Analytical Balances

An analytical balance reads to 0.0001 g (0.1 mg) or finer and is enclosed in a glass draft shield because air movement alone shifts the reading by several increments. Capacities are typically 120–220 g, and the instrument is the reference standard for gravimetric assay, USP <41> weighing and reference-material verification.

Analytical balance selection

Application	Typical capacity	Typical readability	Notes
General analytical chemistry	220 g	0.1 mg	Standard four-decimal balance
Pharmacy compounding, USP <41>	120–220 g	0.1 mg	Internal calibration, minimum weight report
Reference standards, micro samples	50–100 g	0.01 mg	Semi-micro, controlled environment
Filter and residue weighing	120 g	0.1 mg	Ionizer strongly recommended

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

- Minimum weight, not readability. Determine it in your own room before qualifying the balance.
- Internal calibration. Compensates for temperature drift without opening the draft shield.
- Environment. Stone bench, no HVAC airflow, stable temperature, out of foot traffic.
- Static control. An ionizer pays for itself with plastic vessels and dry powders.
- Compliance features. GLP printout, audit trail, and traceable calibration certificate.

Frequently asked questions

What is an analytical balance used for?

Gravimetric analysis, standard and reagent preparation, pharmacy compounding, filter and residue weighing, and any procedure where sub-milligram accuracy determines the result.

Why does an analytical balance need a draft shield?

At 0.1 mg resolution, ordinary room air currents exert enough force on the pan and sample to move the reading by several increments. The shield isolates the pan from moving air.

What is minimum weight under USP <41>?

The smallest net sample that can be weighed with the required accuracy — defined as 820 times the balance's repeatability standard deviation, measured in place, so that measurement uncertainty stays within 0.10%.

How accurate is a 0.1 mg balance?

Repeatability is typically 0.1 mg with linearity within ±0.2 mg, provided the balance is level, warmed up, calibrated, and used in a draft-free, vibration-free location.

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/analytical-balances