

# UniqueTek “Tips” File #2:

## “15 Tips for Electronic Powder Scale Accuracy”

By Lee Love

Rev. 17; 06/2025

**Weighing powder charges** requires as much care as throwing the charge. All your careful powder measure technique is useless if you can't weigh it accurately. I finally saved up and bought an electronic powder scale thinking it would solve all my frustrations with using a balance beam scale. Well, actually, it did solve most of them. It certainly is faster, but it also brought a few new problems to the table ... umm, make that reloading bench.

### Tip #1: Stability & Vibration

The scale must be on a rock steady table. A table that wiggles just isn't going to cut it. If your bench doesn't have adjustable feet, place shims under the legs. Remember to protect your scale by taking it off the bench before hammering any shims into place.

Even if the table doesn't wiggle, vibrations through the table can affect measurements. If possible, move the scale to a separate table that is isolated from the press vibrations. If that is not possible, make sure that you aren't doing anything else while weighing.



The press may not be the only source of vibrations. I've seen more than one or two reloading benches sharing a room with the clothes washer and dryer. The wife doing laundry while you are dialing in a powder weight is not a good idea. Just how you go about getting her cooperation on this is a whole other can of worms!

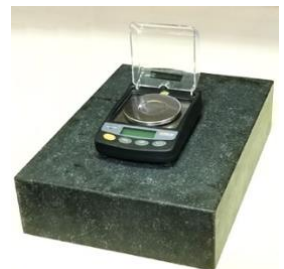
Analytical labs place their scales on heavy marble tables. The mass of the marble slab absorbs vibration. But these are too large and expensive for the average reloading room. I've also seen “Anti-Vibration” foam pads that you place under your scale to absorb vibrations. Before you buy one, just try an old mouse pad and see if it helps. I took both concepts, combined them, and designed my own anti-vibration pad. I took a brick, set it on an old mouse pad and placed my scale on top. It works and cost practically nothing.



A customer sent me this link to WT Tool ... an industrial supply outlet. They have granite “surface plates” at an exceptionally low price. The smallest one is 2"H x 9"W x 12"L and weighs 25.5lb. It is currently priced at just \$35.00. A 2" thick plate is difficult to find as Surface Plates are usually 3" thick. And this is a bit large for just a powder scale. But if you took it to a local granite countertop shop, you might be able to get them to cut it into two 9" x 6" pieces. Keep one for yourself and sell the other to a reloading buddy to recover some of the expenses.

<https://www.wttool.com/rdx-precision-black-granite-surface-plate>

Be prepared that the shipping may cost more than the price due to the weight.



Powder Scale on  
9"x12"x3"  
Granite Surface Plate

### Tip #2: Leveling

I originally thought this would be the first and most critical Tip of this list. As it turns out, leveling is not as critical as I would have thought with modern electronic powder scales. Many don't even have adjustable leveling feet, just three or four fixed feet. If your bench is level enough that bullets aren't constantly rolling off the edge, it is probably okay. But if you needed to shim the feet of your bench to make the bench stop rocking in Tip #1, you may as well take the time to level it while you are there.



If you do want to check that your scale is level, and it doesn't have a built-in bubble level, buy a small bubble level that you can place directly on the weighing pan. Make sure it is the right size to rest flat on the pan and that it doesn't weigh more than your scale's capacity. And don't forget to turn the scale off before leveling. You can easily find a lightweight, bullseye level on the web for under \$10. It will also be handy for checking that your bench is level.



When adjusting leveling feet, start with the feet fully screwed into the scale. The further they are screwed out, the more they may tend to wobble. The image at right shows a typical leveling foot that is screwed out farther than needed. For corner-to-corner leveling, adjust both leveling feet an equal amount rather than making all the adjustment on just one leveling foot.



Typical Leveling Foot

**TIP:** Even with the leveling feet screwed out the minimum turns needed to level the scale; they can still be a bit wobbly. The best fix I've found for this is to simply put a few wraps of Teflon® tape on the threads of each leveling foot. The Teflon® tape takes up the tolerance in the fit of the threads.

### Tip #3: Batteries and AC Power

A weak battery can make an electronic powder scale give erroneous readings long before it ever goes dead or gives a low battery warning. If you frequently run your scale on batteries instead of external power, I recommend installing fresh batteries about every six months or so and use the old batteries for some other less critical application. Buy good quality batteries. This is not the place to use a cheap battery.



**Battery Types:** Never substitute rechargeable NiCad, NiMH batteries or Lithium batteries if the recommended battery is Alkaline. This could actually damage the scale's electronics if not designed for it. Additionally, the low battery indicator circuit is calibrated for the specific battery type. It may not warn you when the battery is low if you use something other than the recommended type. Check the instruction manual for the recommended battery type. If nothing is mentioned, you should use the same type of battery that it came with. If batteries were not included, it is safe to assume Alkaline batteries. Of course, you can always call the manufacturer and ask them what battery type(s) they recommend.



**AC Power Adapters:** If your scale can run on external power, by all means use it. It will allow you to leave the scale on for extended periods without worrying about the battery going dead in the middle of a reloading session. Scales typically disconnect the batteries when plugged into external power. So, if you only use external power, the batteries can be removed. In fact, removing the batteries is recommended as a safeguard against scale damage due to battery leakage.



**EMI/RFI "Noise":** You should be aware that inexpensive "wall wart" power adapters are not "regulated" and can pass on any line voltage fluctuations or power line "noise" to your scale resulting in instability. If your scale is acting unstable and you are using a power adapter, try running off batteries (use fresh batteries please) and see if it improves. You can try clamping a "ferrite bead" around the DC output line. Ferrite beads can attenuate high-frequency EMI/RFI electronic noise. Wrap the wire 4 or 5 passes before clamping the unit shut. Some AC Adapters already have a ferrite bead installed on the output line (like the one in the photo above right).

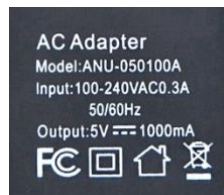


Ferrite Beads

**USB Power:** Now days, many scales are designed to run on USB power (5.0VDC). And since most households have a whole drawer full of old USB power adapters, these scales are typically shipped with only a USB cable.

Most scales will specify how much current (mA) they require. The USB power adapter must be rated for at least that much. If the power requirement isn't stated on the scale or in the manual, contact the manufacturer.

**TIP:** A power adapter that has to run full time at near 100% of its rated current output is never a good idea as they are likely to run too hot. I always plan on a significant safety margin. For instance, if the device needs 200 mA, I'll look for a power adapter rated for double that output. And higher output isn't a problem as the device (scale) will only draw as much current as it needs.



#### Tip #4: Warm-up time

Warm-up time can affect the scale's measurement stability. Some scales can take as long as 30 minutes to warm up to a stable internal temperature, especially if the room is unusually cold. With an AC powered scale, you can just leave it on while you are making other preparations. If your scale has an Auto-Off feature, you should disable it or set it for the maximum time possible. Scales powered only by batteries may not allow long warm-up periods to preserve the batteries. In that case, allow 30 to 60 seconds warm up time, keep the room temperature as stable as possible before starting a reloading session and use the Zero/Tare button before every weight measurement. I've seen some scales with a fixed time delay as short as 60 seconds. I consider these unacceptable for reloading.



#### Tip #5: Calibration

Those check weights that come with most scales aren't just for looks. Use them! I check my scale calibration every time I set up for a reloading session. It is a good way to tell if your scale has warmed up and is ready to use. You should also check calibration if the scale has been moved (like to your shooting buddy's house), is being operating at a significantly different temperature than when it was last calibrated, and after you change the battery. If you just bought a new scale, checking the calibration is the first thing you should do before using the scale. Perform the calibration procedure as described in the owner's manual only if the calibration is off. But before deciding to perform calibration, make absolutely certain the scale has had a chance to warm up and the readings are stable. You may find that after sufficient warm up time, calibration will not be needed.



**TIP:** If the scale is new or just moved from another location, I like to allow it to equilibrate to the room environment for 24 hours before using it.

Always use the calibration weight(s) that came with your scale. Depending on the resolution of the scale, the "class" of calibration weight(s) that come with it will vary. Lower resolution scales (0.1 grain) may only come with ASTM Class 6 (equivalent to OIML class M2) calibration weights. A 50g Class 6 calibration weight can vary by as much as  $\pm 7\text{mg}$  ( $\pm 0.007\text{g}$  /  $\pm 0.107\text{grain}$ ) and a 100g calibration weight can vary by as much as  $\pm 10\text{mg}$  ( $\pm 0.010\text{g}$  /  $\pm 0.154\text{grain}$ ). That doesn't sound like much but if you use these weights to calibrate a scale with higher resolution, it can make a significant difference.

Scales with higher resolution require a calibration weight with tighter specifications. For instance, the UniqueTek High-Precision Electronic Powder Scale, which has a resolution of 0.02 grains (0.001g), comes with a 20g calibration weight rated Class F2 (OIML Class F2 fits in between ASTM Class 3 and Class 4). For a 20g calibration weight, the allowable tolerance is only 0.8mg (0.0008g) compared to a Class 6 tolerance of 3.0mg (0.003g). By substituting a 20g calibration weight from a lower resolution scale, the calibration could be off. A balance should be calibrated using a weight with a class tolerance factor greater than the readability of the balance. For example, a balance with readability of 0.001g should be calibrated with a weight having a known tolerance of at least 0.0009g. So why not just buy a calibration weight set made to tighter tolerances? In short,

cost! I was given a set of calibration weights made by Ohaus. They are Class 6 brass weights ranging from 20mg to 50g, and the entire set sold for about \$40.00. The cost of calibration weight sets with tighter tolerance is excessive ... especially if you want a set that comes with a certificate with exact value of each calibration weight!

Here are some examples of weight sets similar to the Ohaus set I was given:

- Class 6 brass = \$40.00 / \$139.00 with Certificate
- Class 4 stainless steel = \$320.00 / \$815.00 with Certificate
- Class 1 stainless steel = \$600.00 / \$1225.00 with Certificate

In the United States, three classifications are used.

- ASTM E 617-97, Classes 0 through 7
- OIML R111, classes: E1, E2, F1, F2, M1, M2, M3.
- NIST Class F; (Only used for commercial weights & measures testing)



Ohaus  
Class F1 20g  
Stainless Steel

If you want to read a complete table comparing these weight classes, see [Calibration Weight Tolerances.pdf](#)

To make things even more difficult, some calibration weights are 2-piece assemblies. They are hollow and have either a plug in the bottom or a handle that is screwed on top. These are purposely manufactured a bit heavy and then metal is shaved off the handle or inside the bottom to calibrate it to the correct mass. If the plug falls out or the handle comes unscrewed, your calibration weight may be compromised. Fortunately, you can buy individual calibration weights on the Internet. I recommend that you contact your scale manufacturer and determine the correct size and tolerance classification of calibration weight(s) for your scale. You may also be able to buy replacement calibration weights directly from the scale manufacturer. Of course, it is OK to use a higher-class calibration weight than specified, but it is never OK to use a lower-class calibration weight.

## Tip #6: Air Currents

Some electronic scales come with a cover. On some of these, the cover isn't just to keep dust off when not in use. Some covers are designed to be used during measurements and provide a valuable function by blocking air currents that can affect accuracy (the owner's manual will tell you if your cover is intended to be closed during measurements). You can sometimes identify covers that are designed to be closed during measurement as they may have a hole in the top. The hole allows you to add powder with the lid already down. As you can imagine, closing or opening the cover after placing a pan of powder on the scale will likely upset the measurement.



A few scales come with a “draft ring”, which is usually a glass ring that fits around the weighing pan to protect it from air currents. Make certain it is in place for all measurements. Other scales may have complete acrylic boxes with sliding doors to provide a draft-free environment. But these would be difficult to use with a trickler.



Even if your scale has a draft ring or a cover designed for use during measurements, make sure it is located away from air currents in the room. Or, better yet, make a draft shield on three sides. I made one out of mat board (the stuff on which artists mount photographs). It is rigid, easy to cut with a utility or X-ACTO® knife, finished on both sides and available in lots of interesting colors. Mat board is cheap and easily found at art & craft stores or office supply stores. Make it tall enough to extend at least 3 inches above the weighing pan.



NOTE: Do not use “Foam Core” as the polystyrene foam will hold a static charge.



Adding a draft shield may not be enough. I had an air conditioning wall vent that blew in the direction of the reloading bench and the draft shield I made just didn't help enough.

**Adjustable Fin Vent:** You can find a vent that itself has individually adjustable fins. Or you may find that your existing vent already has adjustable fins. The vent in my reloading room didn't have adjustable fins so, I decided to try a deflector.

**Deflector:** I found a clear plastic deflector at the local hardware store that magnetically attached to the face of the wall vent and deflected the airflow away from the reloading bench. Simple, elegant, inexpensive ... and it worked!



## Tip #7: Static Electricity & Magnetic Fields

Static electricity near an electronic scale can affect measurement accuracy just as much as a stray air current. Keep any plastic materials away from the scale, including plastic loading blocks, die storage boxes, ammunition storage boxes, AkroBins and anything made of Styrofoam (Expanded Polystyrene) or Vinyl. Keeping a clear space around the scale is generally a good practice anyway.



Don't forget the static on your body! Even though the days of the polyester leisure suit are (thankfully) long gone, you may have carpet under your reloading bench. I'm sure we've all scuffed our shoes across a carpet and then zapped some poor unsuspecting soul with a big arc of static electricity. A static spark to an electronic powder scale is not only bad for accuracy, it can destroy the scale's circuits! Even if you don't build enough charge to cause a spark, it can be enough charge to affect your powder scale's accuracy. Fortunately, a little anti-static laundry spray (Static Guard®) applied to carpet periodically is very effective.



I talked on the phone with a customer, multiple times over several days, trying to help him diagnose the problem with his powder scale's instability. The scale was in a half-bath that was accessible from his reloading room. It had a Formica countertop and tile floor, so static charge was the last thing he thought of being the problem. But the reloading room floor was carpeted. Even with him standing bare foot on the tile, he was still carrying a static charge that he'd built up on his body from the carpet. And the tile, being an electrical insulator, was not allowing the static on his body to bleed to ground. The clue was that the scale would be perfectly stable when he stood back three feet away from the scale. But when he reached out toward the scale, it would begin drifting when his hand got within an inch or two. I then had him reach over and touch the metal faucet (to bleed off any static on his body) before touching the scale ... and the drift problem disappeared. The scale instability was simply due to static on his body. He never told me how many scales he had returned to the manufacturer before calling me.



Touching a grounded metal object (the screw on the wall plate of a light switch or electrical outlet cover plate, a metal water pipe or metal faucet) occasionally will also remove any charge from your body. If you replace the plastic cover plate with a metal one, you don't have to aim for the tiny screw ... just touch anywhere on the metal plate. The photo at right shows a stainless-steel wall plate for an old-style toggle switch, but they are also made for "Decora" style switches as well as for outlets.



**TIP:** Look for a "Gray Metal" or Stainless-Steel plate as they will not have any coating (e.g., clear lacquer) that will act as an electrical insulator.

Scales can also be strongly affected by magnetic fields and electrical interference generated by electronic devices. Don't use a scale near any electronic device such as a computer, monitor, radio, or cell phone. Fluorescent lights can also generate interference. If you are experiencing a problem, test it with nearby electronics and lights turned off.



## Tip #8: Checking Zero

Use that “TARE” (or “ZERO”) button ... frequently! I always zero the scale immediately before every measurement. Some may feel this is overkill, but I feel it is worth the few extra seconds it takes to ensure the best measurement accuracy I can obtain from my scale.

While we are discussing the TARE button, let’s look at just how handy this feature can be. The most basic use is to “Tare” the weight of your powder pan so the scale reads 0.0 grains with the empty pan in place and the scale will display the weight of just the powder charge. This same technique can also be used for sorting bullets, cartridge cases or even loaded cartridges.

**Example 1:** Let’s say you want to sort a new batch of bullets by weight relative to a favorite bullet weight you know from previous test is ideal for your cartridge. If you were smart, you would keep a sample bullet from that earlier batch that is the ideal weight. Keep it wrapped in a piece of soft cloth and in a small bottle with a label on the outside noting the manufacture, type and weight and anything else you want to record.

1. Press TARE to zero the scale.
2. Place the example bullet on the scale and check that it weighs what you expect.
3. With the example bullet still on the scale, press TARE to zero the scale and then remove the example bullet.
4. Start weighing bullets from the new batch. Bullets that are an exact match will weigh 0.0 grains. Sort the bullets into weight groups depending on how close you need them to be to the example bullet weight.

**Example 2:** If you have a sneaking suspicion that you may have double charged or not charged a cartridge, just tare the weight of a known good cartridge and then start weighing the suspect cartridges. All the good cartridges should weight 0.0 grains (or very close to it). So, all you need to do is look for one that weighs too much or too little by the weight of the powder charge. This greatly speeds up the inspection process!

## Tip #9: Center the Load

Place the load (powder pan, bullet, calibration weight, etc.) at the center of the weighing platform. An off-center load may cause binding of the load cell resulting in error. Some powder scales have a cup shaped platform that automatically centers the powder pan. But if you are weighing a bullet, loaded cartridge or some other odd-shaped object, try to center it as best as possible. To keep round objects (e.g., a ball bearing) from rolling around, first place a simple gun cleaning patch on the scale, press “Tare” to zero the weight, then place the object on the patch.



## Tip #10: Cleanliness

Keep your scale clean. Dust and stray powder grains getting into the load cell can bind the mechanism. If your scale comes with a cover, keep it closed when you are not using the scale. If your scale came with a storage box, you should place it back in the box if it will not be used for an extended period of time.

I keep a can of compressed air at my reloading bench. It is handy for blowing powder grains off the powder scale, as well as off the press, and doesn’t blow with enough force to damage anything.



You may also want to consider one of those miniature battery-operated keyboard vacuum cleaners. Since a keyboard vacuum sucks up the powder grains, it has the added advantage of reducing the risk of blowing powder grains into the powder scale interior. And it won’t generate enough vacuum force to damage anything. Look for one that has lots of small interchangeable tips and brushes that can reach into small spaces. You can even find some that are reversible ... so it can blow as easily as vacuum.

**TIP:** I added an 18" length of clear braid reinforced PVC tubing that was the right size to hold the tips. That way, I don't have to hold the weight of the whole vacuum. I feel that it gives me more control and makes it less likely that I'll apply too much force to any parts of the scale.

If powder grains (or other particles) do get into the interior of the scale, they can cause all sorts of instability problems including drifting off zero, drifting after displaying final weight, displaying wildly inaccurate weight, displaying a different weight each time, and inability to calibrate the scale. If you experience these symptoms with your scale, and you've already replaced the batteries, contamination in the load cell is the next most likely cause. Think of the load cell as a tuning fork. If dust or powder grains are clinging to it, it will change the pitch.

The weighing platform can be removed on some scales, allowing you to more easily clean underneath. A soft artist's paintbrush or a gentle puff of air is about all that should be needed to clean it. Just be certain to brush or blow in a direction that flushes particles off the scale and not down the hole under the weighing platform! You can turn your scale upside-down while cleaning, but do not shake it to dislodge dust and powder grains. Shaking could permanently damage the load cell!

**TIP:** I always clean my scale over a sheet of white paper so I can see what, if anything, falls out.

Check with the scale manufacturer before attempting to open the scale up to clean out dust or powder grains that may have gotten inside. Messing around inside can cause permanent damage if you don't know what you are doing and may void the manufacturer's warranty. Indeed, the scales from some manufacturers are snapped together or even glued to make them impossible to open.

After cleaning, re-calibration will be needed. You may need to calibrate it several times to get it back to normal ... especially if it was heavily contaminated.



Don't forget to clean your powder pan. Over time, a film of powder residue can build up on the powder pan. This can cause powder grains to stick to the pan, and not be transferred to the cartridge case. This is often misinterpreted as static cling and most frequently treated by rubbing the pan with an anti-static clothes drier sheet. But repeated use of drier sheets may also leave residue buildup. Residue buildup happens with both metal and plastic powder pans. The cure is simple. Just wash the powder pan with a drop of liquid dish soap, rinse thoroughly and let dry. Do not use abrasive soaps or scouring pads. The resulting scratches can cause powder grains to cling.

The powder pan you use can make a difference too. If every grain of powder doesn't make it into the cartridge, then all your efforts to this point are in vain. My favorite powder pans are the metal pans that commonly come with balance beam type scales (e.g., Dillon Eliminator: Redding No.2 and RS-1; RCBS® Models 502, 505 and 1010; LEE Safety Scale™; Lyman® Pro 500 and Pro 1000; etc.). Metal powder pans have a few advantages over plastic pans.

1. They don't hold a static charge
2. They tend to need cleaning less frequently (see Tip #10)
3. Powder grains tend to slide off quite easily
4. They are usually a shiny gold or bare aluminum color, so you can easily see that all powder grains have been transferred to the cartridge case.



RCBS Powder Pan  
MSRP = \$23.99

The gold or silver color also makes inspecting powder grain structure easy. Plastic pans are usually black and inspecting dull gray particles against a black background is difficult.

NOTE: If you ever lose the metal powder pan from a beam balance, it can be difficult and expensive to find an exact replacement. And it is highly recommended that you find the same pan that originally came with your balance beam scale. The hanger support is designed to fit the pan exactly, and a pan from another scale probably won't fit correctly. Your best bet is to call the manufacturer and get the pan that originally came with your scale. If that isn't possible, try to get the pan and hanger from another scale.

Most electronic powder scales come with plastic powder pans (Lyman® is one exception). The plastic pans that come with many electronic scales leave much to be desired. Fortunately, there are alternatives. If you have an old balance beam scale packed away, just use the metal pan. If you don't happen to have a metal powder pan, the best plastic powder pans I've found are:

- [Lyman® Powder Pal™](#) (\$8.95 MSRP)
- [RCBS® Scale Pan/Funnel](#) (\$8.99 MSRP)

Both are made of anti-static plastic and have a unique feature of combining a scale pan with a powder funnel. In the previous revision of this Tips, I gave the RCBS® pan a slight advantage because it also had a conventional pour spout. But Lyman has since changed their design to include a pour spout ... making it essentially identical to the RCBS® pan. One caveat is that these are not recommended for use on a balance beam scale. Not sure just why that is, but it is most likely because the scale "zero" adjustment may not have enough range to adjust for the difference in weight between the metal and plastic pans. The plastic powder pan is also unlikely to fit the hanger.



Lyman® Powder Pal™

If you can't find an alternative powder pan that fits your powder scale, try washing the original powder pan thoroughly and then spraying it with Static Guard® (mentioned previously). PACT recommends washing their powder pan occasionally with soapy water and allowing the soap film to dry on the pan. The soap film helps dissipate static electricity.

If your scale has a cover that is designed to be closed during weighing, make sure that any pan you choose fits under the cover with plenty of clearance! The Lyman® Powder Pal and RCBS® Scale Pan/Funnel have a much taller profile and may not fit. Likewise, if you have an electronic scale that has an integrated, or connects to, an auto-trickling mechanism, you must make certain that any replacement pan doesn't interfere with the trickler.

## Tip #12: Working with Auto Powder Tricklers

Several automatic powder trickler scales are currently on the market. (e.g., Lyman® Gen 6™ Compact Touch Screen Powder System, RCBS ChargeMaster Link Electronic Powder Measure, Hornady® Lock-N-Load™ Auto Charge™ Pro). As good as they are, you may not want to trust them 100%. Crosschecking one is easy if you still have the scale you used before buying the auto trickling scale. And if you have a spare powder pan, you can start trickling the next charge while crosschecking the first charge using your old scale ... so you won't be losing time while doing the crosscheck. Of course, if your auto trickler is performing well, you won't need to do this every charge. But it is a good habit to crosscheck periodically during a loading session to make sure nothing has drifted, and in particular when trickling gunpowders you haven't used before. I recommend using the same pan as came with the auto trickler. And all three models mentioned above come with nice metal pans that are certain to work with the trickler. They should be easy to get directly from the manufacturer.

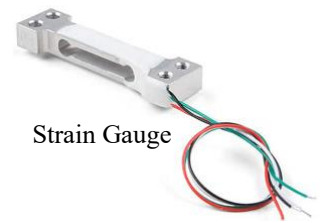


Lyman® Gen 6™



### Tip #13: How NOT to Break the Strain Gauge in your Powder Scale

At the heart of every electronic scale is a Strain Gauge or Load Cell. Lower priced scales usually use a strain gauge similar to the one in the photo at right. One end is attached to the frame of the scale and the other to the weighing platform. Strain gauges can be easily damaged if handled roughly.



Here are a few basic rules to follow.

- Never leave a load on a scale for an extended period of time as this can damage the strain gauge. The length of time to trickle a powder charge is no problem. But leaving weight on overnight is.
- Never place more weight on a scale than its uppermost limit. Overloading the scale can damage the strain gauge. Don't forget that the scale's weight limit includes any "tare" weight. For instance, if your scale has a 500 grain maximum capacity and you "tare" the scale (zero) with a powder pan that weighs 100 grains, the remaining capacity is now only 400 grains. Even though the scale reads zero, if you place a 500 grain weight on the scale, you will overload the scale.
- Never drop anything on the weighing pan. Always place the load or calibration weight gently onto the scale. Dropping weight on the scale can damage the strain gauge, even if the weight is well below the scale's uppermost limit.



**Overload Indicator:** Most scales have an Overload indicator of some type. It may be text (like the example at right) or it may be an icon. On a few scales, the backlight may turn red. Check the User Manual to see what it looks like. If the Overload indicator ever appears on the display, immediately remove the weight from the scale!

O-Ld

If you ever do accidentally overload your scale, it is a good idea to check the calibration before continuing. You may get lucky and the scale's overload protection worked. If there is damage, and the damage is slight, you may be able to save the scale by recalibrating. You may need to calibrate it several times to get it back to normal. NOTE: Although many scales do have built-in overload protection, it is not good practice to depend on it to protect your scale.

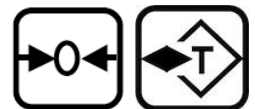
### Tip #14: Read your Owner's Manual

The owner's manual for your scale is full of useful information specific to your scale. It may not be as exciting as a Tom Clancy techno-thriller, but it is worth reading.



### Tip #15: The Difference Between Zero and Tare

I've added this section in response to the many inquiries I've receive about the difference between Zero and Tare. Some scales have both "TARE" and "ZERO" buttons. Other scales combine these functions into one "TARE" button. Although they would seem to be identical functions, there is a discrete difference.



NOTE: Scales from different manufacturers may have Zero and Tare buttons that look different than the button icons at right. In fact, on most scales the buttons will simply have "ZERO" and/or "TARE" in text on the buttons. These icons are from the buttons on a [CTS-30000 Precision Counting Scale](#).

NOTE: The examples below are based on the characteristics of a MyWeigh® Gempro-300 (see photo at right). But this is not an endorsement. In fact, the Gempro-300 was dropped and is no longer being manufactured. But it is a good example of a scale that had both "TARE" and "ZERO" buttons.



MyWeigh® Gempro-300

**ZERO:** If your scale has a separate “ZERO” button, it does just one thing. If the display doesn’t read 0.000 after removing all objects from the weighing platform, pressing the “ZERO” button will force the display to read 0.000.

If you have separate “TARE” and “ZERO” buttons, pressing the “ZERO” button with weight on the weighing platform will do nothing. Of course, someone will point out that the scale isn’t smart enough to know that there really isn’t anything on the weighing platform and thus allow the “ZERO” button to work regardless. The answer is that it’s all in the programming. The Zero function of the scale is programmed with a weight limit. On a Gempro-300, that limit is 6 grams (92.59 grains). Anything over that and the “ZERO” button is disabled. Strangely enough, it is only limited in the + direction. So, if I Tare a 50 gram weight and then remove it, the display will show –50 grams. I can then use either the “TARE” or “ZERO” button to restore the display to 0.00. At least Zero behaves that way on a Gempro-300. Scales from other manufacturers may be programmed differently. But if you think about it, it does make sense as it is impossible to overload a scale in the negative direction.

**TARE:** A “TARE” button sets the display to 0.00 with an object on the weighing platform. This is a very handy function. When weighing gunpowder, you Tare the weight of the empty powder pan. The display then shows only the weight of powder you add to the powder pan. Essentially it is doing the math for you.

But there is a limitation to the Tare function. Tare doesn’t change the scale’s total capacity. For example, if your scale’s maximum capacity is 1000 grains and your powder pan weighs 100 grains, and you Tare the weight of the empty powder pan, you’ll only be able to weigh a powder charge up to 900 grains. Some older scales limited how much you could Tare. I believe this was done to reduce the possibility of overloading the scale. Most modern scales have overload protection and allow you to Tare up to the total capacity of the scale. Of course, if you did that, the scale would not be able to weigh anything additional.

But wait! If there was a 6-gram offset and you used the “ZERO” button to bring the display back to 0.00, doesn’t that also deduct 6 grams from the scale’s total capacity? The short answer is No. That is because the Gempro-300 is designed with an extra 6 grams of hidden capacity to allow the Zero function to work without deducting from the scale’s rated capacity. Tricky, eh? Other electronic scale manufacturers may include a similar capability.

**NOTE:** Scales from different manufacturers, and different scales from the same manufacturer, will have different limits and offset values from those mentioned above.

## A Final Word

These tips will get you a head start on accurate powder weighing and, hopefully, save you a few of the lessons I learned the hard way.

## Acknowledgements

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