



4026.27

Gear Oil EP/E GL-5

SAE 85W/140

Lubricant for mechanical transmissions, not limited slip differentials and final drives.

PAKELO GEAR OIL EP/E GL-5 SAE 85W/140 is a mineral based lubricant specific for heavy loaded gears and in general all couplings working under very heavy working conditions where the following performances are required: API GL-5 and MIL-L-2105D.

The particular and updated performance additive package confers to PAKELO GEAR OIL EP/E GL-5 SAE 85W/140 high anti-oxidative, anti-rust, anti-wear, anti-foam properties and excellent EP (**E**xtr**E**m**E** Pressure) performances.

The EP additivation prevents wear phenomena due to scoring, ruffle, abrasion and stretching of gear cogs (also hypoid).



0242.22

Universal Diesel FK-2

SAE 20W/50

Multigrade lubricant for hydraulic systems and “Powershift” transmissions.

Zinc content higher than 900ppm.

PAKELO UNIVERSAL DIESEL FK-2 SAE 20W/50 is a multigrade lubricant formulated with the best solvent refined paraffinic base stocks and a special engine type additive package that provides excellent performance for hydraulic systems and Powershift transmissions.

The additivation confers to PAKELO UNIVERSAL DIESEL FK-2 SAE 20W/50 high detergent, dispersant, anti-oxidative, anti-wear, antifoam and anticorrosion properties.

PAKELO UNIVERSAL DIESEL FK-2 SAE 20W/50 provides:

- excellent thermal-oxidative stability;
- good protection against formation of lacquers, sludge and deposits;
- excellent detergency/dispersancy;
- anti-rust, anti-corrosion, anti-foam anti-oxidative properties;
- excellent performance in the hydraulic systems: on request the product can be filtered at 6 micron for a better contamination control of hydraulic and lubrication systems. The advantage of such filtration is represented by longer life and better functioning of pumps, valves and of all the hydraulic parts of the system.

0242.22

Universal Diesel FK-2

SAE 20W/50

Application fields

PAKELO UNIVERSAL DIESEL FK-2 SAE 20W/50 is recommended for the lubrication of hydraulic systems and Powershift transmissions.

The product is available in different SAE J300 Viscosity Grades.

Take always into consideration suitable Viscosity Grades with concern to ambient temperatures and Constructors' Recommendations

Performance levels

API CF / SJ.

Chemical-Physical Characteristics

Universal Diesel FK-2	Method analysis	Unit measure	Value SAE 20W/50
Density at 15°C	ASTM D1298	kg/l	0,887
Kinematic Viscosity at 40°C	ASTM D445	cSt	158,3
Kinematic Viscosity at 100°C	ASTM D445	cSt	18,2
Viscosity Index	ASTM D2270	-	128
C.C.S. Viscosity at -15°C	ASTM D5293	cP	6.900
T.B.N. (Total Base Number)	ASTM D2896	mg(KOH)/g	6,3
Sulphated Ash	ASTM D874	% (w/w)	0,8
Flash Point (C.O.C.)	ASTM D92	°C	220
Pour Point	ASTM D97	°C	-23

The data just above refer to average values and must not be understood as guaranteed characteristics.

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0242.22

Universal Diesel FK-2

SAE 20W/50

**Lubrificante multigrado per motori Diesel e benzina, anche sovralimentati, sistemi idraulici e trasmissioni tipo “Powershift”.
Contenuto di zinco maggiore di 900ppm.**

PAKELO UNIVERSAL DIESEL FK-2 SAE 20W/50 è un lubrificante multigrado formulato con basi minerali paraffiniche di prima raffinazione e con un particolare pacchetto di additivi che consente al prodotto di possedere elevate prestazioni motoristiche, per impianti idraulici e trasmissioni tipo “Powershift”.

L’additivazione presente conferisce a PAKELO UNIVERSAL DIESEL FK-2 SAE 20W/50 spiccate proprietà detergenti, disperdenti, elevate caratteristiche antiossidanti, antiusura, antischiuma ed anticorrosione.

PAKELO UNIVERSAL DIESEL FK-2 SAE 20W/50 possiede le seguenti principali caratteristiche:

- eccellente stabilità termico/ossidativa;
- elevata protezione contro la formazione di lacche, morchie, vernici e depositi;
- ottimo potere detergente/disperdente;
- elevate caratteristiche antiruggine, anticorrosive, antiossidanti, antischiuma;
- ottime prestazioni negli impianti idraulici. Il prodotto (a richiesta) può essere filtrato a 6 micron assoluti per un migliore controllo della contaminazione ed un prolungamento della vita di tutti i componenti del sistema in particolar modo di pompe e valvole.

0242.22

Universal Diesel FK-2

SAE 20W/50

Campi di applicazione

PAKELO UNIVERSAL DIESEL FK-2 SAE 20W/50 è raccomandato per la lubrificazione dei motori Diesel, benzina anche sovralimentati, dei sistemi idraulici e di trasmissioni tipo "Powershift".

PAKELO UNIVERSAL DIESEL FK-2 è disponibile in varie gradazioni viscosimetriche previste dalla SAE J300.

La scelta della viscosità corretta deve essere eseguita in riferimento alle temperature ambientali ed alle raccomandazioni dei Costruttori.

Livelli di prestazione

API CF / SJ.

Caratteristiche chimico-fisiche

Universal Diesel FK-2	Metodo di analisi	Unità di misura	Valore SAE 20W/50
Densità a 15°C	ASTM D1298	kg/l	0,887
Viscosità cinematica a 40°C	ASTM D445	cSt	158,3
Viscosità cinematica a 100°C	ASTM D445	cSt	18,2
Indice di Viscosità	ASTM D2270	-	128
Viscosità C.C.S. a -15°C	ASTM D5293	cP	6.900
T.B.N. (Total Base Number)	ASTM D2896	mg(KOH)/g	6,3
Ceneri solfatate	ASTM D874	% in peso	0,8
Punto di infiammabilità (C.O.C.)	ASTM D92	°C	220
Punto di scorrimento	ASTM D97	°C	-23

I dati di cui sopra si riferiscono a valori medi e non devono essere intesi come caratteristiche garantite.

Le informazioni riportate sono state sottoposte ad ogni cura per assicurare la migliore completezza. Non si accettano comunque responsabilità per danni causati da errori ed omissioni. In base a continue ricerche e sviluppi per il miglioramento del prodotto le informazioni riportate nella presente Scheda Tecnica possono variare anche senza preavviso



4001.17

Multisint Ultra

SAE 10W/40

Synthetic based lubricant for gasoline and Diesel engines, also turbocharged, of the latest generation.

PAKELO MULTISINT ULTRA SAE 10W/40 is a new generation lubricant formulated with high quality base stocks and exclusive additives that confer to the product high detergent, dispersant, anti-oxidative, anti-corrosion, anti-wear and antifoam properties.

PAKELO MULTISINT ULTRA SAE 10W/40, thanks to the use of a selected synthetic base stock, provides better characteristics when compared to a straight mineral lubricant.

Volatility, oxidation and the formation of carbon residues are reduced: this enables PAKELO MULTISINT ULTRA SAE 10W/40 to improve anti-oxidative properties and to avoid formation of deposits also with presence of high working temperatures.

The SAE Viscosity Grade 10W/40 guarantees the correct viscosity also in case of severe climatic conditions: this means easy and safe start-ups at very low temperatures (also at -25°C) and reduction of the hazard of wear to minimum during warming up phases.

The product improves protection of all modern engines guaranteeing longer life of post-treatment devices used in modern cars or vans.

PAKELO MULTISINT ULTRA SAE 10W/40 exceeds some of the main performance levels on the market (Mercedes Benz, Volkswagen, etc.).

It is possible to extend oil drain intervals, according to Constructors' recommendations.

Oil drain intervals are usually specified by OEMs and/or on-board electronic devices of latest generation vehicles; their recommendations should be taken into consideration to guarantee engine reliability.

PAKELO MULTISINT ULTRA SAE 10W/40 is perfectly compatible with all the lubricants that have the same application. However, we recommend to avoid mixing it with other products for not undermining its properties.

4001.17

Multisint Ultra

SAE 10W/40

Application fields

PAKELO MULTISINT ULTRA SAE 10W/40 has been developed for gasoline and Diesel engines, aspirated or supercharged (turbo), working also under heavy duty conditions as for instance "stop and go" service.

The product also satisfies the Specification ACEA A3/B4 and is thus particularly recommended for latest generation turbodiesel engines using "common rail" or "injection-pump" systems.

The use of special additives and a selected synthetic base stock enable the use also in earlier generation of car engines and vans.

Performance levels

ACEA A3/B4, API SL / CF, MB 229.1, VW 501.01, VW 505.00.

Chemical-Physical Characteristics

Multisint Ultra	Method analysis	Unit measure	Value SAE 10W/40
Density at 15°C	ASTM D1298	kg/l	0,870
Kinematic Viscosity at 40°C	ASTM D445	cSt	93,8
Kinematic Viscosity at 100°C	ASTM D445	cSt	13,9
Viscosity Index	ASTM D2270	-	151
C.C.S. Viscosity at -25°C	ASTM D5293	cP	6.400
HT-HS Viscosity at 150°C / 10 ⁶ s ⁻¹	ASTM D4683	cP	4,05
T.B.N. (Total Base Number)	ASTM D2896	mg(KOH)/g	10,1
Sulphated Ash	ASTM D874	% (w/w)	1,30
Flash Point (C.O.C.)	ASTM D92	°C	220
Pour Point	ASTM D97	°C	-28
Noack evaporability test	ASTM D5800	% (w/w)	11,9

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0401.21

Multisint MBK

SAE 15W/50

High performance semi-synthetic lubricant specific for latest generation 4 stroke motorbike engines.

PAKELO MULTISINT MBK SAE 15W/50 is a special **semi-synthetic** lubricant. It guarantees high performance, High Viscosity Index obtained with exclusive additives that provide high detergent, dispersant properties, anti-oxidative, anti-corrosion, anti-wear and anti-foam characteristics.

The product, thanks to the presence in the formulation of fine specially selected synthetic bases, shows superior properties compared to a lubricant formulated with mineral base stocks.

PAKELO MULTISINT MBK SAE 15W/50 provides high thermal and oxidative resistance; reduces evaporation losses (less volatility of the product) and formation of carbon residues when compared to mineral based product.

PAKELO MULTISINT MBK SAE 15W/50 is specifically formulated for keeping, also at high working temperatures - typical of motorbike application - the best lubrication film, the correct fluency between engine and transmission contacts.

Furthermore, it enables very easy start-ups and idling stability when the engine is still cold.

PAKELO MULTISINT MBK SAE 15W/50 thanks to its special additive package, keeps extremely clean engine parts and guarantees at the same time outstanding anti-wear protection of components such as camshaft and transmission parts working under extreme conditions.

The product is highly recommended also for motorbike engines with wet clutch lubrication. The special formulation of PAKELO MULTISINT MBK SAE 15W/50 guarantees the correct friction coefficient and thus prevents slippage during power transfer.

0401.21

Multisint MBK

SAE 15W/50

Application fields

PAKELO MULTISINT MBK SAE 15W/50 is specifically studied for four stroke motorbike engines also of the latest generation.

PAKELO MULTISINT MBK series is available in several Viscosity Grades envisaged by SAE J300 Specification.

The choice of suitable Viscosity Grade should be done taking into consideration working conditions and Constructor's recommendations.

Performance levels

API SL, JASO MA2.

Chemical-Physical Characteristics

Multisint MBK	Method analysis	Unit	Value SAE 15W/50
Density at 15°C	ASTM D1298	kg/l	0,868
Kinematic Viscosity at 40°C	ASTM D445	cSt	127,8
Kinematic Viscosity at 100°C	ASTM D445	cSt	18,9
Viscosity Index	ASTM D2270	-	167
C.C.S. Viscosity at -20°C	ASTM D5293	cP	5.000
T.B.N. (Total Base Number)	ASTM D2896	mg(KOH)/g	7,7
Sulphated Ash	ASTM D874	% (w/w)	0,90
Flash Point (C.O.C.)	ASTM D92	°C	> 220
Pour Point	ASTM D97	°C	-31

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4002.17

Multisint EVO

SAE 10W/40

Lubricant for gasoline and Diesel engines, also turbocharged, of the latest generation.

PAKELO MULTISINT EVO SAE 10W/40 is a new generation lubricant fully formulated with Group II mineral base stocks and exclusive additives that confer to the product high detergent, dispersant, anti-oxidative, anti-corrosion, anti-wear and antifoam properties.

The bases used reduce product volatility, oxidation and formation of carbon residues.

This enables PAKELO MULTISINT EVO SAE 10W/40 to provide extraordinary anti-oxidative properties and to avoid formation of deposits also under high working temperatures.

The low volatility of synthetic bases results into a very significant reduction of oil losses caused by evaporation.

The SAE Viscosity Grade 10W/40 guarantees the correct viscosity for the most severe climatic conditions: this means easy and safe start-ups at very low temperatures (also at -25°C) and reduction of wear risks to minimum.

Thanks to the special viscosity properties, the use PAKELO MULTISINT EVO SAE 10W/40 can result into a prompt reply of the engine, making functioning soft and uniform.

PAKELO MULTISINT EVO SAE 10W/40 also exceeds the new Specification for gasoline engines API SN that includes engine tests that show better properties in terms of Fuel Economy compared to earlier generation products.

The product improves protection of all modern engines guaranteeing longer life of post-treatment devices used in modern cars or vans.

PAKELO MULTISINT EVO SAE 10W/40 exceeds the main performance levels on the market (Mercedes Benz, Volkswagen, etc.). It is possible to extend oil drain intervals, according to Constructors' recommendations.

Oil drain intervals are usually specified by OEMs and/or on-board electronic devices of latest generation vehicles; their recommendations should be taken into consideration to guarantee engine reliability.

PAKELO MULTISINT EVO SAE 10W/40 is perfectly compatible with all the lubricants that have the same application.

However, we recommend to avoid mixing it with other products for not undermining its exceptional properties.

4002.17

Multisint EVO

SAE 10W/40

Application fields

PAKELO MULTISINT EVO SAE 10W/40 has been developed for gasoline and Diesel engines, aspirated or supercharged (turbo), working also under heavy duty conditions as for instance “stop and go” service.

The product also satisfies the Specification ACEA A3/B4 and is thus particularly recommended for latest generation turbodiesel engines using “common rail” or “injection-pump” systems.

The use of special additives and highly selected mineral base stocks enable the use also in earlier generation of car engines and vans.

Performance levels

ACEA A3/B4, API SN / SM, MB 229.3, VW 502.00, VW 505.00, Renault RN0700.

Chemical-Physical Characteristics

Multisint EVO	Method analysis	Unit measure	Value SAE 10W/40
Density at 15°C	ASTM D1298	kg/l	0,867
Kinematic Viscosity at 40°C	ASTM D445	cSt	94,4
Kinematic Viscosity at 100°C	ASTM D445	cSt	14,5
Viscosity Index	ASTM D2270	-	160
C.C.S. Viscosity at -25°C	ASTM D5293	cP	6.900
HT-HS Viscosity at 150°C / 10 ⁶ s ⁻¹	ASTM D4683	cP	4,15
T.B.N. (Total Base Number)	ASTM D2896	mg(KOH)/g	10,8
Sulphated Ash	ASTM D874	% (w/w)	1,20
Flash Point (C.O.C.)	ASTM D92	°C	210
Pour Point	ASTM D97	°C	-33
Noack evaporability test	ASTM D5800	% (w/w)	11,2

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0162.00

Multiservice 4

SAE 10W/30

Universal **synthetic based lubricant for HD (Heavy Duty) Diesel engines, hydraulic systems, hydrostatic transmissions and “Powershift” transmissions of earth moving machinery. Zinc content higher than 900ppm.**

PAKELO MULTISERVICE 4 SAE 10W/30 is a multigrade lubricant formulated with a blend of solvent refined paraffinic mineral base stocks and selected synthetic base stocks that confer to the finished product high thermal-oxidative resistance.

Thanks to its particular additive package and its synthetic base stocks, the product satisfies nearly all main world-wide specifications for Heavy Duty Diesel Engines (trucks, buses, earth moving machines, etc.): specifically the product also satisfies the severe requests of American Specification **API CI-4** and European Specification **ACEA E7**.

Furthermore PAKELO MULTISERVICE 4 SAE 10W/30 exceeds performance levels of the main American Constructors (Cummins, Caterpillar, etc.) and European ones (Mercedes-Benz, MAN, Renault, Volvo, etc.) and it enables consumers that possess wide range of vehicles to simplify the lubrication, save money, space, time and possible filling mistakes.

Its specific engine additive package guarantees high performance also for hydraulic systems, hydrostatic and Powershift transmissions of earth moving machinery.

PAKELO MULTISERVICE 4 SAE 10W/30 thus provides the following properties:

- **good low temperature properties** to enable easy start ups of the lubricated mechanical components;
- **high Viscosity Index** to guarantee a low power absorbance due to viscosity resistance during start-up at low temperatures and high viscosity at high temperatures to guarantee a suitable lubrication film: this characteristic is particularly appreciated in hydraulic systems in order to guarantee a correct functioning in every working and ambient condition;
- **excellent dispersant properties** that guarantee a great control of sludge and oil thickening also in case of high presence of soot and deposits. These phenomena are typical of modern engines that work at higher temperature due to the use of EGR system;
- **high detergent properties** that guarantee cleanness performance and long drain intervals;
- **high thermal-oxidative stability** at high working temperatures and **low volatility** also thanks to the presence of synthetic base stocks: in this way the evaporability of the product is further reduced (Noack's Test);
- **excellent wear control**;
- **anti-corrosive properties** to guarantee protection against combustion acid products and moisture caused by combustion and ambient;
- **good anti-foam properties** to reduce or to remove discontinuity of lubricant film caused by excessive formation of inner foam;
- **good compatibility** with gaskets.

0162.00

Multiservice 4

SAE 10W/30

Application fields

PAKELO MULTISERVICE 4 SAE 10W/30 is recommended for hydraulic systems, hydrostatic, Powershift and automatic transmissions of earth moving machinery.

The product, thanks to its engine performance levels, can also be used in heavy duty Diesel engines, naturally aspirated or turbocharged too.

It can be adopted to extend oil drain intervals, with respect of Constructors' recommendations and combined with a complete monitoring of oil in service through specific oil analyses.

Take always into consideration correct oil drain intervals to obtain maximum engine life.

Performance levels

ACEA E7, API CI-4 / CH-4 / CG-4/ CF-4 / CF, MB 228.3, MAN M3275, Volvo VDS-2, Renault Trucks RD-2 / RLD, Mack EO-M Plus, Caterpillar ECF-2 / ECF-1a, Cummins CES 20.078, Cummins CES 20.077 / CES 20.076, Allison C4.

Chemical-Physical Characteristics

Multiservice 4	Method analysis	Unit measure	Value SAE 10W/30
Density at 15°C	ASTM D1298	kg/l	0,880
Kinematic Viscosity at 40°C	ASTM D445	cSt	73,2
Kinematic Viscosity at 100°C	ASTM D445	cSt	11,2
Viscosity Index	ASTM D2270	-	144
C.C.S. Viscosity at -25°C	ASTM D5293	cP	6.700
HT-HS Viscosity at 150°C / 10 ⁶ s ⁻¹	ASTM D4683	cP	3,50
T.B.N. (Total Base Number)	ASTM D2896	mg(KOH)/g	11,3
Sulphated Ash	ASTM D874	% (w/w)	1,45
Flash Point (C.O.C.)	ASTM D92	°C	220
Pour Point	ASTM D97	°C	-34
Noack evaporability test	ASTM D5800	% (w/w)	12,2

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4011.17

Multi-Engine

SAE 10W/40

Synthetic based lubricant for latest generation gasoline engines, also turbocharged.

PAKELO MULTI-ENGINE SAE 10W/40 is a new generation lubricant formulated with high quality base stocks and exclusive additives that confer to the product high detergent, dispersant, anti-oxidative, anti-corrosion, anti-wear and antifoam properties.

The use of selected synthetic base stocks for PAKELO MULTI-ENGINE SAE 10W/40 provides better characteristics when compared to standard mineral based lubricant.

This enables to reduce evaporability, oxidation and formation of carbon residues also at high working temperatures.

The SAE Viscosity Grade 10W/40 of PAKELO MULTI-ENGINE guarantees the correct viscosity also in case of severe climatic conditions that means easy and safe start-ups at very low temperatures (also at -25°C) and minimum wear during warming up phases.

The product improves protection of all modern engines by guaranteeing longer life of post-treatment devices used in modern cars.

PAKELO MULTI-ENGINE SAE 10W/40 is compatible with all the lubricants designed for the same application. However, we recommend to avoid mixing it with other products for not undermining its properties.

4011.17

Multi-Engine

SAE 10W/40

Application fields

PAKELO MULTI-ENGINE SAE 10W/40 has been developed for gasoline engines, aspirated or supercharged (turbo), working also under heavy duty conditions as for instance "stop and go" service.

Special additives and selected synthetic base stocks enable to recommend the use of this product also for earlier generation car engines.

Performance levels

API SL.

Chemical-Physical Characteristics

Multi-Engine	Method analysis	Unit measure	Value SAE 10W/40
Density at 15°C	ASTM D1298	kg/l	0,870
Kinematic Viscosity at 40°C	ASTM D445	cSt	96,6
Kinematic Viscosity at 100°C	ASTM D445	cSt	14,0
Viscosity Index	ASTM D2270	-	148
C.C.S. Viscosity at -25°C	ASTM D5293	cP	6.800
HT-HS Viscosity at 150°C / 10 ⁶ s ⁻¹	ASTM D4683	cP	4,1
T.B.N. (Total Base Number)	ASTM D2896	mg(KOH)/g	10,1
Sulphated Ash	ASTM D874	% (w/w)	1,30
Flash Point (C.O.C.)	ASTM D92	°C	215
Pour Point	ASTM D97	°C	-27
Noack evaporability test	ASTM D5800	% (w/w)	12,3

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0151.22

Multi V2

SAE 20W/50

Multigrade lubricant for gasoline and Diesel engines of cars and vans.

PAKELO MULTI V2 SAE 20W/50 is a multigrade lubricant formulated with selected high quality base stocks and exclusive additives that confer to the product high detergent, dispersant, anti-oxidative, anti-corrosion, anti-wear and antifoam properties.

PAKELO MULTI V2 SAE 20W/50 provides high anti-oxidative properties and avoids formation of deposits also with presence of high working temperatures.

The SAE Viscosity Grade SAE 20W/50 allows easy and safe start-ups at low temperatures (-15°C) and reduction of the hazard of wear to minimum.

The product improves protection of all modern engines guaranteeing longer life of post-treatment devices used in modern cars or vans.

PAKELO MULTI V2 SAE 20W/50 exceeds some of the main performance levels present in the market (Mercedes Benz, Volkswagen, etc.) and can be used to extend oil drain intervals, according to Constructors' Recommendations.

0151.22

Multi V2

SAE 20W/50

Application fields

PAKELO MULTI V2 SAE 20W/50 has been developed for gasoline and Diesel engines, aspirated or supercharged (turbo), of cars and vans also of previous generation.

Performance levels

ACEA A3/B3, API SL / CF, MB 229.1, VW 505.00.

Chemical-Physical Characteristics

Multi V2	Method analysis	Unit measure	Value SAE 20W/50
Density at 15°C	ASTM D1298	kg/l	0,890
Kinematic Viscosity at 40°C	ASTM D445	cSt	187,5
Kinematic Viscosity at 100°C	ASTM D445	cSt	19,87
Viscosity Index	ASTM D2270	-	122
C.C.S. Viscosity at -15°C	ASTM D5293	cP	8.500
HT-HS Viscosity at 150°C / 10 ⁶ s ⁻¹	ASTM D4683	cP	5,50
T.B.N. (Total Base Number)	ASTM D2896	mg(KOH)/g	8,8
Sulphated Ash	ASTM D874	% (w/w)	1,20
Flash Point (C.O.C.)	ASTM D92	°C	228
Pour Point	ASTM D97	°C	-26

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0151.18

Multi V2

SAE 15W/40

Multigrade lubricant for gasoline and Diesel engines of cars and vans.

PAKELO MULTI V2 SAE 15W/40 is a multigrade lubricant formulated with selected high quality base stocks and exclusive additives that confer to the product high detergent, dispersant, anti-oxidative, anti-corrosion, anti-wear and antifoam properties.

PAKELO MULTI V2 SAE 15W/40 provides high anti-oxidative properties and avoids formation of deposits also with presence of high working temperatures.

The SAE Viscosity Grade 15W/40 allows easy and safe start-ups at low temperatures (-20°C) and reduction of the hazard of wear to minimum .

The product improves protection of all modern engines guaranteeing longer life of post-treatment devices used in modern cars or vans.

PAKELO MULTI V2 SAE 15W/40 exceeds some of the main performance levels present in the market (Mercedes Benz, Volkswagen, etc.) and can be used to extend oil drain intervals, according to Constructors' Recommendations.

0151.18

Multi V2

SAE 15W/40

Application fields

PAKELO MULTI V2 SAE 15W/40 has been developed for gasoline and Diesel engines, aspirated or supercharged (turbo), of cars and vans also of previous generation.

Performance level

ACEA A3/B3, API SL / CF, MB 229.1, VW 505.00.

Chemical-Physical Characteristics

Multi V2	Method analysis	Unit	Value SAE 15W/40
Density at 15°C	ASTM D1298	kg/l	0,885
Kinematic Viscosity at 40°C	ASTM D445	cSt	112,6
Kinematic Viscosity at 100°C	ASTM D445	cSt	14,9
Viscosity Index	ASTM D2270	-	137
C.C.S. Viscosity at -20°C	ASTM D5293	cP	5.800
HT-HS Viscosity at 150°C / 10 ⁶ s ⁻¹	ASTM D4683	cP	4,20
T.B.N. (Total Base Number)	ASTM D2896	mg(KOH)/g	8,8
Sulphated Ash	ASTM D874	% (w/w)	1,20
Flash Point (C.O.C.)	ASTM D92	°C	220
Pour Point	ASTM D97	°C	-27

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0268.00

Small 2TS P

Fully synthetic lubricant for all 2 stroke engines also heavy duty. Bivalent product suitable also for separate lubricators in modern scooters.

Recommended also for Power Tool engines such as chainsaw and leaf blowers engines.

PAKELO SMALL 2TS P represents one of the most updated and reliable formulations for two stroke engines.

This is a **fully synthetic** product with exceptional anti-oxidative properties and able to reduce to the minimum the formation of carbon residues.

The product shows a natural low Pour Point and a High Viscosity Index: it can withstand high temperatures and high rpms typical of two stroke engines (also racing and Power Tool engines).

The product shows excellent detergent properties and guarantees extreme cleanness.

At the same time it provides efficient lubrication that protects the various mechanical parts of the engine.

PAKELO SMALL 2TS P is formulated with special Low Ash additives (with low ash content) that enable to have efficient detergency and dispersancy. This limits to a maximum or removes any residues in the most critical parts of the engine.

In particular the detergency property turns out to be fundamental for a correct cleanness of the combustion chamber where combustion residues form in particular next to exhaust ports and sparking plugs.

0268.00

Small 2TS P

Application fields

PAKELO SMALL 2TS P is a lubricant to be used for preparing the blend for all two stroke engines with an air cooling system: motorcycles, scooters, competition engines (motocross, trial, enduro, etc.) even working under heavy duty conditions.

Thanks to its high performance and low Pour Point it can also be used in lubrication of 2 stroke snowmobile engines.

PAKELO SMALL 2TS P is suitable for engines equipped with separated lubricators generally present in modern scooters.

Furthermore its special formulation guarantees a perfect functioning even in all 2 stroke Power Tool engines (i.e. chainsaws, brush cutters, leaf blowers engines, etc.).

The product guarantees a perfect functioning also if, by accident, a percentage of lubricant lower than average is added.

However, we strongly recommend to **observe the oil/fuel mix percentage requested by the engine Constructor.**

Performance levels

JASO FD, ISO-L-EGD, API TC capable.

Chemical-Physical Characteristics

Small 2TS P	Method analysis	Unit measure	Value
Density at 15°C	ASTM D1298	kg/l	0,863
Kinematic Viscosity at 40°C	ASTM D445	cSt	51,2
Kinematic Viscosity at 100°C	ASTM D445	cSt	9,0
Viscosity Index	ASTM D2270	-	157
Sulphated Ash	ASTM D874	% (w/w)	0,10
Flash Point (C.O.C.)	ASTM D92	°C	100
Pour Point	ASTM D97	°C	-35

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0268.00

Small 2TS P

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0268.00

Small 2TS P

Application fields

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Thanks to its high performance and low Pour Point it can also be used in lubrication of 2 stroke snowmobile engines.

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Furthermore its special formulation guarantees a perfect functioning even in all 2 stroke Power Tool engines (i.e. chainsaws, brush cutters, leaf blowers engines, etc.).

The product guarantees a perfect functioning also if, by accident, a percentage of lubricant lower than average is added.

However, we strongly recommend to **observe the oil/fuel mix percentage requested by the engine Constructor.**

Performance levels

JASO FD, ISO-L-EGD, API TC capable.

Chemical-Physical Characteristics

Small 2TS P	Method analysis	Unit measure	Value
Density at 15°C	ASTM D1298	kg/l	0,863
Kinematic Viscosity at 40°C	ASTM D445	cSt	51,2
Kinematic Viscosity at 100°C	ASTM D445	cSt	9,0
Viscosity Index	ASTM D2270	-	157
Sulphated Ash	ASTM D874	% (w/w)	0,10
Flash Point (C.O.C.)	ASTM D92	°C	100
Pour Point	ASTM D97	°C	-35

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4441.84

Krypton XT

SAE 5W/40

Synthetic lubricant for gasoline and Diesel engines, also turbocharged, of the latest generation.

PAKELO KRYPTON XT SAE 5W/40 is a new generation **synthetic** lubricant formulated with selected high quality base stocks and exclusive additives that confer to the product high detergent, dispersant, anti-oxidative, anti-corrosion, anti-wear and antifoam properties.

The synthetic bases used reduce product volatility, oxidation and formation of carbon residues.

This enables PAKELO KRYPTON XT SAE 5W/40 to provide extraordinary anti-oxidative properties and to avoid formation of deposits also under high working temperatures.

The low volatility of synthetic bases results into a very significant reduction of oil losses caused by evaporation.

The SAE Viscosity Grade 5W/40 guarantees the correct viscosity for the most severe climatic conditions: this means easy and safe start-ups at very low temperatures (also at -30°C) and reduction of wear risks to minimum.

Thanks to the special viscosity properties, the use PAKELO KRYPTON XT SAE 5W/40 can result into fuel savings and a prompt reply of the engine, making functioning soft and uniform.

PAKELO KRYPTON XT SAE 5W/40 also exceeds the new Specification for gasoline engines API SM that includes engine tests that show better properties in terms of Fuel Economy compared to earlier generation products.

The product improves protection of all modern engines guaranteeing longer life of post-treatment devices used in modern cars or vans.

PAKELO KRYPTON XT SAE 5W/40 exceeds the main performance levels on the market (Mercedes Benz, BMW, Volkswagen, General Motors, etc.). It is possible to extend oil drain intervals, according to Constructors' recommendations.

Oil drain intervals are usually specified by OEMs and/or on-board electronic devices of latest generation vehicles; their recommendations should be taken into consideration to guarantee engine reliability.

PAKELO KRYPTON XT SAE 5W/40 is perfectly compatible with all the lubricants that have the same application.

However, we recommend to avoid mixing it with other products for not undermining its exceptional properties.

4441.84

Krypton XT

SAE 5W/40

Application fields

PAKELO KRYPTON XT SAE 5W/40 has been developed for gasoline and Diesel engines, aspirated or supercharged (turbo), working also under heavy duty conditions as for instance “stop and go” service.

The product also satisfies the Specification ACEA A3/B4 and is thus particularly recommended for latest generation turbodiesel engines using “common rail” or “injection-pump” systems.

The use of special additives and highly selected synthetic base stocks enable the use also in earlier generation of car engines and vans.

Performance levels

ACEA A3/B4, API SN / SM, MB 229.5 / 226.5, VW 502.00, VW 505.00, BMW LL-01, GM LL B-025, PSA B712296, Renault RN0700 / RN0710, Porsche A40.

Chemical-Physical Characteristics

Krypton XT	Method analysis	Unit measure	Value SAE 5W/40
Density at 15°C	ASTM D1298	kg/l	0,860
Kinematic Viscosity at 40°C	ASTM D445	cSt	80,2
Kinematic Viscosity at 100°C	ASTM D445	cSt	13,5
Viscosity Index	ASTM D2270	-	172
C.C.S. Viscosity at -30°C	ASTM D5293	cP	5.800
HT-HS Viscosity at 150°C / 10 ⁶ s ⁻¹	ASTM D4683	cP	3,85
T.B.N. (Total Base Number)	ASTM D2896	mg(KOH)/g	11,4
Sulphated Ash	ASTM D874	% (w/w)	1,25
Flash Point (C.O.C.)	ASTM D92	°C	225
Pour Point	ASTM D97	°C	-39
Noack evaporability test	ASTM D5800	% (w/w)	10,4

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4441.83

Krypton XT

SAE 5W/30

Synthetic lubricant for gasoline and Diesel engines, also turbocharged, of the latest generation.

PAKELO KRYPTON XT SAE 5W/30 is a new generation **synthetic** lubricant formulated with selected high quality base stocks and exclusive additives that confer to the product high detergent, dispersant, anti-oxidative, anti-corrosion, anti-wear and antifoam properties.

The synthetic bases used reduce product volatility, oxidation and formation of carbon residues.

This enables PAKELO KRYPTON XT SAE 5W/30 to provide extraordinary anti-oxidative properties and to avoid formation of deposits also under high working temperatures.

The low volatility of synthetic bases results into a very significant reduction of oil losses caused by evaporation.

The SAE Viscosity Grade 5W/30 guarantees the correct viscosity for the most severe climatic conditions: this means easy and safe start-ups at very low temperatures (also at -30°C) and reduction of wear risks to minimum.

Thanks to the special viscosity properties, the use PAKELO KRYPTON XT SAE 5W/30 can result into fuel savings and a prompt reply of the engine, making functioning soft and uniform.

The product improves protection of all modern engines guaranteeing longer life of post-treatment devices used in modern cars or vans.

PAKELO KRYPTON XT SAE 5W/30 exceeds the main performance levels on the market (Mercedes Benz, BMW, Volkswagen, General Motors, etc.).

It is possible to extend oil drain intervals, according to Constructors' recommendations.

Oil drain intervals are usually specified by OEMs and/or on-board electronic devices of latest generation vehicles; their recommendations should be taken into consideration to guarantee engine reliability.

PAKELO KRYPTON XT SAE 5W/30 is perfectly compatible with all the lubricants that have the same application. However, we recommend to avoid mixing it with other products for not undermining its exceptional properties.

4441.83

Krypton XT

SAE 5W/30

Application fields

PAKELO KRYPTON XT SAE 5W/30 has been developed for gasoline and Diesel engines, aspirated or supercharged (turbo), working also under heavy duty conditions as for instance “stop and go” service.

The product also satisfies the Specification ACEA A3/B4 and is thus particularly recommended for latest generation turbodiesel engines using “common rail” or “injection-pump” systems.

The use of special additives and highly selected synthetic base stocks enable the use also in earlier generation of car engines and vans.

Performance level

ACEA A3/B4, API SL, MB 229.5, VW 502.00, VW 505.00, BMW LL-01, GM LL A-025, GM LL B-025, Renault RN0700.

Chemical-Physical Characteristics

Krypton XT	Method analysis	Unit	Value SAE 5W/30
Density at 15°C	ASTM D1298	kg/l	0,855
Kinematic Viscosity at 40°C	ASTM D445	cSt	69,7
Kinematic Viscosity at 100°C	ASTM D445	cSt	11,6
Viscosity Index	ASTM D2270	-	162
C.C.S. Viscosity at -30°C	ASTM D5293	cP	6.200
HT-HS Viscosity at 150°C / 10 ⁶ s ⁻¹	ASTM D4683	cP	3,55
T.B.N. (Total Base Number)	ASTM D2896	mg(KOH)/g	11,4
Sulphated Ash	ASTM D874	% (w/w)	1,25
Flash Point (C.O.C.)	ASTM D92	°C	225
Pour Point	ASTM D97	°C	-42
Noack evaporability test	ASTM D5800	% (w/w)	10,0

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1441.84

Krypton XT LA

SAE 5W/40

Synthetic lubricant for latest generation gasoline and Diesel engines with exhaust gas post-treatment devices (CAT and DPF).

PAKELO KRYPTON XT LA SAE 5W/40 is a new generation **synthetic** lubricant formulated with selected high quality base stocks and exclusive additives that confer to the product high detergent, dispersant, anti-oxidative, anti-corrosion, anti-wear and antifoam properties.

The synthetic bases used reduce product volatility, oxidation and formation of carbon residues.

This enables PAKELO KRYPTON XT LA SAE 5W/40 to provide extraordinary anti-oxidative properties and to avoid formation of deposits also under high working temperatures.

The low volatility of synthetic bases results into a very significant reduction of oil losses caused by evaporation.

The SAE Viscosity Grade 5W/40 guarantees the correct viscosity for the most severe climatic conditions: this means easy and safe start-ups at very low temperatures (also at -30°C) and reduction of wear risks to minimum.

Thanks to the special viscosity properties, the use PAKELO KRYPTON XT LA SAE 5W/40 can result into fuel savings and a prompt reply of the engine, making functioning soft and uniform.

PAKELO KRYPTON XT LA SAE 5W/40 improves protection of all modern engines.

The use of exclusive additives with low content of Phosphorous, Sulphur and Sulphated Ash allows to extend working life of all post-treatment devices present in latest generation engines.

Low content of Ash helps to reduce PM content in DPF (Diesel Particulate Filter) used in modern Diesel engines.

Low content of Phosphorous and Sulphur avoids danger of "poisoning" in catalytic converters (CAT) of latest gasoline vehicles.

On the contrary the presence of these chemical elements affects life of post-treatment devices.

PAKELO KRYPTON XT LA SAE 5W/40 exceeds the main performance levels on the market (Mercedes Benz, BMW, Volkswagen, etc.).

It is possible to extend oil drain intervals, according to Constructors' recommendations.

Oil drain intervals are usually specified by OEMs and/or on-board electronic devices of latest generation vehicles; their recommendations should be taken into consideration to guarantee engine reliability.

1441.84

Krypton XT LA

SAE 5W/40

Application fields

PAKELO KRYPTON XT LA SAE 5W/40 is recommended for latest generation high performance gasoline and Diesel engines with exhaust gas post-treatment devices (CAT and DPF).

Ideal for gasoline engines (also direct injection) and direct injection, “common rail” or “pump-injector” turbocharged diesel engines.

Furthermore, thanks to synthetic base stocks used and to the low ash content, the product can also be used for gas engines.

Performance levels

ACEA C3, API SN / SM, MB 229.51, VW 502.00, VW 505.00, VW 505.01, BMW LL-04, Porsche A40.

Approvals

Approved as **BMW** Longlife-04 oil, **MB**-Approval 229.51, **Porsche** A40.

Chemical-Physical Characteristics

Krypton XT LA	Method analysis	Unit measure	Value SAE 5W/40
Density at 15°C	ASTM D1298	kg/l	0,852
Kinematic Viscosity at 40°C	ASTM D445	cSt	75,8
Kinematic Viscosity at 100°C	ASTM D445	cSt	13,0
Viscosity Index	ASTM D2270	-	174
C.C.S. Viscosity at -30°C	ASTM D5293	cP	6.300
HT-HS Viscosity at 150°C / 10 ⁶ s ⁻¹	ASTM D4683	cP	3,65
T.B.N. (Total Base Number)	ASTM D2896	mg(KOH)/g	7,3
Sulphated Ash	ASTM D874	% (w/w)	0,80
Flash Point (C.O.C.)	ASTM D92	°C	230
Pour Point	ASTM D97	°C	-36
Noack evaporability test	ASTM D5800	% (w/w)	10,0

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1441.83

Krypton XT LA

SAE 5W/30

Synthetic lubricant for latest generation gasoline and Diesel engines with exhaust gas post-treatment devices (CAT and DPF).

PAKELO KRYPTON XT LA SAE 5W/30 is a new generation **synthetic** lubricant formulated with selected high quality base stocks and exclusive additives that confer to the product high detergent, dispersant, anti-oxidative, anti-corrosion, anti-wear and antifoam properties.

The synthetic bases used reduce product volatility, oxidation and formation of carbon residues.

This enables PAKELO KRYPTON XT LA SAE 5W/30 to provide extraordinary anti-oxidative properties and to avoid formation of deposits also with presence of high working temperatures.

The low volatility of synthetic bases results into a very significant reduction of oil losses caused by evaporation.

The SAE Viscosity Grade 5W/30 guarantees the correct viscosity for the most severe climatic conditions: this means easy and safe start-ups at very low temperatures (also at -30°C) and reduction of wear risks to minimum.

Thanks to the special viscosity properties, the use PAKELO KRYPTON XT LA SAE 5W/30 can result into fuel savings and a prompt reply of the engine, making functioning soft and uniform.

PAKELO KRYPTON XT LA SAE 5W/30 improves protection of all modern engines.

The use of exclusive additives with low content of Phosphorous, Sulphur and Sulphated Ash allows to extend working life of all post-treatment devices present in latest generation engines.

Low content of Ash helps to reduce PM content in DPF (Diesel Particulate Filter) used in modern Diesel engines.

Low content of Phosphorous and Sulphur avoids danger of "poisoning" in catalytic converters (CAT) of latest gasoline vehicles.

On the contrary the presence of these chemical elements affects life of post-treatment devices.

PAKELO KRYPTON XT LA SAE 5W/30 exceeds the main performance levels on the market (Mercedes Benz, BMW, Volkswagen, etc.).

It is possible to extend oil drain intervals, according to Constructors' recommendations.

Oil drain intervals are usually specified by OEMs and/or on-board electronic devices of latest generation vehicles; their recommendations should be taken into consideration to guarantee engine reliability.

1441.83

Krypton XT LA

SAE 5W/30

Application fields

PAKELO KRYPTON XT LA SAE 5W/30 is recommended for latest generation high performance gasoline and Diesel engines with exhaust gas post-treatment devices (CAT and DPF).

Ideal for gasoline engines (also direct injection) and direct injection, “common rail” or “pump-injector” turbocharged diesel engines.

Furthermore, thanks to synthetic base stocks used and to the low ash content, the product can also be used for gas engines.

Performance levels

ACEA C3, API SN / SM, MB 229.51, MB 229.52, VW 502.00, VW 505.00, VW 505.01, BMW LL-04, GM Dexos 2.

Chemical-Physical Characteristics

Krypton XT LA	Method analysis	Unit measure	Value SAE 5W/30
Density at 15°C	ASTM D1298	kg/l	0,850
Kinematic Viscosity at 40°C	ASTM D445	cSt	70,8
Kinematic Viscosity at 100°C	ASTM D445	cSt	12,2
Viscosity Index	ASTM D2270	-	171
C.C.S. Viscosity at -30°C	ASTM D5293	cP	6.300
HT-HS Viscosity at 150°C / 10 ⁶ s ⁻¹	ASTM D4683	cP	3,55
T.B.N. (Total Base Number)	ASTM D2896	mg(KOH)/g	7,3
Sulphated Ash	ASTM D874	% (w/w)	0,80
Flash Point (C.O.C.)	ASTM D92	°C	230
Pour Point	ASTM D97	°C	-39
Noack evaporability test	ASTM D5800	% (w/w)	9,8

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1841.83

Krypton XT LA 504/507

SAE 5W/30

Synthetic lubricant for latest generation gasoline and Diesel engines with exhaust gas post-treatment devices (CAT and DPF).

PAKELO KRYPTON XT LA 504/507 SAE 5W/30 is a new generation **synthetic** lubricant formulated with selected high quality base stocks and exclusive additives that confer to the product high detergent, dispersant, anti-oxidative, anti-corrosion, anti-wear and antifoam properties.

The synthetic bases used reduce product volatility, oxidation and formation of carbon residues.

This enables PAKELO KRYPTON XT LA 504/507 SAE 5W/30 to provide extraordinary anti-oxidative properties and to avoid formation of deposits also with presence of high working temperatures.

The low volatility of synthetic bases results into a very significant reduction of oil losses caused by evaporation.

The SAE Viscosity Grade 5W/30 guarantees the correct viscosity for the most severe climatic conditions: this means easy and safe start-ups at very low temperatures (also at -30°C) and reduction of wear risks to minimum.

Thanks to the special viscosity properties, the use PAKELO KRYPTON XT LA 504/507 SAE 5W/30 can result into fuel savings and a prompt reply of the engine, making functioning soft and uniform.

PAKELO KRYPTON XT LA 504/507 SAE 5W/30 improves protection of all modern engines.

The use of exclusive additives with low content of Phosphorous, Sulphur and Sulphated Ash allows to extend working life of all post-treatment devices present in latest generation engines.

Low content of Ash helps to reduce PM content in DPF (Diesel Particulate Filter) used in modern Diesel engines.

Low content of Phosphorous and Sulphur avoids danger of "poisoning" in catalytic converters (CAT) of latest gasoline vehicles.

On the contrary the presence of these chemical elements affects life of post-treatment devices.

PAKELO Krypton XT LA 504/507 SAE 5W/30 can be used to extend oil drain intervals, according to Constructors' recommendations.

Oil drain intervals are usually specified by OEMs and/or on-board electronic devices of latest generation vehicles; their recommendations should be taken into consideration to guarantee engine reliability.

1841.83

Krypton XT LA 504/507

SAE 5W/30

Application fields

PAKELO KRYPTON XT LA 504/507 SAE 5W/30 is recommended for latest generation high performance gasoline and Diesel engines with exhaust gas post-treatment devices (CAT and DPF).

Ideal for gasoline engines (also direct injection) and direct injection, “common rail” or “pump-injector” turbocharged diesel engines.

Furthermore, thanks to synthetic base stocks used and to the low ash content, the product can also be used for gas engines.

Performance levels

ACEA C3, MB 229.51, VW 504.00, VW 507.00, BMW LL-04, Porsche C30.

Chemical-Physical Characteristics

Krypton XT LA 504/507	Method analysis	Unit measure	Value SAE 5W/30
Density at 15°C	ASTM D1298	kg/l	0,853
Kinematic Viscosity at 40°C	ASTM D445	cSt	70,2
Kinematic Viscosity at 100°C	ASTM D445	cSt	11,7
Viscosity Index	ASTM D2270	-	162
C.C.S. Viscosity at -30°C	ASTM D5293	cP	5.800
HT-HS Viscosity at 150°C / 10 ⁶ s ⁻¹	ASTM D4683	cP	3,55
T.B.N. (Total Base Number)	ASTM D2896	mg(KOH)/g	6,8
Sulphated Ash	ASTM D874	% (w/w)	0,70
Flash Point (C.O.C.)	ASTM D92	°C	220
Pour Point	ASTM D97	°C	-42
Noack evaporability test	ASTM D5800	% (w/w)	10,1

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4241.67

Krypton Racing

SAE 10W/60

Very high performance fully synthetic lubricant suitable for latest generation car engines.

PAKELO KRYPTON RACING SAE 10W/60 is a high performance **fully synthetic** lubricant, specific for latest generation car engines.

It is the result of long-term experience developed during numerous races and continuous scientific and technological research.

The product efficiently protects the engine in different working temperatures and guarantees a safe and reliable application also under the most severe working and climate conditions.

PAKELO KRYPTON RACING SAE 10W/60 is formulated with selected high quality base stocks and exclusive additives that confer to the product high detergent, dispersant, anti-oxidative, anti-corrosion, anti-wear and antifoam properties.

Furthermore the use of thermally stable Friction Modifiers additives reduces friction and working temperatures, supporting a prompt reaction of the engine and turning the functioning smooth and uniform.

The special synthetic base stocks used reduce oxidation and formation of carbon residues: this enables PAKELO KRYPTON RACING SAE 10W/60 to provide extraordinary anti-oxidative properties and to avoid formation of deposits also with presence of high working temperatures.

The low volatility of synthetic base stocks results into a very significant reduction of oil losses due to evaporation.

PAKELO KRYPTON RACING SAE 10W/60 thus provides extraordinary resistance to thermal changes and oxidation, avoiding formation of deposits on valves and keeping the engine clean.

Furthermore, its great fluency under the most severe cold climate conditions guarantees easy and safe start-ups at very low temperatures and reduction of wear risks to minimum, providing superior reliability.

PAKELO KRYPTON RACING SAE 10W/60 improves protection of all modern engines also under the most severe working conditions and it can be used even in modern cars equipped with post-treatment devices.

The product shows mixability with all the lubricants for the same application.

However, we recommend to avoid mixing it with other products for not undermining its exceptional properties.

PAKELO KRYPTON RACING series is available in several multigrade Viscosity Grades.

The choice of suitable Viscosity Grade should be done taking into consideration Constructor's recommendations, kind of engine, climatic and working temperatures, need for more performance or reliability, etc..

4241.67

Krypton Racing

SAE 10W/60

Application fields

PAKELO KRYPTON RACING SAE 10W/60 has been studied for gasoline engines of latest generation cars, also turbocharged with high supercharging pressure.

It is particularly indicated for sporty and racing engines working at high revs and/or highly rated, also in extreme climatic conditions.

Thanks to its characteristics, PAKELO KRYPTON RACING SAE 10W/60 can also be used in Diesel and turbodiesel engines of modern vehicles and earlier generation engines.

Performance levels

The additive package used enables, in the set Viscosity Grades, to meet the following Performance Levels: **ACEA A3/B4, API SM, API SL / CF.**

Chemical-Physical Characteristics

Krypton Racing	Method analysis	Unit	Value SAE 10W/60
Density at 15°C	ASTM D1298	kg/l	0,867
Kinematic Viscosity at 40°C	ASTM D445	cSt	153,9
Kinematic Viscosity at 100°C	ASTM D445	cSt	22,8
Viscosity Index	ASTM D2270	-	177
C.C.S. Viscosity at -25°C	ASTM D5293	cP	6.700
HT-HS Viscosity at 150°C / 10 ⁶ s ⁻¹	ASTM D4683	cP	5,60
T.B.N. (Total Base Number)	ASTM D2896	mg(KOH)/g	11,4
Sulphated Ash	ASTM D874	% (w/w)	1,25
Flash Point (C.O.C.)	ASTM D92	°C	> 230
Pour Point	ASTM D97	°C	-37

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0441.67

Krypton MBK

SAE 10W/60

Fully synthetic lubricant with exceptional performance specific for latest generation 4 stroke motorbike engines.

PAKELO KRYPTON MBK SAE 10W/60 is a special **fully synthetic** lubricant. It guarantees exceptional performance, High Viscosity Index obtained with exclusive additives that provide superior detergent, dispersant properties, anti-oxidative, anti-corrosion, anti-wear and anti-foam characteristics.

The product, thanks to the presence in the formulation of fine specially selected synthetic bases, shows superior properties compared to a lubricant formulated with mineral base stocks.

PAKELO KRYPTON MBK SAE 10W/60 provides very high thermal and oxidative resistance; reduces evaporation losses (less volatility of the product) and formation of carbon residues when compared to mineral based product.

PAKELO KRYPTON MBK SAE 10W/60 is specifically formulated for keeping, also at high working temperatures - typical of motorbike application - the best lubrication film, the correct fluency between engine and transmission contacts.

Furthermore, it enables very easy start-ups and idling stability when the engine is still cold.

PAKELO KRYPTON MBK SAE 10W/60 thanks to its special additive package, keeps extremely clean engine parts and guarantees at the same time outstanding anti-wear protection of components such as camshaft and transmission parts working under extreme conditions.

The product is highly recommended also for motorbike engines with wet clutch lubrication. The special formulation of PAKELO KRYPTON MBK SAE 10W/60 guarantees the correct friction coefficient and thus prevents slippage during power transfer.

0441.67

Krypton MBK

SAE 10W/60

Application fields

PAKELO KRYPTON MBK SAE 10W/60 is specifically studied for four stroke motorbike engines also of the latest generation.

PAKELO KRYPTON MBK series is available in several Viscosity Grades envisaged by SAE J300 Specification.

The choice of suitable Viscosity Grade should be done taking into consideration working conditions and Constructor's recommendations.

Performance level

API SM, JASO MA2.

Chemical-Physical Characteristics

Krypton MBK	Method analysis	Unit	Value SAE 10W/60
Density at 15°C	ASTM D1298	kg/l	0,849
Kinematic Viscosity at 40°C	ASTM D445	cSt	170,1
Kinematic Viscosity at 100°C	ASTM D445	cSt	23,2
Viscosity Index	ASTM D2270	-	165
C.C.S. Viscosity at -25°C	ASTM D5293	cP	6.700
T.B.N. (Total Base Number)	ASTM D2896	mg(KOH)/g	7,7
Sulphated Ash	ASTM D874	% w/w	0,90
Flash Point (C.O.C.)	ASTM D92	°C	> 230
Pour Point	ASTM D97	°C	-40

The data just above refer to average values and must not be understood as guaranteed characteristics.

This Technical Data Sheet has been carefully checked to guarantee complete and precise information. However, we do not take any responsibility in case of damages caused by any mistakes or omissions. Due to continual product research and development, the information contained herein is subject to change without notification.



0441.20

Krypton MBK

SAE 10W/50

Fully synthetic lubricant with exceptional performance specific for latest generation 4 stroke motorbike engines.

PAKELO KRYPTON MBK SAE 10W/50 is a special **fully synthetic** lubricant.

It guarantees exceptional performance, High Viscosity Index obtained with exclusive additives that provide superior detergent, dispersant properties, anti-oxidative, anti-corrosion, anti-wear and anti-foam characteristics.

The product, thanks to the presence in the formulation of fine specially selected synthetic bases, shows superior properties compared to a lubricant formulated with mineral base stocks.

PAKELO KRYPTON MBK SAE 10W/50 provides very high thermal and oxidative resistance; reduces evaporation losses (less volatility of the product) and formation of carbon residues when compared to mineral based product.

PAKELO KRYPTON MBK SAE 10W/50 is specifically formulated for keeping, also at high working temperatures - typical of motorbike application - the best lubrication film, the correct fluency between engine and transmission contacts.

Furthermore, it enables very easy start-ups and idling stability when the engine is still cold.

PAKELO KRYPTON MBK SAE 10W/50 thanks to its special additive package, keeps extremely clean engine parts and guarantees at the same time outstanding anti-wear protection of components such as camshaft and transmission parts working under extreme conditions.

The product is highly recommended also for motorbike engines with wet clutch lubrication. The special formulation of PAKELO KRYPTON MBK SAE 10W/50 guarantees the correct friction coefficient and thus prevents slippage during power transfer.

0441.20

Krypton MBK

SAE 10W/50

Application fields

PAKELO KRYPTON MBK SAE 10W/50 is specifically studied for four stroke motorbike engines also of the latest generation.

PAKELO KRYPTON MBK series is available in several Viscosity Grades envisaged by SAE J300 Specification.

The choice of suitable Viscosity Grade should be done taking into consideration working conditions and Constructor's recommendations.

Performance level

API SM, JASO MA2.

Chemical-Physical Characteristics

Krypton MBK	Method analysis	Unit	Value SAE 10W/50
Density at 15°C	ASTM D1298	kg/l	0,855
Kinematic Viscosity at 40°C	ASTM D445	cSt	139,8
Kinematic Viscosity at 100°C	ASTM D445	cSt	19,6
Viscosity Index	ASTM D2270	-	161
C.C.S. Viscosity at -25°C	ASTM D5293	cP	5.700
T.B.N. (Total Base Number)	ASTM D2896	mg(KOH)/g	7,7
Sulphated Ash	ASTM D874	% w/w	0,90
Flash Point (C.O.C.)	ASTM D92	°C	> 235
Pour Point	ASTM D97	°C	-38

The data just above refer to average values and must not be understood as guaranteed characteristics.

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1442.83

Krypton FXT LA

SAE 5W/30

Synthetic “fuel economy” lubricant for latest generation gasoline and Diesel engines with exhaust gas post-treatment devices (CAT and DPF).

PAKELO KRYPTON FXT LA SAE 5W/30 is a new generation synthetic lubricant formulated with selected high quality base stocks and exclusive additives that confer to the product high detergent, dispersant, anti-oxidative, anti-corrosion, anti-wear and antifoam properties.

The synthetic bases used reduce product volatility, oxidation and formation of carbon residues.

This enables PAKELo KRYPTON FXT LA SAE 5W/30 to provide extraordinary anti-oxidative properties and to avoid formation of deposits also under high working temperatures.

The low volatility of synthetic bases results into a very significant reduction of oil losses caused by evaporation.

The SAE Viscosity Grade 5W/30 guarantees the correct viscosity for the most severe climatic conditions: this means easy and safe start-ups at very low temperatures (also at -30°C) and reduction of wear risks to minimum.

PAKELO KRYPTON FXT LA SAE 5W/30 is specifically developed for engines requiring “fuel-economy” lubricants. Thanks to its special viscosity properties, the use of the product can result into fuel savings and favours a prompt reply of the engine, making the functioning soft and uniform.

PAKELO KRYPTON FXT LA SAE 5W/30 exceeds recent API SN and ACEA C2 performance levels and thus providing better “fuel-economy” properties when compared to previous generation lubricants.

The product improves protection of all modern engines guaranteeing longer life of post-treatment devices used in modern cars or vans. The use of exclusive additives with low content of Phosphorous, Sulphur and Sulphated Ash allows to extend working life of all post-treatment devices present in latest generation engines.

The presence of these chemical elements affects life of post-treatment devices introduced to reduce emissions.

Low content of ash helps to reduce PM content in DPF (Diesel Particulate Filter) used in modern Diesel engines and low content of Phosphorous and Sulphur avoids danger of “poisoning” in catalytic converters (CAT) of latest gasoline vehicles.

PAKELO KRYPTON FXT LA SAE 5W/30 can be used to extend oil drain intervals, according to Constructors’ Recommendations.

Oil drain intervals are usually specified by OEMs and/or on-board electronic devices of latest generation vehicles; their recommendations should be taken into consideration to guarantee engine reliability.

1442.83

Krypton FXT LA

SAE 5W/30

Application fields

PAKELO KRYPTON FXT LA SAE 5W/30 has been specifically developed for latest generation gasoline and Diesel engines with exhaust gas post-treatment devices (CAT and DPF) and requiring “*fuel-economy*” lubricants.

PAKELO KRYPTON FXT LA SAE 5W/30 is a specific product for engines requiring lubricants with ACEA C2 or ACEA A5/B5 performance levels also working under severe conditions and/or long drain intervals. The product can also be used for engines requiring lubricants with ACEA A1/B1 performance level.

The product is not suitable for engines requiring lubricants with ACEA C3, ACEA A3/B4 or ACEA A3/B3 performance levels.

Performance levels

ACEA C2, ACEA A5/B5, API SN, PSA B712290.

Chemical-Physical Characteristics

Krypton FXT LA	Method analysis	Unit measure	Value SAE 5W/30
Density at 15°C	ASTM D1298	kg/l	0,852
Kinematic Viscosity at 40°C	ASTM D445	cSt	57,0
Kinematic Viscosity at 100°C	ASTM D445	cSt	10,1
Viscosity Index	ASTM D2270	-	166
C.C.S. Viscosity at -30°C	ASTM D5293	cP	5.500
HT-HS Viscosity at 150°C / 10 ⁶ s ⁻¹	ASTM D4683	cP	3,15
T.B.N. (Total Base Number)	ASTM D2896	mg(KOH)/g	8,0
Sulphated Ash	ASTM D874	% (w/w)	0,80
Flash Point (C.O.C.)	ASTM D92	°C	220
Pour Point	ASTM D97	°C	-39
Noack evaporability test	ASTM D5800	% (w/w)	10,4

The data just above refer to average values and must not be understood as guaranteed characteristics.

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1442.45

Krypton FXT LA F

SAE 5W/20

Synthetic “fuel economy” lubricant for latest generation gasoline and Diesel engines with exhaust gas post-treatment devices (CAT and DPF).

PAKELO KRYPTON FXT LA F SAE 5W/20 is a new generation synthetic lubricant formulated with selected high quality base stocks and exclusive additives that confer to the product high detergent, dispersant, anti-oxidative, anti-corrosion, anti-wear and antifoam properties.

The synthetic bases used reduce product volatility, oxidation and formation of carbon residues.

This enables PAKELO KRYPTON FXT LA F SAE 5W/20 to provide extraordinary anti-oxidative properties and to avoid formation of deposits also under high working temperatures.

The low volatility of synthetic bases results into a very significant reduction of oil losses caused by evaporation.

The SAE Viscosity Grade 5W/20 guarantees the correct viscosity for the most severe climatic conditions: this means easy and safe start-ups at very low temperatures (also at -30°C) and reduction of wear risks to minimum.

PAKELO KRYPTON FXT LA F SAE 5W/20 is specifically developed for engines requiring “fuel-economy” lubricants. Thanks to its special viscosity properties, the use of the product can result into fuel savings and favours a prompt reply of the engine, making the functioning soft and uniform.

PAKELO KRYPTON FXT LA F SAE 5W/20 exceeds recent ACEA A1/B1 and Ford 948-B performance levels and thus providing better “fuel-economy” properties when compared to previous generation lubricants.

The product improves protection of all modern engines guaranteeing longer life of post-treatment devices used in modern cars or vans. The use of exclusive additives with low content of Phosphorous, Sulphur and Sulphated Ash allows to extend working life of all post-treatment devices present in latest generation engines.

The presence of these chemical elements affects life of post-treatment devices introduced to reduce emissions.

Low content of ash helps to reduce PM content in DPF (Diesel Particulate Filter) used in modern Diesel engines and low content of Phosphorous and Sulphur avoids danger of “poisoning” in catalytic converters (CAT) of latest gasoline vehicles.

PAKELO KRYPTON FXT LA F SAE 5W/20 can be used to extend oil drain intervals, according to Constructors’ Recommendations.

Oil drain intervals are usually specified by OEMs and/or on-board electronic devices of latest generation vehicles; their recommendations should be taken into consideration to guarantee engine reliability.

1442.45

Krypton FXT LA F

SAE 5W/20

Application fields

PAKELO KRYPTON FXT LA F SAE 5W/20 has been specifically developed for latest generation gasoline and Diesel engines with exhaust gas post-treatment devices (CAT and DPF) and requiring “fuel-economy” lubricants.

PAKELO KRYPTON FXT LA F SAE 5W/20 is a specific product for engines requiring lubricants with ACEA A1/B1 and Ford 948-B performance levels also working under severe conditions and/or long drain intervals.

The product is not suitable for engines requiring lubricants with ACEA C3, ACEA A3/B4 or ACEA A3/B3 performance levels.

Performance levels

ACEA A1/B1, API SN, Ford WSS-M2C 948-B.

Chemical-Physical Characteristics

Krypton FXT LA F	Method analysis	Unit measure	Value SAE 5W/20
Density at 15°C	ASTM D1298	kg/l	0,848
Kinematic Viscosity at 40°C	ASTM D445	cSt	42,4
Kinematic Viscosity at 100°C	ASTM D445	cSt	7,9
Viscosity Index	ASTM D2270	-	160
C.C.S. Viscosity at -30°C	ASTM D5293	cP	4.100
HT-HS Viscosity at 150°C / 10 ⁶ s ⁻¹	ASTM D4683	cP	2,65
T.B.N. (Total Base Number)	ASTM D2896	mg(KOH)/g	8,1
Sulphated Ash	ASTM D874	% (w/w)	0,8
Flash Point (C.O.C.)	ASTM D92	°C	210
Pour Point	ASTM D97	°C	-40
Noack evaporability test	ASTM D5800	% (w/w)	11,8

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18 September 2013

PAKELO MOTOR OIL S.r.l

Mr. Roberto Scolaro(Technical Dept.)
Via Fontanelle 52, 54
37047 San Bonifacio (VERONA)
ITALY

Dear Mr. Roberto Scolaro

Thank you for your new applications.

We are enclosing the "Notification and Written Consent" about your documents as follows.

D039PAK004 GoldenStar LA
D039PAK005 GoldenStar LA

We are going to publicize the information about this on-filed products from October 2013.

We would like you to check the following information.

If you find some wrong points, please tell us.

①Oil Code	D039PAK004	D039PAK005
②Brand Name	GoldenStar LA	GoldenStar LA
③Submitter Name	PAKELO MOTOR OIL s.r.l	PAKELO MOTOR OIL s.r.l
④Viscosity Grade	10W-40	10W-40
⑤Performance classifications	DH-1	DH-2

If there are any questions, please feel free to contact us.

Best Regards,



Shigenori Hidan
Business Dept.

4292.17

GoldenStar LA 77-51

SAE 10W-40

Fully Synthetic lubricant with **LOW S.A.P.S. technology** (low content of Sulphated Ash, Phosphorus, Sulphur) for all latest on/off road HD Diesel engines.

PAKELO GOLDENSTAR LA 77-51 SAE 10W/40 is a **fully synthetic** lubricant developed for latest generation on/off road Heavy Duty Diesel engines.

Thanks to its special additive package and to the selected synthetic base-stocks used, PAKELO GOLDENSTAR LA 77-51 SAE 10W/40 satisfies, at the same time, the severe international **API CJ-4** and **ACEA E9, E7, E6, E4** specifications and has been developed to satisfy main OEMs specifications. Such performance within one single product means obtaining a key fundamental result that is necessary also to unify lubrication when engines have sometimes slightly different requirements.

The emission reduction systems used by OEMs, depending on the different technology, are very sensitive to the presence of some chemical elements that could also be found in lubricants of recent formulation. In particular the chemical elements that are considered to be harmful are **Sulphur** (present in the additives and in solvent neutral base stocks), **Phosphorus** (generally bound to Zinc in order to give greater anti-oxidative and anti-wear protection) and **Sulphated Ash** (mostly from detergent additives).

PAKELO GOLDENSTAR LA 77-51 SAE 10W/40 has been formulated with the lowest content of these elements and thus with the use of an innovative chemistry and special almost sulphur free synthetic base stocks.

This innovative new allows to obtain a product with high TBN (Total Base Number) and to fulfill at the same time ACEA E6 and E4 specifications.

Furthermore this chemistry is ideal to guarantee high detergency with a moderate ash content and in this way the same lubricant can be used for different engine requirements.

The particular formula of PAKELO GOLDENSTAR LA 77-51 SAE 10W/40 thus provides the following properties:

- **LOW S.A.P.S.** (low content of Sulphated Ash, Phosphorus and Sulphur) **technology**: furthermore it satisfies **MID S.A.P.S. technology** requirements;
- **suitable for long drains**; it enables *Extended Service Interval*;
- **excellent low temperature** properties: easy start-ups at very low temperatures to guarantee the lubricant action for all engine moving parts right from the first working periods and to reduce to the minimum the hazards of wear especially when comparing the product with SAE 15W/40 Viscosity Grade lubricants;
- **very high thermal-oxidative stability** at high temperatures also thanks to the synthetic base stocks used to formulate the product;
- **HT-HS** (High Temperature, High Shear) **value optimized** for severe and specific needs of modern Heavy Duty Diesel engines;
- **low formation of lacquers and varnishes** at low temperatures and in particular during stop-and-go service;
- **low volatility** of the product results into a very significant reduction of oil losses due to evaporation;
- **very high detergent properties** that guarantee cleanness performance and long drain intervals;
- **excellent dispersant properties** that guarantee a great control of sludge and oil thickening phenomena also in case of high presence of soot and deposits;
- **excellent wear control** in every working and ambient temperatures;
- **excellent pumpability** at low temperatures of used oil too.

4292.17

GoldenStar LA 77-51

SAE 10W-40

Application fields

PAKELO GOLDENSTAR LA 77-51 SAE 10W/40 is a very high performance lubricant recommended for on/off-road Heavy Duty Diesel engines also working under severe conditions.

Furthermore, thanks to synthetic base stocks used and to the low ash content, the product can also be used for CNG (Compressed Natural Gas) engines.

The product satisfies the main international OEMs' performance levels.

The product can be adopted to extend oil drain intervals, with respect of Constructors' Recommendations and combined with a complete monitoring of oil in service through specific oil analyses.

Please also follow recommended oil drain intervals to obtain maximum engine life.

Performance level

ACEA E9 / E7 / E6 / E4, **API** CJ-4, **JASO** DH-2 / DH-1, **MB** 228.51 / 228.31,

MAN M3477 / M3575 / M3271-1, **Volvo** VDS-4, **Renault** RLD-3 / RLD-2,

MTU Type 3.1 / Type 2.1, **Mack** EO-O Premium Plus / EO-N Premium Plus,

Caterpillar ECF-3, **Cummins** CES 20.081, **Deutz** DQC IV-10LA, **Detroit Diesel** 93K218.

Approvals

MB-Approval 228.51, **MAN** M3477, **MAN** M3575, **MAN** M3271-1.

Meets: JASO DH-2, JASO DH-1.

Chemical-Physical Characteristics

GoldenStar LA 77-51	Method analysis	Unit measure	Value SAE 10W-40
Density at 15°C	ASTM D1298	kg/l	0,866
Kinematic Viscosity at 40°C	ASTM D445	cSt	86,5
Kinematic Viscosity at 100°C	ASTM D445	cSt	13,3
Viscosity Index	ASTM D2270	-	145
C.C.S. Viscosity at -25°C	ASTM D5293	cP	6.600
HT-HS Viscosity at 150°C / 10 ⁶ s ⁻¹	ASTM D4683	cP	3,90
T.B.N. (Total Base Number)	ASTM D2896	mg(KOH)/g	12,8
Sulphated Ash	ASTM D874	% (w/w)	< 1,00
Typical phosphorus content	ASTM D5185	ppm	< 800
Typical sulphur content	ASTM D5185	ppm	< 3000
Flash Point (C.O.C.)	ASTM D92	°C	> 220
Pour Point	ASTM D97	°C	-33
Noack evaporability test	ASTM D5800	% (w/w)	11,0

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Daimler AG - 70546 Stuttgart

Pakelo Motor Oil S.r.l.
Attn. Mr. Roberto Scolaro
Via Fontanelle, 52/54
37047 San Bonifacio (Vr)
ITALY

Telefon/Phone +49 7 11 17-	Telefax/Fax +49 7 11 17-	Hauspost-Code/ Internal Code
24801	59756	C401

Ihr Zeichen, Ihre Nachricht vom/
Your reference
04.07.2013

Unser Zeichen, unsere Nachricht vom/
Our reference
RD/PDI-F-40020

Name
E-Mail
Mrs. Fuchs

Datum/Date
13.09.2013

MB-Approval Certificate

Changing the Formulation

MB-Approval 228.51 for Engine Oil: "PAKELO GOLDENSTAR LA 77-51"
Oil-Code: 4292.17, SAE-Grade: 10W-40

Dear Sir or Madam,

The aforementioned operating fluid complies with the requirements of the Mercedes-Benz Specifications for Operating Fluids, sheet 228.51 and is therefore approved for the respective Mercedes-Benz vehicles and assemblies. The application range is shown on the MB sheet and further defined on the sheet 223.2. Further requirements, e.g. SAE grades, capacities, change intervals etc. must also be observed.

The following regulations apply for the MB-Approval:

- The MB-Approval comes into force on the date shown on this certificate
- The MB-Approval will expire in 5 years at the latest
- The MB-Approval automatically terminates on expiry of the validity period at the latest
- The MB-Approval is only valid as long as the product name is listed in MB BeVo-ONLINE <http://bevo.mercedes-benz.com>
- Applications for renewals or new approvals etc. must be made in good
- In addition, the regulations laid down in the "Obligations Regarding Approval for Operating Fluids" contract signed on 06.08.2013 apply.

A 2-liter back-up sample of each formulation, which can be called upon by Daimler AG at any given moment, must be retained for at least 3 years. We will inform you of the dispatch address. Former MB-Approval Certificates for the aforementioned operating fluid are hereby rendered invalid.

Sincerely
Daimler AG

i.V. Gorbach
i.V. Dr. Andreas Gorbach

i.V. Breitbach
i.V. Dr. Hermann Breitbach



ZF Friedrichshafen AG · 88038 Friedrichshafen

Pakelo Motor Oil s.r.l.
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Corporate Research & Development

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E-mail	Stella.Braunschweig@zf.com
Your Ref.	
Our Ref.	
Date	2014-07-01

Goldengear LD Plus SAE 75W/80

Dear Madam / Sir

Due to your confirmation that the formulation of your lubricant Goldengear LD Plus SAE 75W/80 (ZF approval number ZF000488) has not changed and will continue to conform to the data of your approval application of 2012-06-11, we confirm approval for application according to the ZF Lubricant Class/es

- **TE-ML 02L**
- **TE-ML 16K**

Approval is based on the data in your approval application of 2012-06-11, extended on 2014-07-01. Any alterations of these data will result in withdrawal of approval and the need to submit a new application. You are under the obligation to report any changes to approved products without delay.

Approval is valid for 12 months. If after 11 months you use our approval system "lubricant data file" to confirm unaltered condition of the formulation, approval will be extended by another 12 months. If not, approval will automatically be withdrawn. A reminder will be mailed to you in good time.

Best regards

ZF Friedrichshafen AG

i.A. Stella Braunschweig

Stella Braunschweig



Volvo Group Trucks Technology

STD 417-0002 approval request

Data supplied by requesting company

Company name:*	Pakelo Motor Oil S.r.l.
Brand name:*	Golden Star
Oil code:	4289.83
Viscosity grade:	5W-30
Marketing area:	Worldwide
Other approvals:	ACEA E4-08, E7-08
	API
	OEM MB 228.5, MAN M 3277

*) As they shall appear in approved products lists

Date of submission 13.06.2014

Submitted by

Name: Roberto Scolaro
Company: Pakelo Motor Oil S.r.l.

Return approval to:

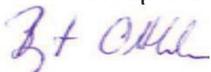
Name: Roberto Scolaro
e-mail: roberto.scolaro@pakelo.it

Approval

Volvo VDS-3 approval	Yes
Mack EO-N approval	Yes
Renault VI RLD-2 approval	Yes

Approval date: June 23, 2014 **Approval #:** 417-0002-14-990

Validity: Approval expires two years after the approval date.
For approval extension, a complete and updated approval form must be submitted at the expiry date ± two months.

Signed: Volvo Group Trucks Technology

Bengt Otterholm
Lubricants Coordinator

Disclaimer: This approval is solely based on information submitted by the applicant and no further quality check is made by Volvo. Hence, Volvo takes no responsibility to ensure that the quality of this product is continuously maintained. This is the sole responsibility of the Company (see above).



4287.17

Golden Long Drain

SAE 10W/40

Very high performance fully synthetic lubricant for all latest generation Heavy Duty Diesel engines, and those equipped with EGR or SCR systems for the reduction of polluting emissions.

PAKELO GOLDEN LONG DRAIN SAE 10W/40 is a **fully synthetic** lubricant developed for Diesel engines of latest generation. It is a U.H.P.D.O. lubricant (Ultra High Performance Diesel Oil) and it is suitable for Heavy Duty Diesel engines of main world-wide Constructors: Scania, Mercedes-Benz, MAN, Volvo, Renault, MTU, etc..

Thanks to its special additive package and the synthetic base oil used, PAKELO GOLDEN LONG DRAIN SAE 10W/40 satisfies nearly all main world-wide specifications for Heavy Duty Diesel Engines (i.e. trucks, buses, earth moving machines, etc.). The product also satisfies, at the same time, the severe the European Specifications **ACEA E7** and **E4**.

Such Performance within one single product means obtaining a key fundamental result that is necessary also to unify lubrication when engines have sometimes slightly different requirements.

ACEA E4 and MB 228.5 Specifications have been developed in order to satisfy Recommendations from major OEMs and to slightly extend oil drain intervals. Such Specifications demand a lubricant with very high detergent properties so to keep the engine but in particular pistons and liners extremely clean.

This technology often relies on a high content of ashes and thus sometimes contrasts with recommendations from low emission engines that normally produce bigger quantities of soot (responsible for wear). In this case lubricants need to provide high dispersancy in order to keep soot in suspension yet without affecting viscosity during operation.

To further improve the reduction of polluting emissions, mainly regarding the production of nitrogen oxides, recent specification has been developed, such as the European ACEA E7.

One of the ways to reduce the production of nitrogen oxides is the adoption of the **EGR (Exhaust Gas Recirculation)** system. Through the EGR system, part (sometimes also a large amount) of exhaust gas is made to re-circulate in the combustion chamber. Acid particulate matter, carbon and nitrogen oxides are thus re-introduced in the combustion chamber. Such particles, by absorbing heat, decrease the maximum temperature that can be reached in the combustion chamber and as a consequence of this the total NO_x formation is reduced.

As a side-effect there is an increase of the soot produced in the combustion chamber and this means to require a further improvement in performance to the lubricant. In fact, tests made with the same lubricant on the same engines, one with EGR, have highlighted higher wear increase due to soot in the engine with EGR system.

ACEA E7 lubricants used in engines with EGR enable to have the same protection and reliability as in engines without EGR.

4287.17

Golden Long Drain

SAE 10W/40

That means when using ACEA E7 lubricants for engines without EGR valve, there is higher protection compared to lubricants that have not been studied for this application. This guarantees longer life and cleanness of engine.

An alternative solution to reduce emissions is to use the **SCR (Selective Catalytic Reduction)** system. In this case ammonia generated from urea, that comes from a specific tank, is injected into the exhaust gas over the catalyst to reduce the NO_x to water and molecular nitrogen. Sometimes the joint use of particulate traps allows further emissions reduction.

The European Specification ACEA E7 was designed for testing suitable lubricants for this kind of engines (EURO IV and EURO V type). A new generation chemistry allows to obtain a product with suitable TBN (Total Base Number). In this way the lubricant is also compatible with the majority of after treatment devices.

Having a product that can satisfy ACEA E7 and ACEA E4 Specifications means providing a product with a very high technological content.

The particular formula of PAKELO GOLDEN LONG DRAIN SAE 10W/40 thus provides the following properties:

- **excellent low temperature properties:** easy start-ups at very low temperatures to guarantee the lubricant action for all the engine moving parts right from the first working periods and to reduce to the minimum the hazards of wear specially when comparing the product with SAE 15W/40 Viscosity Grade lubricants;
- **very good thermal-oxidative stability** at high working temperatures also thanks to the synthetic bases used;
- **HT-HS (High Temperature, High Shear) value optimized** for severe and specific needs of modern Heavy Duty Diesel engines;
- **low formation of lacquers and varnishes that form at low temperatures** specially during *stop-and-go* service;
- **low volatility of the product** results into a very significant reduction of oil losses due to evaporation;
- **very high detergent properties** that guarantee cleanness performance and long drain intervals;
- **excellent wear control**;
- **good compatibility** with gaskets;
- **excellent pumpability** at low temperatures of used oil too.

4287.17

Golden Long Drain

SAE 10W/40

Application fields

PAKELO GOLDEN LONG DRAIN SAE 10W/40 is a high performance lubricant recommended for Heavy Duty Diesel engines also working under on-road (EURO IV ed EURO V type) and off-road (Stage IIIA/IIIB, Tier III/IV type) severe conditions.

The product satisfies the main OEMs' performance levels and has been specifically developed to satisfy the severe SCANIA Specification (LDF-2 and LDF-3) requested for last generation engines.

PAKELO GOLDEN LONG DRAIN SAE 10W/40 can be adopted to extend oil drain intervals, with respect of Constructors' Recommendations and combined with a complete monitoring of oil in service through specific oil analyses.

Please also follow recommended oil drain intervals to obtain maximum engine life.

Performance level

ACEA E7 / E4, API CF, MB 228.5, MAN M3277, Scania LDF-3 / LDF-2 / LDF, Volvo VDS-3, Renault Trucks RXD / RLD-2 / RLD / RD-2, DAF (Extended Drain), MTU Type 3, Cummins CES 20.072, Deutz DQC III-05.

Approvals

Scania LDF-3.

Chemical-Physical Characteristics

Golden Long Drain	Method analysis	Unit	Value SAE 10W/40
Density at 15°C	ASTM D1298	kg/l	0,866
Kinematic Viscosity at 40°C	ASTM D445	cSt	86,3
Kinematic Viscosity at 100°C	ASTM D445	cSt	13,1
Viscosity Index	ASTM D2270	-	152
C.C.S. Viscosity at -25°C	ASTM D5293	cP	6.400
HT-HS Viscosity at 150°C / 10 ⁶ s ⁻¹	ASTM D4683	cP	3,80
T.B.N. (Total Base Number)	ASTM D2896	mg(KOH)/g	16,1
Sulphated Ash	ASTM D874	% (w/w)	1,90
Flash Point (C.O.C.)	ASTM D92	°C	240
Pour Point	ASTM D97	°C	-34
Noack evaporability test	ASTM D5800	% (w/w)	9,3

The data just above refer to average values and must not be understood as guaranteed characteristics.

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4287.17

Golden Long Drain

SAE 10W/40

Very high performance fully synthetic lubricant for all latest generation Heavy Duty Diesel engines, and those equipped with EGR or SCR systems for the reduction of polluting emissions.

PAKELO GOLDEN LONG DRAIN SAE 10W/40 is a **fully synthetic** lubricant developed for Diesel engines of latest generation. It is a U.H.P.D.O. lubricant (Ultra High Performance Diesel Oil) and it is suitable for Heavy Duty Diesel engines of main world-wide Constructors: Scania, Mercedes-Benz, MAN, Volvo, Renault, MTU, etc..

Thanks to its special additive package and the synthetic base oil used, PAKELO GOLDEN LONG DRAIN SAE 10W/40 satisfies nearly all main world-wide specifications for Heavy Duty Diesel Engines (i.e. trucks, buses, earth moving machines, etc.). The product also satisfies, at the same time, the severe the European Specifications **ACEA E7** and **E4**.

Such Performance within one single product means obtaining a key fundamental result that is necessary also to unify lubrication when engines have sometimes slightly different requirements.

ACEA E4 and MB 228.5 Specifications have been developed in order to satisfy Recommendations from major OEMs and to slightly extend oil drain intervals. Such Specifications demand a lubricant with very high detergent properties so to keep the engine but in particular pistons and liners extremely clean.

This technology often relies on a high content of ashes and thus sometimes contrasts with recommendations from low emission engines that normally produce bigger quantities of soot (responsible for wear). In this case lubricants need to provide high dispersancy in order to keep soot in suspension yet without affecting viscosity during operation.

To further improve the reduction of polluting emissions, mainly regarding the production of nitrogen oxides, recent specification has been developed, such as the European ACEA E7.

One of the ways to reduce the production of nitrogen oxides is the adoption of the **EGR (Exhaust Gas Recirculation)** system. Through the EGR system, part (sometimes also a large amount) of exhaust gas is made to re-circulate in the combustion chamber. Acid particulate matter, carbon and nitrogen oxides are thus re-introduced in the combustion chamber. Such particles, by absorbing heat, decrease the maximum temperature that can be reached in the combustion chamber and as a consequence of this the total NO_x formation is reduced.

As a side-effect there is an increase of the soot produced in the combustion chamber and this means to require a further improvement in performance to the lubricant. In fact, tests made with the same lubricant on the same engines, one with EGR, have highlighted higher wear increase due to soot in the engine with EGR system.

ACEA E7 lubricants used in engines with EGR enable to have the same protection and reliability as in engines without EGR.

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Golden Long Drain

SAE 10W/40

That means when using ACEA E7 lubricants for engines without EGR valve, there is higher protection compared to lubricants that have not been studied for this application. This guarantees longer life and cleanness of engine.

An alternative solution to reduce emissions is to use the **SCR (Selective Catalytic Reduction)** system. In this case ammonia generated from urea, that comes from a specific tank, is injected into the exhaust gas over the catalyst to reduce the NO_x to water and molecular nitrogen. Sometimes the joint use of particulate traps allows further emissions reduction.

The European Specification ACEA E7 was designed for testing suitable lubricants for this kind of engines (EURO IV and EURO V type). A new generation chemistry allows to obtain a product with suitable TBN (Total Base Number). In this way the lubricant is also compatible with the majority of after treatment devices.

Having a product that can satisfy ACEA E7 and ACEA E4 Specifications means providing a product with a very high technological content.

The particular formula of PAKELO GOLDEN LONG DRAIN SAE 10W/40 thus provides the following properties:

- **excellent low temperature properties:** easy start-ups at very low temperatures to guarantee the lubricant action for all the engine moving parts right from the first working periods and to reduce to the minimum the hazards of wear specially when comparing the product with SAE 15W/40 Viscosity Grade lubricants;
- **very good thermal-oxidative stability** at high working temperatures also thanks to the synthetic bases used;
- **HT-HS (High Temperature, High Shear) value optimized** for severe and specific needs of modern Heavy Duty Diesel engines;
- **low formation of lacquers and varnishes that form at low temperatures** specially during *stop-and-go* service;
- **low volatility of the product** results into a very significant reduction of oil losses due to evaporation;
- **very high detergent properties** that guarantee cleanness performance and long drain intervals;
- **excellent wear control**;
- **good compatibility** with gaskets;
- **excellent pumpability** at low temperatures of used oil too.

4287.17

Golden Long Drain

SAE 10W/40

Application fields

PAKELO GOLDEN LONG DRAIN SAE 10W/40 is a high performance lubricant recommended for Heavy Duty Diesel engines also working under on-road (EURO IV ed EURO V type) and off-road (Stage IIIA/IIIB, Tier III/IV type) severe conditions.

The product satisfies the main OEMs' performance levels and has been specifically developed to satisfy the severe SCANIA Specification (LDF-2 and LDF-3) requested for last generation engines.

PAKELO GOLDEN LONG DRAIN SAE 10W/40 can be adopted to extend oil drain intervals, with respect of Constructors' Recommendations and combined with a complete monitoring of oil in service through specific oil analyses.

Please also follow recommended oil drain intervals to obtain maximum engine life.

Performance level

ACEA E7 / E4, API CF, MB 228.5, MAN M3277, Scania LDF-3 / LDF-2 / LDF, Volvo VDS-3, Renault Trucks RXD / RLD-2 / RLD / RD-2, DAF (Extended Drain), MTU Type 3, Cummins CES 20.072, Deutz DQC III-05.

Approvals

Scania LDF-3.

Chemical-Physical Characteristics

Golden Long Drain	Method analysis	Unit	Value SAE 10W/40
Density at 15°C	ASTM D1298	kg/l	0,866
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Kinematic Viscosity at 100°C	ASTM D445	cSt	13,1
Viscosity Index	ASTM D2270	-	152
C.C.S. Viscosity at -25°C	ASTM D5293	cP	6.400
HT-HS Viscosity at 150°C / 10 ⁶ s ⁻¹	ASTM D4683	cP	3,80
T.B.N. (Total Base Number)	ASTM D2896	mg(KOH)/g	16,1
Sulphated Ash	ASTM D874	% (w/w)	1,90
Flash Point (C.O.C.)	ASTM D92	°C	240
Pour Point	ASTM D97	°C	-34
Noack evaporability test	ASTM D5800	% (w/w)	9,3

The data just above refer to average values and must not be understood as guaranteed characteristics.

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10 March 2010

PAKELO MOTOR OIL S.r.l

Mr. Roberto Scolaro(Technical Dept.)
Via Fontanelle 52, 54
37047 San Bonifacio (VERONA)
ITALY

Dear Mr. Roberto Scolaro

Thank you for your Application.

We are enclosing the "Notification and Written Consent" about your document as follows.

D039PAK001.....Golden Diesel Plus

We are going to publicize the information about this on-filed product from 1 April 2010.

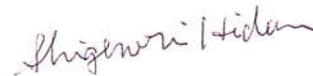
We would like you to check the following information.

If you find some wrong points, please tell us.

①Oil Code	D039PAK001
②Brand Name	Golden Diesel Plus
③Submitter Name	PAKELO MOTOR OIL s.r.l
④Viscosity Grade	15W-40
⑤Performance classifications	DH-1

If there are any questions, please feel free to contact us.

Sincerely yours,



Shigenori Hidan
Business Dept.

CC., Yoichi Yokoyama - Secretary General of the Japan lubricating oil society(JALOS)



0283.17

Golden Diesel HPS/A

SAE 10W/40

Synthetic based multigrade lubricant for all latest generation Diesel engines, and those equipped with EGR or SCR systems for the reduction of polluting emissions.
Also suitable for gasoline engines.

PAKELO GOLDEN DIESEL HPS/A SAE 10W/40 is a synthetic based multigrade lubricant developed for Diesel engines of latest generation.

It is suitable for Heavy Duty and Light Duty Diesel engines of main world-wide Constructors.

Thanks to its particular additive package, PAKELO GOLDEN DIESEL HPS/A SAE 10W/40 satisfies nearly all main world-wide specifications for Heavy Duty Diesel Engines (trucks, buses, earth moving machines, etc.): specifically the product also satisfies the severe requests of American Specification **API CI-4** and European Specification **ACEA E7**.

International OEMs are asked to design low emission engines in order to meet more and more severe American and European standards regarding environmental pollution.

Such low emissions engines usually produce higher quantity of soot and need lubricants with high dispersant properties which allow to maintain soot in suspension without changing of viscosimetric characteristic during service.

To further improve the reduction of polluting emissions, mainly regarding the production of nitrogen oxides, specifications have been developed, such as the American API CI-4 and the European ACEA E7.

One of the ways to reduce the production of such substances is the adoption of the **EGR (Exhaust Gas Recirculation)** system.

Through the EGR system, part (sometimes also significant) of exhaust gas is made to re-circulate in the combustion chamber.

Acid particulate matter, carbon and nitrogen oxides are thus re-introduced in the combustion chamber. Such particles, by absorbing heat, decrease the maximum temperature that can be reached in the combustion chamber and as a consequence of this the total NO_x formation is reduced.

As a side-effect there is an increase of the soot produced in the combustion chamber and this means to require a further improvement in performance to the lubricant.

In fact, tests made with the same lubricant on the same engines, one with EGR, have highlighted higher wear increase due to soot in the engine with EGR system.

API CI-4 lubricants used in engines with EGR enable to have the same protection and reliability as in engines without EGR.

That means, when using API CI-4 lubricants for engines without EGR valve, there is higher protection if compared to lubricants that have not been studied for this application. This guarantees longer life and cleanness of engine.

0283.17

Golden Diesel HPS/A

SAE 10W/40

An alternative solution to reduce emissions is to use the **SCR (Selective Catalytic Reduction)** system. In this case ammonia generated from urea, that comes from a specific tank, is injected into the exhaust gas over the catalyst to reduce the NO_x to water and molecular nitrogen.

Sometimes, the joint use of particulate traps allows further emissions reduction.

The American Specification API CI-4 and the European Specification ACEA E7 were designed for testing suitable lubricants for this kind of engines (EURO IV and EURO V type).

In particular, lubricants that meet the API CI-4 and ACEA E7 Specifications have to pass the following tests: oxidation controls, aeration, viscosity loss in service, deposit on pistons, corrosion, oil thickening due to soot, wear of liners, pistons, rings, oil consumption, cleanness of filters, compatibility with gaskets, used oil pumpability.

Furthermore, PAKELO GOLDEN DIESEL HPS/A SAE 10W/40 exceeds performance levels of the main American Constructors (Cummins, Caterpillar, etc.) and European ones (Mercedes-Benz, MAN, Renault, Volvo, etc.) and it enables to consumers that possess wide range of vehicles to simplify the lubrication, saving money, space, time and possible filling mistakes.

The particular formula of PAKELO GOLDEN DIESEL HPS/A SAE 10W/40 thus provides the following properties:

- **very good low temperature properties** (this means easy and safe start-ups and reduction of wear risks to minimum in comparison with SAE 15W/40 products);
- **high Viscosity Index** to guarantee a low power absorbance due to viscosity resistance during start-up at low temperatures and high viscosity at high temperatures to guarantee a suitable lubrication film;
- **excellent dispersant properties** that guarantee a great control of sludge and oil thickening also in case of high presence of soot and deposits. These phenomena are typical of modern engines that work at higher temperature due to the use of EGR system;
- **very high detergent properties** that guarantee cleanliness performance and long drain intervals;
- **low formation of lacquers and varnishes that form at low temperatures** specially during “stop-and-go” service;
- **high thermal-oxidative stability;**
- **low volatility;**
- **excellent wear control;**
- **anti-corrosive properties** to guarantee protection from combustion acid products and moisture caused by combustion and ambient;
- **anti-foam properties** to reduce or to remove discontinuity of lubricant film caused by excessive formation of inner foam;
- **good compatibility** with gaskets;
- **excellent pumpability** at low temperatures of used oil too, to guarantee the presence of the lubricant for all the engine moving parts right from the first working periods.

0283.17

Golden Diesel HPS/A

SAE 10W/40

Application fields

PAKELO GOLDEN DIESEL HPS/A SAE 10W/40 is a high performance lubricant recommended for heavy duty Diesel engines (industrial, earth moving, building site machines, heavy trucks, buses, etc.) also under severe working conditions.

The product has been formulated to satisfy the requirements of new generation low emission engines (EURO IV and EURO V type).

It is also suitable for earlier generation Diesel engines such as EURO III, EURO II type and previous ones.

It can be adopted to extend oil drain intervals, with respect of Constructors' recommendations and combined with a complete monitoring of oil in service through specific oil analyses.

Take always into consideration correct oil drain intervals to obtain maximum engine life.

Since PAKELO GOLDEN DIESEL HPS/A SAE 10W/40 satisfies the Specifications for gasoline and light Diesel engines (ACEA A3/B4-04, API SL) it can also be used for mixed vehicle fleets.

Performance levels

ACEA E7, API CI-4 / CH-4 / CG-4 / CF-4 / CF, API SL, Global DHD-1, MB 228.3, MAN M3275, Volvo VDS-3, Renault Trucks RLD-2 / RLD, MTU Type 2, Mack EO-N / EO-M Plus, Caterpillar ECF-2 / ECF-1a, Cummins CES 20.078, Cummins CES 20.077 / CES 20.076, Deutz DQC III-10, Allison C4.

Chemical-Physical Characteristics

Golden Diesel HPS/A	Method analysis	Unit measure	Value SAE 10W/40
Density at 15°C	ASTM D1298	kg/l	0,870
Kinematic Viscosity at 40°C	ASTM D445	cSt	93,7
Kinematic Viscosity at 100°C	ASTM D445	cSt	14,1
Viscosity Index	ASTM D2270	-	155
C.C.S. Viscosity at -25°C	ASTM D5293	cP	6.700
HT-HS Viscosity at 150°C / 10 ⁶ s ⁻¹	ASTM D4683	cP	4,05
T.B.N. (Total Base Number)	ASTM D2896	mg(KOH)/g	10,5
Sulphated Ash	ASTM D874	% (w/w)	1,35
Flash Point (C.O.C.)	ASTM D92	°C	225
Pour Point	ASTM D97	°C	-38
Noack evaporability test	ASTM D5800	% (w/w)	12,0

The data just above refer to average values and must not be understood as guaranteed characteristics.

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0282.22

Golden Diesel HP/A

SAE 20W/50

Multigrade lubricant for all latest generation Diesel engines, and those equipped with EGR or SCR systems for the reduction of polluting emissions. Also suitable for gasoline engines.

PAKELO GOLDEN DIESEL HP/A SAE 20W/50 is a multigrade lubricant developed for Diesel engines of latest generation.

It is suitable for Heavy Duty and Light Duty Diesel engines of main world-wide Constructors.

Thanks to its particular additive package, PAKOLO GOLDEN DIESEL HP/A SAE 20W/50 satisfies nearly all main world-wide specifications for Heavy Duty Diesel Engines (trucks, buses, earth moving machines, etc.): specifically the product also satisfies the severe requests of American Specification **API CI-4** and European Specification **ACEA E7**.

International OEMs are asked to design low emission engines in order to meet more and more severe American and European standards regarding environmental pollution.

Such low emissions engines usually produce higher quantity of soot and need lubricants with high dispersant properties which allow to maintain soot in suspension without changing of viscosimetric characteristic during service.

To further improve the reduction of polluting emissions, mainly regarding the production of nitrogen oxides, specifications have been developed, such as the American API CI-4 and the European ACEA E7.

One of the ways to reduce the production of such substances is the adoption of the **EGR (Exhaust Gas Recirculation)** system.

Through the EGR system, part (sometimes also significant) of exhaust gas is made to re-circulate in the combustion chamber.

Acid particulate matter, carbon and nitrogen oxides are thus re-introduced in the combustion chamber. Such particles, by absorbing heat, decrease the maximum temperature that can be reached in the combustion chamber and as a consequence of this the total NO_x formation is reduced.

As a side-effect there is an increase of the soot produced in the combustion chamber and this means to require a further improvement in performance to the lubricant.

In fact, tests made with the same lubricant on the same engines, one with EGR, have highlighted higher wear increase due to soot in the engine with EGR system.

API CI-4 lubricants used in engines with EGR enable to have the same protection and reliability as in engines without EGR.

That means, when using API CI-4 lubricants for engines without EGR valve, there is higher protection if compared to lubricants that have not been studied for this application. This guarantees longer life and cleanness of engine.

0282.22

Golden Diesel HP/A

SAE 20W/50

An alternative solution to reduce emissions is to use the **SCR (Selective Catalytic Reduction)** system. In this case ammonia generated from urea, that comes from a specific tank, is injected into the exhaust gas over the catalyst to reduce the NO_x to water and molecular nitrogen.

Sometimes, the joint use of particulate traps allows further emissions reduction.

The American Specification API CI-4 and the European Specification ACEA E7 were designed for testing suitable lubricants for this kind of engines (EURO IV and EURO V type).

In particular, lubricants that meet the API CI-4 and ACEA E7 Specifications have to pass the following tests: oxidation controls, aeration, viscosity loss in service, deposit on pistons, corrosion, oil thickening due to soot, wear of liners, pistons, rings, oil consumption, cleanness of filters, compatibility with gaskets, used oil pumpability.

Furthermore, PAKELO GOLDEN DIESEL HP/A SAE 20W/50 exceeds performance levels of the main American Constructors (Cummins, Caterpillar, etc.) and European ones (Mercedes-Benz, MAN, Renault, Volvo, etc.) and it enables to consumers that possess wide range of vehicles to simplify the lubrication, saving money, space, time and possible filling mistakes.

The particular formula of PAKELO GOLDEN DIESEL HP/A SAE 20W/50 thus provides the following properties:

- **Viscosity Grade SAE 20W/50** particularly suitable for heavy duty services even with presence of high working and ambient temperatures;
- **high Viscosity Index** to guarantee a low power absorbance due to viscosity resistance during start-up at low temperatures and high viscosity at high temperatures to guarantee a suitable lubrication film;
- **excellent dispersant properties** that guarantee a great control of sludge and oil thickening also in case of high presence of soot and deposits. These phenomena are typical of modern engines that work at higher temperature due to the use of EGR system;
- **very high detergent properties** that guarantee cleanliness performance and long drain intervals;
- **low formation of lacquers and varnishes that form at low temperatures** specially during “stop-and-go” service;
- **high thermal-oxidative stability;**
- **low volatility;**
- **excellent wear control;**
- **anti-corrosive properties** to guarantee protection from combustion acid products and moisture caused by combustion and ambient;
- **anti-foam properties** to reduce or to remove discontinuity of lubricant film caused by excessive formation of inner foam;
- **good compatibility** with gaskets;
- **excellent pumpability** at low temperatures of used oil too, to guarantee the presence of the lubricant for all the engine moving parts right from the first working periods.

0282.22

Golden Diesel HP/A

SAE 20W/50

Application fields

PAKELO GOLDEN DIESEL HP/A SAE 20W/50 is a high performance lubricant recommended for heavy duty Diesel engines (industrial, earth moving, building site machines, heavy trucks, buses, etc.) also under severe working conditions.

The product has been formulated to satisfy the requirements of new generation low emission engines (EURO IV and EURO V type).

It is also suitable for earlier generation Diesel engines such as EURO III, EURO II type and previous ones.

It can be adopted to extend oil drain intervals, with respect of Constructors' recommendations and combined with a complete monitoring of oil in service through specific oil analyses.

Take always into consideration correct oil drain intervals to obtain maximum engine life.

Since PAKELO GOLDEN DIESEL HP/A SAE 20W/50 satisfies the Specifications for gasoline and light Diesel engines (ACEA A3/B4-04, API SL) it can also be used for mixed vehicle fleets.

Performance levels

The additive package used allows to satisfy, in the recommended Viscosity Grades, the following performance levels: **ACEA E7, ACEA A3/B3, API CI-4 / CH-4 / CG-4 / CF-4 / CF, API SL, MB 228.3 / 229.1, MAN M3275, Volvo VDS-3, Renault Trucks RLD-2 / RLD, MTU Type 2, Mack EO-N / EO-M Plus, Caterpillar ECF-2 / ECF-1a, Cummins CES 20.077 / CES 20.076, Deutz DQC III-10, Allison C4.**

Chemical-Physical Characteristics

Golden Diesel HP/A	Method analysis	Unit measure	Value SAE 20W/50
Density at 15°C	ASTM D1298	kg/l	0,896
Kinematic Viscosity at 40°C	ASTM D445	cSt	180,1
Kinematic Viscosity at 100°C	ASTM D445	cSt	19,9
Viscosity Index	ASTM D2270	-	128
C.C.S. Viscosity at -15°C	ASTM D5293	cP	8.900
HT-HS Viscosity at 150°C / 10 ⁶ s ⁻¹	ASTM D4683	cP	5,55
T.B.N. (Total Base Number)	ASTM D2896	mg(KOH)/g	9,2
Sulphated Ash	ASTM D874	% (w/w)	1,15
Flash Point (C.O.C.)	ASTM D92	°C	232
Pour Point	ASTM D97	°C	-25

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0282.18

Golden Diesel HP/A

SAE 15W/40

Multigrade lubricant for all latest generation Diesel engines, and those equipped with EGR or SCR systems for the reduction of polluting emissions. Also suitable for gasoline engines.

PAKELO GOLDEN DIESEL HP/A SAE 15W/40 is a multigrade lubricant developed for Diesel engines of latest generation.

It is suitable for Heavy Duty and Light Duty Diesel engines of main world-wide Constructors.

Thanks to its particular additive package, PAKOLO GOLDEN DIESEL HP/A SAE 15W/40 satisfies nearly all main world-wide specifications for Heavy Duty Diesel Engines (trucks, buses, earth moving machines, etc.): specifically the product also satisfies the severe requests of American Specification **API CI-4** and European Specification **ACEA E7**.

International OEMs are asked to design low emission engines in order to meet more and more severe American and European standards regarding environmental pollution.

Such low emissions engines usually produce higher quantity of soot and need lubricants with high dispersant properties which allow to maintain soot in suspension without changing of viscosimetric characteristic during service.

To further improve the reduction of polluting emissions, mainly regarding the production of nitrogen oxides, specifications have been developed, such as the American API CI-4 and the European ACEA E7.

One of the ways to reduce the production of such substances is the adoption of the **EGR (Exhaust Gas Recirculation)** system.

Through the EGR system, part (sometimes also significant) of exhaust gas is made to re-circulate in the combustion chamber.

Acid particulate matter, carbon and nitrogen oxides are thus re-introduced in the combustion chamber. Such particles, by absorbing heat, decrease the maximum temperature that can be reached in the combustion chamber and as a consequence of this the total NO_x formation is reduced.

As a side-effect there is an increase of the soot produced in the combustion chamber and this means to require a further improvement in performance to the lubricant.

In fact, tests made with the same lubricant on the same engines, one with EGR, have highlighted higher wear increase due to soot in the engine with EGR system.

API CI-4 lubricants used in engines with EGR enable to have the same protection and reliability as in engines without EGR.

That means, when using API CI-4 lubricants for engines without EGR valve, there is higher protection if compared to lubricants that have not been studied for this application. This guarantees longer life and cleanness of engine.

0282.18

Golden Diesel HP/A

SAE 15W/40

An alternative solution to reduce emissions is to use the **SCR (Selective Catalytic Reduction)** system. In this case ammonia generated from urea, that comes from a specific tank, is injected into the exhaust gas over the catalyst to reduce the NO_x to water and molecular nitrogen.

Sometimes, the joint use of particulate traps allows further emissions reduction.

The American Specification API CI-4 and the European Specification ACEA E7 were designed for testing suitable lubricants for this kind of engines (EURO IV and EURO V type).

In particular, lubricants that meet the API CI-4 and ACEA E7 Specifications have to pass the following tests: oxidation controls, aeration, viscosity loss in service, deposit on pistons, corrosion, oil thickening due to soot, wear of liners, pistons, rings, oil consumption, cleanness of filters, compatibility with gaskets, used oil pumpability.

Furthermore, PAKELO GOLDEN DIESEL HP/A SAE 15W/40 exceeds performance levels of the main American Constructors (Cummins, Caterpillar, etc.) and European ones (Mercedes-Benz, MAN, Renault, Volvo, etc.) and it enables to consumers that possess wide range of vehicles to simplify the lubrication, saving money, space, time and possible filling mistakes.

The particular formula of PAKELO GOLDEN DIESEL HP/A SAE 15W/40 thus provides the following properties:

- **good low temperature properties;**
- **high Viscosity Index** to guarantee a low power absorbance due to viscosity resistance during start-up at low temperatures and high viscosity at high temperatures to guarantee a suitable lubrication film;
- **excellent dispersant properties** that guarantee a great control of sludge and oil thickening also in case of high presence of soot and deposits. These phenomena are typical of modern engines that work at higher temperature due to the use of EGR system;
- **very high detergent properties** that guarantee cleanliness performance and long drain intervals;
- **low formation of lacquers and varnishes that form at low temperatures** specially during “stop-and-go” service;
- **high thermal-oxidative stability;**
- **low volatility;**
- **excellent wear control;**
- **anti-corrosive properties** to guarantee protection from combustion acid products and moisture caused by combustion and ambient;
- **anti-foam properties** to reduce or to remove discontinuity of lubricant film caused by excessive formation of inner foam;
- **good compatibility** with gaskets;
- **excellent pumpability** at low temperatures of used oil too, to guarantee the presence of the lubricant for all the engine moving parts right from the first working periods.

0282.18

Golden Diesel HP/A

SAE 15W/40

Application fields

PAKELO GOLDEN DIESEL HP/A SAE 15W/40 is a high performance lubricant recommended for heavy duty Diesel engines (industrial, earth moving, building site machines, heavy trucks, buses, etc.) also under severe working conditions.

The product has been formulated to satisfy the requirements of new generation low emission engines (EURO IV and EURO V type).

It is also suitable for earlier generation Diesel engines such as EURO III, EURO II type and previous ones.

It can be adopted to extend oil drain intervals, with respect of Constructors' recommendations and combined with a complete monitoring of oil in service through specific oil analyses.

Take always into consideration correct oil drain intervals to obtain maximum engine life.

Since PAKELO GOLDEN DIESEL HP/A SAE 15W/40 satisfies the Specifications for gasoline and light Diesel engines (ACEA A3/B4-04, API SL) it can also be used for mixed vehicle fleets.

Performance levels

ACEA E7, ACEA A3/B3, API CI-4 / CH-4 / CG-4/ CF-4 / CF, API SL, MB 228.3 / 229.1,

MAN M3275, Volvo VDS-3, Renault Trucks RLD-2 / RLD, MTU Type 2,

Mack EO-N / EO-M Plus, Caterpillar ECF-2 / ECF-1a,

Cummins CES 20.077 / CES 20.076, Deutz DQC III-10, Allison C4.

Approvals

Volvo VDS-3, Mack EO-N, Renault Trucks RLD-2.

Chemical-Physical Characteristics

Golden Diesel HP/A	Method analysis	Unit measure	Value SAE 15W/40
Density at 15°C	ASTM D1298	kg/l	0,886
Kinematic Viscosity at 40°C	ASTM D445	cSt	105,8
Kinematic Viscosity at 100°C	ASTM D445	cSt	14,2
Viscosity Index	ASTM D2270	-	139
C.C.S. Viscosity at -20°C	ASTM D5293	cP	6.900
HT-HS Viscosity at 150°C / 10 ⁶ s ⁻¹	ASTM D4683	cP	4,20
T.B.N. (Total Base Number)	ASTM D2896	mg(KOH)/g	9,2
Sulphated Ash	ASTM D874	% (w/w)	1,15
Flash Point (C.O.C.)	ASTM D92	°C	215
Pour Point	ASTM D97	°C	-34
Noack evaporability test	ASTM D5800	% (w/w)	12,2

The data just above refer to average values and must not be understood as guaranteed characteristics.

This Technical Data Sheet has been carefully checked to guarantee complete and precise information. However, we do not take any responsibility in case of damages caused by any mistakes or omissions. Due to continual product research and development, the information contained herein is subject to change without notification.



Volvo Group Trucks Technology

STD 417-0002 approval request

Data supplied by requesting company

Company name:*	Pakelo Motor Oil
Brand name:*	Golden Diesel HP-A
Oil code:	0282.18
Viscosity grade:	15W-40
Marketing area:	Worldwide
Other approvals:	ACEA E7-08 Issue 2
	API CI-4, SL
	OEM MB 228.3, M3275, MTU Type II

*) As they shall appear in approved products lists

Date of submission 12.09.2014

Submitted by

Name: Roberto Scolaro
 Company: Pakelo Motor Oil

Return approval to:

Name: Roberto Scolaro
 e-mail: roberto.scolaro@pakelo.it

Approval

Volvo VDS-3 approval	Yes
Mack EO-N approval	Yes
Renault VI RLD-2 approval	Yes

Approval date: September 17, 2014 **Approval #:** 417-0002-14-538

Validity: Approval expires two years after the approval date.
 For approval extension, a complete and updated approval form must be submitted at the expiry date ± two months.

Signed: Volvo Group Trucks Technology


 Bengt Otterholm
 Lubricants Coordinator

Disclaimer: This approval is solely based on information submitted by the applicant and no further quality check is made by Volvo. Hence, Volvo takes no responsibility to ensure that the quality of this product is continuously maintained. This is the sole responsibility of the Company (see above).

4288.18

Golden Diesel EVO

SAE 15W-40

Multigrade lubricant with MID S.A.P.S. technology (medium content of Sulphated Ash, Phosphorus, Sulphur) for Heavy Duty Diesel engines. Suitable also for the latest generation on-road and off-road Diesel engines.

PAKELO GOLDEN DIESEL EVO SAE 15W/40 is a multigrade lubricant, fully formulated with Group II mineral base-stocks, developed for latest generation Heavy Duty Diesel engines.

It is suitable both for on-road and off-road Heavy Duty Diesel engines of main International OEMs.

Thanks to its particular additive package and to the Group II mineral base-stocks used (better than traditional Group I mineral base-stocks), PAKELO GOLDEN DIESEL EVO SAE 15W/40 satisfies the severe requests of American Specification **API CJ-4** and European Specification **ACEA E9**.

Furthermore, the product has been developed to satisfy other OEMs Specifications such as **MB 228.31**, **Volvo VDS-4** and **Caterpillar ECF-3** both for on and off-road Heavy Duty Diesel engines.

In order to reduce polluting emissions International OEMs are using different combustion technologies and exhaust gas after-treatment devices (EGR, SCR, DPF, etc.).

All these systems are very sensitive to the presence of some chemical elements that could also be found in lubricants of recent formulation.

In particular the chemical elements that are considered to be harmful are:

- **Sulphur:** present in the additives and in solvent neutral base stocks;
- **Phosphorus:** generally bound to Zinc in order to give greater anti-oxidative and anti-wear protection;
- **Sulphated Ash:** mostly from detergent additives.

For the reasons we just referred to, there was the need to formulate lubricants with a lower content of these elements (MID S.A.P.S.). This brought to use innovative chemistry and special almost sulphur free mineral base oil (Group II).

MID S.A.P.S. lubricant technology is the main issue for the American Specification API CJ-4 and European Specification ACEA E9.

Several Diesel engines, in particular those adopting EGR system (Exhaust Gas Recirculation), show an increase of the produced soot when compared to standard Diesel engines without EGR. For this reason they require lubricants with increased anti-wear and soot handling performance.

The Specification API CJ-4 and ACEA E9 were designed for testing suitable lubricants with high detergent and dispersant properties.

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Golden Diesel EVO

SAE 15W-40

Furthermore, lubricants that meet the API CJ-4 and ACEA E9 specifications provide better anti-oxidative and anti-wear properties, less viscosity loss in service, less deposits on pistons, and better soot thickening and corrosion control.

The particular formula of PAKELO GOLDEN DIESEL EVO SAE 15W/40 thus provides the following properties:

- **MID S.A.P.S.** (medium content of Sulphated Ash, Phosphorus and Sulphur) **technology**;
- **suitable for long drains**; it enables *Extended Service Interval*;
- **excellent low temperature properties**: easy start-ups at very low temperatures to guarantee the lubricant action for all the engine moving parts right from the first working periods and to reduce to the minimum the hazards of wear;
- **higher thermal-oxidative stability** also thanks to the base stocks used to formulate the product;
- **HT-HS** (High Temperature, High Shear) **value optimized** for severe and specific needs of modern Heavy Duty Diesel engines;
- **low formation of lacquers and varnishes** at low temperatures and in particular during stop-and-go service;
- **low volatility** of the product results into a very significant reduction of oil losses due to evaporation;
- **very high detergent properties** that guarantee cleanness performance and long drain intervals;
- **excellent dispersant properties** that guarantee a great control of sludge and oil thickening phenomena also in case of high presence of soot and deposits;
- **excellent wear control** in every working and ambient temperatures;
- **good compatibility** with gaskets;
- **excellent pumpability** at low temperatures of used oil too.

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Golden Diesel EVO

SAE 15W-40

Application fields

PAKELO GOLDEN DIESEL EVO SAE 15W/40 is a high performance lubricant recommended for the latest generation on-road and off-road Heavy Duty Diesel engines also working under severe conditions.

The product satisfies the main OEMs' performance levels and has been formulated for the requirements of new generation low emission Diesel engines. Furthermore, it can also be used in earlier generation Diesel engines.

PAKELO GOLDEN DIESEL EVO SAE 15W/40 can be adopted to extend oil drain intervals, with respect of Constructors' Recommendations and combined with a complete monitoring of oil in service through specific oil analyses.

Please also follow recommended oil drain intervals to obtain maximum engine life.

Performance levels

API CJ-4 / CI-4 PLUS / CI-4 / CH-4 / CG-4, **API** SN / SM, **ACEA** E9, **MB** 228.31, **MAN** M3575, **Volvo** VDS-4, **Renault Trucks** RLD-3, **MTU** Type 2.1, **Mack** EO-O Premium Plus, **Caterpillar** ECF-3 / ECF-2 / ECF-1a, **Cummins** CES 20.081, **Detroit Diesel** 93K218, **Deutz** DQC III-10LA.

Chemical-Physical Characteristics

Golden Diesel EVO	Method analysis	Unit measure	Value SAE 15W-40
Density at 15°C	ASTM D1298	kg/l	0,870
Kinematic Viscosity at 40°C	ASTM D445	cSt	115,0
Kinematic Viscosity at 100°C	ASTM D445	cSt	15,4
Viscosity Index	ASTM D2270	-	142
C.C.S. Viscosity at -20°C	ASTM D5293	cP	6.900
HT-HS Viscosity at 150°C / 10 ⁶ s ⁻¹	ASTM D4683	cP	4,35
T.B.N. (Total Base Number)	ASTM D2896	mg(KOH)/g	8,5
Sulphated Ash	ASTM D874	% (w/w)	1,0
Typical phosphorus content	ASTM D5185	ppm	1.100
Typical sulphur content	ASTM D5185	ppm	3.700
Flash Point (C.O.C.)	ASTM D92	°C	220
Pour Point	ASTM D97	°C	-33
Noack evaporability test	ASTM D5800	% (w/w)	12,5

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4026.27

Gear Oil EP/E GL-5

SAE 85W/140

Lubricant for mechanical transmissions, not limited slip differentials and final drives.

PAKELO GEAR OIL EP/E GL-5 SAE 85W/140 is a mineral based lubricant specific for heavy loaded gears and in general all couplings working under very heavy working conditions where the following performances are required: API GL-5 and MIL-L-2105D.

The particular and updated performance additive package confers to PAKELO GEAR OIL EP/E GL-5 SAE 85W/140 high anti-oxidative, anti-rust, anti-wear, anti-foam properties and excellent EP (**Extreme Pressure**) performances.

The EP additivation prevents wear phenomena due to scoring, ruffle, abrasion and stretching of gear cogs (also hypoid).

4026.27

Gear Oil EP/E GL-5

SAE 85W/140

Application fields

PAKELO GEAR OIL EP/E GL-5 SAE 85W/140 can be used for mechanical transmissions in general, gearboxes, differentials (not limited slip) and reduction units where a lubricant with API GL-5 performance level is requested.

The choice of suitable viscosity grades must be made in compliance with Recommendations from Constructors and according to ambient temperatures.

Performance Levels

API GL-5, MIL-L-2105D.

Chemical-Physical Characteristics

Gear Oil EP/E GL-5	Method analysis	Unit	Value SAE 85W/140
Density at 15°C	ASTM D1298	kg/l	0,911
Kinematic Viscosity at 40°C	ASTM D445	cSt	414,6
Kinematic Viscosity at 100°C	ASTM D445	cSt	28,5
Viscosity Index	ASTM D2270	-	96
Brookfield Viscosity at -12°C	ASTM D2983	cP	85.000
Flash Point (C.O.C.)	ASTM D92	°C	> 210
Pour Point	ASTM D97	°C	-14

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