Laboratory Balances

A laboratory balance is a high-resolution weighing instrument reading from 0.1 g down to 0.01 mg, used for sample preparation, formulation, density determination and quality control. Precision (top-loading) balances cover 0.001–0.1 g; analytical balances read 0.1 mg or finer and require a draft shield.

Laboratory balance selection

Application	Typical capacity	Typical readability	Notes
Teaching, general lab, formulation	600 g–6 kg	0.01–0.1 g	Precision balance
Sample prep, QC checks	120–3,000 g	0.001 g	Precision, draft ring recommended
Assay, USP <41> compliance	120–220 g	0.1 mg	Analytical with draft shield
Micro-sample and reference work	50–100 g	0.01 mg	Semi-micro, controlled room

Certification and compliance

- Authorized A&D Weighing dealer. Sold as an authorized dealer since 1998, so every unit carries the full manufacturer warranty and factory firmware — not grey-market stock.
- NIST-traceable calibration certificate. Any instrument can ship with a calibration certificate produced in our Cypress, Texas lab using mass standards traceable to NIST, with as-found and as-left values recorded.
- Class I / II accuracy models. Analytical, precision and jewelry instruments here are built to NTEP Class I and Class II accuracy classes — the classes required when weight is read to 0.1 mg–0.01 g.
- ASTM E617 / OIML R111 test weights. Verification weights are supplied in ASTM Class 1–6 or OIML E2–M3 tolerances, sized so the standard's tolerance stays inside one third of the scale's smallest division.
- In-house repair & on-site service. Factory-trained technicians repair, adjust and re-certify weighing equipment in our own Texas workshop and on-site across the Houston metro.

Specification checklist

- Smallest net weight, not capacity. Repeatability at your smallest sample determines whether the balance is fit for purpose.
- Internal calibration. Essential where room temperature swings or where audits require documented self-calibration.
- Draft protection. Mandatory at 0.1 mg; a draft ring is worthwhile at 1 mg.
- Data integrity. GLP/GMP printout, RS-232/USB output and audit-trail support for regulated labs.
- Weighing below the balance. A hook underneath enables density determination and magnetic sample work.

Frequently asked questions

What is the difference between an analytical and a precision balance?

An analytical balance reads to 0.1 mg or finer and is enclosed in a draft shield; a precision (top-loading) balance reads 0.001 g to 0.1 g with higher capacity and much lower environmental sensitivity.

How often should a lab balance be calibrated?

Perform a daily or per-use check with a certified test weight, and a full NIST-traceable calibration annually — or per your quality system, which for GMP labs is often semi-annual.

What calibration weight class do I need?

As a rule the test weight's tolerance should be no more than one third of the balance's permitted error at that load: ASTM Class 1 for analytical balances, Class 2 for most precision balances.

Why does my balance reading drift?

Most drift is environmental — air movement, temperature change, static, or an unstable bench. Allow warm-up time, level the balance, keep it out of airflow, and ground or ionize static-prone samples.

Terminology

Analytical balance	A balance reading to 0.0001 g (0.1 mg) or finer, enclosed in a draft chamber. Used for analytical chemistry, pharmaceutical assay and trace-level formulation.
ASTM E617	The American standard that defines tolerance classes for mass standards. Class 1 weights are the tightest commonly used for laboratory balances, Class 2 for 0.01 g balances, and Classes 4 and 6 for industrial platform and crane scales.
Auto-zero tracking	A function that continuously re-zeros small drifts near zero so the display stays at 0 when the pan is empty. It can mask a very slow addition of material, so it is disabled for some dispensing work.
Drift	A slow change in reading with no change in load, usually caused by temperature change, air movement, static, or a settling mechanical assembly rather than by an instrument fault.
Force restoration	A weighing mechanism that balances the load with an electromagnetic coil and measures the current needed to do so. It gives faster settling, better linearity and lower drift than a strain gauge, and is what A&D's SHS sensor uses.
GLP output	A printout or data record that includes date, time, instrument identification and calibration status, as required by Good Laboratory Practice and comparable quality systems for audit trails.
Moisture analyzer	A balance combined with a controlled heater that weighs a sample, dries it, and reports moisture content as a percentage of the mass lost. Also called a loss-on-drying balance.
Precision balance	A balance reading to between 0.1 g and 0.001 g, usually with an open pan. Coarser than an analytical balance and far finer than a bench or platform scale.

EK1200i.com — authorized A&D Weighing dealer since 1998. Calibration, repair and application support from Cypress, Texas.
Call 832-290-3120 · info@mnmscales.com · https://ek1200i.com/lab-balances