



DESCRIPTION

Environmental awareness, subsidies, and proven reduction in operating costs are leading drivers to install natural gas fuel systems on their vehicles, especially LPG. The LPG commonly found on the market is made up of 40% butane and 60% propane, which has a higher octane number. SYNECO examined a few samples of gas available on the market, finding foreign substances such as olefins and other pollutants derived from the LPG production process, as, for example, furfural, which is a product used both as a solvent in lubricant refinement and as a tracer in household LPG.

SYNECO has also been able to run hardness and elasticity tests on the membrane controlling the LPG flow inside the combustion chamber, which often wears out prematurely, putting the whole system out of use.

The increase in surface hardness of the aforementioned membrane confirmed the hypothetical presence of olefins that stiffen the elastomer's surface, weakening it as it undergoes the continuous strains it is subjected to.

SYNECO approached the problem scientifically and came up with an additive for LPG that solves the problems related to the widespread presence of polluted LPG throughout the distribution network.

PROPERTIES

The presence of pollutants inside the fuel system's conducts causes the wearing out of the rubber pieces and gaskets, which in turn leads to the degradation of the entire fuel system. Furthermore, it causes the formation of carbon residues that clog up the filter and may precipitate in the oil, increasing the risk of premature oxidation.

SYNECO TOP GPL, a product formulated with innovative detergent and dispersion technologies, separates the pollutants from the liquefied petroleum gas, keeps the fuel system clean, guaranteeing regularity of combustion, cleanliness of injectors and filters, and easy cold starts.

Difficulty to start the engine and a certain "jerkiness" in its performance are very often caused by deposit formation on the injectors. Regular use of the additive allows to efficiently hinder the formation of these deposits and greatly reduce fuel consumption as well as pollution.

The deposits observed on certain elastomeric parts are particularly crucial.

SYNECO TOP GPL has been developed to optimize the functioning of the fuel system of cars powered by LPG, guaranteeing cleanliness and lubrication of injectors and intake valves in a broad range of engines. The detergent effect has been demonstrated by numerous tests performed in the most important research laboratories and the results are shown in the following charts.

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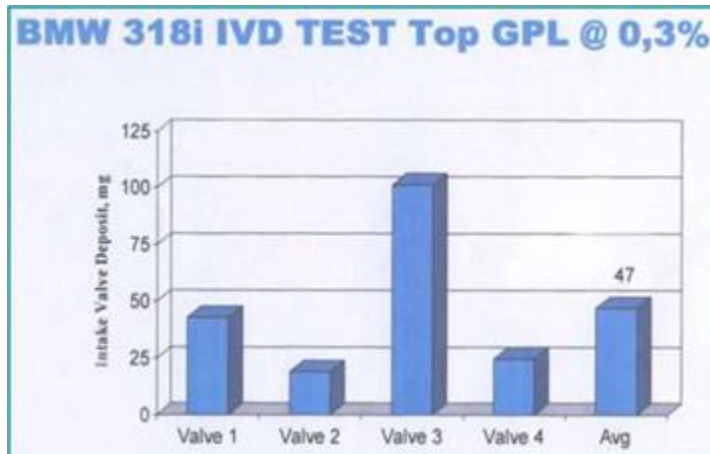


Chart 1: deposits that formed on the intake valve

Chart No.1 shows the values in mg of soot quantities on the intake valves of a BMW engine powered by LPG. As it can be clearly observed by examining also chart No.2, carbon deposits on the valve seats have undergone a 50% reduction by using SYNECO TOP GPL additive. It is important to notice in the following charts how greater valve cleanliness increases the air intake flow compared to a valve whose opening is slightly reduced by the presence of carbon residues.

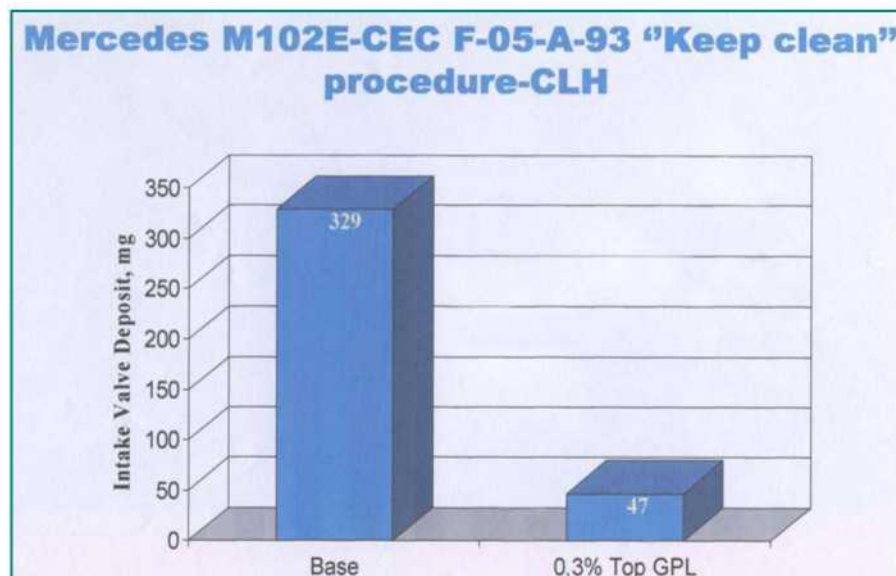


Chart 2: benefits of using TOP GPL in relation to deposits on the intake valve

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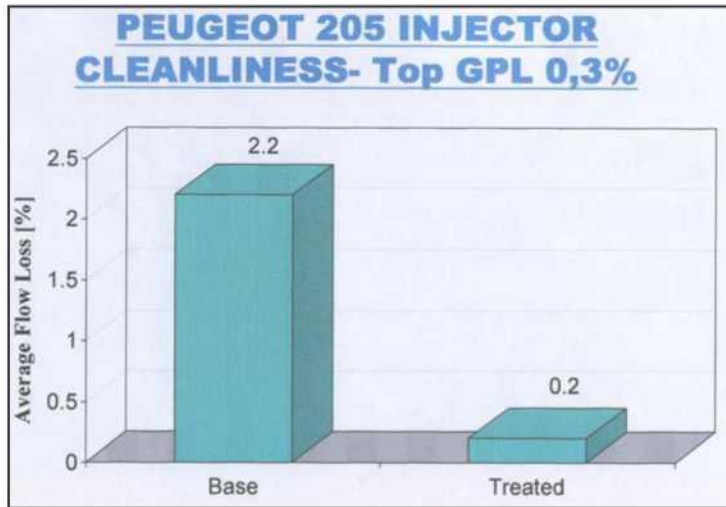


Chart 3: benefits in using TOP GPL in relation to loss of intake flow

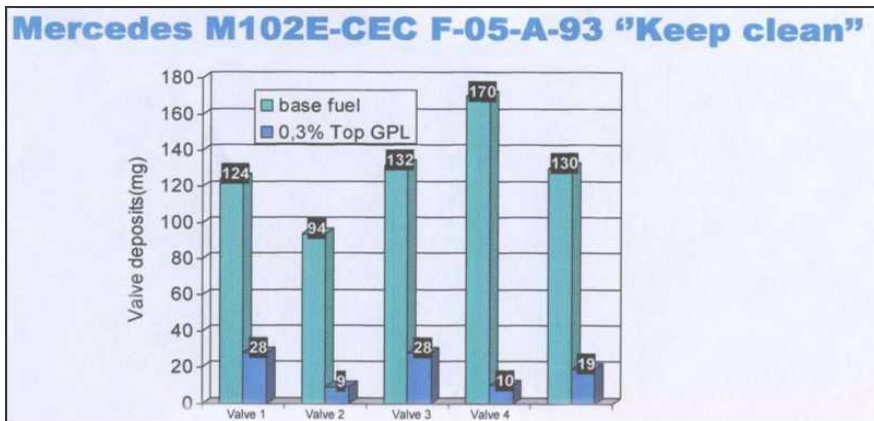


Chart 4: benefits in using TOP GPL in relation to valve deposits

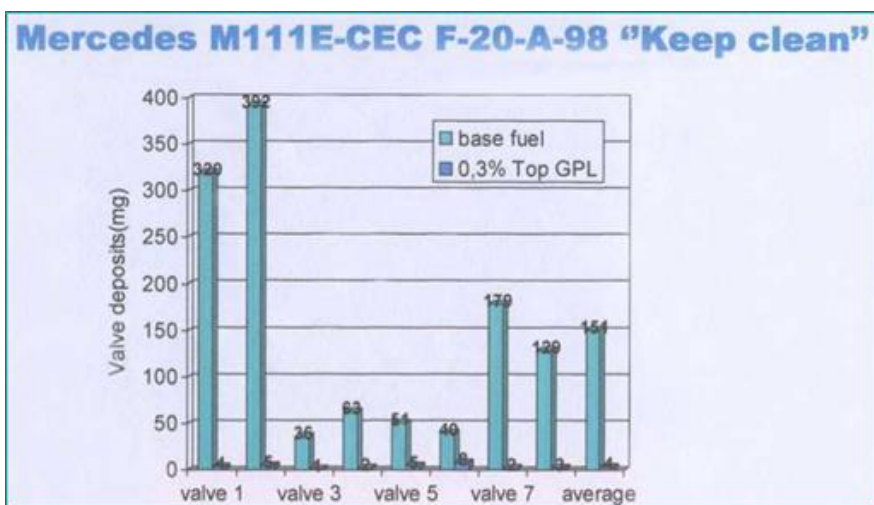


Chart 5: benefits in using TOP GPL in relation to valve deposits

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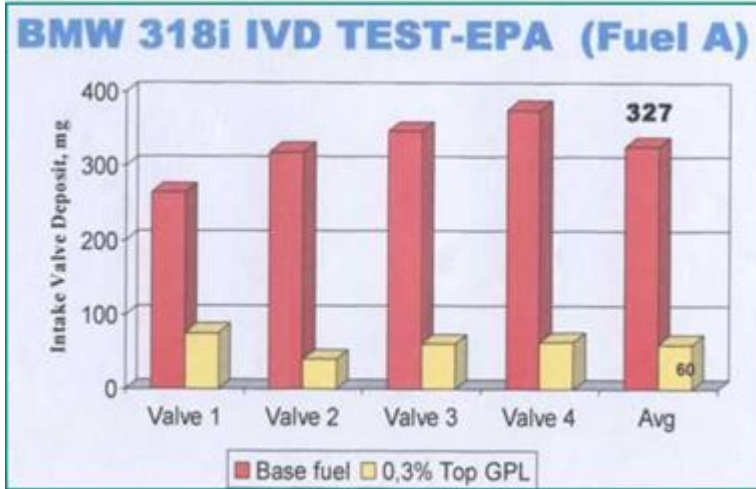


Chart 6: benefits in using TOP GPL in relation to valve deposits

The action of **SYNECO TOP GPL** guarantees good protection against corrosion and assures good compatibility with materials that make up the fuel system. **SYNECO TOP GPL** also helps to eliminate any traces of water in the tank, protecting it from deposits and corrosion.

Compatibility tests have been performed with aluminum (7570 - T6, UNS A97075), bronze, and with high-density polyethylene, after which the product was considered suitable.

| MATERIAL | RESULT |
|----------------------------------|----------------------------|
| Aluminum (7570 - T6, UNS A97075) | No surface variation |
| Brass (CDA 443) | No surface variation |
| Viton | Recommended |
| High-density polyethylene | Minimum surface variations |
| Low-density polyethylene | Not recommended |
| Polypropylene | Not recommended |
| PVC | Not recommended |

The product has been developed by the Syneco laboratory, so as to guarantee perfect compatibility and solubility with LPG.

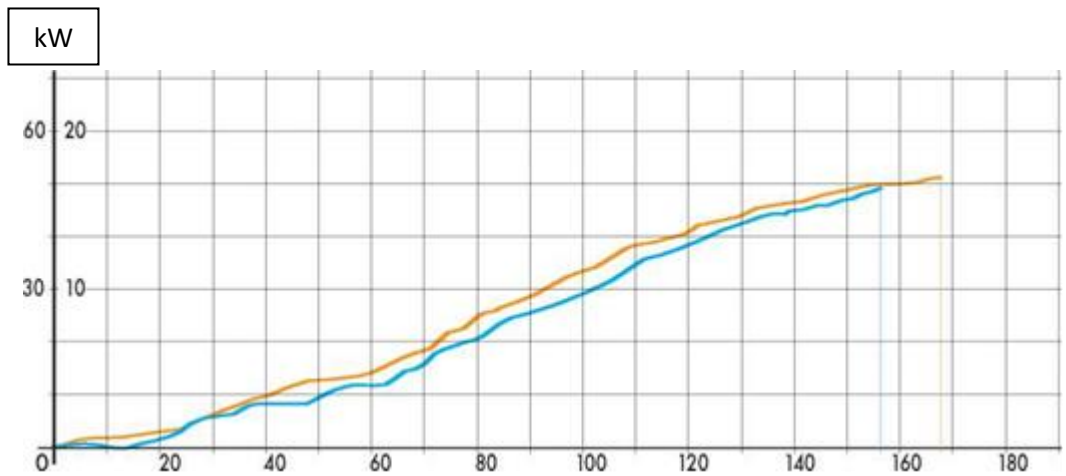
Further stability tests have shown perfect miscibility even with high concentrations (a 25% v/v solution of the product). After one month of storage no separation of the product from the fuel was detected.

The product heightens the lubricating properties of the fuel in which it is dissolved.



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The detergent and dispersing action of SYNECO TOP GPL is particularly recommended in engines of high-mileage vehicles, where use of the additive helps remove fuel system deposits. Furthermore, as highlighted by the bench test performed (Bosch), use of an additive allows to obtain an increase in power, reach greater speeds (10km/h higher), and allows to the engine to function more regularly.



INSTRUCTIONS FOR USE

Since the LPG tank's internal pressure is greater than the outside atmospheric pressure, it isn't possible to inject the **SYNECO TOP GPL** additive without using the appropriate tool. 150cc of **SYNECO TOP GPL** per full tank of LPG is the recommended amount.



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CHEMICAL-PHYSICAL CHARACTERISTICS

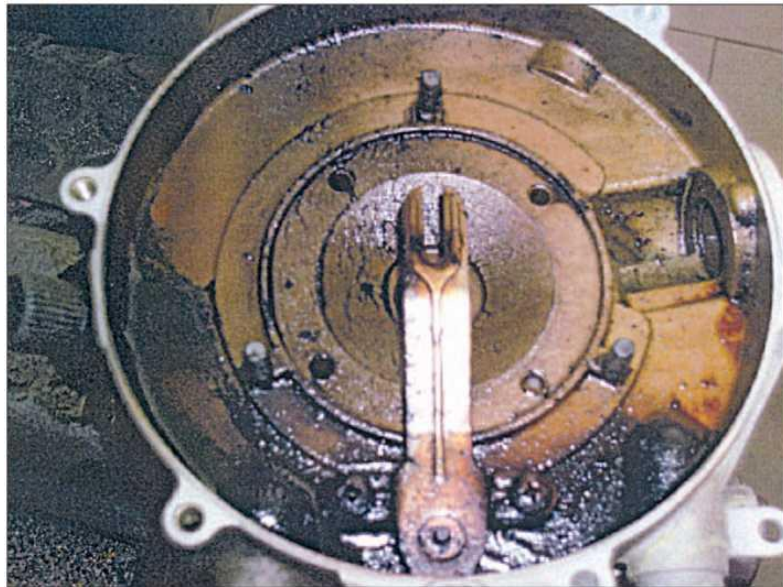
Density at 15°C kg/l : 0.760-0.800

Appearance : light-colored transparent liquid

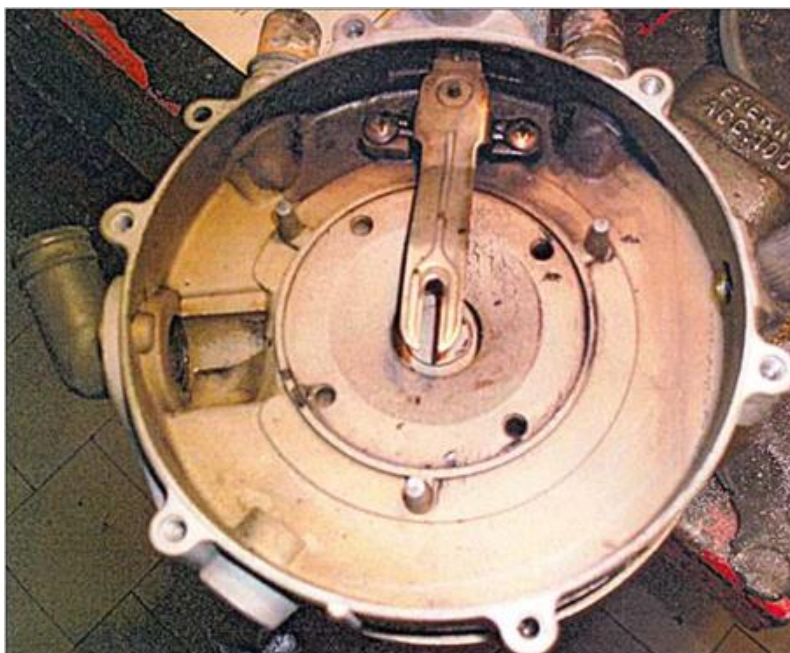
(The above values refer to normal industrial production and do not constitute technical specification.)

EXAMPLE OF PRODUCT APPLICATION

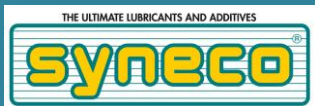
1. VISUAL ANALYSIS OF A PRESSURE REGULATOR BEFORE INJECTION OF THE ADDITIVE



2. ELIMINATION OF THE RESIDUES PRESENT IN THE APPARATUS IS CLEARLY VISIBLE AFTER ONLY TWO TREATMENTS USING THE **TOP GPL** ADDITIVE



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SYNECO TOP GPL

SPECIFIC ADDITIVE FOR PROTECTING AND CLEANING
LPG FUEL SYSTEMS

TECHNICAL
BULLETIN

Version 3.1

Correlated products:

In addition, SYNECO offers:

- **SYNECO PLUS PETROL:** for the start-up phase of gas engines. This is an additive for gasoline that improves lubricity inside the combustion chamber and facilitates engine start-up. It also reduces the number of paraffin elements and pollutants.

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