ESG Environmental Scientifics Group

Soil Mechanics

Site Investigation

Thermal Conductivity Testing

Soil Mechanics steady state thermal cell provides a unique testing method for a commercial geotechnical world looking for greater data accuracy and reliability when evaluating the thermal conductivity of the ground.

Applications

Ground Source Heat Pump systems (GSHP) - Developments in technology have led to increasing interest in alternative sources of energy including harnessing ground temperature to cool and heat buildings and the subsequent need for the efficient design and operation of GSHP systems. With this in mind, Soil Mechanics' steady state thermal cell provides the thermal conductivity parameters required for accurate foundation design and installation.

Volumetric heat - Used during pipeline and power cable surveys to measure the volumetric heat capacity and thermal diffusivity of the material to ascertain whether it will allow excess heat to dissipate during operation.

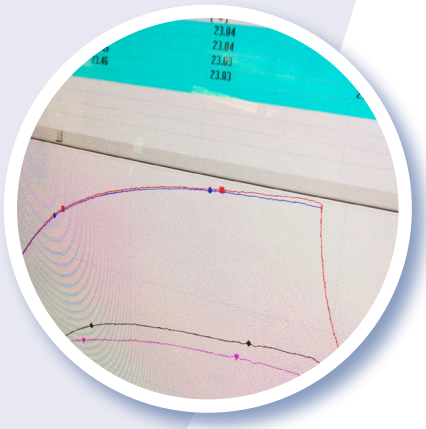
Unique Test Cell Design

A vacuum insulated design enables steady state thermal properties to be measured in the laboratory as an integral part of any ground investigation. Unlike traditional techniques such as transient single point methods which are generally based on comparative testing, the steady state thermal cell isn't limited to small soil samples and can routinely provide conductivity, resistivity and diffusivity data to measure the specific heat generated or stored in the ground by mass materials with greater accuracy.

Steady State Conditions

The thermal cell provides DC steady state conditions for direct measurement and allows testing to be carried out on conventional 100mm diameter undisturbed samples.

Quality control



Our laboratories provide a controlled test environment for measuring the soil's capacity to transmit and store heat. The results are analysed using the latest computer-based technology to report on:

- Density and water content
- Temperature variations with time
- Derived value of thermal conductivity.

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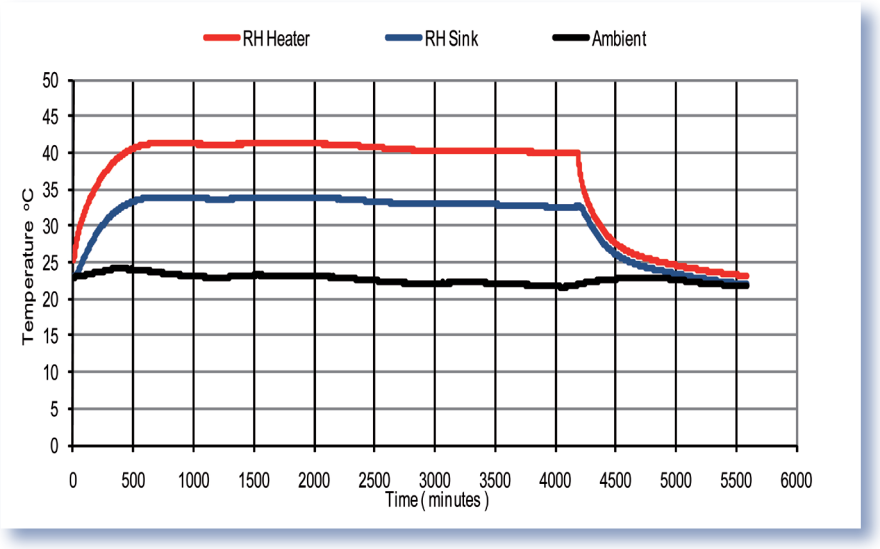
Flexible Service

Soil Mechanics can manage the testing and analysis either as part of its own ground investigations, where we can include other geotechnical parameters relevant to any energy project or GSHP installation, or directly from soil samples provided by other contractors.



Temperature variation against time for a test on undisturbed firm brownish grey slightly gravelly clay consisting mainly of fine to medium sized chalk fragments.

ESG House, Bretby Business Park, Ashby Road, Burton-upon-Trent, Staffordshire, DE15 OYZ Tel. 0845 603 2112 E-mail: sales@esg.co.uk