



SIMDIST Analysers

- Solutions comply with ASTM, CEN, DIN, IP and ISO SIMDIST methods
- SIMDIST software fully integrated in Chromeleon datasystem
- Optimised injector technology
- Data merge of High Temp SIMDIST and DHA Front End

AN 205WA0620L

GAS offers custom configured GC analysers for many application fields since 40 years. GAS analysers are designed to meet many standardised methods from GPA, ASTM, UOP, ISO, EN and others. The efficient configurations are based on proven GC technology, resulting in robust instruments with an optimal return on investment. The determination of boiling point distribution of petroleum products and crudes by GC is a fast and reliable tool, which is widely used to replace conventional labour intensive distillation methods like D86 and D1160. This proven technology is supported by several standardised methods.

GAS offers fully automated solutions for SIMDIST which enables you to generate TBP data according to international reference methods. The instruments are fully factory calibrated, fine-tuned to the specified method and tested to certified reference materials. Proven GC technology with optimised inlets offer reliable SIMDIST results. GAS SIMDIST Calculator software is completely integrated in Chromeleon data system, providing a clear and user friendly workflow as a result. Figure 1 shows the sample sequence list with samples, calibrations runs, blanks and check standards, while figure 2 displays a typical SIMDIST chromatogram with baseline subtraction.

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		4										TotalGasoil DO_LVGO KERO			

Figure 1. Chromeleon datasystem with SIMDIST Calculator software showing clear and accessible acquisition list



Figure 2. SIMDIST D2887 chromatogram with baseline subtraction

Figure 3. GC Trace 1310 with RSH autosampler

SIMDIST Calculator software provides:

- ▲ ASTM D86 and D1160: correlation for atmospheric and vacuum distillation
- Custom correlation models can be added by the user
- ▲ DIN 51.581 (NOACK): evaporative loss in mass% of lubricants at 250°C
- ▲ ASTM D6417 (MOV): evaporation loss in mass% of lubricants at 371°C
- ▲ Flashpoint correlations according to ASTM D56, D93 and D3828
- Cut point tables
- ▲ SIMDIST/DHA MERGE of ASTM D7169/ IP545 data according to ASTM D7900
- ▲ Carbon number report: list of carbon numbers with their appropriate boiling points. See figure 7.

Besides the boiling point distribution report (figure 4), a quality control report is available as well (figure 5). This report shows the conformity with reference samples, and is therefore very important for the overall reliability of the method.

Available hardware solutions:

- ▲ Thermo Trace 1300/1310 GC with InstantConnect injector and detector modules
- ▲ Split/Splitless Injector (medium volatile sample range)
- Optimised PTV injector module for true quantitative analytical results for all sample types
- PTV-Backflush for ASTM D7900 (application note available)
- Optional On-Column injector
- ▲ Triplus RSH or AI/AS 1310 autosamplers

SIMDIST application package including:

- ▲ Set of standards, Polywax (500, 655 or 1000) or hydrocarbon mix according to the required method to set the boiling point distribution versus retention time
- ▲ External reference sample, for quantification and performance verification
- Analytical column, MXT-1 2887, or MXT-1HT for high temperature SIMDIST up to FBP 750 °C



Figure 6. Easy injector/detector exchange with InstantConnect modules

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oiling Point Distribu	tion Table
%OFF	BP (°C)
0.5	138.4
5.0	185.1
10.0	208.7
15.0	226.6
20.0	238.9
25.0	253.4
30.0	265.5
35.0	277.5
40.0	288.3
45.0	301.2
50.0	311.8
55.0	321.8
60.0	332.3
65.0	343.9
70.0	354.6
75.0	365.2
80.0	376.1
85.0	388.3
90.0	401.6
95.0	420.0
99.5	466.9

В

Model:	D86
%OFF	BP (°C)
IBP	192.9
5.0	219.8
10.0	231.6
20.0	252.0
30.0	272.2
40.0	
50.0	307.1
60.0	
70.0	341.3
80.0	357.0
90.0	377.2
95.0	393.4
FBP	404.9
%vol @ 350°C	75.5
Flash point (°C):	
D56 (Jet Fuel)	79.3
D93 (Diesel)	78.9

Correlation Results

Cut Points	
BP (°C)	%OFF
150.0	1.0
200.0	8.1
250.0	23.4
300.0	44.2

D3828 (Jet Fuel) 82.8

	mass %
DIN 51581 (Noack)	Not valid
	mass %
ASTM D6417(MOV)	77.5

Figure 4. Sample report

	QA System Check Report	
Injection Name:	QA oil	
Vial Number:	3	
Injection Type:	Check Standard	
Sequence:	# Data G.A.S.SimDist pack ASTM D2887	
Instrument Method:	ASTM2887	
Processing Method:	Analysis	
Injection Date/Time:	41814.95637	
Injection Name:	QA oil	
Used data files		
Blank:	1: blank (24-6-2014 22:23:18)	
RT Calibration:	2: rt (24-6-2014 21:49:53)	
QA / RF Standard:	3: QA oil (24-6-2014 22:57:10)	
General Results		

Reference Check PASSED

Boiling Point Table:

Reference material Ref D2887

%OFF	Expected BP	Allowable Diff	Boiling Point	Difference	Pass/Fail
0.5	115	7.6	114.8	0.2	Pass
5	151	3.8	151.1	0.1	Pass
10	176	4.1	178.1	2.1	Pass
15	201	4.5	204.2	3.2	Pass
20	224	4.9	227.7	3.7	Pass
25	243	4.9	246.7	3.7	Pass
30	259	4.7	262.7	3.7	Pass
35	275	4.7	278.1	3.1	Pass
40	289	4.3	291.8	2.8	Pass
45	302	4.3	302.3	0.3	Pass
50	312	4.3	313.2	1.2	Pass
55	321	4.3	322.1	1.1	Pass
60	332	4.3	331.3	0.7	Pass
65	343	4.3	342.8	0.2	Pass
70	354	4.3	353.6	0.4	Pass
75	365	4.3	365.7	0.7	Pass
80	378	4.3	378.5	0.5	Pass
85	391	4.3	391.8	0.8	Pass
90	407	4.3	409.1	2.1	Pass
95	428	5	432.1	4.1	Pass
99.5	475	11.8	484.9	9.9	Pass

Figure 5. Quality control report

Specifications

Configuration:

Optional: Application:

Sample requirements: Analysis time: Software

1 or 2 channel instrument based on Thermo GC Trace 1300, with InstantConnect SSL, PTV or Cold-On-Column injector module and InstantConnect FID detector module,

Triplus RSH or AS/AI-1310 liquid autosamplers

Cryogenic oven cooling (liquid N₂ or liquid CO₂)

Custom configured analyser for light hydrocarbon products up to crude oil, lube oil and residual samples SIMDIST analyser tuned for applications according to the standardised methods

Neat or dissolved in CS₂ (safety issue: CS₂ is extremely flammable and toxic)

Depending on method

GAS SIMDIST Calculator for Chromeleon. See page 3 for specification

SIMDIST/DHA MERGE of ASTM D7169/ IP545 data according to ASTM D7900 (application note available)



Figure 7. Optional carbon number report

Boiling point	-200	-100	0	100	200	300	400	500	600	700	800
ASTM D3710				gasoline							
ASTM D7096				gasoline + etha	nol						
ASTM D5399				solve	nts						
ASTM D2887					ре	troleum fractio	ns				
ASTM D5442							petroleur	n wax			
ASTM D7213						medium petr	oleum destillat	es			
ASTM D6417						mediu	m petroleum d	estillates			
ASTM D6352						medium	and heavy peti	roleum destilla	tes		
ASTM D5307		crude petroleum									
ASTM D7500		medium and heavy petroleum destillates									
ASTM D7169		crude oil and residues									
DIN 51581-2						medium pet	roleum destilla	tes			
DIN 51435						medium and	l heavy petrole	um destillates			
IP 406					ре	troleum produc	ots				
IP 480						middle destil	lates and lubric	cating base oil	\$		
IP 507						١	/acuum destilla	ates and residu	ies		
IP 545						crude oil					
EN 15199-1						middle	destillates and	lub base oils			
EN 15199-2						١	acuum destilla	ates and residu	ies		
EN 15199-3						crude oil					
ISO 3924						petroleum frac	tions				

Figure 8. Available standardised methods with boiling point and application range



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