

Boiling Point, Density and Cetane Index
in a Single Analyzer

MicroDist®


www.paclp.com



Surpassing Expectations with a Real Distillation

- Increase profitability through cut point optimization and minimal product giveaway
 - Robust process control through real distillation and cycle time in less than 10mn
 - Ensure full compliance with ASTM D86 & D7345 lab standards
- Optional density measurement to report density and boiling points in a single analyzer
 - Cetane Index Calculation in accordance with ASTM D4737 and D976

SURPASSING EXPECTATIONS WITH A REAL DISTILLATION

COMPLETE AND ACCURATE ONLINE DISTILLATION TECHNOLOGY IN ONLY 10 MINUTES!

The MicroDist™ analyzer is designed to determine in a fast and reliable way the boiling range characteristics of various commercially available petroleum products, light and middle distillates on process streams.

The easy-to-use MicroDist allows a complete distillation of the product in less than 10 minutes. The results obtained are correlated to the ASTM D86, ASTM D7345, ISO 3405 test methods and their analogs. Thanks to the fast and reliable measurements that match those obtained by quality control laboratories, the MicroDist allows a precise and continuous adjustment of the process streams.

✓ INCREASE
PROFITABILITY

✓ ROBUST AND
RELIABLE PROCESS
CONTROL

✓ EXCELLENT SYSTEM
PERFORMANCE

✓ INNOVATIVE
TECHNOLOGY FOR
HIGH AVAILABILITY



MICRODIST - LEADING TECHNOLOGY FOR ONLINE DISTILLATION

MicroDist has a clear differentiated advantage over existing technologies. MicroDist has been adopted around the world as the preferred on-line distillation solution at major firms. This preference is driven by MicroDist performance, ease of use and reliable operation that results in short investment payback and high ROI.

The optional density meter can be used as a standalone measurement, or used to calculate the Cetane Index in accordance with D4737 and D976.

EXCELLENT SYSTEM PERFORMANCE

With equivalent or better precision than D86 and excellent repeatability

- Direct correlation with ASTM D86 with equivalent or better precision and excellent repeatability (+/- 1.5°C)
- Validate calibration with reference stream (1+2 multi-stream option)
- Built-in nitrogen generator (optional) - facilitates operation with only instrument air (4-10 bar)



INNOVATIVE TECHNOLOGY FOR HIGH AVAILABILITY

High levels of automation and hardware advancements

- Real distillation eliminates the need for models or “simulated” distillation
- Perfect result on first analysis even for “unknown” samples
- Fully automated regeneration of flask minimizes maintenance requirements

ROBUST AND RELIABLE PROCESS CONTROL

Under 10 minutes cycle time

- Fully automated Initial Heat, Distillation Rate and Final Heat Regulation
- Under 10 minute cycle time – with the smallest sample volume
- Robust results for petroleum products including jet fuel, diesel, gasoline and naphtha (Group 1-4 fuel types)

INCREASE PROFITABILITY

Maximizing production and prevention of product give-away

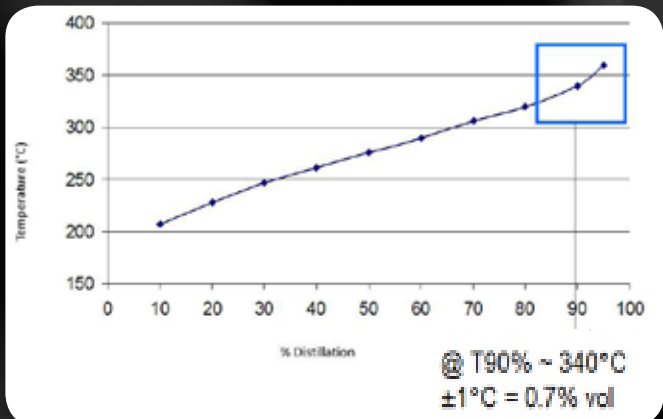
- Maximize production reducing product downgrade due to poor cut point optimization
- Prevent product giveaway by measuring online “real” distillation curve on your final product
- Optimize product blends to improve quality with a fast analytical technique

ROI STUDY

**SIGNIFICANT HIGHER PROFITS:
UP TO \$1M INCREMENTAL PROFITS!**

Less variability translates into tighter control capabilities and allows upgrade maximization from low value to high value product. Increasing T90% by 1°C may result in 0.5 to 1% additional Diesel production:

- Depending on production capacity this can impact up to \$1M on incremental profits
- MicroDist provides the means for this optimization at the same time that Diesel specs are met



BASE CASE

- HDT Diesel Capacity: 22000 bpd
- 1°C Optimization impact
 - 0.7% vol
 - 152 bpd
- Residual Fuel to ULSD upgrade: 29 USD/ bbl
- Yearly impact: 1,1M USD



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SPECIFICATIONS

GENERAL INFO		MicroDist™ - Physical distillation analyzers (online)	
Test Methods	Standards: ASTM D86, ISO3405, IP123, Cetane Index in accordance to ASTM D4737 and ASTM D976 (procedure A & B)		
Cetane Index Application	Capability to measure density (API) and Cetane Index		
Operation			
Measurement Cycle Time	Less than 10 minutes	Repeatability	+/-1.5°C (equal or better than ASTM D86)
Measurement/Temperature Range	Full boiling point curve 20-400 °C (68-752°F)	Accuracy	Distillation accuracy: better than D86, IP-123, ISO 3405 Density accuracy: +/-0.0005g/ml
		Resolution	+/-0.1°C
Sample Requirements			
Sample consumption	<2L/hour (sample should be homogenous, single-phase with no water content)		
Sample return pressure	Atmospheric to < 8 bar or 120 psig (1.4 bar or 20 psig less than supply) Sample flow rate 10-20 L/ hour (application dependent)		
Sample temperature	Min. 15°C below IBP without cooler Max. 30 °C above IBP, application dependent with cooler		
Sample pressure	2 - 10 bars (30-145 psi)		
Enclosure/ Installation and Requirements/Utilities			
Dimensions	L: 940 mm X H: 940 mm X W: 450 mm (31.5 in. X 26 X12.6)		
Weight	75 kg (165 lb.); 80 kg (176 lb) with optional density meter		
Operating Temperature	5°C to 40°C (41 to 104°F) standard -10°C to 40°C (14 to 104°F) with optional internal heater		
Area Classification	NEC Class 1 Division 2 Groups B, C & D, CSA or ATEX Certified Ex II 2 G II T4 Gb for Zone 1 Ex II T3 Gb with cabinet heating option		
Power	115 VAC/6A max, 50/60Hz, 700W; 230 VAC/3A max, 50/60Hz, 700W		
Cabinet Purge Gas	Air Flow > 150 l/min (5.3 SCFM), pressure 4-10 bars (72-145psi) Inert Gas Nitrogen, inlet pressure 3-10bars (43-145psi), purity > 95%		
Installation Site	Avoid direct sun light and provide rain-proof shelter for outdoor installation		
Flame Arrestors	(2) IIA standard		
End User Connections			
Analog Output Signal	Isolated (4) 4-20mA outputs for selected distillation cut point values		
Digital Input/Outputs	8 digital inputs, 8 digital outputs, user assignable, optional 4 additional outputs		
Serial Input/Output Signal	Single RS232 or RS485 bi-directional, Modbus for full curve or Ethernet TCP/IP		
Options available			
Density Meter:	High performance density meter integrated into in the MicroDist		
Nitrogen generator:	Required if no Nitrogen supply		
Sample section heating:	required if the cloud point < the ambient temperature – ATEX or UL/CSA certified		
Sample cooling:	For low IBP (gasoline applications) – ensure correct temperature for sample loading		
Multi-stream:	Up to 2 additional streams available		
Flame arresters:	IIC for hydrogen/acetylene		
External USB Key:	For Data Back Up and Export – ATEX or CSA certified		
Additional 4-20 mA output board:	Adds 4 additional 4-20 mA analog outputs, user assignable		
Standing:	Stand with Wheels or Wall Stand Available		

ABOUT PAC

PAC is a leading global provider of advanced analytical instruments for laboratories and online process applications in industries such as refinery, petrochemical, biofuels, environmental, food & beverage, and pharmaceutical. PAC has decades of experience developing innovative instrumentation in each one of its core technologies, including chromatography, elemental analysis, physical properties, and fuels composition.

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