

A photograph of a cannabis cultivation and retail environment. In the foreground, there are several glass jars filled with cannabis buds. One jar is labeled 'Cinex' and another 'HERE'S MY BIKE'. A price tag for '\$10 PER GRAM' is visible. In the background, a cannabis plant is growing. A diagram with three nodes and connecting lines is overlaid on the image. The nodes are labeled 'CULTIVATION' (top), 'TESTING' (left), and 'RETAIL' (bottom right).

CULTIVATION

TESTING

RETAIL

HEADAM[®]

EQUIPMENTS

Cannabis Industry
PRIMER



The legal cannabis industry has given birth to a “Green Rush” that continues to forge ahead: in the US, more than 30 states and Washington, DC currently allow medical marijuana, while about a third of those states and Washington, DC have legalized recreational use.

Recreational and medicinal use is legal nationwide in Canada, while medicinal use is legal in Mexico and legal by prescription in the UK and Australia. Laws vary from state to state, but each has passed stringent laws and cannabis industry standards to ensure consumer safety.

Adam offers a range of products that can be used across the cannabis industry, from growers to dispensaries, to meet those demands.



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Scales and Balances

for the Cannabis Industry

As the “green rush” continues and more states legalize marijuana for medical and/or recreational use, each segment of the industry, from growers to dispensaries, contends with scrutiny to document every stage along the cannabis plant’s journey from seed to consumer. A big part of that process is weighing the product. With the high price tag per ounce attached to such a commodity, it’s necessary to ensure that everyone is getting the correct amount and that’s where balances come in!

Who are the players?

Growers cultivate the plant and sometimes process the flower themselves but often sell the raw material to a processor, which also acts as a wholesaler.

Processors trim, dry and cure the plants to ready them for manufacture into consumer-ready products.

Manufacturers incorporate the processed material into products.

Dispensaries sell the finished product to patients and consumers.



What Kind of Weighing Scales are required for Selling Cannabis?

All scales and balances used for selling cannabis to consumers need to be Class II, meaning they must display results from 1mg to 50mg (0.05g) and have 10,000 – 100,000 divisions, or better. (For reference, Class I units have more than 100,000 divisions.) Because dispensaries sell cannabis products in small amounts, readability of 0.01g is ideal to have. California's scale requirements offer a representative look at the current state in the industry. Medical laboratories have a bit more leeway in terms of requirements since they don't sell cannabis, but they often utilize balances with readability of 0.0001g, such as an Equinox.

To be used for sales, the balances must also be NTEP-approved/legal-for-trade. **NTEP** (or National Type Evaluation Program by the National Institute of Standard and Technology) approval means that a scale or balance is legally approved in the U.S. for buying or selling goods by weight. As with other

applications – such as biopharmaceuticals or jewelry – the small amounts of cannabis sold in most transactions require a high degree of readability to protect both the buyer and seller. Adam Equipment offers NTEP-approved models in its **Highland** series of precision balances.

For growers, such readability isn't critical during the production process when nothing is being sold, so a Class III bench scale, which offers a much higher capacity than a precision balance, would be a more appropriate choice for uses such as measuring yield. Once the cannabis is ready to move on to the next stage (such as to a wholesaler) where money will be exchanged, a legal-for-trade balance would be required.

Because the industry is changing rapidly and laws vary by state, always check local laws to verify your state's requirements.

What is NTEP and What Does it Mean for Dispensaries?



So your state legalized cannabis and you're going to open a dispensary. You know you'll need scales to weigh your products, but you keep hearing the term NTEP and you're not sure what that is. Let's take a look at NTEP approval and what it means!

NTEP stands for National Type Evaluation Program, an approval system created by the U.S. Department of Commerce's National Institute of Standard and Technology (NIST) and the National Conference on Weights and Measures (NCWM). Any scale or balance used for sales in the U.S. must be NTEP-approved/legal-for-trade, meaning that it's legally approved for buying or selling goods by weight.

Given the high price point per ounce and that dispensaries sell cannabis in small quantities, a scale needs a high degree of readability to ensure the correct amount of product is sold.



Obtaining NTEP certification

To obtain NTEP certification for a scale or balance (per the guidelines listed in NIST's Handbook 44), scale manufacturers submit prototype weighing devices for evaluation to determine that they operate within specific tolerances. NTEP standards entail everything about a device from capacity and readability to the effects on the scale from temperature and humidity – and even the location of the NTEP sticker on the device!

In addition to NTEP approval, precision scales and balances used for selling cannabis to consumers also need to be rated **Class II** by NIST. Class II scales display results from 1mg to 50mg (0.05g) and have 10,000 – 100,000 divisions, or better. Other scale classes include **Class I** (ideal for precision lab work; 100,000+ divisions), **Class III** (industrial or commercial use, such as animal weighing, food weighing and postal scales; 1,000 – 10,000 divisions), **Class III L** (vehicle weighing) and **Class IIII** (used for highway weight enforcement; 100 – 1,000 divisions).

Put simply, NTEP certification provides consumers with the confidence that that they're getting what they paid for by requiring a high degree of readability on the scale. The Highland series of precision balances from Adam Equipment offers NTEP-approved models in its lineup that would be ideal for use in dispensaries.

Local laws and cannabis legislation

The NCWM established a Cannabis Task Group in 2017 to create uniform guidance for the states that have legalized cannabis. As of 2020, 35 states and Washington, DC allow medical marijuana, while 11 of those states (Alaska, California, Colorado, Illinois, Maine, Massachusetts, Michigan, Nevada, Oregon, Vermont and Washington) as well as Washington, DC have legalized recreational use and five other states have decriminalized (but not legalized) marijuana. In the 2020 elections, Arizona, New Jersey and Montana passed adult-use laws, Mississippi voted to allow medical marijuana and South Dakota legalized both adult-use and medical at the same time.

Moisture Analyzers and Their Benefits to the Cannabis Industry

OPTIMAL MOISTURE CONTENT BY USAGE

**15%
COMMERCIAL GROWERS**

**6-9%
MEDICAL**

**8%
SMOKING**

**10-12%
SMOKING W/ TOBACCO**

**12-15%
VAPORIZING**

As with any agricultural product, the moisture content of cannabis is an important concern. Cannabis, though, can be stored for weeks or months following harvest until it reaches a dispensary. During this time, it may be susceptible to microorganisms and contaminants such as fungi (too much moisture) or mold (too little moisture).

Moisture control and effective drying practices are critical to keeping cannabis safe and ensuring a high-quality product for patients and consumers. The concern about the wait is particularly relevant in Oregon, where the market has contended with oversupply issues.

How Much Moisture Should Cannabis Have?

Freshly harvested cannabis plants have a moisture content of about 70 to 80 percent by weight. Most commercial growers dry their plants (but don't cure them) to 15 percent. From that point, cannabis is dried to a moisture content dictated by intended use: 6 to 9 percent for medical cannabis, 8 percent for smoking, 10 to 12 percent for smoking with tobacco and 12 to 15 percent for vaporizing.

Curing cannabis increases its potency, as well as affecting its flavor and the quality of smoke. Properly curing it also allows the cannabis to be stored for longer periods of time (up to two years without a significant loss of potency if stored in an airtight container in a cool, dark place). Like any plant, cannabis begins to degrade upon harvesting because it's no longer receiving nutrients from its roots. The process of curing stops degradation before terpenes and cannabinoids evaporate or transform into less desirable compounds, altering their psychoactive properties.



The Role of Moisture in Cannabis Testing

Beyond the safety concerns of preventing mold or fungi, moisture can also affect THC levels, which in turn affects the classification of the plant as cannabis or hemp, as well as sales prices. Extractors, for example, often buy based on the amount of THC.

Consider two identical 10g samples of cannabis containing 2g of THC, which would yield a THC content of 20 percent. Drying one sample – which reduces its weight – to 5g would increase its percentage of THC to 40 percent, despite the actual amount of THC remaining the same.

Regulations at the state and local levels commonly require testing for THC potency, both for cannabis and hemp. To compensate for moisture's effect on THC levels, submit cannabis samples that have been dried or cured to the moisture level expected at the point of sale.

To be classified as hemp in the U.S., the THC level cannot exceed 0.3 percent on a dry weight basis. (The definition varies by country, with some capping the THC level of hemp as low as 0.2 percent and as high as 1 percent.) Farm bills in 2014 and 2018 relaxed restrictions on American hemp production, which has led to a dramatic increase in the growing of hemp. Because of differences in grower licensing between hemp and cannabis production, hemp that tests above the legal limit of 0.3 percent THC must be destroyed.

Moisture Analyzers in the Cannabis Industry

How do moisture analyzers – sometimes called moisture balances – help cannabis growers, extractors and wholesalers? A common misconception is that they measure water content. They don't. A

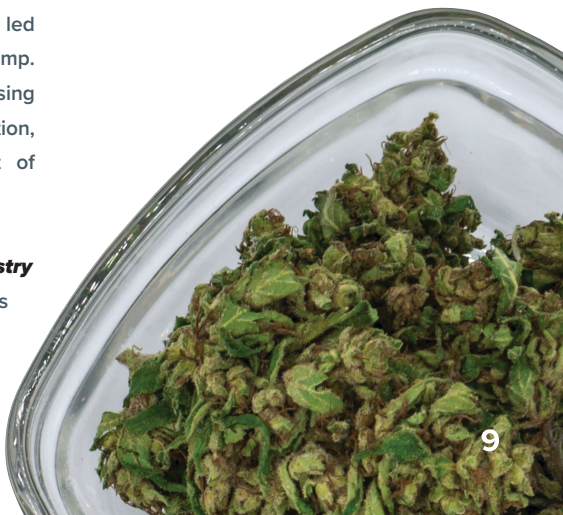
loss-on-drying moisture analyzer such as Adam Equipment's PMB actually measures the weight change of the sample. They analyze anything that evaporates, whether it's water, oils, fats or other similar substances.

For quality control, the industry needs accurate measurement of moisture content for raw cannabis, dried cannabis, cured cannabis, edible cannabis and CBD products.

Too much moisture is certainly bad for the plant itself, but it could also lead to complications for the cannabis consumer, especially those with immunodeficiencies. Smoking increases the health risks even further, though the shelf life, flavor, texture and processability would likely be impacted for edibles.

Moisture analyzers also save time. Sample preparation for analytics of active ingredients (such as terpenes and cannabinoids) or for CO2 extraction would take hours with a drying oven. A moisture analyzer cuts that time down hours to minutes.

In addition to the cannabis industry, moisture analyzers can also be used in food processing, pharmaceutical, environmental and materials science labs.





Edibles & Dosing: How QC Can Ensure the Correct Potency of Cannabis Products

Quality control and consistency isn't really something that's typically been a concern with cannabis products of the past. However, with cannabis and CBD products making their way to the mainstream through both medicinal and recreational channels, manufacturers are now more concerned than ever with maintaining standards and meeting local regulations to make sure that the products they produce are acceptable and traceable. Balances used for weighing out samples are much more important in this process to provide monitoring from seed to sale.

Is My Budtender Also My Pharmacist?

While dosing may seem strange for a substance many see as akin to beer, wine or spirits, it's worth remembering that we also use a form of dosing for those: a shot of liquor, 5 oz. of wine, etc. But a budtender cannot "prescribe" a dosage of THC for a customer any more than a bartender can prescribe a dosage of alcohol. With edibles, the level of THC is simply an indicator that lets the consumer decide how much to consume to achieve the desired effect.

Dosing

With edibles, THC is absorbed through the gut and the absorbed compounds are processed in the liver (which metabolizes THC into 11-hydroxy-THC, a compound more potent than THC) before the remaining THC and its metabolites circulate through the bloodstream to eventually reach the brain. The process can take anywhere from 45 minutes to three hours. Because it takes so long, the consumer may eat an edible and think it had no effect, then eat more before realizing that they've overindulged. Proper dosing – and waiting – is critical to provide a safe experience and that begins with the correct labeling of the dosage. The goal isn't necessarily to get high: often the goal is pain management, prevention of seizures or more mundane uses such as sleep aid.

Potency

Because there are differences in the way labs measure the potency of an edible versus cannabis flower or a concentrate, it's not as simple as listing the percentage of cannabinoid strength (i.e., 5% THC) the way the alcohol industry labels beer, for example, as a percentage of alcohol by volume (ABV). Instead, the packaging for edibles will often indicate both the milligrams of THC per serving, as well as the total in the entire package: for example, a package of gummy bears may contain 150mg of THC while each gummy bear has 10mg.

Cannabis – both the plant species, as well as individual plants – doesn't contain a consistent concentration of THC throughout the plant, so to provide edibles with the correct dosage, manufacturers don't just add cannabis flower into the mix. They add a THC concentrate produced during earlier parts of the production process. During production, manufacturers often use balances such as Adam's Equinox range, which meets GLP guidelines, to precisely measure ingredients such as concentrate.

By using the concentrate, which can be tested, edibles manufacturers can ensure consistency. Because THC is so heavily regulated, each batch of edibles is tested prior to being released for retail sale to ensure correct labeling and consistent dosages. Full compliance tests require a minimum of 8g of a sample. Solid samples – such as edibles and cannabis flower – are ground up, combined with a liquid to dilute and extract the substance to be tested, then mixed. The resulting mixture should accurately represent the complete molecular makeup of the original sample. To measure consistent amounts

of compounds, active ingredients, excipients or other pharmaceutically inert material, test labs employ balances like Adam's NTEP-approved Highland series. Quality control and the assurance that the consumer is aware of accurate THC levels remain critical to ensuring a safe, effective experience with edibles.

Because the legal cannabis industry continues to change rapidly and laws vary by state, always check local laws to verify your local regulations and requirements for cannabis products and derivatives. Adam provides information to demonstrate how our balances and scales may be used within the industry but does not make any representation or recommendations about the use of CBD or THC. Always consult your doctor if you are considering using cannabis products for yourself.



Adam Solutions

for the **Cannabis Industry**

Highland Approved Portable Precision Balances



With NTEP approval, Highland approved balances offer dispensaries convenience and high readability. Highland contains practical features that simplify lab work, bioscience research, pharmaceutical testing, jewelry measurement, or any legal-for-trade weighing application.

Model	Capacity	Readability	Pan Size
HCB 103aM	100g	d=0.001g e=0.01g	4.7" / 120mm ø
HCB 302aM	300g	d=0.05g e=0.05g	
HCB 602aM	600g	d=0.01g e=0.1g	
HCB 1202aM	1200g	d=0.01g e=0.1g	
HCB 3001aM	3000g	d=0.5g e=0.5g	
HCB 5001aM	5000g	d=0.5g e=0.5g	

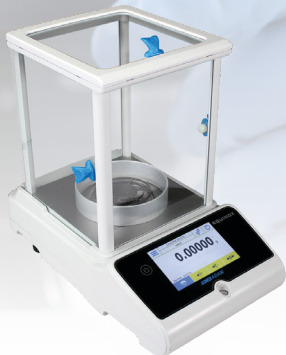
PMB Moisture Analyzers



To avoid too much moisture in cannabis plants and prevent potential microbial contamination, PMB is an ideal choice for processors as they test the plants for moisture as part of the curing process. Some states have included moisture requirements for test samples. Fresh cannabis typically contains approximately 80 percent moisture, while the cured plan should have a moisture level between 6-9 percent.

Model	Capacity	Readability	Pan Size
PMB 53	50g	0.001g / 0.01%	3.9" / 100mm ø
PMB 163	160g	0.001g / 0.01%	
PMB 202	200g	0.01g / 0.05%	

Equinox Semi-Micro and Analytical Balances



Equinox balances meet Good Laboratory Practices (GLP) guidelines, appealing to medical research laboratories as well as manufacturers who produce consumer products like edibles, extracts, vape cartridges, oils and topical cream.

Internal Calibration

Model	Capacity	Readability	Pan Size
EAB 125i	62g / 120g	0.01mg/ 0.1mg	3.1" / 80mm ø
EAB 225i	82g / 220g	0.01mg/ 0.1mg	
EAB 124i	120g	0.0001g	
EAB 224i	220g	0.0001g	
EAB 314i	310g	0.0001g	
EAB 414i	410g	0.0001g	
EAB 514i	510g	0.0001g	

External Calibration

Model	Capacity	Readability	Pan Size
EAB 124e	120g	0.0001g	3.1" / 80mm ø
EAB 224e	220g	0.0001g	
EAB 314e	310g	0.0001g	

GBK Bench Checkweighing Scales



The GBK is designed to stand up to the demands of rigorous industrial applications. With its compact stainless steel platform, the GBK is perfectly suited to the agricultural demands of growers. The GBK-aM version is NTEP- and Measurement Canada-approved.

Model	Capacity	Readability	Pan Size
GBK 15aM	15lb / 6kg	0.002lb / 1g	15.7"x11.8" / 400x300mm
GBK 30aM	30lb / 15kg	0.005lb / 2g	
GBK 60aM	60lb / 30kg	0.01lb / 5g	
GBK 150aM	150lb / 60kg	0.02lb / 0.01kg	
GBK 300aM	300lb / 150kg	0.05lb / 0.02kg	

Who is **BEADAM**®?

Professionals worldwide rely on leading global designer and manufacturer Adam Equipment for an extensive selection of dependable and affordable weighing equipment in the laboratory, medical, education, industrial, legal cannabis, food, and animal/veterinary markets.



6 global distribution centers

400+ products and accessories

Nearly 50 years of industry experience

Combining the best in form and function, Adam's extensive product lineup – including scales, balances, platforms, hanging scales, moisture analyzers, weights, antivibration tables and a range of accessories – offers intuitive operation, dependability, solid performance and value to facilitate everyday work and simplify complex applications.

BENEFITS



Adam offers support that extends well beyond the point of sale. As a valued member of the Adam Equipment dealer network, you have access to benefits and services that will help serve your customers better by adding even more value to their Adam purchases.

- Marketing support to enhance your product listings (including accessory lists for add-on sales) and help your customers select the right product
- Training, including customized webinars for your staff
- Drop shipments directly to your customers for fast, efficient delivery that saves you valuable warehouse space. When selling internationally, we ship from the location that provides the best shipping options.
- Sales support through telephone calls, emails and meetings with your Adam sales representative
- Dealer website with product manuals, data sheets, guides, warranty information, software downloads and other resources



Scan the QR code for a look into our latest catalog to get more details on our products!

THE RIGHT BALANCE
SPEED | PERFORMANCE | VALUE

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