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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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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.

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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.

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.