

SAFE, FAST and ACCURATE Analysis with the Da Vinci Europe Liquefied Gas Injector

Innovative solution for LPG Producers, LPG Cargo Handlers, Auto Manufacturers, Refiners, Chemical Plants, Users of the International methods ASTM D2158, EN 15470 or EN15471.

The challenges many of you are facing in the analysis of oily residues in LPG are safety, analysis time, and accuracy. Conventional methods such as ASTM D2158, EN 15470 and EN 15471 have known limitations in terms of being labor intensive, time consuming environmentally unfriendly as well as not providing the source of contamination in the LPG.



Addressing the Analytical Challenge of Oily Residue Analysis

The Da Vinci Europe (DVE) Liquefied Gas Injector complies with the new ASTM D7756-11 GC method for oily residue analysis in LPG.

The ASTM method for 'Residues in Liquefied Petroleum (LP) Gases by Gas Chromatography with Liquid, On-Column Injection' is now available as D 7756-11.

Da Vinci Europe laboratory solutions developed the Liquefied Gas Injector (LGI) that complies with this new ASTM method in close cooperation with Shell Global Solutions. With the new ASTM D7756-11 method you will now have an alternative analysis method that addresses your challenges with analyzing oily residues in LPG and at the same time improving the analysis in terms of safety, time and accuracy.

Advantages of ASTM D7756-11

- No Open Air Evaporation of LPG
- Faster Analysis time < 30 minutes
- Effective Waste Management
- Standard GC Analysis
- Indicates source of contamination

Direct On-column Injection

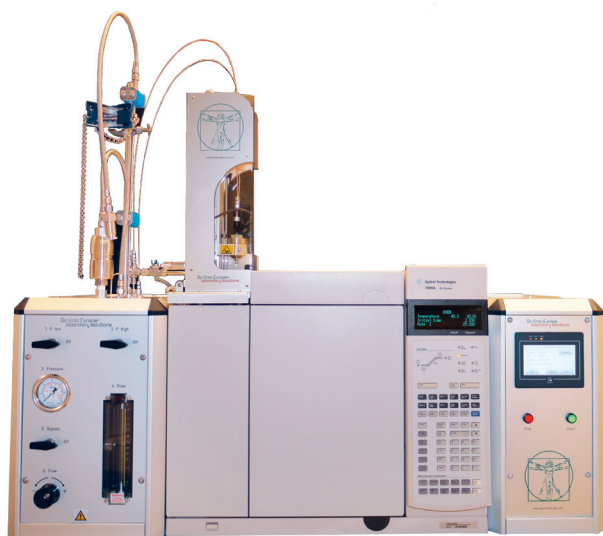
The LGI is able to inject gases in liquid phase under high pressure directly on-column through the proven Gasoline Direct Injector (GDI).

The GDI is used in the automotive industry to inject fuel in the combustion chamber. After injection, the GC analysis technique uses a vapor exit to flush the LPG light end fraction. The oily residue remains on the column and is separated by boiling point order. The result is reported as concentration in mg/kg (mass ppm).

The analysis range starts from 10 up to 600 mg/kg having a repeatability of less than 5% and a relative standard deviation between 2.4 and 4.7%. The required analysis time is less than 30 minutes.

Key Benefits of the LGI:

- Direct on-column injection on to GC up to 30 bar
- Fast analysis time of 30 minutes
- Repeatability less than 5%
- Proven Gasoline Direct Injector Technology (GDI)
- Sample size from 50 up to 500 ul
- Low maintenance solution
- Results are reported in mg/kg
- Chromatogram indicated composition of contamination to trace source.



Proven Technology

The DVE Liquefied Gas Injector was introduced in 2010. That same year the LGI was awarded the Best New Technology at the Gulf Coast Conference in Galveston, Texas. Since that time the LGI has been successfully sold and installed at customer sites in Africa, Australia, Asia, Europe and the U.S.A.



Envantage, Inc.
15585 NEO Parkway
Cleveland, OH 44128

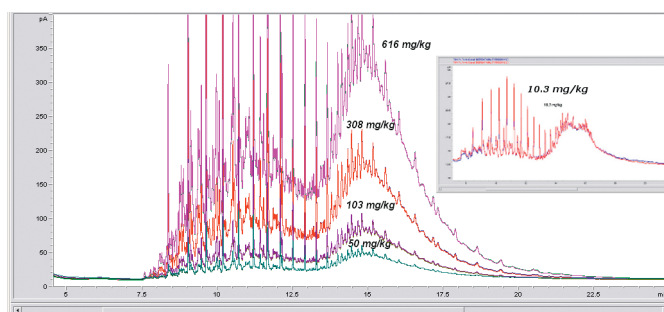
Phone 216-475-5919
Toll Free 1-800-216-7863
Fax 216-475-9954
www.envantage.com

New Applications for the LGI:

Mineral Oil in LPG

LPG offers several benefits over traditional fuels as LPG is a clean-burning transport fuel with a high energy content and the infrastructure is well developed. One of the fuel specifications for LPG concerns the amounts of oily residues, as these lead to troublesome deposits and material changes. Conventional test methods to specify the oily residues require the evaporation of large amounts of LPG and therefore present a high safety risk.

A new technique to determine the oily residues using a fast, safe and accurate method (ASTM D 7756-11) is based on Gas Chromatography combined with the LGI.



pTBC in Butadiene

The LGI can be used to determine pTBC in Butadiene. Results demonstrated that the relative standard deviation is less than 4% with an analysis time of 15 minutes. Also a proof of principle has been carried out successfully for the analysis of elemental sulphur and DIPA in LPG.

