# GLP 13

## Good Laboratory Practice for Drying “To Contain” Volume Standards

1 Purpose for drying

Vessels calibrated "To Contain"(TC) must be dried of all measurable water to obtain an "empty" weight. The drying process should not contaminate the container; otherwise, it will need to be re-cleaned before further calibration or volumetric use. The following is presented as guidance when drying is required.

2 Methods for drying

Drain as much of the residual water as practical before starting any drying process. If time is not a consideration, a glass tube may be inserted into the container to blow clean dry air (or nitrogen) through it to evaporate the residual water film. A filter or dust trap may be necessary to pre-clean the air used. Air lines must be selected to ensure that aging and wear do not introduce contaminants. Air may be drawn through a tube connected to a vacuum pump, but with some danger of drawing in dirty air from the surroundings. Clean absorbent cotton placed at the neck opening can minimize the entrance of foreign matter. Compressed air systems may introduce finely atomized oils or moisture into the air which may not be visible. If laboratory quality air is not available, nitrogen may be used.

Cleaning with solvents may be performed; ethanol is the preferred medium. Preliminary rinsing with acetone will remove large amounts of water, with which it is infinitely miscible, but this solvent often contains impurities such as traces of oils that could deposit on the container walls and be a disposal problem. Thus, a final alcohol (preferably ethanol or methanol) rinse is recommended, even if acetone is used to remove most of the water. Care must be taken to ensure that the alcohol is not mixed with acetone, and that the alcohol is not denatured with oils to an extent that will leave residue on the standard. The alcohol is drained as much as possible, followed by air drying as described above.

Some metal containers may be internally coated to minimize corrosion. When present, it should be ascertained that such coatings are not affected by alcohol or acetone; otherwise, solvent treatments should not be used.

The external surfaces of all containers should be clean when gravimetric calibrations are performed. Otherwise, any removal of external dust or dirt during the measurement process could cause errors of unknown magnitude.

Analytical glassware should not be dried by heating in an oven as the glass may suffer non-elastic expansion and put the glassware out of calibration.

2.1 Calibration Tip

Cover a vessel after it is clean and dry to minimize contaminants from collecting inside the vessel. Clean and dry the flask one to two days prior to the calibration

and allow the flask to come to equilibrium with the environment. Obtain an initial baseline “dry weight” of the clean container for use as a dry reference weight on subsequent weighing and drying cycles.

### 2.2 Safety Note

Safety Data Sheets (SDSs) must be available in the laboratory and should be reviewed to ensure safe handling and disposal of all chemicals noted in this procedure. Care must be taken to avoid mixing chemicals such as acetone and alcohols in the laboratory.