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WHITE PAPER

Extended Measurement Ranges for Testing Oil Content in Water and/or Soil with the InfraCal 2 Analyzers

There are several options for InfraCal users who would like to measure from sub-ppm to percent levels of fats, oil and grease (FOG) or total petroleum hydrocarbons in water, drill cuttings or soil. The new InfraCal 2 has the capability of multiple calibrations for different concentration ranges while the standard InfraCal TOG/TPH Analyzers only hold one calibration. Listed below are the typical InfraCal 2 Analyzer calibration ranges for different applications.

0.5 - 7.5 ppm

The increased sensitivity of the InfraCal 2 Analyzer allows for lower levels of detection than attainable with the standard InfraCal Analyzers for customers that require a lower detection of oil and grease in their wastewater. Spectro Scientific provides standards and factory calibrations for this range.

2 - 200 ppm

This is the standard calibration range for measuring TOG, TPH or FOG in water from the factory using an extraction ratio of 10 parts sample to 1 part solvent (10:1). Both calibration standards and factory calibrations are available for either TOG/TPH or FOG.

200 - 2000 ppm for oil in water/ 15 - 2000 pmg/kg for oil in soil

The same calibration standards can be used to create another factory calibration for a 1 part sample to 1 part solvent extraction ratio to be able to measure a range of 200-2000 ppm for oil in water or 15-2000 mg/kg for oil in soil as well as the 2-200 ppm range for a 10:1 extraction ratio. This can be provided as an additional factory calibration in the InfraCal 2 at no additional charge. The user must be sure to use the correct extraction ratio for the calibration, either 10:1 or 1:1. Because of the accuracy required for water samples, it is not suggested to use the 1:1 extraction for levels under 200 ppm.

2000 ppm (0.2%) to 20,000 ppm (2%)

For levels above 2000 ppm (0.2%) to 20,000 ppm (2%) range, a 1:1 extraction solvent ratio is used for analysis (both water and soil samples). 1 ml of the solvent extract is then diluted by a factor of 10. Detailed instructions are included in the analyzer operating manuals. While a 1 part sample to 10 parts solvent (1:10) extraction ratio could be used, a couple factors should be considered.

First, for a 25 ml grab sample it would require 250 ml of solvent, while performing the test using the dilution method would only take 34 ml of solvent (25 for extraction, 9 additional ml for dilution). Second, by simply reducing the sample size to reduce the solvent amount there is a risk in a varied waste stream that there is not enough sample for a representative average. A larger sample volume will tend to average anomalies in the waste stream.

1-10%

Higher levels of oil are often required when testing drilling mud, drill cuttings or water sampled prior to going to the oil/water separator. With the InfraCal 2 ATR-SP, the analysis range can be extended by using an infrared transparent solvent such as perchloroethylene or S-316 instead of hexane which normally would be used with this analyzer. With the IR transparent solvents, there is no need for evaporation and the measurement is done directly in the solvent. Please note that a cover is needed to prevent evaporation—this is an accessory item that can be ordered at the time the analyzer is purchased. The higher levels are measured since the sample is not concentrated during evaporation and due to the short path length of the ATR sampling crystal. While Spectro Scientific does not have calibration standards for this procedure, we can provide instructions for calibration or a quotation for a custom calibration.

Please feel free to contact us about increasing the useful range of your InfraCal 2 Analyzer.

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