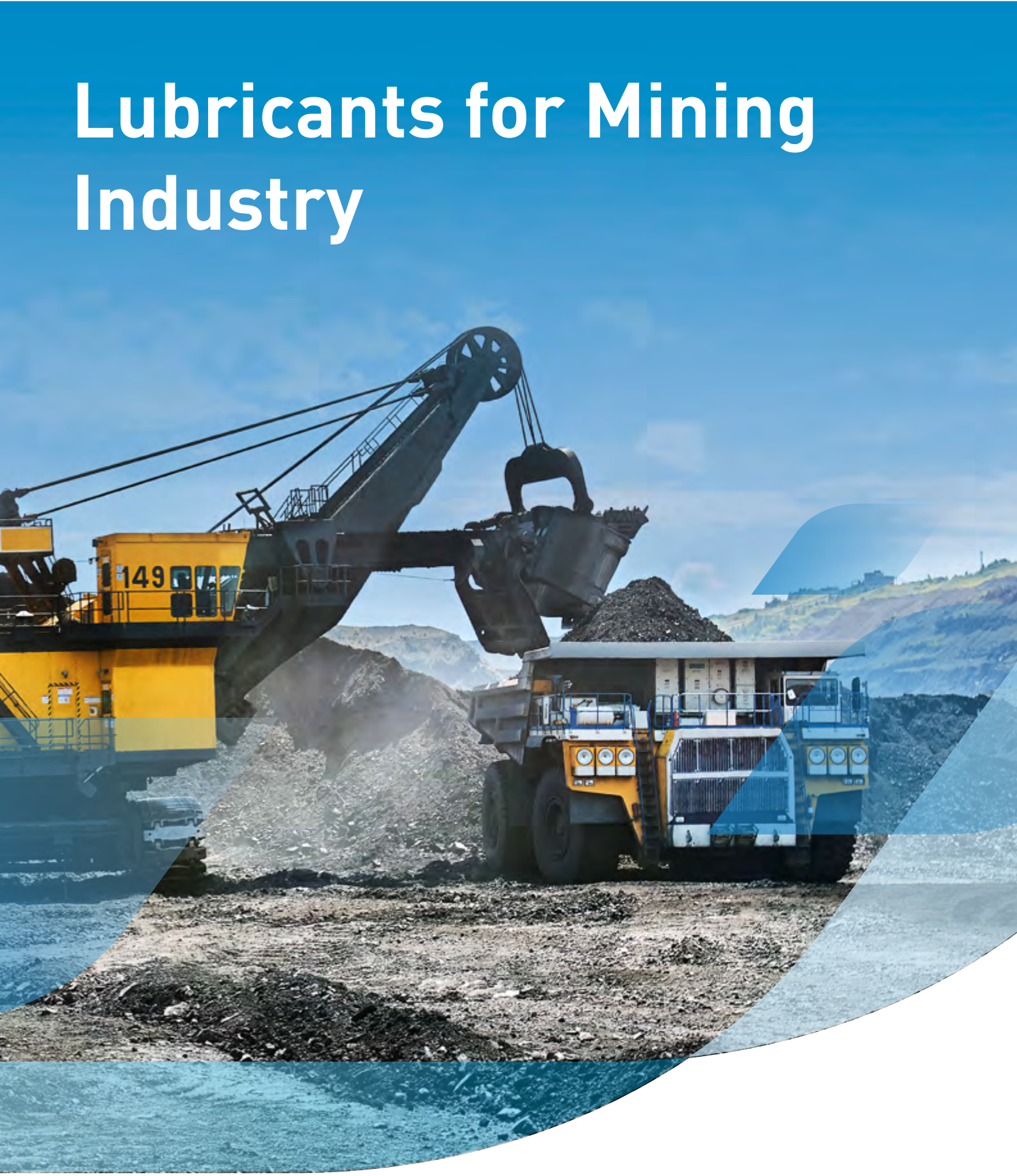
Lubricants for Mining Industry



GAZPROM NEFT | LUBRICANTS

www.gazpromneft-oil.com

Content

Company overview

Gazpromneft-Lubricants Ltd. is a 100% subsidiary of Gazprom Neft PJSC, specialized on the manufacture and sale of lubricants, greases and technical fluids.

3rd
MARKET SHARE
PACKAGED LUBRICANTS IN RUSSIA *

700k
TONS PER YEAR
LUBRICATING OILS, GREASES AND TECHNICAL FLUIDS*

22%
MARKET SHARE
PACKAGED LUBRICANTS IN RUSSIA*

6 PRODUCTION SITES

- **OMSK**
  One of the one of the most technologically advanced advanced blending plants in Eastern Europe.
  Production Capacity - 300 thousand tons.
  Most advanced production facilities of hi-tech greases in Russia.
  Production capacity - 11 thousand tons.
- **YAROSLAVL**
  Production of Group III (VHVI) base oils.
  Production capacity - 50 thousand tons.
- **BARI**
  (GAZPROMNEFT LUBRICANTS ITALIA)
- **FRYAZINO**
- **NOVI SAD**
  (NIS PETROL LUBRICANTS)
- **NIZHNIJ NOVGOROD**

EXPORT TO 78 COUNTRIES WORLDWIDE

Gazpromneft Lubricants Ltd supplies lubricants to "Severstal", "SIBUR Holding", "Gazprom", Evraz", MMK, TMK, NLMK, "Rusal", "Alrosa", Russian Railways, "MECH-EL", "ILIM Group", "Metalloinvest", "SUEK", "SDS-Ugol", "Polyus", "Polymetal". These are the large industrial enterprises and the leaders of their respective industries.

The quality management system of Gazpromneft-Lubricants Ltd. and its production facilities is certified according to international standards.

ISO 9001, ISO 14001, ISO 50001, OHSAS 18001, IATF 16949

* According to estimates 2019

G-PROFI ENGINE OIL

Lubricants and technical fluids branded as G-Profi, G-Box, G-Truck, G-Special and G-Energy exceed performance limits set by original equipment manufacturers. Provides effective operation of machinery in heavy duty operating conditions.

GAZPROMNEFT ENGINE OIL

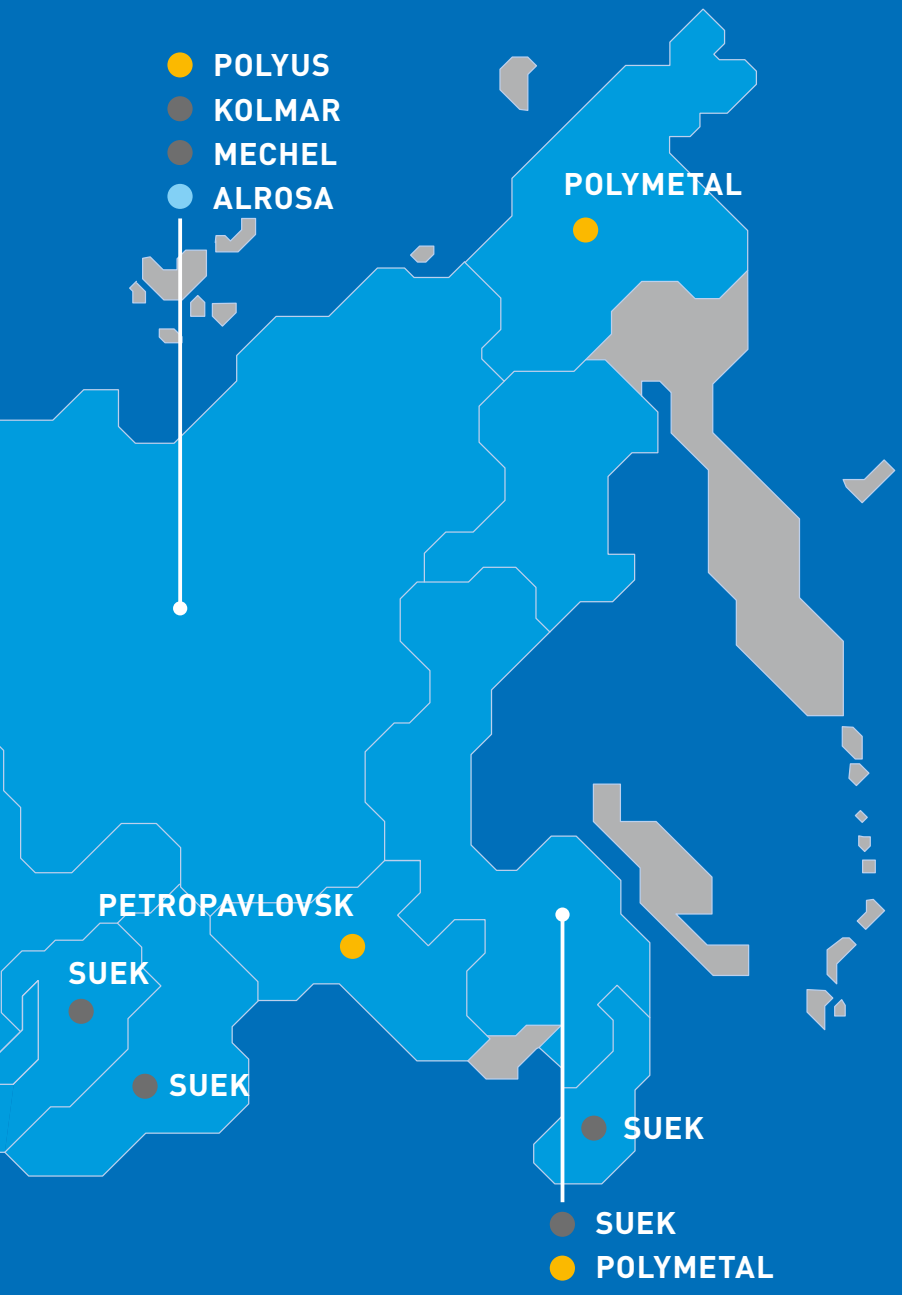
Gazpromneft lubricating oils, greases and technical fluids are formulated to meet the latest demands placed on modern lubricants. They are approved by leading equipment manufacturers and provide reliable operation of machinery.

Gazpromneft-Lubricants Ltd. is focused on the development and promotion of specialized lubricants that meet international quality standards and requirements of leading global equipment manufacturers.

This catalogue overviews engine oils, transmission, hydraulic, compressor and gear oils, as well as lubricating oils, greases and technical fluids designed for Mining industry.

Key partners

Key Partners



INDUSTRY TYPE

- Iron Ore
- Coal
- Diamonds
- Precious Metals
- Non-ferrous Metals
- Phosphates

MORE THAN 2,1 BLN RUBLES/YEAR

VALUE OF LUBRICANTS SUPPLIED TO MINING INDUSTRY

Engine Oil Specifications

G-Profi oils according to International specifications

Specifications		G-Profi GTS		G-Profi GT	G-Profi GT LA	G-Profi MSJ			G-P rofi MSI Plus	G-Profi MSI		G-Profi MSH		G-Profi MSF			
SAE Viscosity Grade		5W-30	10W-40	10W-40	10W-40	5W-30	10W-30	15W-40	15W-40	5W-40	10W-40	10W-40	15W-40	10W-40	15W-40	10W, 30	40, 50
ACEA	E4	✓	✓	✓													
	E6				✓	✓											
	E7	✓	✓	✓	✓	✓			✓	✓	✓		✓				
	E9				✓	✓	✓	✓									
API	CF													✓	✓	✓	✓
	CF-4													✓	✓	✓	✓
	CG-4																
	CH-4											✓	✓				
	CI-4			✓	✓				✓	✓	✓						
	CJ-4					✓	✓	✓									
	SG													✓	✓	✓	
	SJ																
	SL								✓	✓	✓	✓	✓				
	SN					✓	✓	✓									
Global	DHD-1			✓													
JASO	DH-1								✓								
	DH-2				✓	✓											

Specifications valid through 2019. See www.g-energy.org for actual specifications/approvals and detailed information.

G-Profi oils according to specifications of Original Equipment Manufacturers

Specifications		G-Profi GTS		G-Profi GT	G-Profi GT LA	G-Profi MSJ			G-Profi MSI Plus	G-Profi MSI		G-Profi MSH		G-Profi MSF			
SAE Viscosity Grade		5W-30	10W-40	10W-40	10W-40	5W-30	10W-30	15W-40	15W-40	5W-40	10W-40	10W-40	15W-40	10W-40	15W-40	10W, 30	40, 50
Caterpillar	ECF-1a				✓		✓	✓	✓		✓						
	ECF-2						✓	✓	✓		✓						
	ECF-3					✓	✓	✓									
Cummins	CES 20076/77	✓			✓				✓		✓		✓				
	CES 20078			✓					✓		✓						
	CES 20081					✓	✓	✓									
Deutz	DQC II											✓	✓				
	DQC III		✓						✓		✓						
	DQC III-LA						✓	✓									
	DQC IV	✓		✓													
	DQC IV-LA				✓	✓											
MTU	Cat. 2								✓		✓	✓	✓				
	Cat. 2.1						✓	✓									
	Cat. 3	✓	✓	✓													
	Cat. 3.1				✓	✓											
Komatsu				✓					✓			✓	✓				
Volvo	VDS-2											✓	✓				
	VDS-3	✓	✓	✓	✓	✓			✓	✓	✓						
	VDS-4					✓	✓	✓									
MACK	EO-M Plus	✓	✓	✓	✓	✓					✓		✓				
	EO-N	✓	✓	✓	✓				✓		✓						
	EO-N PP					✓											
	EO-O PP					✓	✓	✓									
MAN	M 3275								✓	✓	✓	✓	✓				
	M 3277	✓	✓	✓													
	M 3377			✓													
	M 3477				✓	✓											
	M 3575						✓	✓									
	M 3677					✓											
MB	228.3								✓	✓	✓	✓	✓				
	228.31					✓	✓	✓									
	228.5	✓	✓	✓													
	228.51				✓	✓											
Renault Trucks	RLD-2	✓	✓	✓	✓	✓			✓		✓						
	RLD-3					✓	✓	✓									
Scania	LDF 3	✓	✓														
	Low Ash				✓	✓											
JSC Avtodizel (YAMZ)				✓	✓				✓		✓	✓	✓	✓	✓		
JSC KAMAZ									✓		✓	✓	✓	✓	✓		
JSC TMZ				✓	✓				✓		✓	✓	✓	✓	✓		

Specifications valid through 2019. See www.g-energy.org for actual specifications/approvals and detailed information.

Gazpromneft oils according to International and OEM specifications

Specifications		Gazpromneft Diesel Ultra	Gazpromneft Diesel Premium				Gazpromneft Diesel Prioritet	Gazpromneft Diesel Extra		Gazpromneft Turbo Universal
SAE Viscosity Grade		5W-30 10W-40	5W-40	10W-30	10W-40	15W-40	10W-30 10W-40 15W-40 20W-50	10W-40 15W-40 20W-50	40, 50	15W-40 20W-50
ACEA	E7		✓	✓	✓	✓				
	E4	✓								
API	CD									✓
	CF								✓	
	CF-4							✓	✓	
	CH-4						✓			
	CI-4	✓	✓	✓	✓	✓				
	SG							✓		
	SJ						✓			
	SL		✓	✓	✓	✓				
Caterpillar	ECF-1a		✓	✓	✓	✓				
	ECF-2		✓	✓	✓	✓				
Cummins	CES 20076	✓	✓	✓	✓	✓	✓			
	CES 20077	✓	✓	✓	✓	✓				
	CES 20078	✓	✓	✓	✓	✓				
Deutz	DQC III		✓	✓	✓	✓				
	DQC IV-10	✓								
Global	DHD-1		✓	✓	✓	✓				
MACK	EO-M Plus		✓	✓	✓	✓				
	EO-N	✓	✓	✓	✓	✓				
MAN	M 3275		✓	✓	✓	✓	✓			
	M 3277	✓								
MB	228.3				✓					
	228.5	✓								
MTU	Cat. 2		✓	✓	✓	✓	✓			
	Cat. 3	✓								
Renault Trucks	RLD-2	✓	✓	✓	✓	✓				
Volvo	VDS-3	✓	✓	✓	✓	✓				
JSC AVTODIZEL (YAMZ)			✓	✓	✓	✓	✓	✓		✓
JSC KAMAZ			✓	✓	✓	✓	✓	✓		
JSC TMZ			✓	✓	✓	✓	✓	✓		✓

Specifications valid through 2019. See www.gazpromneft-oil.com for actual specifications/approvals and detailed information.

Conditions and environment specific to engines operating in a quarry

Mineral extraction and transportation equipment is exposed to specific adverse operating conditions. Dust, air humidity, substantial daily temperature fluctuations, extreme loads and inconsistent quality of fuel are regular conditions for quarrying.

Equipment manufacturers strive to provide sufficient margin of engine reliability but poor quality lubricants can easily destroy even most robust engines. That may result in costly downtime. To cope with harsh quarrying environment and conditions, we developed a series of engine oils with properties not just complying with the demands of key OEMs but significantly exceeding them. This quality margin compensates for the high levels of contamination and temperature extremes in real life operating conditions.

Described quality margin provides G-Profi and Gazpromneft engine oil series. Alkalinity surplus and advanced detergent additive package eliminate sludge related problems even if inconsistent fuel quality has been permitted. Reinforced dispersancy takes control over wear inducing soot particles and moves them to the oil filter. Effective antioxidant additives provide sufficient oil properties during entire drain interval and additional sludge control if extended drains are prescribed.

4.1. Product range and classification of G-Profi engine oils

G-Profi GT
10W-40

ACEA E4, E7
EURO-5
Cummins CES 20078
MTU Cat. 3

G-Profi MSF
10W-40, 15W-40

API CF-4
EURO-1, 2

G-Profi GTS
5W-30, 10W-40

ACEA E4, E7
EURO-5
MTU Cat. 3

G-Profi MSH
10W-40, 15W-40

API CH-4
EURO-3
Cummins CES 20077
MTU Cat. 2

G-Profi GT LA
10W-40

ACEA E6, E9
EURO-6
MTU Cat. 3.1

G-Profi MSI
5W-40, 10W-40

API CI-4
EURO-4
Cummins CES 20078
Caterpillar ECF-2
MTU Cat. 2

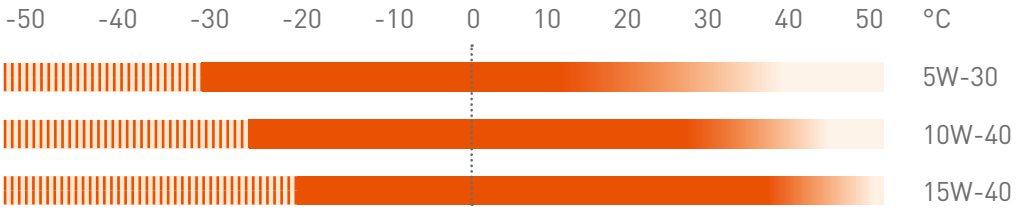
G-Profi MSI Plus
15W-40

API CI-4
EURO-4, 5
Cummins CES 20078
Caterpillar ECF-2
MTU Cat. 2

G-Profi MSJ
5W-30, 10W-30, 15W-40

API CJ-4
EURO-6
Cummins CES 20081
Caterpillar ECF-3
MTU Cat. 3.1/2.1

Application of engine oils depending on viscosity grade



Specifications valid through 2019. See www.g-energy.org for actual specifications/approvals and detailed information.

G-Profi engine oils

Name, SEA viscosity grade	Aftertreatment compatibility		Gas engine applicability	Antiwear protection	Anticorrosion protection	Sludge control	High-Sulphur fuel compatibility	Soot control	Fuel economy*
	EGR+ SCR	DPF							
G-Profi GTS									
5W-30	✓			■■■	■■■	■■■	■■■■	■■■	✓
10W-40	✓			■■■	■■■	■■■	■■■■	■■■	
G-Profi GT									
10W-40	✓			■■■	■■■	■■■	■■■	■■■	
G-Profi MSI Plus									
15W-40	✓			■■■	■■■	■■	■■■	■■■	
G-Profi MSI									
5W-40, 10W-40	✓			■■	■■	■■	■■	■■	
G-Profi MSH									
10W-40, 15W-40				■■	■■	■■	■	■■	
G-Profi MSF									
10W-40, 15W-40, 10W, 30, 40, 50				■	■	■	■	■	
G-Profi MSJ									
5W-30	✓	✓	✓	■■■	■■■	■■■	■	■■■	✓
10W-30	✓	✓	✓	■■■	■■■	■■■	■	■■■	✓
15W-40	✓	✓	✓	■■■	■■■	■■■	■	■■■	
G-Profi GT LA									
10W-40	✓	✓	✓	■■	■■■	■■■	■	■■	

* Fuel economy compared to xxW-40 viscosity grade oils.

G-Profi MSI Plus 15W-40

SHPD (Super High Performance Diesel) category oil for application in heavy-duty diesel engines of cargo vehicles as well as quarrying and special machinery. Enhanced detergent properties provide excellent soot control property at any ambient temperature.

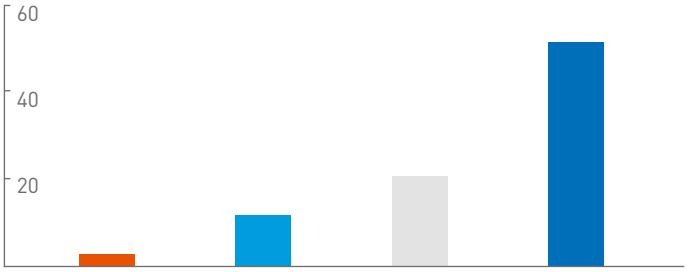
APPROVALS:
API CI-4/SL; JASO DH-1;
Cummins CES 20078;
Detroit Diesel DDC 93K215;
Deutz DQC III; Mack EO-N;
MAN M 3275-1; MB-Approval 228.3;
MTU Cat.2; Renault Trucks RLD-2;
Volvo VDS-3; JSC Kamaz;
JSC Avtodizel (YAMZ); JSC TMZ.

SPECIFICATIONS:
ACEA E7; Cummins CES 20076/77;
Caterpillar ECF-1a/ECF-2; Komatsu.

Corrosion*

Superior corrosion inhibition of G-Profi MSI Plus 15W-40 contributes to extended life cycle of crankshaft bearings and other engine parts.

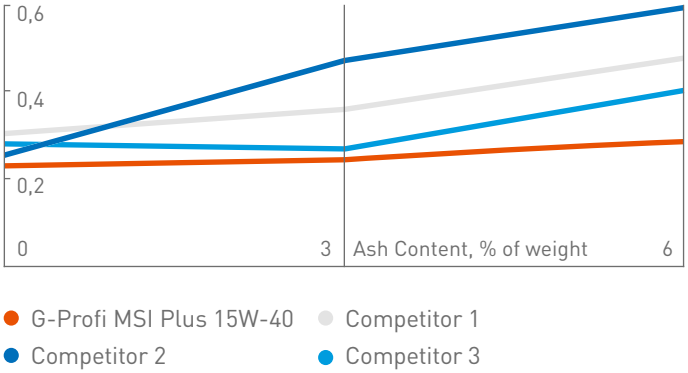
Metal particle content in oil, ppm



Soot Control**

Excellent disperging capability of G-Profi MSI Plus 15W-40 provides outstanding soot control and minimizes piston/bore wear.

Diameter of wear scar, mm



* Corrosion test ASTM D6594; ** High Frequency Reciprocating Rig test.

Advantages of G-Profi MSI Plus 15W-40

High oxidation stability	Retains oil properties till the end of drain interval - extends oil life, reduces expenses.
Excellent dispergency/detergency properties	Eliminates deposits and sludge on the parts and surfaces of engine - reduces engine downtime and repair expenses.
High TBN	Protects engine elements and oil against combustion by-products - prolongs life cycle of the engine.
Soot control	Lessens engine oil thickening due to soot contamination - maintains optimal oil pressure.
Viscosity stability at high temperatures	Provides reliable lubrication at any operational mode of the engine - reduces the number of unplanned downtimes.
Good corrosion inhibition properties	Protects engine parts against corrosion - saves budget on spare parts.

Confirmed high degree of engine protection during field trials in mining dump truck engines.
For detailed information, see — chapter 15.

G-Profi GTS 5W-30

Synthetic fuel saving engine oil for the most advanced dump truck, quarrying and special machinery diesel engines without DPF particle filters (up to and including Euro 5) operating in a wide ambient temperature range. Oil formula consists of synthetic base stock components, including top performance Group IV (PAO). Provides high detergent properties and enhanced alkalinity for long-lasting acid neutralization.

APPROVALS:
MACK EO-N; MAN M 3277; MB-Approval 228.5; Renault Trucks RLD-2; Volvo VDS-3; formulation approved according to Scania LDF 3.

SPECIFICATIONS:
ACEA E4/E7; Cummins CES 20077; DAF Extended Drain; Deutz DQC IV; Ford WSS-M2C212-A1; Iveco 18-1804 TFE; MACK EO-M Plus; MB 235.28; MTU Cat. 3; Renault Trucks RXD; Voith Retarder Oil Class B.

G-Profi GTS 10W-40

Synthetic engine oil for the most advanced dump truck, quarrying and special machinery diesel engines without DPF particle filters (up to and including Euro 5) operating in a wide ambient temperature range. Provides high detergency potential and enhanced alkalinity for long-lasting acid neutralization.

APPROVALS:
MAN M 3277; MB-Approval 228.5; formulation approved according to Scania LDF 3.

SPECIFICATIONS:
ACEA E4/E7; Cummins CES 20072; DAF Extended Drain; Deutz DQC III-10; Iveco; MACK EO-N/EO-M Plus; MTU Cat. 3; Renault Trucks RLD-2/RXD; Volvo VDS-3; ZF TE-ML 04C.

G-Profi GT 10W-40

Synthetic engine oil for the most advanced dump truck, quarrying and special machinery diesel engines without DPF particle filters (up to and including Euro 5) operating in a wide ambient temperature range. Provides enhanced oxidation stability.

APPROVALS:
API CI-4; Deutz DQC IV; MACK EO-N; MAN M 3277; MAN M 3377; MB-Approval 228.5; Renault Trucks RLD-2; Volvo VDS-3; JSC Avtodizel (YAMZ); JSC TMZ.

SPECIFICATIONS:
ACEA E4/E7; Cummins CES 20078; Global DHD-1; Detroit Diesel DDC 93K215; Komatsu; MACK EO-M Plus; MTU Cat. 3; Renault Trucks RXD.

G-Profi GT LA 10W-40

Synthetic engine oil for the most advanced dump truck, quarrying and special machinery diesel engines (emission category Euro 5 and 6) operating in a wide ambient temperature range. Due to low ash content (Low-SAPS) compatible to all exhaust gas aftertreatment devices. Applicable for some gas engines.

APPROVALS:
API CI-4; MACK EO-N; MAN M 3271-1; MAN M 3477; MB-Approval 228.51; Renault Trucks RLD-2; Volvo VDS-3; JSC Avtodizel (YAMZ); JSC TMZ.

SPECIFICATIONS:
ACEA E6, E9, E7; Caterpillar ECF-1a; Deutz DQC IV-LA; Cummins CES 20076/77; JASO DH-2; MACK EO-M Plus; MTU Cat. 3.1; Renault Trucks RGD/RXD; formulation performance level according to Scania Low Ash.

Specifications valid through 2019. See www.g-energy.org for actual specifications/approvals and detailed information.

G-Profi MSJ 5W-30

Synthetic engine oil for the most advanced dump truck, quarrying and special machinery diesel engines (emission category Euro 5 and 6) operating in a wide ambient temperature range and particularly suitable for extreme cold. Oil formulated on the basis of top performance Group IV (PAO) base stock. Due to low ash content (Low-SAPS) compatible to all exhaust gas aftertreatment devices. Applicable for some gas engines.

APPROVALS:
API CJ-4/SN; Cummins CES 20081; MACK EO-O PP; MAN M 3271-1; MAN M 3477; MAN M 3677; MB-Approval 228.51; Renault Trucks RLD-3; Volvo VDS-4.

SPECIFICATIONS:
ACEA E6, E9, E7; Caterpillar ECF-3; Deutz DQC IV-LA; JASO DH-2; Detroit Diesel DDC 93K218; MACK EO-M Plus; MACK EO-N PP; MB 228.31; MB 235.28; MTU Cat. 3.1; Renault Trucks RGD/RLD-2/RXD; Voith Retarder Oil Class B; Volvo VDS-3. Volvo CNG; formulation performance level according to Scania Low Ash, Scania LDF 4.

G-Profi MSJ 10W-30, 15W-40

Engine oil for the most advanced dump truck, quarrying and special machinery diesel engines (emission category Euro 5 and 6) operating in a wide ambient temperature range. Due to a reduced level of ash content (mid-SAPS) the product is compatible with all exhaust gas aftertreatment devices. Applicable for some gas engines.

10W-30

APPROVALS:
API CJ-4/SN; Cummins CES 20081; MACK EO-O PP; MAN M 3575; Renault Trucks RLD-3; Volvo VDS-4.

SPECIFICATIONS:
ACEA E9; Deutz DQC III-LA; Caterpillar ECF-1a, ECF-2, ECF-3; MB 228.31; MTU Cat. 2.1.

15W-40

APPROVALS:
JSC Avtodizel (YAMZ).

SPECIFICATIONS:
ACEA E9; API CJ-4/SN; Cummins CES 20081; Caterpillar ECF-1a, ECF-2, ECF-3; Detroit Diesel DDC 93K218; Deutz DQC III-LA; MACK EO-O PP; MAN M 3575; MB 228.31; MTU Cat. 2.1; Renault Trucks RLD-3; Volvo VDS-4.

G-Profi MSI 5W-40, 10W-40

Engine oil for the advanced dump truck, quarrying and special machinery diesel engines (up to and including Euro 4) operating in a wide ambient temperature range. Oil formulated on the basis of semi-synthetic base stock.

5W-40

SPECIFICATIONS:
ACEA E7; API CI-4/SL; MB 228.3; MAN M 3275; Volvo VDS-3.

10W-40

APPROVALS:
API CI-4/SL; Cummins CES 20078; Deutz DQC III; MACK EO-N; MAN M 3275-1; MB-Approval 228.3; MTU Cat. 2; Volvo VDS-3; Renault Trucks RLD/RLD-2; JSC Avtodizel (YAMZ); JSC Kamaz; JSC TMZ.

SPECIFICATIONS:
ACEA E7; Caterpillar ECF-2; JASO DH-1; Cummins CES 20076/77; MACK EO-M Plus; Detroit Diesel DDC 93K215; Komatsu.

G-Profi MSH 10W-40, 15W-40

Semi-synthetic (10W-40) and mineral (15W-40) engine oil for dump truck, quarrying and special machinery diesel engines (up to and including Euro 3) operating in a wide ambient temperature range.

10W-40

APPROVALS:
JSC Avtodizel (YAMZ); JSC Kamaz; JSC TMZ.

SPECIFICATIONS:
API CH-4/SL; Deutz DQC II; Komatsu; MAN M 3275; MB 228.3; MTU Cat. 2; Renault Trucks RD/RD-2; Volvo VDS-2.

15W-40

APPROVALS:
Deutz DQC II; MAN M 3275-1; MTU Cat. 2; Renault Trucks RD/RD-2; Volvo VDS-2; JSC Avtodizel (YAMZ); JSC Kamaz; JSC TMZ.

SPECIFICATIONS:
ACEA E7; API CH-4/SL; Komatsu; MB-228.3; Cummins CES 20076/77; MACK EO-M Plus.

G-Profi MSF 10W-40, 15W-40

Semi-synthetic (10W-40) and mineral (15W-40) engine oil for dump truck, quarrying and special machinery diesel engines (up to and including Euro 2) operating in a wide ambient temperature range.

10W-40

APPROVALS:
JSC Avtodizel (YAMZ); JSC Kamaz; JSC TMZ.

SPECIFICATIONS:
API CF/CF-4/SG; Volvo VDS.

15W-40

APPROVALS:
JSC Avtodizel (YAMZ); JSC Kamaz; JSC TMZ.

SPECIFICATIONS:
API CF/CF-4/SG; Volvo VDS; MAN 271; MB 228.1; MTU.

G-Profi MSF 10W, 30, 40, 50

Mineral engine oil for dump truck, quarrying and special machinery diesel engines (up to and including Euro 2) operating in a limited ambient temperature range.

10W, 30

SPECIFICATIONS:
API CF/CF-4/SG; MAN 270; MB 228.0; MTU; Volvo VDS.

40, 50

SPECIFICATIONS:
API CF/CF-4/SG; MAN 270; MB 228.0.

4.2. Product range and classification of Gazpromneft engine oils

Gazpromneft Diesel Extra
10W-40, 15W-40, 20W-50, 40, 50
API CF-4
EURO-1, 2

Gazpromneft Diesel Prioritet
10W-40, 10W-30, 15W-40, 20W-50
API CH-4
EURO-3, 4
Cummins CES 20076
MTU Cat. 2

Gazpromneft Diesel Premium
5W-40, 10W-40, 10W-30, 15W-40
API CI-4
EURO-4
Cummins CES 20078
Caterpillar ECF-2
MTU Cat. 2

Gazpromneft Diesel Ultra
5W-30, 10W-40
API CI-4
EURO-5
Cummins CES 20078
MTU Cat. 3

Gazpromneft Diesel engine oils

Name, SEA viscosity grade	Aftertreatment Compatibility (EGR+SCR)	Antiwear protection	Anticorrosion protection	Sediment control	High-Sulphur fuel compatibility	Soot control	Fuel economy*
Gazpromneft Diesel Ultra							
5W-30	✓	■■■	■■■	■■■	■■■	■■■	✓
10W-40	✓	■■■	■■■	■■■	■■■	■■■	
Gazpromneft Diesel Premium							
5W-40	✓	■■□	■■□	■■□	■■□	■■□	
10W-30	✓	■■□	■■□	■■□	■■□	■■□	✓
10W-40 15W-40	✓	■■□	■■□	■■□	■■□	■■□	
Gazpromneft Diesel Prioritet							
10W-30		■■□	■■□	■□□	■□□	■■□	✓
10W-40 15W-40 20W-50		■■□	■■□	■□□	■□□	■■□	
Gazpromneft Diesel Extra							
10W-40 15W-40 20W-50 40, 50		■□□	■□□	■□□	■□□	■□□	
Gazpromneft Turbo Universal							
15W-40 20W-50		□□□	□□□	□□□	□□□	□□□	

* Fuel economy compared to xxW-40 viscosity grade oils.

Specifications valid through 2019. See www.gazpromneft-oil.com for actual specifications/approvals and detailed information.

Gazpromneft Diesel Ultra

Series of synthetic engine oils with enhanced acid neutralizing properties for the most advanced turbocharged diesel engines made by European or American manufacturers and complying to Euro 5 exhaust gas requirements (without DPF). Intended for wide range of ambient temperature applications.

SAE Viscosity Grades: 5W-30, 10W-40.

5W-30
10W-40

SPECIFICATIONS:
ACEA E4; API CI-4; Cummins CES 20078; Deutz DQC IV-10; MACK EO-N; MAN M 3277; MB 228.5; MTU Cat. 3; Renault Trucks RLD-2; Volvo VDS-3.

Gazpromneft Diesel Premium

Series of universal semi-synthetic (5W-40, 10W-30; 10W-40) and mineral (15W-40) engine oils for dump truck, quarrying and special machinery heavy-duty diesel engines according to exhaust gas control requirements up to and including Euro 4. Oils are formulated to obtain good detergent/dispersant properties, high alkali content and is applicable in a wide range of ambient temperatures.

SAE Viscosity Grade: 5W-40, 10W-40, 10W-30, 15W-40.

5W-40

APPROVALS:
JSC Avtodizel (YAMZ); JSC Kamaz; JSC TMZ.

SPECIFICATIONS:
ACEA E7; API CI-4/SL; Caterpillar ECF-1a/ECF-2; Cummins CES 20076/77/78; Deutz DQC III; Global DHD-1; MACK EO-M Plus; MACK EO-N; MAN M 3275-1; MTU Cat. 2; Renault Trucks RLD/RLD-2; Volvo VDS-3.

10W-30

APPROVALS:
JSC Avtodizel (YAMZ); JSC TMZ.

SPECIFICATIONS:
ACEA E7; API CI-4/SL; Caterpillar ECF-2; Cummins CES 20076/77/78; Deutz DQC III-10; Global DHD-1; MACK EO-M Plus; MACK EO-N; MAN M 3275-1; MTU Cat. 2; Renault Trucks RLD-2; Volvo VDS-3; JSC Kamaz.

10W-40

APPROVALS:
API CI-4/SL; Cummins CES 20078; Deutz DQC III; MACK EO-N; MAN M 3275-1; MB-Approval 228.3; Renault Trucks RLD-2; Volvo VDS-3; JSC Avtodizel (YAMZ); JSC Kamaz: JSC TMZ.

SPECIFICATIONS:
ACEA E7; Caterpillar ECF-1a, ECF-2; Global DHD-1; MACK EO-M Plus; MTU Cat. 2; Detroit Diesel DDC 93K215.

15W-40

APPROVALS:
API CI-4/SL; Cummins CES 20078; MACK EO-N; MAN M 3275-1; MTU Cat. 2; Renault Trucks RLD-2; Volvo VDS-3; JSC Avtodizel (YAMZ); JSC Kamaz: JSC TMZ.

SPECIFICATIONS:
ACEA E7; Caterpillar ECF-1a/ECF-2; Cummins CES 20076/77; Deutz DQC III; Global DHD-1; MACK EO-M Plus.

Gazpromneft Diesel Prioritet

Series of universal semi-synthetic (10W-30; 10W-40) and mineral (15W-40; 20W-50) engine oils for dump truck, quarrying and special machinery heavy-duty diesel engines according to exhaust gas control requirements up to and including Euro 3. Oils are applicable in a wide range of ambient temperatures.

10W-30
10W-40

APPROVALS:
JSC Avtodizel (YAMZ);
JSC Kamaz; JSC TMZ.

SPECIFICATIONS:
API CH-4/SJ; Cummins CES 20076;
MAN M 3275-1; MTU Cat. 2.

15W-40

APPROVALS:
API CH-4/SJ; Cummins CES 20076;
MAN M 3275-1; JSC Kamaz;
JSC Avtodizel (YAMZ); JSC TMZ.

SPECIFICATIONS:
MTU Cat. 2.

20W-50

APPROVALS: JSC Kamaz;
JSC Avtodizel (YAMZ); JSC TMZ.

SPECIFICATIONS:
API CH-4/SJ; Cummins CES 20076;
MAN M 3275-1; MTU Cat. 2.

Gazpromneft Diesel Extra

Series of universal semi-synthetic (10W-40) and mineral (20W-50, 40, 50) engine oils for dump truck, quarrying and special machinery heavy-duty diesel engines according to exhaust gas control requirements up to and including Euro 2. Oils are applicable in a different ranges of ambient temperatures.

SAE Viscosity Grades: 10W-40, 15W-40, 20W-50, 40, 50.

10W-40
15W-40
20W-50

APPROVALS:
JSC Avtodizel (YAMZ);
JSC Kamaz; JSC TMZ.

SPECIFICATIONS:
API CF-4/SG.

SAE 40
SAE 50

SPECIFICATIONS:
API CF; API CF-4; MAN 270; MB 228.0.

Gazpromneft Turbo Universal

Series of engine oils designed specially for all season application in diesel engines instead of oils with limited ambient temperature range properties: M-8DM, M-10DM, M-10G2K, M-10G2, M-8G2K, M-8G2.

SAE Viscosity Grades: 15W-40, 20W-50.

15W-40
20W-50

APPROVALS:
JSC TMZ.

SPECIFICATIONS:
API CD; JSC Avtodizel (YAMZ).

4.3. Classification of Engine Oils

API classification of heavy-duty diesel engine oils

CJ-4 Introduced in 2006. These oils are formulated for use in all applications with diesel fuels ranging in sulfur content up to 500 ppm (0.05% by weight). Especially effective at sustaining emission control system durability where particulate filters (DPF) and other advanced aftertreatment systems are used. Designed to provide enhanced protection against oil oxidation, viscosity loss due to shear, and oil aeration as well as protection against catalyst poisoning, particulate filter blocking, engine wear, piston deposits, degradation of low- and high-temperature properties, and soot-related viscosity increase.

CI-4 Introduced in 2002. For modern heavy-duty diesel engines designed to meet 2004 exhaust emission standards. CI-4 oils are formulated to sustain engine durability where exhaust gas recirculation (EGR) is used and are intended for use with diesel fuels ranging in sulfur content up to 0.5% by weight. High oxidation stability, dispergency and antiwear properties provide good soot control.

CH-4 Introduced in 1998. For high-speed diesel engines designed to meet 1998 exhaust emission standards. Provides high protection against corrosion and engine wear, as well as good oxidation stability of the oil. CH-4 oils are specifically compounded for use with diesel fuels ranging in sulfur content up to 0.5% by weight.

CG-4 Introduced in 1994. Developed for heavy-duty on-highway and off-road diesel engines. Introduced to meet exhaust gas control requirements according to USA's 1994 legislation.

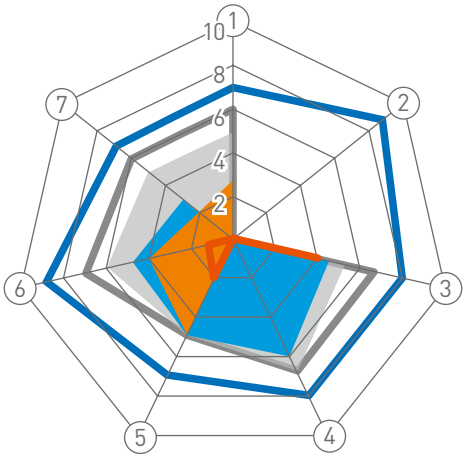
CF-4 Introduced in 1990. Developed for high-speed diesel engines. Designed to provide enhanced control over piston deposits and minimize oil consumption through burning.

CD Introduced in 1955. This oil category is obsolete. Developed for older naturally aspirated and turbo charged diesel engines. Compared to earlier categories of this classification it sets higher piston deposit formation and antiwear requirements. Not suitable for engines manufactured after 1994.

Comparison of specifications

● CJ-4 ● CI-4 ● CH-4 ● CG-4 ● CF-4 ● CD

1. Protection against Bore Polishing
2. DPF compatibility
3. Anticorrosion protection
4. Oxidation stability and thickening inhibition
5. Prevention of high-temperature deposits
6. Soot control
7. Antiwear properties



According to The Lubrizol Corporation.

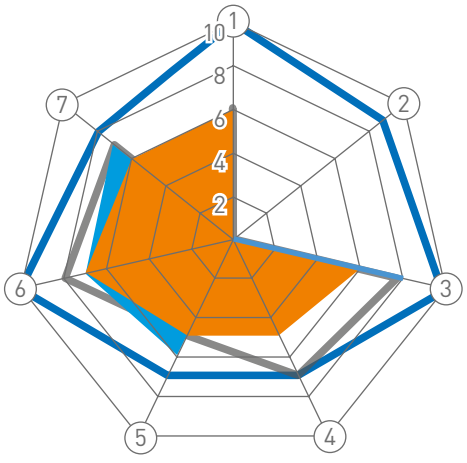
Engine oil specifications: Cummins engines

CES 20081	Category developed for highly rated diesel engines equipped with exhaust gas recirculation system (EGR). Compatible with diesel particle filters (DPF). Developed on the basis of API CJ-4 with addition of Cummins specific tests.
CES 20078	Category developed for highly rated diesel engines equipped with exhaust gas recirculation system (EGR). Developed on the basis of API CI-4 with addition of Cummins specific tests.
CES 20077	Category developed for highly rated diesel engines without exhaust gas recirculation system (EGR), operating in extreme conditions outside North America. Developed on the basis of ACEA E7 with addition of Cummins specific tests.
CES 20076	Category developed for highly rated diesel engines without exhaust gas recirculation system (EGR). Developed on the basis of API CH-4 with addition of Cummins specific tests.

Comparison of specifications

● CES 20081 ● CES 20078 ● CES 20077 ● CES 20076

1. Protection against Bore Polishing
2. DPF compatibility
3. Anticorrosion protection
4. Oxidation stability and thickening inhibition
5. Prevention of high-temperature deposits
6. Soot control
7. Antiwear properties



According to The Lubrizol Corporation.

JASO classification of heavy-duty diesel engine oils

JASO DH-1	Heavy duty equipment diesel engine oil category for pump protection, anticorrosion protection, oxidation inhibition and soot control. These oils are recommended for engines without diesel particle filter (DPF). High Sulphur fuels above 0,05% admissible for engines lubricated by motor oils according to DH-1.
JASO DH-2	Heavy duty diesel oils for engines equipped with aftertreatment systems like diesel particle filters (DPF) and catalysts. Requirements to antiwear, sludge, anticorrosion and soot control properties similar as set by JASO DH-1 oils.

ACEA classification of heavy-duty diesel engine oils

ACEA E6	Oil providing excellent control of piston cleanliness, wear, soot handling and lubricant stability. It is recommended for highly rated diesel engines meeting up to Euro VI emission requirements and running under very severe conditions, e.g. significantly extended oil drain intervals. It is suitable for EGR engines, with or without particulate filters, and for engines fitted with SCR NOx reduction systems. E6 quality is strongly recommended for engines fitted with particulate filters and is designed for use in combination with low sulphur diesel fuel.
ACEA E9	Oil providing effective control with respect to piston cleanliness and bore polishing. It further provides excellent wear control, soot handling and lubricant stability. It is recommended for highly rated diesel engines meeting up to Euro VI emission requirements and running under severe conditions, e.g. extended oil drain intervals. It is suitable for engines with or without particulate filters, and for most EGR engines and for most engines fitted with SCR NOx reduction systems. E9 is strongly recommended for engines fitted with particulate filters and is designed for use in combination with low Sulphur diesel fuel.
ACEA E4	Oil providing excellent control of piston cleanliness, wear, soot handling and lubricant stability. It is recommended for highly rated diesel engines meeting up to Euro V emission requirements and running under very severe conditions, e.g. significantly extended oil drain intervals according to the manufacturer's recommendations. It is suitable for engines without particulate filters, and for some EGR engines and some engines fitted with SCR NOx reduction systems.
ACEA E7	Oil providing effective control with respect to piston cleanliness and bore polishing. It further provides excellent wear control, soot handling and lubricant stability. It is recommended for highly rated diesel engines meeting up to Euro V emission requirements and running under severe conditions, e.g. extended oil drain intervals. It is suitable for engines without particulate filters, and for most EGR engines and most engines fitted with SCR NOx reduction systems.

Engine oil specifications: Caterpillar engines

ECF-3	Low Ash technology oils for latest Caterpillar engines. Compatible with diesel particle filters (DPF). Developed on the basis of API CJ-4 requirements with additional Caterpillar tests. Comply with engine requirements according to Tier 4.
ECF-2	Engine oil category for Caterpillar engines, including engines equipped with ACERT and HEUI systems. Developed on the basis of API CI-4 requirements with additional Caterpillar tests.
ECF-1a	Engine oil category for Caterpillar engines, including engines equipped with ACERT and HEUI systems. Developed on the basis of API CH-4 requirements with additional Caterpillar tests.

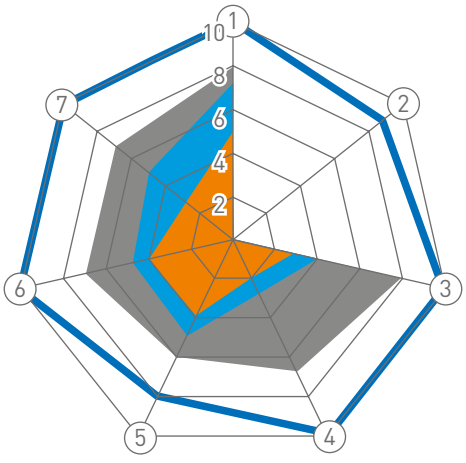
Engine oil specifications: Volvo engines

VDS-4	Low ash engine oils for the latest Volvo engines, including Tier III. Compatible with diesel particle filters (DPF). Comply to API CJ-4 requirements.
VDS-3	Engine oils for Volvo engines. Specification based on ACEA E7 demands with additional requirements to high-temperature deposits and protection against bore polishing. Specification includes test trials on Volvo engines.
VDS-2	Engine oil for Volvo engines. Specification confirms successful field trials on Volvo engines in extreme conditions.
VDS	Engine oils for Volvo engines. Contains API CD/CE specifications/requirements and field trial tests on Volvo engines.

Comparison of specifications

● Volvo VDS-4 ● Volvo VDS-3 ● Volvo VDS-2 ● Volvo VDS-1

1. Protection against Bore Polishing
2. DPF compatibility
3. Anticorrosion protection
4. Oxidation stability and thickening inhibition
5. Prevention of high-temperature deposits
6. Soot control
7. Antiwear properties



According to The Lubrizol Corporation.

Engine oil specifications: Deutz engines

DQC IV LA	Low ash diesel engine oils according to UHPD requirements. In some instances conforms to higher requirements to closed crankcase ventilation system engines compared to ACEA. Provides enhanced thermal stability under high thermal stress.
DQC IV	Oil for diesel engines with closed crankcase system and high thermal stress according to UHPD specifications.
DQC III	Oil for high performance engines with closed crankcase ventilation system and/or high thermal stress.
DQC II	General purpose engine oils for engines with open crankcase ventilation system and standard drain intervals. Developed according to ACEA E7 and API CH-4 norms.
DQC I	Oils for standard applications if equipment manufacturer do not require latest specification oils. Developed on the basis of ACEA E2 and API CF specifications.

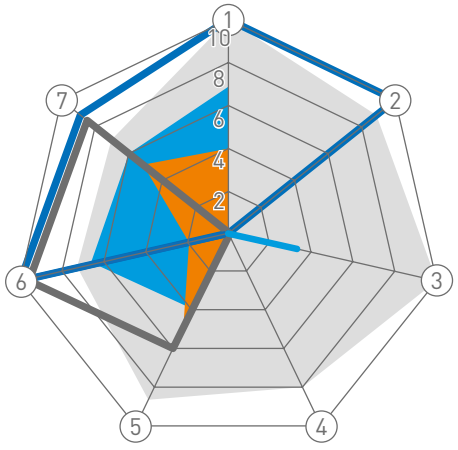
Engine oil specifications: MTU engines

Cat. 3.1	Low ash top quality oils for wide ambient temperature range applications (Low Sulfated Ash, Phosphorus and Sulphur). Depending on operational conditions, prolonged oil drain intervals are admissible. DPF compatible. Based on ACEA E6 specification.
Cat. 3	Top quality oils for wide ambient temperature range applications. Depending on operational conditions, prolonged oil drain intervals are admissible. Based on ACEA E4 specification.
Cat. 2.1	Low ash top quality oils for wide ambient temperature range applications (Low Sulfated Ash, Phosphorus and Sulphur). DPF compatible. Based on ACEA E9 and API CJ-4 specifications.
Cat. 2	Mainstream products for various ambient temperature range applications. Based on ACEA E5 specification.
Cat. 1	Multigrade oils for various ambient temperature range applications. Based on ACEA E2 and API CG-4 specifications.

Comparison of specifications

● Cat. 3.1 ● Cat. 3 ● Cat. 2.1 ● Cat. 2 ● Cat. 1

1. Protection against Bore Polishing
2. DPF compatibility
3. Anticorrosion protection
4. Oxidation stability and thickening inhibition
5. Prevention of high-temperature deposits
6. Soot control
7. Antiwear properties



According to The Lubrizol Corporation.

Conditions and environment specific to transmissions operating in a quarry

Due to specific conditions in mining industry quarry roads are bumpy and uneven. Such road surface is detrimental not just to chassis and suspension but is tough on transmission too. Primarily described operation conditions cause excessive shock-loads on the gear teeth and bearings of transmission. Besides quarry equipment transmissions continuously operate at low gears and poorly ventilated environment that often leads to overheating of systems. Dust and humidity worsen conditions even further and contribute to corrosion and sludge formation in transmission.

To cope with conditions and environment described above, G-Truck, G-Box and Gazpromneft transmission oils are formulated with high safety margin of properties. Good antiwear and antiscuffing capabilities provide perfect gear protection against micropitting and wear at a wide range of loads and variable speed. High antioxidant additive content provides stable viscosity and eliminates sludge formation during high temperature peaks. Good foam control additionally protects transmission against mechanical failures. Anticorrosion additives prevent chemical degradation of surfaces in presence of water.

5.1. Classification of transmission oils

	API GL-4	API GL-5	API GL-4/GL-5
			
Application	Manual transmissions and other lightly loaded transmissions. 	Differentials, Manual transmissions with steel synchronizers or non-synchronized transmissions. 	Various transmissions with copper alloy elements, or hypoid transmissions. 
Product range	G-Truck GL-4 80W-90 G-Truck Z 75W-80 G-Box GL-4 75W-90 G-Box Expert GL-4 75W-90, 80W-85	G-Truck GL-5 80W-90, 85W-90, 85W-140, 75W-140 G-Box GL-5 75W-90 G-Box Expert GL-5 75W-90, 80W-90 Special oils for LSD differentials: G-Truck LS 80W-90, 85W-90, 85W-140	G-Truck GL-4/GL-5 80W-90 G-Box GL-4/GL-5 75W-90
	Gazpromneft GL-4 75W-90, 80W-85, 80W-90, 90, 140	Gazpromneft GL-5 75W-90, 80W-90, 85W-140, 90, 140 Gazpromneft Super T-3 85W-90	Gazpromneft GL-4/GL-5 75W-90
	G-Truck G-Box Gazpromneft	G-Truck G-Box Gazpromneft	G-Truck G-Box Gazpromneft

Property icon

 Antiwear

 Antiscuffing properties

 Extended drain interval

 Limited Slip Friction modified

 Copper alloy compatibility

5.2. Product range of G-Truck and G-Box transmission oils

Name, SAE Viscosity Grade		Base oil	Provention of micropitting	Extended drain interval	Limited Slip compatibility	Oil film strength	Copper alloy compatibility	OEM require-ments
API GL-4/ GL-5	**G-Box GL-4/GL-5 75W-90**		■■■	✓		■■□	✓	■■■
	G-Truck GL-4/GL-5 80W-90		■■■	✓		■■□	✓	■■■
API GL-5	**G-Box GL-5 75W-90**		■■■			■■□		
	G-Truck GL-5							
	80W-90, 85W-90		■■■			■■□		■■□
	85W-140		■■■			■■■		■■□
	75W-140		■■■	✓		■■■		■■□
	G-Truck LS							
	80W-90, 85W-90		■■■		✓	■■□		■■□
	85W-140		■■■		✓	■■■		■■□
	G-Box Expert GL-5							
	75W-90		■■■			■■□		
	80W-90		■■■			■■□		
API GL-4	**G-Box GL-4 75W-90**		■■□			■■□	✓	
	G-Truck GL-4 80W-90		■■□			■■□	✓	■■■
	G-Truck Z 75W-80		■■□			■□□	✓	■□□
	G-Box Expert GL-4							
	75W-90		■■□			■■□	✓	
	80W-85		■■□			■□□	✓	■■□

 Synthetic oils

 Semi-synthetic oils

 Mineral oils

* Limited Slip differential

G-Truck GL-5 80W-90, 85W-140

80W-90

APPROVALS: MB-Approval; ZF TE-ML 16B, 17B, 19, 21A.

SPECIFICATIONS: MAN 342 Type M1; API GL-5; DAF Axle; Volvo 97310; Renault Trucks; ZF TE-ML 05A, 07A, 08.

85W-140

APPROVALS: ZF TE-ML 16D, 21A.

SPECIFICATIONS: API GL-5; DAF Axle; Volvo 97310; Iveco; ZF TE-ML 05A, 07A, 08.

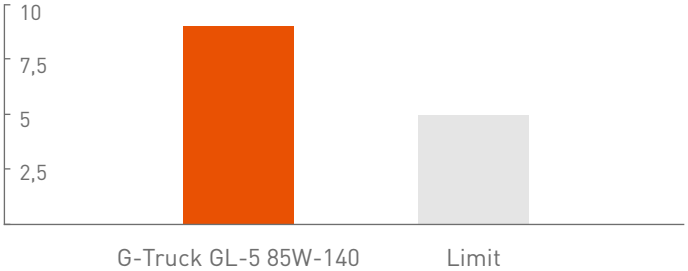
Advantages of G-Truck GL-5 80W-90, 85W-140

Excellent antiscuffing properties	Maintains reliable lubrication of gear teeth even at the most extreme loads - long life cycle of differentials.
Highly stable viscosity	Oil retains its lubricating properties over whole drain interval - consistent protection of gear transmission mechanisms.
High thermal stress resistance	Prevents deposit formation on sliding surfaces - deposit layer on gear surfaces impairs heat exchange capability.
Seal compatibility	Eliminates leakage and unplanned downtime.

Protection of hypoid transmission at high torque conditions*

G-Truck GL-5 oils form reliable antiscuffing layers to prevent micropitting of the gear teeth even at high loads on transmission.

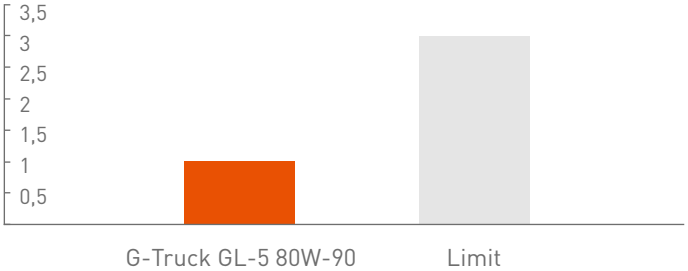
Antiwear protection, Rating



Amount of insoluble deposits (in pentane) after oxidation**

G-Truck GL-5 oils minimize deposition of insoluble deposits on the surfaces of hypoid transmission gear teeth, thus maintaining effective heat dissipation.

Insoluble deposits, %



* ASTM D6121 (L-37) test; ** ASTM D5704 (L-60) test.

Specifications valid through 2019. See www.g-energy.org for actual specifications/approvals and detailed information.

API GL-4/GL-5

G-Box GL-4/GL-5 75W-90

Universal transmission oil made of synthetic base stock for light and heavy-duty cargo vehicles, special and off-road machinery. Applicable for transmissions requiring API GL-4 oil (differentials without hypoid spiral bevel gears, synchronized manual gearboxes, transfer boxes, power take-off gearboxes etc.), as well as for units requiring API GL-5 oils (hypoid transmissions, non-synchronized manual gearboxes, transfer boxes, power take-off gearboxes etc.). Provides extended drain intervals compared to mineral based lubricants. Not recommended for limited slip differentials (LSD).

APPROVALS:
MAN 341, Type Z2; MAN 342 Type S1; MB-Approval 235.8; Volvo 97312; ZF TE-ML 02B, 05A, 12L, 12N, 16F, 17B, 19C, 21A.

SPECIFICATIONS:
API GL-4/GL-5/MT-1; ArvinMeritor 076-N; MAN 341 Type E3; Eaton Europe Extended Drain; MACK GO-J; MAN M 3343 Type S; MIL-L-2104D; MIL-PRF-2105E. formulation performance level according to Scania STO 1:0.

G-Truck GL-4/GL-5 80W-90

Multigrade transmission oil made of mineral base stock for heavy-duty cargo vehicles, special and off-road machinery operating in a wide ambient temperature range. Applicable for transmissions requiring API GL-4 oils (differentials without hypoid spiral bevel gears, synchronized manual gearboxes, transfer boxes, power take-off gearboxes etc.), as well as for units requiring API GL-5 oils (hypoid transmissions, non-synchronized manual gearboxes, transfer boxes, power take-off gearboxes etc.). Not recommended for limited slip differentials (LSD).

APPROVALS:
MAN 341 Type Z2; MAN 342 Type M2; MB-Approval 235.0; ZF TE-ML 02B, 05A, 12L, 12M, 16B, 17H, 19B, 21A.

SPECIFICATIONS:
API GL-4/GL-5/MT-1; ArvinMeritor 076-A/D; MACK GO-J; MAN 341 Type E2; MAN M 3343 Type M; MIL-L-2104D; MIL-PRF-2105E. formulation performance level according to Scania STO 1:0.

API GL-5

G-Box GL-5 75W-90

Semi-synthetic transmission oil for light and heavy-duty cargo vehicles, special and off-road machinery operating in a wide ambient temperature range. Applicable for transmissions requiring API GL-5 oils (hypoid transmissions, non-synchronized manual gearboxes, transfer boxes, power take-off gearboxes etc.). Provides extended drain intervals compared to mineral based lubricants. Not recommended for limited slip differentials (LSD).

SPECIFICATIONS:
API GL-5.

API GL-5

G-Box Expert GL-5 75W-90, 80W-90

Transmission oil for light and heavy-duty cargo vehicles, special and off-road machinery operating in a wide ambient temperature range. Applicable for transmissions requiring API GL-5 oils (hypoid transmissions, non-synchronized manual gearboxes, transfer boxes, power take-off gearboxes etc.). Not recommended for limited slip differentials (LSD).

APPROVALS:
JSC Avtovaz.

SPECIFICATIONS:
API GL-5.

G-Truck GL-5 85W-90

Mineral transmission oil for heavy-duty cargo vehicles, special and off-road machinery operating in a wide ambient temperature range. Applicable for transmissions requiring API GL-5 oils (hypoid transmissions, non-synchronized manual gearboxes, transfer boxes, power take-off gearboxes etc.). Not recommended for limited slip differentials (LSD).

SPECIFICATIONS:
API GL-5; DAF Axle; Iveco; MAN 342 Type M1; MB 235.0; ZF TE-ML 05A, 16C, 17B, 19B, 21A.

G-Truck GL-5 75W-140

Synthetic transmission oil based on top performance Group IV (PAO) base stock for heavily loaded hypoid transmissions of heavy-duty cargo, special and off-road machinery operating in a wide range of ambient temperatures. Applicable for heavy-duty hypoid transmissions requiring API GL-5 oils with SAE XW-140 viscosity grade. Provides extended drain intervals compared to mineral based lubricants. Not recommended for limited slip differentials (LSD).

SPECIFICATIONS:
API GL-5.

G-Truck LS 80W-90, 85W-90, 85W-140

Series of transmission oils intended for driving axles of heavy duty cargo, special and off-road machinery with limited slip differentials (LSD) operating in a wide range of ambient temperatures. Oils of this series can be used for lubrication of other transmission units requiring API GL-5 oils (non-synchronized manual gearboxes, transfer boxes, power take-off gearboxes etc.).

APPROVALS:
ZF TE-ML 05C, 12C, 16E valid for SAE 85W-90 and 85W-140 only, 21C.

SPECIFICATIONS:
API GL-5.

API GL-4

G-Box GL-4 75W-90

Semi-synthetic transmission oil for light and heavy-duty cargo vehicles, special and off-road machinery operating in a wide ambient temperature range. Applicable for transmissions requiring API GL-4 oils (differentials without hypoid spiral bevel gears, synchronized manual gearboxes, transfer boxes, power take-off gearboxes etc.). Provides extended drain intervals compared to mineral based lubricants.

SPECIFICATIONS:
API GL-4.

G-Box Expert GL-4 75W-90, 80W-85

Transmission oil for light and heavy-duty cargo vehicles, special and off-road machinery operating in a wide ambient temperature range. Applicable for transmissions requiring API GL-4 oils (differentials without hypoid spiral bevel gears, synchronized manual gearboxes, transfer boxes, power take-off gearboxes etc.).

APPROVALS:
JSC Avtovaz;
ZF TE-ML 17A SAE 80W-85 only.

SPECIFICATIONS:
API GL-4; MB 235.1
(only SAE 80W-85).

G-Truck GL-4 80W-90

Mineral transmission oil for light and heavy-duty cargo vehicles, special and off-road machinery operating in a wide ambient temperature range. Applicable for transmissions requiring API GL-4 oils (differentials without hypoid spiral bevel gears, synchronized manual gearboxes, transfer boxes, power take-off gearboxes etc.).

APPROVALS:
ZF TE-ML 16A, 17A, 19A.

SPECIFICATIONS:
API GL-4; MAN 341 Type E1/Z2;
ZF TE-ML 02B.

G-Truck Z 75W-80

Semi-synthetic fuel saving transmission oil containing top performance Group IV (PAO) base stock for transmissions of light and heavy-duty cargo, special and off-road machinery operating in a wide range of ambient temperatures. Applicable for transmissions requiring API GL-4 oils (differentials without hypoid spiral bevel gears, synchronized manual gearboxes, transfer boxes, power take-off gearboxes etc.). Provides extended drain intervals compared to mineral based lubricants. Intended for ZF transmissions of commercial vehicles manufactured up to 2014.

SPECIFICATIONS:
API GL-4; DAF Axle; Iveco;
Eaton Europe Extended Drain;
MAN 341 Type Z3; Renault
Trucks; Volvo 97305;
ZF TE-ML 02D.

Automatic Transmission Fluids (ATF)

Basic ATF applications in Mining Industry

	Power steering and several other hydraulic systems of heavy duty equipment.
POWERSHIFT	Powershift gear boxes.

Specifics of Dexron classification

1955		
1960 1965 1970	**Type A Suffix A (TASA)**	General Motors develops first specification for automatic transmission fluids: Type A (later - Type A Suffix A)
1975 1980 1985	**Dexron II (D)**	Oils made of plant and animal origin are replaced by solely mineral base oils, additives and other components
1990	**Dexron II (E)**	Synthetic base oils are applied
1995 2000	**Dexron III (G)**	
2005	**Dexron III (H)**	

Key features

- Low temperature
- Viscosity performance
- Protection of friction discs
- Antioxidative capability
- Enhanced anticorrosion

G-Box oils for Automatic Transmissions

Name	Base Oil	Drain interval	Sludge control	Clutch protection	Viscosity stability	Low temperature properties
G-Box ATF DX III		■■■	■■■	■■■	■■■	■■■
G-Box Expert ATF DX III		■■	■■	■■	■■	■■
G-Box ATF DX II		■■	■■	■	■■	■■

Synthetic Oils Semi-Synthetic Oils Mineral Oils

5.3. Product range of Gazpromneft Transmission Oils

Name, SAE Viscosity Grade	Base oil	Provention of micropitting	Extended drain intervals	Film strength	Copper alloy compatibility	OEM requirements
Gazpromneft GL-4/GL-5 75W-90		■■■	✓	■■	✓	■■■
Gazpromneft GL-5						
75W-90		■■■		■■		
80W-90		■■■		■■		■■■
85W-140, 140		■■■		■■■		
90		■■■		■■		
Gazpromneft Super T-3 85W-90		■■■		■■		■■■
Gazpromneft GL-4						
75W-90		■■		■■	✓	
80W-85, 80W-90, 90		■■		■■	✓	
140		■■		■■■	✓	

Synthetic oils Semi-synthetic oils Mineral oils

API GL-4/GL-5

Gazpromneft GL-4/GL-5 75W-90

Multigrade transmission oil made of synthetic base stock for machinery operating in a wide ambient temperature range. Applicable for transmissions requiring API GL-4 oils (differentials without hypoid spiral bevel gears, synchronized manual gearboxes, transfer boxes, power take-off gearboxes etc.), as well as for units requiring API GL-5 oils (hypoid transmissions, non-synchronized manual gearboxes, transfer boxes, power take-off gearboxes etc.). Not recommended for limited slip differentials (LSD). Provides extended drain intervals compared to mineral based lubricants.

SPECIFICATIONS:
API GL-4, GL-5, MT-1;
MIL-PRF-2105E; SAE J2360.

APPROVALS:

ZF TE-ML 02B, 05A, 12L, 12N, 16B, 17B, 19C, 21A; MAN 342 Type M3; MAN 341 Type Z2, E2; formulation approved according to Scania STO 1:0 requirements.

API GL-5

Intended for transmission systems if equipment requires API GL-5 oils (hypoid transmissions, non-synchronized manual gearboxes, transfer boxes, power take-off gearboxes etc.). Not recommended for limited slip differentials (LSD).

Gazpromneft GL-5 75W-90

Semi-synthetic transmission oil operating in a wide ambient temperature range.

SPECIFICATIONS:
API GL-5.

Gazpromneft GL-5 80W-90

Mineral transmission oil operating in a wide ambient temperature range.

APPROVALS:
ZF TE-ML 05A, 12E, 16B, 17B, 19B, 21A;
JSC Avtovaz.

SPECIFICATIONS:
API GL-5; MAN 342 Type M2;
ZF TE-ML 07A/08/16C/16D.
Formulation performance level according to Scania STO 1:0.

Gazpromneft Super T-3 (SAE 85W-90)

Mineral transmission oil operating in a wide ambient temperature range.

SPECIFICATIONS:
API GL-5; MAN 342 Type M1; MB 235.0;
JSC GAZ.

APPROVALS:
ZF TE-ML 16C, 17B, 19B, 21A;
JSC Avtovaz.

Gazpromneft GL-5 85W-140

Mineral transmission oil operating in a wide ambient temperature range. Intended for heavily loaded hypoid transmissions designed for API GL-5 oil with viscosity grade SAE xxW-140.

SPECIFICATIONS:
API GL-5.

Gazpromneft GL-5 90, 140

Transmission oil for heavy duty hypoid transmissions operating in a limited ambient temperature range.

SPECIFICATIONS:
API GL-5.

API GL-4

Intended for transmission systems if equipment requires API GL-4 oils (non-hypoid final drives, synchronized manual gearboxes, transfer boxes, power take-off gearboxes etc.).

Gazpromneft GL-4 75W-90

Semi-synthetic transmission oil for a wide ambient temperature range.

SPECIFICATIONS:
API GL-4.

Gazpromneft GL-4 80W-85, 80W-90

Transmission oil for a wide ambient temperature range.

APPROVALS:
JSC Avtovaz.

SPECIFICATIONS:
API GL-4; ZF TE-ML 08.

Gazpromneft GL-4 90, 140

Transmission oil for a limited ambient temperature range.

SPECIFICATIONS:
API GL-4.

Specifications valid through 2019. See www.gazpromneft-oil.com for actual specifications/approvals and detailed information.

Gazpromneft Automatic Transmission Fluids

Name	Base Oil	Drain Interval	Protection against deposits	Clutch protection	Viscosity stability	Low temperature properties
Gazpromneft ATF DX III						
Gazpromneft ATF DX II						

Semi-synthetic Oils

Mineral Oils

5.4. API classification for manual transmission oils, manual transaxles, and axles

GL-5	Transmission oils containing highly effective extreme pressure additives. Capable to withstand harsh shock-load operation conditions, e.g. hypoid transmissions at high speed. Recommended for differentials of modern vehicles. Not recommended for manual transmissions with copper alloy synchromesh.
GL-4	Transmission oils containing highly effective extreme pressure additives. Recommended for manual gearboxes, including transmissions with copper alloy synchromesh. Not effective for lubrication of hypoid transmissions under shock-loads.
GL-3	Transmission oils containing moderate extreme pressure additives. Recommended for light-duty manual transmissions and differentials.
GL-2	Mineral oils containing antiwear additives. Application similar to API GL-1 but capable to withstand higher loads.
GL-1	Straight mineral oil without additives. Applicable for light-duty non-synchronized transmissions, spiral bevel and worm gears. Specification is obsolete.

Specifications of oils for ZF transmissions

TE-ML 01	Manual ZF transmissions for trucks
TE-ML 02	Manual and automated ZF transmissions for trucks, buses, light commercial vehicles and special vehicles
TE-ML 03	Transmissions for off-road equipment
TE-ML 04	Marine transmissions
TE-ML 05	Axles for off-road vehicles
TE-ML 06	Tractor transmissions and hydraulic lifts
TE-ML 07	Hydrostatic-mechanical and electric drive systems
TE-ML 08	Steering systems (non-power-assisted) for cars, commercial vehicles and off-road vehicles
TE-ML 09	Steering systems and oil pumps for cars, commercial vehicles and off-road vehicles
TE-ML 11	Manual transmissions, double-clutch transmissions and automatic transmissions for cars
TE-ML 12	Axles and wheel heads for buses and trucks
TE-ML 14	Powershift transmissions, type Ecomat, for buses, trucks, and special vehicles
TE-ML 15	Brake systems for special vehicles
TE-ML 16	Transmissions for rail vehicles
TE-ML 17	Transmissions and axles for lift-trucks
TE-ML 19	Transfer and offset transmissions for commercial vehicles
TE-ML 20	Powershift transmissions, type EcoLife, for buses and trucks
TE-ML 21	Tractor axles, transmissions for harvesters and final drives

Conditions and environment specific to hydraulic systems operating in Mining industry

Hydraulic systems of mobile machinery, particularly those operating in mining, are subjected to significant loads. Wide range of ambient temperatures combined with dust and humidity of the working environment pose high risk of water and dust contamination. That leads to corrosion and premature wear of components.

Due to extreme pump capacity of mining hydraulic systems oil is exposed to substantial temperature rise what potentially leads to varnish formation and cavitation.

Excellent oxidation stability properties combined with high quality base oils inhibits the varnish formations. Good antiwear properties provide protection of hydraulic system components against failure. Excellent water separation properties separate emulsified water even in small oil sumps. Enhanced anticorrosion properties protect components of hydraulic systems in case if water contamination is inevitable. Minimized tendency to foaming and rapid air release provides additional protection of hydraulic pumps against overheating, cavitation and wear.

As a result, hydraulic oils of G-Special and Gazpromneft series provide considerable performance safety gap.

6.1. Classification of Hydraulic Oils

DIN 51524	ISO 6743/4	GOST 17479.3	Type of Oil	Application
H	**HH**	**А**	Mineral oils without additives	Outdated hydraulic systems of earlier generations equipped with gear or piston pumps under low system pressure.
HL	**HL**	**Б**	Mineral oils with anti-oxidants and corrosion inhibitors	Outdated hydraulic systems of earlier generations equipped with any type of pump under different types of pressure. Extended drain interval compared to previous category.
HLP	**HM**	**В**	HL + antiwear additives	Modern hydraulic systems equipped with any type of pump and capable of operating under or high pressure. Category sets additional requirements for antiwear properties. Applicable at ambient temperatures above 0°C (indoors or outdoors at moderate climate conditions).
HVLP	**HV**		HM + viscosity modifiers	Modern hydraulic systems equipped with any type of pump capable of operating under high pressure. Category sets additional requirements for antiwear properties. Applicable for a wide range of ambient temperatures, including tempretures under 0 °C.
HVLPD			HV + dispergents	Modern hydraulic systems equipped with any type of pump, capable of operating under high pressure. Recommended for specific conditions when potential water, dirt or other contamination is highly probable and accumulated water can not be drained from the sump. Applicable for a wide range of ambient temperatures.

6.2. Product range of G-Special hydraulic oils

Name, ISO Viscosity Grade	Base oil	Oxidation stability	Viscosity stability*	Antiwear properties	Water separation	Emulsifying property	Antifoaming property	Zinc-Free technology	Low temperature properties
G-Special Hydraulic Nord-32		■■■■	■■□	■■■	✓		■■■		■■■■
G-Special Power HVLP ISO VG: 32, 46		■■■■	■■■	■■■	✓		■■■		■■■□
G-Special Hydraulic HVLP ISO VG: 22, 32, 46		■■□□	■■□	■■■	✓		■■■		■■□□
G-Special Hydraulic HVLPD-46		■■□□	■■□	■■■		✓	■■□	✓	■■□□

Synthetic Oils

Mineral Oils

* Ability to stay in initially assigned ISO viscosity grade.

G-Special Hydraulic Nord-32

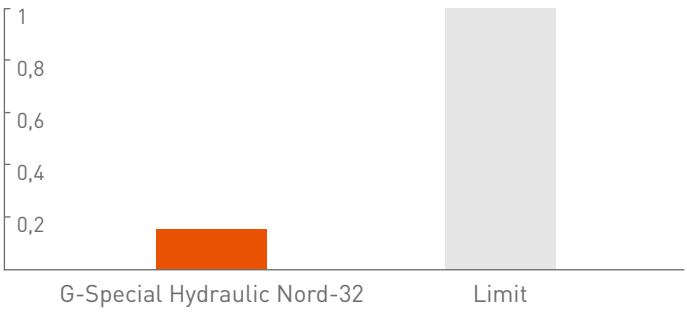
Hydraulic oil providing superior properties at low ambient temperatures. Formulation designed using synthetic components of Group IV (PAO) and Group V base stock according to API classification. Intended for application in hydraulic systems of quarrying, special and off-road equipment operating in a harshest Nordic climate conditions (e.g. Northern Siberia). Excellent viscosity behavior at extremely low temperatures makes it possible to operate hydraulic systems the whole year round. High antiwear protection, oxidation stability and good filterability prolongs life cycle of hydraulic components.

SPECIFICATIONS:
DIN 51524 Part 3 (HVLP);
ISO 11158 HV.

High temperature oxidation stability*

High oxidation stability at high temperatures makes G-Special Hydraulic Nord-32 exceptionally resistant against sludge formation and improves filterability, as well as anticorrosion properties.

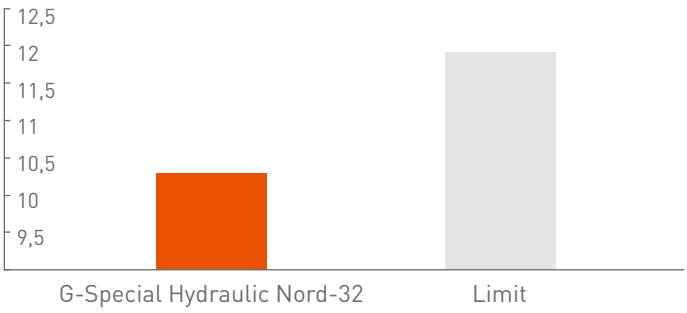
Acid Number TAN, mg KOH/g



Seal compatibility**

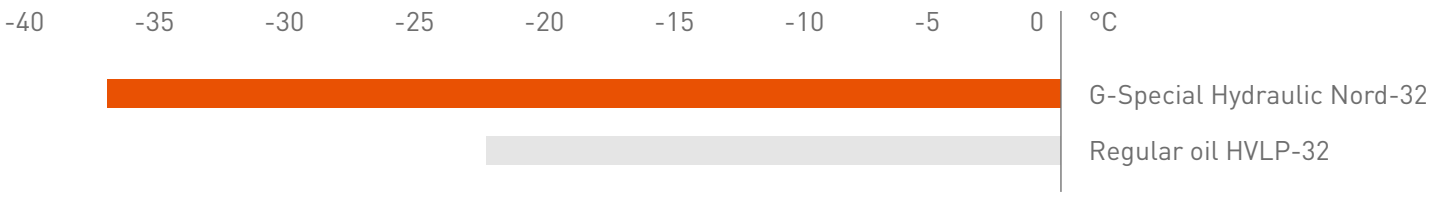
G-Special Hydraulic Nord-32 compatibility with elastomers minimizes leakage and top-up volume of lubricant.

Hardening, degree



* Test ASTM D4310; ** Test ISO 6427.

Minimum temperature for cold start of hydraulic pump*



* Temperature when hydraulic oil reaches maximum cold start dynamic viscosity limit admissible by Bosch Rexroth pumps.

Specifications valid through 2019. See www.g-energy.org for actual specifications/approvals and detailed information.

G-Special Power HVLP-32, 46

Energy saving hydraulic oil providing improved performance of equipment and fuel saving advantages. Since oil formula is based on synthetic base stock product possesses excellent oxidation stability and minimized sludge formation tendency, as well as effectively protects parts of hydraulic system against corrosion and cavitation at high loads and various climate conditions. Last generation thickener provides maximal oil viscosity stability during elevated mechanical loads on the hydronic system and varying operating temperatures throughout the entire drain period.

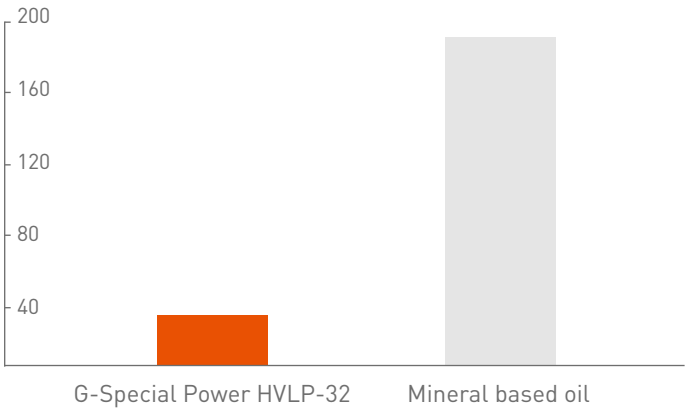
APPROVALS:
Denison Hydraulics HF-0,1,2 (ISO 32).

SPECIFICATIONS:
DIN 51524 Part 3 (HVLP);
ISO 11158 HV;
Bosch Rexroth;
RDE 90235.

High temperature oxidation stability*

Excellent oxidation stability of G-Special Power HVLP-32 provides stable performance and varnish control in hydraulic system within the entire drain interval.

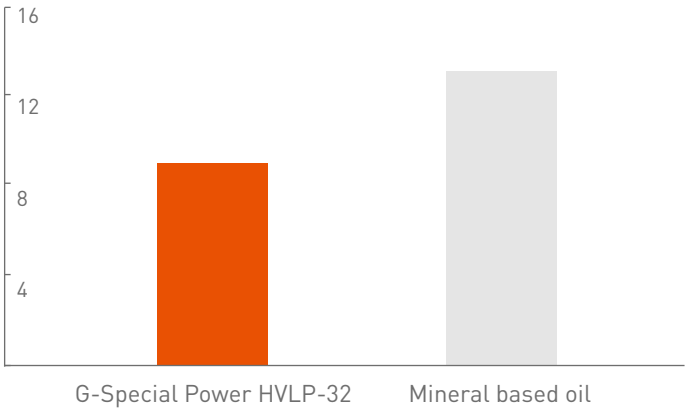
Increase of oxidation by-products at IR spectrum, $см^{-1}/мм$



Viscosity stability**

Outstanding viscosity stability of G-Special Power HVLP-32 guarantees required viscosity and oil pump output at elevated mechanical loads on hydraulic system during the entire drain interval.

Kinematic viscosity change at 100 °C after KRL shear stability test, %



* ASTM D7214; ** DIN 51350-6.

G-Special Hydraulic HVLP-22, 32, 46, 68

Series of hydraulic oils designed for application in hydraulic systems of quarrying, special and off-road machinery, as well as stationary equipment operating at high and low ambient temperatures. Oils provide operation of mobile hydraulic systems at wide range of weather conditions, protect hydraulic system components against wear, contribute to quick air and water separation, inhibit oxidation and foam formation.

SPECIFICATIONS:
DIN 51524 Part 3 (HVLP);
ISO 11158 HV;
Denison Hydraulics HF-0,1,2 (ISO VG 32, 46, 68); MAG P-68/69/70 (ISO VG 32, 46, 68);
Eaton Vickers 35VQ25;
Bosch Rexroth RDE 90235.

G-Special Hydraulic HVLPD-46

Oil for round the year application in quarrying, special and off-road machinery operating at extremely dirty and wet conditions. Suitable for the hydraulic sump with no water draining system. Oil keeps water and dirt suspended so that contamination is driven to the oil filter instead of settling out on the surfaces, which prevents the negative effect on the hydraulic system

SPECIFICATIONS:
DIN 51524 Part 3 (HVLP) (except Water Separation according to ASTM D1401 - not applicable to HVLPD type of oils).

6.3. Product range of Gazpromneft hydraulic oils

Name, ISO Viscosity Grade	Oxidation stability	Viscosity stability*	Antiwear properties	Water separation	Emulsifying property	Air separation/ Antifoaming property	Zinc-Free technology	Wide ambient temperature application
Gazpromneft Hydraulic Nord-32	■■■	■■	■■■	✓		■■■		■■■
Gazpromneft Hydraulic HVLP ISO VG: 10, 15, 22, 32, 46, 68	■■	■■	■■■	✓		■■■		■■
Gazpromneft Hydraulic HLP ISO VG: 32, 46, 68, 100	■■	■■■	■■■	✓		■■■		■
Gazpromneft Hydraulic HZF ISO VG: 32, 46, 68	■■	■■■	■■	✓		■■■	✓	■
Gazpromneft Hydraulic HLPD ISO VG: 32, 46, 68	■■	■■■	■■		✓	■■	✓	■
Gazpromneft Hydraulic ISO VG: 32, 46, 68, 100	■■	■■■	■■	✓		■■		■

* Ability to stay in initially assigned ISO viscosity grade.

Specifications valid through 2019. See www.g-energy.org for actual specifications/approvals and detailed information.

Gazpromneft Hydraulic Nord-32

Hydraulic fluid providing enhanced low temperature resistance properties which make hydraulic system start possible in extreme climate conditions (such as Northern Siberia). Intended for mobile hydraulic systems.

SPECIFICATIONS:
DIN 51524 Part 3.

Gazpromneft Hydraulic HVLP

Series of hydraulic oils designed for application in hydraulic systems of quarrying, special and off-road machinery, as well as stationary equipment operating at high and low ambient temperatures. Oils provide operation of mobile hydraulic systems at wide range of weather conditions, protect hydraulic system components against wear, deposit formation and corrosion.

AVAILABLE VISCOSITY GRADES
ISO VG: 10, 15, 22, 32, 46, 68.

SPECIFICATIONS

APPROVALS/ SPECIFICATIONS	ISO viscosity grade					
	10	15	22	32	46	68
ISO 11158 HV	✔	✔	✔	✔	✔	✔
DIN 51524 Part 3 (HVLP)	✔	✔	✔	✔	✔	✔
Denison HF-0,1,2				✔✔	✔✔	✔✔
Eaton Vickers 35VQ25		✔	✔	✔✔	✔✔	✔✔
Bosch Rexroth 90220-01						✔✔
Bosch Rexroth RDE 90235						✔
Bosch Rexroth Fluid Rating List RDE 90245				✔✔	✔✔	
MAG P-68 (ISO 32) MAG P-69 (ISO 68) MAG P-70 (ISO 46)				✔✔	✔✔	✔✔

✔✔ — APPROVALS; ✔ — SPECIFICATIONS.

Specifications valid through 2019. See www.gazpromneft-oil.com for actual specifications/approvals and detailed information.

Rexroth
Bosch Group

Gazpromneft Lubricants Ltd. is the first Russian company to have passed the toughest examination and acquired Bosch Rexroth RDE 90235 (Bosch Rexroth RDE 90245 list) approval:

- **Gazpromneft Hydraulic HLP-32;**
- **Gazpromneft Hydraulic HLP-46;**
- **Gazpromneft Hydraulic HLP-68;**
- **Gazpromneft Hydraulic HVLP-32;**
- **Gazpromneft Hydraulic HVLP-46.**

Pump test characteristics:

- Control of 90 physical/chemical parameters.
- Oil tested before, during and after the operation period.
- New test on axial piston pump:

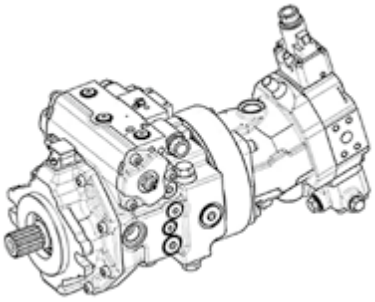
Duration, h
500

Pressure, atm
500

Speed, rpm
4 000

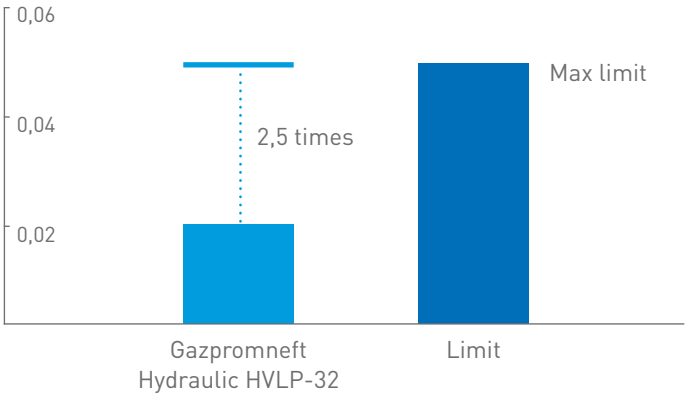
During the pump test evaluated:

- Preservation of nitride layer on the pistons.
- Antiwear properties of the oil.
- Ability to maintain reliability of hydraulic system.

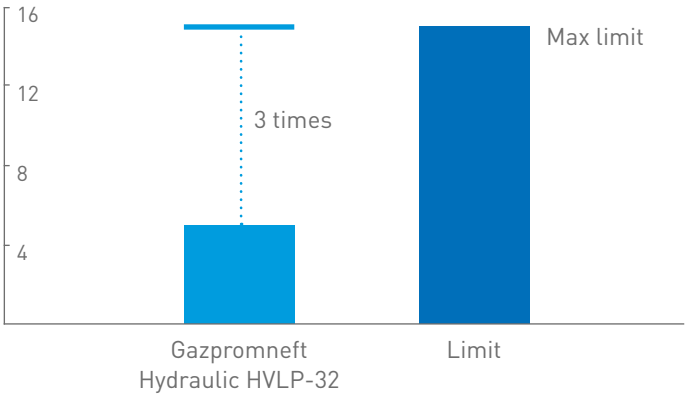


Advantages of Gazpromneft Hydraulic HVLP compared to the leading global hydraulic oil standard Bosch Rexroth RDE 90235:

Axial Shoe lift of hydraulic pump after 510 hour test, mm



Hydraulic pump piston wear loss after 510 hour test, mg



Preservation of pump piston ends' sphericity

Effective pump operation during entire life cycle

Best antiwear protection of parts

Maximized life cycle and minimized downtime of the equipment

Gazpromneft Hydraulic HZF-32, 46, 68

Series of zinc-free oils for hydraulic systems with a fine clearance servo-valves (silver coated parts present) installed on quarrying, special, off-road machinery or stationary equipment. Application for low temperature operation admissible only according to recommendation of equipment manufacturer.

Zn-FREE

APPROVALS:
Denison Hydraulics HF-0,1,2; Bosch Rexroth RE 90220.

SPECIFICATIONS:
DIN 51524 Part 2 (HLP); ISO 11158 HM; MAG P-68, 69, 70; Eaton Vickers 35VQ25.

Gazpromneft Hydraulic HLP-32, 46, 68, 100

Series of zinc-free oils for heavy-duty hydraulic systems of the quarrying, special, off-road machinery or stationary equipment. Highly recommended for the systems which require high viscosity stability during the whole drain interval. Application for low temperature operation admissible only according to recommendation of equipment manufacturer.

Approvals of leading equipment manufacturers.

SPECIFICATIONS

APPROVALS/ SPECIFICATIONS	ISO Viscosity Grade			
	32	46	68	100
DIN 51524 Part 2 (HLP)	✓	✓	✓	✓
ISO 11158 HM	✓	✓	✓	✓
Denison Hydraulics HF-0,1,2	✓✓	✓✓	✓✓	✓
Eaton Vickers 35VQ25	✓✓	✓✓	✓✓	✓
Bosch Rexroth 90220-01				✓
Bosch Rexroth Fluid Rating List RDE 90245	✓✓	✓✓	✓✓	
MAG P-68 (ISO 32) MAG P-69 (ISO 68) MAG P-70 (ISO 46)	✓✓	✓✓	✓✓	
Engel		✓✓		
Battenfeld	✓	✓✓	✓	✓
Beltramelli	✓✓	✓✓	✓✓	✓
Bekum		✓		
Demag			✓	
Danieli		✓	✓	

✓✓ — APPROVALS; ✓ — SPECIFICATIONS.

Specifications valid through 2019. See www.gazpromneft-oil.com for actual specifications/approvals and detailed information.

Gazpromneft Hydraulic-32, 46, 68, 100

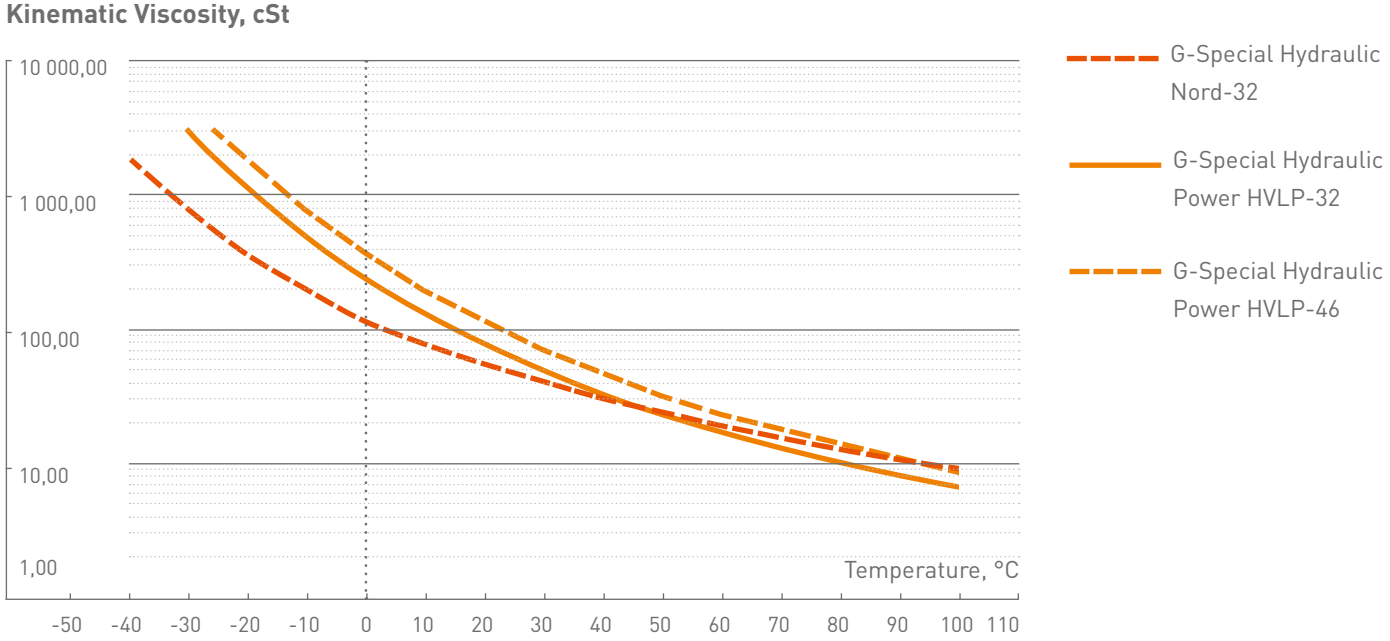
Series of hydraulic oils designed to replace monograde oils (IGP, IGS) quality requirements and is intended for application at temperature above 0 °C

SPECIFICATIONS:
DIN 51524 Part 2 (HLP).

6.4. Diagrams: dependence of kinematic viscosity of hydraulic oil on temperature

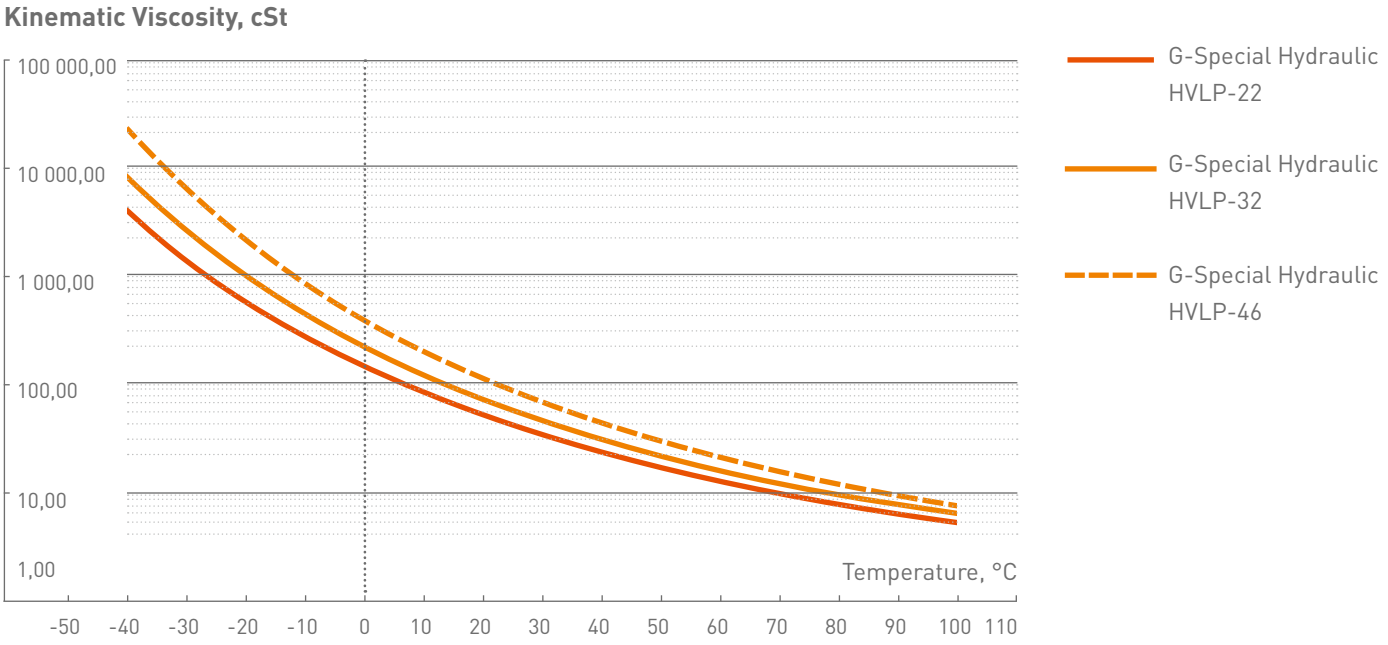
G-Special Hydraulic Nord-32; G-Special Power HVLP-32, 46

Dependence of kinematic viscosity on temperature:
G-Special Hydraulic Nord-32; G-Special Power HVLP-32, 46.



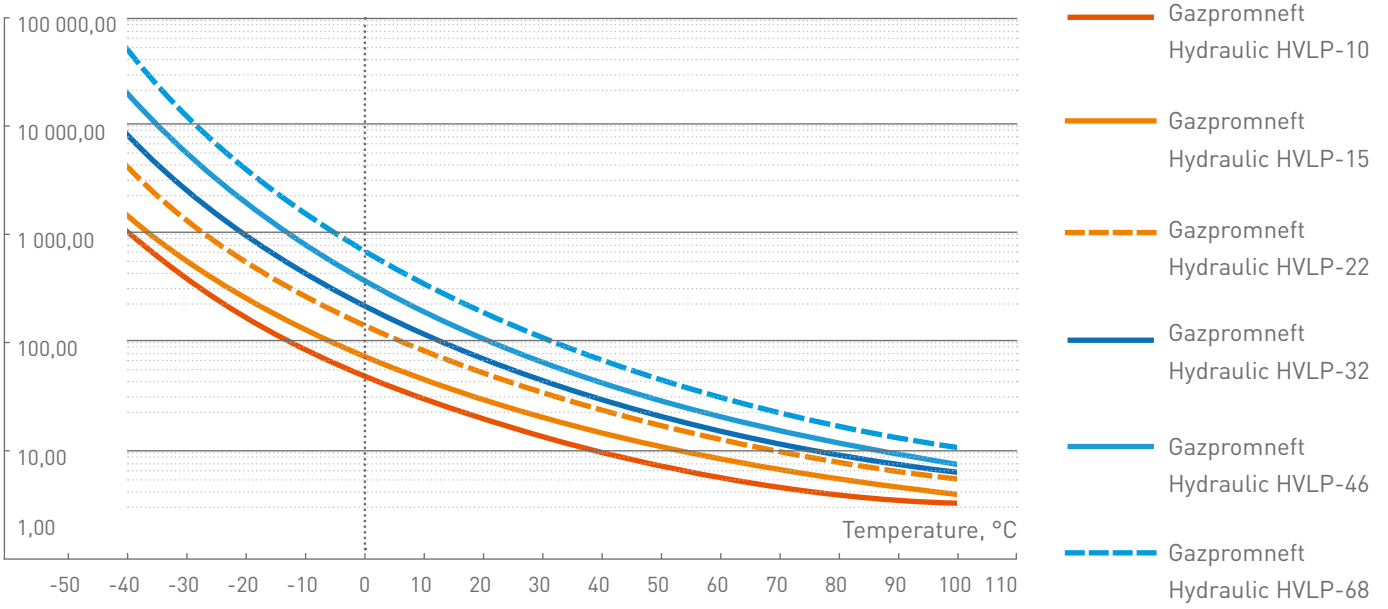
G-Special Hydraulic HVLP

Dependence of kinematic viscosity on temperature:
G-Special Hydraulic HVLP series.



Gazpromneft Hydraulic HVLP

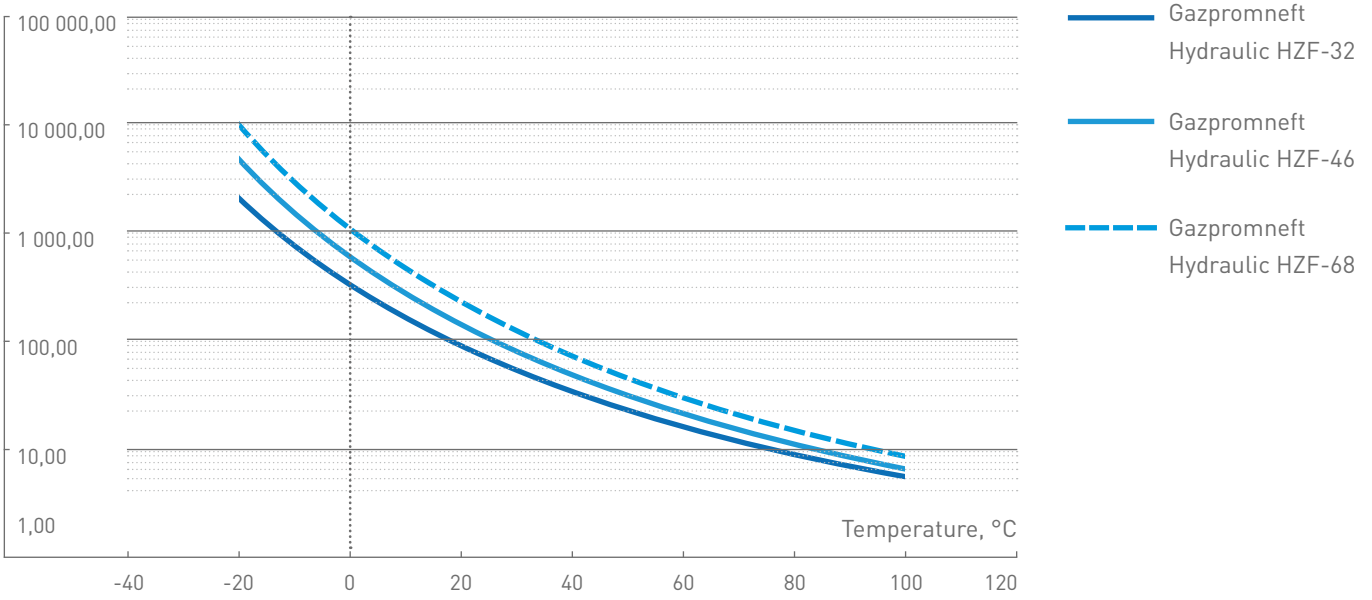
Dependence of kinematic viscosity on temperature:
Gazpromneft Hydraulic HVLP series.



Gazpromneft Hydraulic HZF

Dependence of kinematic viscosity on temperature:
Gazpromneft Hydraulic HZF series.

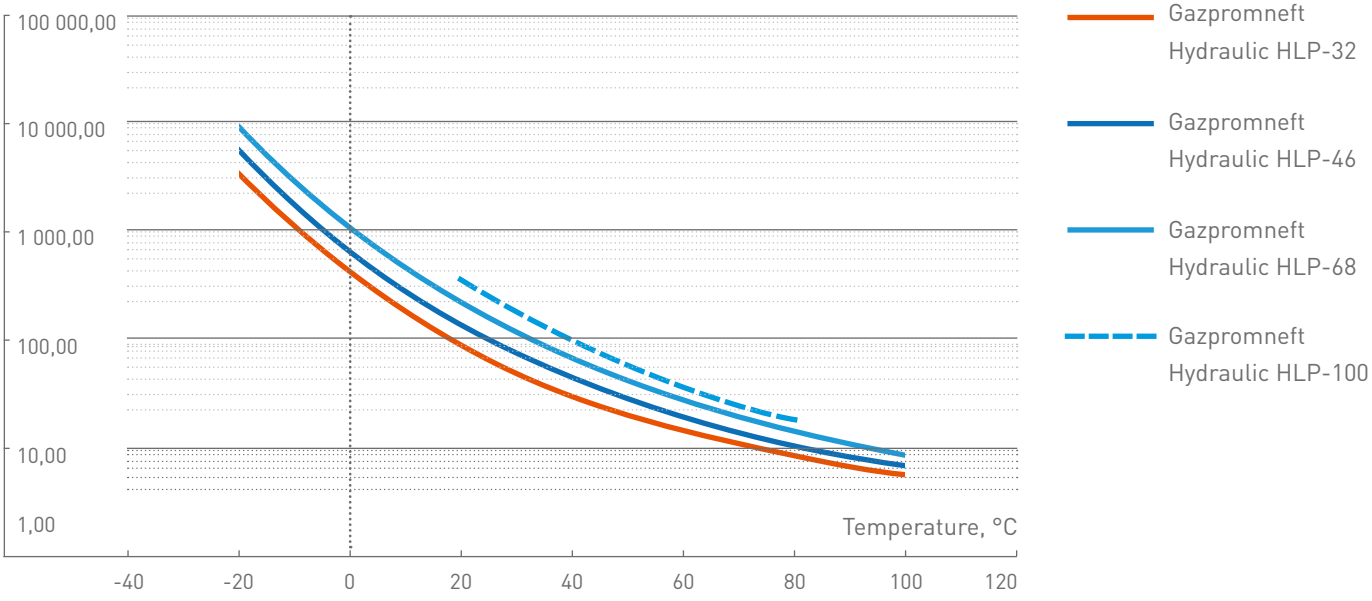
Kinematic Viscosity, cSt



Gazpromneft Hydraulic HLP

Dependence of kinematic viscosity on temperature:
Gazpromneft Hydraulic HLP series.

Kinematic Viscosity, cSt



Power Transmission and Hydraulic Transmission Fluids

Off-road machinery applications require widely used universal products (TO-4, UTTO, STOU) supposed to be suitable for various transmissions and hydraulic systems. Due to extreme loads engineers of quarrying equipment prefer oils according to TO-4 specification for power transmission.

Oils of these specifications perform equally well for: gear teeth protection against wear and micropitting, protection of clutch and wet brake friction elements against destruction and overheating. It also works well as a hydraulic fluid. Besides these oils must provide sufficient friction of clutch discs, so that transmission shifts smoothly without disruption of torque and wet brakes provide adequate grip without excessive heat generation.

G-Special TO-4 series oils perfectly fit these conditions. Enhanced antiwear additive property protects transmission and hydraulic system elements against premature failures. Antioxidative properties, combined with high quality base oils, inhibit sludge and deposit formation while friction properties provide smooth transmission and wet brake operation.

G-Special Universal Oils

Name, SAE viscosity grade	Sludge control	Viscosity stability	Heavy-duty mining application	Engine application	Low temperature properties
G-Special TO-4 Arctic 0W-20	■■■	■■	✓		■■■
G-Special TO-4					
10W	■■	■■■	✓		■■
30, 50	■■	■■■	✓		■
G-Special UTTO Premium 10W-30	■■■	■■			■■
G-Special UTTO 10W-30	■■	■■			■■
G-Special STOU 10W-30, 10W-40	■■■	■■		✓	■■

Oils classified according to TO-4 and UTTO/STOU are not interchangeable and are intended for diverse applications.

7.1. Power Transmission Oils according to TO-4

G-Special TO-4 10W, 30, 50

Transmission units

Hydraulic system

Clutch systems of heavy duty equipment

Series of hydraulic-transmission fluids designed for hydraulic systems and transmissions of heavy duty quarrying, special and off-road machinery. High and stable friction properties provide effective operation of highly loaded wet brakes and continuous torque in a transmission.

VISCOSITY GRADES:
10W, 30, 50.

APPROVALS:
ZF TE-ML 03C (SAE 10W, 30);
ZF TE-ML 07F (SAE 30).

SPECIFICATIONS:
Caterpillar TO-4; Allison C-4;
API CF/CF-2; ZF TE-ML 03C, 07F (SAE 30, 50);
Komatsu KES 07.868.1.

Advantages of universal G-Special TO-4 oils

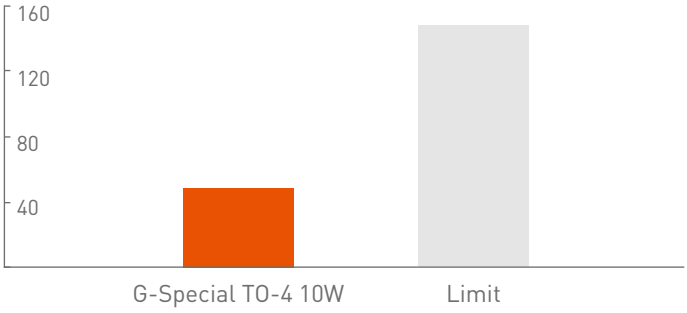
Stable friction properties	Provides smooth operation of clutch discs and brakes - reliability of equipment.
High oxidation stability	Prevents deposit formation on the parts - maximized life cycle of equipment
Excellent antiwear properties	Protects hydraulic system - saved maintenance budget
High viscosity stability	Maintains stable viscosity properties during operation - reliable lubrication of units and long-lasting performance of hydraulic system.
Universal application	Provides the option of multiple applications including hydraulic systems, transmissions and wet brakes - saved storage space and budget.

Specifications valid through 2019. See www.g-energy.org for actual specifications/approvals and detailed information.

Antiwear protection*

G-Special TO-4 10W minimizes wear of gear teeth and prolongs life cycle of gears.

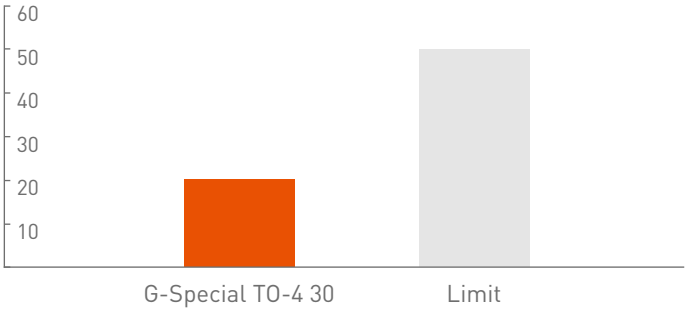
Iron, mg



Foam control**

Low foaming tendency of G-Special TO-4 30 provides enhanced capacity of hydraulic system.

Foam volume, ml



* FZG Wear Test; ** TASTM D892.

G-Special TO-4 Arctic 0W-20

Transmission units

Hydraulic system

Clutch systems of heavy duty equipment

Synthetic hydraulic-transmission fluid (based on Group IV PAO base stock) designed for hydraulic systems and transmissions of heavy duty quarrying, special and off-road machinery. High and stable friction properties provide effective operation of highly loaded wet brakes and continuous torque in a transmission. Maintains lubricating properties at low ambient temperatures and provides operational capacity of equipment in the harsh climate conditions.

SPECIFICATIONS:
Caterpillar TO-4; Allison C-4; Komatsu Micro-Clutch; Eaton Vickers 35VQ25.

7.2. Universal UTTO and STOU tractor oils

G-Special UTTO Premium 10W-30

Transmission units

Hydraulic systemem

Clutch systems of heavy duty equipment

Semi-synthetic hydraulic-transmission fluid for hydraulic systems and transmissions of special and off-road machinery operating in a wide range of ambient temperatures. Optimal friction properties provide smooth operation of wet brakes and power transmissions. In contrary to mineral oils extended drain intervals can be applied.

APPROVALS:
Massey Ferguson CMS M1145, ZF TE-ML 03E, 05F, 06K, 17E, 21F;
Volvo 97303 (WB 101).

SPECIFICATIONS:
Massey Ferguson CMS M1143, M1141, M1135;
John Deere JDM J20C, JDM J20D; Allison C-4;
New Holland CNH MAT 3540;
New Holland CNH MAT 3525 (FNHA-201.00 = M2C 134D);
New Holland CNH MAT 3526 (FNHA 2-C-200.00), 3510 (MS1317 = GL-4), 3509, 3506, 3505; Ford ESN M2C 86 B/C, M2C 134-D; Fendt (Non Vario);
Komatsu; API GL-4;
Deutz-Fahr; Kubota UDT;
Claas; Landini;
AGCO Power fluid 821XL;
AGCO Q-186 (White Farm), Ford ESN M2C 134-D, 86 B/C;
MS 1209, 1210, 1230.

G-Special UTTO 10W-30

Transmission units

Hydraulic system

Clutch systems of moderate duty equipment

Hydraulic-transmission fluid for hydraulic systems and transmissions of special and off-road machinery operating in a wide range of ambient temperatures. Optimal friction properties provide smooth operation of wet brakes and power transmissions.

APPROVALS:
ZF TE-ML 03E, 05F, 17E, 21F;
Volvo 97303 (WB 101);
Massey Ferguson CMS M1145.

SPECIFICATIONS:
Allison C-4, API GL-4,
Massey Ferguson CMS M1143,
New Holland CNH MAT 3525,
John Deere JDM J20C/D.

G-Special STOU 10W-30, 10W-40

Transmission units

Hydraulic system

Clutch systems of moderate duty equipment

Engines of special machinery (check OEM recommendations)

Series of semi-synthetic multigrade tractor oils suitable for application in engines, hydraulic systems and transmissions of special and off-road machinery. Provide optimal operational properties of wet brakes.

SAE viscosity grades: 10W-30, 10W-40.

APPROVALS:
Massey Ferguson CMS M1145*.

SPECIFICATIONS:
Ford WSS- M2C159B/C, M2C86B, M2C134A**; John Deere JDM J27; New Holland NH 024C*, NH410B**, NH420A**; FNH 82009201**, 82009202**, 82009203*; Sperry Vickers/Eaton I-280-S/M2950S; Sauer Sunstrand/Danfoss Hydro Static Trans Fluid; Fiat AF87*; Massey Ferguson CMS M1144, M1145**, 1139**, 1135**, 1127A**; ZF TE-ML* 05K, 06B, 06C, 07B, 07D; API CG-4, CF-4, CF, CE, CD, SF, SE; API GL-4; ACEA E3; MAN 271; Caterpillar TO-2; Allison C-4; MB 227.1; MB 228.1*.

* Only G-Special STOU 10W-40; ** Only G-Special STOU 10W-30.

Greases

Gazpromneft series of greases is intended for long-lasting operation in harsh conditions under extreme loads. Applicable to specific mining and quarrying equipment. Due to shock-loads, vibration, dusty environment and wide range of ambient temperatures, all lubricants used in this environment undergo extensive testing and improvement process. Just high-grade and most contemporary technologies used for production of Gazpromneft greases. All components in greases, including additives, thickeners and solids, are carefully selected for the specificity of mining industry.

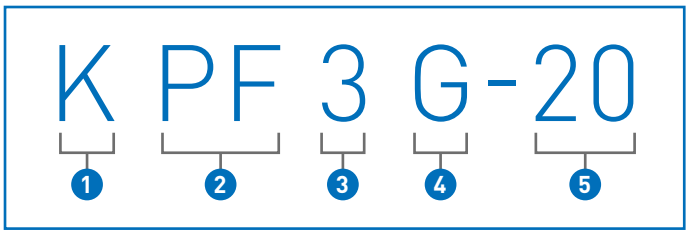
Application:

- Centralized grease system.
- Sliding bearings.
- Rolling bearings.
- Gear transmissions.

8.1. Classification of greases

Classification of greases according to DIN 51 502

According to this classification greases are divided by properties - composition, temperature range of application, consistency etc. Special code, assigned to the performance level, makes the choice of grease easier.



1 Type of grease lubricant

K	Grease lubricants for antifriction bearings,plain bearings and sliding faces according to DIN 51825
G	Grease lubricants for enclosed drives according to DIN 51826
OG	Grease lubricants for open drives
M	Lubricants for bearings and seals

2 Lubricating materials (base oil, additives etc.)

P	EP Additive
F	Solid lubricants
E	Polyester
FK	Perfluor liquids
HC	Synthetic hydrocarbons
PH	Ester of phosphoric acid
PG	Polyglycols
SI	Silicon oils
X	Others

3 Consistency index (NLGI Class)

NLGI	Penetration at 25 °C	Consistency	Application
000	445–475	Very soft (like viscous oil)	Enclosed gear systems / central lubrication systems
00	400–430		
0	355–385	Soft - semifluid	
1	310–340	Soft	Enclosed gear systems / central lubrication systems / rolling and sliding bearings
2	265–295	Normal grease	Sliding bearings / rolling bearings / sliding surfaces / central lubrications systems
3	220–250	Firm	Sliding bearings / rolling bearings
4	175–205	Hard	Rolling bearings / water pump sealing
5	130–160	Very hard	Open gear systems / water pump sealing
6	85–115		

4 Code letter (reaction to water)

Code letter	Upper operating temperature, °C	Reaction to water °C according to DIN 51807*
C	60	0 at 40 °C or 1 at 40 °C
D		2 at 40 °C or 3 at 40 °C
E	80	0 at 40 °C or 1 at 40 °C
F		2 at 40 °C or 3 at 40 °C
G	100	0 at 90 °C or 1 at 90 °C
H		2 at 90 °C or 3 at 90 °C
K	120	0 at 90 °C or 1 at 90 °C
M		2 at 90 °C or 3 at 90 °C
N	140	by agreement
P	160	
R	180	
S	200	
T	220	
U	>220	

5 Code number for lower service temperature

Lower operating temperature limit where grease reliably sustains its properties.

* 0 — no change; 1 — slight change; 2 — moderate change; 3 — major changeя.

8.2. Product range of Gazpromneft greases

Greases	Method	Gazpromneft Grease L EP 00	Gazpromneft Grease L EP 0	Gazpromneft Grease L EP 1	Gazpromneft Grease L EP 2	Gazpromneft Grease L EP 3	Gazpromneft Grease L Moly EP 2	Gazpromneft Metalgrease AC
Code according to DIN 51502	DIN 51502	KP 00 K-30	KP 0 K-30	KP 1 K-30	KP 2 K-30	KP 3 K-30	KPF 2 K-30	KPF 2S-30
NLGI Grade	ASTM D217	00	0	1	2	3	2	2
Operating temperature, °C		-30 up to 120*	-30 up to 120*	-30 up to 120*	-30 up to 120*	-30 up to 120*	-30 up to 120*	-30 up to 200*
Color	Visually	Amber	Amber	Amber	Amber	Amber	Dark Grey	Glassy Copper
Thickener		Lithium Soap	Lithium Soap	Lithium Soap	Lithium Soap	Lithium Soap	Lithium Soap	Bentonite
Solid additives		—	—	—	—	—	Molybde-num Disulfide	Copper, Molybdenum Disulfide, Graphite
Drop point, °C	ASTM D566 GOST 6793	>170	>170	>180	>190	>190	>190	No
Base oil		mineral	mineral	mineral	mineral	mineral	mineral	mineral
Kinematic viscosity of Base oil at 40 °C, мм²/с	ASTM D445	150	150	150	150	150	150	110
4-ball welding load, (not less than), N	ASTM D2596 DIN 51350 4 GOST 9490	2 400	2 400	2 400	2 400	2 400	2 800	3 200
4-ball wear scar diameter, mm	ASTM D2266 DIN 51350 5 GOST 9490	0,5	0,5	0,5	0,5	0,5	0,5	0,4

Gazpromneft Grease LTS 1	Gazpromneft Grease LTS 2	Gazpromneft Grease LTS Moly EP 2	Gazpromneft Grease LX EP 1	Gazpromneft Grease LX EP 2	Gazpromneft Steelgrease CS 1	Gazpromneft Steelgrease CS 2	Gazpromneft Grease Synth LX EP 2	Gazpromneft Grease Nord Moly
KP 1 K-30	KP 2 K-30	KPF 2 K-30	KP 1 P-30	KP 2 P-30	KP 1 S-30	KP 2 S-30	KPHC 2 N-50	KPF 0 K-50
1	2	2	1	2	1	2	2	0
-30 up to 120*	-30 up to 120*	-30 up to 120*	-30 up to 160*	-30 up to 160*	-30 up to 200*	-30 up to 200*	-50 up to 150*	-50 up to 120*
Dark Brown	Dark Brown	Dark Grey	Blue	Blue	Amber	Amber	Light Beige	Dark Grey
Lithium-Calcium Soap	Lithium-Calcium Soap	Lithium-Calcium Soap	Lithium-Complex Soap	Lithium-Complex Soap	Calcium Sulfonate	Calcium Sulfonate	Lithium Complex Soap	Lithium Complex Soap
—	—	Molybdenum Disulfide	—	—	—	—	—	Molybdenum Disulfide
>190	>190	>190	>250	>250	>300	>300	>250	>250
mineral	mineral	mineral	mineral	mineral	mineral	mineral	synthetic	VHVI
220	220	220	220	220	420	420	100	20
2 800	2 800	4 136	3 000	3 000	4 500	4 500	2 600	4 000
0,5	0,5	0,4	0,4	0,4	0,5	0,5	-	0,6

* Short peaks - up to +150 °C.

Gazpromneft Grease Nord Moly

High quality lithium complex grease containing molybdenum disulfide. Intended for lubrication of units operated under extreme loads and at wide range of ambient temperatures, including low temperatures characteristic such as Northern Siberia. Applicable for central lubrication systems.

Advantages

- Excellent performance at the range of ambient temperature between -50 to +120 °C. (short peaks up to +150 °C)
- EP additives and molybdenum disulfide provide exceptional antiwear and anti-micropitting properties. Grease withstands high loads and prevents failure of highly loaded units.
- Excellent oxidation stability provides long life cycle of the grease in arduous operating conditions.
- Assures highly effective anticorrosion protection in particularly harsh conditions like presence of moisture, cold or hot water.
- GREASE — High mechanical stability insures applicability in units under severe vibration forces.

Gazpromneft Grease LTS Moly EP 2

High quality lithium complex grease containing solid lubricant (molybdenum disulfide) and advanced extreme pressure additive package. Gazpromneft Grease LTS Moly EP 2 provides reliable protection of equipment operating at various weather conditions (down to -30 °C) and at wide range of mechanical loads. Suitable for mining machinery operating at moderate climate conditions.

Advantages

Excellent performance at the range of ambient temperature between -30 to +120 °C. (short peaks up to +150 °C)

EP additives and molybdenum disulfide provide exceptional antiwear and anti-micropitting properties. Grease withstands high loads and maintains lubricating properties even in cases of insufficient amount of grease being applied to the unit or operating environment being contaminated.

Assures highly effective anticorrosion protection in particularly harsh conditions like presence of moisture, cold or hot water.

Gazpromneft Grease LTS 2

Multifunctional lithium-calcium grease containing extreme pressure (EP) additives. Applicable for lubrication of units run under overloaded operational mode.

Advantages

Excellent performance at the range of ambient temperature between -30 to +120 °C. (short peaks up to +150 °C)

Excellent oxidation stability provides long life cycle of the grease in high temperature operating conditions.

Highly water resistant.

UNIVERSAL

Universal characteristics of the grease provide wide range of applicability. Such feature simplifies relubrication routines, as well as optimizes stock value and number of stored items.

Gazpromneft Grease LX EP 2

Multipurpose lithium complex soap-based grease containing extreme pressure additive package. Grease applicable for various units of mining machinery if solid additives are not required and operating conditions include high ambient temperatures and excessive loads.

Advantages

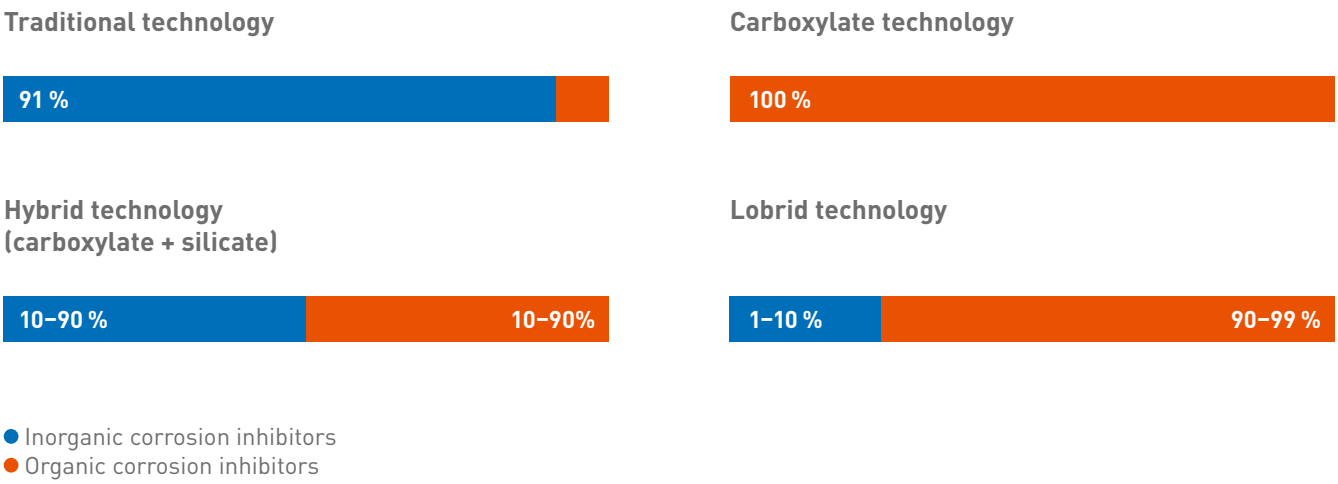
- Excellent performance at the range of ambient temperature between -30 to +160 ºC.
- Perfect sealing properties protect equipment units against water ingress, contamination and dust.
- Assures highly effective anticorrosion protection in particularly harsh conditions like presence of moisture, cold or hot water.
- High mechanical stability insures applicability in units under severe vibration forces.

Coolants

Due to specific operating conditions and design of quarrying, earth moving and special machinery diesel engines, high performance lubricants are not enough to guarantee long life cycle of the engine. Coolant is another fluid providing problem-free operation. Immense size of the parts and units plus extremes of ambient temperature require enhanced protection of bore cylinders against cavitation. Besides various metal alloys in combination with non-metallic composite sealing materials are used for the design of parts and gaskets. That makes any development of the universal coolant recipe impossible.

Hence G-Energy and Gazpromneft series of coolants made to satisfy requirements of all main OEMs. Products represent various corrosion inhibiting additive technologies: carboxylate acid (OAT), lobrid, hybrid and traditional (IAT).

Classification of antifreezes according to additive technologies



9.1. Product range of G-Energy antifreezes

Name	Additive technology	Conformity to industry ASTM	Approvals	Color	Application
G-Energy Antifreeze SNF	OAT	ASTM D4985	MAN 324-SNF MB 325.3 MWM	Red	For light and heavy operating conditions. Lightly and heavily loaded engines. Comply with DAF, MTU, Volvo Trucks requirements.
G-Energy Antifreeze		ASTM D3306		Green	For light operating conditions and equipment made in Russia. Comply with KAMAZ, LIAZ, PAZ, GAZ, NEFAZ requirements.
G-Energy Antifreeze NF	Hybrid	ASTM D4985	MAN 324-NF MB 325.0 Deutz DQC CA-14, Jenbacher TI 1000-0201	Blue-Green	For light and heavy operating conditions. Comply with Liebherr, MWM, Volvo Trucks requirements.
G-Energy Antifreeze Si-OAT	Lobrid		MB 325.5 MAN 324-SI-OAT	Purple	For light and heavy operating conditions. Comply with Cummins CES 14603, Deutz, Liebherr, MWM, Mercedes-Benz, MTU requirements.
G-Energy Antifreeze HD		ASTM D4985 ASTM D6210			For light and heavy operating conditions. Reinforced protection against cavitation. Comply with Caterpillar CAT EC-1, Cummins, Detroit Diesel requirements.

Specifications valid through 2019. See www.g-energy.org for actual specifications/approvals and detailed information.

G-Energy Antifreeze NF

Concentrated and premix coolant based on ethylene glycol and designed according to hybrid technology (organic acid salt and silicate based corrosion inhibitors).

Hybrid technology antifreezes are widely used for engines of European manufacturers like Liebherr, MTU, Mercedes-Benz, MAN, DEUTZ (according to OEM requirements instruction manual must be checked before application).

DIVERSE OPTIONS:

- **G-Energy Antifreeze NF** — concentrated coolant for dilution.
- **G-Energy Antifreeze NF 40** — premixed coolant with anti-freezing protection at -40 °C. 50:50 ratio concentrated coolant and water mix.

OFFICIAL APPROVALS:
MB 325.0; Deutz DQC CA-14;
MAN 324 NF;
Jenbacher TI 1000-0201.

SPECIFICATIONS:
Jenbacher TA-Nr. 1000-0201;
Liebherr Machines Bulle TLV 035;
Liebherr Machines Bulle TLV 23009 A; Porsche 924, 928, 944, 968;
Saab 6901599;
General Motors B 040 0240;
BMW N 600 69.0;
Mercedes-Benz Daimler; Ford;
General Motors; Iveco;
VW TL 774-C (G-11); ASTM D3306, D4985; AS 2108-2004;
ONORM V 5123; CUNA NC 956-16;
SANS 1251:2005; BS 6580-2010;
GOST 33591-2015.

G-Energy Antifreeze HD

Concentrated and premix coolant based on ethylene glycol and designed according to lobrid technology (organic acid salts, nitrites and molybdates based corrosion inhibitors).
Lobrid technology antifreezes are widely used for heavy duty engines of American manufacturers like Caterpillar, Cummins, as well as for JCB engines (according to OEM requirements instruction manual must be checked before application).

DIVERSE OPTIONS:

- **G-Energy Antifreeze HD** — concentrated coolant for dilution.
- **G-Energy Antifreeze HD 40** — premixed coolant with anti-freezing protection at -40 °C. 50:50 ratio concentrated coolant and water mix.

SPECIFICATIONS:
Caterpillar ELC (EC-1);
Cummins 90T8-4;
Detroit Diesel 7SE298;
Freightliner 48-22880;
General Motors 1825, 1899M, 6277M;
ASTM D6210, D3306, D4985;
SAE J1034; J1038; TMC RP329;
GOST 33591-2015.

G-Energy Antifreeze SNF

Concentrated and premix coolant based on ethylene glycol and designed according to OAT technology (organic acid salt based corrosion inhibitors).

OAT technology antifreezes are widely used for engines of European and Japanese manufacturers like MTU, Mercedes-Benz, MAN, Komatsu, Volvo, Hitachi (according to OEM requirements instruction manual must be checked before application).

DIVERSE OPTIONS:

- **G-Energy Antifreeze SNF** — concentrated coolant for dilution.
- **G-Energy Antifreeze SNF 40** — premixed coolant with anti-freezing protection at -40 °C. 50:50 ratio concentrated coolant and water mix.

OFFICIAL APPROVALS:
MAN 324 Typ SNF; MB 325.3; MWM.

SPECIFICATIONS:
Caterpillar; DAF MAT 74002; Deutz DQC CB-14; MTU MTL 5048; VW TL-774-F (G12+); Ford; Porsche; JSC Avtovaz; ASTM D3306, D4985; Afnor NF R15-601; ONORM V 5123; CUNA NC 956-16; SANS 1251:2005; BS 6580-2010; GOST 33591-2015;

9.2. Product range of Gazprom coolants

Name	Additive technology	Conformity to industry ASTM	Approvals	Color	Application
Gazpromneft ANTIFREEZE SF 12+	OAT	ASTM D4985	MAN 324-SNF	Red	Light and heavy duty operational conditions. Comply to Mercedes-Benz and MTU requirements.
Gazpromneft ANTIFREEZE (BS)	Traditional	ASTM D3306		Green	Light duty operating conditions. Designed for vehicles made in Russia and abroad at post-warranty period.
Gazpromneft ANTIFREEZE		ASTM D4985 ASTM D6210	JSC Avtodizel (YAMZ) JSC Kamaz OJSC "MMP"	Red	Light and heavy duty operating conditions. Enhanced protection against cavitation. Comply to Caterpillar, Cummins, Detroit Diesel, Freightliner, John Deere requirements.
Gazpromneft TOSOL				Blue	Used for various equipment at post-warranty period.

Specifications valid through 2019. See www.g-energy.org and www.gazpromneft-oil.com for actual specifications/approvals and detailed information.

Gazpromneft ANTIFREEZE

Concentrated and premix coolant based on ethylene glycol and designed according to traditional inorganic acid salt technology (low content of silicate additives and nitrites).

Antifreezes of these series are widely used for Catepillar, Cummins engines and can be applied for KAMAZ engines as well (according to OEM requirements instruction manual must be checked before application).

DIVERSE OPTIONS:

- **Gazpromneft ANTIFREEZE** — concentrated coolant for dilution.
- **Gazpromneft ANTIFREEZE 40** — premixed coolant with anti-freezing protection at -40 °C. 50:50 ratio concentrated coolant and water mix.
- **Gazpromneft ANTIFREEZE Arctic** — coolant fluid formulation containing increased percentage of anti-cavitation additives. Protection against freezing down to -50 °C, 60:40 ratio of concentrated fluid and water.

OFFICIAL APPROVALS:
JSC Avtodizel (YAMZ);
JSC Kamaz;
JSC Minsk Motor Plant.

SPECIFICATIONS:
Cummins CES 14603; Caterpillar; Detroit Diesel 7SE298; General Motors 6038M; John Deere 8650-5; Case Corp. MS1710; New Holland 9-86; Navistar; Freightliner 48-22880; PACCAR; MACK; Waukesha 4-1974D; GAZ Ltd.; JSC Avtovaz; ASTM D3306, D4985, D6210; TMC RP329; SAE 1941; BS 6580-1992; GOST 33591-2015.

Gazpromneft ANTIFREEZE (BS)

Concentrated and premix coolant based on ethylene glycol and designed according to traditional inorganic acid salt technology (nitrites containing additives).

Antifreezes of these series are widely used for American and Russian made engines like Caterpillar, Cummins, KAMAZ (according to OEM requirements instruction manual must be checked before application).

DIVERSE OPTIONS:

- **Gazpromneft ANTIFREEZE (BS)** — concentrated coolant for dilution.
- **Gazpromneft ANTIFREEZE (BS) 40** — premixed coolant with anti-freezing protection at -40 °C. 50:50 ratio concentrated coolant and water mix.

SPECIFICATIONS:
ASTM D3306, D4985;
GOST 33591-2015.

Gazpromneft ANTIFREEZE SF 12+

Concentrated and premix coolant based on ethylene glycol and designed according to OAT technology (organic acid salt based corrosion inhibitors). OAT technology antifreezes are widely used for special equipment engines of European and Japanese manufacturers like MTU, Mercedes-Benz, MAN, Komatsu, Volvo, Hitachi (according to OEM requirements instruction manual must be checked before application).

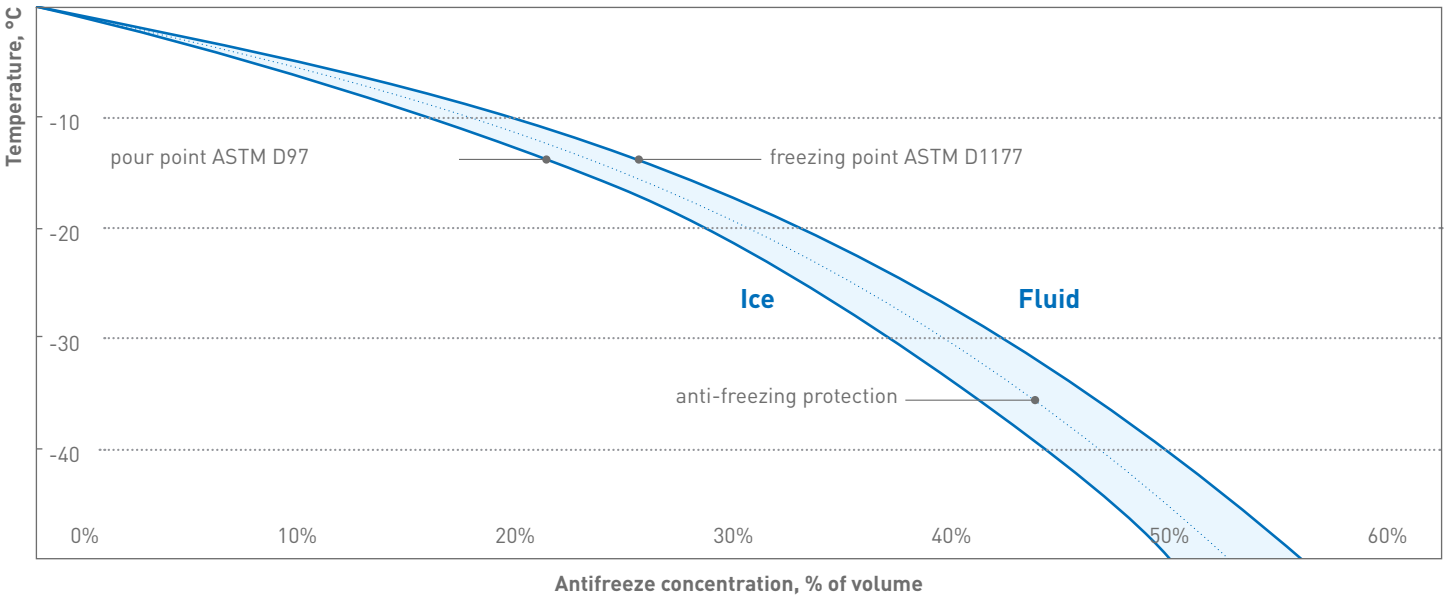
DIVERSE OPTIONS:

- **Gazpromneft ANTIFREEZE SF 12+** — coolant concentrate for dilution in water.
- **Gazpromneft ANTIFREEZE SF 12+ 40** — coolant with anti-freezing protection temperature -40 °C, concentrate dilution in water at 50:50 ratio.

OFFICIAL APPROVALS:
MAN 324 Typ SNF.

SPECIFICATIONS:
MB 325.3; VW TL 774-F (G12+);
ASTM D3306, D4985;
Afnor NF R15-601;
BS 6580-2010; SAE J1034;
GOST 33591-2015.

9.3. Diagram: Anti-freezing protection temperature* dependency on concentration



* Anti-freezing protection temperature - average value between freezing point (first ice crystals) and pour point (loss of fluidity).

Gear Oils

Mineral extraction and processing involves big number of various mechanisms. All of them require transfer and reduction of torque. Due to immense energy transferred through the systems, many gearboxes are exposed to high mechanical and thermal loads. Presence of the dust and humidity in the air are regular conditions of everyday operation.

In light of these conditions strong antiwear and extreme pressure properties must be reinforced by gear oils with high antioxidation and anticorrosion capabilities, able to rapidly separate water.

Gazpromneft Gear Oils

Name, SAE viscosity grade	Base Oil	Oxidation stability	Anticorrosion	Anticorrosion	Low temperature properties	Antiscuffing properties	Seal compatibility
Gazpromneft Reductor F Synth 150, 220, 320, 460		■■■	■■■	■■■	■■■	■■■	■■■
Gazpromneft Reductor CLP 68, 100, 150, 220, 320, 460, 680		■■	■■■	■■	■	■■■	■■
Gazpromneft Reductor WS 100, 150, 220		■■	■■	■■	■■	■■	■■
Gazpromneft Reductor ITD 68, 100, 150, 220, 320, 460, 680		■	■	■	■	■■	■■

Synthetic Oil

Mineral Oil

Product range of Gazpromneft oils

Gazpromneft Reductor F Synth

Series of synthetic gear oils for modern industrial reduction gears (e.g. Flender) operating in tough conditions. Synthetic base provides maintenance of oils properties at high and low ambient temperatures. Oils of Gazpromneft Reductor F Synth series, compared to mineral based lubricants, are applicable for extended drain intervals.

ISO Viscosity Grades: 150, 220, 320, 460.

APPROVALS:
Flender rev. 16.

SPECIFICATIONS:
DIN 51517 Part 3;
AGMA 9005-E02.

Gazpromneft Reductor CLP

Series of gear oils for industrial reduction gears operating in tough conditions. Suitable also for transmissions lubricated by circulation system or by splashing. Not recommended for reduction gears made by Flender.

ISO Viscosity Grades: 68, 100, 150, 220, 320, 460, 680.

APPROVALS:
MAG P-77 (ISO VG 150 only);
MAG P-74 (ISO VG 150 only).

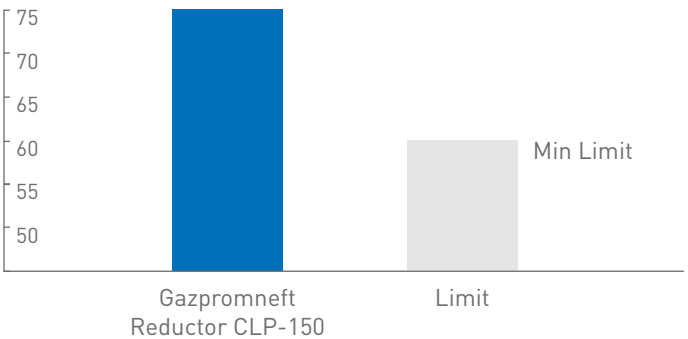
SPECIFICATIONS:
DIN 51517 Part 3;
AGMA 9005-E02, AIST 224;
David Brown S1.53.101(E);
Danieli (except ISO VG 68 and 100).

High load carrying capacity	Oil is capable to operate under extreme loads and to protect teeth surface against micropitting.
Formation of protective layers	Consistent separation of friction surfaces reduces probability of surface fatigue and prolongs life cycle of equipment.
Great resistance against thermal degradation	Prevents insufficient lubrication due to sludge formation. High operating capacity achieved.
Resistance to emulsification with water	Oil easily separates water and maintains reliable oil film thickness, thereby provides safe operation at a presence of water.
Anticorrosion protection	Minimized corrosion risk at a presence of moisture cuts maintenance and costs.

Load capacity*

Gazpromneft Reductor CLP series of oils demonstrate high gear teeth antiwear and anti-micropitting protection capabilities extending life cycle of equipment.

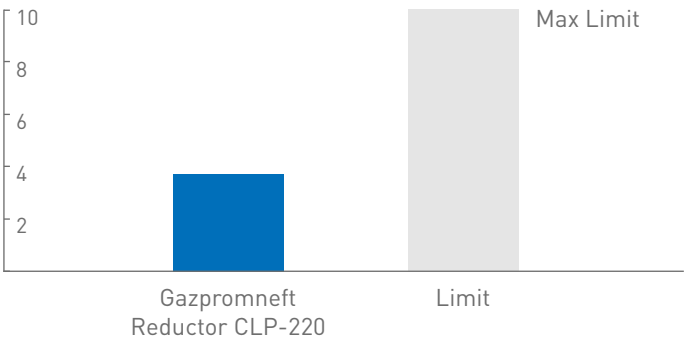
Load, lbs



Seal compatibility**

Gazpromneft Reductor CLP series of oils are delicate to elastomers and reduce unplanned maintenance costs.

Relative swelling of elastomer, %



* ASTM D2782; ** DIN ISO 1817.

Specifications valid through 2019. See www.gazpromneft-oil.com for actual specifications/approvals and detailed information.

Gazpromneft Reductor WS

Series of special gear oils for heavily loaded industrial reduction gears operating at wide range of ambient temperatures, e.g. unheated industrial facilities. Combination of met DIN 51517 requirements and enhanced low temperature properties provide an adequate operational capacity of equipment throughout the year.

ISO Viscosity Grades: 100, 150, 220.

SPECIFICATIONS:
DIN 51517 Part 3.

Gazpromneft Reductor ITD

Series of gear oils containing modern additive package providing conformity to DIN 51517 Part 3 requirements. Excellent alternative to the monograde oils (ITD, ISP etc.).

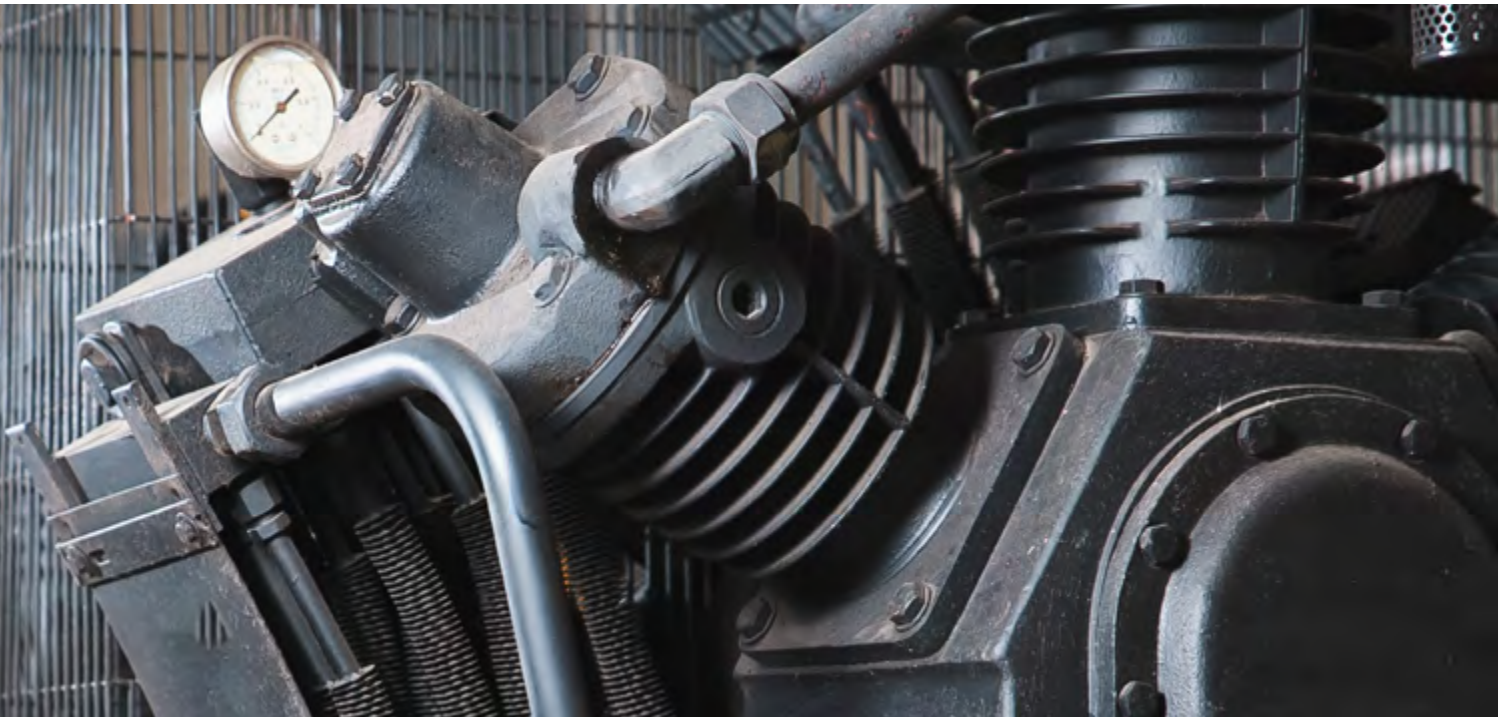
ISO Viscosity Grades: 68, 100, 150, 220, 320, 460, 680.

SPECIFICATIONS:
DIN 51517 Part 3.

Compressor Oils

Besides electric and hydraulic power, the mining industry has another source of power generation pneumatics are involved in significant part of mineral extraction and processing. Pneumatics are used for rock drills, mining scalars, pneumatic conveying of extracted minerals, sprinkling of fluids, air supply for enrichment processes etc. Air compressors are operated everywhere - underground, in quarries and enrichment plants. Mining conditions are harsh: high air humidity and dense dust pose corrosion and premature wear risk on compressors. In addition high power output combined with compact dimensions of the compressors generate extreme operating temperatures. This is why mining industry sets severe requirements on sludge and deposit control, oxidation stability, water separation and antiwear properties.

11.1. Product range of Gazpromneft compressor oils



Gazpromneft compressor oils

Name, SAE viscosity grade	Sludge control	High temperature stability	Rotary compressor application	Piston compressor application	Low temperature properties
Gazpromneft Compressor F Synth					
46, 68	■■■	■■■	✓		■■■
Gazpromneft Compressor S Synth					
46, 68	■■□	■■□	✓		■■□
100, 150	■■□	■■□		✓	■■□
Gazpromneft Compressor Oil					
46, 68	■■□	■□□	✓		■□□
100, 150, 220, 320	■■□	■□□		✓	■□□

Product range of Gazpromneft compressor oils

Gazpromneft Compressor F Synth

Series of synthetic compressor oils for modern screw and vane compressors operating in harsh conditions (discharge temperature up to 220 °C). Synthetic base stock provides excellent protection against sludge and deposit formation. Compared to mineral and semi-synthetic oils has extended drain intervals. Quick water separation provides good inhibition of corrosion.

ISO Viscosity Grades: 46, 68.

SPECIFICATIONS:
DIN 51506 VDL; ISO 6743 DAJ; ROTORCOMP VERDICHTER GmbH.

Gazpromneft Compressor S Synth

Series of semi-synthetic compressor oils for modern positive displacement and dynamic type air compressors (piston, screw, vane) operating in harsh conditions (discharge temperature up to 220 °C). Synthetic base stock provides excellent protection against sludge and deposit formation. Compared to mineral based oils has extended drain intervals. Quick water separation provides good inhibition of corrosion.

ISO Viscosity Grades: 46, 68, 100, 150.

SPECIFICATIONS:
DIN 51506 VDL; JSC Compressor Plant "Borets" (ISO VG 100 and 150 only); ROTORCOMP VERDICHTER GmbH.

Gazpromneft Compressor Oil

Series of compressor oils for modern positive displacement and dynamic type air compressors (piston, screw, vane) operating in harsh conditions (discharge temperature in mobile systems up to 220 °C, in stationary up to 160 °C). Careful selection of high quality base oils and additives provides protection of compressor components against sludge formation and corrosion.

ISO Viscosity Grades: 46, 68, 100, 150, 220.

SPECIFICATIONS:
JSC UKZ; DIN 51506 VCL; JSC Sumy NPO; ROTORCOMP VERDICHTER GmbH.

Monograde oils

Even up to this day there are many machines and a lot of equipment of 80's operating in the mining industry. Regardless of the age, this equipment requires specific but still high quality lubricants. Product range of these lubricants isn`t narrow at all. In general monograde oils or corresponding substitutes made of modern components are intended for the application.

Accurate maintenance and use of high quality lubricants often prolongs a life cycle of such machinery for many years. For instance, maximized equipment life cycle can be achieved by replacement of monograde oils with improved and more universal products.

Engine Oils

Substituting monograde oils

Name	Sludge control	Oxidation stability	Ambient temperature range	Antiwear protection	Soot control	All season application
Gazpromneft Turbo Universal*	■■	■■	■■	■■	■■	✔
Oils M-8DM, M-10DM	■	■	■	■	■	

* Detailed product information in section Engine Oils..

Product range of engine oils

Diesel Turbo SAE 20 (M-8DM)

Engine oil for highly loaded cargo vehicles, special and off-road machinery operating during winter period.

SPECIFICATIONS:
API CD.

M-10DM

Engine oil for highly loaded cargo vehicles, special and off-road diesel engines operating during summer period.

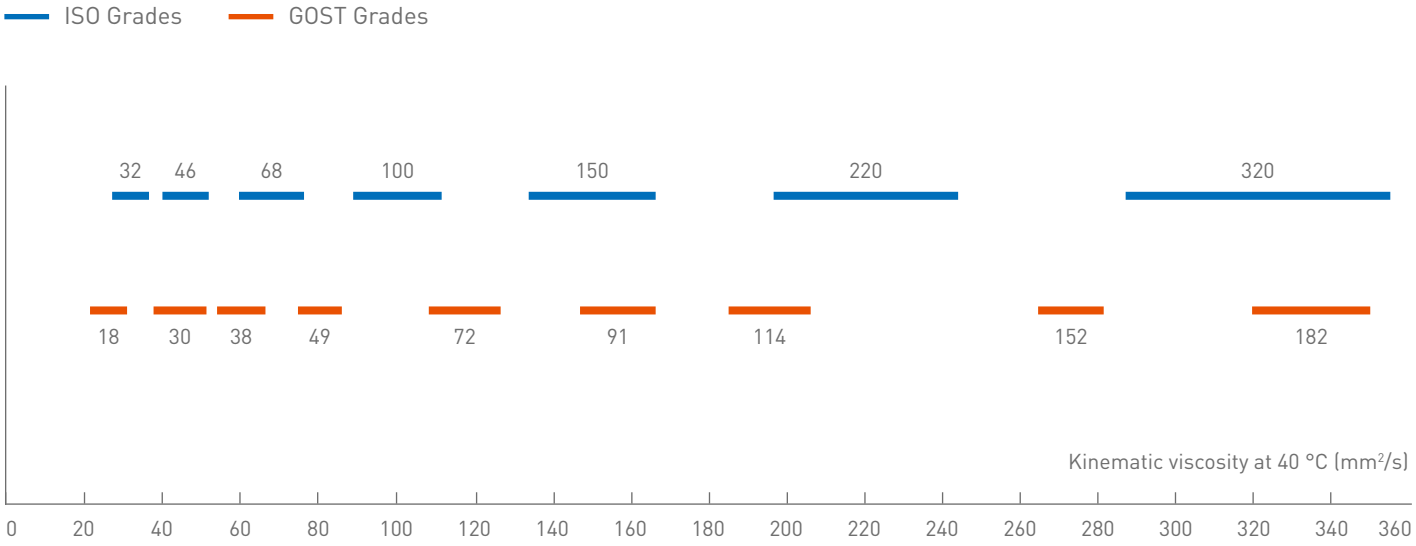
SPECIFICATIONS:
API CD; JSC TMZ.

Hydraulic Oils

Substituting monograde oils

Name	Antiwear properties	Oxidation stability	Antifoaming properties	Water separation	Cleanliness class	Compliance to DIN 51524 Part 2 requirements
Gazpromneft Hydraulic*	■■□	■■□	■■□	■■□	■■■	✓
IGP series oils	■□□	■□□	■□□	■□□	■□□	

* Detailed product information in section Hydraulic Oils.



Product range for hydraulic systems

Gazpromneft Mark "A"

Hydraulic-transmission fluid intended for torque converters, automatic transmissions and hydrostatic drives of cargo trucks, passenger vehicles and special equipment.

Gazpromneft Mark "R"

Special oil for application in power steering systems and hydrostatic drives of cargo trucks, passenger vehicles and special machinery.

Gazpromneft VGMZ

Series of hydraulic oils intended for application in hydraulic and hydraulic steering systems of construction, road building, logging, lifting and other machinery operating outdoors in a wide range of ambient temperature.

MGE-46V

Hydraulic oil intended for hydraulic and hydrostatic drive systems of special machinery operating in a wide range of ambient temperature.

Gazpromneft Industrial 30, 40

Series of industrial oils intended for application in lightly loaded units of industrial equipment. Compared to I-30A and I-40A demonstrates much higher performance. Thereby is perfect choice to replace monograde oils.

SPECIFICATIONS:
DIN 51524 Part 2.

I-12A, I-20A, I-30A, I-40A, I-50A product line

Product line of industrial equipment oils without additives.

IGP-18, 30, 38, 49, 72, 91, 114, 152, 182

Product line of industrial hydraulic oils containing additives for machine tools, presses, automatic industrial conveyors if oils providing enhanced oxidation stability and antiwear properties are required. IGP-152 is applied for lubrication of highly loaded cogwheels and worm gears of industrial transmissions.

SPECIFICATIONS:
SVNIINP (IGP-18 and IGP-38).

Gear Oils

Substituting monograde oils

SAE viscosity grade	Extreme Pressure and antiwear properties	Oxidation stability	Antifoaming properties	Water separation	Anticorrosion properties	Compliance to DIN 51524 Part 3 requirements
Gazpromneft Gear ITD*	■■	■■	■■	■■	■■	✓
Regular oils series ITD, ISP, ISPi, IPp, ITP	■	■	■	■	■	

* Detailed product information in section Gear Oils.

Product range of Gear Oils

Gazpromneft Reductor ITD

Product line of gear oils containing modern additive package that makes product complying with DIN 51517 Part 3 requirements. Perfect substitute for corresponding monograde oils (ITD, ISP etc.)

SPECIFICATIONS:
DIN 51517 Part 3.

Other monograde oils

Compressor Oils

Kp-8S - enhanced stability

Compressor oil containing additives for lubrication of centrifugal and turbo compressors, including "turbine - gearbox" systems. Applicable for some ammonia pump-out compressors.

KS-19p A

Compressor oils containing additives for application in piston compressors operated under moderate and high pressure. Applicable for rotary compressors if equipment manufacturer requires viscosity grade of this product. Suitable for single or multistage compressors operating in various industries compressing air or other insoluble gases.

Transmission Oils

TSp-15K

Transmission oil for manual gearboxes, transfer boxes, power take-off units and final drives without hypoid gears operated on heavy-duty cargo, special and off-road machinery. Applicable if oil according to API GL-3 or lower EP grade is required.

SPECIFICATIONS:
API GL-3; JSC Kamaz; JSC Avtodizel (YAMZ).

Greases

Litol-24

Multipurpose antifriction grease based on mineral oil. Thickened by lithium soap and contains effective additive package. Providing good lubrication of rolling and sliding bearings, swivels, cogwheel and other gearings, sliding surfaces of mobile or stationary equipment and industrial equipment.

SPECIFICATIONS:
DIN 51502 K 3 K -40.

Coolants

Gazpromneft TOSOL

Concentrated and premix coolant based on ethylene glycol. Additive package contains traditional inhibitors of corrosion. Properties precisely comply to GOST 28084-89, GOST 33591-2015 requirements.

SPECIFICATIONS:
GOST 33591-2015.

Diverse options:

Gazpromneft TOSOL — coolant concentrate for dilution.

Gazpromneft TOSO 40 — coolant with anti-freezing temperature -40 °C.

Gazpromneft TOSO 65 — coolant with anti-freezing temperature -65 °C.

Oil recommendations for Mining Industry

Quarrying dump trucks

			BELAZ		Caterpillar	Komatsu
			7555	7513	777 G	HD785-5
Engine		Model	KTTA 19C / QSK19-C	MTU12V 4000 / KTA 50 / KTA 38 / QSK 45C	C32 Acert	Komatsu SA12V140
		Sump volume, L	54/70	253/195/156/195	109	130
		Product	G-Profi MSI Plus 15W-40		G-Profi MSJ 10W-30 / G-Profi MSI Plus 15W-40	G-Profi MSI Plus 15W-40
		Service interval	250 mh	500 mh (MTU) 250 mh (Cummins)	500 mh / 3 months	500 mh
Hydraulic system		Product	G-Special Hydraulic Nord-32 (>7500 mh) G-Special Power HVLP Gazpromneft Hydraulic HVLP (viscosity choice depends on ambient temperature)		G-Special TO-4 Arctic 0W-20 G-Special TO-4 10W	G-Special TO-4 10W
		Sump volume, L	300	510	461	248
		Service interval	4 000 mh		1 000 mh / 6 months	2 000 mh
TRansmission units	**Hubs**	Product	G-Truck GL-5 85W-140		—	
		Sump volume, L	—	92 (46*2)		
		Service interval	2 500 mh			
	Final drive cases, wheel gears	Product	G-Truck GL-5 80W-90		See instruction manual	G-Special TO-4 30 G-Special TO-4 50
		Sump volume, L	108	—		132 / 59
	Differential, final drive **Differential, wheel gears, wheel bearings**	Service interval	Service twice a year			2 000 mh
	Gearbox	Product	G-Box ATF DX II, G-Box ATF DX III		G-Special TO-4 10W G-Special TO-4 30	G-Special TO-4 10W G-Special TO-4 30
		Sump volume, L	146	—	166	125
		Service interval	1 000 mh		500 mh	1 000 mh
	Front suspension, rear suspension, brake system, brake cooling	Product	—			G-Special TO-4 10W
		Sump volume, L				20/18/2/366
		Service interval				2 000 mh
Coolant		Product	Engine Cummins — Gazpromneft ANTIFREEZE Engine MTU — G-Energy Antifreeze SNF		G-Energy Antifreeze HD, Gazpromneft ANTIFREEZE	G-Energy Antifreeze SNF
Greases		Load on one unit	up to 4000 N	Gazpromneft Grease Nord Moly. Application: Central lubrication of highly loaded units.		
			up to 3600 N	Gazpromneft Grease LTS Moly EP 2. Application: highly loaded units.		
			up to 3000 N	Gazpromneft Grease LX EP 2. Application: universal grease if solid additives are not required.		
			up to 2600 N	Gazpromneft Grease Synth LX EP 2. Application: universal grease if solid additives are not required (up to -50 °C).		

Information above supplied for reference only. Check equipment instruction manual to establish lubrication system customized for specific equipment and conditions.

Excavators

		Hitachi	Komatsu
		EX 2500	PC 3000
Engine	Model	Cummins KTA 50C	Komatsu SSA12V159
	Sump volume, L	163	190
	Product	G-Profi MSI Plus 15W-40	G-Profi MSI Plus 15W-40
	Service interval	250 mh / 6 months	—
Hydraulic system	Oil (arctic/moderate winter/moderate summer)	G-Special Power HVLP Gazpromneft Hydraulic HLP Gazpromneft Hydraulic HVLP (viscosity choice depends on ambient temperature of operating) G-Special Hydraulic Nord-32	
	Sump volume, L	2 950	4 400
	Service interval	2 000 mh	2 000 mh / 12 months
Transmission units — **Swing gearbox**	Product	G-Truck GL-4 80W-90	Gazpromneft Hydraulic HLP-32 Gazpromneft Reductor CLP-220
	Sump volume, L	100 L (x2)	42
	Service interval	1 000 mh	3 000 mh / 12 months
Transmission units — **Gear unit**	Product	G-Truck GL-4 80W-90	Gazpromneft Reductor F Synth-220 Gazpromneft Reductor CLP-220
	Sump volume, L	137 L (x2)	60
	Service interval	2 000 mh	3 000 mh / 12 months
Transmission units — **Track rollers & idlers**	Product	—	—
	Sump volume, L		
	Service interval		
Transmission units — **Power take-off**	Product	—	Gazpromneft Reductor CLP-150
	Sump volume, L		up to 87 (depending on model))
	Service interval		3 000 mh / 12 months
Pump transmission	Product	G-Special TO-4 10W G-Special TO-4 30	—
	Sump volume, L	26	
	Service interval	500 mh	
Coolant	Product	G-Energy Antifreeze SNF	

Greases	Load on one unit	up to 4000 N	Gazpromneft Grease Nord Moly. Application: Central lubrication of highly loaded units
		up to 3600 N	Gazpromneft Grease LTS Moly EP 2. Application: highly loaded units.
		up to 3000 N	Gazpromneft Grease LX EP 2. Application: universal grease if solid additives are not required.
		up to 2600 N	Gazpromneft Grease Synth LX EP 2. Application: universal grease if solid additives are not required (up to -50 °C).

Information above supplied for reference only. Check equipment instruction manual to establish lubrication system customized for specific equipment and conditions.

Excavators

Caterpillar	Komatsu	Liebherr	Hitachi
340D2 L	PC 1250	R966	ex 1200
C9 Acert	Komatsu SAA6D170E-3/5	Liebherr D9508	Cummins QSX-23
35.5	68 / 97	60	118
less than 0,1% Sulphur in fuel: G-Profi MSJ 5W-30 G-Profi MSJ 10W-30 **more than 0,1% Sulphur in fuel:** G-Profi MSI 5W-40 G-Profi MSI Plus 15W-40	G-Profi MSI Plus 15W-40	G-Profi GT LA 10W-40	G-Profi MSI Plus 15W-40
	250 mh / 6 months	1125 to 500 mh (depending on Sulphur content in fuel, operating temperature and conditions)	250 mh (or according to OEM recommendations, see instruction manual)
G-Special TO-4 Arctic 0W-20 G-Special TO-4 10W G-Special TO-4 30	G-Special TO-4 10W	See instruction manual	G-Special Power HVLP Gazpromneft Hydraulic HLP Gazpromneft Hydraulic HVLP (viscosity choice depends on ambient temperature) G-Special Hydraulic Nord-32
410	1 180		1 350
2 000 mh / 12 months	2 000 mh		2 000 mh
G-Special TO-4 10W G-Special TO-4 30 G-Special TO-4 50	G-Special TO-4 10W G-Special TO-4 30	G-Truck LS 85W-90	G-Truck GL-4 80W-90 G-Box GL4/GL-5 75W-90
19	24		See service interval
2 000 mh / 12 months	1 000 mh	1 000 mh	
G-Special TO-4 10W G-Special TO-4 30 G-Special TO-4 50	G-Special TO-4 30	G-Truck GL-5 80W-90	G-Truck GL-4 80W-90 G-Box GL-4/GL-5 75W-90
8 L each	22		43 (x2)
2 000 mh / 12 months	2 000 mh	2 000 mh	2 000 mh
G-Special TO-4 30	—	—	—
See instruction manual			
—	G-Special TO-4 10W G-Special TO-4 30	—	—
	14		
	1 000 mh		
—	—	—	—
G-Energy Antifreeze HD, Gazpromneft ANTIFREEZE	G-Energy Antifreeze SNF	G-Energy Antifreeze NF, G-Energy Antifreeze Si-OAT	G-Energy Antifreeze HD, Gazpromneft ANTIFREEZE

Information above supplied for reference only. Check equipment instruction manual to establish lubrication system customized for specific equipment and conditions.

Bulldozers

		Caterpillar		Komatsu	Liebherr
		D9R / D9T	D10T	D375	PR 744
Engine	Model	3408C / C18 ACERT	C27 Acert	SA6D170E-3	D936L A6 (w/out DPF)
	Sump volume, L	—	68	68	43
	Product	G-Profi MSI Plus 15W-40	G-Profi MSI Plus 15W-40	G-Profi MSI Plus 15W-40	G-Profi GTS 5W-30 G-Profi GT 10W-40
	Service interval	Depending on model, see instruction manual	500 mh / 3 months	500 mh	500 mh / 12 months (Sulphur content in fuel <0,5%, operating temperature above -10 °C)
Hydraulic system	Product	G-Special TO-4 10W G-Special TO-4 30		G-Special TO-4 10W G-Special TO-4 30	See instruction manual
	Sump volume, L		144	270	
	Service interval	2 000 mh	2 000 mh / 12 months	2 000 mh	
Transmission units **Gearbox**	Product	G-Special TO-4 Arctic 0W-20 G-Special TO-4 10W G-Special TO-4 30 G-Special TO-4 50		G-Special TO-4 10W G-Special TO-4 30	G-Box GL-5 75W-90 G-Truck GL-5 85W-140
	Sump volume, L	—	193	275	6,5
	Service interval	1 000 mh	1 000 mh / 6 months	1 000 mh	500 mh / 24 months
Primary drive	Product	G-Special TO-4 30 G-Special TO-4 50	G-Special TO-4 30 G-Special TO-4 50	G-Special TO-4 30	—
	Sump volume, L	—	23	65 (x2)	
	Service interval	2 000 mh / 12 months	2 000 mh / 12 months	2 000 mh	
Pivot shaft bearings / Track roller frame recoil spring	Product	G-Special TO-4 10W G-Special TO-4 30 G-Special TO-4 50		—	
	Sump volume, L	Depending on model, see instruction manual			
	Service interval				

Information above supplied for reference only. Check equipment instruction manual to establish lubrication system customized for specific equipment and conditions.

Bulldozers

			Caterpillar		Komatsu	Liebherr
			D9R / D9T	D10T	D375	PR 744
Transmission units	Track drives	Product	—			G-Box GL-5 75W-90 G-Truck GL-5 85W-140
		Sump volume, L				18
		Service interval				1 000 mh / 48 months
	Track rollers & idlers	Product	Depending on model: G-Special TO-4 30	—	G-Special TO-4 30	—
		Sump volume, L	Depending on model, see instruction manual		—	
		Service interval			—	
Pivot shaft bearings		Product	G-Special TO-4 10W G-Special TO-4 30 G-Special TO-4 50			
		Sump volume, L	Depending on model, see instruction manual			
		Service interval				
Coolant		Product	G-Energy Antifreeze HD, Gazpromneft ANTIFREEZE		G-Energy Antifreeze SNF	G-Energy Antifreeze NF, G-Energy Antifreeze Si-OAT
Greases		Load on one unit	up to 4000 N	Gazpromneft Grease Nord Moly. Application: Central lubrication of highly loaded units.		
			up to 3600 N	Gazpromneft Grease LTS Moly EP 2. Application: highly loaded units.		
			up to 3000 N	Gazpromneft Grease LX EP 2. Application: universal grease if solid additives are not required.		
			up to 2600 N	Gazpromneft Grease Synth LX EP 2. Application: universal grease if solid additives are not required (up to -50 °C).		

Information above supplied for reference only. Check equipment instruction manual to establish lubrication system customized for specific equipment and conditions.

Technical Support and Services

14.1. G-Energy Academy

ALEXANDER TRUHAN
General Director
of Gazpromneft-Lubricants Ltd.:

"Technological development of the tools for education and improvement of qualification is the latest trend that we managed to effectively implement in G-Energy Academy. Nowadays application of advanced technologies is mandatory for product development. As well as sales promotion and training of stuff".

G-Energy Academy is a strategic project developed by Gazpromneft - Lubricants Ltd. Main objective of this project is to increase expertise of our customer's stuff in realms of lubrication.

G-Energy Academy offers various platforms: face to face seminars, online conferences, webinars as well as studies in virtual reality. Virtual reality headset allows to employ digitalization technologies like dialogue simulation that particularly helps to avoid costly mistakes in the real life conditions.

Educational program includes virtual tour around the lube blending plant in Omsk city, dialogue simulations on vehicle service and other interactive courses.

Main action focus of G-Energy Academy

Various tools applied for the qualification boost of customer's personnel

Experts from G-Energy Academy offer expertise to solve lube application issues

14.2. Technical services

Gazpromneft - Lubricants Ltd. technical services is a system providing reliability of equipment. These services help customer to establish optimal lubrication schedules and procurement routines as well as optimize equipment maintenance according to condition based maintenance rules.

Aim of services is to reveal advantages of Gazpromneft - Lubricants Ltd. products in combination with knowledge of our engineers and tools available.

Practically technical services carried out by our experts contain set of unique mobile diagnostic appliances for instant real-time evaluation of lubricant and condition of equipment. IR-Spectrometer, XRF-Spectrometer and Mini-Viscometer can be operated right at a customer's production site.

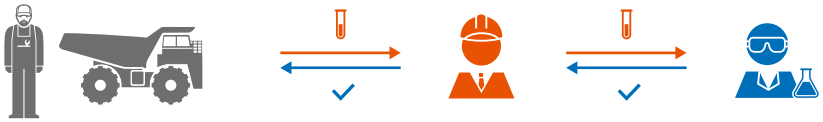
IR - Spectrometer

XRF - Spectrometer

Mini - viscometer

OTS — OIL TESTING SERVICE

Testing and evaluation of lubricants.



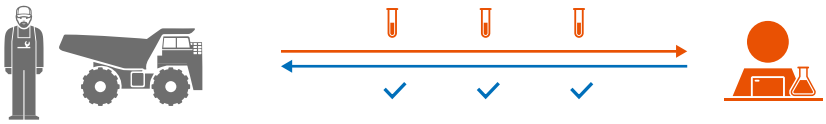
PURPOSE OF SERVICE
Intended for confirmation of lubricating properties of the products made by Gazpromneft - Lubricants Ltd. in real operating conditions of machinery. Changes of lubricant properties, additive package depletion and contaminations are measured.

COMPANY'S TECHNITIANS PERFORM
temporal monitoring of Gazpromneft - Lubricants Ltd. applications (1-3 oil drain intervals). 4-6 units out of whole fleet are chosen for testing lubricants operated in the systems. Research of samples is performed by an independent laboratory.

SERVICE MAKES POSSIBLE
easy product choice and oil drain interval optimization for specific customer and his unique operating conditions.

OTS-MONITORING

Performance monitoring of the products manufactured by Gazpromneft – Lubricants Ltd.



PURPOSE OF SERVICE
Additional means of controlling equipment condition. Express-analysis of used lubricant.

COMPANY'S TECHNITIANS PERFORM
long-term monitoring of Gazpromneft - Lubricants Ltd. product applications. Samples of used oil taken from selection of many units at each fluid draining. Sample research done by mobile laboratory. Research data and analysis results of each unit uploaded onto website and accessible by individual login.

SERVICE MAKES POSSIBLE
instant control of lubricants and equipment condition, drain interval corrections, recognition of hidden problems and elimination of failures on the early development stage.

OTS-SCREEN

Express-audit of lube applications at customers production site.

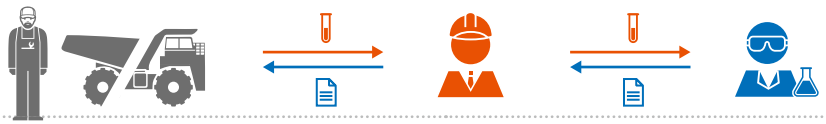
PURPOSE OF SERVICE
Evaluation of lubricant application effectiveness at customers production site by means of mobile diagnostic equipment.

COMPANY'S TECHNITIANS PERFORM
evaluation of storage conditions, distribution and application of lubricants, as well as evaluation of actual condition of equipment operated by specific lubricant. Samples of used oil are taken during a working day from units of different age. Analysis of the samples is done by mobile diagnostic tools during maintenance service at production site.

SERVICE MAKES POSSIBLE
evaluation of lubrication routines, actual equipment condition and adequacy of stated drain intervals to the conditions of operation.

OIL EXPERT SERVICE

Survey and analysis of operational conditions.



PURPOSE OF SERVICE
Resolving of controversial situations related to application of Gazpromneft - Lubricants Ltd. products.

COMPANY'S TECHNITIANS PERFORM
evaluation of operating lubricant and lubricant in original containers. Research of samples is done by independent laboratory. According to analysis report customer is introduced to conclusions in regard of problem causes and recommendations on necessary steps to solve them.

SERVICE MAKES POSSIBLE
identification of root cause of the problem and it`s coherence to condition of the lubricant.

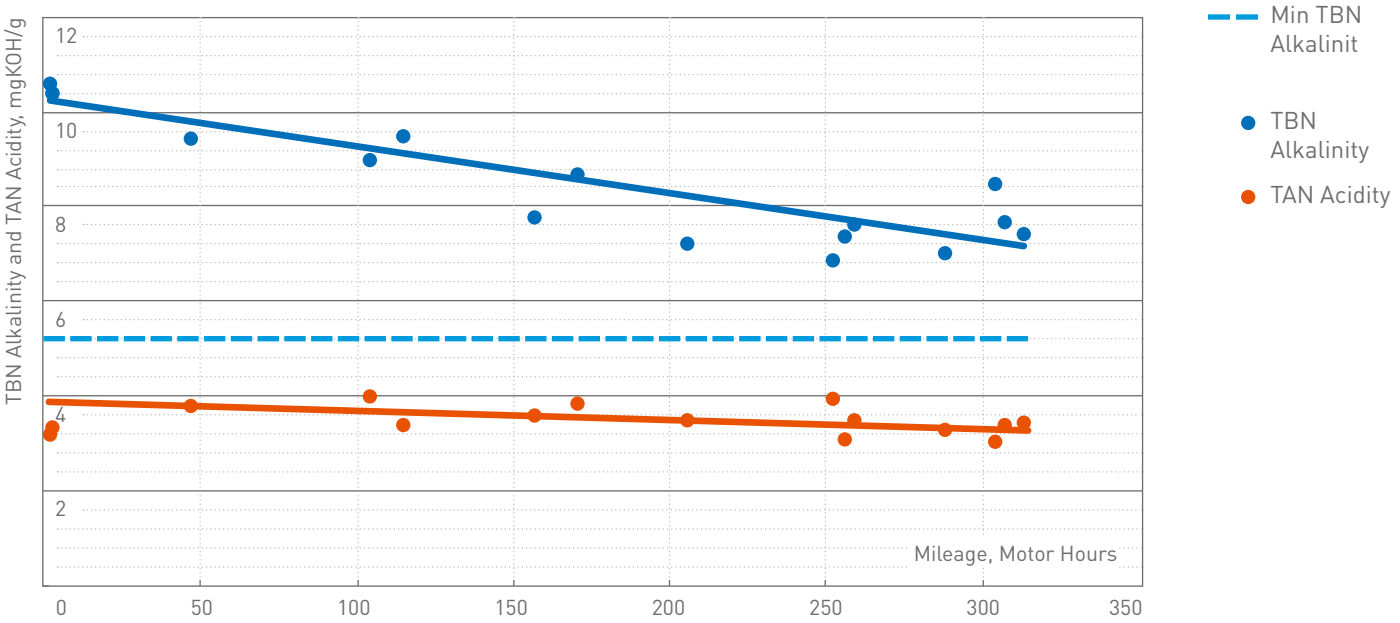
Product field trials

15.1. Product: G-Profi MSI Plus 15W-40

Dump truck OEM	Model	Load capacity, T	Engine	Confirmed drain interval
BELAZ	75473	45	KTA-19	more than 250 motor hours
	7555	55	KTTA-19C	more than 300 motor hours
	75581	90	QST-30	more than 500 motor hours
	75131	136	KTA-50	more than 500 motor hours
	75302	220	MTU DD16V4000	more than 500 motor hours
	75306	220	QSK-60	more than 300 motor hours
Komatsu	785-5	90	SA12V140E-3	more than 500 motor hours
	785-7	90	SAA12V140E-3	more than 500 motor hours
Caterpillar	785C	136	Caterpillar 3512	more than 500 motor hours
	777D	90	Caterpillar C8	more than 250 motor hours
Unit Rig	MT 3300	136	MTU DD12V4000	more than 500 motor hours

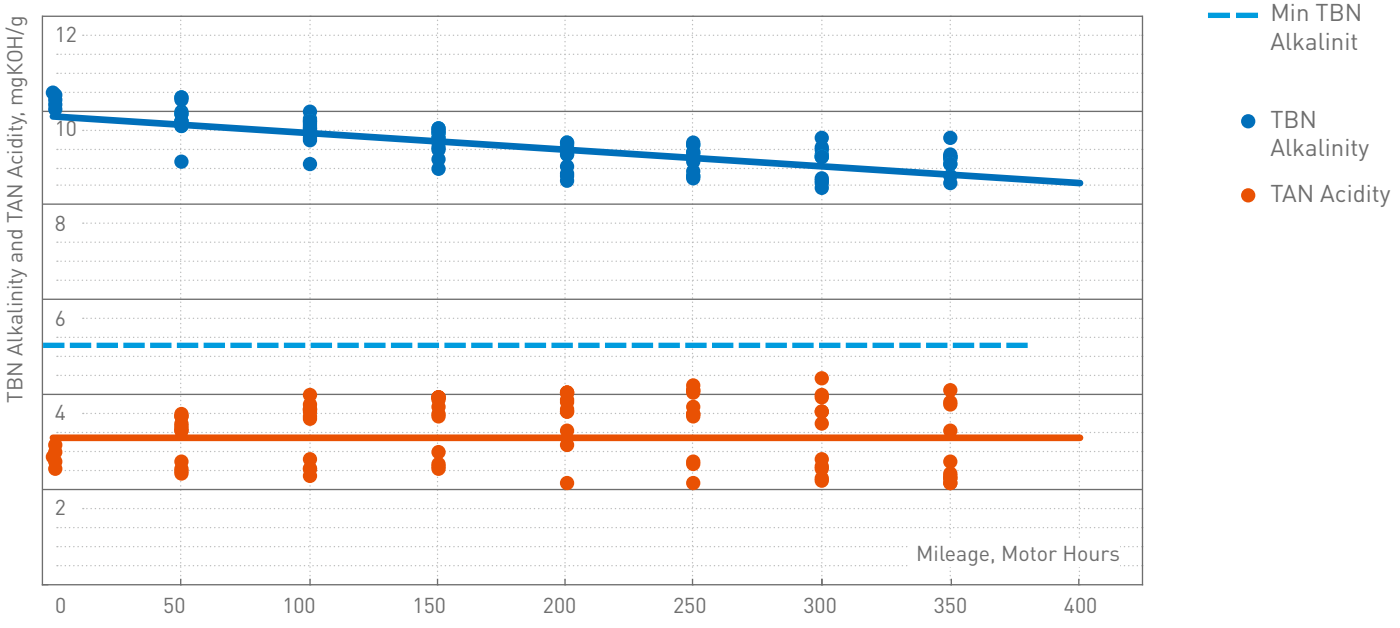
1. Dump truck BELAZ-75473, engine KTA-19

Dependence of base number (ASTM D4739) on mileage. G-Profi MSI Plus 15W-40.



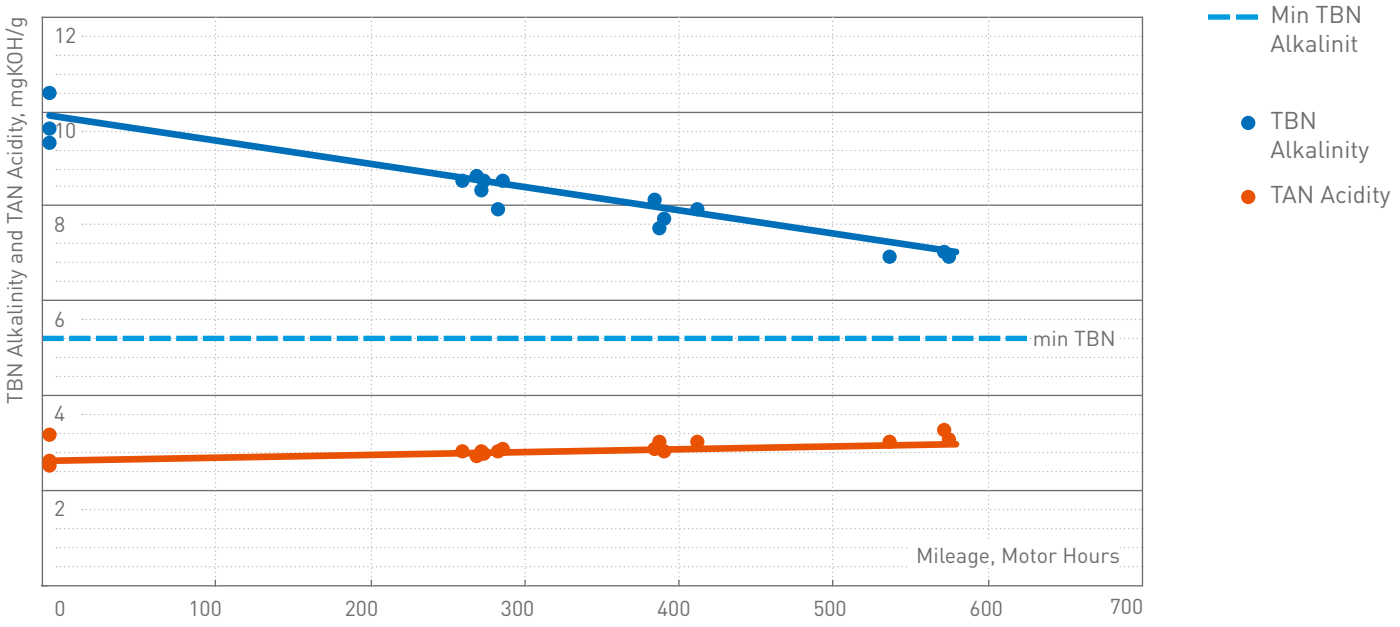
2. Dump truck BELAZ-7555, engine KTTA-19

Dependence of base number (ASTM D4739) on mileage. G-Profi MSI Plus 15W-40.



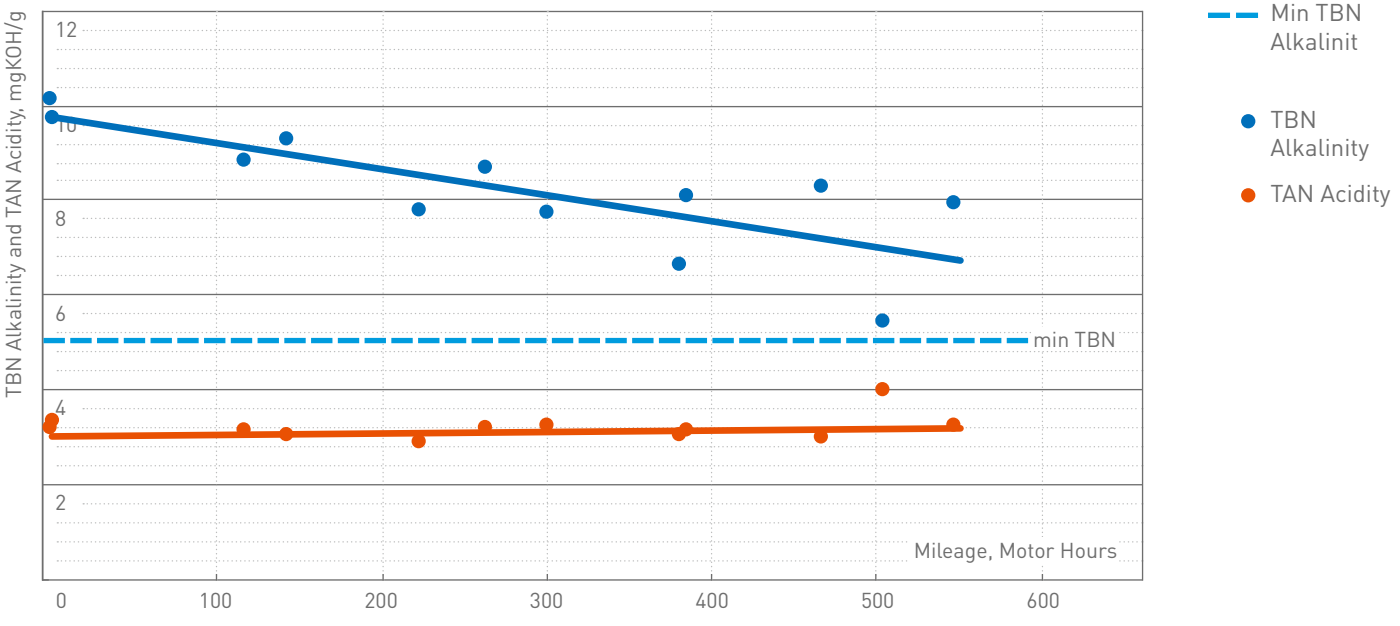
3. Dump truck BELAZ-75581, engine QST-30

Dependence of base number (ASTM D4739) on mileage. G-Profi MSI Plus 15W-40.



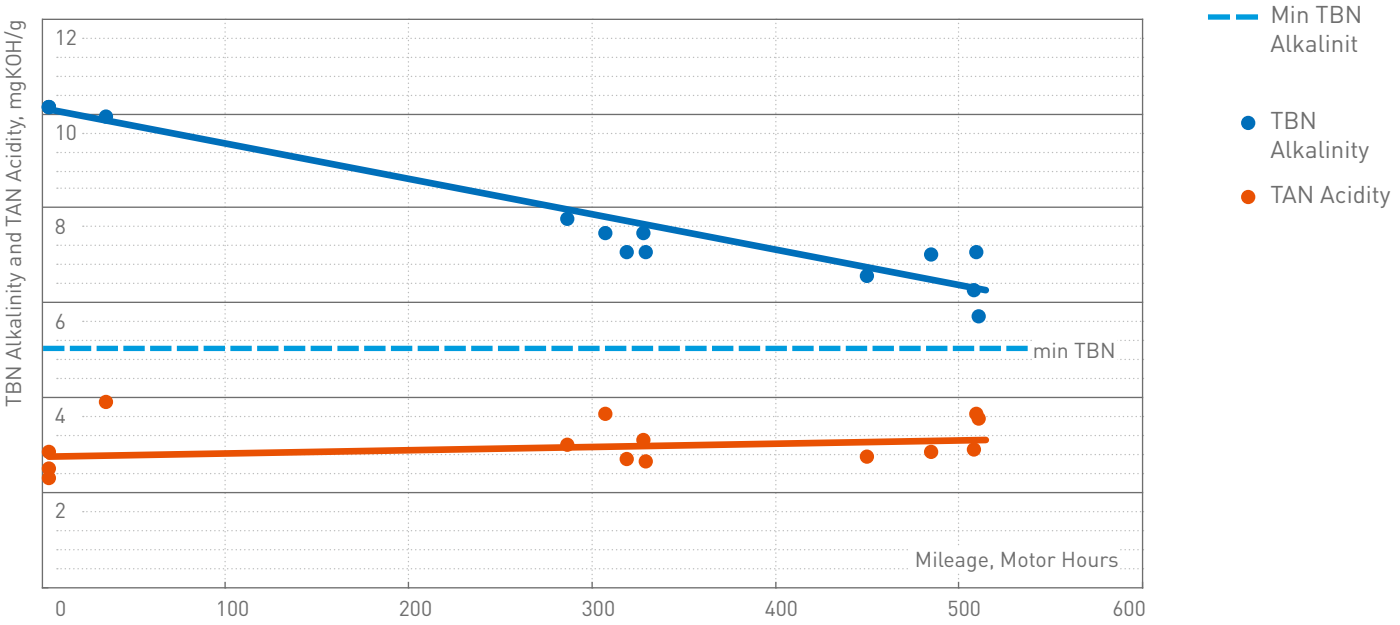
4. Dump truck Komatsu 785-5, engine SA12V140E-3

Dependence of base number (ASTM D4739) on mileage. G-Profi MSI Plus 15W-40.



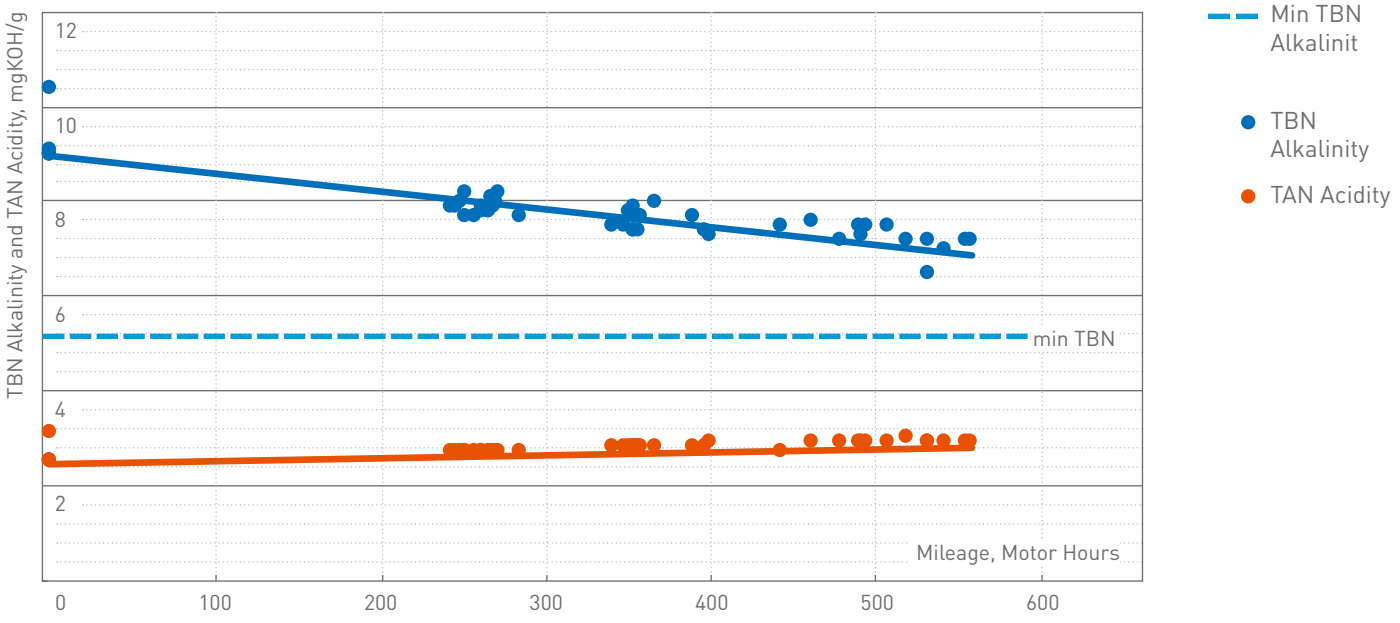
5. Dump truck Komatsu 785-7, engine SAA12V140E-3

Dependence of base number (ASTM D4739) on mileage. G-Profi MSI Plus 15W-40.



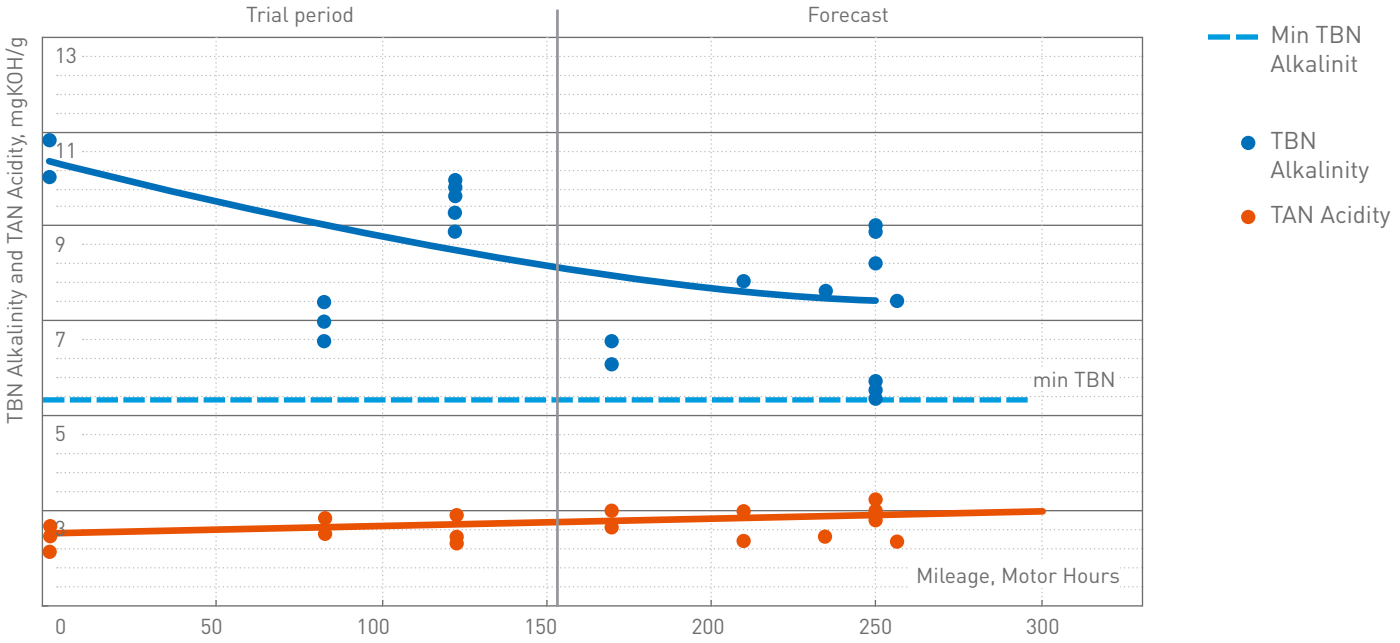
6. Dump tuck BELAZ-75131, engine KTA-50

Dependence of base number (ASTM D4739) on mileage. G-Profi MSI Plus 15W-40.



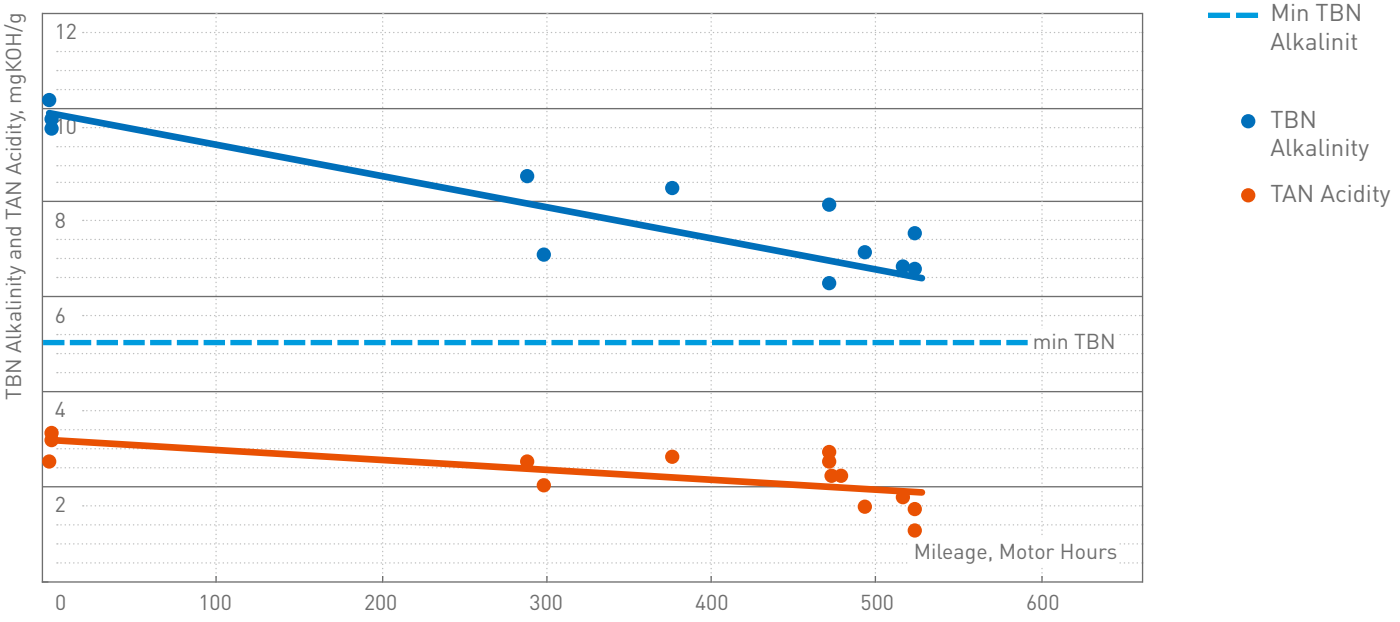
7. Dump truck Caterpillar 777D, engine Caterpillar C8

Dependence of base number (ASTM D4739) on mileage. G-Profi MSI Plus 15W-40.



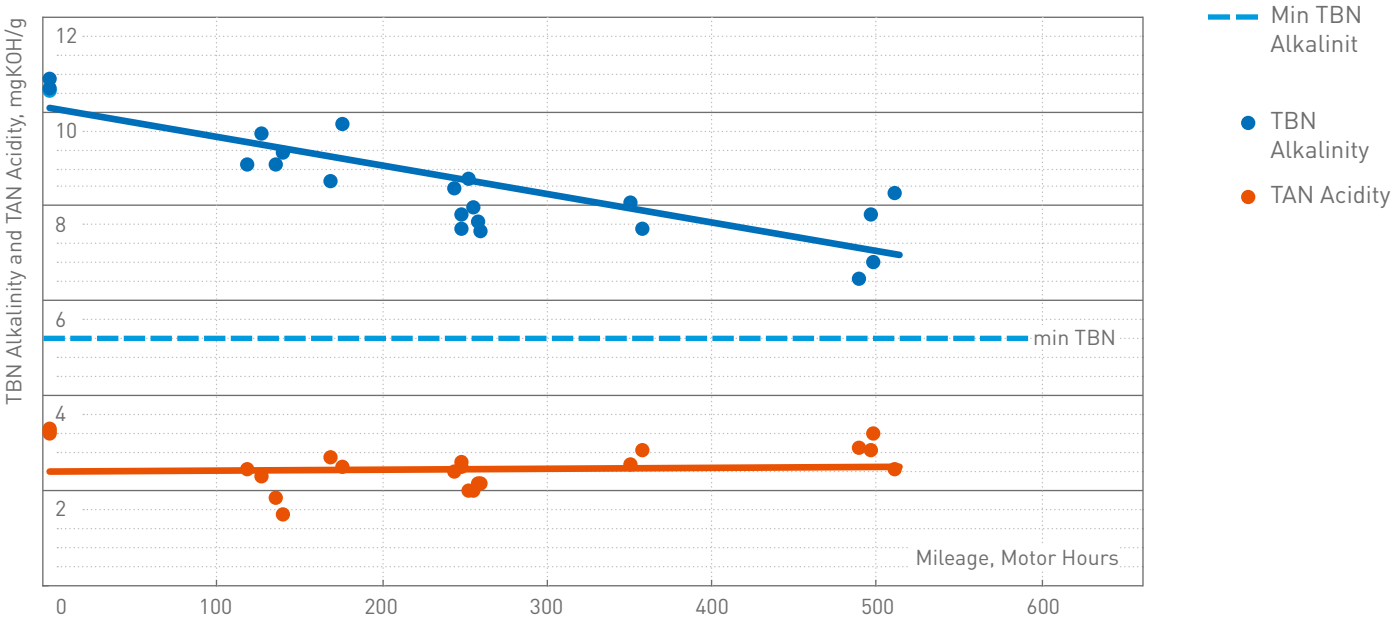
8. Dump truck Caterpillar 785C, engine Caterpillar 351a

Dependence of base number (ASTM D4739) on mileage. G-Profi MSI Plus 15W-40.



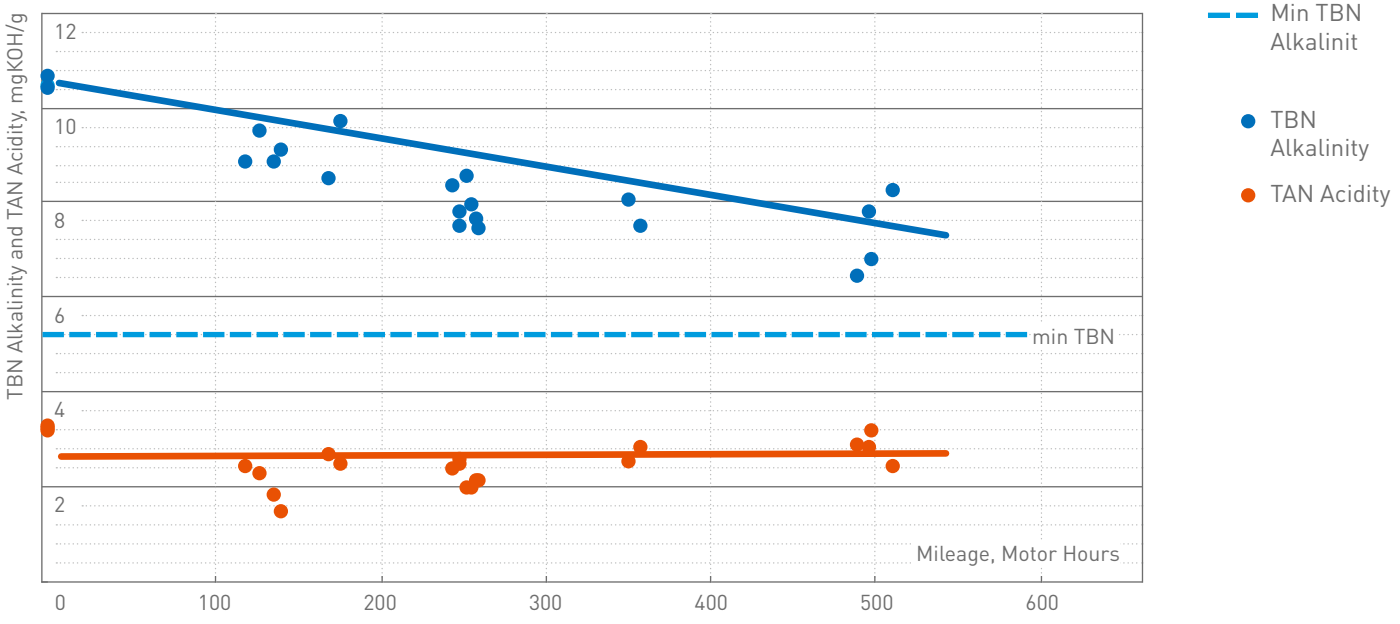
9. Dump truck Unit Rig MT 3300, engine MTU DD12V4000

Dependence of base number (ASTM D4739) on mileage. G-Profi MSI Plus 15W-40.



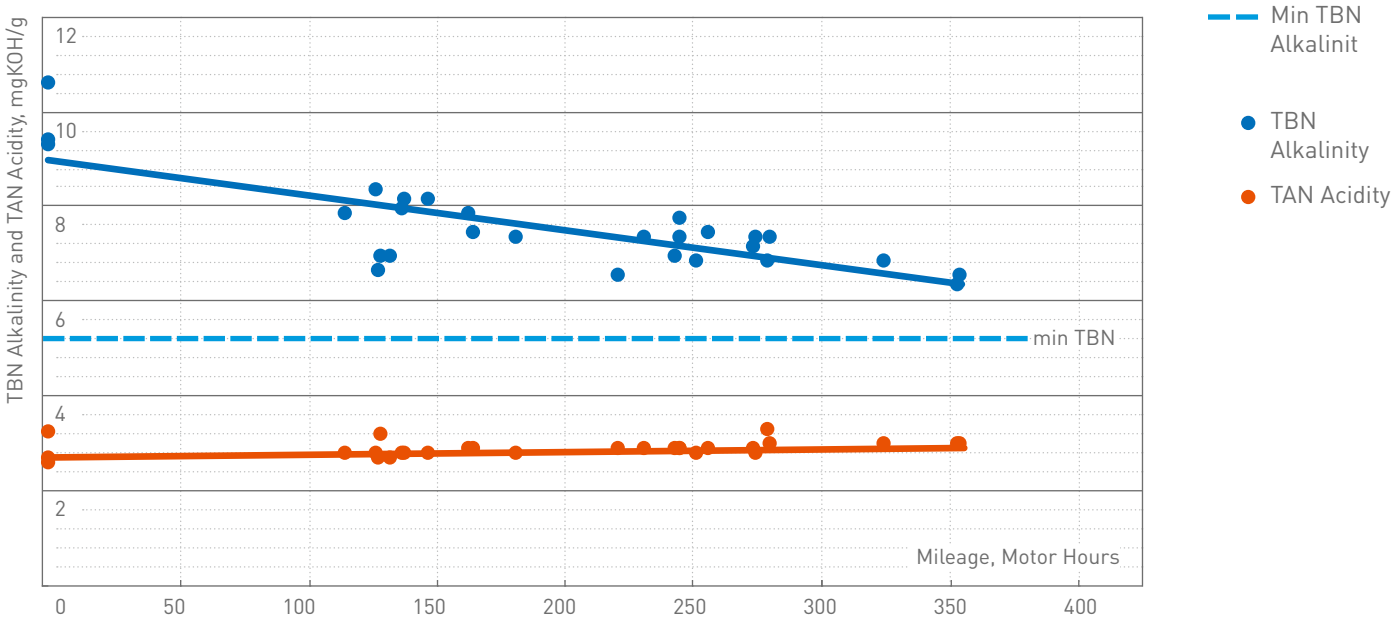
10. Dump truck BELAZ-75302, engine MTU DD16V4000

Dependence of base number (ASTM D4739) on mileage. G-Profi MSI Plus 15W-40.



11. Dump truck BELAZ-75306, engine QSK-60C

Dependence of base number (ASTM D4739) on mileage. G-Profi MSI Plus 15W-40



15.2. Product: Gazpromneft Hydraulic HVLP-46

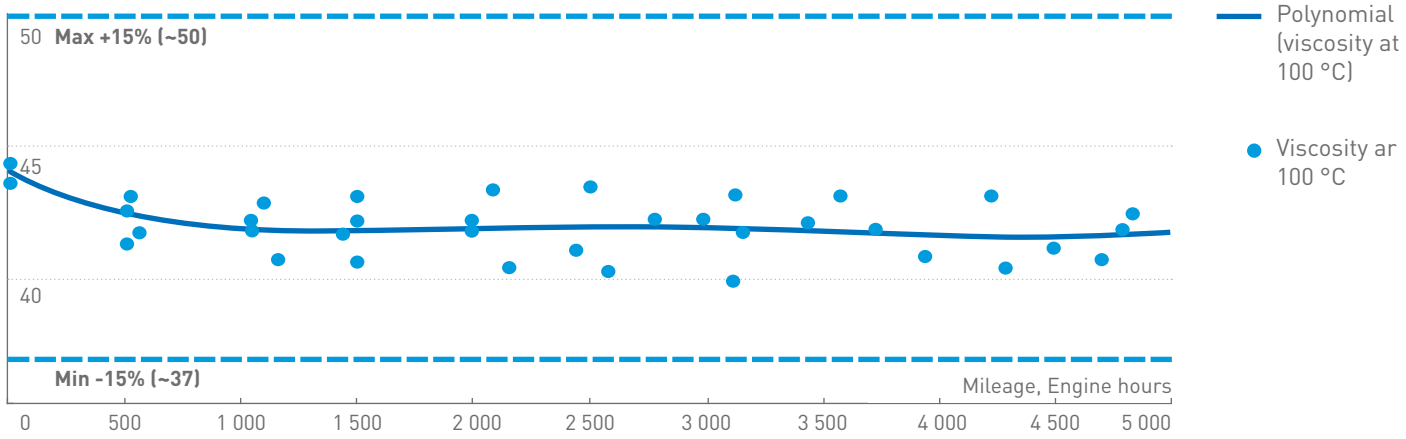
Gazpromneft Hydraulic HVLP-46 has been successfully used for lubrication of BELAZ-75306 engines. Used oil analysis data indicates absolute top performance of the oil during entire drain interval (4500 mh). Oil tested in the combined hydraulic systems, powered by Bosch Rexroth axial pumps, provided not just problem-free performance but maintained its properties well above limits set by equipment manufacturer.

Dump truck BELAZ-75306

Dump truck manufacturer	Model	Drain interval	Viscosity	Wear metals	
				Aluminum	Copper
BELAZ	75306	more than 4500 motor hours	in grade ISO VG 46	no more than 4,6 g/t	no more than 3,4 g/t

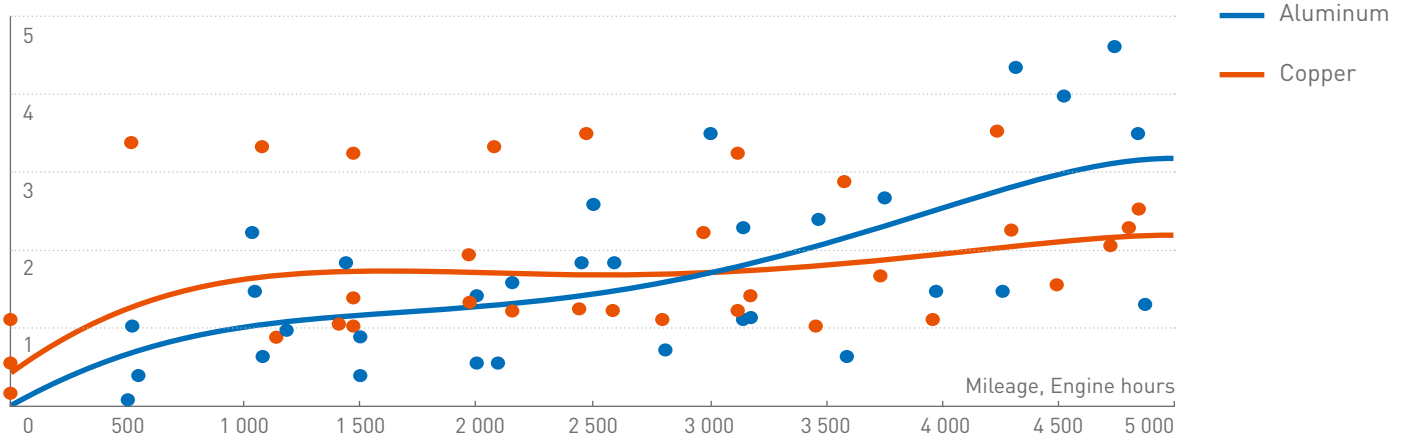
✅ Viscosity of the oil stays in grade during entire drain interval.

Kinematic viscosity at 100 °C (mm2/s)



✅ Wear metal concentration confirms excellent antiwear properties.

Aluminum and Copper content, g/t



16. Product properties and technical data

Gazpromneft engine oils

Properties	Method	Gazpromneft Diesel Ultra 5W-30	Gazpromneft Diesel Ultra 10W-40	Gazpromneft Diesel Premium 5W-40	Gazpromneft Diesel Premium 10W-30	Gazpromneft Diesel Premium 10W-40	Gazpromneft Diesel Premium 15W-40	Gazpromneft Diesel Prioritet 10W-30	Gazpromneft Diesel Prioritet 10W-40	Gazpromneft Diesel Prioritet 15W-40	Gazpromneft Diesel Prioritet 20W-50	Gazpromneft Diesel Extra 10W-40	Gazpromneft Diesel Extra 15W-40	Gazpromneft Diesel Extra 20W-50	Gazpromneft Diesel Extra 40	Gazpromneft Diesel Extra 50	Gazpromneft Turbo Universal 15W-40	Gazpromneft Turbo Universal 20W-50
Kin.Viscosity at 100 °C, mm²/s	ASTM D445	12,3	14,9	14,5	11,5	14,8	14,8	11,5	15,0	15,0	18,9	15,1	14,9	18,5	15,5	21,2	14,9	18,9
Viscosity Index	ASTM D2270	162	155	172	146	153	133	143	151	132	125	150	130	120	94	94	134	119
Flash Point Open Cup, °C	ASTM D92	232	233	230	227	230	228	224	221	227	233	230	234	240	257	262	230	240
Pour Point, °C	GOST 20287	-40	-35	-44	-39	-36	-34	-36	-35	-33	-27	-34	-32	-27	-16	-13	-31	-24
TBN Alkalinity mg KOH/g	GOST 11362	15,5	15,5	10	10	10	10	9	9	9	9	11	11	11	11	11	9	9

G-Profi engine oils

Properties	Method	G-Profi GTS 5W-30	G-Profi GTS 10W-40	G-Profi GT 10W-40	G-Profi GT LA 10W-40	G-Profi MSJ 5W-30	G-Profi MSJ 10W-30	G-Profi MSJ 15W-40
Kin.Viscosity at 40 °C, mm²/s	ASTM D445	72	91,4	105,3	92,8	69,7	79,6	110,5
Kin.Viscosity at 100 °C, mm²/s	ASTM D445	12,1	13,7	15,2	14,2	11,5	11,8	14,9
Dynamic Viscosity (CCS) at -30/-25/-20 °C, mPa*s	ASTM D5293	6 500 (-30 °C)	6 650 (-25 °C)	6 200 (-25 °C)	6 000 (-25 °C)	6 100 (-30 °C)	6 350 (-25 °C)	6 250 (-20 °C)
Viscosity Index	ASTM D2270	166	152	152	158	165	143	140
Flash Point Open Cup, °C	ASTM D92	231	233	235	230	226	230	235
Pour Point, °C	ASTM D97	-42	-37	-36	-37	-42	-39	-35
TBN Alkalinity mg KOH/g	ASTM D2896	15	16	12,3	9,7	9,7	8,5	8,5
TBN Alkalinity mg KOH/g	GOST 11362	—	—	—	—	—	—	—

Data stated above are typical average for the listed products but may vary insignificantly depending on product batch. Data valid through 2019.

Universal G-Special oils

Properties	Method	G-Special TO-4 10W	G-Special TO-4 30	G-Special TO-4 50	G-Special TO-4 Arctic 0W-20	G-Special UTTO 10W-30	G-Special UTTO Premium 10W-30	G-Special STOU 10W-30	G-Special STOU 10W-40
Kin.viscosity at 40 °C, mm²/s	ASTM D445	37,4	105,0	—	33,8	57,8	61,1	80,0	100,5
Kin.viscosity at 100 °C, mm²/s	ASTM D445	6,2	11,3	18,9	6,9	9,7	10,2	11,9	14,5
Viscosity index	ASTM D2270	111	92	—	170	152	155	143	150
Flash point open cup, °C	ASTM D92	226	244	252	208	228	259	228	228
Pour point, °C	ASTM D97	-36	-30	-20	-60	-37	-40	-37	-37
Dynamic viscosity brookfield at -55 °C, mPa*s	ASTM D2983	—	—	—	66 000 (-55 °C)	50 000 (-35 °C)	30 000 (-35 °C)	—	—

G-Profi MSI Plus 15W-40	G-Profi MSI 5W-40	G-Profi MSI 10W-40	G-Profi MSH 10W-40	G-Profi MSH 15W-40	G-Profi MSF 10W-40	G-Profi MSF 15W-40	G-Profi MSF 10W	G-Profi MSF 30	G-Profi MSF 40	G-Profi MSF 50	G-Profi CNG LA 10W-40	G-Profi CNG LA 15W-40	G-Profi CNG 15W-40
115,7	91,4	110,0	101,0	118,0	100,6	118,5	38,8	107,0	157,4	258,1	93,8	111,7	110,4
15,1	14,7	15,0	14,6	15,0	14,6	14,9	6,4	11,8	14,9	20,5	14,6	14,6	14,4
6 150 (-20 °C)	5 900 (-30 °C)	6 400 (-25 °C)	6 350 (-25 °C)	6 350 (-20 °C)	6 250 (-25 °C)	6 900 (-20 °C)	—	—	—	—	4 400 (-25 °C)	5 300 (-20 °C)	6 100 (-20 °C)
134	168	149	150	132	150	129	115	98	94	93	162	134	133
232	233	228	234	232	227	239	222	242	254	265	253	247	236
-32	-41	-38	-36	-33	-35	-33	-38	-22	-17	-15	-36	-35	-32
11,3	11	11	9,7	9,7	—	—	—	—	—	—	6,4	6,4	8,3
—	—	—	—	—	8,9	8,9	8,9	8,9	11,6	11,6	—	—	—

Data stated above are typical average for the listed products but may vary insignificantly depending on product batch. Data valid through 2019.

G-Special hydraulic oils

Properties	Method	G-Special Hydraulic Nord-32	G-Special Power HVLP-32	G-Special Power HVLP-46	G-Special Hydraulic HVLPD-46	G-Special Hydraulic HVLP-22	G-Special Hydraulic HVLP-32	G-Special Hydraulic HVLP-46
Kin.viscosity at 40 °C, mm²/s	ASTM D445	32	32	46	46	22	32	46
Kin. viscosity at -30/-20/-10 °C, mm²/s	ASTM D445	450 (-30 °C)	1 100 (-20 °C)	800 (-10 °C)	—	700 (-20 °C)	1 200 (-20 °C)	1 000 (-10 °C)
Viscosity index	ASTM D2270	308	182	178	155	160	175	143
Flash point open cup, °C	ASTM D92	139	228	246	220	196	218	232
Pour point, °C	ASTM D97	-56	-50	-48	-45	-52	-48	-42
General purity class	GOST 17216	12	11	11	12	12	12	12

G-Box and G-Truck transmission oils

Properties	Method	G-Box GL-4/GL-5 75W-90	G-Box GL-4 75W-90	G-Box GL-5 75W-90	G-Box Expert GL-4 75W-90	G-Box Expert GL-4 80W-85	G-Box Expert GL-5 75W-90	G-Box Expert GL-5 80W-90
Kin.viscosity at 100 °C, mm²/s	ASTM D445	15,0	15,8	15,2	15,8	13,1	15,4	14,9
Flash point Open Cup, °C	ASTM D92	176	202	198	206	226	206	216
Pour point, °C	ASTM D97	-49	-44	-42	-44	-28	-42	-29
Dynamic viscosity, brooksfield at -40/26/-12 °C, mPa*s	ASTM D2983	70 000 (-40 °C)	123 000 (-40 °C)	135 000 (-40 °C)	125 000 (-40 °C)	106 000 (-26 °C)	125 000 (-40 °C)	115 000 (-26 °C)
FZG A/8.3/90, load stage	DIN ISO 14635-1	>12	>12	>12	>12	>12	>12	>12

Data stated above are typical average for the listed products but may vary insignificantly depending on product batch. Data valid through 2019.

Gazpromneft transmission oils

Properties	Method	Gazpromneft GL-4/GL-5 75W-90	Gazpromneft GL-4 75W-90	Gazpromneft GL-4 80W-85	Gazpromneft GL-4 80W-90	Gazpromneft GL-4 90	Gazpromneft GL-4 140	Gazpromneft GL-5 75W-90	Gazpromneft GL-5 80W-90	Gazpromneft GL-5 85W-140	Gazpromneft GL-5 90	Gazpromneft GL-5 140	Gazpromneft Super T-3, SAE 85W-90	Gazpromneft ATF DX III	Gazpromneft ATF DX II
Kin.viscosity at 100 °C, mm²/s	ASTM D445	15,74	15,36	12,50	14,50	16,70	25,70	15,80	14,30	25,50	17,00	25,80	17,30	7,24	7,30
Flash point open cup, °C	ASTM D92	173	218	224	232	238	254	200	220	236	234	258	218	213	220
Pour point, °C	GOST 20287	-42	-42	-30	-30	-15	-15	-42	-32	-19	-17	-15	-25	-48	-44
Dynamic viscosity, brooksfield at -40/26/-12 °C, mPa*s	ASTM D2983	130 000 (-40 °C)	145 000 (-40 °C)	147 000 (-26 °C)	147 000 (-26 °C)	—	—	130 000 (-40 °C)	150 000 (-26 °C)	42 500 (-12 °C)	—	—	23 000 (-12 °C)	16 000 (-40 °C)	35 000 (-40 °C)
4-ball scar tribologic properties at 20 °C, index, N	GOST 9490	750	575	560	575	570	585	584	656	690	572	670	568	—	—
4-ball scar tribologic properties at 20 °C, load, N	GOST 9490	5 500	3 920	3 479	3 920	3 950	4 350	3 743	4 381	4 880	4 250	5 500	4 136	—	—

G-Truck GL-4/GL-5 80W-90	G-Truck GL-4 80W-90	G-Truck Z 75W-80	G-Truck GL-5 80W-90	G-Truck GL-5 85W-90	G-Truck GL-5 75W-140	G-Truck GL-5 85W-140	G-Truck LS 80W-90	G-Truck LS 85W-140	G-Truck LS 85W-90	G-Box ATF DX III	G-Box Expert ATF DX III	G-Box ATF DX II
14,6	15,0	9,0	14,4	16,4	27,4	25,4	14,5	24,6	15,8	7,2	7,3	7,7
215	218	240	208	210	220	212	220	208	216	205	208	218
-30	-27	-42	-30	-27	-45	-24	-27	-24	-25	-45	-52	-45
100 000 (-26 °C)	110 000 (-26 °C)	70 000 (-40 °C)	124 000 (-26 °C)	18 000 (-12 °C)	120 000 (-40 °C)	65 000 (-12 °C)	85 000 (-26 °C)	58 000 (-12 °C)	15 000 (-12 °C)	12 000 (-40 °C)	16 000 (-40 °C)	37 000 (-40 °C)
>12	>12	>12	>12	>12	>12	>12	>12	>12	>12	-	-	-

Data stated above are typical average for the listed products but may vary insignificantly depending on product batch. Data valid through 2019.

Compressor oils

Properties	Method	Gazpromneft Compressor F Synth-46	Gazpromneft Compressor F Synth-68	Gazpromneft Compressor S Synth-46	Gazpromneft Compressor S Synth-68	Gazpromneft Compressor S Synth-100	Gazpromneft Compressor S Synth-150	Gazpromneft Compressor Oil-46	Gazpromneft Compressor Oil-68	Gazpromneft Compressor Oil-100	Gazpromneft Compressor Oil-150	Gazpromneft Compressor Oil-220	Gazpromneft Compressor Oil-320	Gazpromneft Compressor Oil T-46
Kin.viscosity at 40 °C, mm²/s	ASTM D445	46	68	46	68	100	150	46	68	100	150	220	320	46
Viscosity index	ASTM D2270	130	146	105	104	103	102	97	93	93	93	91	91	102
Flash point Open Cup, °C	ASTM D92	230	246	241	252	253	258	235	246	251	257	263	264	228
Pour point, °C	GOST 20287	-39	-40	-32	-31	-31	-29	-32	-30	-28	-23	-20	-17	-15

Gazpromneft hydraulic oils

Properties	Method	Gazpromneft Hydraulic Nord-32	Gazpromneft Hydraulic HVLP-10	Gazpromneft Hydraulic HVLP-15	Gazpromneft Hydraulic HVLP-22	Gazpromneft Hydraulic HVLP-32
Kinematic viscosity at 40 °C, mm²/s	ASTM D445	32	10	15	22	32
Kinematic viscosity at temperatures below 0 °C, mm²/s	ASTM D445	2 450 (-40 °C)	1 100 (-40 °C)	600 (-30 °C)	700 (-20 °C)	1 200 (-20 °C)
Viscosity index	ASTM D2270	302	170	170	155	160
Flash point open cup, °C	ASTM D92	112	175	160	196	218
Pour point, °C	GOST 20287	-56	-60	-58	-50	-46
Max. purity class	GOST 17216	12	12	12	12	12

Data stated above are typical average for the listed products but may vary insignificantly depending on product batch. Data valid through 2019.

Gear oils

Properties	Method	Gazpromneft Reductor F Synth-150	Gazpromneft Reductor F Synth-220	Gazpromneft Reductor F Synth-320	Gazpromneft Reductor F Synth-460	Gazpromneft Reductor CLP-68	Gazpromneft Reductor CLP-100	Gazpromneft Reductor CLP-150	Gazpromneft Reductor CLP-220	Gazpromneft Reductor CLP-320	Gazpromneft Reductor CLP-460	Gazpromneft Reductor CLP-680	Gazpromneft Reductor WS-100	Gazpromneft Reductor WS-150	Gazpromneft Reductor WS-220
Kin.viscosity at 40 °C, mm²/s	ASTM D445	150	220	320	460	68	100	150	220	320	460	680	100	150	220
Viscosity index	ASTM D2270	159	163	166	168	94	92	92	92	92	90	90	101	98	97
Flash point open cup, °C	ASTM D92	228	235	238	240	238	240	242	252	254	276	292	238	244	256
Pour point, °C	GOST 20287	-38	-37	-35	-34	-20	-20	-19	-18	-17	-15	-15	-35	-30	-27
FZG A/8.3/90, load stage	DIN ISO 14635-1	>14	>14	>14	>14	—	—	—	—	—	—	—	—	—	—
Loadwear index, N	GOST 9490	—	—	—	—	454	464	470	480	509	530	550	—	—	—
Scar diameter, mm	GOST 9490	—	—	—	—	0,25	0,26	0,27	0,27	0,28	0,28	0,29	—	—	—

Gazpromneft Hydraulic HVLP-46	Gazpromneft Hydraulic HVLP-68	Gazpromneft Hydraulic HZF-32	Gazpromneft Hydraulic HZF-46	Gazpromneft Hydraulic HZF-68	Gazpromneft Hydraulic HLP-32	Gazpromneft Hydraulic HLP-46	Gazpromneft Hydraulic HLP-68	Gazpromneft Hydraulic HLP-100
46	68	32	46	68	32	46	68	100
1 100 (-10 °C)								
142	141	97	96	95	101	98	96	94
226	230	218	226	236	221	230	236	242
-40	-38	-32	-32	-32	-34	-32	-32	-30
12	12	10	10	10	10	10	10	10

Data stated above are typical average for the listed products but may vary insignificantly depending on product batch. Data valid through 2019.

Arguments to choose
Gazpromneft - Lubricants Ltd.

- OEM approvals, recommendations on application, strong references from main mining industry players
- Optimal drain intervals
- Complex range of products and services
- Technical expertise
- Optimized logistics, Extensive supply chain

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Notes

Abbreviations

SAE xxW-x

Classification of viscosity grades

API Sx/Cx; ACEA Ex; JASO DH-x

Classification of lubricants by applications, properties and quality

MB xxx, Cummins CES 200xx, Caterpillar ECF-x, MTU Cat. x, Deutz DQC xx and other

Specifications developed by OEMs. Usually sets higher required quality limits than API, ACEA, JASO.

EGR

Exhaust Gas Recirculation. Can be installed on diesel and gas engines. Intended to reduce toxicity of exhaust gases.

SCR

Selective Catalytic Reactor. Can be installed on diesel engines. Intended to reduce toxicity of exhaust gases.

DPF

Diesel Particle Filter. Can be installed on diesel engines. Intended to reduce toxicity of exhaust gases.

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