

Checking bullet performance with the **Bullet Test Tube**

by North American correspondent Thomas Tabor



Ballistic Technology's Bullet Test Tube is essentially a tube filled with a wax-type penetration medium.

Ballistic Technology can supply you with virtually everything needed in order to capture and evaluate your bullet performance. From front to back and left to right: Target Disk, Expansion Material Solvent, Wound Cavity Bottle, Bullet Test Tube, Ultra-Mag Xtender Tube and Inner Mould.



Many amateur ballisticians and serious hunters prefer to test their ammunition and bullets prior to using them in hunting situations. This allows the shooter to evaluate performance and better understand what to expect when their bullets make contact with the bones and flesh of an animal. It simply makes good sense to not gamble when it comes time to squeeze off a shot at game, but many procedures for testing bullet performance are problematic, time-consuming and expensive.

For many years ballistic gelatine has been the most universally accepted substitute for animal matter when evaluating terminal performance, hydraulic shock and penetration of bullets. Most bullet and ammo manufacturers use gelatine on a routine basis as part of their testing and analytical processes, but while ballistic gelatine is a great medium, it does have its drawbacks. At the quantities needed, ballistic gelatine can be quite expensive, difficult to produce, process and maintain and is sometimes not readily available in quantities a shooter needs.

In addition, even though, to a certain extent, gelatine is recyclable, its life expectancy is usually short. Each time the gelatine is reprocessed it must be tested in order to make sure it still falls within the industrial standards for density. Sometimes this means that a block will fail the test after only a couple of firings, meaning it must be discarded.

If you don't want all the hassles associated with ballistic gelatine, you might find the new Bullet Test Tube to your liking. Produced by West Virginia, USA-based Ballistic Technology, the Bullet Test Tube provides a method much more conducive for individual use. When compared to gelatine there are several inherent advantages worth considering. Most shooters find the 'Tube' cheaper in the long run to purchase and use, there is no worry about the density changing or the medium wearing out and there are no density tests to perform because the medium simply does not change over time.



This Bullet Test Tube was shot with the wildcat calibre of .17 Mach IV handloaded with 25-grain Berger Bullets.

How it works

The Bullet Test Tube is a relatively simple process. It involves a cylindrical cardboard tube measuring about 15cm in diameter by 28cm long that has been filled with a wax-type material. The shooter aligns the tubes to the bullet flight and fires into the end. A single cylinder is all that is usually needed to stop and capture most varmint bullets, but when larger, more powerful cartridges are tested, it may be necessary to use one or more of what the company calls Xtender tubes behind the main tube. In essence, the Xtender Tubes are very similar in appearance to the main test tube units.

I found it necessary to use one Test Tube, plus one Xtender Tube in my own testing with my .300 Winchester Magnum firing 180-grain Barnes MRX bullets at a muzzle velocity of 3160fps. The bullet travelled the full length of both tubes, a distance of about 53cm, and left a dimple in

VIHTAVUORI Premium Smokeless Powders

N530 - This is the fastest burning powder in the N500 series, its burning rate close to Vihtavuori N135 and Hodgdon BL-C(2). Developed especially for 5.56mm NATO cartridges and gives excellent performance in many .45-70 Govt loads, and .308 Win loads with bullet weights under 10 grams (155 grains).

N540 - A mid-burning rate powder similar to N140 and close to Hodgdon H414 and Win 760. Useful in applications where more power is needed, especially in .223 Rem, .308 Win and .30-06 Springfield loads with heavier bullets.

N550 - Burning rate close to N150, IMR 4350 and Reloder 19. Good choice for more powerful loads for 6.5x55 SE, .308 Win, .30-06 Springfield and similar.

N560 - Burning rate is between N160 and N165, close to Norma MRP and Reloder 22. Powder especially for Magnum cartridges to obtain maximum performance from cartridges such as .270 Win, 7mm Rem Mag, 7mm Wby Mag, .300 Win Mag, .300 Wby Mag and .338 Lapua Mag.

N570 - This is the newest member of the N500 series powders and also the slowest burning. The burning rate of N570 is close to N170 while faster burning than 24N41. The characteristics of this high-energy powder with its large grain size extract maximum velocities from cartridges with very large volume cases like 6.5-.284 Norma, .300 Win Mag, .300 Rem Ultra Mag and .338 Lapua Mag, amongst others.

N110 - This is the fastest burning rifle powder from Vihtavuori with similar uses to Hodgdon H110 and Win 296. N110 can be used in small rifle cases like .22 Hornet and .30 carbine; also in magnum pistol and revolver cartridges, for example .357 S&W Mag, .41 Mag, .44 Mag, .454 Casull and .500 S&W.

N120 - Slower burning powder for small capacity rifle cases and for lighter bullets in many .22 centrefire cartridges. N120 needs higher pressure than N110 to burn efficiently. Burning rate is close to that of Accurate 1680, IMR 4198 and Reloder 7. N120 is also suitable for 7.62x39, .30-30 Winchester and .444 Marlin.

N130 - This powder is used in many .22 and 6mm PPC factory cartridges. Suitable also for lighter bullets in .223 Rem and for straight-wall rifle cases like .45-70 Govt and .458 Win Mag. Burning rate is similar to Hodgdon H322 and Accurate 2230.

N133 - The choice of many benchrest and standard rifle shooters who shoot 6mm PPC. Used also in many .222 Rem, .223 Rem loads as well other applications where a relatively fast burning powder is needed, like .45-70 Government. Similar burning rate to Norma 201, Hodgdon H335 and Vectan Sp10.

N135 - An excellent powder for .308 Win loads with bullet weights under 10 grams (155 grains). Applications as per IMR4064, Hodgdon H4895 or Accurate 2520. Capability for various cartridges and loads ranging from .17 Rem to .458 Win Mag.

N140 - A true multipurpose powder which can usually be used in place of IMR4320, Reloder 15 or Hodgdon H380. Good choice also for .223 Rem, .22-250 Rem, .308 Win, .30-06 Springfield, 8x57 JS (8mm Mauser) and .375 H&H Mag.

N150 - This powder burns a bit more slowly than N140 and works in the same applications as Hodgdon H414 and Win 760. Typically used with heavier bullets in accuracy and hunting loads for medium-capacity cartridges, like .308 Win, 6.5x55 SE and .30-06 Springfield.

N160 - A slow burning powder for magnum cartridges and cartridges with a large case volume and comparatively small bullet diameter. Burning speed of N160 is close to Reloder 19, Win WMR and the various 4831s. For example some ideal applications are: .243 Win, 6.5-.284 Norma, 7mm Wby Mag, .300 Win Mag, .338 Win Mag and all of the Winchester Short Mags.

N165 - A very slow burning powder for magnum cartridges with heavy bullets. N165 offers performance equivalent to Norma MRP and Reloder 22. To be used with heavy bullets in cartridges ranging from 6.5x55 SE all the way up to .416 Rigby.

N170 - The slowest burning N100 series rifle powder from Vihtavuori and one of the slowest canister reloading powders generally available from any manufacturer. Its applications are similar to those for Hodgdon H1000 and Accurate 8700. Good performance in most belted magnum cartridges like .300 Wby Mag. Also suitable for .300 Rem Ultra Mag and .338 Lapua Mag.

N310 - Very fast burning and for similar applications to Alliant Bullseye, Hodgdon HP38 and Vectan BA 10. It has uses in a very wide range of cartridges from .32 S&W Long Wadcutter up to .45 ACP.

N320 - A comparatively fast burning multi-purpose handgun powder with burning rate similar to Win 231 or Alliant Red Dot. Currently available reloading data for 9mm Luger, .38 Super Auto, .38 Special, .357 Mag, .40 S&W, .44 S&W Spl, .44 Rem Mag, .45 ACP and .45 Colt.

N326 - A new special powder called TIN STAR developed for Cowboy Action shooters loading lead bullets for revolvers and lever action rifles. It has low bulk density (less free space in the case) and burns very cleanly leaving only a little residue with a burning rate between N320 and N330. Reloading data is currently available for .38 Special and .44 Magnum.

N330 - Burning rate is a bit slower than N320 corresponding to Alliant Unique and Vectan BA 9. Especially designed for 9mm Luger but also suitable for .38 Spl, .40 S&W, .44 S&W Spl and .45 Colt.

N340 - An excellent multi-purpose handgun powder with a burning rate generally around that of Accurate No. 5 or Alliant Herco. Wide application range covers the following handgun cartridges - 9mm Luger, 9x21, .357 Sig, .38 Super Auto, .38 Spl, .357 Mag, .40 S&W, 10mm Auto, .44 S&W Spl, .44 Rem Mag, .45 ACP and .45 Colt.

N350 - This is the slowest burning N330 series handgun powder and can usually be used instead of Accurate No. 7, IMR Hi-Skor 800-X and Alliant Blue Dot. An appropriate choice for many powerful handgun loads, for eg, in cartridges 9mm Luger, 10mm Auto and .45 AP.

3M37 - Originally developed for .22 rimfire cartridges but it has proven very versatile and popular in competitive handgun shooting disciplines. The burning speed of this small-grain powder is close to N350 and Vectan AO. Reloading data available for all popular handgun cartridges.

3M38 - This specially designed powder for competition handgun shooting is recommended for high velocity loads in 9mm Luger, .38 Super Auto and .40 S&W with mid-bullet weights. Burning rate is similar to Vectan SP2.

N105 - A slow burning handgun powder filling the gap between N350 and N110. Especially developed for handgun cartridges with heavy bullets and/or large case volumes. Reloading data is currently available for the following cartridges - .38 Super Auto, .357 Mag, .357 Rem Maximum, .40 S&W, 10mm Auto, .41 Rem Mag, .44 Rem Mag, .45 Colt, .45 Win Mag, .454 Casull and .500 S&W Mag.

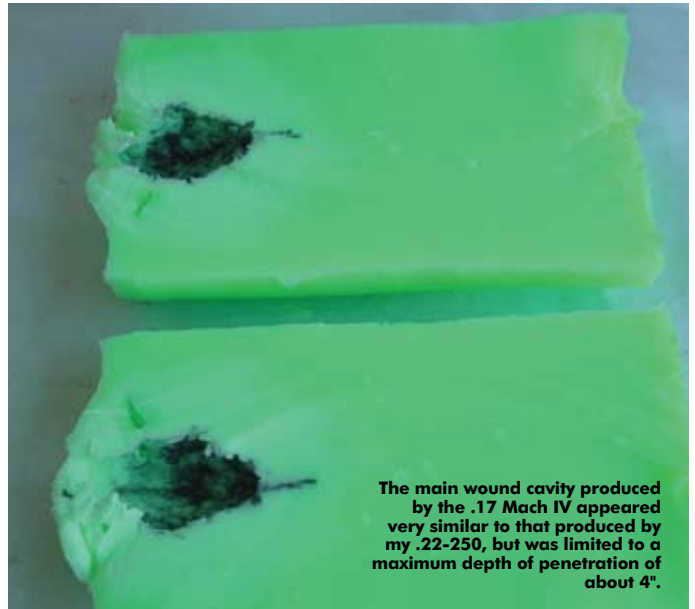
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the end cap of the last tube.

On the other hand, when I tried the same set-up firing my 7mm WSM with 160-grain Barnes Triple Shock X-Bullets, the bullet travelled the full 53cm length of the two units and exited out the backside of the Xtender. For this reason, I would recommend that a total of three units be used for most Magnum cartridges. A calibre such as .243, .270 or .30-06 would likely only need two units, but if you are testing big-bore calibres, it will likely require several more units.



The main wound cavity produced by the .17 Mach IV appeared very similar to that produced by my .22-250, but was limited to a maximum depth of penetration of about 4".

Evaluating the wound cavity

The wound cavity and degree of penetration can be evaluated in several different ways. You can figure out how large a cavity the bullet produced by measuring the amount of water it takes to fill it. A convenient way to do so is to use the company's Wound Cavity Bottle, which is volume-marked along the side. After that, you should remove the cardboard mould of the Tube and using the provided steel wirecutter, split the penetration medium directly down the bullet path. This will permit you to see precisely the damage produced by the terminal performance and hydraulic shock of the bullet.



Testing conducted by Ballistic Technology for the Department of Natural Resources demonstrated the differences between various .223 ammunition. (Image supplied by Ballistic Technology.)



A 6-quart crockpot works well to melt the Bullet Test Tube medium in order for it to be recycled.

In order to measure the size of the wound cavity, I filled it with water and measured the volume. In this particular case, when shot with the .17 Mach IV, it took 85ml to fill the void.

Recycling the tube medium

The penetration medium of the Bullet Test Tube is fairly easily recyclable. A crockpot, having the capacity of at least six quarts, is the usual method used for melting the material. In order to liquefy the medium, it must reach a temperature of 77 to 79C (170 to 175F). Once melted, it should be poured into a mould and allowed to set for at least 24 hours at an ambient temperature of around 21C (70F) before it can be shot again.

Bullets specifically intended for use on small varmints will usually break up, leaving only small particles of copper and lead suspended inside. When melted, any bullet fragments or intact bullets will settle to the bottom of the pot for easy removal and evaluation.

If you intend to test a lot of bullets, some shooters substitute a piece of PVC pipe for the factory-supplied moulds by first spraying the inside of the pipe with cooking oil, then lining it with a plastic bag.

Additional uses

In addition to checking penetration and bullet performance of rifles, Ballistic Technology also makes tubes specifically intended for other firearms such as handguns and even 'turkey guns'. There are no reusable moulds for the Handgun and Turkey Tubes, but reportedly, the Turkey Tubes can be shot many times before having to be recast.

The Bullet Test Tube is not yet available in Australia. However, if you are interested in learning more, contact Ballistic Technology at 3702 Rocky Branch Road, Princeton, WV, USA 24740. Phone (304) 425 8823, email info@thebullettesttube.com or visit their website at www.thebullettesttube.com

Allana's exposure reaps rewards



FANS OF ALLANA TAYLOR, the aspiring Queensland pistol shooter and model, will be pleased to hear that our coverage of her in the October *Australian Shooter* has resulted in her obtaining a full sponsorship deal for her shooting endeavours.

Allana thanked us for the "positive and professional" profile.

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