

# SOIL REMEDIATION RESEARCH



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The in-situ cleaning of soil is becoming more and more important. Under the groundwater table the breakdown must take place under anaerobe conditions. In order to be able to predict these breakdown processes soil samples must be taken from the saturated zone. In uncohesive soils like sand, this can be done using a piston sampler (see P1.01).

## 04.26 Bio-core anaerobe sampling system

The patented Bio-core sampling system was developed in order to be able to divide a soil sample into four perfectly identical sub-samples with a length of 20 cm. A purposive application of nitrogen in a special sample dividing vessel (glove box principle) guarantees that the transfer of sample material from the sampler into the four sub-samples takes place in an inert nitrogen filled environment.

Subsequently the divided samples can be stored in a cold store in order to be researched separately for

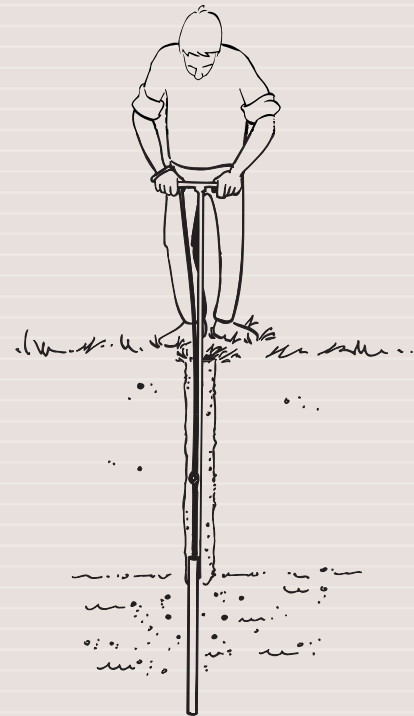
spontaneous anaerobe breakdown and/or gas generation with an interruption of for instance several months. The glove box without sample divider can be applied for filling of bottles with groundwater under anaerobe conditions.

The Bio-core anaerobe sampling system is supplied as a complete set with the sample dividing vessel, the sample divider with holder, bio-core sample tubes and silicone rubber stoppers. Also included is a dividable piston sampler set for sampling to a depth of 5 m with piston tubes with a length of 50, 100 and 150 cm length.

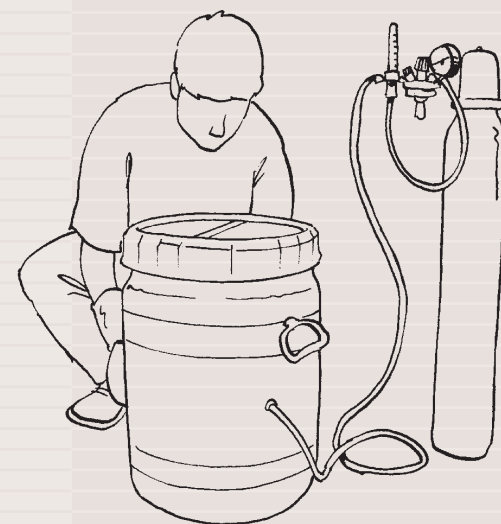
## 18.46 Soil respiration measurement system

How much organics (pollutants or from natural origin) that a soil or compost contain, can be digested by microbial activity? This question can be answered by means of this modern measurement set-up. Important application is to determine remediation (natural or man-initiated) activity of micro-organisms of polluted soils eg. Hydrocarbons.

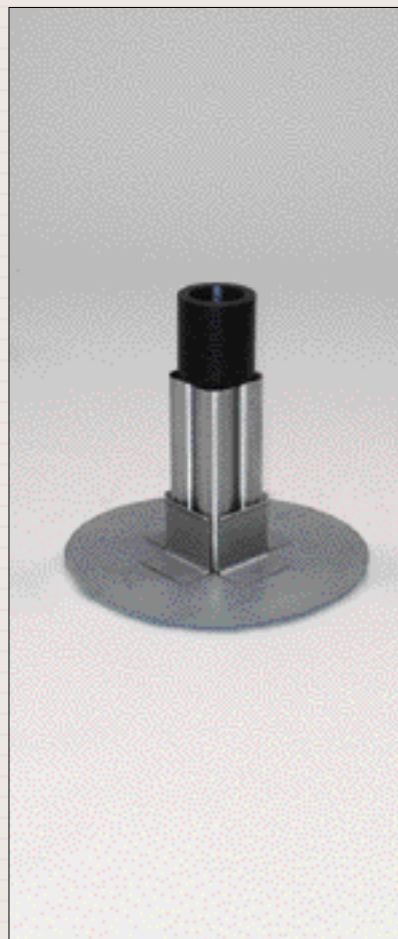
**A sample is taken with the piston sampler.**



**The sample is separated in the sample dividing vessel.**



Bio-core sample dividing vessel



Bio-core sample divider

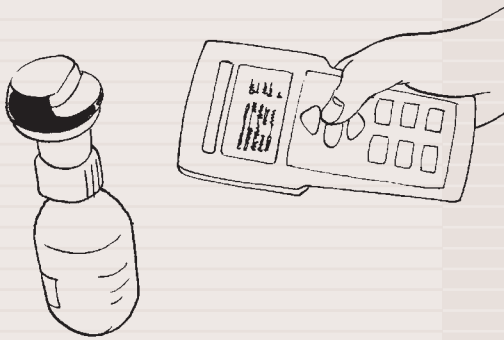


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**The IR-pressure sensor is screwed on top of the sample flask.**



**Reading out the IR sensor with the Sensomat Scientific.**



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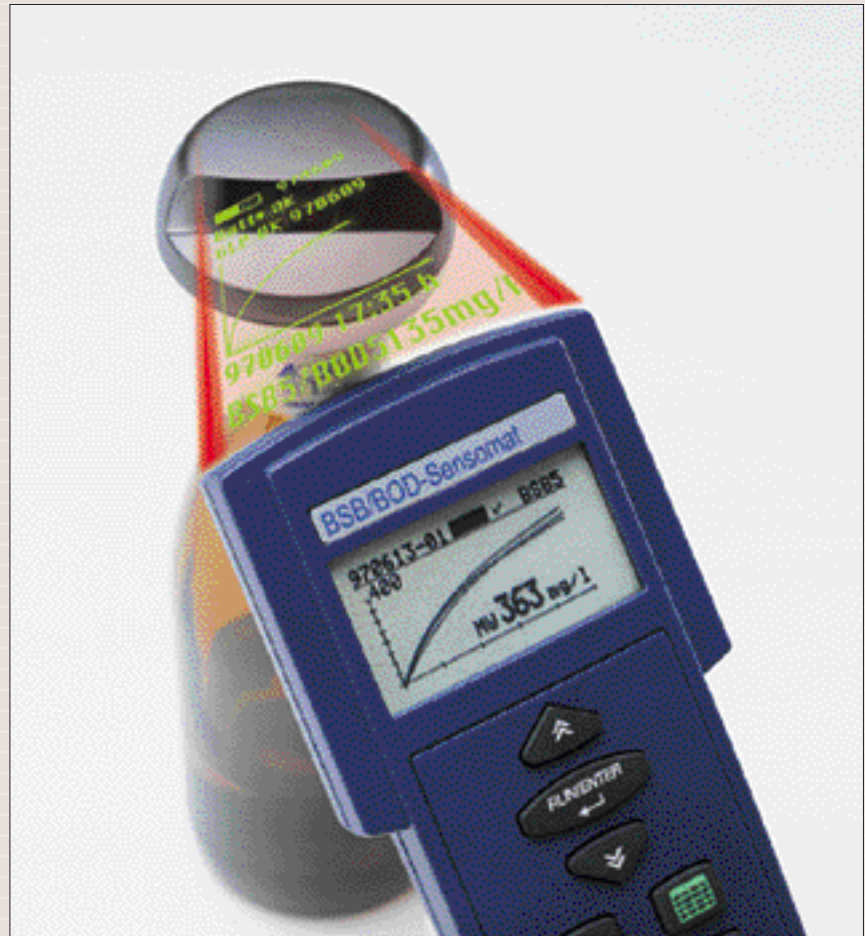
Practically all organics in soil or compost will be digested by micro-organisms in a certain period. Micro-organisms may be present in the soil naturally or initiated or stimulated by man. They may be available in the aerobe as well as in the anaerobe zone of the soil. The set-up includes jars in which a small amount of soil to be investigated can be done together with air and an adsorber for CO<sub>2</sub>. The pressure that develops in the bottle due to metabolism activity and gas exchange is measured and logged with the pressure sensor on top of the jar. The separate Sensomat mobile controller can, by means of wireless Infra Red communication, read-out and program the pressure loggers on the jars. Data can be recorded via a PC and IR printer. We supply a complete system for 6 measuring points, with 6 sample flasks suitable for aerobic soil respiration measurements, a Sensomat mobile controller, IR pressure sensors 500-1350 hPa, sterilizable adapters and CO<sub>2</sub> absorption agent, software and interface cable.

The set-up is used for determining microbial

respiration according to DIN-standard 19737.

- Universal measurement system for aerobic metabolism according to DIN standard.
- The standard set-up for aerobic measurements can be extended for anaerobic measurements.
- Graphic display of reaction kinetics quasi on-line at the push of a button.
- Software-supported operator guide ensures easy operation.
- Rugged and maintenance free.
- Easy documentation of all records on your PC or IR-printer
- Supports GLP-/ISO 9000 requirements with electronic data logging and tools for functional checking.

The IR-pressure Sensor is both a measuring device and data storage. With the sample vessel, it forms a mobile, closed unit and is linked to the Sensomat via the IR-interface. The sample flasks can be linked to the Sensomat System with adapters and enables adjustment to a variety of investigations purposes.



Soil respiration measurement system