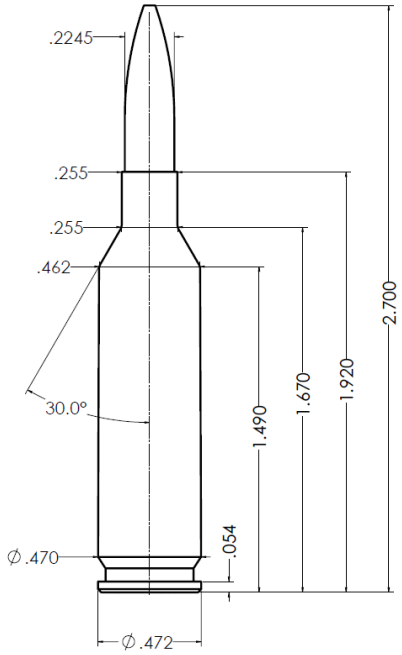
Revised: 04/09/2020

Peterson Cartridge: 22 Creedmoor Load Data

Cartridge Specifications



Maximum Average Pressure (MAP)

62,000 PSI

Test Specifications / Components

Universal Receiver

Firearm Used: Universal Receiver

Barrel Length: 24”

Rate-of-Twist: 1 in 7”

Casing Manufacturer: Peterson Cartridge Co.

Casing Type: .22 Creedmoor LRP (Large Rifle Primer)

Casing Trim Length: 1.910”

Primer: Federal Large Rifle Magnum Match (GM215M)

Rifle

Firearm Used: Horizon Firearms .22 Creedmoor

Barrel Length: 24”

Rate-of-Twist: 1 in 8”

Casing Manufacturer: Peterson Cartridge Co.

Casing Type: .22 Creedmoor LRP (Large Rifle Primer)

Casing Trim Length: 1.910”

Primer: Federal Large Rifle Magnum Match (GM215M)

Initial Comments:

Since its’ inception, in 2007 by Hornady, the 6.5 Creedmoor has seen some pretty meteoric growth in popularity. That growth continues as of this writing, as the cartridge has now gone mainstream with hunters and shooters alike. As the popularity of the 6.5 Creedmoor has increased, so has the number of wildcat cartridges based off of it. Some of those popular wildcat cartridges are the 6 Creedmoor, .25 Creedmoor, and now the .22 Creedmoor. This data sheet will cover the .22 Creedmoor.

Peterson Cartridge is committed to supporting its customers. One way we support our customers is by producing the high-quality casings they have come to expect from us. Another way we provide support, is by investing in the equipment necessary to test the products we produce, so we can provide technical information to those who need it. To help our customers, and anyone else who shoots .22 Creedmoor, we decided to create this data sheet and distribute it.

Below you will find four (4) common bullets, and four (4) common rifle powders used when handloading the .22 Creedmoor cartridge. We then took the different bullet and powder combinations and loaded them up to the SAAMI Maximum Average Pressure (MAP) for the 6.5 Creedmoor and 6 Creedmoor cartridges, which is 62,000 psi.

Please understand that the bullets and powders we chose to evaluate may not be the most popular among some shooters, however, our goal was to provide a wide spectrum of bullet weights and the powders used with them. In doing that, regardless of what bullet and powder you choose, if you have access to a chronograph and a powder burn rate chart, you will be able to estimate a safe maximum pressure load for your rifle chambered in .22 Creedmoor.

All of the following data was gathered by our ballistician in our indoor ballistics lab located in our factory in Pennsylvania. Although we were able to gather pressure and velocity data in our lab, we have not tested these loads for accuracy. Again, these loads are just designed to give shooters information regarding what velocity, a given bullet and powder charge combination, will produce the SAAMI Maximum Average Pressure (MAP) of 62,000 psi. Again, the following loads were not tested for accuracy or consistent velocity, but are just reference points for you to use when working up your own loads.

Along with more than 25 other calibers, Peterson Cartridge now offers casings in 6.5 Creedmoor, 6 Creedmoor, .25 Creedmoor, and .22 Creedmoor. Also, please try our new extremely accurate loaded ammunition which is available through https://www.grafs.com/.

Maximum Pressure Load Data

55 Grain Hornady V-Max (Part # 22271)

Load #1

Universal Receiver

COAL: 2.450”
Powder Type: H4350
Powder Charge Weight: 41.5 Grains
Velocity: 3,814 fps
Pressure: 62,048 psi

* Hornady recommends a twist rate of 1 in 14” for barrels shooting this bullet.

Rifle

COAL: 2.470”
Powder Type: H4350
Powder Charge Weight: 41.7 Grains
Velocity: 3,817 fps
Pressure: 62,000 psi (Estimate)

* Hornady recommends a twist rate of 1 in 14” for barrels shooting this bullet.

Load #2

Universal Receiver

COAL: 2.450”
Powder Type: Hodgdon Superformance
Powder Charge Weight: 45.7 Grains
Velocity: 3,892 fps
Pressure: 61,978 psi

* Hornady recommends a twist rate of 1 in 14” for barrels shooting this bullet.

Rifle

COAL: 2.470”
Powder Type: Hodgdon Superformance
Powder Charge Weight: 45.8 Grains
Velocity: 3,873 fps
Pressure: 61,500 psi (Estimate)

* Hornady recommends a twist rate of 1 in 14” for barrels shooting this bullet.

75 Grain Hornady ELD-M (Part # 22791)

Load #1

Universal Receiver

COAL: 2.600”
Powder Type: H4350
Powder Charge Weight: 38.2 Grains
Velocity: 3,380 fps
Pressure: 61,818 psi

* Hornady recommends a twist rate of 1 in 7” for barrels shooting this bullet.

Rifle

COAL: 2.630”
Powder Type: H4350
Powder Charge Weight: 38.7 Grains
Velocity: 3,372 fps
Pressure: 61,500 psi (Estimate)

* Hornady recommends a twist rate of 1 in 7” for barrels shooting this bullet.

Load #2

Universal Receiver

COAL: 2.600”
Powder Type: H1000
Powder Charge Weight: 44.5 Grains
Velocity: 3,434 fps
Pressure: 62,522 psi

* Hornady recommends a twist rate of 1 in 7” for barrels shooting this bullet.

Rifle

COAL: 2.630”
Powder Type: H1000
Powder Charge Weight: 45.1 Grains
Velocity: 3,435 fps
Pressure: 62,500 psi (Estimate)

* Hornady recommends a twist rate of 1 in 7” for barrels shooting this bullet.

Load #3

Universal Receiver

COAL: 2.600”
Powder Type: Reloader 26 (RL26)
Powder Charge Weight: 42.5 Grains
Velocity: 3,457 fps
Pressure: 61,978 psi

* Hornady recommends a twist rate of 1 in 7” for barrels shooting this bullet.

Rifle

COAL: 2.630”
Powder Type: Reloader 26 (RL26)
Powder Charge Weight: 43.2 Grains
Velocity: 3,463 fps
Pressure: 62,000 psi (Estimate)

* Hornady recommends a twist rate of 1 in 7” for barrels shooting this bullet.

Load #4

Universal Receiver

COAL: 2.600”
Powder Type: Hodgdon Superformance
Powder Charge Weight: 42.0 Grains
Velocity: 3,432 fps
Pressure: 62,223 psi

* Hornady recommends a twist rate of 1 in 7” for barrels shooting this bullet.

Rifle

COAL: 2.630”
Powder Type: Hodgdon Superformance
Powder Charge Weight: 42.6 Grains
Velocity: 3,427 fps
Pressure: 62,000 psi (Estimate)

* Hornady recommends a twist rate of 1 in 7” for barrels shooting this bullet.

80.5 Grain Berger FULLBORE Target (Part # 22427)

Load #1

Universal Receiver

COAL: 2.560”
Powder Type: H4350
Powder Charge Weight: 36.3 Grains
Velocity: 3,228 fps
Pressure: 62,223 psi

* Berger recommends a twist rate of 1 in 8” or faster for barrels shooting this bullet.

Rifle

COAL: 2.610”
Powder Type: H4350
Powder Charge Weight: 36.9 Grains
Velocity: 3,232 fps
Pressure: 62,500 psi (Estimate)

* Berger recommends a twist rate of 1 in 8” or faster for barrels shooting this bullet.

Load #2

Universal Receiver

COAL: 2.560”
Powder Type: H1000
Powder Charge Weight: 42.5 Grains
Velocity: 3,296
Pressure: 62,578 psi

* Berger recommends a twist rate of 1 in 8” or faster for barrels shooting this bullet.

Rifle

COAL: 2.610”
Powder Type: H1000
Powder Charge Weight: 43.0 Grains
Velocity: 3,303 fps
Pressure: 62,750 psi (Estimate)

* Berger recommends a twist rate of 1 in 8” or faster for barrels shooting this bullet.

Load #3

Universal Receiver

COAL: 2.560”
Powder Type: Reloader 26 (RL26)
Powder Charge Weight: 40.8 Grains
Velocity: 3,318 fps
Pressure: 62,363 psi

* Berger recommends a twist rate of 1 in 8” or faster for barrels shooting this bullet.

Rifle

COAL: 2.610”
Powder Type: Reloader 26 (RL26)
Powder Charge Weight: 41.9 Grains
Velocity: 3,323 fps
Pressure: 62,500 psi (Estimate)

* Berger recommends a twist rate of 1 in 8” or faster for barrels shooting this bullet.

Load #4

Universal Receiver

COAL: 2.560”
Powder Type: Hodgdon Superformance
Powder Charge Weight: 39.0 Grains
Velocity: 3,238 fps
Pressure: 62,208 psi

* Berger recommends a twist rate of 1 in 8” or faster for barrels shooting this bullet.

Rifle

COAL: 2.610”
Powder Type: Hodgdon Superformance
Powder Charge Weight: 39.6 Grains
Velocity: 3,246 fps
Pressure: 62,500 psi (Estimate)

* Berger recommends a twist rate of 1 in 8” or faster for barrels shooting this bullet.

95 Grain Sierra HPBT (Part # 1396C)

Load #1

Universal Receiver

COAL: 2.680”
Powder Type: H1000
Powder Charge Weight: 39.8 Grains
Velocity: 3,016 fps
Pressure: 61,933 psi

* Sierra recommends a twist rate of 1 in 6.5” or faster for barrels shooting this bullet.

Rifle

COAL: 2.700” (Maximum Cartridge Length)
Powder Type: H1000
Powder Charge Weight: 40.0 Grains
Velocity: 3,012 fps
Pressure: 61,750 psi (Estimate)

* Sierra recommends a twist rate of 1 in 6.5” or faster for barrels shooting this bullet.

Load #2

Universal Receiver

COAL: 2.680”
Powder Type: Reloader 26 (RL26)
Powder Charge Weight: 38.4 Grains
Velocity: 3,030 fps
Pressure: 62,660 psi

* Sierra recommends a twist rate of 1 in 6.5” or faster for barrels shooting this bullet.

Rifle

COAL: 2.700” (Maximum Cartridge Length)
Powder Type: Reloader 26 (RL26)
Powder Charge Weight: 38.6 Grains
Velocity: 3,027 fps
Pressure: 62,500 psi (Estimate)

* Sierra recommends a twist rate of 1 in 6.5” or faster for barrels shooting this bullet.

Primers

You might have noticed that we used large rifle magnum primers for this testing. Since the .22 Creedmoor isn’t a typical magnum cartridge, we thought it would be helpful to explain why we chose to use large rifle magnum primers instead of standard large rifle primers. The main reason we chose the magnum primers, is due to the typical powders used when handloading the .22 Creedmoor. When you look at the typical powder choices for the 6.5 Creedmoor and the 6 Creedmoor, pretty much everyone is using H4350. (When they can find it in stock)

Although H4350 does work well in the .22 Creedmoor when using mid-weight bullets, it does tend to cause pressure spikes, earlier than say RL26, when you are using the heavy-for-caliber bullets like the Sierra 90 grain and 95 grain MatchKing’s. With those slower burning powders, like H1000 and RL26, we wanted to make sure we used a primer with the most potential to ignite them. Again, that is the main reason we chose to perform this testing with large rifle magnum primers.

With that said, we understand the technical audience we are producing this data sheet for. So, we took the time to do a little testing to show the difference using a magnum primer can make compared to a standard primer when shooting .22 Creedmoor. To illustrate this difference, we loaded 5 casings with **large rifle magnum** primers. We then took the same load, and used **standard large rifle primers** instead. That way, the only difference between the two sets of 5 rounds was the type of primer used. Also, both the magnum and standard primers were of the same brand, which was Federal. The primers were also of “Match” grade quality.

We then fired both sets of 5 rounds, and recorded the pressure and velocity for each round. We have compiled the data below. Both sets of rounds were fired in our lab, using our universal receiver, which has a 24” barrel. New casings were used for both tests.

Standard vs. Magnum Primer Data

Standard Large Rifle Primer	Large Rifle Magnum Primer
COAL: 2.600”	COAL: 2.600”
Bullet: 75 Grain Hornady ELD-M	Bullet: 75 Grain Hornady ELD-M
Powder Type: Reloader 26 (RL26)	Powder Type: Reloader 26 (RL26)
Powder Charge Weight: 42.5 Grains	Powder Charge Weight: 42.5 Grains
Average Velocity: 3,432 fps	Average Velocity: 3,457 fps
Average Pressure: 60,478 psi	Average Pressure: 61,978 psi
* SD = 8 fps	* SD = 15 fps
* ES = 18 fps	* ES = 32 fps

Analyzing the above data, changing between using standard large rifle primers and large rifle magnum primers did cause a slight change in a few things, including velocity and pressure, during our test. I will summarize the changes we observed; #1. Magnum primers increased our velocity, on average, 25 fps. #2. Magnum primers increased our pressure, on average, 1,500 psi. #3. Magnum primers increased our velocity standard deviation (SD) and extreme spread (ES) by 7 fps and 14 fps, respectively.

Keep in mind these results are only for this particular load. It could be possible that the velocity increase we recorded, due to the magnum primers, was enough to push that load out of a consistent velocity node. Similarly, this increase in velocity could have caused the SD and ES to increase. In some instances, the velocity SD and ES might get much better or much worse, depending on where you are at in relation to a consistent velocity node in your particular rifle. You just can’t be sure unless you run all of the different test combinations, and this small test was just conducted for our own curiosity.

Rifling Twist Rates

One thing we haven’t covered in this data sheet yet, is the difference rifling twist causes, as it relates to pressure. As we have discussed above, estimating pressure is very important when trying to develop a load for your rifle which is under the SAAMI Maximum Average Pressure (MAP). For our testing, we did not have a second universal receiver barrel with an identical twist rate to match the rifle we conducted our testing in. Therefore, in the “Maximum Pressure Load Data” section listed above, we were only able to estimate the pressure each load produced in the rifle.

Fundamentally, we believe that reducing/slowing the twist rate in your rifle, going from a 1 in 7” to a 1 in 8” twist, will reduce the pressure the casing experiences during firing. The reason we believe this, is because, theoretically, the bullet will have less resistance in a slower twist barrel due to the rifling not slowing the bullet down as much to put a faster rate-of-twist on the bullet as it passes through the barrel. However, this I just a theory we have, since we don’t currently have the equipment at this time to test the theory.

Online Forum Load Data

After we gathered all of our test data, just for reference, we searched the popular internet forums to gather a few loads shooters were currently using in their .22 Creedmoor rifles. The loads we chose to test were ones which we thought might be overpressure. We then tested those loads in our universal receiver so we could record a pressure for each load. As a bonus to this data sheet, we have included a few of the loads, with their associated pressures and velocities, below. It should be noted with the below loads, we did have to shorten the COAL of the round slightly to fit into our universal receiver. The pressure measured for each load was not meaningfully affected by this slight COAL shortening. Each of the below loads are over pressure. **Do not use the below loads in your rifle**

Load #1

75 Grain Hornady ELD-M

COAL: 2.600”
Primer: Federal Large Rifle Magnum Match (GM215M)
Powder Type: H1000
Powder Charge Weight: 45.5 Grains
Velocity: 3,498 fps
Pressure: 66,068 psi

* **This load is a little over pressure, and should be backed down a small amount to get under the 62,000 psi safe working pressure.**

Load #2

80 Grain Hornady ELD-M

COAL: 2.600”
Primer: Federal Large Rifle Magnum Match (GM215M)
Powder Type: Reloader 26 (RL26)
Powder Charge Weight: 46.8 Grains
Velocity: 3,700 fps
Pressure: 83,818 psi

* **This load is very close to a “proof pressure” load. It is, without any question, unsafe. In our opinion, this load should not be used by anyone.**

Load #3

80 Grain Berger VLD Target

COAL: 2.600”
Primer: Federal Large Rifle Magnum Match (GM215M)
Powder Type: H4350
Powder Charge Weight: 40.5 Grains
Velocity: 3,500 fps
Pressure: 77,343 psi

* **This load is over pressure, and should be backed down considerably to get under the 62,000 psi safe working pressure.**

Load #4

90 Grain Sierra MatchKing

COAL: 2.620”
Primer: Federal Large Rifle Magnum Match (GM215M)
Powder Type: H4350
Powder Charge Weight: 40.0 Grains
Velocity: 3,350 fps
Pressure: 84,693 psi

* **This load is very close to a “proof pressure” load. It is, without any question, unsafe. In our opinion, this load should not be used by anyone.**

Load #5

95 Grain Sierra MatchKing

COAL: 2.680”
Primer: Federal Large Rifle Magnum Match (GM215M)
Powder Type: H1000
Powder Charge Weight: 41.5 Grains
Velocity: 3,150 fps
Pressure: 70,493 psi

* **This load is over pressure, and should be backed down enough to get under the 62,000 psi safe working pressure.**

Equipment and Reloading Supplies

As the .22 Creedmoor has grown in popularity, so has the number of companies who produce components and rifles designed for, and chambered in, the new caliber. I have listed below a few of the companies we believe produce quality components, supplies, and rifles related to .22 Creedmoor.

Horizon Firearms, located in College Station, Texas, produces some of the finest bolt action firearms on the market today. Besides the almost endless calibers they chamber their rifles in, they also were one of the 1st companies to begin mass producing rifles chambered in .22 Creedmoor. Horizon Firearms is also a retailer of Peterson Cartridge .22 Creedmoor casings, their own brand of .22 Creedmoor loaded ammunition, and Whidden reloading dies for the .22 Creedmoor. You can check out their operation at https://horizonfirearms.com/ or https://22creedmoor.com/. They are also the operator of the .22 Creedmoor Facebook page located at https://www.facebook.com/22CreedmoorRifles/.

F4 Defense is a top-tier rifle manufacturer who specializes in semi-automatic rifles, specifically small fame AR10's. Unlike other rifle manufacturers, F4 Defense has taken the lead on producing small frame AR10 semi-automatic rifles chambered in .22 Creedmoor. You heard that correctly. Now you can own a small frame AR10 rifle chambered in .22 Creedmoor. In addition to producing some of the lightest AR10's in the world, F4 Defense is the only company in the gas gun industry that has a SUB-1/2MOA accuracy guarantee. In addition to their rifles, F4 also sells AR15 receivers, handguards, barrels, and Nightforce optics. F4 Defense, in a partnership with Spark Munition's, now also offers their own line of loaded ammunition. The F4 Defense website is https://www.f4defense.com/.

Sierra bullets needs little introduction, as they produce some of the highest quality projectiles available today. In addition to their hundreds of other bullet options, Sierra also produces some heavy-for-caliber 22 caliber bullet options which are suited well for use with the .22 Creedmoor. In particular, their 77 Gr SMK, 80 Gr SMK, 90 Gr SMK, and 95 Gr SMK are great. The Sierra website is https://www.sierrabullets.com/, and you can find their products wherever you currently shop for reloading supplies.

John Whidden produces some of the most precise and well-built custom reloading dies you can purchase. Along with his reloading dies, he also produces reloading tools and custom rifles. He is also a reseller of Barnard Actions, Peterson Cartridge rifle brass, loaded ammunition, and projectiles. John has really stepped up for the .22 Creedmoor community by producing a great set of reloading dies which work well with our, and others, .22 Creedmoor casings. Please check out his website at https://www.whiddengunworks.com/.

Primal Rights has been a big proponent of the .22 Creedmoor since before consumers were able to purchase properly headstamped .22 Creedmoor brass. Besides having created a ton of helpful articles on reloading, and shooting in general, Primal Rights also produces and sells some advanced reloading equipment and rifle parts. In fact, we (Peterson Cartridge) personally own one of their Competition Primer Seaters which we use for our development work in our loading operation. It has worked flawlessly for us so far. Primal Rights is also a reseller of Tangent Theta optics, as well as offering marksmanship training at their facility located in South Dakota. Please check out their article on the .22 Creedmoor here https://www.primalrights.com/library/cartridge-guides/22-creedmoor, and you can check out their website here http://www.primalrights.com/.

Final Comments:

As of this writing, the .22 Creedmoor is still considered a "wildcat" cartridge since it has not yet been formally adopted by the Sporting Arms and Ammunition Manufacturers Institute (SAAMI). One of the benefits of a cartridge being standardized by SAAMI, is that manufacturers who publish loading manuals will begin publishing load data for the new cartridge. Up until now, that has not happened with the .22 Creedmoor. We hope the above data will help you shoot your .22 Creedmoor with more confidence that the load you have developed to work in your rifle, not only shoots great, but is also at a safe working pressure.

As most shooters know, Peterson Cartridge casings can handle more pressure than the SAAMI Maximum Average Pressure (MAP) lists as safe. However, we need to take a moment and caution everyone reading this data sheet not to exceed the SAAMI Maximum Average Pressure (MAP), we have listed of 62,000 psi, for the .22 Creedmoor. Just because the casings can handle extra pressure, doesn't mean you should do it. More often than not, the fastest load is not the most accurate load.

As and aside, it has been reported that when standard lead-core copper-jacketed bullets are used in the .22 Creedmoor, if the bullets are pushed at too fast a velocity, they might disintegrate in the air before they reach the target. In our opinion, the easiest way to avoid this problem is by not exceeding the established safe velocities we have listed above. We have also found that frequent rifle cleaning, to remove carbon fouling, can help prevent bullet disintegration. Similarly, choosing bullets with thicker jackets will also help prevent disintegration during flight.

Lastly, some shooters on the internet forums have used our casings to push bullets to extraordinary velocities without any problem. However, the faster you push the bullets, the higher likelihood you will experience a problem with your bullets disintegrating in flight. Also, the faster you push the bullets, in general, the shorter your barrel life will be.