

## Calculations of Stopping Power

**John Taylor** did a study and developed what I have followed most of my life on shooting dangerous game. He called them “Knock Out Values”, hence the term Taylor’s Knock Out values or, TKO.

To have a starting point to understanding this one must have the math used for John Taylor’s table. Consider the case of a standard NATO 7.62 × 51 mm cartridge. It has the following characteristics:

- Diameter: 7.62 mm or 0.30 inches
- Mass: 9.7 grams or 150 grain bullet
- Velocity: 860 meters per second or 2820 feet per second

The calculation is performed as shown above.

$$\text{TKOF} = \frac{0.30 \cdot 150 \cdot 2820}{7000} = 18.1$$

18.1 TKO is not bad for a .308.

Here are some examples of TKO factors. The factory loaded cartridges listed I borrowed data and are as follows:

500gr .500 S&W, 1200fps =42.86  
450gr .45-70, 1250fps =36.48  
370gr .475 Linebaugh, 1400fps =35.15  
325gr .480 Ruger, 1350fps =29.77  
300gr .405 Win, 2000fps =34.71  
260gr .454 Casull, 1800fps =30.22  
255gr .38-55, 1650fps =22.84  
240gr .44 Mag, 1350fps =19.86  
230gr .45 ACP, 885fps = 13.11  
200gr .35 Rem, 2100fps =21.06  
170gr 30-06, 2850fps =20.76  
165gr .40 S&W, 1080fps =10.44  
158gr .357 Mag, 1400fps =11.28  
150gr .30-30, 2250fps =14.85  
115gr 9mm, 1250fps =7.31  
85gr .243, 2950fps =8.70  
71gr .32acp, 900fps =2.83  
55gr .223, 3300fps =5.78  
50gr .25acp, 750fps =1.33  
30gr .22LR, 1400fps =1.33

Now look down near the bottom of the list at the illustrious 5.56mm or .223 has a TKO of 5.78. Note that TKO. Come on up a little to the .243 and you see TKO 8.70. Slide on up now to the 9 mm and look at that TKO 7.31. See next your .357; then the .40mm; and come on up the scale finally to the .45 acp..... What do you see? **TKO 13.11.**

These are "**put a man down**" calculations. Not necessarily dead, but **DOWN. Down and incapacitated.**

What is not readily appreciated is the penetration of bullets in this chart. We assume the projectile is stopped by something to get these numbers and there lies the error in calculation; most do not HAVE this stopping power. Most projectiles on the pistol class go right through without doing much damage at all. Assuming they DID, we can read this chart and make something of it.

In tests, the .45 acp generally did well and why tests like those carried out on it in 1903 are valid today.

So using this chart what fires in an automatic pistol, has the greatest knock down power, has the lowest recoil, and has a killing range of 400 yards? (Actually to 1,000 yards if you could sight a pistol that far) The answer is the .45 acp. And there IS no other gun in the world BUT the **Combat NCO** that will deliver that distance accurately; certainly over an extended period of use.

Now a Black Hills 950 fps 230 FMJ HP +P round travels "at sea level" (not up here in the thin air of Colorado) at 400 yards is traveling at 745 fps and has 283 foot pounds of energy. At 600 yards that is 670 fps and 229 FPE. So, one would have to conclude that if HIT with a 230gr bullet at any of these distances with a projectile traveling +P at 950 fps it WILL kill you; **Period.**

### **Here are the short facts:**

Former Chief Sniper Instructor tests the guns and that independent report is posted with another online; 10th Special Forces gave an award for the Pistol and shoots it 400 yards in mass; FBI agent have shot it; Federal Law Enforcement Training Center 200 yards; SEALS at 300 yards; I even shoot it accurately at 600 as shown elsewhere and in Sept 2012 set the World Record at that distance; on and on. Are all these people kidding? **The fact is that any pistol CAN be made to shoot 400 yards** if they are tight, will group, and have the sights for it. **It must hold 5 minute accuracy** or less at 100 yards to do it. (Or a 5" group at 100 yards). Most **Combat NCO's** hold 1-2 minute groups and do it for 100 years!

A "5 minute group" at 100 yards translates to variance at 400 yards by multiplying the number of 5" x 4 = 20". A man is 21" wide. Therefore the maximum effective range established by me for the **Combat NCO** pistol was 400 yards. Will the **NCO** go further? Yes, but it is sighted at 400 yards with M1911 Ball. The original military spec I tested in 1987 was on a 36" target, a little too big a target for practical shooting that far. The problem is it is just too hard to identify and shoot a target at say 600 yards accurately especially with a pistol; but as demonstrated a NCO will hold a variance of less than 32"

at 650 yards with a 5 minute gun and still be within the original military target provided of 36". So if you **HAVE a tight pistol, and do what I say in "The Business of shooting Distance", man is no longer safe at four hundred yards nor standing in the open at 600 if faced with a 1911 A2™ NCO pistol. The TKO at 600 yards is 9.94. That is greater than a 9mm at the muzzle!!!**

***The Rules Of Engagement Have Forever Changed with the Combat NCO. It is effective at 600 yards.***

Now one can say what about the **Stanley Goddard report 1988 and the physics of a 9mm and .45acp impacting a target using weights?** What about the 9mm compared by Taylor or Lippard on live targets? **The answer is penetration.** Taylor's calculations were arrived at on animals. On dangerous animals where penetration is mandatory to incapacitate if not immediately kill. Now I have personal experience with a .45 acp hit and can comment with authority on that result. Further, I have killed more animals with more different types of loads than most. Like Taylor I can draw conclusions from field use on live targets to draw conclusions. I feel without any doubt that the "Calculations of Stopping Power" by John Taylor to be text book. But for those who feel physics of Goddard to be a better choice of selection should read the FBI report more closely. **It is not surface contact of a projectile one should be calculating but rather 12" deep into a specific target.** We select bullet shape, diameter and weight delivered at a speed sufficient to penetrate far enough to impart the greatest amount of energy on specific target. It might be thin skinned or hard. The target might be light or heavy. In the end what does 150 years of a .45 caliber bullet experience tell us about the effects of it on man? It tells us without physics that it incapacitates, kills, and destroys the ability to fight. We know it to be effective slow moving. If distance is necessary, pick that distance, "Calculate its Stopping Power," load to that delivery and call it a day.

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You know it might be wise for Military and Law Enforcement to come up to speed on their profession. I would make it mandatory that all law enforcement and military read up on their weapon of choice; read this article for sure and other articles here in the ***Technical Library***. You are only out gunned by lack of education. The solution is neither costly nor hard to obtain. The question is will you be properly armed and trained or, die from someone who is.

Sgt. Karl Lippard

