ΣΥΣΤΗΜΑ ΔΕΙΓΜΑΤΟΛΗΨΙΑΣ ΒΙΟΑΕΡΙΟΥ

BACKGROUND

A wide range of on site instruments are available on the market for the detection and quantification of many of the gas components found on and near contaminated land and landfill sites. Serious site investigations should also require periodic verification of on site readings together with quantitative analysis of minor gas components and investigation of the origin of some of the bulk gasses, most commonly methane.

This analysis is laboratory based and involves a variety of techniques from Gas Chromatography to Mass Spectrometry.

Gas Sampling Equipment is generally accepted as the most reliable and cost effective method of taking a gas sample for laboratory analysis. This is due to the ease with which a sample can be taken at the site and the convenience of transporting it to the laboratory for analysis. A sampling kit weighing only 5 kg and requiring no electrical supply is widely used for most applications. The compressed sample can be introduced from the cylinder into the analyser via a dosing valve or septum allowing a comprehensive analysis to be carried out from a single sample.

The cylinders used are extremely durable and are available in aluminium alloy and stainless steel. At the recommended pressure of 14 Bar the most popular 55ml cylinder will contain nearly 0.75l of sample gas at atmospheric pressure.

EQUIPMENT

Gas Sampling Kit: contains one Gas Sampling Pump, six 55ml Stainless Steel Sample Cylinders, Filling Indicator, Purging Attachment, Connecting Tube, Spare Valves with Insertion Tool. All items in the Kit are available separately.

Gas sampling Kit contains all you need to start collecting Gas Samples: one Gas Sampling Pump, six 55ml Stainless Steel Sample Cylinders, one Filling Indicator, one Purging Attachment, Connecting Tube, Spare Valves with Insertion Tool.

Sampling Pump. Predominately made from Stainless Steel the two stage Sampling Pump easily fills the sample cylinders to the recommended 17 bar.

Filling Indicator. Fits between the Pump and the cylinder to show when the cylinder is full.

Purging Attachment. Is used to hold open the "free" cylinder valve to enable the cylinders to be purged quickly with minimum effort.

Sample Cylinders come in various sizes including 15ml which is ideal for collecting samples from small initial volumes minimising the risk of sample dilution. The popular size is Double Headed, Stainless Steel, 55ml.

Cylinder Testing Unit is used in the Laboratory to Transfer the Sample to the analysis equipment.

TAKING A SAMPLE

USING OFF GAS/AIR SAMPLING EQUIPMENT

All procedures in operation on the site relevant to monitoring and control must be adhered to. If sampling is to take place in a confined space, work systems as defined in HSE Guidance Note GS5 "Entry into confined spaces" must be followed.

Sampling with the Hand Pump, Single or Double Headed Sample Cylinders and Filling Indicator (optional).

1. Remove Dust Cap from Cylinder Head.

2. Check Sample Cylinder is empty by depressing Schrader Valve in the Cylinder Head against the Pump Handle Retaining Bolt Head.

3. Plug the Sample Cylinder into the Bayonet Adaptor on the Pump. The Filling Indicator (if being used) is fitted between the Pump and the Sample Cylinder.

4. The Cylinder should now be purged by pumping up to pressure several times and releasing the contents of the cylinder as in 2 above. With Double Ended Cylinders the Purging Attachment can be used. The Attachment is fitted to the "free" end of the cylinder and the pump "pumped" several times to enable sample to flow through to atmosphere. The Attachment is removed before the sample is taken.

5. The sample is now collected by "Pumping" the Pump until the required pressure of sample is obtained within the Sample Cylinder. This can be monitored by using the Filling Indicator or by counting the number of Double Strokes, (Push/Pull), of the Pump that have been made. As a guide the table below shows the number of Double Strokes required to obtain a sample of 14 bar (200 psi) in the different size Sample Cylinders available. THE PRESSURE MUST NOT EXCEED 17bar (250 psi).

Cyl Capacity (ml)	15ml	30ml	55ml	70ml	110ml
No Push Pull Strokes	9	16	24	33	43

When using the Filling Indicator the number of strokes shown above will register the gauge approximately mid-way in the green section.

6. When the sample has been taken the Sample Cylinder is unplugged from the Pump and the Dust Cap replaced. The Sample Cylinder now contains the sample ready for analysis.

7. In the laboratory the Sample is released from the Cylinder using a Cylinder Testing Unit.

MEINTENANCE

SAMPLING PUMP

The dust filter in the nose of the Pump should be changed on a regular basis. The frequency of replacement will need to be established by the user and will depend on the conditions of sampling.
The Pump will need to be lubricated if it starts to get a little stiff. A couple of drops of "Fomblin". should be put onto the piston "Lubricant Wick" and onto the Piston Shaft. Care should be taken not to over lubricate the Pump.

LUBRICATION

The Sampling Pumps are lubricated at the factory with Fomblin YVAC 0616 fluid. Fomblin is the registered trade name of a Perflouropolyether (PFPE) Fluid. (Silicon Lubricants are not recommended as they can absorb C02).
Fomblin has been selected because it is inert to most reactive chemicals and is non-flammable. Fomblin can be used in direct contact with U176, F2, oxygen, ozone, etc. Fomlin has been approved by NASA for liquid oxygen systems.
NOTE: Pumps that have been lubricated with Fombiin can be identified as they are fitted with Black Aluminium Handles. Earlier pumps were lubricated with Edwards High Vacuum Grade 8K and can be identified by the Natural Finish Aluminium Handles.
Pumps that are returned to us for service are automatically converted to "Fomblin" unless otherwise requested in writing by the user.

SAMPLE CYLINDERS

The Schrader Valves should be replaced on a regular basis in order to safeguard the Sample. The cost of a new Valve is small compared to collecting and analysing the sample.
Periodic examinations of the Sample Cylinders should be made for signs of external damage or corrosion. **On no account should the Cylinder Head or End Cap be removed.** The Sample Cylinders are Pressure Vessels and for safety reasons any dismantling must only be undertaken by approved personnel.

SAMPLE CYLINDER TESTING

Cylinders in service should be returned to our Engineerings every two years for Examination & Pressure Testing. If the cylinders are used in particularly corrosive environments examination should be more frequent. We have a fixed price service that includes a 70bar Water Pressure Test, Internal Inspection, new valves and seals, and a test certificate.

Gas Sampling Kit contains:

1 Gas Sampling Pump,
6 Double Headed Stainless Steel 55ml Sample Cylinders,
1 Filling Indicator,
1 Purging Attachment,
2m Neoprene Tube,
1 Schrader Core Tool,
5 Spare Schrader Cores,
- all packed into Plastic Foam Lined Case.

Normaly this is in stock and it will take a few days to be in GR with a courier.