### **Glass Holding Fixture**

March 15, 2024 (Terry Cross, 1 MIL Right)



"I have had a resurgence in L.E. requests to share how we hold glass windshields, window panes and glass panels when testing rifle ammo against such barriers.

I would like to share this with the intent to encourage further development of this specialized niche of our training."

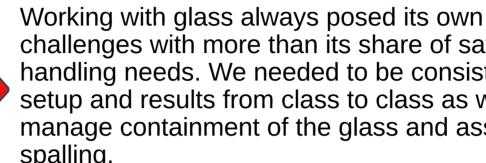
#### Why?

Part of my vocation is teaching certain vertical skillsets and training methodology to Law Enforcement professionals who specialize in high-risk operations. In doing so there is a large amount of information to prepare as well as pre-positioning equipment, targets and other logistics for each class to minimize our down time between blocks of training.



Most high-risk operations begin with a barricaded suspect with or without hostages, so we must address and prepare for such contingencies involving glass barriers.

Working with glass brings challenges from a safety standpoint as well as post testing range cleanup. This made it difficult to get approval from hosting ranges and cumbersome if it was approved.



challenges with more than its share of safety and handling needs. We needed to be consistent with setup and results from class to class as well as manage containment of the glass and associated spalling.

**How and What?** 

Here is the way I approached this chore. You are welcome to duplicate and modify as you need to best suit your budget and needs.

I decided on a "sawhorse" type approach to handling the weight, as well as something with the ability to fold flat when stowed. After considerable searching, I chose an inexpensive plastic set carried by Lowes.

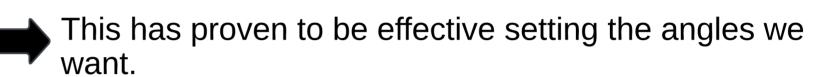


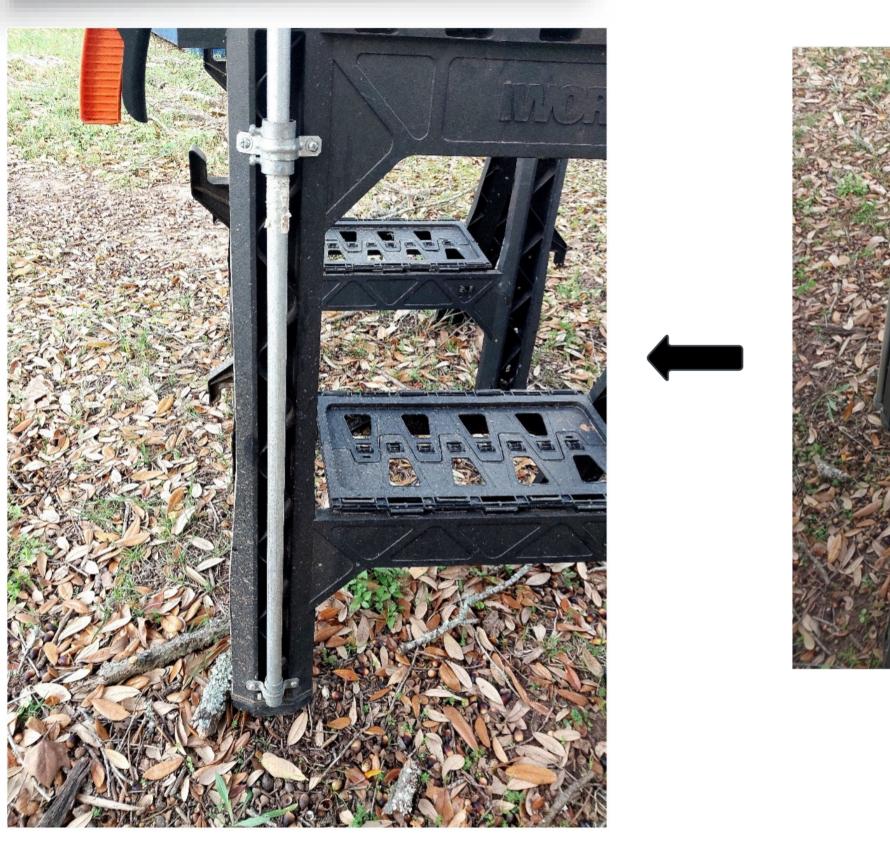
This particular product is still available from Lowes WORX 27-in W x 32-in H Abs Saw Horse (1000-lb Capacity) CLICK HERE

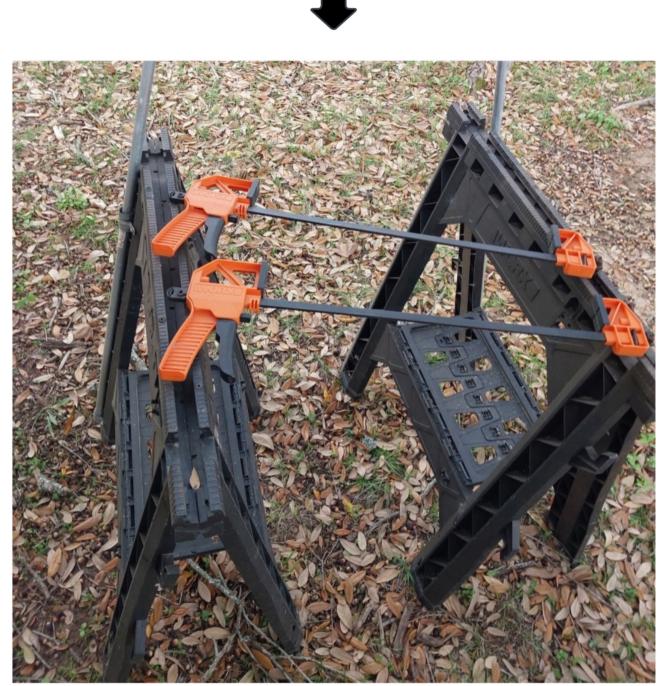


The decision was heavily influenced by <u>adjustable clamps</u> being integrated into the top of the saw horses.

I thought these would allow guick and solid adjustment options for how each piece of barrier material could be held.







Next, I decided to use rigid conduit to lock the sawhorses together while also acting as my fixed vertical feature.

I used one 10ft piece and shaped it appropriately to duplicate the angle of the opened saw horse legs.

I then used 4 conduit clamps and 4 conduit joint couples of the same size to mount as "guides" on the outbound sides of each saw horse.

I fixed the joint couples to the plastic sawhorse with the conduit clamps and some small machine screws and nuts.

When assembled, this setup offers a fairly wide and stable footprint with a reasonably low center of gravity.

> Dropping the shaped piece of rigid conduit into position locks the sawhorses together reasonably well and keeps them stabilized enough to place and remove your barrier material to without knocking over or out of place.

Placing your barrier material into position actually adds additional stability to the setup due to the added weight.



It is imperative for us to leave our hosting ranges better than we found them.

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This most certainly would include not leaving shattered glass debris or other bullet/barrier spalling at our test area.

I have found this is best managed by purchasing economy grade tarps from Harbor Freight, Tractor Supply or similar. The economy grade will be the least expensive product and is more than serviceable as a one time use ground barrier.

The whole

fixture quickly

reduces down to

**5** components

for storage or

travel.

We place our tarp flat on the ground and place our barrier stand front of center to maximize the protected area in the cone of the debris field generated by post barrier transits. Obviously, the stand will hold down the tarp in general but we make sure to add other objects to weigh down the perimeter of it as well so that the wind or an errant boot doesn't kick it out of position and maximize its coverage.

After working this block of instruction or demo, we remove all the larger bodies of glass being sure to use gloves to protect hands. We then use a broom to knock glass dust and shards off of the holding fixture described in this paper. We then carefully disassemble the stand while staying over the tarp

so that any debris caught in the grooves and interior tracks of the stand can fall to the tarp, then we remove the stand components from the tarp.

Before moving the tarp we use multiple people to team up and police the perimeter of the ground around the tarp for any debris or target trash that may have made it past the edges of the tarp. \*Use flashlights to inspect the ground after dark even on well-lit ranges.

At this point, we carefully fold the tarp folding edge over top, toward the center being careful to contain everything. Once the tarp is properly folded and secured, it is disposed of along with the larger glass pieces. We retain possession of the glass until we see it go into a dumpster.

### WRAPPING IT UP

### **PROS**:

- \* Under \$100 build
- \* It folds flat for easy storage and transport.
- \* Combined weight is maybe 40lbs at most.
- \* You can control the angle of the target material by adjusting the included clamps in relation to the vertical conduit.

\* We have held panels weighing almost 200lbs with this setup when considering center of gravity and stability during the placement. \* All materials are pretty much resistant to water and environment so less concern with storage options.

\* The materials seem to be very resistant to retaining glass shards, jacket debris and other related spalling.

**CONS:** LIKE ASS

### **ADDITIONAL NOTE 1:**

Some large commercial glass panels or armored synthetics may be too large or heavy to easily mount in this fixture.

Most testing of materials in this size/weight range do not necessarily have to be fixtured with compound angles available in our sawhorse fixture. In those situations, I have simply used two T-posts driven into the ground at an appropriate distance apart and then used standard wood working clamps to secure the test panel into a standing position against the T-posts.



## **ADDITIONAL NOTE 2:**

Larger glass panels as encountered with most double pane, insulated commercial glass can be successfully utilized for multiple test penetrations without having to shoot through previously compromised surfaces.

I have found that dividing the glass panel into areas separated by heavy duct tape prior to testing does a great job of restricting collateral cracking or compromise of the integrity of the piece that could cause the entire piece to collapse.

With quality test pieces difficult to obtain, this technique has been valuable in giving us the most use of each panel and minimize down time that would be needed to swap in new panels more frequently.

\*\*This technique is a solid No Go if the glass is spec'd as Tempered Safety. Panels in that class will totally shatter and collapse. Even if you could successfully avoid a total collapse, there would be no uncompromised surface area remaining to allow a meaningful ballistic test.

# **ADDITIONAL NOTE 3:**

The testing shown in photo #1 and #6 above was done in a very contained concrete floored area that the host agency had previously reserved just for this block of our instruction. Plans and resources were pre-allocated specifically for glass clean up. \*\*This was very nice but exceptionally unusual. Do not count on this being the case at most of your locations.

