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Proof vs. Resistant:

The Truth is in the Test

By Ken Bowditch

There is a growing need to create entrances in our schools, businesses, and government facilities that are blast, bullet, intrusion and/or storm resistant. It is sad to know we live in a time where we need to design entrance solutions for keeping our families and property safe. As a result, we must continually innovate to overcome the threats that present themselves in daily life.

Within this growing segment of the industry, we find a new set of labels, terminology, and testing standards. At times these can get quite confusing and misleading; however, they do not need to be if you have a good understanding of a few key terms.

Proof vs. Resistant

Have you ever heard someone say that an object was *Something "Proof"* and in reality, it should have been *Something "Resistant"*? According to *Webster's Dictionary*, the definition of proof is "Able to withstand something damaging; resistant." Ok, that makes sense... until you look up the definition of resistant in the same dictionary. That definition goes something like this: "Opposed to something; wanting to prevent something from happening." So, proof or resistant, tomato or tomato? They should mean the same thing, not exactly. The "proof" is in the pudding.

Yes, *bulletproof* sounds more impressive than *bullet resistant*. Using the term *bulletproof* is an absolute statement that is not exactly true. At the



end of the day, if someone or something wants in, the laws of physics *will* work against you. If something is big enough, powerful enough, hard enough, wet enough, fast enough—you get the picture—it's coming in. For this reason, I would rather see the term "resistant" used in all descriptions having anything to do with bullet, blast, intrusion or storm rated entrance systems.

Read on to find out why it's important to direct attention to the testing standards by which products are evaluated when explaining the levels of protection or comparing products.

Storm Resistant

Let's begin with hurricane ratings. Most hurricane *resistant* doors are required to meet at least one of following standards:

- ANSI (American National Standards Institute)
- ASTM (American Society for Testing and Materials)
- TAS (Testing Application Standard)
- IBC (International Building Code)
- IRC (International Residential Code)

Most test protocols will include static loads, cyclic loads, air infiltration, large missile impact, water infiltration and forced entry.

Refer to the AHJ (Authority Having Jurisdiction) to determine which one is used in your area.

Most test protocols will include static loads, cyclic loads, air infiltration, large missile impact, water infiltration and forced entry. The most stringent of these requirements is approval in Miami-Dade County. If a product can make it through Miami-Dade's NOA (Notice of Acceptance) protocol (TAS 201, 202 and 203), it can most generally be submitted in other states or regions (such as the Florida Building Commission or Texas Department of Insurance) with a high degree of confidence in approval.

A lot of homework is required to determine how a product will perform under test conditions before sending it to the testing lab. This upfront work reduces the likelihood of a failure during testing. Water infiltration is an excellent example.

Water is not your friend in the test lab. *One drop* of water that infiltrates a test specimen results in a failure. Through many trials and tribulations, we found that all-fiberglass or fiberglass/aluminum doors perform exceptionally well during this type of test. Furthermore, due to their resistance to humidity and salt water, they are great options when considering new or replacement doors in the coastal regions of the U.S.

One important consideration to remember is the size of the product that you intend to sell or install cannot exceed the size of the specimen tested (although it can be smaller). The hardware/seals must be consistent with the configuration used in the approval. You can deviate from the approval only with permission from the AHJ.

Bullet Resistant (Ballistic)

Depending on the level of bullet resistance, there are several ratings by which products can be tested. The most common are:

1. UL 752
2. National Institute of Justice (NIJ) 0108.01
3. State Department SD-STD-02.01
4. ASTM F-1233
5. HP White Laboratories HPW-TP 0500.02
6. European Standard DIN EN 1063
7. British Standards Institution BS 5051
8. Councils of Standards Australia/New Zealand AS/NZ 2343



When deciding on a bullet-resistant opening solution, I strongly recommend exploring the pultruded ballistic door options that are available. Believe it or not, steel is not always the answer to solving these complex entrance problems.



These tests are done in a controlled environment at a certified test lab. The range of weapons varies from handguns to rifles, and the ratings are quite different depending on the standard to which you are testing. For example, you may hear someone refer to "Level 3", which has a different meaning depending on which standards test is used. Level 3, UL 752, calls for a .44 magnum handgun. National Institute of Justice (NIJ) Level 3 calls for the use of a 7.62mm (.308 Winchester) rifle. So, as you can see, there is a difference.

I have worked on several projects developing bullet-resistant doors using a fiberglass pultrusion process. When deciding on a bullet resistant opening solution I strongly recommend exploring the pultruded ballistic door options that are available. Believe it or not, steel is not always the answer to solving these complex entrance problems. When used properly, fiberglass has excellent ballistic properties without the concern of deterioration due to rust or corrosion.

Blast Resistant

In some cases, such as in government installations, there is a blast requirement for most if not all exterior entrance systems. There are a couple of different approaches to achieve a blast specification.

1. **Arena Testing**—This is obviously the most fun. As you can imagine by the name, this testing occurs outside in a controlled area, by setting off explosives

to achieve the desired load and duration. The entrance system is instrumented to record the forces felt during the explosion. The advantage of using the arena test is that you are not limited to a product of a particular size. The downside with this method is that it is more difficult to obtain a specific pressure and duration due to the variation in explosive behavior.

2. **Shock Tube**—The shock tube is an instrument used to replicate and direct blast waves at a sensor or a model to simulate actual explosions and their effects, usually on a smaller scale. The advantage of using the shock tube is that you can repeat the test more accurately than arena testing. The disadvantage is that the size of the specimen is restricted by the size of the shock tube.

Intrusion Resistance

If you are looking for solutions that would slow down a perpetrator from gaining access to your building, one of the options is to add intrusion resistant glazing to your entrance. The definition of intrusion is: "the act or an instance of intruding; an unwelcome visit." There are several test standards used depending on the approval. The most common are ASTM and UL (Underwriters Laboratories), and the U.S. State Department forced entry test. In addition, some state correction facilities utilize their own standards. Some companies are trying to



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“update” the current standards that would better represent current conditions.

Depending on the data that you look at, the national average for the police to respond to a 911 call is between six and ten minutes. The goal of an intrusion resistant entrance system is to delay intruders from gaining access until the cavalry arrives. These systems may or may not be bullet resistant; remember, the object here is to delay the intruder from gaining access to the facility, not to stop a bullet.

There are two innovative variations of intrusion-resistant glazing that can be used for this requirement. One option is a patent pending product that slows down intruders up to 12 minutes before gaining access. The laminated glass comes in 5/16-inch and 1-inch insulated. This glass is a bit more expensive but provides all the benefits of a glass vision lite that an end user may prefer.

The second option is a clear polycarbonate that has a scratch resistant coating. I strongly suggest packing a lunch if you are trying to break through this material. You can literally go after it with a sledgehammer and not break it! This polycarbonate is an inexpensive solution for intrusion resistance.

It is important to note that the glazing material is only one aspect of an intrusion resistant system. The doors and vision lite kits used to hold this glazing material are just as important. They must all work as a system to counteract

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the threat. When selecting intrusion resistant products, it is important that you select intrusion resistant doors, frames, glazing, and vision lite kits. The vision lite kits are usually reinforced with more fasteners and material to allow the system to withstand a threat.

I know what you're thinking: *More fasteners? No one is going to buy that!* Well, just because there are more fasteners doesn't mean you have to see them! There are companies that have developed clever ways of disguising their intrusion resistant glazing kits so it does not look reinforced to the average person.

How Do I Know what Level of Protection is Needed for an Entrance?

To summarize all of this, the load results for HVHZ-approved systems are calculated in pounds per square foot. With ballistic systems, you need to understand the caliber of bullet your



entrance must withstand in an attack; that will dictate the level of protection required.

For blast protection, you will need to know the blast load the product needs to withstand, calculated pounds per square inch (psi), as well as the impulse calculated in pounds per square inch and milliseconds (psi-ms). For intrusion resistance, you need to know the amount of time that you want to hold a perpetrator at bay and if you want laminated glass or polycarbonate glazing.

To be successful when ordering these types of systems, I strongly recommend you take the time to understand

the science behind the products that will protect you and your customers. Understanding the requirements of your state or local jurisdictions and having all the information ensures you and your customer have on-time deliveries and products that meet the requirements for the project. ■



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