## **Specifications**

### **ASTM D4815**

Application:	Analysis of oxygenated components (alcohols and ethers) in liquid gasoline samples						
Configuration:	Single channel instrument based on Thermo Trace 1300 GC series with SSL, valve oven and FID						
Optional:	Automated liquid sample injector						
Sample tubing:	Sulfinert <sup>®</sup> tubing for inert sample path						
Analytes:	see chromatograms						
Dynamic range:	Alcohols 0,1-12 mass%; ethers 0,1-20	) mass%					
Sample requirements:	Liquid sample	<u>) Back</u> methanol Area	ethanol Area	iso-propanol Area	tert-butanol Area	n-propanol Area	MTBE
Analysis Time:	25 minutes	63270608.00	116907659.00	132222037.00	188493863.00	154701553.00	96730492.00
Minimum Detectability	> 0.01% for all individual components	63107282.00	11516/155.00 115711239.00	129645627.00 130257330.00	184103697.00 184986922.00	151462471.00 152205250.00	94548119.00 94785798.00
		61926993.00	113277238.00	127490613.00	181083453.00	149044444.00	93080557.00
Repeatability:	> 2% RSD (n=10)	61566054.00	112398168.00	126432574.00	179676025.00	147946145.00	92020934.00
Data systems	Chromeleon ChromCard	62799844.00	114292002.00	128557785.00	182513989.00	150113173.00	94106693.00
	Open ab E7Chrom ChromOuest	63886931.00 62407023.00	116390923.00	130986661.00	185972432.00	152816665.00	95792708.00
	Openicab, Ezonioni, ChiomQuest	63415742.00	115583013.00	130086503.00	184668771.00	151832433.00	94951867.00

Min: Max Mean: Std Dev: %RSD:

61566054.00

64983316.00

63085248.80

183245406.00

181006617.00

180762820.0 178251549.00

188889541.00

183120859.60 3342965.94

1.83

9397.00

1.56

112398168.00

118486400.00

115194362.50

1828076.99

1.59

ETBE

1649670.00 20

01972250.00 208438393.00

00546119.00 201269247.00

00002235.00 200901944.00

01787268.00 205269188.00

03719848.00 208635343.00

100002235.00 200901944.00

106054778.00 216368082.00

100034778.00 21030002.00 102419128.90 207318642.80 1805204.68 4792903.33 1.76 2.31

9101 00 204971301 00

54778.00 21636



#### Linearity MTBE (D4815)

#### Repeatability D4815

126432574.00

133795125.00

129763822.00

2221860.17

855.00

1.71

179676025.00

190598015.00

184435484.40

3326686.29

75587109.00

75901233.00

74394422.00

78371451.00 73738215.00

75039952.00

76471452.00

74951308.00

73738215.00

78371451.00

75789835.50 1402742.08 1.85

1.80

TAA

147946145.00

156237140.00

151604026.60

68155405.00

168617375.00

165526128.00

173243074.00

164289728.00

166483876.00

169071195.00

166232712.00

164289728.00

173243074.00

168243006.10 2908088.92

1.73

2556404.72

1.69

#### EN 13132

**Application: Configuration: Optional:** Analytes: Sample requirements: Analysis Time: Minimum Detectability: Repeatability: Data systems

Analysis of oxygenated components (alcohols and ethers) in liquid gasoline samples Single channel instrument based on Thermo Trace 1300 GC series with SSL and double FID Automated liquid sample injector see chromatograms Liquid sample 35 minutes > 0.01% for all individual components > 2% RSD (n=10) Chromeleon, ChromCard, OpenLab, EZChrom, ChromQuest

## **Optional:**



SCIENTIFIC

92498522.00

93279798 00

89573064.00

187670455.00

95033347.00

187670455.00

199106415.00

192977545.40 3364341.67 1.74

92020934.00 155665435.00 98073652.00 164676943.00

94801531.10 159593332.60 1746190.60 1.84

2787590.17

1.75

TAN

8936.0

186426030.0

190112580 (

193549997 (

186426030.0

199040250.0

191934978.1 3689983.4

1.9

Trace 1310 GC with auxiliary oven

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GLOBAL™ ANALYSER SOLUTIONS **G**·A·S

> Robust Highest uptime: > 99% Small footprint



**APPLICATION NOTE 204WA0712E** 

# **Oxygenates Analysers**





EN 13132 **ASTM D4815** 

GAS offers custom configured GC analysers for complex separations, data processing and reporting. We have over 35 years of experience in designing and building turnkey analysers for many application fields. Our analysers are designed to meet many accepted standard methods (like GPA, ASTM, UOP, ISO, etc.) in the Oil and Gas industry. The efficient configurations are based on proven GC technology, resulting in robust instruments with an optimal return on investment.

Automobile emission is reduced nowadays by replacing the usual anti-knock components with oxygenated additives like ethers and alcohols. The type and concentration of these various oxygenates are specified and regulated to ensure acceptable commercial gasoline quality. The analysis of these compounds is described in standardised methods ASTM D4815 and EN 13132.

**ASTM D4815** 



#### Diagram ASTM D4815 analyser





ASTM method D4815 describes the use of 2 separation columns, a 10-

port column switching valve, liquid injection using SSL, and FID detection. The first separation column (a highly polar micro-packed TCEP column)

retains the oxygenates and the heavy hydrocarbons, while the light

hydrocarbons are directed to a vent. The oxygen containing components

are subsequently injected onto a non-polar wide-bore column by switching the valve, and separated according to their boiling point order. After eluting

TAME (tert-amyl methyl ether), the valve is switched back and the heavy

hydrocarbon fraction is backflushed to the detector. Siltek®/Sulfinert®

treated tubing is used to prevent adsorption of oxygenates in the sample

pathway. The 10-port diaphragm valve is located in an independently

heated isothermal valve oven, mounted on top of the GC, avoiding any cold

spots and ensuring long valve life time.



**GLOBAL**<sup>®</sup>

G·A·S

GAS diaphragm valve



Diagram EN 13132



Trace 1310 GC with optional AS1310 autosampler for liquid samples

#### **GLOBAL** G·A·S SOLUTION



Chromatograms EN 13132. Red areas: cutting windows containing oxygenates

## EN 13132

Standardised method EN13132 is an alternative to ASTM D4815. Two narrow bore capillary columns are used for enhanced selectivity for oxygenated components. In contrast to D4815, multiple fractions are transferred from the first to the second column using a Deans Heartcut configuration, see the chromatogram (red windows). This results in even higher selectivity, since many hydrocarbon components are excluded from entering the second column, and therefore cannot cause false positive results.

#### **Trace 1300 GC**

GAS offers ASTM D4815 and EN 13132 on Thermo Trace 1300 GC series. InstantConnect injector and detector modules guarantee high uptime and easy maintenance.



InstantConnect injector and detector technology