Discover the benefits of the AMPTS II
Methane potential analysis made easier

Determine the true methane potential

The Automatic Methane Potential Test System (AMPTS) II allows users to determine the true biochemical methane potential and dynamic degradation profile of any biomass substrate. This in turn will allow users to more easily determine the optimal retention time and mix of substrates for co-digesting, screen proper pre-treatment methods and evaluate the need for additives.

Significantly reduce your labour demands

The AMPTS II is a well engineered analytical device, developed for online measurements of ultra low biomethane and biogas flows produced from the anaerobic digestion of any biological degradable substrate at laboratory scale. The automated analytical procedure significantly reduces labour demands when compared to traditional methods or competitive solutions on the market.

Standardise and compare results

The AMPTS II is a universal platform for all anaerobic biodegradability, methane potential (BMP) and specific methanogenic activity (SMA) test protocols, allowing for the standardisation of measurement procedures, data interpretation and reports. This allows for data from different laboratories around the world to be easily compared, thus creating value over and above the high quality results obtained from operating the AMPTS II.

Get access to highly precise and accurate data

The real-time performance and outstanding features of the AMPTS II satisfy the highest demands for data accuracy and precision. This high quality data can be used to extract important kinetic information of the degradation process, which in turn provides for a much better understanding of the dynamic degradation behaviour of a specific substrate.
The internal software of the AMPTS II runs on an embedded ARM CPU utilising the Linux operating system.

Outstanding real-time performance

The AMPTS II is an efficient analytical instrument for conducting real-time BMP, anaerobic biodegradability and SMA assays, having sampling, analysis, recording and report generation fully integrated and automated.

A multi-channel analyser consisting of 15 parallel reactors and the same number of gas flow meters (flow cells) attached to a data acquisition system, allows for the real-time investigation of a high number of samples. This unique design makes the AMPTS II an extremely precise and accurate instrument, and with a wide range of applications.

Temperature and pressure compensation

The real-time temperature and pressure compensation feature of the AMPTS II ensures that the impact of measurement conditions can be minimised and data presentation standardised.

The temperature and pressure are measured every time a flow cell opens, allowing the user to derive exact kinetic information compensated for any variation over time, while considering the vapour content of the gas. The normalised volumes are presented under dry conditions at 0 °C and 1 atm.

Automatic removal of gas overestimation

Methane gas overestimation arises after flushing the system with an inert gas such as nitrogen. Consequently, carbon dioxide in the newly formed biogas is mistakenly counted as methane gas. This can lead, in some cases, to an overestimation of methane gas production by as much as 20–30 percent, and even more depending on the volume of the headspace.

The AMPTS II calculates and removes this overestimation, providing for more accurate and reliable data on methane gas production.

Network ready and easy access

The AMPTS II is designed to allow easy access from a remote location. Through the use of standard protocols and connections, the AMPTS II behaves like any other unit on an internal network, secured by a user definable password. All interactions with the software are conducted through a web browser using any computer. Thus, experiment monitoring can be carried out with any smartphone or tablet.

The analytical capacity of AMPTS II can be easily expanded by connecting multiple instruments together with an Ethernet switch. With this feature, each AMPTS II can be operated alone or connected in parallel for analytical capacity expansion, entirely depending on user needs.

Up to 12 litres cumulative gas per channel for each batch test
A software application designed for methane potential tests

The AMPTS web-based software application has been specially designed for carrying out methane potential and other related tests. This application, which is easy to understand and navigate, allows users to set-up an experiment, monitor its progress and download results with little effort. Moreover, all data is in a format that allows for easy analysis.

The AMPTS software application is simply a natural extension of an already universal hardware platform that has been designed for carrying out methane potential, specific methanogenic activity and anaerobic biodegradability tests.

A simple and intuitive experiment setup

The Experiment Settings feature of the AMPTS software application allows users to prepare an experiment by calculating and setting up individual data for each batch test. The user enters values for the total amount of sample, volatile solids (VS) or COD content of inoculum and substrate, inoculum to substrate ratio, total reactor volume, and expected methane content of the produced gas. The software then automatically calculates and generates experiment guidelines for the amount of substrate and inoculum needed in each batch test.
Total control throughout an experiment

The Control feature of the AMPTS software application allows users to control both the mixing of reactors and status of each batch test in real-time during an ongoing experiment. Users can control the interval, speed, rotation direction and on/off time of mechanical agitation to ensure each reactor is operated under optimum mass transfer conditions. Users can also easily start, pause and stop data acquisition of an ongoing experiment at anytime by means of a simple to use cell control feature, which also indicates the status of a cell at all times.

Overall, this allows users to have optimal control of all reactors and batch experiments at all times with the simple click of a virtual button from the software user interface.

See your experiment in real-time and anywhere

The Graph feature of the AMPTS software application and embedded web server allows users to see their experiment in real-time and from anywhere. Users can easily monitor the accumulated gas volume and flow rate of each reactor in real-time by selecting and viewing only the one they wish to see.

Moreover, all values displayed are already adjusted for gas volumes normalized to 1 atmospheric pressure, 0 °C and zero moisture content.

If a flush gas with a different gas composition from biogas is used for establishing an anaerobic condition, the impact of the flush gas is also taken care of by the AMPTS software application.

This flexibility and precision allows AMPTS users to always know the status of an experiment, as well as the data being produced.
The AMPTS II is currently used by academic scientists, public and private laboratories, energy producers, organic waste handlers, wastewater treatment plants, food producers, bio-ethanol producers, and bio-hydrogen producers.

The AMPTS II can be used to conduct specific methanogenic activity tests, anaerobic respiration studies, biodegradability tests, anaerobic toxicity assays and determining the true biochemical methane potential (BMP) and dynamic degradation profile of any biomass substrate.
Technical specifications

Sample incubation unit
- Maximum number of reactors per system: 15
- Reactor material: glass
- Standard reactor volume: 500 ml
- Dimension: 59 x 34 x 28 cm
- Temperature control: up to 95 °C (203 °F) (precision of 0.2 °C)
- Mixing in the reactor: mechanical agitation (adjustable interval, speed and rotation directions), max. speed 200 rpm

Carbon dioxide absorption unit
- Carbon dioxide trap bottles: 15
- Volume of carbon dioxide trap bottles: 100 ml
- Dimension of unit: 44 x 30 x 6 cm
- Absorption liquid: 3 M NaOH with pH indicator, 80 ml per bottle (not included)
- Absorption efficiency: >98%

Flow cell array and DAQ unit
- Working principle: liquid displacement and buoyancy
- Up to 15 cells running in parallel
- Built-in pressure and temperature sensor
- Measuring resolution: 9 ml (standard) or 2 ml (optional)
- Detection capacity: up to 12 l cumulative gas per channel for each batch test with 9 ml flow cell; up to 2.5 l cumulative gas per channel for each batch test with 2 ml flow cell
- Measuring range for instant gas flow rate: 9 to 110 ml/min for 9 ml flow cell; 2 to 24 ml/min for 2 ml flow cell
- Integrated data acquisition (maximum capacity 2 x 10^4 flow cell openings)
- Dimension: 51 x 44 x 18 cm
- Housing: plastic
- Measuring precision: CV≤ 1%

Software and System
- A software application specially designed for biogas potential and anaerobic biodegradability tests
- Web-based software running on an embedded server
- Online real-time gas flow and volume display
- Automatic real-time pressure and temperature compensation
- Real-time gas flow and volume normalisation
- Algorithm to avoid overestimation of gas flow and volume that may be introduced by flush gas during experiment setup
- Possibility of multiplexing, allowing for simultaneous batch analysis at different startup times
- User friendly guidelines for experiment setup
- Online system logger for operational diagnosis
- Power supply: 12 V DC / 5 A (Flow cell array and DAQ unit), 24 V DC / 2.7 A (mechanical agitation)
- Usage: indoor
Bioprocess Control is a market leader in the area of low gas flow analytical instruments for biotechnology related applications. We invest in innovation and development of smart instruments that allow for more efficient, reliable and higher quality research and analysis, leading to significant reductions in time and labour. We ensure the highest product quality throughout our portfolio, and focus on being service minded and always meeting the needs of our customers.

The company’s flagship product, the Automatic Methane Potential Test System (AMPTS), has become the preferred analytical instrument around the world for conducting various anaerobic batch fermentation tests. Bioprocess Control’s product portfolio offers academic and industrial actors working with biogas, animal feed, wastewater, and other fields exciting products for low gas flow measurements, substrate analyses and process simulations.