SOLVITA® IRTH™ CO_2 RESPIROMETER
INVESTIGATE SOLUTIONS FOR SOIL CARBON CYCLING

Solvita IRTH™ is a simple yet highly sophisticated CO_2 tool for monitoring carbon dioxide emissions as they naturally occur in moist biological samples such as soil. IRTH™ (pronounced "earth") is an elegant and exciting means to observe and precisely measure biological decay or deterioration of soils, plant litter, composts and more.

IRTH™ replaces more complicated, costly devices, and it is flexible, to enable the capture of diverse data. This instrument is specifically designed for soil ecologists, conservationists and carbon researchers to answer pertinent questions about carbon transformation. For example, IRTH™ allows you to compare soil treatments or quantify the turnover of carbon due to cover crops or the addition of manure or plant litter. With IRTH™, you can observe the influence of amendments on soil biological functions and gain a broader understanding of natural carbon reactivity, which can lead to better decision-making.

IRTH™ stores and calculates results in several fashions: It reports the internal atmospheric CO_2 change during treatment, allowing you to test certain assumptions, and it calculates overall decay rate as CO_2-C in relation to the original sample weight. It produces a finished, client-friendly report showing test parameters. Use IRTH™ on an ongoing basis for 1-day, 3-day or 7-day runs to build a response spreadsheet for a series of treatments. No other instrument combines all of these features in such a simple, flexible and cost-effective package.

IRTH™ is an investigator's ideal tool to monitor and validate carbon cycling and carbon sequestration in small-scale biological systems.

Applications for IRTH™

- **Soil respiration** (an indicator of soil health)
- **Decay rate** (of plant litter such as leaves, grass clipping or stover mixed into the soil)
- **Spoilage rate** (of foodstuffs such as grains and vegetables)
- **Compost stability** (such as determining when active decay has ended)

One of the main applications for IRTH™ is measuring soil biological reactions. The preferred method uses fresh, moist soil to measure natural basal respiration. IRTH™ can also measure disturbance events when dried, processed soils are re-moistened to produce a CO_2 pulse or burst.

In addition, IRTH™ can measure biodegradation rate or decay in organic residues such as bio-plastics, plant litter, mixed-waste materials, food scraps and compost products. These results provide valuable information to derive a carbon loss rate or a stability index.

IRTH™ offers the flexibility to conduct any of these tests with varying amounts of samples and produce results in just hours or days.

IRTH™
CO_2 RESPIROMETRY

IRTH™ Design

Solvita IRTH's nucleus is its *smart lid* – as soon as you cap the sample and power it on, it begins assessing results. IRTH™ is designed to be a temperature- and CO_2-sensitive lid that fits on premium-quality Schott glassware. It uses a wide-range infrared (IR) cell sensor that monitors continuously, differing from other IR cell tests that flush or dump CO_2 periodically to maintain accuracy. IRTH™ accepts the input of variable weight and moisture for any sample and produces a report in CO_2 atmospheric change and ppm (mg/kg) as carbon released per unit weight of the sample.

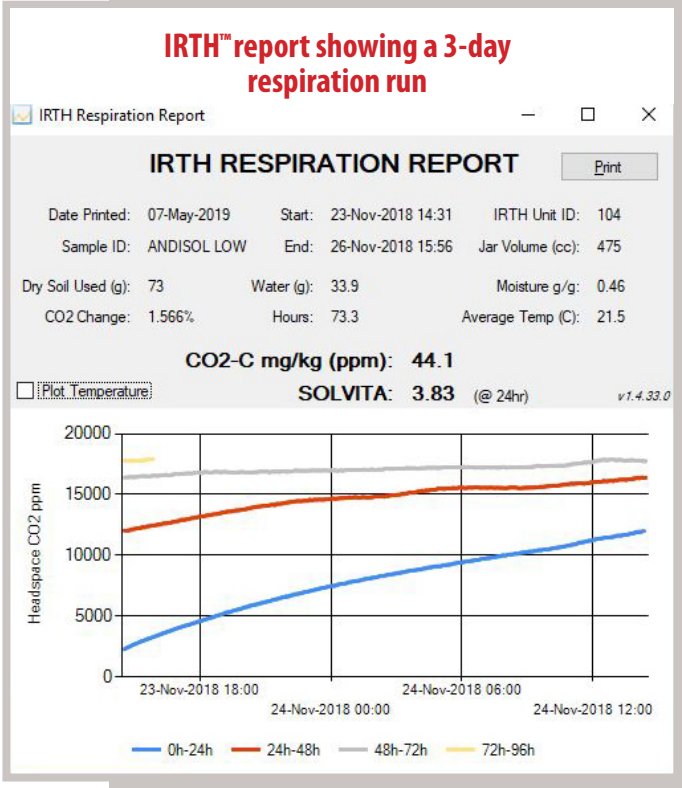
Using IRTH™

Using Solvita IRTH™ is a simple six-step process:

1. Fill the jar with a sample test substance (soil, compost or plant litter).
2. Close the gas-sensitive lid.
3. Connect IRTH™ via USB cable to a PC or direct USB power hub.
4. Allow IRTH™ simply to run, or use its software to set a predetermined length
5. See results immediately on the LED screen, even before downloading.
6. Use Solvita software to create sample reports and manage data.

The results from an IRTH™ investigation may be reported as field respiration, biological activity, decay rate or carbon cycling.

IRTH™ report showing a 3-day respiration run



Science in Action

IRTH™ is the result of more than 30 years of work at Wood End Laboratories comparing IR, GC, Solvita-Gel and Alkali-BaseTrap systems for collecting CO_2 in several kinds of biological systems. It is carefully crafted to overcome the unique limitations in these other approaches. When used with soils, IRTH™ recognizes the Solvita color system, a Log Scale for soil fertility much like the pH scale. IRTH™ integrates effortlessly with Solvita monitoring software to provide a simple means for generating lab respiration reports. Storage and export functions allow IRTH™ to provide .csv files for easy spreadsheet tabulation and manipulation.

IRTH™ design and functionality draws on key elements of current, leading-edge innovations in measuring CO_2 microbiology.

SOLVITA®

For more information or to order Solvita IRTH™, visit solvita.com/irth/.