



**ERACHECK**

# Guidance Sheet

How to measure the  
HYDROCARBON CONTENT in SOIL

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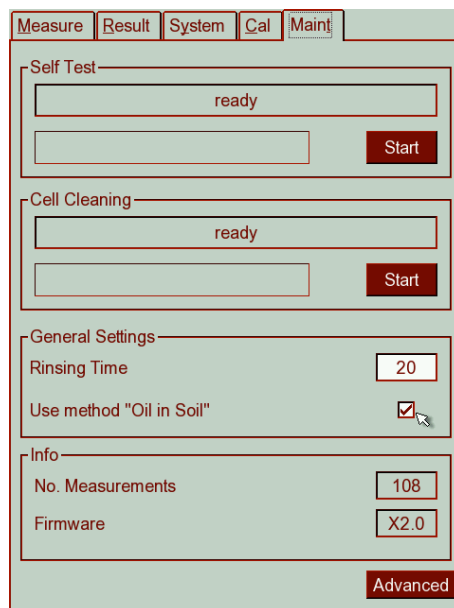
## Introduction

The ERACHECK oil in water analyzer provides the option to determine hydrocarbons in soil. Before measurement, the hydrocarbons have to be transferred from soil into cyclohexane. The extraction is carried out according to DIN ISO 16703[2]. The only exception to this method is the usage of cyclohexane as solvent.

### How to obtain the hydrocarbon content in soil:

#### 1.) Change to "Oil in Soil" Mode

Tick the checkbox named "Use method Oil in Soil" in the "Maint" tab of the ERACHECK software to analyze soil samples. This procedure changes the user interface in the "Measure" menu.



#### 2.) Sample preparation

Prepare approximately 20g of soil sample. Determine the exact weight. To remove water from the sample, comminute the soil sample with 20g sodium sulfate in a mortar. Fill the soil sample into a 100 mL glass flask with PTFE lined cap. Add 40mL cyclohexane. Close the flask airtight and shake it rigorously for several minutes.

Note:

Use 80 mL instead of 40 mL cyclohexane in case of soil samples with low density.

#### 3.) Clean-up procedure

The clean-up procedure has to be carried out for all samples. The remaining extraction solvent is cleaned up by  $\text{Na}_2\text{SO}_4$  and Florisil® according to methods ISO 9377-2 or OSPAR 2005-1. As the solvent has already been dried by  $\text{Na}_2\text{SO}_4$  in step 1, solely Florisil® can be used alternatively. During this step, all polar substances are removed. For exact background determination, the pure solvent has to be cleaned up, too. Ignoring may result in negative results when measuring low concentrations.

Note:

Ready-made cartridges filled with Florisil® or  $\text{Na}_2\text{SO}_4$ /Florisil® can be used for clean-up. See the ERACHECK Measurement Card for details.

#### 4.) Measurement of petroleum hydrocarbons

Perform an ERACHECK measurement of the Florisil®-treated pure solvent. At best, use the calibration of the oil under investigation. If calibration data are not available, use an alternative calibration, such as tetradecane calibration (Factory Cal.). If you have already calibrated for oil-in-water measurements, you can simply use this calibration.

The screenshot shows the 'Measure' tab of the ERACHECK software. It features a top navigation bar with tabs for 'Measure', 'Result', 'System', 'Cal', and 'Maint'. The main interface includes three dropdown menus: 'SAMPLE ID' set to 'Soil Sample A', 'OPERATOR' set to 'Joe', and 'CALIBRATION' set to 'Factory Cal.'. Below these is an 'ENRICHMENT' section containing two input fields: 'Soil mass [g]' with the value '20' and 'Solvent Volume [mL]' with the value '40'. At the bottom of the interface, there is a green 'READY' button and two red buttons labeled 'RUN' and 'RINSE'.

Enter the soil mass (in g) and the solvent volume (in mL) into the "Measure" tab before starting a measurement. Default values: 20 g soil and 40 mL cyclohexane.

Note:

The display will show the result in mg/L water. When measuring oil in soil the result must be interpreted in mg/kg soil. Future software updates will enable the ERACHECK to show mg/kg for oil-in-soil measurements.

After measurement you should also consider the amount of water in your sample. Usually the unit of concentration is mg/kg dry weight. The result you obtain from the ERACHECK refers to moist weight. To correct the result, determine the relative humidity of the soil sample.

Example: Result from ERACHECK: 250 mg/kg  
 Relative humidity: 50 percent by weight  
 Corrected result = 250mg/kg moist weight \* (1/0.5) = 500mg/kg dry weight

#### 5.) Doing a calibration

The calibration procedure for oil-in-soil measurements is described in section 10 of the ERACHECK instruction manual (version > 9.0). It is recommended to make a one-point calibration. The preparation of calibration samples is described in section 5.2 of the manual. Add 90 mg of your target oil in to a 50 mL volumetric flask. Fill up the flask to 50 mL with cyclohexane. Always perform the clean-up procedure for the calibration solution (see 2.).

Note:

If using a target crude oil other than tetradecane, calibration solutions have to be cleaned up.

**If further guidance is required for putting the above procedure into practice  
 please call your local dealer for support.**