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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, PAKELO 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.

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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.

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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.