

StepSaver™

Operation & Instruction Manual



Environmental Express StepSaver Instructions

The Environmental Express StepSaver is intended to be used for any type of Solid Phase Extraction (SPE) technique using an extraction disk. The complete StepSaver Systems (items G6000, G6047, and G6090) have been created to perform SPE following the US EPA Method 1664 for Oil & Grease extractions. Below are instructions for using the EE StepSaver for Oil & Grease extractions using the UltraPrep extraction disks. This method is intended only as a supplement to EPA Method 1664 and should only be used as a guide. This method will need to be modified appropriately when performing SPE extractions with other extraction disks or for other analytes.

Setting up the StepSaver

The StepSaver System from Environmental Express will come pre-assembled except for the barbed fitting for the vacuum and the plug. To install these and check for proper seals, follow the instructions below:

- Wrap PTFE tape around the threads of the vacuum hose barb and plug and thread into the manifold base.



- Thread on the luer fitting onto the underside of the elution platform. This is where the G1065 drying cartridge will connect.
- Connect vacuum and look for any leaks. Tighten any necessary part to prevent vacuum leaks.

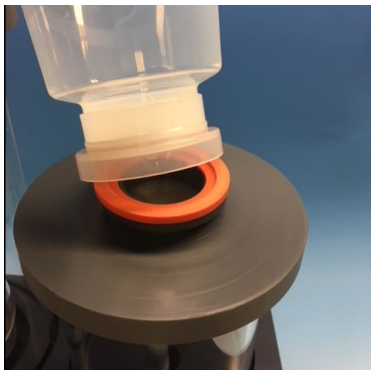
Once fully assembled, the StepSaver will look like this (photo with disposable funnel):



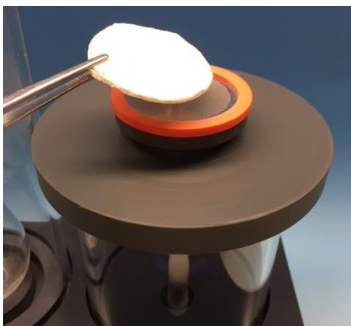
- For optimal performance do not chain more than three (3) units together at once.
- When running multiple units together, only perform the sample filtration or elution step on an individual unit at one time.

Performing an extraction of a sample

- Mark the level of liquid in the sample bottle using a Sharpie or other method. You will need this to determine the volume of sample after the extraction is completed.
- Clamp a disposable funnel with disk or a glass funnel with disk to the filter platform on the sample filtration side (right side) of the unit.
 - If using the disposable funnel add the orange gasket only to the platform.



- If using the glass funnel, add the orange gasket and stainless steel support screen to the platform.

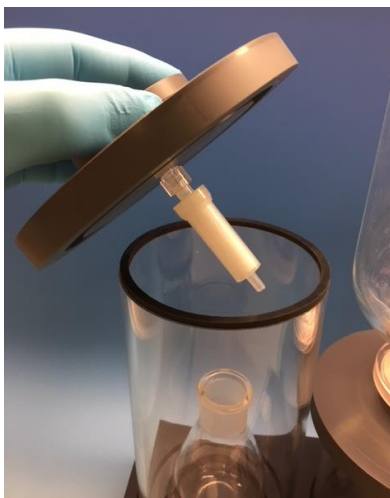


- Ensure the funnel is level and clamped securely.
- When clamping, do not move the clamp hinge flush to the funnel as this will cause a tilt of the funnel which may lead to leaks.

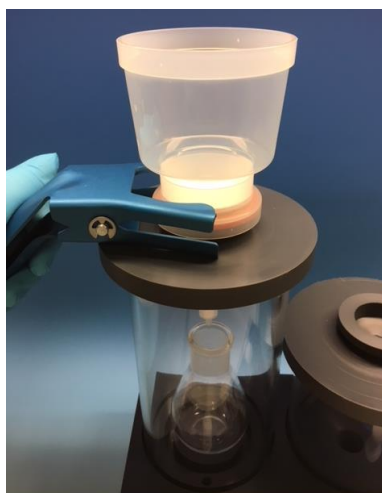


- Rinse the funnel and disk with a small volume of n-Hexane to clean the system and direct to waste.

- Pour the sample into the funnel.
 - When using the UltraPrep disks, an activation step using a polar solvent such as Methanol is not required. If using alternative disks a disk activation may be necessary.
- Turn on the vacuum pump.
- Turn the sample filtration stopcock to open the vacuum and completely filter the sample through the disk.
 - Sample will flow out of the StepSaver and into the waste carboy.
 - Ensure all sample has been filtered and allow the vacuum to continue to pull for an additional 10 minutes to remove as much trace water as possible.
- Turn the stopcock to close off the vacuum and turn off the vacuum pump.
- Place a pre-weighed pan or flask into the elution side of the StepSaver (left side).
- Place a drying cartridge (G1065) onto the underside of the elution side lid by threading onto the luer connector.



- Move the funnel and disk to the elution side of the StepSaver (left side).



- Pour 10 - 15mL of n-Hexane into the sample collection bottle and shake to remove any residual Oil & Grease that may be sticking to the walls of the bottle.
 - ***Pressure from the solvent will build up so ensure venting of the cap takes place when shaking***
- Pour the hexane from the sample collection bottle into the funnel and allow to sit for 5 minutes.
- Turn on the vacuum.
- Slowly open the stopcock on the elution side to pull the n-Hexane through the SPE disk and into the pan or flask.
- Repeat 2 more times.
- Rinse the sides of the funnel with hexane after the final elution step is done to remove any Oil & Grease that may still be sticking to the walls.
- Remove the pan or flask from the StepSaver and evaporate the solvent until 1 – 2 mL remain.
- Remove the pan or flask from the heating device and allow the remaining solvent to evaporate.
- Place in a desiccator until room temperature and weigh on a balance.
- Record weight and return pan or flask to the desiccator for 30 minutes.
- Weigh pan or flask a second time and record the weight. If the weight is within +/- 0.0005 g the pan or flask is considered weight stable. If not it must be returned to the desiccator for additional time and weighed again until weight stable.
- Fill the sample bottle to the line marked in the first step with water. Pour the water into a graduated cylinder and record the volume as your sample volume.