

UniqueTek “Tips” File #28: “Test Tube Powder Charge Holders”

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Foreword

This “Tips” file is the result of a suggestion from Steven, a UniqueTek customer. It describes a technique that he developed and uses for containing weighed powder charges for his rifle cartridges. I thought that it was a novel approach and asked if he wanted to share it with the world. He agreed and sent me all the details ... as well as the test tubes, boxes and powder funnels shown. I wrote the text, but the concept is 100% his.

— Lee Love

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The Normal Procedure

The normal procedure for loading rifle cartridges on a single-stage press is to pour the weighed powder charge into a primed case and then set it into a load block where it awaits the next step. But, sometimes, you may want to “multitask” and measure all the powder charges while the cases are still being prepared.

Glass Test Tubes

Steven found glass Culture Test Tubes that were a perfect size to hold the weighed powder charges. The test tubes are clean, non-conductive and powder easily slides out of them. And being crystal clear, you can easily see that you have achieved 100% powder transfer.



Culture Test Tube Specifications and Sources

The test tubes have the following specifications.

- Material: Borosilicate Glass or Pyrex®
- Diameter: 12mm
- Length: 75mm
- Capacity: 6ml
- Manufacturers: Corning®, Kimble® or Kimax®

This size Culture Test Tube will hold up to about 78 grains of H4350 or 63 grains of H4190 with approximately 1/2" of free space at the top. Although they are available with either a “straight” or “beaded” rim, I recommend the straight rim. You can also find similar test tubes in Polypropylene and Polystyrene, but they should be avoided for this use due to static cling and/or clarity issues.

Unfortunately, most laboratory supply outlets only sell Culture Test Tubes in minimum quantities of 1000 or 500, and only rarely 250 or less. Try alternate web sources (e.g., eBay, Amazon, etc.) for smaller quantities and lower prices. Regardless of the source, you will notice that the price per tube drops hugely at larger quantities. So, you might want to partner with several shooting buddies or your local club and get a case of 1000.

- ASTM Type 1 Borosilicate Glass Disposable Culture Tubes (Kimble® #73500-1275): \$9.99/25 or \$24.99/250 or \$34.97/1000 on Amazon.

https://www.amazon.com/Kimble-73500-1275-Borosilicate-Unmarked-Disposable/dp/B0842YWF7G/ref=sr_1_4?crd=TCBG83RYG97I&keywords=6ml%2Bculture%2Btubes&qid=1656437566&s=industrial&srefix=6ml%2Bculture%2Btubes%2Cindustrial%2C93&sr=1-4&th=1

NOTE: The link above was the best deal I could find at this time. But web links are in a constant state of flux, so be prepared to do a little searching for a source if this link is dead by the time you read this.

Supporting Powder Filled Test Tubes

Plastic Ammo Storage Boxes

A plastic ammunition box is the ideal way to support and store the test tubes full of gunpowder. And the lid is a key feature! Although the lid won't prevent powder spillage if the box is turned upside-down, it closes tightly enough to prevent any contamination from entering the test tubes. This is especially handy if you are weighing charges a day or more ahead, or if your reloading session gets interrupted while weighing the powder charges. Also, the wells are deep enough to support the test tubes.

Since the dimensions of the Culture Test Tubes are very close to the SAAMI specifications for the .308 Winchester rim diameter and COL, the MTM Case-Gard ammo box for .308 Win. cartridges turns out to be perfect.

Indeed, there may be other brands of ammo boxes that will also work just as well, but this is the only one that has been tested and confirmed to fit these test tubes.

- MTM Case-Gard RM-50 (photo at right): ≈ \$5.00

Note: Available at multiple sources on the web. Just search by name.



TIP: Because the test tubes are crystal clear, you also get one last time to visually check the powder charge. If you scan across the tubes in the box and see the powder level in a test tube looks a little higher or lower than the rest, it is worth reweighing to confirm it is correct before pouring into a case.

TIP: Store empty test tubes in the ammo box to prevent contamination and breakage.

Powder Funnels

Getting the powder into the Test Tubes and from the Test Tubes into the cartridge case can easily be achieved with most common powder funnels, including those from Lee, RCBS, Redding, Hornady, Lyman and others. These fit over the case mouth ... and the test tubes ... to ensure 100% transfer. Indeed, Steven uses a Lee powder funnel that he happened to have (see photo at right).

But you may want to consider a funnel that goes inside the test tube. That way you can be certain that no powder grains have hung up on the rim of the Test Tube ... which is much thicker than a brass case. Steven also bought this set of stainless-steel funnels on the web (see photo at right). The medium size was the best fit. This particular funnel has a handle which you may find handy. But there are many options available on the web.



Closing Thoughts

This is a really handy idea for handloaders who weigh each powder charge. In particular, I like these glass Culture Test Tubes because:

1. You can see the powder level in the tubes before pouring them into a case,
2. There is no static cling to hold back powder grains,
3. You can see that 100% of the powder has been transferred into each case.

It is also a time saver in that you can weigh and safely store powder charges while other operations are being completed.

That completes the description of Steven's basic concept. But, during the writing, I came across additional information that I included in an addendum on the following page. It will be particularly useful for cartridges with larger powder capacities than the 12mm x 75mm test tubes can contain.

Addendum

Scaling Up for Larger Cartridges

The Culture Test Tubes discussed in this document hold up to about 75 grains of powder. But if you are loading a large magnum cartridge like the .338 Lapua Magnum, you'll need larger test tubes. Fortunately, they are available in several larger sizes (see table below). To calculate which Test Tube size you'll need for your powder charge, you can refer to a ["Volume Measure Density" \(VMD\) chart](#) like the one made by LEE Precision and use the formula: Charge Weight (gn) x VMD = Charge Volume in Cubic Centimeters (cc). And for practical purposes, 1cc = 1ml.

Tube O.D. (mm)	Tube Length (mm)	Overflow Volume (ml)	Calculated Max Powder Capacity (gn)*	
12	75	6	H4198 = 80.0	H4350 = 82.8
13	100	10	H4198 = 133.3	H4350 = 137.9
16	100	15	H4198 = 200.0	H4350 = 206.9
16	150	24	H4198 = 320.0	H4350 = 313.0

* Calculated based on the Overflow Volume. Back off several ml to leave about 1/2" free space below the rim of the test tube to avoid spillage. I used H4198 and H4350 as examples simply because I happened to have them on hand.

Culture Test Tubes are also available in both smaller and larger sizes, but this list covers the practical range for most handloading applications out to the .50 BMG cartridge.

Test Tube Racks

Since no ammo boxes are available that will hold 100mm or 150mm test tubes, you'll need an alternative. I recommend an actual laboratory Test Tube Rack. I like either the "Test Tube Snap-N-Racks" or "No-Wire Test Tube Rack". Both are stable and low cost. They can also be disassembled and stored flat when not in use to save space. They are available in four colors (White, Blue, Yellow and Red) and three sizes (13mm, 17mm & 21mm) although you'll want the 13mm size to fit the 12mm diameter of the test tubes previously mentioned. Both racks for 13mm test tubes have a capacity of 90 test tubes. So, you can cut back to only 3 test tubes per row and stagger space them to provide more room for your fingers yet still have the capacity for 45 tubes.

- Test Tube Snap-N-Racks (top right photo): ≈ \$20.00
- No-Wire Test Tube Rack (bottom right photo): ≈ \$20.00

Note: Both are available at multiple sources on the web. Just search by name.



TIP: Since there is no lid on test tube racks to protect against contamination, I suggest getting a piece of tempered glass custom cut to lay across the top of the test tubes. Any local glass shop can do this for you for not a lot of money. Don't use plexiglass as it will hold a static charge.

What About Load Blocks?

Although you may already have load blocks that fit your cartridges, I cannot recommend them for this purpose. As test tubes have a rounded base instead of flat like a cartridge, most load blocks are too shallow to support them sufficiently. And the stability only gets worse if you need to use the larger capacity 100mm or 150mm test tubes. And of course, there is no lid.

Within an hour of the initial release of this Tips file, I received a call from another customer who was already using this technique. He uses the same 12mm x 75mm Culture Test Tubes but uses a test tube rack instead of an ammo box and then uses Test Tube Caps to seal the test tubes. He provided the following source for all of these items ... at very low prices!

Karter Scientific

Home Page: <https://www.kartersci.com>

Test Tubes

These are the same Borosilicate Glass Culture Test Tubes but manufactured under the Karter Scientific brand name. They are available in 25-packs at an amazingly low price.

Item#: 220C5

Price: \$2.37

Web Link: <https://www.kartersci.com/ProductDetails.asp?ProductCode=PC%2D220C>

Test Tube Rack

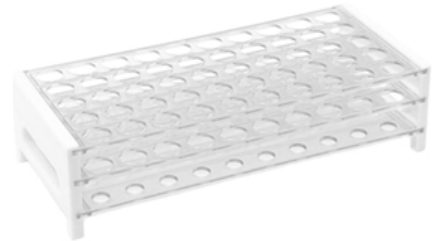
This is another style of Test Tube Rack. It is sized to hold 50, 12/13mm diameter test tubes, made from ABS plastic and disassembles to store flat. The most incredible thing about this rack is the extremely low price!

12/13mm, 50 Place

Item#: 208V2

Price: \$2.91

Web Link: <https://www.kartersci.com/50 Place 12 13mm Detachable Test Tube Rack ABS P p/pc-208v.htm?1=1&CartID=0>



It is available in a larger size to hold up to 17mm diameter test tubes.

15/17mm, 50 Place

Item#: 208U2

Price: \$5.99

<https://www.kartersci.com/50 Place 15 17mm Detachable Test Tube Rack ABS P p/pc-208u.htm?1=1&CartID=0>

Another handy trick the customer described about these test tube racks is that you can remove one of the layers and still be able to use the rack. So, he removes the top layer and then uses the rack when ultrasonically cleaning rifle cases. This keeps the cases oriented upright, so the ultrasonic energy is focused on the primer pockets for faster and more thorough cleaning. You could even configure it to use as a load block for cartridges.

TIP: These Test Tube Racks can also be used as load blocks. The 12/13mm rack will fit most common rifle cartridges. The larger 15/17mm rack will fit larger diameter cartridges (e.g. All Win Super Short Mag cartridges, 8mm Rem Mag., .45-70 Govt. .270 Weatherby Magnum, .338 Lapua, etc.).

I bought one of these to “play” with. As a load block, it is very flexible and can be used with all three layers installed or with just two layers in any combination of the three slots. It can also be completely disassembled and stored flat when not in use.

Test Tube Caps

This customer described how he uses Test Tube Caps to seal each individual Test Tube instead of storing them in an ammo box as described earlier. The caps are available in six (6) colors. When doing load workups, he keeps notes to identify the charge weight for each color rather than writhing on the tubes with a china marker or Sharpie. The caps are available in bags of 25. They are available for 12mm, 13mm and 16mm diameter Test Tubes.



Item# (25pks): 207U3 (Blue), 207V3 (Green), 207T3 (Mauve), 207Q3 (Neutral), 207R3 (White), 207S3 (Red)
Price: \$1.72 (25-pack for 12mm Test Tubes, any color.)

Web Link: https://www.kartersci.com/Test_Tube_Cap_Flange_Type_Karter_Scientific_p/pc-207u.htm?1=1&CartID=0

TIP: These Test Tube Caps have flanges instead of threads. When removing them from a test tube, twist them while gently pulling and they will come out in a controlled manner ... avoiding spilling any powder.

Final Thoughts

As I noted at the beginning, I thought that Steven's approach was quite novel. Although the old school approach has served well for generations, there is always room for innovation. In fact, I now use the Karter Scientific Model 208V2 Test Tube Rack as my preferred loading block.

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