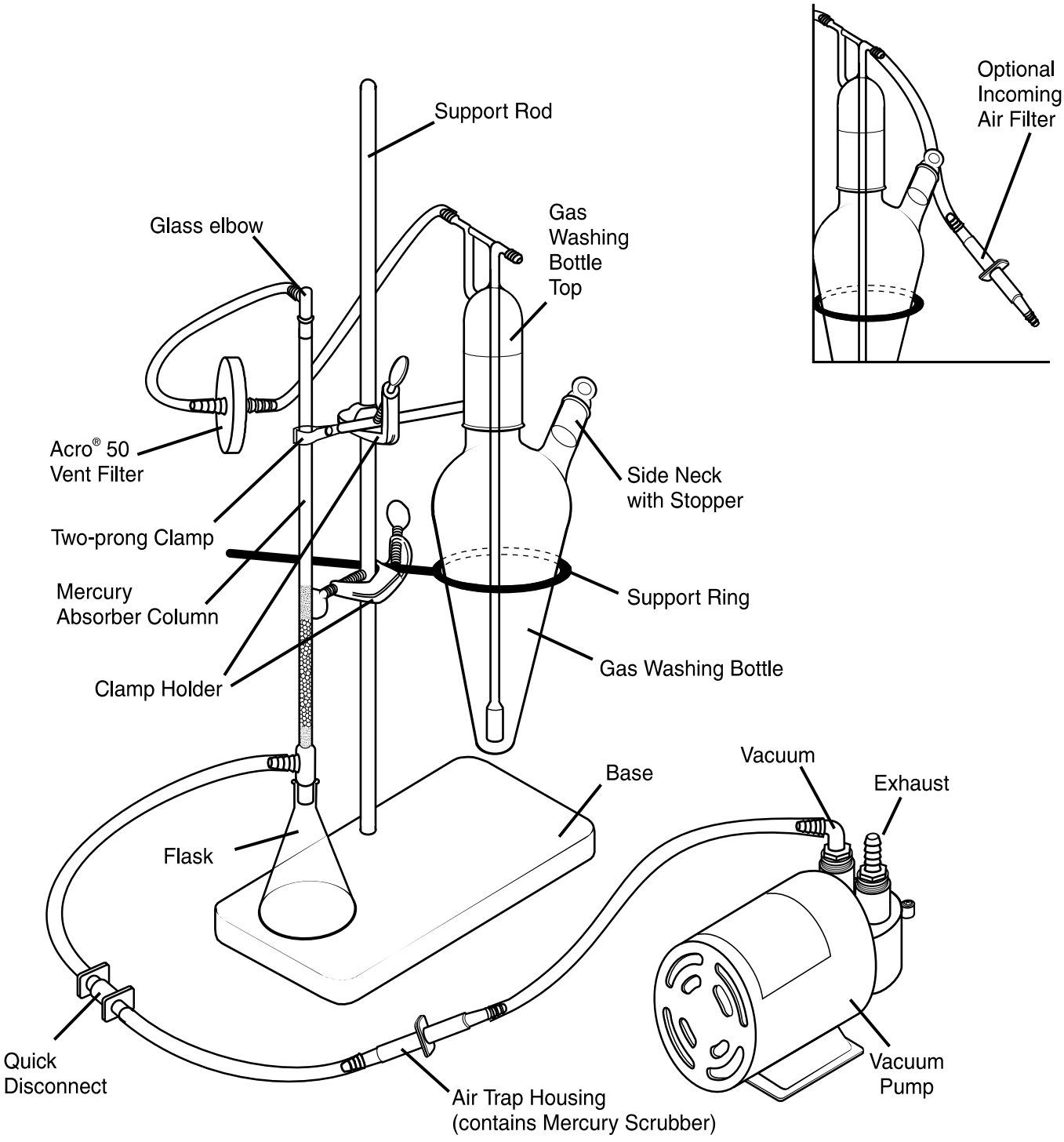
INSTRUCTION SHEET

Cold Vapor Mercury Apparatus*

Purpose

This instruction sheet shows how to assemble the apparatus set (26744-00) necessary for performing the Hach Cold Vapor Mercury Method (method 10065).

Figure 1 Cold Vapor Mercury Apparatus Assembly Overview



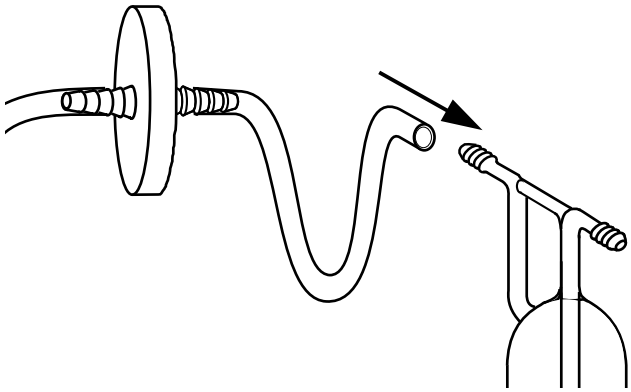
*Patent pending

Assembly Instructions for the Cold Vapor Mercury Apparatus

1. Refer to *Figure 1* for Steps 1-8. Screw the support rod into the support base.
2. Attach one clamp holder to the support rod 8 inches (20 cm) above the support base.
3. Attach a second clamp holder to the support rod 11 inches (28 cm) above the support base.
4. Clamp the support ring for the Gas Washing Bottle into the lower clamp holder. Position the support ring so the center of the ring is located over the middle of the right half of the support base. Securely tighten the thumb screw on the clamp holder.
5. Place the clamp for the Mercury Absorber Column into the upper clamp holder. Position the clamp for the Mercury Absorber Column so the Mercury Absorber Column will be located over the middle of the left half of the support base. Securely tighten the thumb screw on the clamp holder.
6. Attach two, 6-inch (15 cm) long pieces of white C-Flex tubing to the Acro® 50 Vent Filter.
7. Attach one of the tubes connected to the Acro® 50 Vent Filter to the glass elbow that fits on top of the Mercury Absorber Column. Air flow through the filter can be in either direction.
8. Place the Gas Washing Bottle into the support ring. Place the top onto the Gas Washing Bottle.
9. The Acro® 50 Vent Filter must be correctly attached to the top of the Gas Washing Bottle. Attach the tubing on the Acro® 50 Vent Filter to the glass tube fused onto the **side** of the Gas Washing Bottle top (see *Figure 2*).

***Note**: Do not attach the filter to the glass tube fused into the center of the top. The glass tube fused into the center of the top reaches to the bottom of the Gas Washing Bottle. This tube allows air to enter the Gas Washing Bottle. The Incoming Air Filtration Apparatus (optional) may be attached to this tube to prefilter entering air (see Figure 5).*

Figure 2 Attaching The Acro® 50 Vent Filter To The Gas Washing Bottle

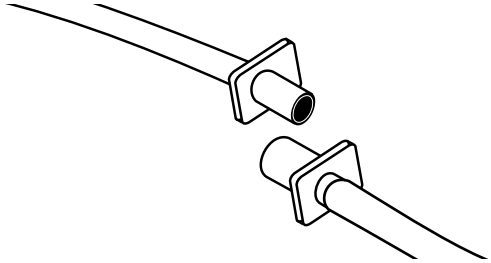


10. Place the Mercury Absorber Column into the clamp. Tighten the thumb screw on the clamp enough to hold the Mercury Absorber Column securely while still allowing the column to be raised and lowered during operation.
11. Place the erlenmeyer flask onto the bottom of the Mercury Absorber Column.

12. Attach one, 6-inch (15-cm) long piece of white C-Flex tubing to the hose connection on the Mercury Absorber Column.

13. Attach one half of the Quick Disconnect to the tubing on the Mercury Absorber Column (see *Figure 3*).

Figure 3 Quick Disconnect Assembly



14. Attach one, 6-inch (15-cm) long piece of white C-Flex tubing to the other half of the Quick Disconnect.

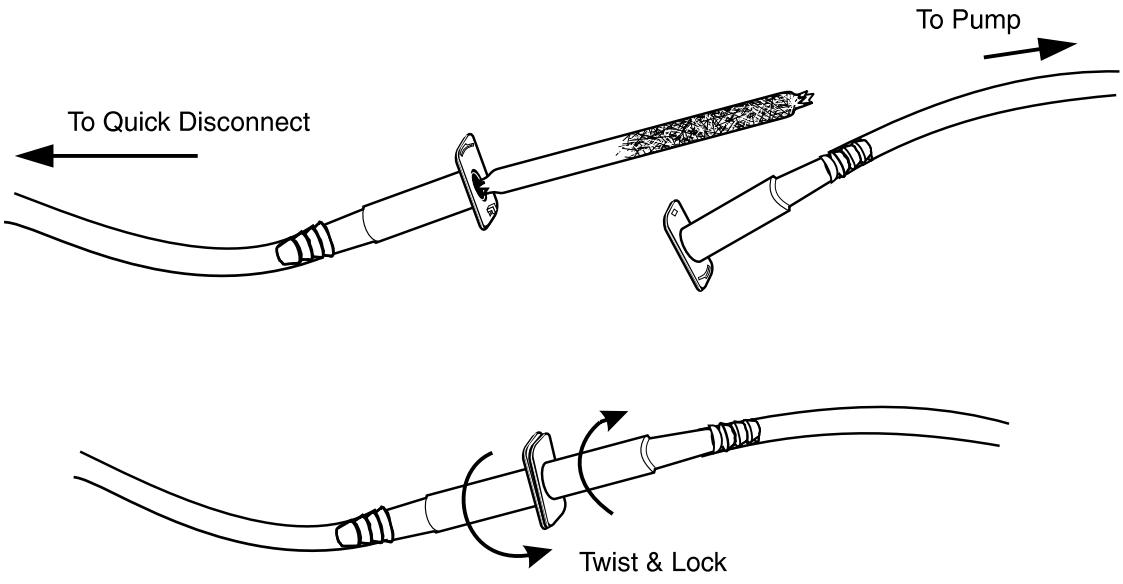
15. Attach one half of the Air Trap Housing to the tubing connected to the Quick Disconnect.

16. Attach white C-Flex tubing to the other half of the Air Trap Housing. This tubing should be long enough to reach to the vacuum source.

17. Use the Breaker/Capper tool to open a Mercury Scrubber included with the mercury test reagent set. See the instructions on *page 5* for the using Breaker/Capper tool.

18. Insert the opened Mercury Scrubber into the Air Trap Housing. The packed side of the scrubber should be toward the vacuum source. Air flow should enter the empty end of the Mercury Scrubber and exit from the packed end (see *Figure 4*).

Figure 4 Mercury Scrubber Assembly



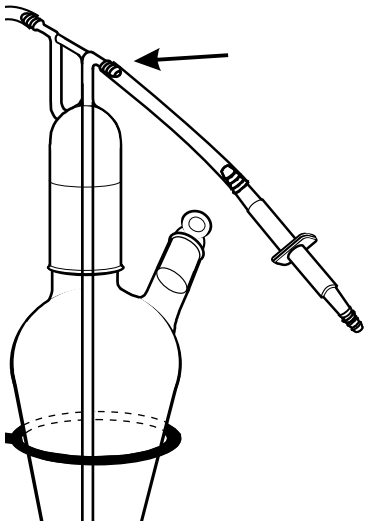
19. Press together the two halves of the Air Trap Housing containing an opened Mercury Scrubber. Twist the housing to lock the two halves together.

20. Press the two halves of the Quick Disconnect together.

21. Connect the white C-Flex tubing to the vacuum source.

22. Attach the optional Incoming Air Filtration Apparatus to the glass tube fused into the center of the top of the Gas Washing Bottle (see *Figure 5*).

Figure 5 Optional Incoming Air Filtration Installation



System Startup

Hach Company recommends performing a few analyses on mercury standards and blanks for system equilibration before beginning a sequence of sample testing. This allows the system to stabilize before processing a sample.

Startup Standard

Test a mercury standard solution by following the procedure in **Accuracy Check, Standard Solution Method** in the step-by-step procedure. Continue with the following step (g) if the value is not within specified limits.

g) Pipet 10.0 mL of the 0.1 mg/L Mercury Standard solution into the purged solution in the Gas Washing Bottle. Immediately stopper the Gas Washing Bottle.

h) Begin at step 3 of phase 2, Cold Vapor Separation and Preconcentration of Mercury.

i) Test the eluate as described in phase 3, Colorimetric Analysis. The displayed concentration should be between 0.9 µg/L to 1.1 µg/L Hg. Repeat steps (g) to (i) if the value is not within these limits.

Startup Blank

Run a system blank by using the purged solution in the Gas Washing Bottle after a satisfactory mercury test for the **Startup Standard** has been completed.

1. Leave the purged solution in the Gas Washing Bottle. Do not add an aliquot of mercury standard.
2. Begin at step 3 of phase 2, Cold Vapor Separation and Preconcentration of Mercury.
3. Test the eluate as described in phase 3, Colorimetric Analysis. The displayed concentration should be near 0.0 mg/L mercury. Repeat the Startup Blank Test until a reproducible value is obtained.

System Storage

Store the apparatus as follows for quickest system stabilization and greatest sensitivity:

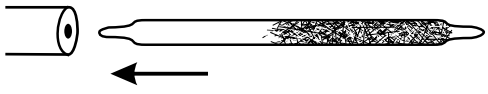
1. Store the Gas Washing Bottle filled with deionized water containing 15 mL of concentrated sulfuric acid. The stopper and top should be closing the Gas Washing Bottle.
2. The Mercury Absorber Column should be stored with the packing wetted with HgEX Reagent B. The erlenmeyer flask should be on the bottom of the column. The top of the Mercury Absorber Column should be connected to the Gas Washing Bottle with the glass elbow as in the procedure.

System Maintenance

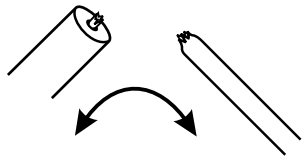
- With proper care and storage the Mercury Absorber Column may be used an unlimited number of times.
- Replace the Mercury Scrubber in the Air Trap Housing at least for each reagent set. The Mercury Scrubber will capture mercury vapor if the Mercury Absorber Column is not properly activated using HgEX Reagent B and HgEX Reagent C. It will also capture mercury if the capacity of the absorber column is exceeded. If the Mercury Scrubber has captured mercury, it must be disposed of according to applicable regulations.
- If moisture buildup on the Gas Washing Bottle side of the Acro® 50 Vent Filter reduces the purging air flow rate then the filter must be dried or replaced. Dry the Acro® 50 Vent Filter in an oven at 110 °C.

Breaker/Capper Tool Instructions

1. Insert the flame-sealed end of a glass Mercury Scrubber into the small hole on the end of the Breaker/Capper tool. Two Mercury Scrubbers come with each reagent set.



2. While firmly pressing the Mercury Scrubber into the Breaker/Capper tool, snap the end off the Mercury Scrubber. If necessary, tap the side of the Breaker/Capper tool against a trash can to dislodge broken glass from the small hole.



3. Repeat the process to open the other end of the Mercury Scrubber.

4. To cap a used Mercury Scrubber, drop one cap into the large hole of the Breaker/Capper tool (see *Figure 6*). Be sure the open end of the cap is up.

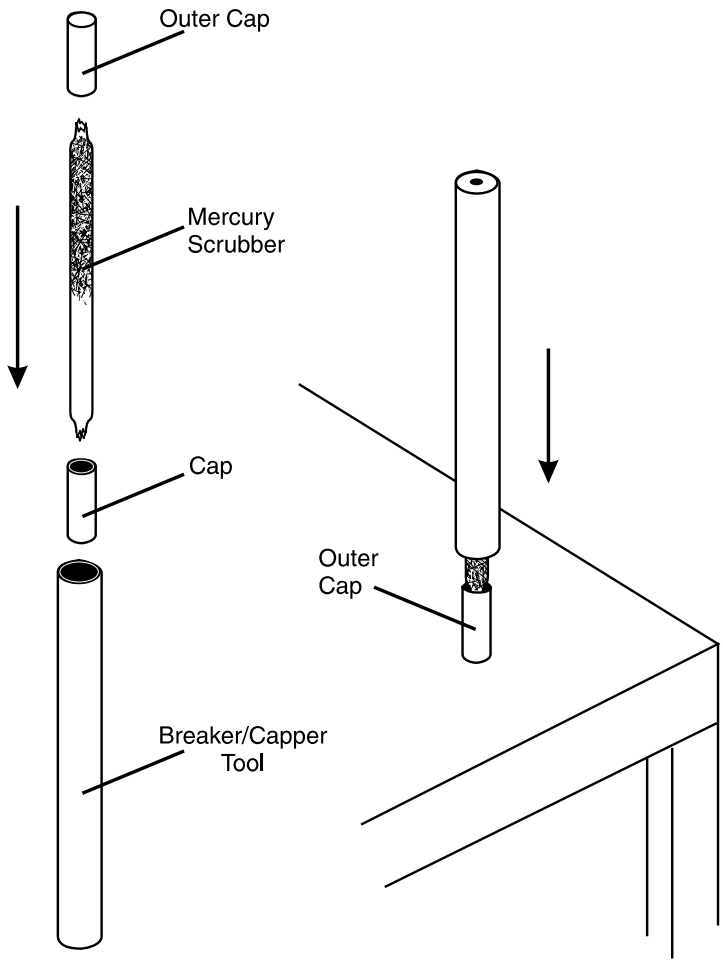
5. Place the used Mercury Scrubber into the Breaker/Capper tool.

6. Place a second cap over the exposed end of the Mercury Scrubber.

7. Turn the tool over while holding the outer cap in place. Place the outer cap against a hard surface such as a table top.

8. Press down on the Breaker/Capper tool to push the caps over the ends of the used Mercury Scrubber. Keep the Breaker/Capper tool; dispose of the Mercury Scrubber appropriately (if it contains mercury, it must be disposed of according to applicable regulations).

Figure 6 Using the Breaker/Capper Tool



Required Apparatus

Cold Vapor Mercury Apparatus Set 26744-00
Includes all the following apparatus:

Description	Cat. No.
Acro® 50 Vent Filter, PTFE membrane, 18/pkg	26833-18
Air Trap Housing, each	26639-00
Ampule Breaker, each	25640-00
Breaker/Capper Tool for Mercury Scrubber, each	26640-00
C-Flex Tubing, 1/4-inch ID X 1/16-inch W, white, 4 ft.	23273-67
Clamp Holder, each (2 required)	326-00
Clamp (2-prong) for Mercury Absorber Column, each	26562-00
Distilling Receiver, 10 mL (special mixing graduated cylinder), each	26554-38
DR/2000 Cell Riser, each	45282-00
DR/3000 Cell Riser, each	48403-00
Flask, erlenmeyer, 100 mL, each	26553-42
Funnel, micro, 35 mm, polypropylene, each	25843-35
Gas Washing Bottle, 1200 mL, each	26622-00
Glass elbow with hose adapter, each	26552-00
Mercury Absorber Column, each	26555-10
Stopper for Distilling Receiver, each	26559-00
Stopper for Gas Washing Bottle, each	26623-00
Support Base plus Rod, each	329-00
Support Ring for Gas Washing Bottle, each	26563-00
Tubing Quick Disconnect, HDPE, 12/pkg	14810-00

Optional Apparatus

Incoming Air Filtration Apparatus, each 26846-00
Vacuum Pump with Fittings, 120 volt, each 26557-00
Vacuum Pump with Fittings, 230 volt, each 26557-02

FOR TECHNICAL ASSISTANCE, PRICE INFORMATION AND ORDERING:
In USA call 1-800-227-4224. Or contact the authorized HACH office or distributor serving you.

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