

TAPPED DENSITY TESTERS

The Tapped Density Testers Series JV have been designed to measure the tapped density of powders, granules and similar products in accordance with **USP Chapter <616> Method 2 and European Pharmacopoeia Chapter 2.9.15.**

This technique is particularly useful in powder flowability studies and also in determining the amount of settlement during transit, to optimise pack sizes e.g. washing powders.

Tapped density is achieved by mechanically tapping a measuring cylinder (i.e. raising the cylinder and allowing it to drop a specified distance under its own weight) containing the sample under test.

Two versions of the tester (JV 1000 and JV 2000) are available dependent on the number of test stations required (1 or 2). Both versions utilise 250 mL measuring cylinders as standard, however 100 mL cylinders (and smaller) together with appropriate platforms are also available if required.

Both of the instruments concerned are equipped with membrane keypads for setting the number of strokes or time and an LCD screen to set the appropriate parameters and monitor the progress of the test.

MODE OF OPERATION

The mode of operation is identical on both models.

Weigh out a predetermined amount of the sample, say 100 g $\pm$ 0.1%, place it in the graduated cylinder provided and note the unsettled volume. Secure the graduated cylinder to the test platform of the tester using the bayonet fitting provided for this purpose.

Unless otherwise specified, set the number of taps via the membrane keypad on the front of the instrument to 500 and operate the device making a note of the resulting tapped volume.



▲ JV 1000 with 1 x 250 mL Measuring Cylinder

Repeat this operation for a further 750 taps noting the volume once again. Continue repeating the test in increments of 1250 taps until the difference in tapped volume is less than 2%. Note the final reading.

The tapped density in grams per mL can now be calculated by dividing the sample weight by the final tapped volume.

Measures of the ability of the powder to flow and its compressibility can now be given in the form of the Hausner ratio (Tapped Density/Bulk Density) and the Compressibility Index ((Tapped Density - Bulk Density/Tapped Density) x 100).



▲ JV 2000 with 1 x 100 mL and 1 x 250 mL Measuring Cylinder

In a free flowing powder, inter-particulate interaction is less significant and unsettled and tapped densities will be closer in value. In poorly flowing powders, the inverse is to be expected. It follows that the closer the Hausner ratio is to 1, the better the flow. Powders with poor flow generally have a ratio of greater than 1.25.

A special **acoustic cabinet** capable of reducing the noise level of the volumeter from about 80 db to 58 db is available on request. The tapped density testers measure 280 x 250 x 670 mm (w x d x h).

Scale of Flowability

Compressibility Index (%)	Flow Character	Hausner Ratio
< 10	Excellent	1.00 - 1.11
11-15	Good	1.12 - 1.18
16-20	Fair	1.19 - 1.25
21-25	Passable	1.26 - 1.34
26-31	Poor	1.35 - 1.45
32-37	Very poor	1.46 - 1.59
> 38	Very, very poor	> 1.60

Cat. No. Description

1601	Tapped Density Tester JV 1000 (1 Cylinder)
1602	Tapped Density Tester JV 2000 (2 Cylinders)
1603	IQ/OQ/PQ Documentation Pack
1604	250 mL Measuring Cylinder (spare)
1605	100 mL Measuring Cylinder (option)
1605A	Special Platform for use with 100 mL Cylinder (option)
1616	Set of Certified Qualification Tools
1606	Acoustic Cabinet