Empore™

New Oil & Grease Extraction Disks

Frequently Asked Questions

Can I use the new 3M™ Empore™ Oil and Grease Disk on the Horizon Technology equipment?

Yes. The new disk can be easily used on automated equipment. When using the Horizon Technology equipment, be sure to center the disk on the filter support before closing the Disk Holder Assembly. It is important to follow manufacturers use instructions when closing the unit and to gently squeeze the assembly once it has closed. This helps compress the disk at the pressure points to assure a good, leak tight seal.

How can I achieve faster flow times when I am testing the EPA hexadecane/stearic acid standard?

Some customers occasionally experience problems with long filtration times upon using EPA hexadecane/stearic acid standard. The problem is most prominent if the standards are used immediately after preparation. This slow filtration effect is due to the fine dispersion or emulsion of the standard that is created when the mixture is shaken with the acetone solution containing the hexadecane/stearic acid. The acetone is soluble in the water and assists in the formation of this emulsion, which can be difficult for most disks to filter because of the very small particle size. There are several ways to improve the flow time of this material.

1) Advanced Preparation Technique

If possible, the standard should be prepared a day before or at least several hours (more than 4) before being used in oil and grease testing. Aging allows some of the hexadecane/stearic acid to agglomerate into larger particles and the acetone to evaporate which results in a faster filtration time.

2) Floating Standard Technique

Another method involves “floating” the standard, either in the sample bottle or directly in the extraction reservoir.

- To prepare the standard by the float method in the sample bottle, the acetone solution of hexadecane/stearic acid should be carefully pipetted onto the surface of the water rather than injecting it into the water. Do not shake the water sample at this point. By waiting a few minutes before use, some of the hexadecane/stearic acid agglomerates resulting in an easier filtering mixture. This technique may also generate test samples that more closely mimic real world samples.

- The float technique may also be used to actually prepare the standard in the filter reservoir of the extraction apparatus. In this procedure, a one-liter bottle of pH 2 acidified water is prepared. A portion of this water is held in the reservoir before filtration begins and the

acetone solution is slowly pipetted onto the surface. The solution is allowed to set for a few moments before opening the vacuum to begin filtration and adding the remainder of the water from the sample bottle. This technique also aids in generating the highest recovery values since there are no transfer losses of the standard from the sample bottle.

3) No Shake Technique

A one-liter EPA standard can also be prepared by injecting the acetone solution into the water as usual. To avoid making a highly dispersed, difficult to filter mixture, the sample is not shaken but allowed to set for a few minutes prior to filtration. The hexadecane/stearic acid will float to the surface and agglomerate to larger particles. The sample water is then poured directly on the disk for the extraction procedure. The longer the sample can set prior to testing, the faster this mixture is likely to flow through the disk.

How can I achieve the lowest possible "blank"?

Excellent blanks are achievable using two rinses of 20mL each for the 47mm disk (30mL for the 90mm disk). However if the "blank" level is still found to be unacceptable, then one of three options made may be used to lower the level.

1. Additional solvent could be used in each of the two hexane rinses. This quantity can be 30 mL for a 47 mm disk and 40 mL for the 90 mm disk.
2. Another technique would be to use three prewashes prior to the methanol addition. One may also increase the soak time by one or two minutes for each of the two to three rinses which will extract more of the residual from the prefilter.
3. A combination of these procedures may be used if especially low blanks are required, i.e. less than 0.2 mg.

Blank determinations should be run using the highest quality water available, as simple DI water may (but not necessarily) contribute to a "blank" during an analysis. This can depend upon the actual quality of the DI water in a particular laboratory. Simple DI water will suffice if 18 megaohm (Type 1) high purity water is not available. Be sure that all glassware is very clean and handle all glassware and extraction disks with gloves to avoid contamination with skin oils.

The new 3M™ Empore™ Oil and Grease disk is highly efficient in capturing low levels of extractable compounds; the high performance is especially observable if the "blank" water is contaminated by materials that can be commonly found in water storage tanks, plastic transfer lines or other sources of contamination.

After running a "blank" determination there is a small quantity of residue in the collection vial. What is this residue?

The polymer used in the preparation of the prefilter for the oil and grease disk contains proprietary additives incorporated by the manufacturer. These compounds are added to the polymer to enhance processing, and to aid in stabilizing the polymer against UV and oxidative degradation. All polymer materials contain processing additives. These materials can be reduced or removed completely immediately prior to the disk being used in an oil and grease analytical determination by hexane prewashes. The greater the quantity of solvent used, and the longer the soak time, the lower the "blank" of a water sample.

Sometimes I notice a few drops of liquid around the edge of the disk in the glass extraction apparatus. How can I prevent this leakage?

Before placing the clamp on the extraction apparatus, with the disk in place, gently press and twist the reservoir. This help compress the disk where it comes in contact with the KEL-F™ support creating a good seal that will not leak.

How can I improve the flow times of the new 3M™ Empore™ Oil & Grease Extraction Disk?

The design of the new 3M Empore Oil & Grease Extraction Disk has been optimized to include a built in prefilter. The prefilter improves the flow rates and reduces potential plugging of the disk. To obtain the best possible flows from this unique new product it is important that there is a consistent seal with the top and bottom portion of the manifold assembly (both manual and automated assemblies).

To ensure the best possible seal 3M is offering, at no charge*, elastomeric gaskets that can be used with automated and manual extraction equipment. The gaskets help to dramatically improve the flow rates for both the 47 and 90mm disks. The following information compares the processing time of the sample being processed with and without the gasket. The reduction in flow times with the gasket will vary and is influenced on the type of sample being processed.

	47mm Disk (automated)[1]		**47mm Disk (manual)[2]**		**90mm Disk (manual)[2]**	
	w/out gasket	**w/gasket**	**w/out gasket**	**w/gasket**	**w/out gasket**	**w/gasket**
Avg. flow time of 3 samples	18 min. 45 sec.	3 min. 8 sec.	2 min. 19 sec.	57 sec.	1 min. 25 sec.	43 sec.

Tests conducted by 3M Company in 3M laboratories.
[1] – Automation equipment used for this study was the Horizon SPE Dex.
[2] – Manual equipment used for this study was the 3M One-Station Manifold Assembly.

47mm Gaskets are available for both automated (Horizon) and manual extraction equipment. 90mm gaskets are currently only available with manual extraction assemblies. To obtain additional information or to request a complimentary* gasket please call 3M Empore Technical Service at 1-800-648-3550.

* Complimentary gaskets are available until August 31, 1999 and will be made available to each account based on the number of extraction assemblies that are in use.

If you have any further questions or comments on these or other issues regarding the new 3M Empore Oil & Grease Extraction Disk please contact 3M Empore Technical Service through the 3M Empore website, email at Empore@3M.com or call at 1-800-648-3550 extension #30.

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