Simulated Distillation Analyzers

- A full range of simulated Distillation Analysis Solution
Bruker’s range of Simulated Distillation Analyzers provide boiling point distribution up to 750 °C. Designed to meet all industry standard methods, Bruker’s analyzer software includes both ASTM D86 and ASTM D1160 correlations.

A gas chromatographic (GC) technique, Simulated Distillation (SimDist) reproduces the physical distillation of petroleum materials and products by determining boiling point distribution. Used for controlling refinery operations, Bruker’s range of SimDist analyzers deliver fast, accurate standard test method results. Bruker’s highly automated 450-GC, Galaxie™ Chromatography Data Handling Software, and integrated SimDist software are also designed to meet worldwide industry standard test methods.

Key Benefits include:

- **Accurate boiling point distribution up to 750 °C**
  The Bruker SimDist Analyzer range tests a variety of distillates, blends, fuels, residues and crude oil, ranging from carbon number C₁ to C₁₂₀ and higher. This enables refinery processes to be monitored and controls product quality with fast, accurate boiling points versus mass distributions up to 750 °C.

- **Integrated standard test methods**
  Bruker offers SimDist analyzers with built-in applications to help monitor refinery processes and control product quality. These applications fully comply with ASTM, IP, DIN and ISO standard test methods used globally. New methods will be added to Bruker’s SimDist software as they are approved and released.

- **Complete control from initial setup to final report**
  The SimDist analyzers are controlled by Bruker’s advanced Galaxie Chromatography Data System software package. The SimDist software is fully integrated into Galaxie for system operation, automation, calibration and report generation.

- **ASTM D86 and ASTM D1160 correlation**
  SimDist software includes both ASTM D86 and ASTM D1160 correlations. Dedicated to a sample type, these correlations are crude independent. With the fully automated Bruker SimDist Analyzer, data is generated rapidly and with increased precision, making ASTM D86 and ASTM D1160 correlations faster and easier.
Operational Simplicity For All SimDist Methods

Bruker’s Galaxie™ Software has pre-programmed settings which streamline instrument setup, analysis and reporting to ensure outstanding data precision and reproducibility. Once the preferred industry standard method is selected, Bruker’s SimDist software automatically corrects any offset to the baseline signal and removes the blank analysis to provide a corrected net area and precise boiling point data. In addition, users may choose to modify individual settings to suit their specific requirements.

Figure 2: Standard Test Methods

Figure 3: Easy to use industry standard test methods are fully integrated into Bruker’s SimDist software.

Figure 4: The intuitive interface enables easy adjustments of integration parameters and result overlays.
Modification of Variables

ASTM D86 and ASTM D1160 Correlation Editor

As the composition of raw materials and intermediates change, the ability to modify the ASTM D86 or ASTM D1160 variables to improve correlation results is required. The Correlation Editor also allows new correlation data at the 40%, 60% and 95% cut-off points to be generated for additional information between the two methods.

Built-in Reports

Bruker’s SimDist software provides a wide variety of report options to meet specific lab requirements including:

- Chromatogram with merged corrected blank analysis and IBP/FBP marks versus retention time
- Table with boiling point versus percentage of sample
- Table and plot with retention time versus boiling point
- Table with D86 and D1160 correlations
- DIN Noak and motor oil volatility reports
- Table with cutpoints and fractions
- Residue analysis with recovery calculation up to C120

Simplified, Accurate Analysis

In order to obtain accurate results:

- Run a blank to obtain an accurate baseline signal
- Run a standard configuration to obtain retention time versus boiling point calibration
- Run the reference sample to validate system performance and to determine the response factor
- Analyze samples
SimDist Analyzer Specifications

Hardware
- Gas chromatograph: Bruker 450-GC (single or dual channel, or three channel)
- Injector: temperature controlled on-column injector for capillary columns full Electronic Flow Control (EFC)
- Column oven: with CO₂ sub ambient cooling
- Detector: FID with EFC control
- Computer: with monitor
- Autosampler: CP-8400 or CP-8410 autosampler with carousel heating and cooling plate

Software
- Bruker’s Galaxie™ system control, data acquisition and report generation software
- Bruker’s Galaxie SimDist application software (fully integrated)

SimDist Analyzer Configurations

Applicability
Seven standard configurations are available for the test methods listed in Table 1. Optional mode kits are also available to facilitate the change from one standard configuration to another. Each mode kit contains all the necessary components, including column and standard samples for a given configuration.

Table 1: Standard configuration methods.

<table>
<thead>
<tr>
<th>Configuration</th>
<th>Method</th>
<th>Sample Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ASTM D3710, ASTM D5399</td>
<td>Gasoline</td>
</tr>
<tr>
<td>2</td>
<td>ASTM D5399</td>
<td>Solvents</td>
</tr>
<tr>
<td>3</td>
<td>ASTM D2887, ISO 3924, IP 406</td>
<td>Petroleum fractions</td>
</tr>
<tr>
<td>4</td>
<td>Fast ASTM D2887</td>
<td>Petroleum fractions</td>
</tr>
<tr>
<td>5</td>
<td>Extended ASTM D2887, DIN 51.435</td>
<td>Petroleum fractions</td>
</tr>
<tr>
<td>6</td>
<td>ASTM D6352, IP 480, IP 507, IP 545</td>
<td>Petroleum distillates, residuals, crude oil</td>
</tr>
<tr>
<td>7</td>
<td>ASTM D5307</td>
<td>Crude petroleum</td>
</tr>
</tbody>
</table>

Figure 8: Diesel fuel analysis with fast 2887 SimDist method reduces analysis time by a factor of five compared to ASTM D2887 (6 rather than 30 minutes).
Chemical Analysis Solutions

**GC quadrupole mass spectrometers**

The Bruker 300-MS series GC/MS systems stand at the pinnacle of versatility for quadrupole mass spectrometer systems. Both the 300-MS and 320-MS are configurable as either single-quadrupole, or triple-quadrupole systems.

The 300-MS delivers the performance you’ve come to expect from an industry leader in quadrupole innovation. It features an 800 Da mass range, superior negative ion sensitivity, and unmatched robustness in its performance class. The 320-MS delivers femtogram sensitivity, 2000 Da mass range, 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! In minutes, our 300-MS series systems can be changed from EI to CI modes of operation. Easily, our 300-MS and 320-MS are the most sensitive, robust, and flexible quadrupole GC/MS systems currently available.

**ICP mass spectrometers**

Choosing an ICP-MS for your elemental analysis needs has never been easier with the Bruker 800-MS Series. The 810-MS is the instrument of choice for routine analysis with industry leading sensitivity and intuitive Web-integrated ICP-MS Expert software. The 820-MS features Bruker’s novel collision reaction interface (CRI), providing interference-free analysis and allowing you to tackle any application with ease. With a vast range of accessories, Bruker has the solution to all your ICP-MS application requirements.

For research use only. Not for use in diagnostic procedures.