Sulfate ash content, % wt. | - | 39.0 | 48.0 |
| Conditions of usage | Recommended solution temperature of additive in base oil is up to 70 °C. Any devices providing uniformity of stirring of package of additives in base oil can be used for dissolving. | | |
| Safety requirements | Before usage the product please read material safety data sheet (MSDS) of the product. | | |

| Product | | Type | |
|-------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|---------|
| ADDITIVE CCK-400 Specification BY 390401182.022-2011 | | High alkaline calcium sulfonate, produced on alkyl benzene sulfonic acid. | |
| Characteristics | Minimum | Typical value | Maximum |
| Kinematic viscosity at 100 °C, cSt | - | 200.0 | 350.0 |
| Flash point (COC), °C | 180 | 196 | - |
| TBN, mg KOH/g | 380 | 405 | 430 |
| Calcium sulfonate content, % wt. | 25.0 | 28.0 | - |
| Calcium content, % wt. | 13.5 | 15.5 | - |
| Sulfate ash content, % wt. | - | 52.7 | 55.0 |
| Conditions of usage | Recommended solution temperature of additive in base oil is up to 70 °C. Any devices providing uniformity of stirring of package of additives in base oil can be used for dissolving. | | |
| Safety requirements | Before usage the product please read material safety data sheet (MSDS) of the product. | | |

| Product | | Type | |
|--------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|---------|
| ADDITIVE CCK-400D Specification BY 390401182.022-2011 | | High alkaline calcium sulfonate , produced on dialkyl benzene sulfonic acid. | |
| Characteristics | Minimum | Typical value | Maximum |
| Kinematic viscosity at 100 °C, cSt | - | 100.0 | 150.0 |
| Flash point (COC), °C | 180 | 214 | - |
| TBN, mg KOH/g | 380 | 405 | 430 |
| Calcium sulfonate content, % wt. | 25.0 | 26.0 | - |
| Calcium content, % wt. | 13.5 | 15.2 | - |
| Sulfated ash content, % wt. | - | 51.7 | 55.0 |
| Color at dilution 15:85 | - | 4.0 | 6.0 |
| Conditions of usage | Recommended solution temperature of additive in base oil is up to 70 °C. Any devices providing uniformity of stirring of package of additives in base oil can be used for dissolving. | | |
| Safety requirements | Before usage the product please read material safety data sheet (MSDS) of the product. | | |

VII. Phenolate additives

| Product | | Type | |
|-----------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| ADDITIVE B-7120 Specification 0257-008-11246224-97 | | Calcium high alkaline phenolate additive. It is used in combination with other detergents in the process of oil manufacture for gasoline and diesel engines. | |
| Characteristics | Minimum | Typical value | Maximum |
| Kinematic viscosity at 100 °C, cSt | - | 130.0 | 250.0 |
| Flash point (COC), °C | 170 | 216 | - |
| TBN, mg KOH/g | 200 | 218 | - |
| Sulfur content, % wt. | 3.0 | 3.2 | 5.0 |
| Sulfate ash content, % wt. | - | 26.0 | 30.0 |
| Conditions of usage | Recommended solution temperature of additive in base oil is up to 70 °C. Any devices providing uniformity of stirring of package of additives in base oil can be used for dissolving. | | |
| Safety requirements | Before usage the product please read material safety data sheet (MSDS) of the product. | | |

| Product | | Type | |
|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| ADDITIVE B-7125 Specification BY 390401182.031-2012 | | Calcium high alkaline phenolate additive. It is used in combination with other detergents in the process of oil manufacture for gasoline and diesel engines. | |
| Characteristics | Minimum | Typical value | Maximum |
| Kinematic viscosity at 100 °C, cSt | - | 180.0 | 300 |
| Flash point (COC), °C | 170 | 210 | - |
| TBN, mg KOH/g | 250 | 278 | - |
| Sulfate ash content, % wt. | - | 33.8 | 40.0 |
| Conditions of usage | Recommended solution temperature of additive in base oil is up to 70 °C. Any devices providing uniformity of stirring of package of additives in base oil can be used for dissolving. | | |
| Safety requirements | Before usage the product please read material safety data sheet (MSDS) of the product. | | |

| Product | | Type | |
|-------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| ADDITIVE B-7130D Specification BY 390401182.027-2012 | | Calcium high alkaline phenolate additive. It is used in combination with other detergents in the process of oil manufacture for gasoline and heavy duty diesel engines. | |
| Characteristics | Minimum | Typical value | Maximum |
| Kinematic viscosity at 100 °C, cSt | - | 200 | 350 |
| Flash point (COC), °C | 170 | 208 | - |
| TBN, mg KOH/g | 250 | 286 | - |
| Sulfate ash content, % wt. | - | 34.0 | 39.0 |
| Conditions of usage | Recommended solution temperature of additive in base oil is up to 70 °C. Any devices providing uniformity of stirring of package of additives in base oil can be used for dissolving. | | |
| Safety requirements | Before usage the product please read material safety data sheet (MSDS) of the product. | | |

JVLL “LLK-NAFTAN”
211440, Novopolotsk
Vitebsk region
Republic of Belarus
www.llk-naftan.by
Tel: 375 214 59 45 13
Fax: +375 214 59 81 62
sales department:
Tel: 375 29 743 83 12