

This topic can be found at:

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

MikeBurke

23 February 2010, 03:05

Terminal Bullet Performance

quote:

Originally posted by michael458:
Mike

Your 416s, 400 gr Barnes? That would be interesting too. An extension of what I did the other day with the Rigby and the 416 B&M. If I do anymore 416 testing and need more velocity or different rifle I am dragging out one of the Win 416 Remingtons for it.

I am not much on double rifles, but I would say that for being a first attempt, that's not shabby at all, and I think you could live with that if it does not get better! I am pretty sure I could! In fact if that is irons, I suspect it is, I pretty well know for sure I can not do that with the bolt guns and irons as I would have a hard time even seeing the black part of the target! Not bad at all!

Michael

The double is with iron sights, anything else would be sacrilegious. Next weekend I will shoot at 100 yards and see what it can do.

I am still not satisfied with the velocity penetration test. A different media will be used next, 12" newspaper, 1 1/2" of hardboard, 1 1/2" of pine, 12" of water, 12" of wet magazines, 1 1/2" of hardboard, 1 1/2" of pine, the remaining box filled with wet newspaper. I want to stop the NF's in the newspaper and see how much difference there will be.

michael458

23 February 2010, 03:19

Buffalo

Speer AGS Tungstens and GSC bullets arrived today! Very interesting! Especially the GSC bullets--I would love to compare direct with our NonCons I have here! Also your NonCons should be leaving here tomorrow! Sorry for taking so long!

Mike

Ahhhh, good eyes, can't see 100 myself, not with irons anymore, those days are gone! One day gotta see about getting these eyes looked at I think, how I would love to hunt iron sights again, that's a lb less weight in scope to tote around.

Well, I like your medium, getting meaner by the test! You can stop the NorthForks in the paper I think, but overall results will most likely remain the same, at least the differences in RN and North Forks!

Keep us posted please! And your efforts are great!

Not sure what I can get tested this week, have a pretty full week. I actually have to work, can you believe that? This work thing sometimes gets in the way of good proper shooting, beginning to get on my nerves a bit!

Michael

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

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

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MikeBurke

23 February 2010, 03:34

I may not shoot any of the Woodleighs, I am tired of tearing up my box and searching for bullets.

Busy week for us, started another business for the company that bought mine a year ago. I can be a glutton for punishment.

someoldguy

23 February 2010, 03:37

quote:

Actual results:

The average velocity was 1617 FPS. The same powder charge was used as with the North Forks but the Woodleighs averaged 44 FPS slower.

At 20-22" all of the bullets in the test began to go off line. This amount of straight line penetration is very consistent as to what I saw with the Woodleighs at over 2000 FPS.

After I got all excited about estimating the rpms where the bullets go unstable, I realized that I have overlooked something. I overlooked the linear velocity of the bullets. Turns out this might be more revealing than the rpms.

Here is the documentation for finding the linear velocity:

Angular velocity (in revolutions per unit of time) x 2 x pi x bullet radius (in feet)

Of course, since we already know the bullet diameter, we can use this and not multiply by 2 at all.

With this in mind, I went back and checked on the several bullets that I have estimated so far. Long story short, there seems to be a relatively narrow band in linear velocity where certain bullets go unstable. Namely this is **85-138 fps**. (This might not be narrow percentage-wise, but I think it's narrow quantity-wise. Because a difference of 53 fps isn't that great.) This might change or even prove to be worthless, but it's the general trend that I've noticed so far with non-deforming bullets.

Now for my evaluation of the above .470, FWIW.
500 grain, .474" solid @ 1617 fps (meplat not known, assumed to be roundnose) Twist rate: 1:20
Estimated penetration: 44", but started to veer at 20-22"

Estimated velocity at 20": 1198 fps
Angular velocity, revolutions per second: $1198 \times 12 / 20 = 719$ rps
Linear velocity: $719 \times \pi \times .474 / 12 = 89$ fps

Estimated velocity at 22": 1148 fps
Angular velocity (rps): $1148 \times 12 / 20 = 689$ rps
Linear velocity: $689 \times \pi \times .474 / 12 = 85$ fps

I haven't entirely sorted out what this means yet, if anything, but I thought it was interesting.

Glenn

ALF 23 February 2010, 04:50

Warrior 23 February 2010, 11:47

In other words we could say that when the bullet loses its stability it goes Munk on you.

Warrior

buffalo 23 February 2010, 12:04

That's great Michael.. Looking forward to see performance of Speer AGS's and GSC's in your testbox..

Ulrik

Gerard 23 February 2010, 12:44

Alf,

quote:

I am still awaiting any proof or mathematical formula or test that shows that other than affording stability to the bullet in air and setting up impact condition in terms of yaw angle Rotational energy or spin has anything to do with penetration depth and wounding!

I may have mentioned it before but you may not have seen/read it: "This is not what we are saying. You are right. Rotational velocity cannot work in this context. Agreed. Yes. No argument on this. Yes. Yes. Yes."

quote:

I am still awaiting any proof or mathematical formula or test that shows that other than affording stability to the bullet in air and setting up impact condition in terms of yaw angle Rotational energy or spin has anything to do with penetration depth and wounding!

You have posted the answer to the straight penetration debate several times yourself. Don't you see it?

someoldguy 23 February 2010, 13:07

quote:

Now that's a good job thumb , carry on with your calculations (you are on the right track with some of them btw) you will actually get to the point where these guys laughed me off this thread for being crazy!

Thanks, ALF.

I've never denied being crazy and I'm usually the first person to laugh at myself, so I suppose I'm still okay here. 🤪

I'm not denying that the energy from the rotation isn't enough to help penetration. I'm just talking about the possible stability of the bullet which affects penetration, and that stability is determined by the twist rate. And I'm thinking this instability begins to occur when certain bullets reach a certain linear velocity, or at least a certain range of linear velocity.

It seems unarguable that if a bullet goes unstable, then its penetration is going to be retarded. I'm sure that's the same thing Michael and the others have been talking about, and successfully proving also. I feel that I'm really learning from them, not vice versa.

Glenn

michael458 23 February 2010, 15:49

quote:

Originally posted by Mike70560:
I may not shoot any of the Woodleighs, I am tired of tearing up my box and searching for bullets.

Mike

I had to learn the hard way, a lot of the time they come out the top, busted lights out, bounced off the ceiling a few times too. Started putting phone books on top of the box about 20-25 inches in. Had them go out the side of the box (2X6) bounce off the back board of the berm, hit the foam on the walls, rip it. Once that RN loses stability there is no prediction on where, what, and how it may go from there. I find I grow tired of them too, they are very predictable and not much reason to test them more. All of us testing, various materials, various mediums, all the same.

Alf

Thanks for your support of Glenn's efforts. I think he is moving in the right direction too. My take on his efforts are a bit different than yours however. You see I think Glenn is searching for a mathematical formula to "Prove" the test work. You on the other hand are attempting a mathematical formula to "disprove" the test work. Now it seems to me, test after test, real world tests that the work stands on it's own, it proves itself! To attempt to disprove reality is in search of something very elusive it would seem.

Now as RIP has so eloquently stated, you are still short the "beef". No beef on the bun, empty buns! While Glenn searches the mighty "bovine" for the beef, you seem to be searching elsewhere?

Alf, let me help you, a bit of advice perhaps, "You won't find the "beef" up a "goats ass". It's not there!



Oh, Alf, please let me apologize at my jest, somewhat at your expense! I could not help myself!

Michael

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DWright 23 February 2010, 19:41



This is crackin me up big time. . . .

OK, has anyone thought about what, if any effect on bullet stability, the addition of 'Sissy Slot's' has on a bullets penetration ability?
Or will the sissy slot's put a amount of yaw in the bullets to decrease penetration?
OK, I'm done now.

<http://www.mazamasportinggoods.com>

DWright

23 February 2010, 20:01

quote:

Originally posted by DWright:



This is crackin me up big time. . . .

OK, has anyone thought about what, if any effect on bullet stability, the addition of 'Sissy Slot's' has on a bullets penetration ability?
Or will the sissy slot's put a amount of yaw in the bullets to decrease penetration?
Alf?
OK, I'm done now.

<http://www.mazamasportinggoods.com>

RIP

23 February 2010, 23:09

quote:

Originally posted by michael458:

Alf
... I think Glenn is searching for a mathematical formula to "Prove" the test work. You on the other hand are attempting a mathematical formula to "disprove" the test work. Now it seems to me, test after test, real world tests that the work stands on it's own, it proves itself! To attempt to disprove reality is in search of something very elusive ... you are still short the "beef". No beef on the bun, empty buns! While Glenn searches the mighty "bovine" for the beef, you seem to be searching elsewhere?

Alf, let me help you, a bit of advice perhaps, "You won't find the "beef" up a "goats ass". It's not there!



Michael

Michael,
No apology needed for stating the obvious!

And again to Alf,
A little slower this time, read my lips:
"No goat crap."
Get your head out of that goat's ass.
Do not try to make reality fit theory.
Make theory fit reality.

If the reality is too complex for the the goldbricking-egg-headed "government workers" 😊 to properly observe and measure to their statistical satisfaction, then go with the best available real life observations, cumulative from all sources!

In other words:
Reality is the beef, the hamburger pattie.
The bun is the understanding of reality, or the means to grasp and ingest the beef.
A bun with no beef in it is mental masturbation, or a bun full of hot air.

On to more reality and the proper understanding of it later.
(burp)
Letter Rip

someoldguy

23 February 2010, 23:43

quote:

I may have mentioned it before but you may not have seen/read it: "This is not what we are saying. You are right. Rotational velocity cannot work in this context. Agreed. Yes. No argument on this. Yes. Yes. Yes."



Gerard, you've had to mention it so many times that you might put it in your signature line.



quote:

You see I think Glenn is searching for a mathematical formula to "Prove" the test work.

That's true, Michael. Or should I say Dr. M.



I'm trying to be as practical as I can, even though sometimes I have to get into some heavier math than what most people like. I'm honestly not really much of a "geek", but I'm just mathematically minded. Sometimes it's good to be able to predict because you don't have the means or the time to test for yourself. That's where I'm really coming from.

quote:

"You won't find the "beef" up a "goats ass". It's not there!



Glenn



No apologies for stating the obvious.
 Just good for a laugh sometimes.
 Having three college degrees and backgrounds in chemical engineering, accounting, and medicine,
 I've had plenty of math and science.
 Math and science fail us, when it is presented as a bun toasted by hot air, with no "reality-beef" in it.

Back to the obvious:
 When a bullet is cavitating the medium, its nose slams the medium aside in a cavitation around the bullet.
 The bullet is not spinning in a medium that is 1000 times as dense as air.
 It may be less dense than air!
 Spin would be even more important there!

Phatman

24 February 2010, 01:48

This is an easy thing to prove.

Any body got a 458 Lott Musket? 😊

Give me COFFEE and nobody gets hurt

capoward

24 February 2010, 03:32

quote:

Originally posted by jwp475:
 [QUOTE]jwp475,
 Not touching that one with a 10 foot pole!
 We are still working on DG with FN solids at close range, so I am willing to forego the above question for now!
 Anyone else feel free to pile on!

JWP,

I think Michael missed your post so perhaps Michael will see this post and clarify his preferences and testing distances for you. In the interim I'll attempt to fill in the blanks...
 Michael can always correct me.

If you look at the first few pages of this thread Michael identifies that he has a two benches in his test lab, one at 25yds and one at 50yds, with chronographs set up in front of each bench and a third set up in front of the bullet box. Additionally he has an outdoor range with 50yd, 100yd, and 150yd target scenarios...but for the testing for this thread he solely uses the indoor lab.

So, if you're looking for DG bullet performance beyond 50yds it will not come from Michael's indoor laboratory.

I believe that Michael has previously stated, whether within this thread or within one of his other threads, he prefers to hunt DG up close but not longer than 50yds. There are bullet performance photographs taken at the 20yd-25yd zone and at the 48yd to 50yd zone as well as some comparison photographs taken while hunting DG and plains game for comparison.

I believe that Michael's preference are in line with comments by the "African hunting experts" that DG are not dangerous to your health until they're within 50yds of you and then truly only dangerous when within 25yds of you; myself, I've not hunted Africa but this position makes sense to me.

Jim 🤖

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

jwp475

24 February 2010, 03:55

quote:

Originally posted by capoward:

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I asked this in reference to the increased twist rate trend in better stabilizing the bullets for better penetration. Since some believe that it take a bit of distance for bullets to go to "sleep". So the question was in reference to would the bullets fired from the slower twist barrels be more stable a bit farther down range

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

24 February 2010, 04:29

quote:

Originally posted by jwp475:
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I understand.

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

michael458

24 February 2010, 04:34

Jim

You are correct, somehow I think I missed JWP on the longer range and bullets going to sleep! However JWP and I spoke about it yesterday anyway. And your same points were made via voice with JWP. I think we also agree that say 100 yds or even further that it makes only good sense that the bullet in question would have better stability at some longer point downrange, and therefore would in fact be more stable during penetration because of this, regardless basically of twist rate. Now, still a faster twist rate would make for better stability I think. However, longer range giving the slower twist time to settle down, and become more stable at some point, whether that is a 100 yds or whatever range, I would think?

But, as you so stated, and I did so with JWP, does not matter anyway, not to me, as our primary discussion is big bores, and we mostly use our big bores in close, 50 yds or so, much past 50 I call it murderous, and while I have no objections with that per say, I personally like to control the situation, and the closer I am the better I can control it. I am an old CQB guy, I like to be in close and fast! I have a rule of thumb for myself, at 25 yds and in, 100% control, I got you! 50 yds, about 75%, 75 yds about 50% and 100yds well it just gets lower. Fact is, this has crap to do with first shot, it's the opportunity to get shot number 2 and 3 where it belongs, after the first shot is taken, the further out you are, the more difficult it gets because of a number of factors, animal runs away behind cover, lost in herd, or my eyes so bad I can't see him anymore, or what have you. Nahh, make mine close and the closer the better!

So for me it is extremely important to test close, the way my indoor range is set up, with the test boxes in front of my impact areas, then it's 22 yds and 48 yds, actually a foot or two one way or the other. In fact I like to test 20 ft too as I have had shots even closer than that.

"African Hunting Experts"---hmmmm? Lot's of them just upstairs from us!

Don't need to be an "African Hunting Expert"---not down here anyway! I would much rather listen to knowledgeable shooters than the so called "experts", not much respect for those types, not from me anyway! This is a business of shooting anyway!

Don't get me started!

Glenn

Yes, of course you can call me ???, Well, whatever the hell you want I suppose. I do like my lab coat however! It's fun! Where did my lab coat come from? Well, my darling beloved Wife got that for me a couple Christmas ago. She, along with some of my shooting pals here, accuse me of being a "Lab Rat", I never named anything that, it's was just the gun room to me. But now it has become known here as the "lab". So she had a Lab Coat done for me, has my name on it and B&M Rifles under my name! I think she did pretty good myself, we all get a big chuckle out of it!

Another friend of mine here has stated this "Michael has finally taken every bit of the fun out of shooting with the load data, terminal tests, and all the other things he does" Well I suppose that could be true in some circles, for plinkers and what have you, but I have a blast and always busy with something!

Thanks Glenn, keep striving to match theory, with our reality! You are doing well, and yes, once you get it, it will be useful! Keep digging!

RIP

You da man! Well Said, and if you keep up the beef talk, makes me hungry, nothing I rather eat than a damn cow!

Have not heard from Alf today???? Gees, maybe someone should make a call, check on him? What if he has his head stuck up the goats ass? He may need help? He will suffocate if he can't get out of there? I think someone should check on him.

ALF? ALF??? ALF??? HEY MAN< YOU OK IN THERE???????

Holy COW, I hope I am not responsible for this? ALF---CAN YOU HEAR ME? Oh man, he has goat crap stuck in his ears too!

ALF? GET YOUR HEAD OUT OF THE GOATS ASS IF YOU CAN, DO YOU NEED HELP???????



Michael

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

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RIP

24 February 2010, 05:29

Michael,
It's official. You have been awarded the
Doctor of Philosophy, Ph.D., in Terminal Ballistics,
from the University of Accurate Reloading, U.A.R.

Hopefully Alf is not choking on goat crap.
If rescue is required, someone might have to perform
the Hind Lick Maneuver on Alf.
Be glad British Columbia is so far away.

As you were.
I'll see that your doctoral diploma is delivered
to you, Doctor M.

Sincerely,
Dr. Rip

boom stick

24 February 2010, 05:43

Rip

I like your Grateful Dead avatar best

[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)

michael458

24 February 2010, 05:57

quote:

Originally posted by RIP:
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Be glad British Columbia is so far away.

As you were.
I'll see that your doctoral diploma is delivered
to you, Doctor M.

Sincerely,
Dr. Rip

Too Much! I don't know what to say? I want to thank everyone, for this great honor that has been bestowed upon me. It's more than I could have ever dreamed of!

However, if the "Hind Lick Maneuver" is required on Alf, well, all I can say is, "Bye Alf!" I know he will understand!



Good Night Gents!

Michael

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jwp475

24 February 2010, 06:02

quote:

"Hind Lick Maneuver"

That's "Hinie Lick Maneuver"

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

RIP

24 February 2010, 06:27

A thought about boards (linear function resistance, LFR) mixed in with waterbuckets, wetpack, or SIM-TEST (exponential function resistance, EFR) as regards to response to velocity of the penetrating bullet and loss of resolving power of the test medium: LFR on the entrance end of the SimBA (simulated buffalo apparatus) contributes little to stopping the bullet, relative to its effectiveness in halting the bullet in the terminal/low velocity end of the SimBA. EFR provides much more resistance on the high velocity end, and less on the terminal end, thus allowing better resolution of difference in penetration, rather than having the LFR stop two close competitors at the same apparent distance, "hitting the wall."

Also, mixing LFR with EFR destroys homogeneity and consistency by introducing unnecessary variables. We cannot and do not need to replicate a game animal. You cannot get consistency with live or dead animals from one shot to the next. As Duncan MacPherson said: "Any belief that tissue must be used in testing bullet terminal ballistics in tissue penetration is fallacious because there are no mystical effects associated with the results of bullet penetration in tissue; in fact, tissue is inferior to a good tissue simulant for this purpose."

I will use only SIM-TEST, no boards, in the STAB.
Refrigerator shopping while the 10" twist .458 B&M is under construction ...

Phatman

24 February 2010, 08:09

Gentlemen,

If I may suggest something.
You have been working very hard extrapolating data from rifling twists that are to similar.

Would it not be better to examine two cartridges that are ballistically similar but with greatly differing rifling twists.
The 9.3x74R at 14 to 1
The 9.3x62 at 9.5 to 1

You may already have these two rifles in your collection as they are popular African calibers.

If this has already been settled, please excuse me as it was lost in the Pissing contest.

Thank You

John

Give me COFFEE and nobody gets hurt

boom stick

24 February 2010, 10:45

Sorry to bring up the "A" word again but was thinking again... (Yeah yeah)

Because of the nature of aluminum bullets and big bores being what they are was thinking of a long aluminum bullet for say a 458 on up to be about twice the length of a nominal bullet say 2.5 to 3" to be a long bore rider single loaded to get maximum distance with a higher BC and maximum weight. think about 1.5" in the case and 1.5" in the barrel. use the right powder to launch the bullet at 3,000 to 3,500 fps in the 300 to 350 grain range of weight.

Also could do a long bullet with nominal tip to canalure but just have more in the case.

Any thoughts?

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

24 February 2010, 13:53

I said:

quote:

Long story short, there seems to be a relatively narrow band in linear velocity where certain bullets go unstable. Namely this is 85-138 fps .

It turns out in my quest to come up with a simpler explanation I came up with a wrong explanation. 😊

In the case of the .470, the linear velocity of the bullet on impact was 120 fps. So my rule is full of it because the bullet didn't go unstable until after a certain penetration depth, not on impact.

So I hope nobody bet the farm on this.



Never fear. I'm still searching. I might even have to pay Munk a visit.

Glenn

RIP

24 February 2010, 18:37

quote:

Originally posted by jwp475:

quote:

"Hind Lick Maneuver"

That's "Hinie Lick Maneuver"

Yep,

But only for those telling jokes. Some Hillbillies really think it is "Hind Lick Maneuver." Same number of syllables as "Heimlich Maneuver." When they finally catch on they go and start laughing and call it the "Hind End Lick Maneuver" or "Hinie Lick Maneuver" like jwp475. 🤔

Phatman John:

Doc M has already done better than you are suggesting with his 500s and 18" versus 12" twist. Guess what? The faster twist penetrated deeper! That CZ 9.3x62 I have has a 9.5" twist and is 0.3 MOA at 100 yards, even with the lightest bullets. If forced to hunt buffalo, I am sure it would handle the heaviest available hunting bullets at slower velocity. CZ got that one right.

Phatman

24 February 2010, 19:36

Thanks Rip,

I missed it.

I have a CZ 550 FS in 9.3x62 that is more accurate than I am.
Love the damn thing

John 🤔

Give me COFFEE and nobody gets hurt

RIP

24 February 2010, 19:36

Got another little dusting of snow here this AM.

Locals are terrified of driving in snow. Global warming strikes again? 🤔

For Phatman John:

12" twist does the same number of revolutions per second as feet per second at the muzzle velocity.

Assume a fixed MV of 2000 fps to compare the various twists.

$(12/X) \times 2000$ gives the rps for the barrel of X twist.

9.5" twist = 2526 rps
10" twist = 2400 rps
12" twist = 2000 rps
14" twist = 1714 rps
18" twist = 1333 rps
20" twist = 1200 rps

Changing muzzle velocity to Y fps multiplies the above RPS by Y/2000.

So you see that

9.5" versus 14" twist is a 47.3% increase in rps
12" versus 18" twist is a 50.0% increase in rps
10" versus 20" is a 100% increase in rps

Doc M,

Do you want your diploma on parchment, sheepskin, or goatskin? 😊

michael458

24 February 2010, 21:14

RIP

You should see folks from SC driving on the snow! Talk about a hoot!

Let's see, I think my diploma should be parchment, sheepskin and goatskin smell too much. Would have to hang them out a month to get the stink out!

Alf? Still stuck in that goats ass?

Well I have managed to at least get a load for the next tests in 416. Buffalo (Ulrik) our good friend from Denmark, was so kind as to send some samples of 400 gr 416 caliber Grand Slams and GSC 330 gr 416 I think Gerard calls them HVs? Looks like a true to form NonCon to me!

I decided I needed a little better precision than what I was getting in the 416 Rigby Ruger #1. The irons are not cutting it with different loads. So I dragged out a Win M70 416 Remington and tested some 400 Hornady at 2450 fps. Only about a 50-70 fps drop from what I was running in the Rigby. Since I am loaded with Leupold scopes with QRW rings attached and all my Winchesters with QRW bases, it only takes a few minutes to scope up and go to work. I don't even know where to start looking for Ruger rings, I have them, but where???? So I am testing the 400 gr Grand Slams in the Win M70 and I think I will get 2450 or so with them. Hopefully that will satisfy Buffalos lust for velocity, or at least be close!

Now I am not all that impressed with the Grand Slam. Nice shape and all, but the meplat appears to be a little small. Buffalo, please measure and see what you come up with too. I have a hell of a time measuring meplats, it's not as easy as you think! I am coming up with from .220 to .240 or somewhere in between. That's something between 52-57% meplat for caliber. Now in my opinion, that's not enough meplat to rely upon straight line penetration. Twist will be important on this one I would think? And I also bet, I don't have fast enough twist to make it work!

It will be next week before I can test, sorry guys, schedule just is not going to allow it this week I don't think.



Now I am testing the GSC 330 in one of my 416 B&Ms. The GSC weighs the same as my 330 Brass NonCon, and I already have a good load for that at 2540 fps. This would be a good comparison between the two vastly different NonCons. As for BC and such, by far the nod goes to the GSC bullet. As for other factors, well I suppose we will see.

Ulrik, by the way, 330 SSK HP Brass NonCons left here yesterday and are on their way to you!

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.

someoldguy

25 February 2010, 01:13

quote:

I have a hell of a time measuring meplats, it's not as easy as you think! I am coming up with from .220 to .240 or somewhere in between. That's something between 52-57% meplat for caliber. Now in my opinion, that's not enough meplat to rely upon straight line penetration. Twist will be important on this one I would think? And I also bet, I don't have fast enough twist to make it work!

The meplat looks way small, I agree. I haven't measured any meplats, but I could understand the problem if you're using a caliper. The only thing I could think of sounds ridiculous. Take a dark crayon, some lipstick or something similar, cover the meplat surface with it, and daub the meplat on a clean piece of paper, being careful not to smudge it.

Then you can measure your mark on the paper with the caliper. It probably won't be precise, but it would undoubtedly be less aggravation.

Glenn

capoward

25 February 2010, 04:40

After a long weekend away from the forum, I've been pondering Alf's multiple posts regarding what we understand and do not understand... Along with pondering that I've been attempting to resolve a question that I've asked him multiple times - mostly without response - but finally with an answer that the current technology of ballistics prevents an answer. The answer sought was, "what is the optimum bullet design to assure maximum straight line penetration"...and I'm adding for clarification here = utilizing current technology.

Today I was mucking around on the internet attempting to find the Mythbuster's show video of the 50 BMG round fired into a swimming pool. My reason was that I seem to recollect their slow motion video showing the bullet spinning; i.e., a rotational spin caused by barrel twist rate, within the water before it stopped. Anyway I couldn't find it so don't know if memory cells are fried or still properly functioning.

But I did find the following which may pictorially portray Alf's propositions along with a possible trail to follow to answer my above noted question. So, here's goes: <http://www.bordeninstitute.arm...apter4/Pages1-12.pdf>
Within this document I identified the following:

Here is Alf's written description of bullet instability in flight and after impact with a more-dense medium than air:

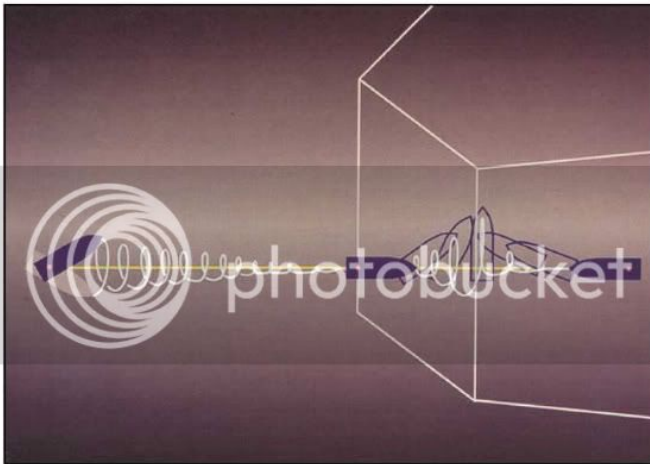


Fig 4-7. The idealized behavior of many rifle bullets. The bullet emerges from the rifle muzzle with a significant angle of yaw. Gyroscopic stabilization gradually aligns the long axis of the bullet and the line of flight. After travelling about 100 m downrange, the angle of yaw has become very small. When the bullet enters the much more dense target tissue, it rapidly destabilizes. The angle of yaw increases until the bullet tumbles.

I did notice that contrary - again if memory serves me correctly - to earlier statements in this thread the bullet gyroscopic spin does not stop within the denser than air media until the bullet stops its forward motion. And,

TABLE 4-1

CHARACTERISTICS OF IMPORTANT MILITARY SMALL-ARM PROJECTILES

Weapon	Era	Construction of Projectile	Diameter (mm)	Weight (g)	Muzzle Velocity (m/s)	Kinetic Energy (muzzle) (J)	Important Features
Smooth-bore musket*	1700	Soft lead round ball	18	33	180	530	Deformation
Muzzle-loading rifle*	1850	Soft lead conoidal bullet	17	37	300	1,655	Deformation
Breech-loading rifle*	1870	Hard lead cylindrical-conoidal bullet	11	25	430	2,300	Deformation
Breech-loading magazine rifle*	1890	Blunt nose lead core, steel jacket	7.9	14	600	2,650	Good stability
Single-shot bolt action rifle*	1910	Pointed nose lead core,	7.9	9	830	3,100	Poor stability
Vickers Mk 7 machine gun (GB)**	WWI	Aluminum cap lead core, copper jacket	1.1	11	750	3,060	Poor stability
Karabiner Model 1898 single shot (GER)**		steel jacket	7.9	11	740	3,000	Poor stability
ACP M1911 automatic pistol (USA)**		Lead core, copper jacket	11.7	15	265	527	Good stability

Edit: Table 4-1 shown is an excerpt of the full page which covers additional ammunition. I also notice that an 1890 era blunt-nose small arms projectile - read here bullet - gave good stability after entry into a heavier-than-air-mass. I also notice that the RN FMJ 45 ACP bullet also gave good stability after entry into a heavier-than-air-mass while all spire point bullets had poor stability.

My read from this article is that twist rate is important to the gyroscopic spin stability of the bullet both within air and within mass and nose shape is of premier importance to straight-line penetration.

Added: I also believe that our current crop of NonCon HP bullets are a very good compromise between the blunt-nose bullet stability and the spire-point nose bullet instability within mass especially when they shed their petals or at least expand very quick to simulate blunt-nose penetration stability.

Ok, that's my two-bits for the day. Fire away.



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

someoldguy

25 February 2010, 06:09

quote:

But I did find the following which may pictorially portray Alf's propositions along with a possible trail to follow to answer my above noted question. So, here's goes:
<http://www.bordeninstitute.arm...apter4/Pages1-12.pdf>

Thanks for sharing that, Jim.

I don't have an answer to your question, but I have a few objections to what was mentioned in the paper when it comes to penetration. That doesn't mean that everything else in the paper is wrong or even that I'm right. Just that I object to a couple of things.

The main ones:

The authors were IMO correct in pointing out the importance of drag in the penetration process. That seems almost unarguable. In the formula that I use, there are two components: The standard drag formula using the target's density that they mentioned, plus the component which employs the target's strength. Despite what the authors said, using the target's strength doesn't require sophisticated analysis. It basically asks the simple question: How much force does it take to punch a hole of a certain area in a target whose strength is known?

Glenn

jwp475

25 February 2010, 06:41

quote:

Originally posted by someoldguy:

quote:

I have a hell of a time measuring meplats, it's not as easy as you think! I am coming up with from .220 to .240 or somewhere in between. That's something between 52-57% meplat for caliber. Now in my opinion, that's not enough meplat to rely upon straight line penetration. Twist will be important on this one I would think? And I also bet, I don't have fast enough twist to make it work!

The meplat looks way small, I agree. I haven't measured any meplats, but I could understand the problem if you're using a caliper. The only thing I could think of sounds ridiculous. Take a dark crayon, some lipstick or something similar, cover the meplat surface with it, and daub the meplat on a clean piece of paper, being careful not to smudge it. Then you can measure your mark on the paper with the caliper. It probably won't be precise, but it would undoubtedly be less aggravation.

I believe that a meplat of 78% in conjunction with a nose profile like the GS Custom with sharp and not rounded shoulders will get the most penetration.

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

ALF

25 February 2010, 10:05

capoward

25 February 2010, 11:52

Alf,

I believe:

quote:

Originally posted by ALF:

Why is it that the faster twist barrels consistently outpenetrate "traditional" and "CIP standard" slower twist barrels for the currently tested **FN monometal bullets**?

The reason is because the faster twist barrels are actually the correct twist for these bullets.

your statement is refuted by recent tests conducted by Mike70560. The following sequence of quotations fully demonstrate that a modern FN monometal bullet outperform the traditional early 20th century FMJ bullet **even** when fired utilizing a traditional *slow* CIP standard twist rate...in this case a 1:20" twist rate in a double rifle:

quote:

Originally posted by Mike70560:

I have completed the first round of penetration testing.

Caliber: 470 Nitro Express

Rifle: Krieghoff Double

Brass: Jamison

Primer: Remington 9 1/2M

Powder: Reloder 15

The test box is fabricated from 2 by 6 pine boards and is 72" long.

Test media consisted of 1/4" 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:

Woodleigh 500 Grain solid @ an average impact velocity of 2065

North Fork 500 Grain solid @ an average impact velocity of 2075

First portion of the test consisted of firing consisted of firing 5 Woodleigh bullets in the test media.

Shot 1: 36" of penetration then came out of the top.

Shot 2: 40" of penetration then stopped at the top of the newspaper.

Shot 3: 33" of penetration then came out of the side

Shot 4: 40" of penetration then stopped in paper, seemed to be straight.

Shot 5: 39" of penetration then came out of the top

The first 12" of penetration was very straight line. I matched the luan from the front of the box to the 2 by 6 positioned 12" behind the luan and the bullet path was straight. Only after traveling through the 1 5/8" of treated pine did the bullet path start to deviate. Please note the bullets entered the wood at a 90° angle. I placed the 2 by 6 to simulate bone.

After this test, five more tests were conducted firing one Woodleigh and then one North Fork. Penetration was measured and the media was changed prior to the next test. While there possibly could have been variations in density from test to test, both brands of bullets were fired in each lot of paper.

All of the North Fork bullets had straightline penetration the entire length of the box. One actually exited the 2 by 6 on the back of the test bed. The others were stuck in the 2 by 6 or the plywood I added at the rear of the box to make certain the bullet did not leave the box. The engraving looked good on the bullets. None were bent or otherwise damaged.

The Woodleigh bullets performed the same as the first five; straight penetration until reaching the 2 by 6. Average reasonably straight penetration was 20" total. After that the bullet would start turning and exit the box out of the top or hit the side or stop sideways in the newsprint at an average of 41".

If any variations in results were noted I would have continued testing. The results were very conclusive: In this media the North Fork Solids simply outperform the Woodleigh Solids in heads up testing. The next test will be the penetration of standard 470 Nitro velocities versus 1650-1700 fps velocity. Both Woodleigh and North Fork bullets will be tested.



Above is the test box with chronograph.



Above is typical damage to the test box caused by the Woodleigh bullets veering off line.



Typical position of Woodleigh bullet found in media.



The above picture is of the typical condition of North Fork bullet after firing.



The above picture is taken from outside of box. It is a North Fork bullet after traveling through 72" of test media.



The above picture is taken from inside of box. It is another North Fork bullet after traveling through 72" of test media.

quote:

Originally posted by Mike70560:

While waiting on powder for the 1700FPS test I tried something a little different.

The test consisted of 4" of completely saturated newspaper, 1 1/4" of HardiPlank nailed to 1 5/8" of pine all on a 20° angle, 28" of water with 9 newspapers suspended in the water with each paper containing 40 pages, 5/8" of HardiPlank nailed to a another 1 5/8" of pine on a 20° angle opposite of the first setup, and then the remainder of the 72" box filled with saturated newspaper.

This is the description of HardiPlank from there site:

First, what is HardiPlank made of? HardiPlank falls in the fiber-cement siding class, which means that it is a combination of cellulose fibers, along with cement-like materials. In other words, it's partly wood, partly cement.

It is also flexible.

I fired one .474 500 grain North Fork solid at 2070 FPS IV. It penetrated through everything in a perfect straight line. The measured deflection was less than 1/2" through the 71" of penetration. It stopped at the back of the box. I thought it would certainly deflect on the hardiplank at the angle particularly after going through 28" of water but did not.

The bullet looked like the other North Forks. It could be fired again.

Tomorrow it will be the Woodleigh's turn.



quote:

Originally posted by Mike70560:

Tonight a .474 500 Grain Woodleigh was fired through the same setup as the .474 500 Grain NF was last night. (The test consisted of 4" of completely saturated newspaper, 1 1/4" of HardiPlank nailed to 1 5/8" of pine all on a 20° angle, 28" of water with 9 newspapers suspended in the water with each paper containing 40 pages, 5/8" of HardiPlank nailed to another 1 5/8" of pine on a 20° angle opposite of the first setup, and then the remainder of the 72" box filled with saturated newspaper.)

The bullet entered center of the box, penetrated the first set-up of boards, went through the water, somewhere in the water it went astray. It hit the second set of boards about 3/4" from the top with the bullet sideways. It exited out of the top of the board and hit the 2 by 6 I use for a lid.

One thing I did note was that the newspaper I suspend in the water was shredded. There was much more damage than the North Fork generated. Maybe because it was traveling sideways going through the water? It may mean nothing but I did note it.

I may or may not come back to this test. The results were basically the same as the multiple shots I fired in the other media.

Hopefully I can start the velocity test this weekend.



quote:

Originally posted by Mike70560:

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 1/4" 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.

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 3/4" 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.

I don't believe that anyone participating in this thread will not agree with you that the new and longer monometal bullets will typically perform better with a faster twist rate, and perhaps even require a faster twist rate due to their extra length, than the C&C expanding and FMJ bullets in vogue at the turn of the 20th century.

Some would also argue that even the early 20th century bullets would perform better utilizing a faster twist rate than was traditional at that time but that is not the argument that has been demonstrated within this thread.

Now I'm aware that you're drawing your statement:

quote:

Originally posted by ALF:

Why is it that the faster twist barrels consistently outpenetrate "traditional" and "CIP standard" slower twist barrels for the currently tested **FN monometal bullets**?

The reason is because the faster twist barrels are actually the correct twist for these bullets.

from my request to Michael458 to try the Barnes Buster 400gr .458 caliber bullet in his 458 B&M rifle with its faster 14" twist rate after the bullets failed to track straight within this bullet box from two of his .45-70 lever action rifles; one having a 1:18" twist rate and one having a 1:20" twist rate. And yes this bullet did provide greater straight-line stability within the bullet box from the faster twist rate rifle.

Now, just so that everyone understands as identifiable by this extract from the Barnes website

quote:

Barnes Buster™ —Hunting Bullets for Handguns and Lever Rifles Introduced

Barnes now offers a new deep-penetrating handgun bullet intended for hunting bear, wild boar, moose, bison, buffalo and other large—even dangerous—game. The bullet features a thick copper jacket and a heavy lead core, resulting in minimal expansion, deep penetration and maximum weight retention.

Available for .44, .45, and .500 magnum revolvers, as well as for .45-70 rifles, this premium hunting bullet combines bone-crushing power with pass-through penetration. Unlike conventional expanding bullets, the Barnes Busters track straight without deflection or deformation. These tough bullets are specifically designed to deliver maximum penetration, even in large game. In one field test, a Barnes Buster fired from a .45-70 T/C Encore drove completely through an American bison, anchoring it on the spot.

These cannellured, heavy-for-caliber bullets drive deep through dense muscle and bone. Bullets remain intact—jackets won't separate from the core. Great for hunting hogs and tough, heavy game. It's the ideal bullet for those who carry handguns for protection against bears in Alaska and other wilderness areas.

<http://www.barnesbullets.com/p...es-busters%e2%84%a2/>

these 400gr .458 caliber bullets were designed by Barnes for the slow twist rates typical of .45-70 lever action rifles. Michael's testing reveals that they perform substantially better utilizing a faster than traditional twist rate.

Whether Barnes screwed up and a 1:14" twist rate is required for these .458 caliber bullets to properly perform is a question I'll let someone else pose to Barnes.

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

ALF **25 February 2010, 12:06**

capoward **25 February 2010, 12:39**

Alf,
 I believe if you re-read Mike70560's posts you'll identify that there were five shots each utilizing the Woodleigh 500gr RN solid and the North Fork 500gr FN solid, all 10 bullets impacting at 32 feet from the muzzle with average impact velocity of w/i 10fps; ten bullets not two.

As far as the test media "actually being uniform"; Mike notes how the media in each test box is prepared and as it is prepared in the same manner each time I would propose that it is sufficiently uniform within a 95% confidence level. And you should be aware that it gets exponentially more costly to raise the confidence level each percentage point above the 95% level...something like of the Aberdeen Proving Grounds is budgeted for... but even they are not budgeted for a 100% confidence level in their findings for testing such as is being conducted here.

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