Ellutia
Chromatography Solutions

200 Series GC

Developing the next generation of scientists through innovative gas chromatography equipment

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Gas chromatography (GC) is a commonly used analytical technique by which complex mixtures of chemicals can be separated, identified and quantified. It is primarily used for the analysis of organic compounds at high molecular weight or low volatility and has many established applications, spanning a range of sectors including: pharmaceutical, environmental, clinical, agriculture, food and beverage and forensics.

GC skills are in high demand in today's academic and industrial markets, and students that have access to hands-on laboratory experience and hold an understanding of the technique can set themselves apart from competition. Emerging markets, such as the booming cannabis market, are witnessing huge demand for analytical testing to provide the reassurances that are associated with pharmaceutical products.

Despite many countries and states having passed regulations that allow cannabis use, for both medicinal and recreational purposes, regulation lacks standardisation. The responsibility for testing often lies with a small number of approved independent testing labs or with the growers and retailers direct. Those that have the ability to test their product increase their competitive advantage. GC is one of the most popular testing methods, dominating the cannabis testing market because of its reliability and simplicity.

Similarly, the brewing industry is thriving as a direct response to increased demand from consumers seeking better quality, flavour and greater choice of craft beers. Large breweries have long used GC for quality control and assurance, but through recent advances in technology, instrumentation has become financially viable for craft breweries, levelling the playing field. As these markets grow, so does the need for trained scientists.

Both Cranfield University and the University of Surrey have programmes that introduce students to the basic functionality of GC testing, how it can be applied to research and real world scenarios.

Casae Study - Cranfield University

Cranfield University is a British postgraduate and research-based public university, specialising in science, engineering, technology and management. The Environmental Analytical Facility (EAF) at Cranfield University is utilised by research staff across the university (including Environment, Agrifood, Water and Energy and Power) for chemical, biological and materials analysis[1].

Jane Hubble, Laboratory Manager at the university, is responsible for the development of the laboratory facilities and first class teaching, as well as providing technical support which enables academic staff and researchers to deliver contracts within budget, timescales and to high standards and in doing so, delivering teaching informed by research.

The university was interested in tapping into the analytical confidence that GC brings and started to investigate the Ellutia 200 Series GC. Designed for the education community, the 200 Series offers an analytical performance equivalent to much larger and more costly instruments from other vendors.

Mrs. Hubble was impressed with its simplicity, robustness, and importantly, its low cost. The EAF has used Ellutia's 200 Series GC for over ten years for the analysis of gas samples, typically carbon dioxide and methane. It is used across a variety of research areas including soil respiration, anaerobic digestion, gas membrane technologies and post-harvest technologies.

Hubble describes recent work[2] they carried out using the 200 Series GC: "We used the 200 Series GC to develop an indirect (headspace) method for the determination of dissolved methane in wastewater effluent, produced from anaerobic processes. This method not only enabled us to become one of the first groups to determine the extent of losses from anaerobic treatment, but also to develop a membrane technology that provided both the separation and concentration of the methane into the gas phase to enable its reuse in the production of electricity."

> "Ellutia is excellent, very responsive and helpful. I would certainly recommend them and have done on several occasions."

Following its success, a second 200 Series GC was purchased and used by the Atmospherics Informatics Group at the University, who joined Cranfield University from Cambridge in 2016. The Group uses the instrument primarily for research into atmospheric pollutants and validation of sensors.

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Ellutia offers a range of services to support its customers in achieving their analytical goals, including worldwide product installation and servicing. Ellutia provides the university with a maintenance service. Hubble explains: "Ellutia is excellent, very responsive and helpful. I would certainly recommend them and have done on several occasions. Cranfield has a higher proportion of industry-funded work than some other universities, so it's important that we have a very fast response to any queries. Our relationship with Ellutia is important to us – and when we do have queries, we know that they understand our needs and how we use the GC."

Case Study - The University of Surrey

The University of Surrey is recognised as one of the leading universities in the United Kingdom, specialising in science, engineering, medicine and business. The Department of Chemistry at the university uses GC primarily for teaching, having bought its first 200 Series GC in 2008. Today, the university has three 200 Series GCs.

Dr Dan Driscoll, Experimental Officer for Separation Sciences in the Department of Chemistry, explains their initial requirement: "We needed a small, inexpensive GC that was reliable, so that students could gain exposure to the technique." He adds: "As a university we naturally have a limited budget and no one could come close to Ellutia's price. The 200 Series is very straightforward and reliable – this is fundamental for students who are using GC for the first time."

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The university has a strong working relationship with Ellutia. Dr Driscoll comments: "It's great working with Ellutia. It's a very user-friendly company that is focussed on problem-solving. If we have any problems, they're resolved immediately. I would definitely recommend them – and have."

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References

1: Cranfield University, Environmental Analytical Facility:

https://www.cranfield.ac.uk/facilities/environmental-analytical- facility

2: Journal of Membrane Science, Dissolved methane recovery from anaerobic effluents using hollow fibre membrane contactors:

https://www.sciencedirect.com/science/article/pii/S0376738815303847

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To learn more about the Ellutia 200 Series GC, please scan the QR code below or visit https://www.ellutia.com/200-series-gas-chromatograph

Colston House, 200 Lancaster Way Business Park, Ely, Cambridgeshire, CB6 3NX, UK
Tel: +44 (0)1353 669916 Web: www.ellutia.com
Ellutia Limited Registered in England Number 2967460
Registered Address Colston House, 200 Lancaster Way Business Park, Ely, Cambridgeshire, England, CB6 3NX

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