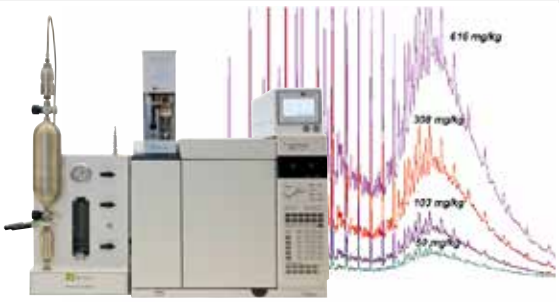
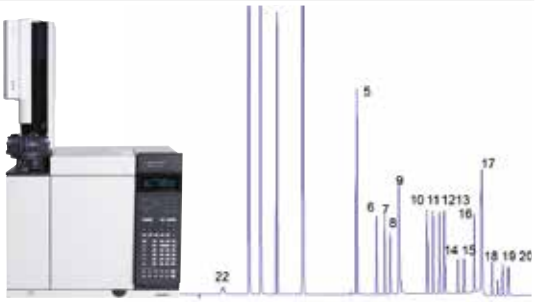
Da Vinci
LABORATORY SOLUTIONS

Analytical Solutions

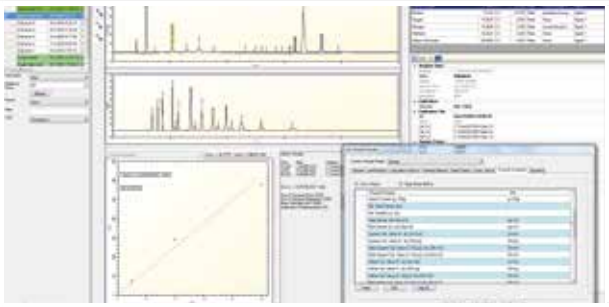
An Overview of GC & XRF Solutions for the Petrochemical Industry

Gas and Liquefied Gas Analysis

Solution	DVLS Liquefied Gas Injector	GC Custom Solutions
		
Method	• ASTM D 7756-13 • EN 16423	• ASTM D1945, D1946, D2163, D2504, D2593, D2597, D2712, D4424, D6159, D6228,D7833 • GPA 2165, GPA 2177, GPA 2186, GPA 2261, GPA 2286, • ISO 6974, ISO 6975, ISO 7941 • UOP 539 • EN 15984, EN 27941 • IP 405 • DIN 51666
Application Range	• LPG • Butadiene • Natural gas condensate • Dimethyl ether (DME)	• Natural gas • Refinery gas • LPG • Gaseous fuels • Propane, Butane • Biogas • Flue Gas
Analysis of	• Residue and light contaminants in LPG • Elemental sulfur in LPG • Desulfurization additives in LPG: DIPA, MEA & DEA • Inhibitors, additives and dimer in butadiene: ρTBC, VCH, NMP, DEHA, BHT, DMF and residue • Natural gas condensate and inert gases • Anti foam • Residue in DME	• Non-condensable gases: nitrogen, carbon dioxide, oxygen, hydrogen sulphide • Individual volatile sulphur-containing compounds • Hydrocarbons in refinery gases • Hydrocarbons in natural gas

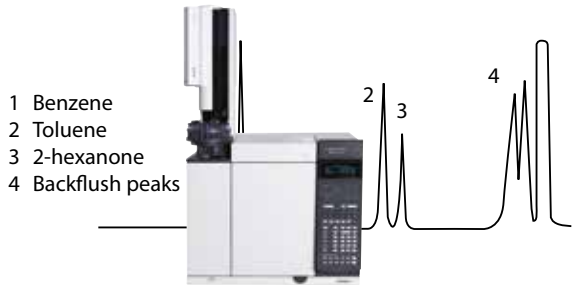
Boosting laboratory efficiency

Gas and Liquefied Gas Analysis

Agilent Micro GC System	DVLS PetroReporter for Gas Calculation	Solution
		
• ASTM D1946, D3588 • ISO 6976 • GPA 2172, GPA 2261 • UOP 539	Gas calculation module: • ASTM D2163 • DIN 51.666 • EN 589, EN 15984 • GPA 2177, GPA 2186, GPA 2261, GPA 2286 • ISO 6976	**Method**
• Natural gas • Refinery gas • LPG • Gaseous fuels • Biogas • Flue gas • Speciality gases • Air • Anaesthetic gases	• Natural gas • Refinery gas • LPG • Gaseous fuels • Biogas • Flue gas	**Application Range**
• Individual hydrocarbons • Calorific value determination • Oil/gas exploration, mud logging • Gas purity analysis • Assessing efficiency of catalysts, fuel cell stacks • Air monitoring • Real-time analysis • Tetrahydrothiophene (THT)	Calculation of all gas values: • Compressibility • Carbon content • Density • Heat of combustion/heating value • Liquid gallons per cubic feet of gas (GPM) • Molecular weight • Motor octane number • Vapour pressure (LPG) • Wobbe index • Custom calculations	**Analysis of**

Liquid Analysis

Solution	DVLS SimDist Kits	DVLS DHA Kits
		
Method	• ASTM D2887, D3710, D5442, D6352, D7096, D7169, D7213, D7500 • IP 406, IP 480, IP 507, IP 545 • ISO 3924 • DIN 51.435, DIN 51.581 • EN 15199-1, EN 15199-2, EN 15199-3	• ASTM D 5134, D6729, D6730, D6733
Application Range	• Naphtha • Reformate/platformate • FCC/CCG • Gasoline • Jet fuel • Diesel fuel • Wax • Lube oil based stocks • Distillates • Thermal cracker feed • Residues • Crude oil	• Straight naphtha • Reformate/platformate • FCC/CCG light • Alkylate • Isomerate • Gasoline • Light ends in crude oils
Analysis of	• True boiling point (TBP) distribution mass percent • Alkanes (Wax) • Cut point distribution • Flash point correlation • Motor oil volatility (MOV) • Noack evaporation loss • Volume correlation	• Individual hydrocarbons • Oxygenates • PIONA • True boiling point (TBP) distribution • DHA/SimDist merge data • Bromine number • Gross and nett heat of combustion of liquid • Reid vapor pressure • RON and MON values • Specific gravity

DVLS PetroReporter for DHA & SimDist	GC Custom Solutions	Solution
		
• ASTM D2887, D3710, D5134, D5442, D6352, D6417, D6729, D6730, D6733, D7096, D7169, D7213, D7500 • IP 406, IP 480, IP 507, IP 545, IP 601 • ISO 3924 • DIN 51.435, DIN 51.581 • EN 15199-1, EN 15199-2, EN 15199-3	• ASTM D3606, D4815, D5501, D5580, D5623, D6584, D7423, D7754 • EN 13132, EN 12177, EN 14103, EN 14106, EN 14110, EN 14105, EN 15721, EN 15779	**Method**
• Naphtha • Isomerate • Reformate/platformate • FCC/CCG • Alkylate • Gasoline • Jet fuel • Diesel fuel • Wax • Lube oil based stocks • Distillates • Thermal cracker feed • Residues • Crude oil	• Gasoline • Gasoline blending streams • Ethanol • Biodiesel • Diesel fuel • Aromatics • Ethylene, Propylene • Butadiene	**Application Range**
SimDist: • True boiling point (TBP) distribution mass percent • Alkanes (Wax) • Cut point distribution • Flash point correlation • Motor oil volatility (MOV) • Noack evaporation loss • Volume correlation DHA: • Individual hydrocarbons • Oxygenates • PIONA • True boiling point (TBP) distribution • DHA/SimDist merge data • Bromine number • Gross and nett heat of combustion of liquid • Reid vapor pressure • RON and MON values • Specific gravity	• Aromatic content • Oxygenate content • Low level oxygenates • Ethanol and methanol content • Fame content • Volatile organic content • Sulfur compounds	**Analysis of**

General Laboratory Equipment

Solution	DVLS GasMix	DVLS GasMix for Liquids	DVLS^3 Simply Smart Sensor	DVLS Gas Generator
				
Application Range	On-site customized gas standard preparation for single and multipoint calibration standards for: • Impurities in gas analysis • Refinery gas analysis • Natural gas analysis • Flavour, fragrance & odour analysis • Air pollution analysis, e.g. NOx • Environmental gas analysis	Gas standard generation of liquids for example VOC's for: • Fragrance & odour analysis • Air pollution analysis • BTEX analysis	Sensor for detecting hydrogen leaks in GC systems. Next to the hydrogen leak detection Da Vinci Laboratory Solutions offers multiple sensors dedicated to the detection of: • Hydrogen (H_2) • Temperature • Barometric Pressure • Level (liquid) weight	• Zero air for GC/LC • N_2 for LC-MS • H_2 for FID • H_2 for GC • N_2 for GC carrier gas • H_2/Air combined

Solution	DVLS Standards	OI PFP Detector	VICI Valco GC Valves	Teckso Fast C3 Analyzer
				
Application Range	• Oxygenate standards for GC • PONA & PIANO Standards • SimDist standards • Benzene/Aromatic and Biodiesel standards • Nitrogen and sulfur standards • Physical properties standards • Physical properties standards • Custom standards	GC detector for selective detection and quantitation of: • S, P • C, N, As, Sn, Se • Pb, Br, B, Al, Si, V, Cr, Mn, Fe, Ni, Cu, Ga, Ge, Ru, Rh, In, Sb, Te, W, Bi, Eu	Vici Valco valves are available with: • 3, 4, 6, 8, 10, 12, or 14 ports • 1/32", 1/16", 1/8", or 1/4" fittings • Bore sizes from 0.25 mm (.010") to 4 mm (.156"). • Wide range of rotor and body materials of any valve available • As manual, pneumatic, or electrically actuated versions	Liquid sample injection device with a special bracket and a liquid injection system for a fast analysis of C1 - C4 hydro-carbons within 5 minutes

Boosting laboratory efficiency

XOS Sindie Bench-Top Analyzer	XOS HD Maxine Analyzer	XOS Phoebe M-Series Analyzer	XOS Clora Bench-Top Choride Analyzer	XOS Signal M-Series Analyzer	Solution
					
• ASTM D7039 • ISO 20884			• ASTM D7536	• ASTM D7757	**Method**
• Ethanol • Gasoline • Naphtha • Jet fuel • Diesel fuel • Wax • Lube oil based stocks • Middle distillates • Heavy distillates • Residues • Crude oil	• Crudes • Downstream hydrocarbons • Lubricants • Used oil	• Hydrocarbon samples • Aqueous samples	• Aromatics • Distillates • Heavy fuels • Aqueous solutions	• Petroleum • Biofuel	**Application Range**
Bench-top: sulfur (0,15 mg/L) On-the-go: sulfur (0,6 mg/L)	Trace metals S, Cl, P, K, Ca, V, Mn, Fe, Co, Ni, Cu, Zn, Hg, As, Pb, Se and more	Phosphorus (0,5 mg/L)	Chlorides (0,1 mg/L)	Silicon (0,5 mg/L)	**Analysis of**

Da Vinci Laboratory Solutions (DVLS) is a supplier of high-performance analytical solutions enhanced by our wide ranging expertise in chromatography and mass spectroscopy.

As the versatile partner for analytical solutions and the authorized Benelux distributor of world-leading manufacturers we offer:

- Analytical instruments for GC, LC & MS
- Automated solutions for sample preparation & introduction
- Instrument control software & information management
- Laboratory supplies & standards
- Technical support & services

We represent more than 20 partners in the Benelux area, such as AccuStandard, Agilent Technologies, Anatune, GERSTEL, LECO, OI Analytical, VICI and XOS.

Da Vinci Laboratory Solutions B.V.

Visiting address:
Cairostraat 10
3047 BC Rotterdam
The Netherlands

Postal address:
P.O. Box 12103
3004 GC Rotterdam
The Netherlands

T +31 (0)10 258 1870
F +31 (0)10 258 1879
E solutions@davinci-ls.com
I www.davinci-ls.com

Service Office

Visiting address:
Da Vinci Laboratory Solutions
Chemelot Campus
Building G122.03.0.26
Urmonderbaan 22
6167 RD Geleen (Gate2)
The Netherlands

Da Vinci Caricom Laboratory Solutions

Visiting address:
Zonnebloemstraat 80a
Paramaribo
Suriname

T +597 49 11 29
F +597 49 51 91
E info@davincicaricom.com

Da Vinci
LABORATORY SOLUTIONS

www.davinci-ls.com