

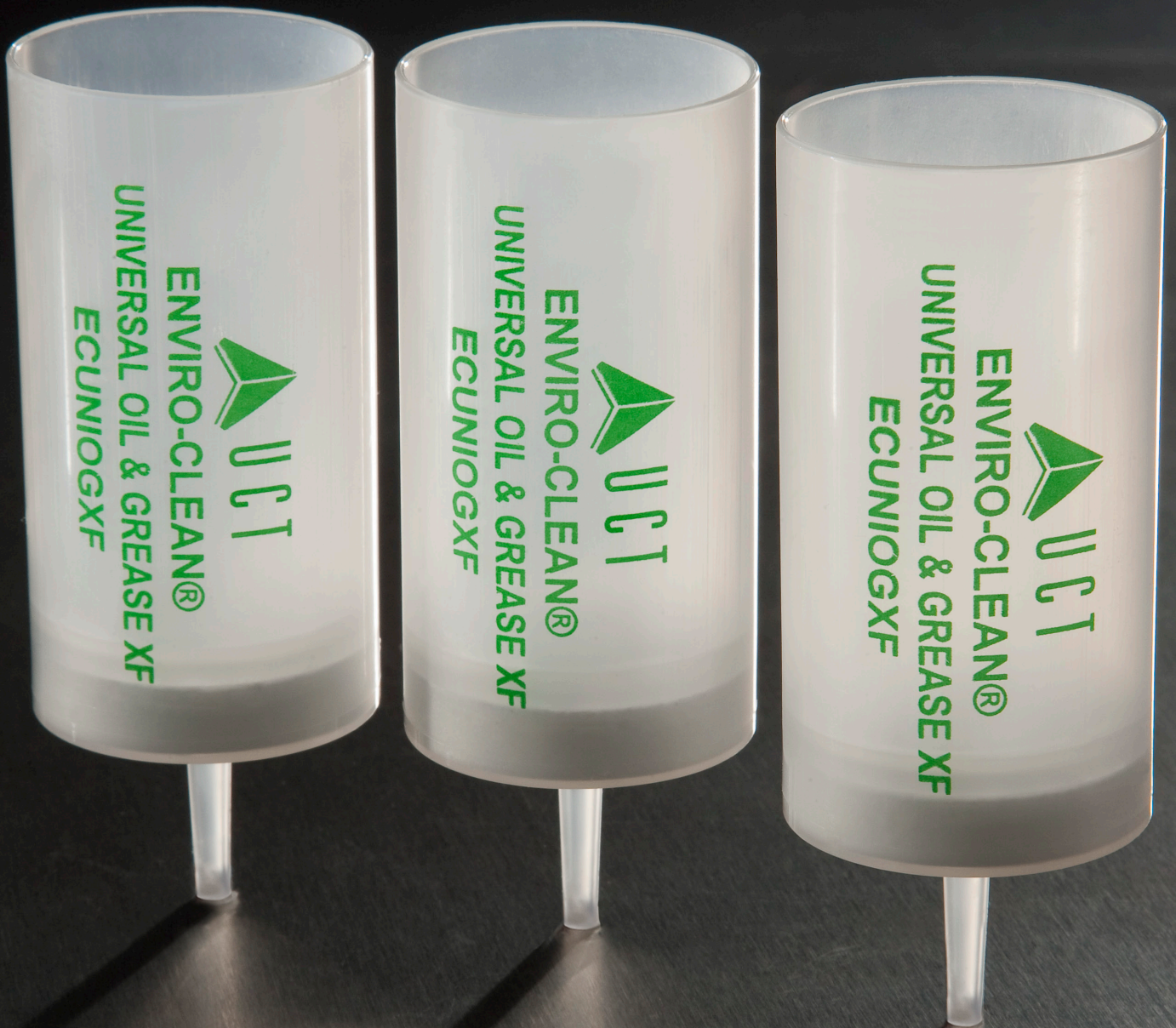


ENVIRO



# EPA Method 1664B

n-Hexane Extractable Material



OIL & GREASE XF

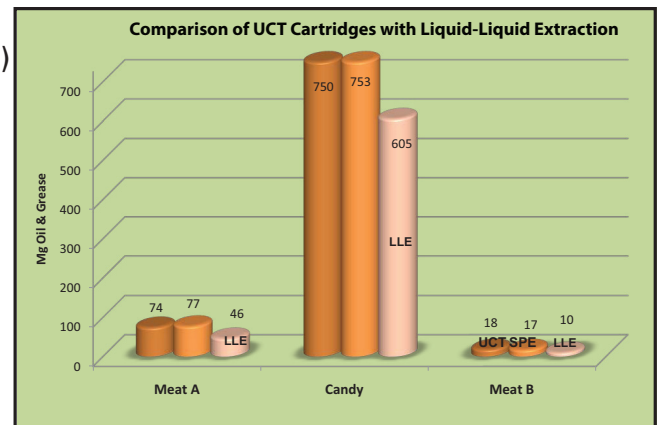
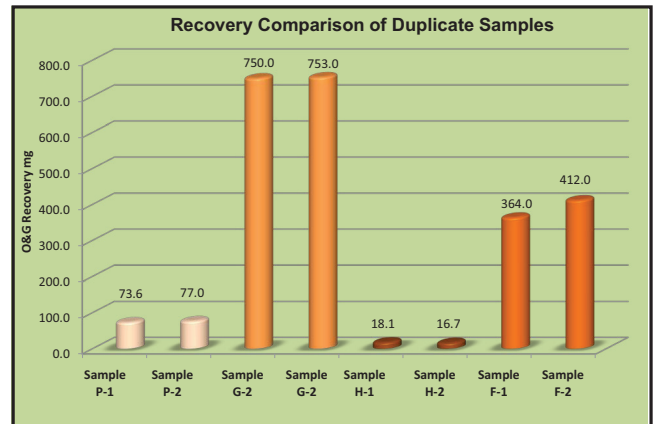
The UCT solid-phase extraction cartridge (ECUNIOGXF) for Oil & Grease Analysis is designed to provide a new level of performance in solid-phase extraction. With its special filter design, superior flow and high capture efficiency can be achieved with the dirtiest of samples.

## Product Benefits

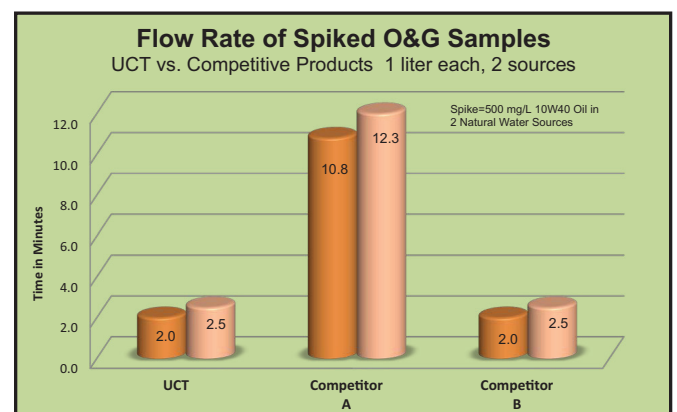
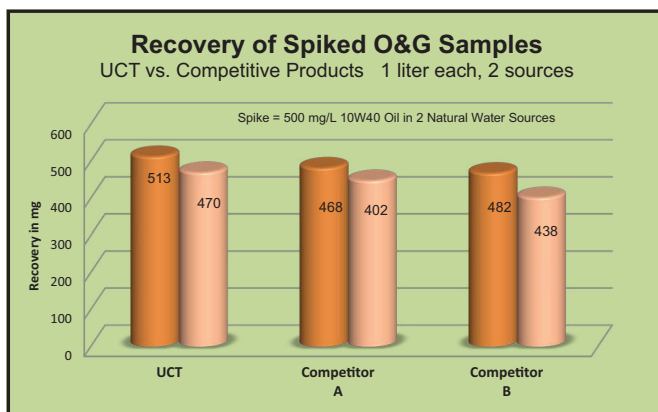
- Active solid-phase multiple media design
- Real SPE not just mechanical filter capture
- Very high capture capacity 3.0 grams/cartridge
- Faster flow rates with high suspended solids (SS) matrices
- Multilayer, multimedia prefilter design for superior plugging resistance
- Reduced solvent usage
- No phase separation problems (no emulsions)
- Excellent analytical reproducibility (MDL 1.66 mg/L)

## Product Features

- 37 mm diameter polypropylene cartridge design
- Can be used on manual single or multi-station manifolds system
- Works with automated extractor systems



UCT cartridge shows the highest analyte recovery along with the fastest flow rate when compared to leading competitive products



# Instructions for Using EPA Method 1664B: n-Hexane Extractable Material (HEM; Oil and Grease)

## UCT part numbers included in method:

**ECUCTVAC6** - Enviro-Clean® 6-Station Vacuum Manifold

**ECROCKER400** - Rocker 400 Vacuum Pump 110 volt

**ECUCTTRAP20** - 20L Manifold Trap

**ECUCTADP** - Enviro-Clean® Glass Cartridge Adaptor

**ECUNIBHD** - Enviro-Clean® Universal White Bottle Holder

**ECUNIOGXF** - Enviro-Clean® Universal Oil & Grease XF 2000mg/83mL

**ECSS25K** - Enviro-Clean® Bulk Anhydrous Sodium Sulfate 25kg

**ECUNIMSS** - Enviro Clean® Universal Cartridge 20g Muffled Sodium Sulfate

## Procedure

### 1) Assemble

- Connect a 6-station vacuum manifold (**ECUCTVAC6**) to a 20-L manifold trap (**ECUCTTRAP20**), and attach the trap to a vacuum pump (**ECROCKER400**)
- Attach the glass adapters (**ECUCTADP**) onto the manifold
- Connect the bottle holders (**ECUNIBHD**) to the top of the SPE cartridges (**ECUNIOGXF**), and attach the cartridges to the glass adaptors on the manifold

### 2) Prepare Water Sample

- Adjust the pH of the sample to < 2 by adding 6N HCl or H<sub>2</sub>SO<sub>4</sub>.
- If acid was added to the sample in the field, do not add more unless the pH > than 2

**Note:** Gloves are recommended as skin oils may affect final sample weight

### 3) Condition the Cartridge

- Rinse the sides of the cartridge and bottle holder with 10 mL of n-hexane
- Allow cartridge to soak for 1 min.
- Draw the hexane through the cartridge using vacuum, leave full vacuum on for 1 min, then release the vacuum
- Add 10 mL of methanol to the cartridge, soak for 1 min
- Slowly draw the methanol through leaving a thin layer on the cartridge frit
- Add about 80 mL of DI water to the cartridge
- Draw all of the water through the cartridge to waste, do not let sorbent go dry

### 4) Sample Addition

- Load sample bottle onto the bottle holder
- Draw the sample through the cartridge under low vacuum. This may take 4 or more minutes depending on the solids in the sample (Note 1). Increase vacuum pressure if necessary. Do not exceed 250 mL/min for optimum recoveries. This is a fast drip, but not a stream
- After all samples are passed through, turn full vacuum on. Remove the cartridges and tap/swing to remove any excess water from the bottom of the cartridges
- Replace the cartridges to the manifold, and dry under full vacuum for 10 min

### 5) Elution

- Insert extract collection vials with a thin layer (about 0.5-0.8 cm) of anhydrous sodium sulfate (**ECSS25K**) in the manifold
- Add a thin layer (about 0.5-0.8 cm) of anhydrous sodium sulfate into the SPE cartridge
- Rinse the sample bottle with 10 mL of n-hexane
- Add the hexane to the cartridge
- Soak cartridges for 2 min. A slow drip of hexane is permissible
- Turn on vacuum and draw the hexane through the cartridges and into the collection vials, leave vacuum on for 0.5 min
- Turn off vacuum then repeat steps 5 c) – f) 2 additional times with 10 mL of n-hexane
- Add 10 mL of hexane to the cartridges, rinsing the bottle holders
- Soak cartridges for 2 min
- Draw the hexane through the cartridges and collect, do not allow the solvent to splash into the collection vial

**6) Dry the Extract**

- a) Remove the collection vials from the manifold
- b) Dry the extracts by pouring them through the drying cartridges (**ECUNIMSS**) pre-rinsed with 10 mL n-Hexane into the pre-weighed vials. Alternatively, use glass wool stopped glass funnel containing approximately 10-20 g anhydrous sodium sulfate (pre-rinsed with n-Hexane).

**Do not use filter paper**

- c) Rinse the extract collection vials with hexane and add it to the sodium sulfate and collect. This will rinse the vial and the sodium sulfate. Poor rinsing of the sodium sulfate will result in low recoveries

**7) Gravimetric Analysis**

- a) Carefully evaporate the samples using a nitrogen evaporator at 40° C until just reaches dryness

**Note:** Do not over dry otherwise low recoveries will result

- b) Allow the samples cool to room temperature in a desiccator before weighing
- c) Record the weight difference, and report as mg/L of HEM

**Notes:**

- 1) If high solids are present, add a small plug of glass wool to the cartridge prior to extraction to prevent clogging and improve flow. The glass wool must be thoroughly rinsed with hexane as part of the cartridge during the condition and elution steps.
- 2) Stearic acid must be in solution in the spiking solution otherwise low recoveries will result. If small crystals are present in the spiking solution, sonicate or shake until dissolved.
- 3) If white crystals are present in the sample bottle after elution, the sample pH was not low enough prior to extraction. Repeat with lower pH.
- 4) HCl will lose strength over time. Sulfuric acid is a good substitute.
- 5) Any residue that does not rinse from the bottle or elute from the cartridge is not HEM.

**For Method 1664 updates see:**

<http://www.epa.gov/waterscience/methods/>

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**WARRANTY**

All products manufactured by UCT are guaranteed against defects in materials and workmanship for a period of 90 days after shipment. UCT will replace any items that prove to be defective during this time period. The exclusive remedy requires the end user to first advise UCT of the defective product by phone or in writing and must include order number, the lot number and the shipping date.

To initiate this action, photographs of the product, including packaging and labeling of the containers, must be submitted to the UCT Representative for approval. With approval a return authorization can be initiated, and must be received within 30 days. Once the materials arrive at UCT a further inspection of the materials must be completed and accepted by our Quality Manager prior to further action of credits or replacement. UCT's total liability is limited to the replacement cost of UCT products.

This warranty does not apply to damage resulting from misuse.



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