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## Attachment: 4024 Determination of Capacity for Glass Containers

### 4024 Determination of Capacity for Glass Containers

The capacity of glass containers includes standard capacity and overflow capacity. Standard capacity refers to the volume of water in the container when the liquid level of the filling water is flush with the scale, also known as the nominal capacity; overflow capacity refers to the volume of water in the container when the liquid level of the filling water is flush with the top of the bottle mouth.

Test environment: Both the sample and water shall be placed at room temperature (10-30°C) for more than 30 minutes.

#### Method I. Indirect method

This method is used to determine the capacity of glass containers. By measuring the weight difference between glass containers before and after filling, the capacity of glass containers can be calculated.

**Instruments:** Analytical balance with an accuracy of 0.1 g. (When the mass is greater than 10 g, the accuracy should not be more than 0.25 g. When the weight is greater than 250 g, the accuracy should not be more than 0.5 g. When the weight is greater than 1000 g, the accuracy should not be greater than 0.125% of the weight).

**Determination** Take the clean and dry sample. Weigh the empty sample on the balance. Record the mass  $m_1$  (g) and then place the sample on a horizontal workbench. Add water to the scale (when determining the standard capacity, add water until the liquid level is flush with the scale line. When determining the overflow capacity, add water until the concave meniscus is flush with the bottle mouth of the sample). Pay attention to keep the outer wall of the sample dry. Then weigh the filled sample on the balance, record the mass  $m_2$  (g).

**Result Calculation** The capacity of the sample (standard capacity or overflow capacity),  $V$ , is calculated as follows.

$$V=(m_2-m_1)/\rho$$

Where,  $V$  is the standard capacity or overflow capacity, in ml;

$m_1$  is the mass of the sample, in g;

$m_2$  is the mass of the sample with water, in g;

$\rho$  is the density of water (1 g/ml at room temperature).

#### Method II. Direct method

**Determination:** Take the clean and dry sample and add water to the scale (when determining the standard capacity, add water until the liquid level is flush with the scale line. When determining the overflow capacity, add water until the liquid level is flush with the bottle mouth of the sample.), transfer the water to a pre-standardized dry measuring cylinder (select cylinder with appropriate capacity so that the volume to be measured accounts for at least 40% of its rated volume), and drain the water as much as possible. Read the volume of water in each sample, as the standard capacity or overflow capacity of each sample.