



EPA Method 1664 Hexane Extractable Material HEM

UCT Product:

ECUNIOGXF ENVIRO-CLEAN® Universal Oil and Grease 83 mL Cartridges

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1) Assemble

- a) Assemble cartridge adapters on the vacuum manifold
- b) Place **ECUNIOGXF** cartridge(s) on each vacuum station needed
- c) Connect the manifold to a suitable trap and attach the trap to a vacuum system capable of attaining a minimum of 25" Hg (635 mm) of vacuum
- d) Insert waste collection vial in manifold (optional)

2) Prepare Water Sample

- a) Adjust the pH of the sample to less than 2 by adding 5 mL of 6N HCl or 2.5 mL of concentrated H_2SO_4
- b) If acid was added to the sample in the field do not add more unless the pH is greater than 2

Gloves are recommended as skin oils may affect final sample weight

3) Condition the Cartridge

- a) Rinse sides of cartridge and bottle holder with 10 mL of hexane
- b) Allow cartridge to soak for 1 minute
- c) Draw the hexane through the cartridge using vacuum
- d) Discard the hexane from waste vial
- e) Draw full vacuum through the cartridge for 2 minutes to dry
- f) Add 10 mL of methanol to the cartridge
- g) Slowly draw the methanol through leaving a layer on the cartridge frit
- h) Soak for one minute
- i) Remove waste vial and discard methanol

From this point on do not let the cartridge dry out otherwise repeat at step f)

- j) Add 30 mL of DI water to the cartridge
- k) Draw the water through the cartridge to waste

4) Sample Addition

- a) Add the 1 liter water sample directly to the cartridge
- b) Draw the sample through the cartridge under low vacuum. This may take several minutes depending on the solids in the sample. (Note 1) Increase vacuum pressure if necessary. Do not exceed 500 mL/minute
- c) Remove the cartridge and tap any excess water from the bottom of the cartridge
- d) Replace cartridge and allow to dry under full vacuum for 10 minutes
- e) Remove any water remaining in the bottom support of the cartridge with a paper towel if necessary

5) Elution

- a) Prepare an extract collection vial containing about 8 mm (0.3 inch) of anhydrous sodium sulfate
- b) Place the vial in the manifold station under the cartridge
- c) Rinse the water sample bottle with 10 mL of hexane
- d) Add the hexane to the cartridge
- e) Soak cartridge for 2 minutes
- f) Turn on vacuum and slowly draw the hexane through the cartridge and into the collection vial
- g) Turn off vacuum then repeat steps 5 c) – f) 2 additional times but use 10 mL of hexane
- h) Do not allow the solvent to splash into the collection vial
- i) Add another 10 mL of hexane to the cartridge, rinsing the bottle holder
- j) Soak cartridge for 2 minutes
- k) Draw the hexane through the cartridge

6) Dry the Extract

- a) Remove the collection vial from the manifold and cover with a screw cap
- b) Shake the extract to form a water/hexane emulsion and immediately pour the extract through a sodium sulfate funnel or column containing approximately 40 g of anhydrous sodium sulfate held in place with a glass wool plug or frit. **Do not use filter paper**
- c) Collect the extract in a clean, pre-weighed vessel
- d) Rinse the collection vial with hexane and add it to the sodium sulfate. This will rinse the vial and the sodium sulfate

7) Gravimetric analysis

- a) Carefully evaporate the hexane using a TurboVap[®] or similar evaporator at 40° C until the extract just reaches dryness.

Note: Do not over dry or low recoveries will result

Do not dry on a hot plate or in an oven or over dry as low recoveries may result

- b) Allow to cool to room temperature in a desiccator before weighing
- c) Record this weight as the mass per unit volume of oil and grease and report as HEM as mg/L

Notes

- 1) If very high solids are present, add glass wool to the cartridge prior to extraction to prevent clogging and improve flow. The glass wool must be thoroughly rinsed as part of the cartridge during the elution step.
- 2) Stearic acid must be in solution in the spiking solution or low recoveries will result. If small crystals are present in the spiking solution, sonicate or shake until dissolved.