

Graduated Cylinders

Graduated Cylinders



- Glass cylinders
- Available in a variety of sizes
 - 10, 25, 50 100, 500 mL
 - 1, 2 Liter
- Available as:
 - Class A
 - Required for permit testing
 - Class B
 - Plastic graduates are Class B

Uses

- Used when specified by the method
- Used for sample volumes and chemical additions where:
 - Measured volume is greater than 25 mL, and
 - Accuracy within $\pm 0.5\%$ is acceptable.

Graduate Selection

- Graduated cylinder should:
 - Have sufficient capacity
 - Be as close to the desired volume as feasible
 - Have graduations that allow measurement to the desired volume

Step 1

- Inspect the graduated cylinder to determine:
 - Volume
 - Graduations
 - Whether it is 'TD' or 'TC'
 - Most graduated cylinders are 'TC'
 - There are no cracks or chips

Step 2

- If the container is larger than can be safely handled during pouring
 - Mix the liquid to be measured
 - Then pour sufficient volume into an appropriately sized, clean beaker.

Step 3

- Place the cylinder on a flat surface

Step 4

- Mix the contents of the beaker or sample container thoroughly

Step 5

- Steady the cylinder with one hand and fill cylinder until the meniscus rests on the desired graduation

Note:

For samples containing solids pouring liquid into the graduated cylinder must be done quickly to avoid loss of solids.

Step 6

- Adjust the volume in the graduated cylinder until the meniscus is resting on the desired volume.
 - Add more sample
 - Remove some sample
 - The easiest way to accomplish this is using a dropping pipet

Note:

If the sample contains large amounts of solids, care must be taken to ensure the contents of the graduated cylinder is mixed during adjustments.

Step 7

- Pour the measured volume from the graduated cylinder into a flask, beaker or filter assembly as required for the test

Step 8

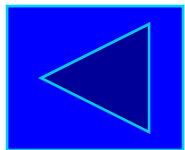
- If the graduated cylinder is marked as “TC”, use a wash bottle containing lab grade water to wet all of the interior surface of the graduated cylinder.

Step 9

- Add the rinse water to the beaker, flask or filter assembly containing the measured volume.

Step 10

- Repeat the rinse procedure three times (3X), adding each rinse to the beaker, flask or filter assembly containing the measured volume.



Potential Errors

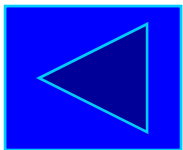
- Problem
 - Pouring samples containing high solids concentrations too slowly.
- Result
 - Solids will settle to the bottom of the beaker or sample container
 - Sample in graduated cylinder will not be representative
- Action
 - Mix the sample frequently throughout the pouring

Potential Errors

- Problem
 - Slow adjustment of the final volume in the graduated cylinder
- Result
 - Final reductions are mainly water. (Increases solids concentration in the graduated cylinder)
 - Final additions contain mainly water. (Reduces solids concentration in the graduated cylinder)
- Action
 - Attempt to pour as close as possible to the required volume the first time.

Potential Errors

- Problem
 - Loss of liquid during transfer from graduated cylinder to beaker, flask or funnel assembly
- Result
 - Actual volume transferred is less than measured amount.
 - Test results are computed using incorrect volume.
- Action
 - Use care when transferring.
 - If any spills occur – ***START OVER***



Department of Environmental Quality

**Copyright
All Rights Reserved 7/2019**