

SIEMENS

**Advance Maxum
Simulated Distillation Process Chromatograph**

NC₄

C₃

Simulated
Distillation
System



Benzzene

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Advance Maxum Simulated Distillation Process Chromatograph

Introduction

Siemens Applied Automation provides what you need in Process Simulated Distillation Analyzers. The Advance MAXUM Programmed Temperature Gas Chromatograph (PTGC) is configured to perform applications in:

- Simulated Distillation
- Boiling Point Determination
- Motor Gasoline Characterization

The chromatograph can be installed in a plant or under process conditions, and meets all electrical and safety codes. It provides repeatable and reliable chromatographic analysis of process samples. Also, its powerful software system produces the calculated outputs required from a simulated distillation analyzer.

General Description

The Advance MAXUM PTGC is part of a family of process chromatographic analyzers. The unit includes an Electronics Controller to provide oven control, data reduction and outputs. The stainless steel lined Isothermal Analytical Oven includes restrictors, valves, and a flame ionization detector used for the chromatographic analysis of a sample. The software-controlled Programmed Temperature Column Compartment houses the capillary columns used for separation of process sample components and provides repeatable control of the column operating temperatures.

The high-reliability stainless steel sample conditioning system prepares process samples for delivery to the analyzer ovens. It employs high speed by-pass loops, rotameters, filters and other required conditioning hardware.

Chromatographic Technique

Plant samples are automatically injected onto Fused Silica Open Tubular Capillary Columns. During the analysis cycle, the programmed temperature oven containing the columns is ramped from starting to ending temperatures, then cooled.

Complete analysis of distillate products is normally performed in 15 – 20 minutes. Outputs are provided for various boiling points and component concentrations.



Our Programmed Temperature Gas Chromatographs are designed to give the precision and stability needed for process monitoring and control.

The Advance MAXUM performs the chromatographic method described in ASTM Specification D-3710 or optionally ASTM D-2887. Additionally, the Advance System improves on these methods by using FSOT columns and obtaining a higher chromatographic resolution than is indicated in the specifications.

The PTGC is capable of working with samples that have end boiling points up to 450 C (850° F).

Software and Outputs

A complete software package is supplied with the chromatograph. Application software, residing in RAM and customizable by the user, runs under the control of the EZ-Chrom operating system. The Siemens Applied Automation application package implements all control and timing functions required by ASTM D-3710 or ASTM D-2887.

The software package also provides for execution of the ASTM STP-577 correlation from D-3710 to D-86. Among the many adjustable factors, a user-entered adjustment factor ("K factor") table is provided to allow the user to make further adjustments to the STP-577 correlation outputs. Since D-86 is a laboratory-based, non-chromatographic technique, the correlation response varies with blend formulations, operating and ambient conditions and many other operating variables. This is why the Advance distillation package includes the software tools the analyst needs to adjust correlation parameters whenever required by changes in the blend or operating conditions.

The application software requires minimal user interaction and incorporates automatic gating, oven temperature

control, calculations and outputs. An automatic calibrated mode can be selected. In this mode, a standard sample, connected to the sample conditioning system is injected and analyzed automatically on a time-of-day or manually-initiated basis.

Component Concentrations

The software provides concentration outputs for any component or group of components, among them for C3, IC4, NC4, IC5, NC5 and Benzene. (Typical for gasoline analysis. Other fuels and some gasolines may contain interfering components.)

D-3710 or D-2887

Outputs are provided for the calculated temperatures at percent off levels of 0.5 (IPB), 10, 20, 30, 50, 70, 80, 90, 95 and 99.5 (FBP). Additional outputs are user-selectable because they don't interfere with the STP-577 correlations. Options for outputs for any temperature increment is also available.

STP-577

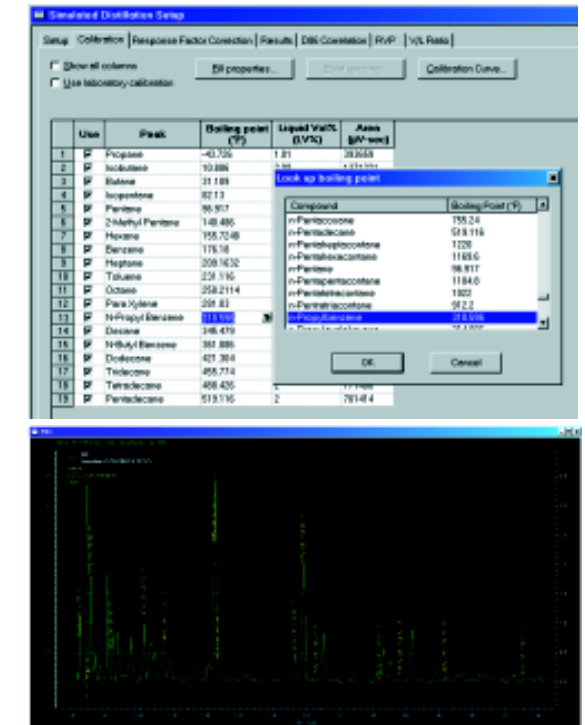
Correlated outputs are provided for the D-86 temperatures at percent off levels 0.5 (IBP), 5, 10, 20, 30, 50, 70, 80, 90 and 99.5 (FBP) or the percent off levels at temperatures 55, 60, 70, 100, 135, 150 and 180 °C .

Other Correlated Outputs

Special outputs are provided for Reid Vapor Pressure, Vapor to Liquid Ratio, Standard or Alternate Methods. Correlation performance can be optimized by the user to compensate for variations in blend, process conditions and other factors.



Analyzer maintenance and engineering functions can be performed at the analyzer using the MMI or via the computer workstation.



Typical calibration setup and chromatogram for an Advance Maxum Simulated Distillation System.

Key Design Features

Analyzer Dimensions:

26" wide x 16" deep x 36" high (66cmx41cmx90cm)
170 lb (77kg)

Power Requirements:

120/240 VAC 50/60 HZ. 28 Amp max at 120 VAC

Oven Air Requirements:

Standard Configuration: 50 psig (350 kPa) or higher, clean dry, oil free, 3 scfm (851/min) per oven. Some variations: 100 psig (690 kPa) at 20 scfm (570 liters/min.)

Electrical Area Classification:

Designed for use in NEC Class 1, Groups B, C, D, Division 1 or European Zone 1, hazardous locations and certified by CSA and CENELEC.

Installation Requirements:

Should be protected from weather. Ambient temperature from 0 - 122°F (-18°C - 50°C)

Repeatability of D-3710 Method:

±1.5°C (±3°F) over entire range; D-86 values are calculated by STP-577 methods and correlation accuracy is not specified.