Application Note

TELEDYNE
ADVANCED MONITORING SOLUTIONS
Everywhereyoulook™

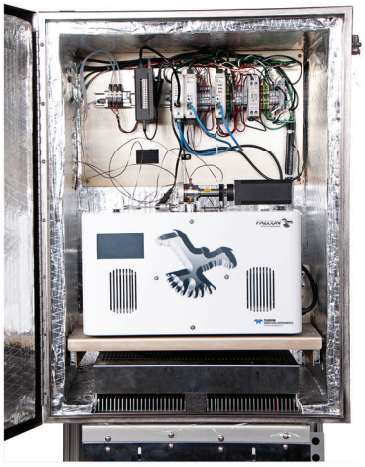
Simulated Distillation D7798

Reference Methods

ASTM D7798, D2887, D86

ASTM D7798 Simulated Distillation

SimDist GC analysis for liquid fuels and fuel component characterization by boiling range distribution including gasoline range organics up through gas oil and even crude oil (i.e. analysis for hydrocarbons to C_{50} in less than 5 minutes).



Application Overview

The Sample Processing Module with a standard split/split-less injection port, incorporating either a syringe through septum injection, Auto Sampler, or automated liquid sample valve delivers the sample to a Programmed Temperature Control Module (PTCM). The inlet includes septum purge to prevent bleed components from entering the system.

The PTCM is controlled by the method. It contains a MXT-1 High Temperature Resistively Heated Stainless Steel Capillary Column and is operated in a temperature programmed mode. The column provides the separation of the hydrocarbons in the liquid fuel sample.

The analyzer includes the Chromperfect® chromatography data system, fully integrated, with InfoMetrix® LineUp™ and Dragon SimDist© running on a Windows PC for liquid hydrocarbon characterization by boiling range and reports defined by ASTM D7798.

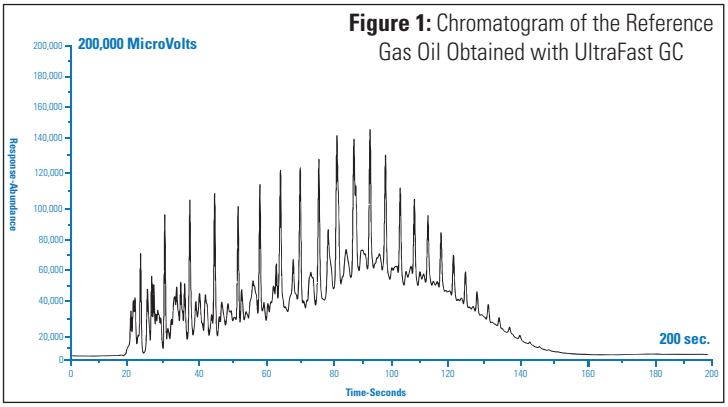


Figure 1: Chromatogram of the Reference Gas Oil Obtained with UltraFast GC

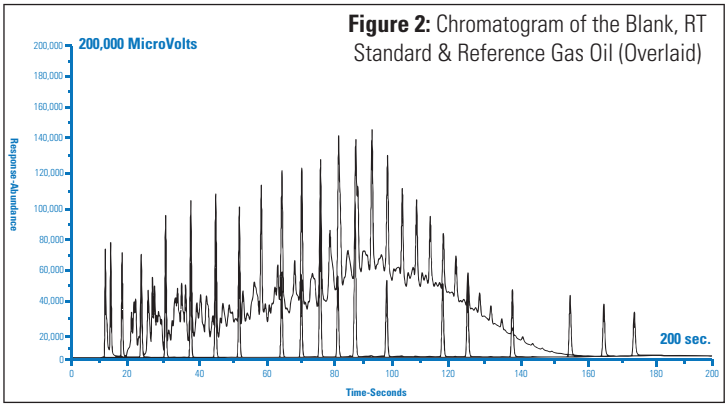


Figure 2: Chromatogram of the Blank, RT Standard & Reference Gas Oil (Overlaid)

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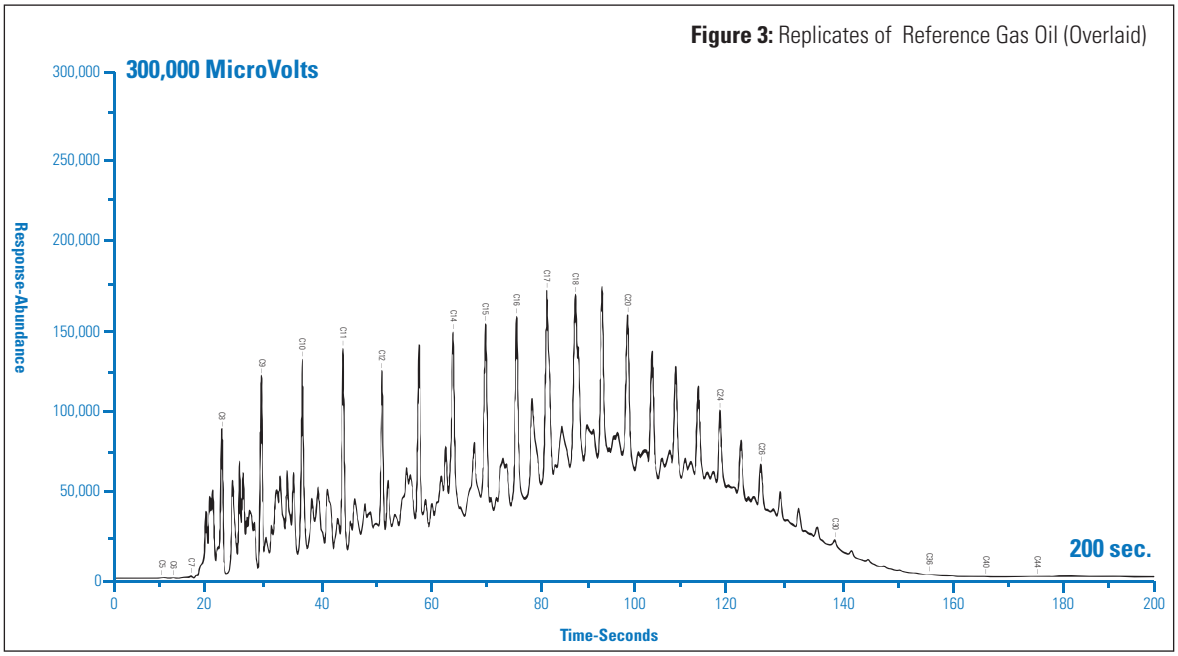

Figure 3: Replicates of Reference Gas Oil (Overlaid)

Implications

ASTM D7798 is a newer "Ultra-fast GC method" and is based upon "directly heating the column" at rates 10-15 times that of conventional GC, resulting in analysis times much faster than D2887.

- Precision of D7798 is 2-3 times better than D2887
  - Better precision allows blending to the BP of specific products by moving more heavy molecules from a less profitable to a more profitable product
- Enables greater product throughput for increased revenues and profits
- Smaller footprint means more bench top or analyzer shelter space. In the lab or plat, space is always at a premium
- Speed and precision for quicker turnaround
- Reduction in utility and maintenance cost (i.e. power and consumables)

Major Analytical Advantages

- Fastest analysis time in the industry for ASTM D7798, with excellent performance and reliability
- Incorporates patented Resistively Heated Stainless Steel Capillary Column Module and its thermal management system, resulting in a paradigm shift in GC analysis
- Area normalization and LineUp account for sample syringe volume and any retention time variance, providing more repeatable data results
- The most powerful, durable, compact and lightweight analytical solution for Ultra-Fast SimDis Analysis (43 cm L x 21.5 cm D x 27.9 cm W, 9.07 kg)

Specifications

Detector	Flame Ionization Detector, 4 meter column
Configuration	Direct liquid injection or process analysis with liquid sampling valve (LSV)
Utilities	UHP hydrogen carrier and FID fuel and zero air (99.999% pure)
Wattage	300 Watts (maximum)
Dimensions	17"W x 11"H x 8.5"W (43 x 22 x 28 cm) Approximately 25 lbs (11 kg)

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