

This topic can be found at:

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

michael458

05 February 2010, 15:28

### Terminal Bullet Performance

Alf

You know something Alf, I was really sorry that you left us the other day, I was sorry that you were being someone "petty" and removed all your posts. I was sorry to lose your input.

But Alf, you really disappoint me, by coming back and making fabricated statements concerning a particular bullet, to suit your own agenda. And the problem with this is basically this is a huge thread, there is a tremendous amount of information here, many posts, many pages, and a lot of folks looking at it, many of which are new to the thread or have not seen it before. There is that possibility that someone could believe what you said to be true, and in fact cannot go back far enough in the thread to see it actually is a false statement? Now either you are ignorant, you are not really comprehending matters, or it is your intention to put out false information to meet a personal agenda? Either way, it makes an ugly situation, for new folks, for the folks in which the statement is made, and more so for yourself!

The statement concerning Gerards GSC doing poorly is horribly and terribly incorrect. In my Rigby in which the twist is believed to be 1:12, one cannot ask for better, deeper, straighter penetration. Velocity and twist rate improved this greatly over my slower twist rate in the 416 B&M in which it did not "stabilize" the long 410 gr bullet. The NorthFork bullet which is very similar to the GSC in 370 gr in 416 caliber did great, Gerard recommends his 380 gr GSC over the 410 gr bullet because of this.



From what you see above, more for the folks out there that joined the thread after this test, this amount of penetration in my test medium is as good as it gets. There are very few bullets that will penetrate this deep and this straight! In addition most all of the solids tested over time in this medium lose stability right at the end of penetration, the last couple of inches. The bullet has slowed down to a point in which it cannot remain stable that last little bit, which is a totally moot point! One GSC 410 gr Solid lost stability because it was too much bullet for my 416 B&M and it's slower twist rate. Drop that to GSC 380 and there is zero issue at all, and none with GSC solids, which is one of the very best solid designs one can get, in my opinion, and I would use them in a second in the field and be completely satisfied.

I have had bullets that penetrate on a regular basis to 62 inches that go completely through broadside elephants, penetrate from the rear of elephants over 7 ft and exit, completely penetrate buffalo from any angle. So when penetration of any of these solids gets up in the 50-60 inches, that is a lot of penetration on animal tissue, more than you will most likely ever need, but more than enough you need not be concerned, as you will have a good bullet that you can rely upon, as good as it gets anyway.

Alf, I am sorry, you are really making yourself look like an ass. You are not by any stretch promoting your ideas in a proper, logical,

or meaningful way. Please don't make me "sorry" you have rejoined us!

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"

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.

**RIP**

**05 February 2010, 15:48**

ALF will be quoted directly below,  
lest he delete.

Yes, better in a .416 Rigby is the 380-grain GSC FN with a 14" twist at 2500 fps.  
I have had that pass through both shoulders of a cape buffalo, including the heaviest possible bone to be encountered in a buffalo, and out the other side, heart penetrated, dead in 30 seconds. SF well over 3.0?

Best of all, with SF over 5.0:  
GSC FN .510/570-grain in 10" twist at 2400 fps.  
Straight through 8 feet of bison from tail to mid neck and out the throat.

Wooly SF requirents?  
SF applies to gyro stability for flight in air.  
A different parameter is needed to describe stability in target.  
That is still eluding the theoreticians, it is so complex.

**RIP**

**05 February 2010, 15:58**

quote:

Originally posted by ALF:

Gerard:

No, that is not what I meant!

If I take two of your bullets and I shoot them at identical speeds one from a fast twist barrel and the other from a slow twist barrel, both impact the target at say 100 m both impact at the same angle of attack..... please show me or explain how the angular velocity difference between the fast and slow bullet effects penetration depth.

There is not a single mathematical derivation whether you use a newtonian mechanics model, a hydromechanics based model or even a thermodynamics based model where Angular velocity, angular momentum, rotational velocity or rotational energy is accounted for in the penetration process.

Secondly more twist means greater static stability but by definition less tractability and that means an increase yaw at impact..... exactly the reason why long distance shooters choose just the right twist rate to give the lowest possible SF values that will give unity over distance. If the twist is too tight the bullet will have a large yaw angle which will negatively impact on drag.

So do you agree with the results of these tests? As I recall you're FN bullets don't do so well here, in fact they seem to be the worst of all of these FN bullets tested..... do you believe that?

What is amazing here is that we all know the earth is round, nobody needs to prove, it's been done before and yet here all are clapping hands because tests are being done to prove that the earth is in fact flat, because it looks flat?

**RIP**

**05 February 2010, 16:42**

quote:

Originally posted by ALF:

Jeffeosso:

Ok I will put out a challenge to you and anyone who wishes to participate.

Here it is:

1. Produce credible evidence or any credible reference to or any reference to a scientific journal /paper/ textbook/ mathematical penetration model, that rotational velocity / angular momentum / angular velocity has any effect on penetration depth of a projectile other than the fact that it sets up angle of attack ( yaw ) at impact.

Thereby, by implication, a faster twist rate barrels give deeper penetration than slower twist rate barrel? Please produce this and I will admit I was wrong!

2. Produce evidence that altering nose shape, other than it's implication with regards to perceived stability of the projectile actually directly has an effect on penetration of "hard solids" and secondly soft viscous solids.

Come to think of it please explain why if FN's are deemed stable they still need to be spun in a rifled barrel on the way to the target? .... if these are stable as you all state and why would you want a faster twist barrel for FN's ?

3. Show that these tests done ie the shooting of paper are valid in terms of comparing penetration or behaviour of one bullet to another ( i'm not asking whether this has validity to compare against other materials ) simply whether you all think that the results you are seeing are here in fact valid ?

A simple point to begin with would be:

1. Was there verification at any time of target density expressed as a unit of density ( example kg/ cubic m ) between shots and secondly was there any verification of compressive yield strength of the targets between shots done seeing as more than one shot is fired into a target ? .... If not then how on earth are we to make anything of this ?

**RIP**

**05 February 2010, 16:47**

Alf said "you all" above.  
He might have a South Afrikaner accent.

**michael458**

**05 February 2010, 17:47**

Let us not get distracted from some factors. Alf asks why we want a faster twist if FN are so good to begin with. Not all FN are created equal, and not all meplat sizes are the same, and they do not react the same once terminal penetration begins. Big difference in stabilization for accuracy and stabilization once terminal!

Meplat size of the 400 Barnes Buster in 458 caliber, as best I can measure, is around 56-58% of caliber, which is important. It is easy to see in the test medium that the faster twist in the 458 B&M is adding to terminal stability, more so than the slower twist of the 45/70. However, as we also see even with the faster twist the smaller meplat of the bullet still is not 100% stable all the time, more so than the slower twist, but here is where meplat size starts to be a factor.

In my tests, and my experiences when that meplat size starts to get above 60% of caliber, and getting on to 70% of caliber, stability starts to increase dramatically even with a less than optimum twist rate, so now, meplat size starts to be more of a factor, and can overcome twist rate! Twist rate for smaller meplat bullets, and round nose solids, is a supreme factor in it's terminal stability. I have this data recorded with my .500s back in 2006 and 2007. By going from 1:18 to 1:12 was a tremendous benefit for the round nose solids I had at the time, and also to stabilize 60% of caliber meplats! I don't need a mathematical formula to prove this to me. It's black and white and repeatable, and I have seen this many times, and the most recent test once again proves it to me. Not only have I seen this in the tests I conduct, but I have seen it in live animals.

Now it is my hope to get enough test bullets in the not too distant future to do a test that 465HH and I discussed. 4 different meplat sizes, 75%-65%-55%-45% meplat of caliber. If being in .500 caliber rifles, I have 1:12 and 1:18 twist rates in which to test the same bullet in both twists. Now this will give us two things, meplat size, and twist rate once again. I might be wrong, I have been wrong before, once, maybe twice, we will call it 3 times just to cover the bases, but I will bet that as we see meplat size drop to 55 and 45% of caliber the 1:12 twist rate will prove deeper, straighter penetration than the 1:18 twist rate. The 1:18 twist rate will not be able to stabilize the 55-45% meplat of caliber bullets, and they will turn at or around 30 inches of penetration and go off who knows where! As we increase meplat size to 65-75% of caliber you will see improved straight line penetration in a 1:12 twist to near perfection, and in addition to that you will see 90% or better straight line penetration in the 1:18 twist rate with the larger meplat size. Wanna place your money and efforts where your mouth is?

I honestly do not understand why there is an issue with this at all, black and white, absolutely logical to me, and it would seem just plain common sense! So me something that proves otherwise, real evidence, not a mathematical formula with no experience!

Of course, I am just a lowly dirt forester, not a scientist, what the f<sup>0</sup>%\$\* could I know about anything? I have no idea where my mind was?   
Michael

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

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**Gerard**

**05 February 2010, 18:07**

Some points I missed through the red mist of Pontificus Erroneus' post.

416Tanzan,

One thing we do know about supercavitation is that it is sustained better by sharp edged shapes than by round shapes. The flow over a sharper edge will supercavitate at lower flow speeds than the flow over a bigger radiused edge.

Your observation of a 338 v cape buff is good. We have 52 consecutive cape buff kills on record with 200gr HVs and a 338WM. It was a motley assortment of bulls cows and calves as it was an entire herd that had to be removed.

Pontificus Erroneus,

quote:

We should obviously bear in mind that an increase in diameter from .366" to .375" plays havoc and so a uniform answer to this whole question is not possible, and it is all due to that difference sitting in the 3rd decimal, eh?

There is your problem. You think that .375 and .366 differ in only the third decimal. (Did you say that you are an accountant?)

Alf,

quote:

Secondly more twist means greater static stability but by definition less tractability and that means an increase yaw at impact.....

Yaw can result in large angles of attack on impact but that is at short range. In cases where tractability becomes a factor on impact, it is because of a high angle of attack which is not yaw induced. Yaw dampens out over distance, unless it is driven by dynamic instability, in which case distance is a moot point again because it won't get there.

**DWright**

**05 February 2010, 19:28**

Alf, you may be right. Yup, I'm sure of it.

But; just for sake of interest here, what say you go ahead and put together some actual testing to prove your theories. Just as Michael has. . . . .

Maybe conduct some penetration tests with some bullets that you prefer. Say some RNS, against some FNs of different brands, thru different media; and let's get the results right here where we can all see them. Just as Michael HAS.

That would be really nice Alf. Wait; what say maybe you should do the tests in actual live game as you say, since fake media won't REALLY give the results we are after here.

Yup, let's say you do that so we can truly understand just what it is you are saying. After all, we are all just simple minded folk, that understand result's, and not so much charts and graphs. The little lines make my eyes water!

Then we can all get our heads out of our asses, and see the light.

What you say Alf? You up for it?

<http://www.mazamasportinggoods.com>

**DWright**

**05 February 2010, 20:01**

OR Alf, are you going on just graphs and charts. But then again, I would imagine that graphs and charts really may not represent what happens in the REAL world. Even less so than fake media. . . . . ?

Now, back to someone that IS conducting testing to show the results for all of us to see.

Back to you Michael!

<http://www.mazamasportinggoods.com>

**jeffosso**

**05 February 2010, 20:20**

Ordered some hammerheads -- 95 BUCKS for 20 rounds?

This should put it to bed, once and for all -- again

#dumptrump

**opinions vary** band of bubbas and STC hunting Club

Information on **Ammoguide** about

the [416AR](#), [458AR](#), [470AR](#), [500AR](#)

[What is an AR round?](#) Case Drawings [416-458-470AR](#) and [500AR](#).

[476AR](#),

<http://www.weaponsmith.com>

**jeffosso**

**05 February 2010, 20:24**

As for Alf's going position that is must be 100% repeatable --- but it aint on game.. and wounded game is different than resting and certainly different than dead .. and hippo aint buffalo .. in other words, he wants emperical results on subjective test media ... like proving a negative, it just can't be done.

Supercavitation, gentlemen, is a MISNOMER -- that occurs when the surface area is traveling through a liquid so fast that it has a permanent (semi) bubble from the pressure making gases release from the fluid .. The russian torpedos do this.. at 45km/h -- NOTHING like bullet speed

its supersonic bow waves, or hypersonic waves, that ACTUALLY happen and are visible in highspeed photography .. PLAINLY visible ...I am kinda dumb, if i can see it, and it repeats, i think i can predict what happens the next time ...

#dumptrump

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[What is an AR round?](#) Case Drawings [416-458-470AR](#) and [500AR](#).

Warrior

05 February 2010, 21:08

quote:

There is your problem. You think that .375 and .366 differ in only the third decimal. (Did you say that you are an accountant?)

Rasputin,

Here we go .... .375  
minus ..... .366  
Difference ..... .009

Yes the **difference** actually seems to be in the 3rd decimal.  
9-thou if you will, and apparantly if makes all the difference. 😊

My 2 brain cells talking to your 1 brain cell.

Warrior

capoward

05 February 2010, 21:16

quote:

O COMO SE DICE EN EL CENTRO DEL CALIFORNIA  
QUE PIENSAS?

Dijo bien! Is this indicative that you've been to or resided within the CalMex frontier zone?

I have a proposal to alleviate one point of contention in our discussion. We have SF to describe or portray the in-flight yaw or lack thereof of the bullet post-exit from barrel and pre-entrance to the target mass, whether the mass be a "¼-inch target/backboard" or a live something that can become greatly pissed very quickly.

What I propose is that we refer to the stability of the bullet within this mass, which generally for our purposes relates to a human generated mix of substances intended to simulate the very large something ready to be greatly pissed very quickly as WMS (Within Mass Stability). Now the use of WMS will eliminate the misuse of words, of phraseology, as well as something of an intellectually scientific nature. Yes WMS if adopted will be indicative of purely of the efforts of the FPS (Flat Penetration Society) vis-à-vis Alf's FES (Flat Earth Society) and will potentially eliminate all arguments over the meaning of how the bullet acts within the WMS as well as whether twist rate has an impact upon WMS.

So as they say, "what all y'all think?"

Jim 🤖

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

416Tanzan

05 February 2010, 21:30

Capoward,

SI, trato visitar cada anyo.  
episkeptomai pollakis.

I appreciate your language, but full words may help us in clarity more than too many acronyms.  
WMS could be (Winchester Magnum Short, a.k.a. B&M) to a dyslexic. Terminal Stability ought to be enough.

And this is probably better described as the  
Deep Penetration Thread, more than just 'flat'.  
Or Straight Penetration Thread.

But we don't want DiPhTheria, nor SPT, just reliable penetration in potentially pissed-off-beasties.

+ + + + +

"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.

hughman

05 February 2010, 21:57

I am not convinced that the bullet's rotation is lost as soon as it enters the testing medium/flesh. Surely the friction acting to reduce the rotation is very small compared to the resistance to the forward progress of the bullet.

Another thought that occurred to me is the affect on the bullet stability of the impact. Perhaps a "less stable" bullet is more easily upset by the impact on the body/box? And thus its forward velocity is slowed by a wobble.

Thanks very much to Michael and all of you. This thread is a great education, and I think will form a basis for a good book on terminal ballistics.

Hugh

**capoward**

**05 February 2010, 23:09**

Tanzan,

SI, trato visitar cada anyo. Desert Rat, Snowbird, or do you have family there? My daughter was born there and I still have a couple of friends in that area but other than the rare drive through I've not visited in years.

Terminal stability is fine with me; my proffer was nothing more than an attempt to eliminate the arguments relating to the rotational stability of the bullet once it penetrated into the mass. I do not believe that the bullet stops rotating once it enters into the mass until the mass has either stopped or sufficiently slowed the bullet's forward momentum. But I'm good with terminal stability.

Jim 

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

**boom stick**

**05 February 2010, 23:37**


What bullet weight?

It would be of interest to shoot the hammerheads as is from a slow twist lever action then pull some of the bullets to test at faster twist rates and higher velocity and see the data.

It is the Garrett claim that his 500 grainers penetrate more @ 1600 than say 2,000 fps

The different twist findings will show stability issues these bullets might have and show if that the lever actions need to adopt a faster twist if shooting bullets greater than 400 grains.

Thanks Jeffeosso!

This is cool 

quote:

Originally posted by jeffeosso:  
Ordered some hammerheads -- 95 BUCKS for 20 rounds?  
  
This should put it to bed, once and for all -- again

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)

**jeffeosso**

**06 February 2010, 00:26**

got the 540grs .. his super penetrators .. .we shall see ..

#dumptrump

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476AR,  
<http://www.weaponsmith.com>

**boom stick**

**06 February 2010, 01:38**

Michael....

Another bullet to add to the list.

What do u think of an aluminium 45-70 bullet with the same powder charge and dimensions as the rem 405's shot out of a 45-70 @ say an estimated 4,000 fps?

How much will it penetrate?

Turn the 45-70 into a varmit gun!!!!

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

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Single Shot Shooters Society S.S.S.S. (Founder)

**Warrior**

**06 February 2010, 01:53**

**This was Gerard's position on 22 August 2005:**

quote:

"With FN bullets we recommend a stability factor in EXCESS of 2.5 for reliable linear penetration. The 300gr FN has a stability factor of 2.39 to 2.44 from 2000fps to 3000fps. Again not ideal."

At the time the above applied to .375 bullets.

**This is Gerard's current position on the .375" 270gr FN:**

"S/F greater than 2.0 is required. A S/F of 2.5 is desirable for faster calibers. There is no upper limit to the S/F here." The way it reads now is that a SF greater than 2.0 is required and no longer greater than 2.5. But there is a but .... when a caliber is 'faster' than those calibers specified, then a SF greater than 2.5 is required.

What made you change your position Gerard? Shooting another several thousand animals more ... eh? Before the SF spec for the 9,3 was 2.0+ and 2.5+ for the .375 H&H.

Now the SF spec for the .375 H&H has been brought down to the same level as the 9,3x62 mm ... haauuu !!!

By changing the barrel twist you will not make the bullet more stable in target, as gyroscopic stability is negated by the target density that is a thousand fold denser than air and the drag the bullet encounters. The overturning force (moment) is driven by drag, and this in turn is velocity dependent. COG and geometry takes over as the mechanism in target. The flat meplat compensates in any event for small yaw angle fluctuations that the bullet incurs in it's path and when it strikes. That is why we see that penetration is almost always straight for the major part of its journey and then either veers off or tumble given enough distance.

Here is another comparison, and you can phone the owner of Rhino Bullets to confirm, the **9.3/286 gr Rhino Solid** yields a **SF value of only 1.39** with a standard twist of 1-in-14". It provides straight-line penetration, as confirmed by various PH's, despite the fact of their much 'lower' SF values than the one's you stated. Likewise, many buffalo have been shot with the **.416/400 gr Rhino Solid** at 2,400 fps in a standard twist of 1-in-16.5", yielding only a **SF value of 1.44**.

Warrior

**someoldguy**

**06 February 2010, 02:45**

quote:

Ordered some hammerheads -- 95 BUCKS for 20 rounds?



Dammit man! That's almost as expensive as Kynoch ammo!

quote:

As for Alf's going position that is must be 100% repeatable

The only thing I know of that's 100 percent repeatable in hunting is a miss!



Ask me how I know.



---

Glenn

**michael458**

**06 February 2010, 05:44**

quote:

Originally posted by boom stick:

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How much will it penetrate?

Turn the 45-70 into a varmit gun!!!!

Boomy? Did you take your meds today?

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**ALF** 06 February 2010, 07:11

**boom stick** 06 February 2010, 07:22

lol No Sir!

Even Tepo Jutsu has experimented with shooting aluminium bullets out of the 458 Socom.

Rob has made Aluminium bullets for the 12GFH

Imagine an aluminium bullet the same dimensions as the Rem 405 but only weighing say 60 grains like a varmit bullet. With the same powder charge to get a 405 grain bullet to go say 1900 fps a 60 grain bullet would go twice that velocity.

Break a velocity record for the lowly 45-70 and a lever action lol

quote:

Originally posted by michael458:

quote:

Originally posted by boom stick:

Michael...

Another bullet to add to the list.

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**Warrior** 06 February 2010, 11:41

i

quote:

As to other equally imposing "Ar'sms"

1. Only FN bullets cavitate or "supercavitate" ?
2. By "supercavitating" bullets become stable?
3. A high Stability factor number ( SF) infers that a bullet is stable, the higher the SF the more stable?
4. FN bullets are stable ? My question then if they are why would you want to shoot them in tight twist barrels ?

and so we can go on

**I wish to add one more perception on FN bullets that is promotional hype, but do understand that it is not that I have anything against a FN bullet, in fact I recognise its virtues, but it is these over the top claims - ok brace yourself and put your safety belts on ...**

"It **has been proven** that a high velocity flat fronted cylinder (**FN bullet**) **shape will leave a larger primary wound channel than a slower, double caliber mushroom**. HV bullets are therefore designed to start mushrooming reliably from much lower speeds than most other premium bullets, typically from around 1000fps. **Two to four centimeters** of penetration is all that is required to fully expand an HV bullet. At higher speeds, HV bullets will lose the petals entirely, shedding 12% to 15% of weight and presenting a flat cylinder shape to the direction of movement. The HV concept thus offers, at worst, a good double caliber mushroom, with extremely high retention and, at best, a high speed cylinder shape for **dramatic primary wound trauma**." .....  
GSC Website.



a) A flat fronted cylinder (FN bullet) cannot leave a larger permanent wound channel than a conrolled expansion bullet that opens up to double caliber, and has not been proven as far as I am concerned. If this were to be the case then all CEB's have become effectively redundant, has been superceded, and we can move on to use FN's exclusively.

b) More so, if an HV loses its petals within the first 4 centimeters (1.6"), which is a long way off before the bullet reaches the vitals, and it becomes a flat fronted cylinder from then on, we read the same hype vis-a-vis other bullets that it causes 'dramatic primary wound trauma'. Again to relegate other bullets down the pile and to elevate this concept of NEW RULES that supposedly supercede the OLD RULES.

**Then back to Gerard's current position (a revised position) on the .375" 270gr FN of ... "S/F greater than 2.0 is required. A S/F of 2.5 is desirable for faster calibers."**

Now as the GSC websites states the max velocity of the 375 H&H at 2,850 fps, I take it that at this velocity we are going to cross the rubicon, as the above statement (actually a prescription) makes mention of upping the SF value when the very same bullet is shot in faster calibers. Typically we can envisage shooting the 270 gr FN bullet now in the 378 Wby Mag. I want to know how this was determined, as the bullet in question runs with a 3.4 SF in a 12-inch twist. So what bullet was used at SF = 2.0 and what bullet was used at SF = 2.5 to actually formulate this ground breaking theory.

Actually, I would think in formulating such a theory one should go up slowly in increments of 0.1 (or even 0.05) from somewhere lower than 2.0 and all the way up to pin-point these critical datum points that are being specified. The point I make is that if the 270 gr FN bullet was used then the theory cannot be documented using a single bullet, as it already operates at SF = 3.4 !!! Gerard the question then becomes did you start with a much shorter bullet and worked you way up or did you cut the bullet shorter all the way down to yield a SF of lower than 2.0 to establish these critical points? Of course this experiment needs to be done on live animals at various increments in bullet length to establish the results of 'straight-line penetration', so the SF specification can be pitched where the breakpoints are. 😊

Warrior

**someoldguy**

**06 February 2010, 12:14**

quote:

Someoldguy actually came the closest to the truth when he referred to the Alekseevski and Tait equations regarding penetration and how in this model both penetrator mass, cross sectional area and nose shape is discounted in the penetration process..

Have Alekseevski and Tait been borrowing my equations again and putting their name on them? Well, see if they get any more Christmas cards from me!



Seriously, which one was that, ALF? The one about the length of the projectile?

Glenn

**someoldguy**

**06 February 2010, 12:38**

quote:

It has been proven that a high velocity flat fronted cylinder (FN bullet) shape will leave a larger primary wound channel than a slower, double caliber mushroom.

From what I've seen, I definitely agree with this statement from Gerard. And velocity doesn't even seem to need to be very high to get an effective wound channel and deep penetration, at least on lighter game. This is borne out convincingly on Rathcoombe's page:

<http://www.rathcoombe.net/sci-...hods.html#flat-nosed>

Glenn

**someoldguy**

**06 February 2010, 14:16**

And for post #3...

I think there is one way to resolve this issue about twist rate and penetration once and for all. No ciphering needed.

Sir Isaac Newton suggested that a rough estimate of impact depth of a projectile at high velocities was from the length of the projectile times the ratio of the projectile's density to the density of the target. No other factors.

[http://en.wikipedia.org/wiki/Impact\\_depth](http://en.wikipedia.org/wiki/Impact_depth)

If this is true, then we should also be aware that longer projectiles are best stabilized by a faster (lower numerically) twist rate:

<http://www.uslink.net/~tom1/twistrate.htm>

So it's pretty obvious to me that a faster twist rate has the potential of favorably affecting penetration depth.

---

Glenn

**Gerard** **06 February 2010, 14:40**

Pontificus Erroneus,

quote:

Here we go .... .375  
minus ..... .366  
Difference ..... .009

Yes the difference actually seems to be in the 3rd decimal. 9-thou if you will, and apparantly if makes all the difference.

My 2 brain cells talking to your 1 brain cell.

When you engage the two you have to adress one of mine while others are busy, you are left with no free resouces and your system crashes. It shows. You are a mental midget - accept it and live with it.

I apologise for not spelling it out the first time: Given that a 9.3x62 is actually .3653" and a 375H&H is actually .3759", the difference remains in the second decimal. As usual, you base your idiot reasoning on incorrect, badly researched facts and then dig the hole deeper from there.

Capoward's signature fits you quite well. Very apt.

**Gerard** **06 February 2010, 14:43**

hughman

quote:

Another thought that occurred to me is the affect on the bullet stability of the impact. Perhaps a "less stable" bullet is more easily upset by the impact on the body/box? And thus its forward velocity is slowed by a wobble.

Absolutely correct. The importance of a high stability factor under certain conditions of close range and higher speed, especially with solids, is beyond debate at this stage. It is proven fact and michael458's tests further confirm this fact. It is not a new idea, just one that has been neglected by most. This discussion goes back many years.

quote:

Posted 29 Oct 2001  
This is why some experiments on penitration reported here from time to time, found that increased twist rates improve penetration. Logically, if the twist rate is fixed (you have bought the rifle), penetration will be more reliable with bullets shorter than what is required for stable flight. Bullets with too little gyroscopic stabilisation will not always tumble on impact, but using slightly shorter bullets than required, is good insurance against that kind of failure. I would rather have assured, linear penetration of a certain depth than possibly more with the risk of vastly less attached to it.

quote:

Posted 10 Dec 2006  
It has a stability factor well above 2.5 and even severely angled shots (high angle of incidence) will result in good transition and linear penetration.

quote:

Posted 23 Jun 2008  
The gyroscopic stability of the short bullet is much higher and results in good transition from flight to tissue.

**Gerard** **06 February 2010, 15:01**

Pontificus Erroneus,

You make mistakes so fast it is difficult to keep up when you start.

quote:

This was Gerard's position on 22 August 2005

Actually, it was my position in November 1997.

quote:

This is Gerard's current position on the .375" 270gr FN

That weird school you went to that taught you to write but not read has come back to bite you, big time.

Here is the page for the 375270FN. Now let me teach you how to read it. 375H&H rifles were made in two twist rates: One in 14" and one in 12". See the little chart above the bullet illustration? Look at the line of the graph that runs from 14 to 12 on the horizontal axis. At 14 it is a fraction over 2.5 on the vertical axis (left) and at 12 it is almost at 3.5.

So what did I say (according to you) on 22 August 2005? "The 270gr FN in the 375H&H should ideally be over 2.5 Stability Factor." What does the chart for the 375270FN say on 6 February 2010? "The 270gr FN in the 375H&H should ideally be over 2.5 Stability Factor."

Looks the same to me. You are such an idiot.

quote:

By changing the barrel twist you will not make the bullet more stable in target,

Here is that reading thing again, coming back to bite you. See my reply to Alf, repeated for the **fourth** time:

quote:

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.

Pontificus erroneus (aka: Warrior/Truvelloshooter/Chris Bek) You say:

quote:

the 9.3/286 gr Rhino Solid yields a SF value of only 1.39

That would be a slightly worse SF than this one?



You also say:

quote:

the .416/400 gr Rhino Solid at 2,400 fps in a standard twist of 1-in-16.5", yielding only a SF value of 1.44

416Tanzan deals with this in his posts a little higher up on this page. You should read it, he has it sussed. (I forgot, you have this reading problem. What the heck, deal with it.)

For those who are new to Warrior's rubbish, please see:  
<http://forums accuratereloadin...471062011#8471062011>

**Warrior**

**06 February 2010, 15:12**

Rasputin,

Always side-tracking from the real issues to create smoke, hey? Your speciality. You have explained nothing so far. We are dying to hear your eloquent explanation to the issues I have raised - the down-scaling of the SF requirement based on empirical evidence, the incorporation of shooting the same bullet in a faster caliber and thereby raising the SF requirement, making these bullets so short that they can operate under a SF value of 2.0, etc. And what is more, how all these myriad of variables were taken account off in your experiment on live animals all by the naked eye.

Warrior

**jro45**

**06 February 2010, 15:15**

I sure do like your range. I Have a 25' range. But it's nothing like your range.

**Warrior**

**06 February 2010, 15:30**

Rasputin,

So you attribute those bend solids from another manufacturer to SF values, eh? Interesting to see your reasoning.

By the same token how do we make then sense of this one ...

"Posted 25 September 2005 04:03 25 September 2005 04:03

I just completed my Alaska Peninsula moose season and had a hunter who borrowed my my .375 H&H loaded with 270 gr GS flat nosed solids at a chronoed 2600fps. Both bulles remained in the moose from broadside shots thru both shoulders. One was slightly bent and the other only shows a bit of widening at the nose. It was good but not spectacular performance. .... Phil Shoemaker"

Was this an SF issue or could it just be that it is something else considering its most ideal SF rating? 😊

Warrior

**michael458**

**06 February 2010, 16:02**

quote:

Originally posted by someoldguy:  
So it's pretty obvious to me that a faster twist rate has the potential of favorably affecting penetration depth.

Glenn

I think so too. No math, no formulas, no ciphering needed, just a tad bit of common sense and as it appears this not only comes from my tests and observations, but many many others too. I don't think we have discovered anything new here concerning twist rates. My observation of this goes back to 2006 I think, and there are many others long before that. As far as I am concerned it is what it is, and really a moot point to argue over. I won't be arguing over it, waste of time. Time to move on to other discoveries still out there!

Thanks

Boomy, how about the aluminum bullet? Of course that would be interesting. But lot's of questions too? Some questions I can't even think of just yet? Aluminum bullet? Hmmmmmmm? Don't know?

Gerard

quote:

Another thought that occurred to me is the affect on the bullet stability of the impact. Perhaps a "less stable" bullet is more easily upset by the impact on the body/box? And thus its forward velocity is slowed by a wobble.

Absolutely correct. The importance of a high stability factor under certain conditions of close range and higher speed, especially with solids, is beyond debate at this stage. It is proven fact and michael458's tests further confirm this fact. It is not a new idea, just one that has been neglected by most. This discussion goes back many years.

quote:

Thanks for the support!

Warrior

I appreciate all the support from everyone with something to contribute. As it appears to me you and Gerard have had a long time disagreement concerning the SF value and factor. Now I will be 100% honest and tell all I really have not studied the SF Values presented, and have no opinion, one way or the other. And once again to be 100% honest, and not being ugly about it either, I really don't care. But, that is just me, I much rather move on to other subjects and not get too much stuck on something like this. You and Gerard have this thing going and that is fine with me, I also have some disagreeable issues with some folks about one point or another, but there is a time and place for that, and at some point one must move on to other things, suffice to say that the disagreement between the two of you will continue, this thread, another thread, and probably forever. These things happen. But for the sake of all, I think it's time to move forward and let this subject be taken care of elsewhere.

jro45

thank you, I love the range too. Since building it I have been able to do so much more than I have in the past. Chronos and equipment can remain set up permanently, not a big hairy issue to do test work as it was before by having to haul everything outside to set up. Rain, shine, wind, night time activities, makes no difference. Want to test and shoot 1 or two rounds, easy, not an issue. I shoot mostly big bore, 98% of everything going downrange is .400 up. 50 yds is all one ever needs for that. Even outside I always shot big bore 50 yds. Outside I still have benches set up at 50 and 100 yds. I can shoot out to 150 yds right here at home. But I can't tell you the last time I shot outside, other than getting ready for a hunt or something. All test work done inside. I also have a tract of land 5 miles from home, I could easy set up a 500 + yard range there, but that's not my thing, so I have not even bothered to think about it.

Jeffe

Damn, \$95 for a box of hammerheads? God almighty, I reckon they must be really good eh? Jeffe, you line out exactly what you want me to do in the tests and that's what we will concentrate on.

To everyone out there, all your input is important, all the support given for this thread is important. I had no idea it would turn into such a big deal. I think all of us can learn a few things as we move on, I know I am. I have got a few surprises over the last few weeks myself. I have been having fun and enjoyed what we have accomplished. Some will disagree, but that's ok too. Proper channeled disagreement can be bonus. Other times, if it comes to a stalemate one must move on.

Lurkers, welcome, join in please, I have no doubts that there is a lot of field experience with lot's of bullets we are not hearing about, and is being lost. Please, if you have some experience with any of the bullets we have tested, chime in with what you have observed! Don't be shy!

Thanks  
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"

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.

**Gerard**

**06 February 2010, 16:13**

Alf,

quote:

I am confused:

I am not surprised about your confusion. You do not read our replies. Did you go to the same school as Bekker, where they taught him to write but not read? This is a snide remark but, quite frankly, you deserve it at this stage. Example:

You say:

quote:

As to ths notion of rotational velocity somehow contributing to penetration.....

Which part of "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." do you not understand? It seems that the entire sentence is beyond your comprehension because it is the **fifth** time that it is repeated here.

I must question your demands for proof.

quote:

And moreover that the bullets impact at the same yaw angle and impact velocity.....

I know you are not stupid and I cannot understand how you can demand this. At short range SF controls yaw angle. SF is determined by twist. So, if yaw angles are kept constant and all other factors are kept constant, how can penetration differ? How can one do an experiment, to prove that increasing twist rate improves transition, if one is not allowed to increase the twist rate?

Penetration depth can only differ if something changes. Increase the momentum and penetration will probably increase. Increase the rotational velocity and, as a result, yaw angle at impact will decrease. This will increase penetration.

So, for the **sixth** time: When the bullet is fully submerged in the target medium - You are right. Rotational velocity cannot work in this context. Agreed. Yes. No argument on this. Yes. Yes. Yes

If you put forward this premise once more, I can only presume that you are being pigheaded and wish to argue for arguments sake.

As for these statements:

quote:

1. Only FN bullets cavitate or "supercavitate" ?
2. By "supercavitating" bullets become stable?
3. A high Stability factor number ( SF) infers that a bullet is stable, the higher the SF the more stable?
4. FN bullets are stable ? My question then if they are why would you want to shoot them in tight twist barrels ?

They are straight from dumb school, have been addressed and do not deserve further discussion. You have not understood a word that was replied, or you are being deliberate. Were they asked by a newcomer, that would be understandable, but from you?

quote:

I think it's time to move forward and let this subject be taken care of elsewhere.

No sweat Michael, replies to Pontificus E will be elsewhere in future. In the past he has declined to follow, I hope he affords us the

courtesy this time.

**michael458**

**06 February 2010, 16:28**

Gerard

quote:

[Redacted]

I know you are not stupid and I cannot understand how you can demand this. At short range SF controls yaw angle. SF is determined by twist. So, if yaw angles are kept constant and all other factors are kept constant, how can penetration differ? How can one do an experiment, to prove that increasing twist rate improves transition, if one is not allowed to increase the twist rate?

Penetration depth can only differ if something changes. Increase the momentum and penetration will probably increase. Increase the rotational velocity and, as a result, yaw angle at impact will decrease. This will increase penetration.

quote:

[Redacted]

An extremely excellent explanation of why a faster twist stabilizes the bullet during terminal penetration, I think a very important point, and even helps me understand it better, thank you!

quote:

[Redacted]

They are straight from dumb school, have been addressed and do not deserve further discussion. You have not understood a word that was replied, or you are being deliberate. Were they asked by a newcomer, that would be understandable, but from you?

quote:

[Redacted]

Exactly!

Michael

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

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**someoldguy**

**06 February 2010, 16:36**

quote:

Rasputin

Hey, that's my nickname! (Really!)  
But I suppose there could be more than two Rasputins.



quote:

I think so too. No math, no formulas, no ciphering needed, just a tad bit of common sense and as it appears this not only comes from my tests and observations, but many many others too. I don't think we have discovered anything new here concerning twist rates.

No, it's no news but it's just a reminder. 😊

---

Glenn

Gerard

06 February 2010, 17:12

[Pontificus Erroneus, Go Here](#)

RIP

06 February 2010, 18:18

alf,  
Another stupid demand of yours is that the test media be utterly, perfectly standardized.  
Get out your copy of the Duncan MacPherson book, the one that both you and Gerard got a copy of, mailed by me.  
There is some discussion there about the ordnance gelatin being variable from batch to batch, and throughout the depths of each individual block,  
no matter what precautions are taken in mixing it, no matter what conditions are controlled in the process of testing.  
The "consistency guilt" of the scientists is assuaged by making sure that a BB from a Daisy Red Ryder penetrates within a certain range on the block, no more, no less.  
Then that block is ready to test, as long as they can keep it at 40 degrees F, standard condition, don't you know.  
It is shot outdoors, not in the refrigerator. Shoot fast!

Let's get real.  
In reality, we ignore the static and listen for the good information, or try to tune it in.

The variations in Michael's wetpack are mere static.  
He is doing the best that is humanly possible here.  
His results are Morse Code, or MUSIC to the ears of evidence-based thinker-shooters.

All are in agreement that faster twist gives better penetration by yaw control on transition from air to target medium.  
Not even Alf, with his vast meta-analysis of the scientific literature, and no practical experience nor "first eye" observations in testing,  
can come up with any studies of the effect of twist on penetration while in target.  
The only observations are theoretical here.  
Yaw control at the surface has already done the job prior to any secondary effects at depth in media.  
It may be a moot point, or of lesser effect,  
and the experiment to isolate the contribution at depth may be impossible to design.

But just why is Alf protesting so much, that some good information seems to be emerging from South Carolina?  
They make a great Winchester there too. 😊

Y'all Lettit Rip

#### **ALF POST for Posterity (lest he delete):**

I am confused:

What is the object of the exercise when various bullets are fired into a test medium ( wetpack) and the results posted on the internet? I would say it fair to think for comparative purposes, not so ?

So Now I am attacked for questioning this notion, snide remarks about 100% certainty and hunting ? when the originator of this thread clearly pointed out that the intent was not to model these tests to living tissue.

So at least then if the test is going to be about comparing how various bullets stack up and then deductions regarding certain processes made; such as the notion that rate of twist is a determinant in penetration (other than it's impact on impact yaw) ..... and as this is done on open internet forum at least humour the rules of physics by standardising on the test.

Most of the penetration data papers that emanate from the various defence or space exploration related ballistics labs around the USA and the rest of the world clearly point out that tests fail or meaningful deductions fail, not due to errors in observation or in their case due to a lack of knowledge in the mathematical process but inconsistencies in the testing media or the penetrator. The standardization of the test medium, whether it is steel, sand, paper, clay, gelatine or even flesh is essential to the process.

Someoldguy actually came the closest to the truth when he referred to the Alekseevski and Tait equations regarding penetration and how in this model both penetrator mass, cross sectional area and nose shape is discounted in the penetration process.... what is clear from this though is that if any two or more bullets are going to be compared then at least the target in this case wetpack be standardised in terms of density, the degree of wetness ( water saturation if is going to be saturated ) and compression yield strength.

And moreover that the bullets impact at the same yaw angle and impact velocity..... without this any deductions regarding penetration depth or behaviour is meaningless

As to this notion of rotational velocity somehow contributing to penetration..... do the test, its simple, standardise on all the parameters including the index parameters such as impact yaw angle ( this will be difficult in lay setting but one can use a plain uncoated paper index card and measure the smear on the paper to determine yaw angle) and you will have the answer.

And to those who believe that somehow rotational velocity is of importance I am patiently awaiting confirmation of this either in the form of an equation, logical physical explanation or credible evidence as proof..... In the meantime I will put my faith in logical physics that discounts the notion.

As to other equally imposing " Ar'sms"

1. Only FN bullets cavitate or "supercavitate" ?
2. By "supercavitating" bullets become stable?
3. A high Stability factor number ( SF) infers that a bullet is stable, the higher the SF the more stable?
4. FN bullets are stable ? My question then if they are why would you want to shoot them in tight twist barrels ?

and so we can go on

