

This topic can be found at:

<https://forums accuratereloading.com/eve/forums/a/tpc/f/4711043/m/2861098911>

jwp475

19 February 2010, 08:03

Terminal Bullet Performance

quote:

have seen reports of artillery testing, by military scientists, which measured velocity and pressure differences between twist rates of 1:15" versus 1:7.5". A two fold difference in twist rate produced only 1/2 of 1% difference in the chamber pressure and the muzzle velocity. The men in white coats and dark glasses behind the electrified fences, however have not bothered to consider testing twist rate effects on game animal penetration. Not so much as a side of beef nor even a block of gelatin or wetpack.
So, Alf, WHERE'S THE BEEF?

The Marine Corps. current 7.62X51 (308) are currently 1 in12 twist they are changing to 1 in 10 twist. Not sure why, but they are. Perhaps better terminal performance?

RIP, I have a friend in a ballistics lab and he said the same thing faster twist barrel do not effect chamber pressure significantly. Translation doesn't matter

A 9mm may expand to a larger diameter, but a 45 ain't going to shrink

Men occasionally stumble over the truth, but most of them pick themselves up and hurry off as if nothing had happened.
- Winston Churchill

boom stick

19 February 2010, 08:12

If it is good for the Marine Corpse (Obligatory Obama joke) that is good enough for me 🇺🇸

quote:

Originally posted by jwp475:

quote:

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577 BME 3"500 KILL ALL 358 GREMLIN 404-375

we band of 45-70ers (Founder)
Single Shot Shooters Society S.S.S.S. (Founder)

ALF

19 February 2010, 08:25

jwp475

19 February 2010, 08:35

quote:

Originally posted by ALF:

1:12 to 1:10 = better long range capabilities on a 30 cal, less drift better long range consistency.

Actually more twist can increase spin drift at the longer distances

A 9mm may expand to a larger diameter, but a 45 ain't going to shrink

Men occasionally stumble over the truth, but most of them pick themselves up and hurry off as if nothing had happened.
- Winston Churchill

capoward

19 February 2010, 08:51

Well the Marines have been using the 7.62x51mm round for their squad level snipers and any of the following bullets would definitely be more usable for this purpose than the standard 150.5gr flat base cartridge. And at the velocities the longer bullets will run at in the short case a 10" twist rate is required for stability purposes:

- Cartridge, Caliber 7.62mm, NATO, Match, M118 (United States): 173-grain 7.62x51mm NATO Full Metal Jacket Boat Tail round specifically designed for Match purposes. Introduced in 1968 as XM118, standardized in 1970 as M118. Produced at Lake City Army Ammunition Plant.
- Cartridge, Caliber 7.62mm, NATO, Ball, Special, M118 (United States): 173-grain 7.62x51mm NATO Full Metal Jacket Boat Tail round specifically designed for match purposes. Produced by Lake City Army Ammunition Plant. This is an interim match round which utilized M80 ball brass with the 173-grain (11.2 g) FMJBT bullet. During this period in the early to late 1980s the performance of the round declined. Powder, primer, brass, bullets were no longer produced in matching lots.
- Cartridge, Caliber 7.62mm, NATO, Ball, Special, M118LR (United States): 175-grain 7.62x51mm NATO Hollow Point Boat Tail round specifically designed for long-range sniping. Produced at Lake City Army Ammunition Plant.
- Cartridge, Caliber 7.62mm, NATO, Match, M852 (United States): 168-grain 7.62x51mm NATO Hollow-Point Boat-Tail cartridge, specifically designed for use in National Match competitions, later approved by US Army JAG for combat use by snipers.

Edit: I acknowledge the M852 will stabilize with an 11" twist rate.

Jim 🇺🇸

"Life's hard; it's harder if you're stupid"
John Wayne

jwp475

19 February 2010, 09:00

The standard issue sniper ammo is loaded with the Sierra 175 grain Match King for the 7.62X51

A 9mm may expand to a larger diameter, but a 45 ain't going to shrink

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- Winston Churchill

NE 450 No2

19 February 2010, 09:34

quote:

Originally posted by capoward:

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Edit: I acknowledge the M852 will stabilize with an 11" twist rate.

I have shot all of the above ammo, a fair amount of it, in 12" twist barrels with perfect accuracy/stability.

Even the 190 Sierra, in handloads and Hertenberger [sp] factory shot ok in 12" twist.

If building my own rifle I always do it with a 10" twist however.

DOUBLE RIFLE SHOOTERS SOCIETY

ALF 19 February 2010, 09:41

capoward 19 February 2010, 09:41

quote:

Originally posted by N E 450 No2:

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If building my own rifle I always do it with a 10" twist however.

Good to know...I stand corrected, Thanks.

Jim 🙄
"Life's hard; it's harder if you're stupid"
John Wayne

jwp475 19 February 2010, 10:05

quote:

Originally posted by capoward:

Well the Marines have been using the 7.62x51mm round for their squad level snipers and any of the following bullets would definitely be more usable for this purpose than the standard 150.5gr flat base cartridge. And at the velocities the longer bullets will run at in the short case a 10" twist rate is required for stability purposes:

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The 168 has been replaced for some time now with the 175 SMK

A 9mm may expand to a larger diameter, but a 45 ain't going to shrink

Men occasionally stumble over the truth, but most of them pick themselves up and hurry off as if nothing had happened.
- Winston Churchill

jwp475 19 February 2010, 10:07

quote:

Originally posted by ALF:

JWP:

Not if you are using a bigger Sectional Density bullet 😊

True, but he did not say that they were going to a bigger sectional density bullet.

Just saying that they did not specify why the change

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- Winston Churchill

N E 450 No2 19 February 2010, 12:03

The 175gr bullet in the 7.62x51 [308 Win] will stay supersonic to 1000 yards.

The 168gr many times does not.

That is reason for the change.

DOUBLE RIFLE SHOOTERS SOCIETY

someoldguy

19 February 2010, 12:32

quote:

Professor M's wetpack is the only beef we have here so far.

The only beef I've found is a minor one. That the wetpack might be only slightly less dense than tissue (which is practically the same density as water.) The density I use for the wetpack is 58 pounds per cubic foot (roughly half water, half paper.) Compare that with roughly 62.4 pounds per cubic foot for tissue. A difference of 4.4 lbs per cu.ft. Or only 0.0025 lbs per cu.in. Whoop-de-f#\$@ing-doo!

Another major component that has to be looked at, at least for the sake of my penetration formula (which is probably about the same as Poncelet's formula), is the compressive strength, or tensile strength. I use pounds (force) per square foot. Many times strength will completely eclipse the density, in terms of importance. For instance, Kevlar is not very dense, only about 90 lb per cu. ft., but its strength is enormous! Michael's test medium is somewhat similar to the situation with Kevlar. Its density might not be impressive, but its strength is obviously nothing to sneeze at. Otherwise, he wouldn't be getting mere inches of penetration of expanding big bore bullets! My rough estimate for his wetpack is 450,000 lbs per square foot for strength, which is somewhat below the strength for what I call "hide" at about 620,000 lbs per sq.ft. Compare this to only 83,000-84,000 for soft tissue.

Class dismissed. No lingering in the halls, please!



Glenn

Gerard

19 February 2010, 16:18

Pontificus Ignoramus

RIP

19 February 2010, 18:34

I see that there is no beef in Alf's theoretical bun.

I call "malpractice" of all terminal ballistic scientists of yore. Gross negligence.

Twist dismissed from the testing, merely because the rotational kinetic energy is always less than 2% of the linear translational kinetic energy of the projectile, and usually much less with the slow twists most often used in their tests.

They never even considered the terminal steering events, where 1% becomes 100% if it helps to keep the projectile straight.

99% quickly becomes 0% if the bullet turns sideways.

Before Professor M arrived on the scene, there has been no beef in the bun.

Plenty of anecdotes from the game fields, however, that faster twist makes for better penetration, even improving the best performing FN solids.

jwp475

19 February 2010, 19:35

No doubt straighter, translates into deeper

A 9mm may expand to a larger diameter, but a 45 ain't going to shrink

Men occasionally stumble over the truth, but most of them pick themselves up and hurry off as if nothing had happened.

- Winston Churchill

DWright

19 February 2010, 19:43

quote:

Originally posted by RIP:

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Rip has it right.

Damn, and we were sooooo close!



<http://www.mazamasportinggoods.com>

boom stick

19 February 2010, 20:13

Stable enough to do a few feet of penetration and kill a bunch of animals.

So are we going back to round balls Alf?

Maybe we need to create the first square bullet where the corners act as fin stabilizers.

Here in the video only the front of the bullet touches the ballistics gelatin.

Look at 7:50 in the video

you will see that the flat nose solid makes a massive temporary cavity and in no way touches any part of the bullet except the tip.

<http://www.video4hire.com/view...4eeabdbb0a7d494132ee>

quote:

Originally posted by ALF:

RIP et al:

Now for a twister 😊

If the target were "infinte" and if we did get "true supercavitation" ie hydrodynamic supercavitation as we get in fluid (not the supercavity like cavities we we in soft solids)..... here's the million dollar question?

Is a FN bullet stable under above condition?

Why do I ask?

Physics tells us that all oblong bullets are unstable no matter what the nose shape! by Oblong meaning $L > D$.

As long as the PP lies in front of the CG the possibility of evoking a overturning moment exists and if it does the time it takes to flip will be determined by the distribution of mass in that bullet and the density of the target.

That is why the minebuster Supercavitating Bullets used by Northrop Grumman and made in Sweden are all fin stabilized.

It is my contention that even FN are unstable in target but because of their ratio of $L_g : L_q$ caused by the blunting of the bullet by making them into a FN they usually come to a stop long before they are able to tumble!

577 BME 3"500 KILL ALL 358 GREMLIN 404-375

we band of 45-70ers (Founder)

Michael458

19 February 2010, 22:20

Well today "TWIST RATE" reared it's head up and won the battle of Terminal Penetration, once again!

Today was 416 Caliber-400 gr Barnes Banded Solids! 416 B&M and 416 Rigby. As we know my 416 B&Ms have 1:14 twist rates, and as we recall testing the GSC Solids at 410 grs we had the exact same issue, stability during penetration. Same story today with the 400 Barnes.

1:14 twist is not enough twist rate to stabilize 400 gr bullets during penetration. These 1;14 twist rifles stabilize 350 Barnes and 370 North Forks, but not 400 Barnes and 410 GSC's.



As best I can measure the 400 Barnes has a 68% of caliber meplat. Whether it is related to CALIBER and meplat size, I am not sure, but in 416 caliber it seems that a 68% meplat of diameter is NOT enough to overcome twist rate! For a fact in caliber .500 and 70% meplat for caliber can overcome a poor twist rate, whether or not that is the 70% meplat or if it is related to much larger caliber, I don't know for sure. My feeling is that it is caliber related, being much larger. For sure if one wishes to stabilize 400 gr 416 caliber solids, better have 1:12 or faster.

Michael

<http://www.b-riflesandcartridges.com/default.html>

The New Word is "Non-Conventional", add "Conventional" to the Endangered Species List!
Live Outside The Box of "Conventional Wisdom"

I do Not Own Any Part of Any Bullet Company, I am not in the Employ Of Any Bullet Company. I do not represent, own stock, nor do I receive any proceeds, or monies from ANY BULLET COMPANY. I am not in the bullet business, and have no Bullets to sell to you, nor anyone else.

Michael458

19 February 2010, 22:24

416 Rigby 400 gr Barnes Banded did much better as you can see. Again, not 100% sure of twist rate here, 1;12 I think. Same story as the 410 GSC's, the Barnes did very well in the Rigby.

So this difference between the two is not bullet, not meplat, not even velocity, it's an issue of stability and twist rates. I am quite sure that the lower velocity would not have penetrated as deep, but it would need to be stable first.



Buffalo, the 400 Barnes in your 1;12 twist would do fine, as does the 410 GSC's.

Michael

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RIP

19 February 2010, 23:11

Thanks Professor M.
Doin' good ain't got no end, eh?

As long as it don't kill you!
I am lazy.
I will for sure do the 1:10" versus 1:20" comparison of same velocity .458/400-grain Barnes Busters, and .458/450-grain North Fork FPs in wetpack!

Long live Professor M! 🤖

416Tanzan

19 February 2010, 23:14

This is helpful for me, too. I purposefully loaded my 416 Rigby with 350s because of the stability issue. Penetration is not a problem for the 350 grain, as long as its really stable. It is even more critical for my Rigby, because my Rigby has the traditional 1 in 16.5" twist.

For those interested, the 350 grain has a 'stability factor (Miller formula)' of 2.59 in a 16.5" twist. The 400 grain would only have a 's.f.' of 2.07 in 2138 fps in 16.5 twist (which is why I went with the 350), but 2.88 in a 14" twist. I have assumed that the 2.59 was on solid ground, but now you have me wondering. You don't happen to have a friend with a CZ550 416 for testing? The CZ uses 16.5" twist.

This is a disturbing test, and a potentially very helpful test for getting our rules of thumb correct, because it implies that a stability factor of over 2.5 is not good enough, even with a flat meplat of over 60%.

+ + + + +

"A well-rounded hunting battery might include:
500 AccRel Nyati, 416 Rigby or 416 Ruger, 375Ruger or 338WM, 308 or 270, 243, 223" --
Conserving creation, hunting the harvest.

416Tanzan

20 February 2010, 00:34

Alf, do you really think that angle of attack could explain the difference between a 35" penetration and a 60" penetration?

First of all, the angle of attack is going to be 89+ degrees of perpendicular. You don't get 35" straight penetration from a 'drunk' bullet. But we've seen a group of deep penetrators, 50-60+" straight, and some that veer off course. We need to know what the contributing factors are, and we need to know how to get 50-60" straight penetration.

+ + + + +

"A well-rounded hunting battery might include:
500 AccRel Nyati, 416 Rigby or 416 Ruger, 375Ruger or 338WM, 308 or 270, 243, 223" --
Conserving creation, hunting the harvest.

Whitworth

20 February 2010, 00:43

quote:

Originally posted by boom stick:
Classic!

I title this one "Wishful thinking"



Dang, Michael, with that lab coat you look like a mad scientist! 🤖

"Ignorance you can correct, you can't fix stupid." JWP

If stupidity hurt, a lot of people would be walking around screaming.

Semper Fidelis

"Building Carpal Tunnel one round at a time"

N E 450 No2

20 February 2010, 00:53

I seem to remember some tests by Art Alphin of A Square, where when he use a 1 in 10" twist on a .458 bore rifle it increased penetration a fair amount.

quote:

Originally posted by michael458:

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Buffalo, the 400 Barnes in your 1;12 twist would do fine, as does the 410 GSC's.

Michael

Michael. Thanks. But you NEED to measure correct twistrate on your Ruger in 416 Rigby. As far as I remember, Ruger have only made 1-14" and 1-16" twistrates in their 416 barrels.. On the other hand, a 1-14" barrel and a bullet with a velocity of almost 2500 f/s gives more revs than same barrel with a 2150 f/s load - giving increased stability?? That might as well be an explanation if you find out that twistrates are 1-14 in both your rifles..

Some Speer AGS tungsten core solids are on their way to you together with the GS Custom 330 grs .416" HV bullets.. I noticed that the AGS solids had a smaller meplat than the Barnes banded solids in 416 caliber. But they are a lot shorter as well, so it will be exciting to see their performance.....

someoldguy

20 February 2010, 03:06

I realize now that my "beef" was used differently than everyone else's "beef." My "beef" meant complaint, whereas everyone else's "beef" meant substance. This is easily explained: No hablo ingles.



quote:

Before Professor M arrived on the scene, there has been no beef in the bun.

I agree. Plenty of burgers for everybody now! 🍔🍔🍔

I used my formula with the two .416 tests. With my formula, near enough is good enough because I only intend it to be an approximation anyway. For the meplat, I assumed that this is a .29 caliber (about 70% of .416 inch bullet diameter.) For the impact velocities I used round numbers, 2100 and 2400 respectively. With all this in mind, the penetrations "should" (theoretically) have been 71" to 76.5". Time to throw the formula into the recycle bin? I don't think so. Because this answer would assume 100 percent stabilization the whole time, which doesn't often happen.

Going back to the formula and using Newton's laws, I estimated that the velocities at the points where the bullets went unstable (3 feet and 5 feet) are 1474 fps for the slower bullet and 1116 fps for the faster one. Since we know the twist rate of the slower bullet, the estimated rpms where the bullet starts veering is $1474 \times 720 / 14$ or just over 75800. (Notice this is a lot faster than the 40,000+ rpms for the .500 inch bullet that I did.) If the twist rate for the faster bullet was 1:12, then the rpms would be 66960. Hmm. That's less than 12 percent difference in rpms.

I think the other reason for the disappointing performance of the .416 bullet is the length. (All due respect to Newton, I've begun to think that his simplified impact depth formula is full of it.) Since I don't have a measurement for the length, just eyeballing it tells me that it's aspect ratio (length to diameter) is likely pretty high. If I'm not mistaken, this would mean that the bullet might go unstable easier, in other words at higher rpms, than the .50 caliber bullet.

Glenn

michael458

20 February 2010, 06:01

Buffalo

You may be correct, I have thought of velocity as a factor also. The only reason I think the twist rate might be faster, same story as the GSC's. My 416 B&M is for sure 1:14, and it has trouble with 400 + there is no doubt, but with 350-370s even down low as 2100 fps to 2450 fps, it is spot on dead straight time after time. Not so with the 400s! The higher velocity of the Rigby may very well be kicking in.

Alf

Angle of Attack! 🎯 Give me a break, it was the same for both tests, the box never moved. So if it was off it was off for both of them, or if it was on, it was on for both of them! Mix was changed of course, but even compressed to the same in both tests. 🙄

Please, don't buy! Got nothing I want to sell you!

RIP and NE450

Of course twist is important for straight and increased penetration. Common sense would tell us that, if one can think with any sort of logic at all. That's really a big no brainer to me, however I have to admit, I never really put much thought into it, until it started proving out in the test work with my .500s. When I first explained the issue to Brian and JD Jones (Alf, do you know JD?) The very first thing both of them said was we need to have a faster twist! Myself, OK, well let's do it, in a week I had a .500 caliber 1;12 in hand shooting, problem solved! Just that quick, No math, no sitting down juggling numbers for a month to try and figure out the problem. Problem solved! JD and Brian have been at this a very very long time, what I am just learning, they already knew 20 yrs ago! I am still learning, right along with the rest. Before just recently doing the tests with these 416s I never put much thought into the twist, didn't care! Now I wish I had 1;12 or 1;10 on the 416s and at least 1;12 on the 458s! But that's ok, not really any issues with the 458 B&M, but lot's with the 416 B&M and 1;14 with 400 gr bullets. But, I must also remember, the entire 416 B&M was built for 350 and less anyway, for large plains game, bears, and such as that. Never ever intended to hunt anything larger than buffalo with the 416s anyway. So I am good to go with what I have. And, if out about about and need a deep diver, the 350 Barnes or 370 NorthFork will do what needs to be done, just happens to have same point of impact as the 350 TSX too! So for my part I can get by without the 400s anyway.

Ulrik

That damn #1 weighs about as much as I do, I would not give two hoots in hell for that thing, much less carry further than the range and back. So I don't put much effort in it. It shoots about 6 inches high with the loads I shot today, 1 round, the first one, skimmed the entire top of the first box, skimmed over half way through the second, riding the top, hit a bundle of paper I had on top, and then into the berm behind. Had to shoot the next ones low! The next tests I do I am dragging out one of the Winchesters in 416 Remington, throw a scope on it quick and go to work!

I have your bullets packed and ready, one of the dumbass girls that work here took it to the post, could not answer a question I forgot to fill out on the customs form, did not have enough damn sense just to write something down, and so returned with it. This was Tuesday. I found it yesterday. It goes back out again Monday! Sorry. Can't get good help here these days!

Whit

Mad Scientist! Damn, that was my best look normal day! I even combed my hair for the photos! I tell you, when I put that lab coat on, the things that go through my mind can't be repeated here.

Michael

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Warrior 20 February 2010, 06:24

quote:

Originally posted by Warrior:

Here is a quotation from Norbert that was made some time back on AR:

"The faster twist for penetration comes into play in the target (animal). The water vapour in the supercavitation bubble needs more rpm for stabilisation than the optimum twist for air. ... Norbert"

Rasputin accused me of fiddling as if Norbert did not say the above. I quoted this piece as it was a simple but profound statement, quite relevant to the discussion here about twist. It says here the faster twist is needed IN TARGET and that the WATER VAPOUR BUBBLE needs the additional spin. This is quite clear and there can be no misunderstanding.

And that is why I did the rpm calculations comparing the 458 Lott with the 460 Wby Mag, hoping that Norbert would reply to his own quotation in relation to my post on the number of spins inside the animal. The talk here is not about the transition from air to flesh, but what happens inside the target where the flesh is denser than air - Norbert actually states it categorically like that.

Anyway Rasputin wanted me to provide the proof that Norbert did in fact say this ... so here it is, see 3rd paragraph:

<http://forums accuratereloadin...=980101911#980101911>

For ease of reference, here is the comparison again between the 458 Lott and the 460 Wby Mag.

"We come back to a question asked earlier ... how many spins (revolutions) would a bullet do inside an animal - say **30 inches and 60 inches**, when we compare the following twist rates:

1-in-10" -- (eg 458 Lott = 2,250 fps x 720/10 = 162,000 rpm) - 3 spins and 6 spins respectively
1-in-12" -- (eg 458 Lott = 2,250 fps x 720/12 = 135,000 rpm) - 2.5 spins and 5 spins respectively
1-in-14" -- (eg 458 Lott = 2,250 fps x 720/14 = 115,714 rpm) - 2.1 spins and 4.2 spins respectively

What is under the spotlight now, is if the **increased spin in target (from 2.1 to 2.5 to 3.0)** enhances straight-line penetration.

And if increased velocity needs more SF, as advocated, where do we stand with the 460 Wby Mag?
Should they be all rebarrelled in line with the new GSC discovery?

If we were to compare the Lott with the Wby Mag, we get this for the Weatherby:

1-in-10" -- (eg 460 Wby = 2,700 fps x 720/10 = 194,400 rpm)
1-in-12" -- (eg 460 Wby = 2,700 fps x 720/12 = 162,000 rpm)
1-in-14" -- (eg 460 Wby = 2,700 fps x 720/14 = 138,857 rpm)

(Standard factory twist being 14")

The conundrum that sticks its head out here is that IF the additional velocity and spin IS TO aid penetration in flesh, not paper, the increased drag in the target (drag goes up to the square of velocity in flesh) will activate the the overturning moment quicker, given enough distance."

Warrior

boom stick 20 February 2010, 06:38

It would be cool to see results of a 460 with a 10 twist vs 14 @ 2700

500 grains @ 2400 is enough of a hammer IMHO

[577 BME 3"500 KILL ALL 358 GREMLIN 404-375](#)

we band of 45-70ers (Founder)
Single Shot Shooters Society S.S.S.S. (Founder)

ALF 20 February 2010, 07:15

DWright 20 February 2010, 07:20



<http://www.mazamasportinggoods.com>

VWarrior 20 February 2010, 10:26

quote:

Wound ballistics of **unstable** projectiles. Part I: projectile yaw growth and retardation.

quote:

Wound ballistics of **unstable** projectiles. Part II: temporary cavity formation and tissue damage.

Am I missing the point here? Is this thread not about the **stable** projectiles?

VWarrior

boom stick 20 February 2010, 10:34

Maybe the bullets need a recoil induced gyroscope inside =>

[577 BME 3"500 KILL ALL 358 GREMLIN 404-375](#)

we band of 45-70ers (Founder)
Single Shot Shooters Society S.S.S.S. (Founder)

someoldguy 20 February 2010, 13:44

quote:

JD Jones

Yes, he's what I would call a "dignitary" because he had his own article in my 8th edition of "Cartridges of the World" under Wildcat Cartridges. 😊

To be blunt, my keen interest and my "ciphering" is about all I have. And it's a poor substitute for actual testing, but that's not going to happen for me. I don't have the means or the health to pursue terminal ballistics testing to any great extent other than through my number crunching and reading others' results. (Like here.) It's just my way of trying to understand.

Glenn

michael458

20 February 2010, 13:58

Glenn

Big difference is that you have some practicality to what you are doing. Keep doing so! Keep ciphering.

Michael

<http://www.b-mriflesandcartridges.com/default.html>

The New Word is "Non-Conventional", add "Conventional" to the Endangered Species List!
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michael458

20 February 2010, 14:07

VWarrior

Spot on. Our only concern is stability during terminal penetration and what effect it has on the bullet during penetration. Far more simple than made out to be. For my part, I am learning much more about twist rates than I anticipated, and it's importance to terminal penetration. I suppose there is a bit more to stability than that too, but I don't think or believe for a second that much of it has tremendous relevance beyond simply stating faster twist provides more stability during terminal penetration with most bullets we are studying, and in my opinion particularly relevant to round nose, and flat nose solids that are somewhat short on meplat size. Also obvious the fact that a faster twist is needed for the 416s in 400 grs., or at least faster than my 1;14 twists, to provide stability to those bullets for terminal penetration.

Michael

<http://www.b-mriflesandcartridges.com/default.html>

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michael458

20 February 2010, 14:09

quote:

Originally posted by boom stick:
Maybe the bullets need a recoil induced gyroscope inside =>

Excellent Idea boomy. This should appeal to some.

M

<http://www.b-mriflesandcartridges.com/default.html>

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MikeBurke

20 February 2010, 20:53

I have completed the first round of penetration testing with different velocities.

Caliber: 470 Nitro Express
Rifle: Krieghoff Double
Twist Rate: 1 in 20 (as checked with cleaning rod and jag)
Brass: Jamison
Primer: Remington 9 1/2M
Powder: Reloder 15 for standard velocity load (approximately 2100 fps)
AA 5744 for reduced loads (approximately 1700 FPS)

The test box is fabricated from 2 by 6 pine boards and is 72" long.
Test media consisted of ¼" luan, 12" of saturated newspaper, 2 by 6 treated pine (shooting through the 1 5/8" thickness), and approximately 60" of saturated newspaper. Great care was taken to make certain the newspaper was thoroughly soaked in a tub prior to placing in the test bed.
After placing the paper in the test bed excess water was permitted to drain for 30 minutes.
The bullet entered the box at 32 feet from the muzzle.

Bullets tested:
North Fork 500 Grain solid

First test consisted of firing consisted of firing 5 North Fork bullets in the test media.

Expected results:
The 2100 FPS load would travel the length of the test box.
The 1700 FPS would travel between 4 and 5 feet.

Actual results:
The 2100 FPS load result was exactly as expected. Every North fork bullets I have fired to date in the 2100 FPS range has performed exactly the same. Straight line and stuck in the wood at the back of the box. (one split the wood and exited, that is why I use scrap plywood to keep the bullets in the box)

The 1700 FPS load surprised me. Average impact velocity was 1661. It penetrated the entire length of the box and the bullets stuck in the first piece of plywood. Penetration was dead straight. I placed the first piece of newspaper over the bullets stuck in the plywood, none were off more than 1". The only difference was the bullets were not stuck in the plywood straight like the 2100FPS loads were.

In summary I was very, very surprised with the results. With an extra 430-440 FPS the difference in penetration was the thickness of a ¾" piece of furniture grade birch plywood. The higher velocity round did penetrate more, but not by much.

I was pleased with the consistency of the results. I take great care in setting up the test. Again the traditional load performed the same as the tests I conducted the last couple of weeks. The reduced loads all penetrated exactly the same as each other.

The next test will be Woodleighs: standard velocity versus reduced velocity.



The picture is of the first piece of newspaper placed over the plywood from the back of the box. None of the bullets are more than 1" off line through 72" of penetration.