

PT-SV100 – Scott Volumeter



Determine Bulk Density of Powder with the PT-SV100 Scott Volumeter

The PT-SV100 Scott Volumeter determines bulk density of powders according to the following standard Monographs: ISO 3923-2 (metallic powders): determination of apparent density, EP <2.9.34.1> USP <616, Method II> bulk density and tapped density of powders and method II, ASTM 32990 standard test method for apparent density of metal powders and compounds

The PT-SV100 is applicable to powders including metal powders, compounds, pigments, and so on that will flow freely through a suitable nozzle.

A comparison of the bulk and tapped densities of powders can give an indication of the type of interaction present between the various particles building up in the powder mass and hence provide an index of powder flowability, e.g., the Hausner ratio and compressibility index.

Operating Principle

The operating principle relies on the measurement of a mass of a certain quantity of powder which fills a container of a known volume inside the PT-SV100. A loose packing condition is obtained by using the PT-SV100 and this is achieved by filling a stainless steel cup or container by cascading the powder sample over a series of inclined glass baffles within a baffle box. The ratio between the mass and the volume represents the apparent density.

The PT-SV100 is easy to use. First weigh then place the stainless steel cup onto the base of the unit. Then carefully pour the powder into the funnel at the top of the baffle box until the cup beneath overflows. Now level off the powder using a flat edge scraper.



Re-weigh the cup and calculate the weight of the collected powder sample. Now use the known volume of the cup to calculate the apparent density. This can be done using the formula:

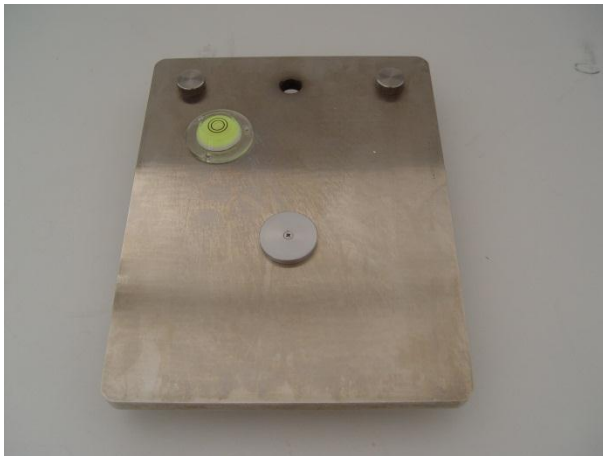
$$p = M/V$$

Where ρ is the density, M = mass in grams and V = volume of the receiving cup in mL. The result is expressed in g/mL.

The USP Procedure States:

Allow an excess of powder to flow through the apparatus into the sample receiving cup until it overflows, using a minimum of 25cm³ of powder with the square cup and 35cm³ of powder with the cylindrical cup. Carefully scrape excess powder from the top of the cup by smoothly moving the edge of the blade of a spatula perpendicular to and in contact with the top surface of the cup, taking care to keep the spatula perpendicular to prevent packing or removal of powder from the cup. Remove any material from the sides of the cup, and determine the weight, M, of the powder to the nearest 0.1%.

Setup of the PT-SV100 Instrument



The design is made from a solid stand and a horizontal, vibration free baseplate including an integrated spirit gauge to check the levelness of the instrument, a stainless steel cylindrical cup, bottom and top funnel, a baffle box, spatula and brush.

A suitable balance is needed to calculate the apparent density.

Result Reporting

Usually there should be a series of at least three tests to provide a basic statistical set of results and to avoid any sample anomalies. Samples should be of a uniform nature and as such should be representatively sampled. This can be achieved by coning and quartering or by the use of suitable riffing device, either electronic or manual. When the test is finished you need to prepare a test report which should include product descriptive information such as batch number, specification, method of drying (if it has been dried).

Advantages

Some of the highlights the PT-SV100 Scott Volumeter offers are:

- Easy to use
- Solid design including vibration free baseplate
- Integrated spirit gauge to check levelness of the instrument

Features

The main features of the PT-SV100 are:

- Fully ISO 3923-2 (metallic powders): determination of apparent density, EP <2.9.34.1> and USP <616, Method II> compliant
- Applicable to powders including metal powders, compounds, pigments
- Instrument comes ready to use, only an analytical balance is needed in addition

Technical Data

Parameter	Specification
Stainless steel receiving cup	25 +/- 0.05ml, round
Funnel mesh size	1.0mm (18 mesh) and 2.00mm (10 mesh)
Dimensions (Packaging)	20 x 26 x 40cm
Net Weight	9.5kg
Gross Weight	14kg

