



AUTOTAP

AUTOMATED TAP DENSITY ANALYZERS

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Tapped Density

Each particle of a solid material has effectively the same true density regardless of size or shape, but more or less geometric space is occupied by the material according to the relative particle-particle cohesion and mechanical interference. That is, the apparent bulk densities of powdered, granular or flaked materials are highly dependent on the manner in which the particles are packed together. Furthermore, handling or vibration of particulate material causes the smaller particles to work their way into the spaces between the larger particles. The geometric space occupied by the powder decreases and its density increases; ultimately no further natural particle packing takes place without the addition of pressure and maximum particle packing is achieved. Under controlled conditions of tapping rate, tap force drop and cylinder diameter, this condition of maximum packing efficiency is highly reproducible. Tap density measurement is formalized in a number of international standards to which both Autotap models conform.

Standards Suitability

- ASTM B527 (metallic powders)
- ASTM D4164 (formed catalysts)
- ASTM D4781 (fine catalysts)
- IDF 134 (dried milk)
- ISO 787-11 (pigments)
- ISO 3953 (metallic powders)
- ISO 8460 (instant coffee)
- ISO 8967 (dried milk)
- ISO 9161 (uranium dioxide powder)
- JIS K5101-12-2 (pigments)
- JIS Z 2512 (metallic powders)
- MPIF 46 (metal powders)
- USP<616>Part II (pharmaceutical powders)

To measure tap density, samples are placed in standard graduated cylinders and mounted on a universal tap platform designed to accommodate cylinders from 10 ml to 500 ml. After noting the initial volume and weight of the material, the number of desired taps is entered and tapping started. When the specified number of taps is completed, tapping stops automatically. Reading of the powder surface is facilitated by automatic rotation of cylinders during tapping which promotes a flat powder interface.

If the material characteristics are unknown, tapping may be done continuously, or step-wise by user specified numbers of taps, while noting or graphing the results until the volume becomes constant. Once the tapping behavior is known the proper number of taps, typically thousands, including a significant excess (to account for future variability between samples) can be preset on subsequent runs thus freeing the operator for other work.

Specifications

Performance

Stations:	Autotap:1 Dual Autotap:2
Cylinder sizes:	250 ml standard; 10ml, 25ml, 50ml, 100ml, 500ml, 1000ml optional. 1000ml requires auxillary plate (p/n 04000-1299) or quick-change assembly (p/n 01470-5830).
Nominal tapping rate:	260 min ⁻¹
Tapping (drop) height:	3mm (0.125 inch).
Tap counter:	1-999999
Display:	LCD, automatic countdown, automatic reset.
Platform rotation:	automatic.
Sample Weight limits:	900g (2 lb) with no effect on tapping rate. 1800g (4 lb) with 5% reduction in tapping rate. 2275g (5 lb) with 15% reduction in tapping rate.
Controls:	on/off, start, stop, counter reset.
Lock-out:	optional keyed padlock for tap counter.

Physical

Height:	175 mm (7 in) excluding cylinders
Width:	540 mm (21 in)
Depth:	280 mm (11 in)
Weight:	11 kg (24 lbs) Autotap 14 kg (31 lbs) Dual Autotap

Electrical

Voltage:	110-120 V or 220-240V
Frequency:	50/60 Hz
Power (max):	150 VA
Connection:	Grounded, single- phase outlet

Environmental

Temperature:	15°C - 40°C
Max. Related Humidity:	80%

Ordering Information

Autotap, 50 Hz, 100-115v:	p/n 02106-50-100-1
Autotap, 50 Hz, 220-240v:	p/n 02106-50-1
Autotap, 60 Hz, 100-115v:	p/n 02106-60-1
Autotap, 60 Hz, 220-240v:	p/n 02106-60-220-1
Dual Autotap, 50 Hz, 100-115v:	p/n 02105-50-100-1
Dual Autotap, 50 Hz, 220-240v:	p/n 02105-50-1
Dual Autotap, 60 Hz, 100-115v:	p/n 02105-60-1
Dual Autotap, 60 Hz, 220-240v:	p/n 02105-60-220-1



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- Mercury Porosimetry
- True Solid Density
- Tapped Density

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Quantachrome is also recognized as an excellent resource for authoritative analysis of your samples in our fully equipped, state-of-the-art powder characterization laboratory.



Quantachrome Instruments Application Laboratory.

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