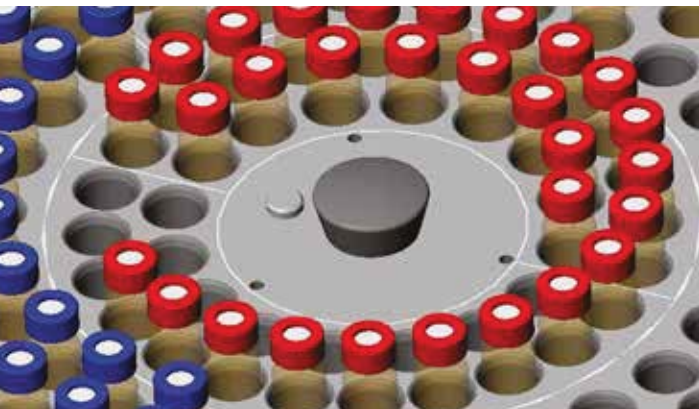




# DHA Analyzer Family

- Optimized Solutions for Detailed Hydrocarbon Analysis



The DHA Analyzer is a complete high resolution gas chromatography solution for the analysis of hydrocarbons in petroleum streams. It is capable of performing all of the standard methods including the analysis of light petroleum streams and crude oil light end.

**Key Benefits include:**

■ **Compliant with all industry standard methods**

Be confident using Scion's DHA Analyzers, which are configured in accordance with all the established standard methods including ASTM D6729, D6730, D6733, D5134, D6623, IP 344/DHA "Front End" and "Fast DHA"

■ **Complete and fully integrated solution**

DHA Analyzers come complete with everything you need to be up and running quickly.

■ **Powerful and easy-to-use analyzer**

With relatively little training, operators can generate outstanding analysis results day after day.

■ **Save time**

Easily generate reports with a few mouse clicks and reduce analysis time using "Fast DHA," increasing lab productivity.

■ **Single vendor solution**

Scion's GC analyzers are built and tested at Scion's factory, as well as installed and performance-verified on-site by Scion trained and certified engineers. Rest assured that our analyzers can meet or exceed your needs throughout the instrument's lifetime.



## ● DHA Analyzer Family

Detailed hydrocarbon analysis is often the preferred technique to fully characterize petroleum streams. The technique is based on the identification of individual components using high performance, high resolution capillary gas chromatography.

### Software Ensures Accurate Identification

To successfully apply gas chromatography to detailed hydrocarbon analysis (DHA) the analyzer must be able to correctly identify a large number of components (many eluting very closely to one another) in a complex chromatogram. The identification is based on a comparison of their individual retention index values to those in a pre-established database. Therefore, it is extremely important that the analyzer functions in a highly repeatable manner.

Because the concentration of some of the individual components can vary considerably from stream to stream, the retention times for those peaks can shift slightly. This "shift" can lead to component misidentification, particularly with peaks that elute extremely close together or

those that may partially co-elute. Scion's based DHA software includes a unique Peak Asymmetry Correction Algorithm to overcome this challenge. It accurately predicts the peak identity even if there is a large concentration change. This dramatically simplifies the operator's job because a single analysis method/retention index database can be used for widely different streams.

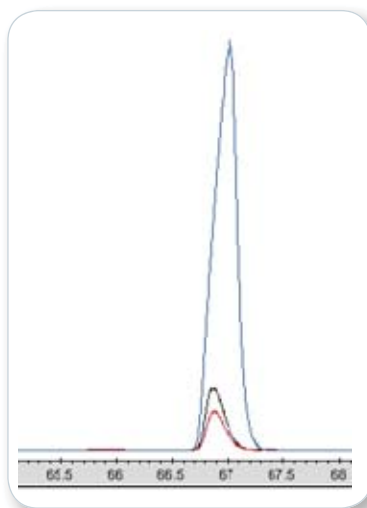


Figure 1: Column overloading has caused a retention time shift by almost 15 seconds. But with the unique peak asymmetry correction algorithm, the retention time is correctly predicted allowing the use of a single database

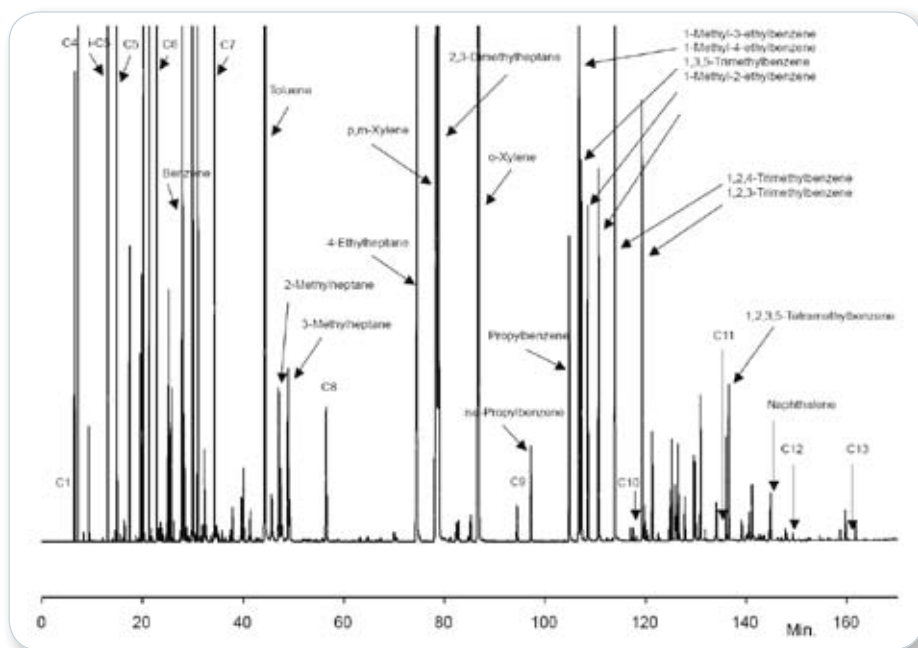


Figure 2: Detailed hydrocarbon analysis of a reformate sample showing aromatics identification according ASTM D6730

## ● Standard Methods

### Selecting Individual Peaks and Updating the Database

The DHA software includes a Peak Select and Database Update function to make identification of unknown peaks as straightforward as possible. The system automatically provides the operator with detailed comparative retention index information for each “unknown” peak including a highlighted “best fit” indicator, making it easy for the operator to determine the ID.

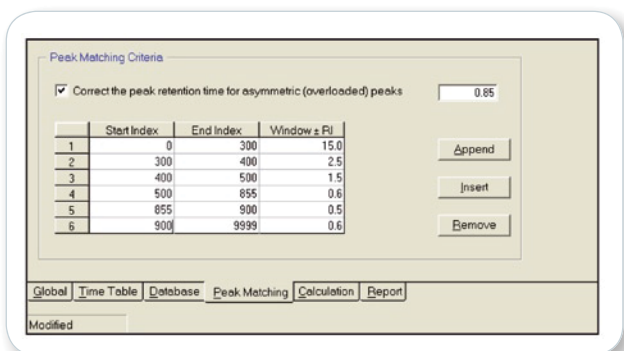


Figure 3: Assigning custom peak matching criteria is easy.

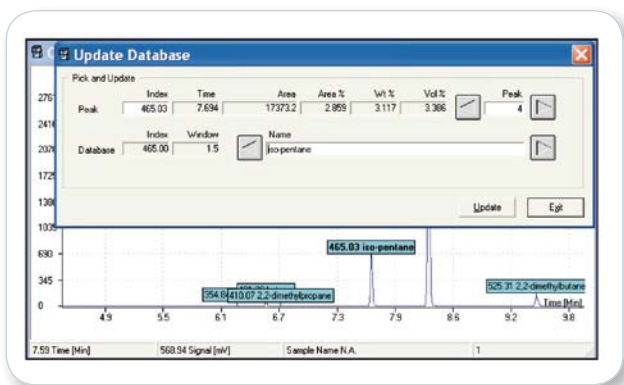


Figure 4: DHA provides an easy-to-use graphical means to select peaks and update the database

### Integrated Standard Test Methods

Scion's DHA analyzers are compliant with the following methods:

- ASTM D6729
- ASTM D6623
- ASTM D6730
- “Fast” DHA
- ASTM D6733
- IP 344 “Front end”
- ASTM D5134



Figure 5: Choosing a preferred standard method is easy with the DHA software

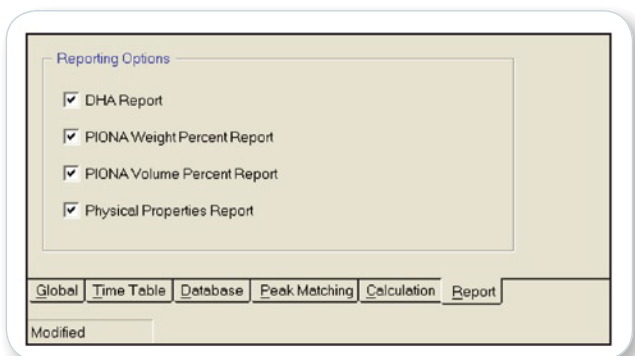


Figure 6: Choosing report options is simple

Although each DHA analyzer is configured, tested and certified at the factory for a standard method specified by the customer, the DHA software permits the operator to utilize any of the other popular standard methods as well. And, because of the outstanding performance and flexibility of the 450-GC and compass CDS software design, Scion is able to quickly modify the existing methods or add new ones if required as a result of the on-going “dynamic” industry standard processes.

### Powerful Reporting is Built-in

Scion's DHA software includes several report options to accommodate the standard methods and/or to meet the customer's special needs. These include:

- Carbon number distribution
- PIONA report; (weight and volume percentage by hydrocarbon group)
- Physical properties calculations; specific gravity and molecular weight
- True distillation profile
- RON/MON specification

## ● Reduce Sample Analysis Time With “Fast DHA”

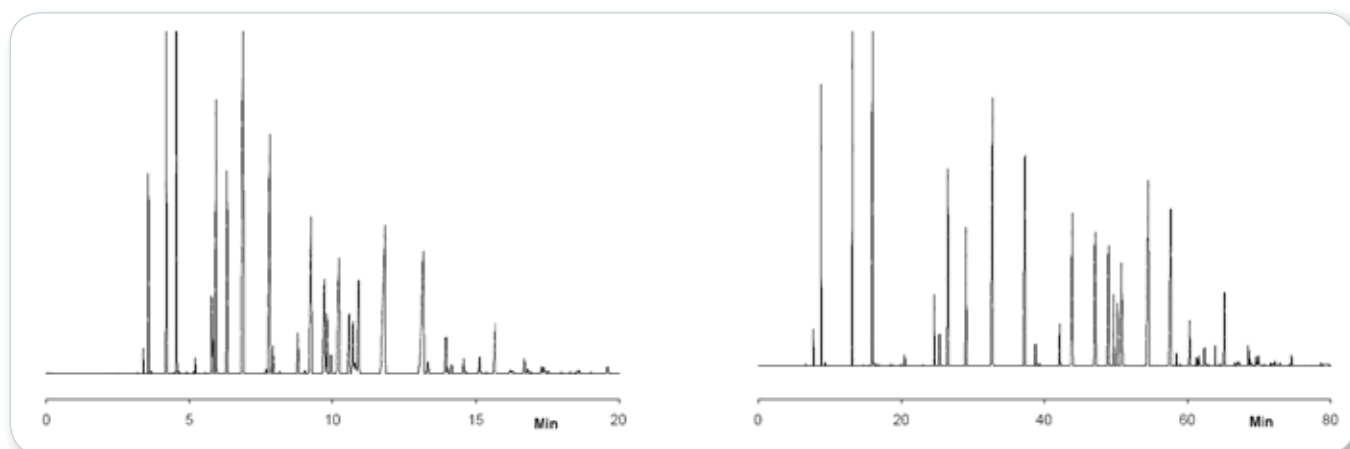


Figure 7: These chromatograms illustrate the decreased analysis time using the “Fast DHA” method. Chromatogram of a naphtha sample run on a 40 m X 0.10 mm X 0.2 µm film CP-Sil PONA CB using the “Fast DHA” method (left). Chromatogram of the same sample, but run on a 100 m X 0.25 mm ID X 0.5 µm film CP-Sil PONA CB column using standard method D6729 (right). Note reduced analysis time from ~80 minutes to ~20 minutes; almost four-fold.

### DHA Analyzer Includes These Key Components

- Scion 456-GC high performance gas chromatograph equipped with:
  - Split/splitless capillary injection port
  - High performance capillary column (dependent on specified method on order)
  - Flame ionization detector (FID)
  - Full electronic flow control (EFC) of all gases
- State of the art backflush capabilities for the IP 344 „Front End” method
- CP-8400 or CP-8410 automatic liquid sampler
- compass CDS for system control, data acquisition and report generation
- compass CDS based DHA application software
- Computer/monitor
- Pre-loaded standard methods
- Factory test
- Reference chromatogram
- Reference standard for use in conducting on-site performance verification

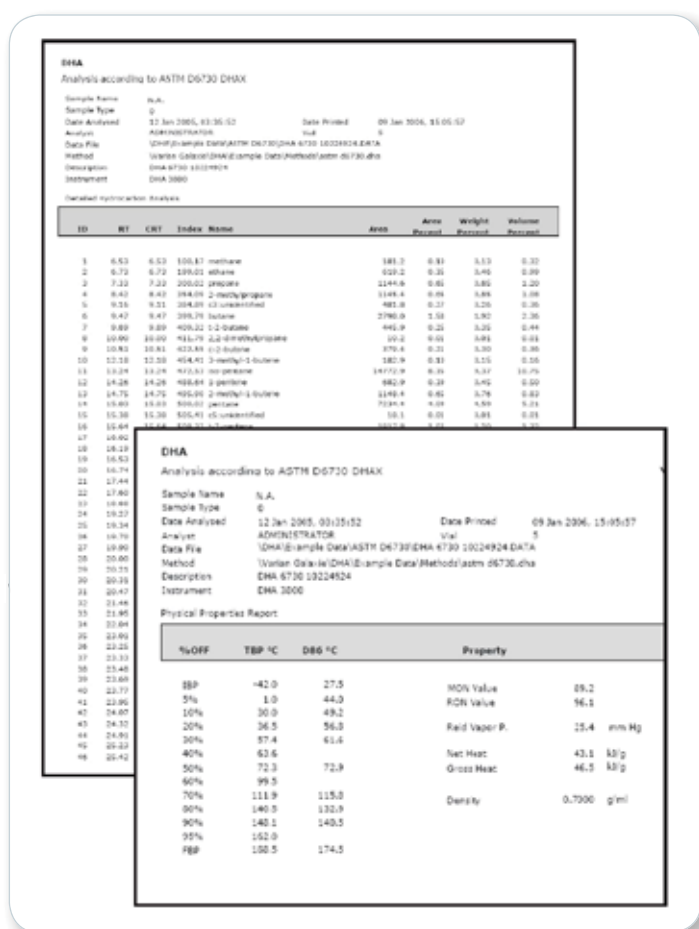


Figure 8: Physical properties and detailed hydrocarbon report

# Chemical Analysis Solutions

## GC quadrupole mass spectrometers

The Scion MS delivers the performance you've come to expect from an industry leader in quadrupole innovation. It features an 1200 Da mass range, superior negative ion sensitivity, and unmatched robustness in its performance class. The Scion MS delivers femtogram sensitivity and a wide array of chromatographic and ionization configurations to uniquely match your needs - all in less than 72 cm. (28 in.) of linear bench space!



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