



Weight Measurement, the Accurate Way

TEMPERATURE STABILITY

Temperature change will cause the weight display to constantly drift in one direction. The effect, known as dynamic buoyancy, does not stop until temperature equilibrium is established. Every sample has a film of moisture that changes with temperature, causing a cold sample to appear heavier and a warm sample lighter. This is especially important when using micro or analytical balances.

*Test the theory:
Weigh a flask and record the weight. Hold the flask in your hands for about 1 minute and repeat the weighing. Result:
The flask appears lighter.*

Pointers

- Acclimatize samples before weighing - never weigh samples taken directly from refrigerator or dryer
- Use tweezers - putting your hand into the weighing chamber will cause it to warm up
- Use sample vessels with small surface area as they acclimatize fastest
- Position balances away from heat sources such as windows and radiators

ELECTROSTATIC CHARGE

Electrostatic charge causes unstable weighing values due to drift and poor reproducibility. It primarily affects low conductivity substances such as plastic, glass and powders, and the principal cause is friction. Electrostatic forces either attract or repel, so the weighing result can deviate in either direction. As the charges dissipate, the interference recedes at a corresponding rate causing an unstable weight reading.

*Test the theory:
Weigh a plastic Vessel, then rub with a wool cloth and re-weigh to see the effect of the charge.*

Pointers

- Use an anti-static instrument to directly neutralize surface charges
- Use products designed to be anti-static, e.g., gloves, weigh boats, etc.
- Maintain air humidity above 60%
- Connect weighing pan to conductive chamber
- Use anti-static, glass, or metal weighing vessels

MOISTURE EVAPORATION/GAIN

Changes in moisture evaporation cause the recorded weight of the sample to slowly decrease or increase. It can be a big problem with volatile substances and hygroscopic material. The effect can also be caused by debris on the weighing pan. Drops of water can evaporate and powder spillage from previous weighing can absorb moisture.

*Test the theory:
Pour some alcohol into a weigh boat and measure the weight. Check the weight again after 1 minute and it will have decreased. Silica gel can be used to show the effect of water absorption.*

Pointers

- Use weighing vessels with narrow necks
- Use covers or stoppers (avoid cork bungs as these can gain or lose considerable water)
- Clean weighing pan of any dirt or water drops

FEATURED PRODUCTS

Static Prevention

Sigma-Aldrich Labware offers a full range of anti-static products, including gloves, weigh funnels & boats, spatulas, tweezers, and brushes for balance pan cleaning. We also list a selection of glass and metal weighing boats and dishes.



Minimizing Moisture Evaporation

Kimax® weighing bottles are available in a variety of capacities and are all supplied with ground glass stoppers to prevent evaporation.



Static Removal

The hand-held Zerostat® anti-static instrument fires an easily directed stream of ions that instantly discharges static on balance pans and weigh boats.

Paula's Pointers

Zerostat Anti-static Instrument

Static not only causes weighing inaccuracies and particles "flying" during transfer, it also causes film, glass, and plasticware to attract dust and lint.

Zerostat is a valuable instrument for neutralizing static electricity in the laboratory. To effectively remove static, simply aim the nose in the direction of static and squeeze the trigger. A stream of ions is emitted to neutralize the static charge.

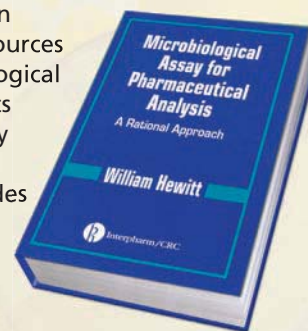
Life expectancy is 1,500 trigger squeezes.



Z108812 Zerostat® Anti-static Instrument

Further Reading

This book provides an explanation of the sources of error in microbiological assay helping analysts choose efficient assay designs to minimize those errors. It includes a chapter specifically on the analytical technique of weighing as a possible source of assay error.



Z702072 Microbiological Assay for Pharmaceutical Analysis

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Latest News

The 2007-2008 Labware Catalog and Aldrich Handbook of Fine Chemicals set is now available! The new Labware catalog contains:

- Approximately 1,300 pages showing 17,000 products carefully selected to support Chemistry and Life Science customers and applications
- Comprehensive 40 page index and thumbnail pictures for easy navigation
- More photos and section tables

To request your 2007-2008 Labware Catalog Aldrich Handbook of Fine Chemicals set, please go to our Web site at sigma-aldrich.com/handbook33. Please continue to send us your comments at labware@sial.com.

Research is easier when you use the right tools!

Labware Listens

Sahla Moradi of Amin Laboratory suggested that we add anti-static gloves to our product offering. In response we have introduced a new brand of Best® gloves, NightHawk.

Best NightHawk gloves are the latest in disposable nitrile hand protection. Not only is NightHawk an accelerator-free, textured fingertip, powder-free disposable nitrile glove, it also offers impressive static-dissipative properties.



These gloves are ideal for any project where static is a problem and hand protection is a necessity. Best NightHawk gloves are available in sizes small (Z647942), medium (Z647950), large (Z647969), and extra-large (Z647977).

If you have any suggestions, please contact us at labware@sial.com.

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			4	5		7		2

Down Time

Sudoku was published by Nicoli in 1986. The name Sudoku is an abbreviation of the Japanese phrase "suji wa dokushin ni kagiru," meaning "digits must occur only once." Fill in all squares in the grid so that each row, each column and each of the 3x3 squares contain all digits from 1 to 9.

Answers can be found at sigma-aldrich.com/labwarenotes.

Labware Links

For more information on the products featured in this newsletter, protocols and many useful Labware Web links, please visit sigma-aldrich.com/labwarenotes.

