

METRIC RELOADING GUIDE for Centerfire Cartridges

2/2002



VIHTAVUORI

Burning Rate Chart

This table indicates the *approximate* order of the burning rate of the commonly available powders. The table is only approximate and *not* to be used for developing loads.

	Vihtavuori	Norma	RWS	SNPE	PRB	IMR	Alliant	Hodgdon	Accurate	W-W
Fast Burning					PCL514			Clays		
	N310	R1	P805	Ba10	PCL504			Clays Int.		
			P801		PCL505		Bullseye	HP38	Solo 1000	231
	N320				PCL505					452
					PCL506	700X PB SR7625	Red Dot Green Dot	Trap100	No. 2	
			P804							473
			P803				Unique	Clays Universal	No. 5	
	N330			Ba9	PCL501			HS-6		540
	N340					SR4756	Herco			
	3N37									
	N350						Blue Dot			571
	3N38									
	N105							HS-7	No.7	
							Hercules 2400		No. 9	
		R-123	P806	S10		SR4759		H110		
	N110		R910	Tubal1	PCL512	IMR4227		H4198		296
Slow Burning										680
		200	R901					H4227	MP 5744	
	N120			Tubal2		IMR4198	Reloader 7		1680	
				Tubal3	PCL508				2015	
	N130	201	R902		PCL507	IMR3031	Reloader 11			
	N133	202						H322	2230	
								BL-(C)2	2460	748
								H335		
			R903							
						IMR4064			2520	
						IMR4895	Reloader 12	H4895		
	N135			Tubal4						
						IMR4320		Varget		
	N140		R907	Tubal5	PCL511		Reloader15	H380	2700	
	N540			Tubal6				H414		760
	N150		R904					H4350	4350	
	N550			Tubal7		IMR4350	Reloader 19			
		204						H450		
	N160					IMR4831				785
	N560		R905	Tubal8				H4831	3100	
	N165	MRP					Reloader 22	H1000		
						IMR7828		H870	8700	
	N170									

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Preface

The new Vihtavuori Metric Reloading Guide 2/2002 for Centerfire Ammunition is an updated version of the previous Vihtavuori Reloading Guide 1/2002. The contents of this new issue 2/2002 has been revised with new loading data for:

- legendary LAPUA D166 FMJBT bullet in cal. 7,62 x 53R
- cal. 7,5 x 55 Swiss GP31
- cal. .300 Remington Ultra Magnum
- cal. .38 Super Lapua, Lapua's implementation of .38 Super Auto.

All the loads in this guide are pressured according to the CIP method. The maximum loads given in the tables are determined according to the CIP/SAAMI maximum pressure specifications, whichever is lower. The listed maximum loads must never be exceeded.

Due to the differences in the cartridge components, individual weapons, shooting temperatures etc. always start developing your load by using the starting load according to the loading data. If there is no indication of the starting load, use 15 % lower charge than the listed maximum load as your starting load.

The Vihtavuori powders are manufactured by Nexplo Vihtavuori Oy in Vihtavuori plant. Sales and marketing of reloading powders as well as customer service is carried out by Nammo Lapua Oy. The list of the powder distributors can be found at **www.vihtavuori.fi/Distributors.html** The distributor information as well as the contact information for customer service is given in the back of this guide.

We wish you successful reloading with Vihtavuori powders.



Rifle Powders

N100 series

The series N100 powders are primarily rifle powders, with suitable speeds to optimize handloading from the tiny .17 Remington and .22 Hornet all the way to the monster bashing .458 Winchester Magnum. There are ten speeds in this series and they include:

N110: This is a very fast burning propellant that can be used in applications which previously used Hercules 2400, Hodgdon H110, or Winchester 296. Typical applications include: .22 Hornet, .25-20 Winchester, .357 S&W Magnum, .357 Maximum, .44 Magnum, and .45 Winchester Magnum.

N 120: This speed needs higher pressure than N110 in order to optimize burning. Burning rate falls near the various 4227s. It works superbly with comparatively light bullets in .22 caliber cartridges. It is, by nature, a limited application propellant.

N130: Burning rate is between IMR4227 and the discontinued Winchester 680. This is the powder used in factory loaded .22 and 6mm PPC.

N133: This speed is very close to IMR 4198 in quickness. Thus, it is ideal for the .222 Remington, .223 Remington, and .45-70 Government and other applications where a relatively fast burning rifle propellant is needed.

N135: This is a moderate burning propellant. It will fit applications similar to Hercules Reloder 12, IMR-4895 or IMR 4064. Applications range from the .17 Remington to the .458 Winchester.

N140: This powder can usually be used in place of Hercules Reloder 15, IMR 4320, and Hodgdon H380. Applications include: .222 Remington Magnum, .22-250 Remington (factory powder), .30-30 Winchester, .308 Winchester, .30-06 Springfield, .375 H&H Magnum, and so on.

N150: This is a moderately slow powder that can help refine rifle cartridge ballistics when N140 is just a tad too fast and N160 is a tad too slow. Works well in many applications previously filled by 760, H414, and IMR 4350.

N160: A relatively slow powder ideally suited to many magnum and standard rounds requiring a slow propellant. It has characteristics that makes it work well for applications previously using various 4350's, Hercules Reloder 19, and the various 4831's. For example some ideal applications are: .243 Winchester, .25-06 Remington, .264 Winchester Magnum, .270 Winchester (factory load), 7mm Remington Magnum, .30-06 Springfield, .300 Winchester Magnum, .338 Winchester Magnum, .375 H&H Magnum, etc. This is destined to being one of our most popular powders.

N165: A very slow burning magnum propellant for use with heavy bullets. Applications begin very heavy bullets in the .30-06, and include the .338 Winchester Magnum.

N170: Our slowest speed propellant and the slowest canister reloading powder generally available from any manufacturer.

N500 series

Adding nitroglycerol to the traditional single base powder makes possible in addition to geometry and coating a third controlled variable of ballistic properties: energy content. Vihtavuori calls powders which have nitroglycerol added (maximum 25 %) high energy NC-powders, which form N500 series.

Adding nitroglycerol to the high energy N500 series is done by impregnation. After that the grains are coated with a new type of chemical which results in very progressive burning characteristics.

The composition of a typical high energy powder is as follows:

- | | |
|------------------------|-----------------------|
| * nitrocellulose | * nitroglycerol |
| * coating agent | * stabilizer |
| * flame reducing agent | * wear reducing agent |

Geometrically the powders in the N500 series are equal to the N100 series. Although these new powders have a higher energy content, they do not cause greater wear to the gun. This is because the surface of the powder has been treated with an agent designed to reduce barrel wear.

N500 series powders work well at different temperatures, even better than the traditional N100 and N300 series. Temperature sensitivity naturally depends very much on the weapon and on the cartridge. The manufacturing technique employed permits a very high bulk density, which in turn makes it possible to use a bigger charge in a certain limited loading volume.

Vihtavuori High Energy powders are available in three burning rates:

N540: Burning rate like N140. Especially for .308 Winchester.

N550: Burning rate like N150. Especially for .308 Winchester and .30-06 Springfield.

N560: Burning rate like N160. Especially for .270 Winchester and 6.5 x 55 Swedish Mauser.

Powders For .50 BMG

For .50 BMG there are two special Vihtavuori powders available, 24N41 and 20N29. They are, like N100 series, single base surface treated powders. The burning rate of them is slower and their grain size is larger than that of the N100 series rifle powders. 24N41 is slightly faster burning than 20N29.

Handgun Powders

Handgun powders include the five N300 series propellants and two special propellants:

N310: Very fast burning and competitive with Bullseye and Accurate No.2. It has applications in a very wide range from the .25 ACP to the 9mm Luger.

N320 is a handgun powder of comparatively fast burning rate. Useful in many popular cartridges. Currently available data includes 9mm Luger, .38 Special, .357 Magnum, .44 Magnum, .45 ACP and .45 (Long) Colt. Burning rate generally is perhaps a tad faster than 231 or generally about like Red Dot.

N330: This is a handgun powder that has a burning rate similar to Green Dot, No. 5, or PB. Data is currently available for 9mm Luger, .38 Special, .40 S&W, .44 S&W Special and .45 (Long) Colt.

N340: With a burning rate not dissimilar to Winchester 540 or Herco, this powder is a wide application type. Data for the following handgun cartridges is currently available: .30 Luger, 9mm Luger, .38 S&W (Colt New Police), .38 Super Auto, .38 Special, .357 Magnum, .44 Magnum, .45 Auto and .45 (Long) Colt.

N350: This is the slowest burning propellant in the N300 series. Burning speed is about like Blue Dot, "Hi-Skor" 800-X or No. 7. Data is currently available for: 9mm Luger, .38 Super Auto, .38 Special, .357 Magnum, .44 Magnum and .45 Auto.

3N37: Burning speed is between N340 and N350, close to "Hi-Skor" 800-X, and it therefore has applications also in handgun cartridges. Data is currently available for all popular handgun calibers. The characteristics of this propellant makes it very desirable for competitive handgun shooting.

3N38: A powder for the high velocity loads of the 9mm Luger and the .38 Super with moderate bullet weight. Designed specially for competitive handgun shooting.

N105 Super Magnum: This special powder has a burning rate between N350 and N110. It is especially developed for handgun cartridges with heavy bullets and/or large case volume. Reloading data is currently available for 9 x 21mm, .38 Super Auto, .357 Magnum, .40 S&W, 10mm Auto, .44 Remington Magnum and .45 Winchester Magnum.

About the Data

Disclaimer

As Nammo Lapua Oy has no control over improper storage, handling, loading or use of our powders after they have left the factory, we make no warranty of any kind, either expressed or implied, limited or full. We specifically disclaim all warranties of fitness for a particular purpose and merchantability. We specifically disclaim all liability

for consequential damages of any kind whatsoever, whether or not due to seller's negligence or based on strict product liability or principle of indemnity or contribution, Nammo Lapua Oy neither assumes nor authorizes any person to assume for it any liability in connection with the use of this product.

How To Use The Data

Our rifle and handgun data listings generally contain maximum charges which are not to be exceeded. In some instances starting loads are also listed. Currently this booklet contains all of the data we can supply. Be certain you use the correct data and the specific bullet weight shown.

By staying 5 % below the maximum powder charge weight, pressures will be reduced by about 10 % while velocities will be only about 3 % lower than listed.

Caution: When loading handgun cartridges it is vital to maintain the minimum cartridge overall length (C.O.L.) listed in the tables. Shorter overall lengths may double chamber pressures. Longer lengths are permissible so long as the functioning of the handgun will not be impaired.

The data in the loading tables were obtained at an ambient temperature of 68 degrees Fahrenheit and relative humidity of 55 %. The values obtained were under carefully controlled conditions and may vary from those obtained with your firearm, specific component lots, loading dimensions, and loading procedures. The maximum charges must NEVER be exceeded. **Start loading with the starting load according to the loading data. If there is no indication of the starting load, use 15 % lower charge than the listed maximum.** When loading cartridges for which the listed charge is 10 grains or less, after firing 10 rounds at the minimum weight (15 % below maximum), increase charge weights by 0.2 grains and fire another 10 rounds. Repeat this procedure, if necessary, until you reach, but do not exceed, the maximum listed charge. The same process is followed for heavier charges except that charge weights from 11 to 25 grains use increments of 0.5 grains. For charges over 25 grains increments of 1.0 grains will be correct.

If even a single test round shows signs of excessive pressure discontinue the use of the load. Do not fire even a single additional cartridge. Seek qualified help before proceeding!

The traditional sign of overpressure is a flattened primer. When flattened primers start to occur, it is a definite warning that the charge should be reduced, quickly. Brass getting into the ejector and extractor cavities is a worse case. Blown out primers are worse still. If a case ruptures it may be a sign of a defective case or a truly lethal chamber pressure.

In case of overpressure signs it is wiser to back off, to be safe rather than sorry. Why risk potentially fatal injury?

Better to stop shooting and immediately discard all such reloads.

Read also the Reloading Safety Rules on pages 9 and 10.

Pressure

There are numerous factors which can change the ballistic performance of a load even when the data is followed exactly. For example: The internal dimensions of a firearm can vary greatly even between two of the same make and model. Pressures can vary to extremes as different firearms are used. Each change in brand and even within different lots of a specific brand component can cause notable ballistic changes. Too, changes in ambient temperature can also cause ballistic altering pressures. Not every bullet of a given diameter and weight will produce alike pressure. Changes in case brand can also affect ballistics. There are numerous other causes of varying pressure levels.

Therefore it is essential that the reloader be well versed in the methods of carefully working up a reload powder charge in small increments as outlined in the various reloading handbooks that are available from reliable sources. The data in this book is not intended for use by persons not thoroughly versed in such procedures.

This guide must be supplemented by a good reloading handbook such as the Lapua Reloading Manual, the DBI Metallic Cartridge Reloading, the Vihtavuori Reloading Manual or other recognized manuals that may offer all appropriate information.

Properties of Smokeless Powder

Smokeless powders, or propellants, are essentially mixtures of chemicals designed to burn under controlled conditions at the proper rate to propel a projectile from a gun.

Smokeless powders are made in three forms:

1. Thin, circular flakes or wafers
2. Small cylinders
3. Small spheres

Single-base smokeless powders derive their main source of energy from nitrocellulose.

The energy released from double-base smokeless powders is derived from both nitrocellulose and nitroglycerine.

All smokeless powders are extremely flammable by design, they are intended to burn rapidly and vigorously when ignited.

Oxygen from the air is not necessary for the combustion of smokeless powders since they contain sufficient built-in oxygen to burn completely, even in an enclosed space such as the chamber of a firearm.

In effect, ignition occurs when the powder granules are heated above their ignition temperature. This can occur by exposing powder to:

1. A flame such as a match or primer flash.
2. An electrical spark or the sparks from welding, grinding, etc..
3. Heat from an electric hot plate or a fire directed or near a closed container even if the powder itself is not exposed to the flame.

When smokeless powder burns, a great deal of gas at high temperature is formed. If the powder is confined, this gas will create pressure in the surrounding structure. The rate of gas generation is such, however, that the pressure can be kept at a low level if sufficient space is available or if the gas can escape.

In this respect smokeless powder differs from blasting agents or high explosives such as dynamite or blasting gelatin, although smokeless powder may contain chemical ingredients common to some of these products.

High explosives such as dynamite are made to detonate, that is, to change from solid state to gaseous state with evolution of intense heat at such a rapid rate that shock waves are propagated through any medium in contact with them. Such shock waves exert pressure on anything they contact, and, as a matter of practical consideration, it is almost impossible to satisfactorily vent away the effects of a detonation involving any appreciable quantity of dynamite.

Smokeless powder differs considerably in its burning characteristics from common "black powder".

Black powder burns essentially at the same rate out in the open (unconfined) as when in a gun.

When ignited in an unconfined state, smokeless powder burns inefficiently with an orange-colored flame. It produces a considerable amount of light brown noxious smelling smoke. It leaves a residue of ash and partially burned powder. The flame is hot enough to cause severe burns.

The opposite is true when it burns under pressure as in a cartridge fired in a gun. Then it produces very little smoke, a small glow, and leaves very little or no residue. The burning rate of smokeless powder increases with increased pressure.

If burning smokeless powder is confined, gas pressure will rise and eventually can cause the container to burst. Under such circumstances, the bursting of a strong container creates effects similar to an explosion.

For this reason, the Department of Transportation (formerly Interstate Commerce Commission) sets specifications for shipping containers for propellants and requires tests for loaded containers - under actual fire conditions - before approving them for use.

When smokeless powder in D.O.T. approved containers is ignited during such tests, container seams split open or lids pop off - to release gases and powder from confinement at low pressure.

How to Check Smokeless Powder for Deterioration

Although modern smokeless powders are basically free from deterioration under proper storage conditions, safe practices require a recognition of the signs of deterioration and its possible effects.

Powder deterioration can be checked by opening the cap on the container and smelling the contents.

Powder undergoing deterioration has an irritating acidic odor. (Don't confuse this with common solvent odors such as alcohol, ether and acetone).

Check to make certain that powder is not exposed to extreme heat as this may cause deterioration. Such exposure produces an acidity which accelerates further reaction and has been known, because of the heat generated by the reaction, to cause spontaneous combustion.

Never salvage powder from old cartridges and do not attempt to blend salvaged powder with new powder. Don't accumulate old powder stocks. The best way to dispose of deteriorated smokeless powder is to burn it out in the open at an isolated location in small shallow piles (not over 1" deep). The quantity burned in any one pile should never exceed one pound. Use an ignition train of slow burning combustible material so that the person may retreat to a safe distance before powder is ignited.

Considerations for Storage of Smokeless Powder

Smokeless powder is intended to function by burning, so it must be protected against accidental exposure to flame, sparks or high temperatures.

For these reasons, it is desirable that storage enclosures be made of insulating materials to protect the powder from external heat sources.

Once smokeless powder begins to burn, it will normally continue to burn (and generate gas pressure) until it is consumed.

D.O.T. approved containers are constructed to open up at low internal pressures to avoid the effects normally produced by the rupture or bursting of a strong container.

Storage enclosures for smokeless powder should be constructed in a similar manner:

1. Of fire-resistant and heat-insulating materials to protect contents from external heat.
2. Sufficiently large to satisfactorily vent the gaseous products of combustion which would result if the quantity of smokeless powder within the enclosure accidentally ignited.

If a small, tightly enclosed storage enclosure is loaded to capacity with containers of smokeless powder, the walls

of the enclosure will expand or move outwards to release the gas pressure - if the powder in storage is accidentally ignited.

Under such conditions, the effects of the release of gas pressure are similar or identical to the effects produced by an explosion.

Hence only the smallest practical quantities of smokeless powder should be kept in storage, and then in strict compliance with all applicable regulations and recommendations of the National Fire Protection Association.

Recommendations for Storage of Smokeless Powder

STORE IN A COOL, DRY PLACE. Be sure the storage area selected is free from any possible sources of excess heat and is isolated from open flame, furnaces, hot water heaters, etc. Do not store smokeless powder where it will be exposed to the sun's rays. Avoid storage in areas where mechanical or electrical equipment is in operation. Restrict from the storage areas heat or sparks which may result from improper, defective or overloaded electrical circuits.

DO NOT STORE SMOKELESS POWDER IN THE SAME AREA WITH SOLVENTS, FLAMMABLE GASES OR HIGHLY COMBUSTIBLE MATERIALS. STORE ONLY IN DEPARTMENT OF TRANSPORTATION APPROVED CONTAINERS.

Do not transfer the powder from an approved container into one which is not approved.

DO NOT SMOKE IN AREAS WHERE POWDER IS STORED OR USED. Place appropriate "NO SMOKING" signs in these areas.

DO NOT SUBJECT THE STORAGE CABINET/SHOULD BE CONSTRUCTED OF INSULATING MATERIALS AND WITH A WEAK WALL, SEAMS OR JOINTS TO PROVIDE AN EASY MEANS OF SELFVENTING.

DO NOT KEEP OLD OR SALVAGED POWDERS. Check old powders for deterioration regularly. Destroy deteriorated powders immediately.

OBEY ALL REGULATIONS REGARDING QUANTITY AND METHODS OF STORING. Do not store all your powders in one place. If you can, maintain separate storage locations. Many small containers are safer than one or more large containers.

KEEP YOUR STORAGE AND USE AREA CLEAN. Clean up spilled powder promptly. Make sure the surrounding area is free of trash or other readily combustible materials.

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Reloading Safety

Reloading is an enjoyable and rewarding hobby that is easily conducted with safety. But like many other human endeavours, carelessness or negligence can make reloading hazardous. The essence of reloading safety is proper handling and storage of primers and powder. As important is strict following of the instructions given by the manufacturers of the reloading equipment as well as the reloading components.

Before you get started, read the safety rules below and keep them in mind whenever reloading. Attention paid to detail and patience ensures safety and quality!

- Reload only when you can give it your undivided attention. **Do not reload**, when fatigued or ill. Develop your own reloading routine to avoid mistakes. Avoid haste, load at a leisurely place and keep in mind that **absolutely no reloading under the influence of alcohol or drugs!**
- Always wear proper eye protection. It is an unnecessary risk to reload without safety glasses.
- Store powder and primers out of reach of children and away from heat and open fire. **Follow the manufacturer's instructions on your powder canister. Never smoke during a reloading session!**
- Keep no more powder than needed available. Immediately return the unused powder to its original factory container to preserve its identity and usable life time.
- Do not use any powder unless its identity is positively known. Scrap all unidentified powders according to the manufacturer's instructions on your powder canister. **Keep in mind that the trial-and-error method may lead to serious injury!**
- **Do not store primers in bulk! Doing so will create a bomb!** Bulk primers will very likely mass detonate. The blast of a few hundred primers corresponds to a hand grenade in a room! Do not force primers in any circumstances. Take special care when filling and handling auto primer feed tubes. Keep primers in their original factory packing until used. Return unused primers to their original packing.
- Do not use primers if their identity is lost. Discard them according to the manufacturer's instructions.
- Start loading with the starting load according to the loading data. If there is no indication of the starting load, use 15% lower charge than the listed maximum load. Increase the charge using small steps watching for overpressure signs from the primer and the case head at each step. **If you detect overpressure signs immediately stop shooting and reduce the charge.** Disassemble always the defected cartridges. **NEVER EXCEED THE MAXIMUM LOADS!**
- Check visually the powder level in the cases so you are absolutely sure that you have no double powder charge. When a double powder charge is fired it may result in a gun damage, personal injury, even death.
- If you change the lot of any component or if you change any of the components of your reload, you must develop your load from the starting load again. A different component as well as a component from a different manufacturing lot may cause changes in cartridge pressure.
- You must absolutely follow the given cartridge overall lengths (C.O.L.) according to the reloading tables. The change in the bullet seating depth has a significant influence on the cartridge pressure.
- **Never reduce loads under the listed starting load.**
- Keep your reloading bench in good order. Clean up spilled powder and primers promptly and completely. Remember that the reloading bench is not a temporary store for other tools, used car spare parts etc.
- Use your reloading equipment according to the manufacturer's recommendations. Study the instructions carefully and don't hesitate to ask, if you don't understand everything.
- **Be safe, be conscientious!**

Reloading Safety

LEAD EXPOSURE

A continuous lead exposure has been found out to create lead accumulation to living bodies, specially to the nervous system causing little by little serious physical impairment. Some unused reloading components as well as fired cases can contain lead or lead compounds, it is possible to a reloader to get exposed during reloading. Primers and bullets contain lead and it may be present as a residue in fired cartridge cases, too.

There are different ways lead may enter the body. However, the two most common are considered to be the mouth and the breathing. Therefore with simple precautions described underneath the possible lead exposure and its dangerous consequences can be avoided.

- **WASH YOUR HANDS** thoroughly with warm water and soap after shooting or reloading.
- **DO NOT EAT OR DRINK** during a reloading session. When handling fired cartridge cases the residual containing lead most likely gets to your hands. Therefore eating something requiring a straight hand contact during a reloading session hazards the reloader to lead exposure. Keep your hands away from your nose or your mouth during a reloading session.
- **KEEP GOOD HOUSEHOLD AT YOUR RELOADING SITE.** Regular cleaning prevents the accumulation of residuals. Use a damp cloth or mop to clean up the reloading bench as well as the floor underneath. **DO NOT USE A VACUUM CLEANER!** The use of it dues to a potential risk of exposure because of spilled powder it collects up. Furthermore an ordinary vacuum cleaner more spreads than collects up the dust containing residuals. Do not use any carpet at your reloading site. Carpet is hard to keep dust-free and it can create static electricity that can accidentally fire a primer.
- **PROTECT YOUR BREATHING AGAINST THE DUST IN THE RELOADING AREA.** When using a dry cleaning media in tumbling the cartridge cases keep in mind that the lead residual from the fired cases moves to the dry cleaning media, where it accumulates by use. Wear always a dust mask when pouring the dry cleaning media out of the tumbler and be careful not to spill the media on your reloading bench.

RIFLE RELOADING DATA

DISCLAIMER

All of this reloading information has been provided by Nexplo Vihtavuori Oy and Nammo Lapua Oy. The data given here were obtained in laboratory conditions following strictly the CIP (Commission International Permanente) June 13, 1990, November 9, 1993 and August 6, 1998 rules. The listed maximum loads have been determined according to the CIP/SAAMI maximum pressure specifications, whichever is lower.

These test methods have been deemed to be safe throughout the world. Pressure is measured at the case mouth or from inside the case according to the CIP. The loads published here do not exceed the maximum pressure introduced by the CIP. **DO NOT ATTEMPT ANY EXTRAPOLATIONS. PLEASE FOLLOW THE DATA AS WRITTEN.**

Before starting the reloading process see the Reloading Safety Rules. Because Nammo Lapua Oy has no control over either handling or storage of the reloading components as well as over the entire reloading process, Nammo Lapua Oy cannot accept any liability for the possible effects of the use of Lapua and/or Vihtavuori reloading components.

The load development is done according to the methods described in Vihtavuori Reloading Manual. For that as well as further reloading information see Vihtavuori Reloading Manual.

.17 Remington

Test barrel: 560 mm, 1 in 16" twist

Primers: Small Rifle

Cases: Remington, trim-to length 45.40 mm

Bullet				Powder	Starting load			Maximum load		
Weight [g] [grs]	Type	Mfg.	C.O.L. [mm]	Type	Weight [g] [grs]	Velocity [m/s]		Weight [g] [grs]	Velocity [m/s]	
1.6 25	HP	Remington	54.5	N135				1.48 22.8		1230

5.6 x 35R

Test barrel: 560 mm, 1 in 16" twist

Primers: Small Rifle

Cases: Sako, trim-to length 35.30 mm

Bullet				Powder	Starting load			Maximum load		
Weight [g] [grs]	Type	Mfg.	C.O.L. [mm]	Type	Weight [g] [grs]	Velocity [m/s]		Weight [g] [grs]	Velocity [m/s]	
2.6 40	FMJ	Sako	43.3	N110				0.55 8.5		750

.220 Russian

Test barrel: 550 mm, 1 in 14" twist

Primers: Small Rifle

Cases: LAPUA, trim-to length 38.50 mm

Bullet				Powder	Starting load			Maximum load		
Weight [g] [grs]	Type	Mfg.	C.O.L. [mm]	Type	Weight [g] [grs]	Velocity [m/s]		Weight [g] [grs]	Velocity [m/s]	
2.8 43	FMJ	Sako	49.0	N120				1.33 20.5		1110

NOTE!

WHEN ONLY THE MAXIMUM LOADS ARE SHOWN IN THE TABLES ABOVE START LOADING WITH APPROXIMATELY 15 % SMALLER POWDER CHARGE.

LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!

.22 Hornet

Test barrel: 600 mm, 1 in 16" twist
 Primers: Small Rifle
 Cases: Sako, trim-to length 35.40 mm

Bullet					Powder	Starting load			Maximum load		
Weight [g] [grs]		Type	Mfg.	C.O.L. [mm]	Type	Weight [g] [grs]		Velocity [m/s]	Weight [g] [grs]		Velocity [m/s]
2.6	40	Spire Point	Speer	43.5	N110	0.50	7.7	700	0.62	9.6	788
2.9	45	Spitzer	Speer	43.5	N110	0.46	7.1	642	0.57	8.8	723
3.2	50	Spitzer	Speer	43.5	N110	0.46	7.1	598	0.54	8.3	672
					N120	0.60	9.3	598	0.69	10.6	682
3.6	55	Spitzer	Speer	43.5	N110	0.40	6.2	551	0.50	7.7	623
					N120	0.57	8.8	561	0.66	10.2	653

.222 Remington

Test barrel: 580 mm, 1 in 14" twist
 Primers: Small Rifle
 Cases: LAPUA, trim-to length 43.00 mm

Bullet					Powder	Starting load			Maximum load		
Weight [g] [grs]		Type	Mfg.	C.O.L. [mm]	Type	Weight [g] [grs]		Velocity [m/s]	Weight [g] [grs]		Velocity [m/s]
2.6	40	Spire Point	Speer	53.0	N110	0.93	14.4	907	1.05	16.2	977
2.6	40	Hornet	Sierra	52.0	N120	1.30	20.1	991	1.35	20.8	1028
2.6	40	Spire Point	Speer	52.0	N120	1.29	19.9	973	1.38	21.3	1051
				52.5	N130	1.40	21.6	973	1.51	23.3	1047
				52.0	N133	1.48	22.8	984	1.63	25.2	1072
2.9	45	Spitzer	Speer	53.0	N110	0.88	13.6	848	1.00	15.4	917
					N120	1.25	19.3	925	1.34	20.7	993
2.9	45	Hornet	Hornady	53.6	N130	1.41	21.8	951	1.50	23.1	1018
2.9	45	Spitzer	Speer	53.0	N133	1.47	22.7	943	1.57	24.2	1015
3.2	50	SXSP	Hornady	53.8	N120	1.21	18.7	876	1.30	20.1	942
					N130	1.33	20.5	889	1.43	22.1	958
					N133	1.44	22.2	905	1.55	23.9	980
					N135	1.40	21.6	831	1.52	23.5	922
3.6	55	SP	Sako	54.2	N120	1.17	18.1	834	1.27	19.6	901
3.6	55	FMJBT	Hornady	53.8	N130	1.29	19.9	854	1.39	21.5	922
3.6	55	SP	Sako	54.2	N133	1.41	21.8	871	1.51	23.3	934
					N135	1.46	22.5	866	1.51	23.3	899
3.9	60	HP	Hornady	54.0	N120	1.11	17.1	779	1.23	19.0	850
				53.8	N130	1.25	19.3	805	1.37	21.1	877
				54.0	N133	1.35	20.8	820	1.46	22.5	892
					N135	1.40	21.6	836	1.52	23.5	868
4.5	69	HPBT	Sierra*	54.0	N130	1.18	18.2	749	1.26	19.4	805
					N133	1.27	19.6	768	1.36	21.0	820
					N135	1.31	20.2	772	1.43	22.1	831
					N140	1.44	22.2	778	1.53	23.6	837

*) The test barrel rifle twist 1 in 7"

BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!
 LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

.223 Remington

Test barrel: 620, 1 in 12" twist

Primers: Small Rifle

Cases: LAPUA, trim-to length 44.50 mm

Bullet					Powder	Starting load			Maximum load		
Weight [g] [grs]		Type	Mfg.	C.O.L. [mm]	Type	Weight [g] [grs]		Velocity [m/s]	Weight [g] [grs]		Velocity [m/s]
2.6	40	Spire Point	Speer	52.7	N120	1.45	22.4	1028	1.56	24.1	1109
					N130	1.58	24.4	1036	1.70	26.3	1123
					N133	1.62	25.0	1020	1.74	26.9	1102
2.9	45	Spitzer	Speer	54.0	N120	1.41	21.8	971	1.52	23.5	1055
					N130	1.52	23.5	986	1.66	25.6	1070
					N133	1.61	24.8	989	1.75	27.0	1086
3.2	50	TNT-HP	Speer	57.0	N135	1.65	25.5	971	1.74	26.9	1035
					N120	1.37	21.1	929	1.50	23.1	1010
					N130	1.49	23.0	944	1.61	24.8	1027
3.6	55	FMJBT	Hornady	57.0	N133	1.59	24.5	949	1.70	26.2	1036
					N135	1.62	25.0	938	1.72	26.5	1016
					N120	1.27	19.6	860	1.46	22.5	955
3.9	60	HP	Hornady	57.0	N130	1.43	22.1	893	1.56	24.1	981
					N133	1.48	22.8	892	1.64	25.3	985
					N135	1.58	24.4	909	1.73	26.7	996
4.5	69	Scenar	Lapua*	57.4	N140	1.64	25.3	878	1.74	26.9	939
					N130	1.38	21.3	852	1.54	23.8	934
					N133	1.45	22.4	845	1.62	25.0	938
4.5	69	HPBT	Sierra*	57.0	N135	1.55	23.9	872	1.68	25.9	937
					N140	1.61	24.8	841	1.72	26.5	900
					N135	1.40	21.6	847	1.49	23.0	905
4.9	75	BTHP	Hornady*	57.4	N140	1.48	22.8	835	1.63	25.2	917
					N540	1.56	24.1	878	1.70	26.2	969
					N133	1.33	20.5	782	1.49	23.0	862
					N140	1.53	23.6	802	1.71	26.4	891
					N135	1.35	20.8	751	1.52	23.5	832
					N140	1.47	22.7	754	1.64	25.3	846
*) The test barrel rifle twist 1 in 7".					N540	1.52	23.5	766	1.68	25.9	856

BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!
LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

.222 Remington Magnum

Test barrel: 580 mm, 1 in 14" twist

Primers: Small Rifle

Cases: Remington, trim-to length 46.80 mm

Bullet					Powder	Starting load			Maximum load		
Weight		Type	Mfg.	C.O.L.	Type	Weight		Velocity	Weight		Velocity
[g]	[grs]					[g]	[grs]		[g]	[grs]	
3.2	50	SXSP	Hornady	57.5	N120	1.42	21.9	950	1.52	23.5	1024
					N133	1.68	24.7	977	1.77	27.3	1056
3.6	55	SP	Sako	58.0	N120	1.39	21.5	903	1.49	23.0	977
					N133	1.63	25.2	933	1.71	26.4	1008
					N135	1.68	25.9	935	1.80	27.8	1002
3.9	60	HP	Hornady	57.9	N133	1.59	24.5	890	1.68	25.9	964
					N135	1.64	25.3	895	1.75	27.0	952
4.5	69	HPBT	Sierra*	58.0	N133	1.48	22.8	824	1.58	24.4	887
					N135	1.52	23.5	837	1.64	25.3	900
*) The test barrel rifle twist 1 in 7".											

*) The test barrel rifle twist 1 in 7".

22 PPC - USA

Test barrel: 610 mm, 1 in 14" twist

Primers: Small Rifle

Cases: Sako, trim-to length 38.30 mm

Bullet					Powder	Starting load			Maximum load		
Weight [g] [grs]		Type	Mfg.	C.O.L. [mm]	Type	Weight [g] [grs]		Velocity [m/s]	Weight [g] [grs]		Velocity [m/s]
3.4	52	HPBT	Sierra	51.4	N120	1.42	21.9	966	1.47	22.7	992
					N130	1.41	21.8	922	1.57	24.2	1016
					N133	1.50	23.1	941	1.67	25.8	1032
					N135	1.62	25.0	954	1.80	27.8	1049
3.6	55	Spitzer	Speer	51.8	N130	1.41	21.8	898	1.58	24.4	976
					N133	1.48	22.8	913	1.65	25.5	985
					N135	1.65	25.5	942	1.83	28.2	1047

5.6 x 50 Magnum

Test barrel: 600 mm, 1 in 13" twist

Primers: Small Rifle

Cases: RWS, trim-to length 49.80 mm

Bullet					Powder	Starting load			Maximum load		
Weight [g] [grs]		Type	Mfg.	C.O.L. [mm]	Type	Weight [g] [grs]		Velocity [m/s]	Weight [g] [grs]		Velocity [m/s]
2.9	45	FMJ	Sako	61.0	N135				1.86	28.7	1075
3.2	50		SP	Sako	61.2				N135	1.83	28.2
					N140				1.85	28.5	1160
3.6	55	SP	Sako	61.2	N140				1.81	27.9	1020
4.5	70	SP	Speer	61.3	N140				1.67	25.8	900

NOTE!

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LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

5.6 x 50R Magnum

Test barrel: 580 mm, 1 in 13½" twist
 Primers: Small Rifle
 Cases: RWS, trim-to length 49.80 mm

Bullet					Powder	Starting load			Maximum load		
Weight [g] [grs]		Type	Mfg.	C.O.L. [mm]	Type	Weight [g] [grs]		Velocity [m/s]	Weight [g] [grs]		Velocity [m/s]
3.2	50	FMJ	Sako	61.0	N133				1.73	26.7	1010
3.6	55		SP	Sierra	61.0				N135	1.68	25.9
					N140				1.77	27.3	960
3.9	60	SP	Hornady	61.0	N140				1.69	26.1	930
4.1	63	SP	Sierra	61.0	N140				1.68	25.9	900
4.5	70	SP	Speer	61.0	N140				1.59	24.5	860

.22-250 Remington

Test barrel: 580 mm, 1 in 14" twist
 Primers: Large Rifle
 Cases: Sako, trim-to length 48.30 mm

Bullet					Powder	Starting load			Maximum load		
Weight [g] [grs]		Type	Mfg.	C.O.L. [mm]	Type	Weight [g]	[grs]	Velocity [m/s]	Weight [g]	[grs]	Velocity [m/s]
2.9	45	Spitzer	Speer	58.9	N130	2.03	31.3	1091	2.24	34.5	1184
					N135	2.24	34.6	1086	2.43	37.5	1184
					N140	2.37	36.6	1090	2.60	40.1	1201
3.2	50	Spitzer	Speer	59.6	N130	1.79	27.6	936	2.05	31.6	1074
					N135	1.96	30.3	963	2.23	34.4	1091
					N140	2.08	32.1	955	2.41	37.2	1094
					N150	2.14	33.0	956	2.48	38.3	1092
					N135	2.01	31.0	959	2.23	34.4	1055
					N140	2.17	33.5	971	2.36	36.5	1062
3.6	55	Spitzer	Speer	59.6	N150	2.23	34.4	972	2.47	38.1	1073
					N140	2.05	31.7	913	2.29	35.3	1010
					N150	2.09	32.2	907	2.37	36.5	1011
3.9	60	HP	Hornady	59.6	N140	1.93	29.8	846	2.19	33.8	938
					N540	1.84	28.4	832	2.24	34.6	983
					N150	1.98	30.6	846	2.27	35.0	943
4.5	69	HPBT	Sierra*	59.6	N550	2.00	30.8	852	2.41	37.2	1007
					N160	2.38	36.7	867	2.64	40.7	962
					N560	2.23	34.4	838	2.78	42.9	1009
*) The test barrel rifle twist 1 in 7"					N560	2.23	34.4	838	2.78	42.9	1009

*) The test barrel rifle twist 1 in 7"

NOTE!

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.220 Swift

Test barrel: 610 mm, 1 in 14" twist

Primers: Large Rifle

Cases: Remington, trim-to length 55.80 mm

Bullet					Powder	Starting load			Maximum load		
Weight		Type	Mfg.	C.O.L.	Type	Weight		Velocity	Weight		Velocity
[g]	[grs]			[mm]		[g]	[grs]	[m/s]	[g]	[grs]	[m/s]
3.2	50	FMJ	Sako	68.0	N140				2.50	38.6	1190
3.6	55	SP	Sako	68.0	N140				2.40	37.0	990
3.6	55	SP	Norma	68.0	N160				2.79	43.1	1130

5.6 x 57

Test barrel: 600 mm, 1 in 10" twist

Primers: Large Rifle

Cases: RWS, trim-to length 56.50 mm

Bullet				Powder	Starting load			Maximum load			
Weight [g] [grs]		Type	Mfg.	C.O.L. [mm]	Type	Weight [g] [grs]		Velocity [m/s]	Weight [g] [grs]		Velocity [m/s]
3.2	50	SP	Sierra	67.0	N140				2.58	39.8	1160
3.6	55	SP	Sako	67.0	N140				2.49	38.4	1110
4.8	74	FMJ	RWS	67.7	N160				2.64	40.7	995

5.6 x 52R

Test barrel: 600 mm, 1 in 10¹/₂" twist

Primers: Large Rifle

Cases: Norma, trim-to length 51.80 mm

Bullet				Powder	Starting load			Maximum load			
Weight [g] [grs]		Type	Mfg.	C.O.L. [mm]	Type	Weight [g] [grs]		Velocity [m/s]	Weight [g] [grs]		Velocity [m/s]
4.6	71	SP	RWS	63.3	N135				1.54	23.8	835
					N140				1.66	25.6	865
					N160				1.96	30.2	830

6 PPC - USA

Test barrel: 580 mm, 1 in 14" twist

Primers: Small Rifle

Cases: Sako, trim-to length 38.30 mm

Bullet				Powder	Starting load			Maximum load			
Weight [g] [grs]		Type	Mfg.	C.O.L. [mm]	Type	Weight [g] [grs]		Velocity [m/s]	Weight [g] [grs]		Velocity [m/s]
4.4	68	HPFB	Euber	53.6	N130	1.52	23.4	842	1.68	25.9	927
					N133	1.63	25.1	839	1.82	28.1	949
4.5	70	HPBT	Sierra	53.6	N120	1.39	21.5	809	1.55	23.9	901
					N130	1.52	23.5	836	1.69	26.1	925
					N133	1.59	24.5	825	1.79	27.6	934

NOTE!

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LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!

6mm BR Norma

Test barrel: 650 mm, 1 in 8" twist
 Primers: Small Rifle
 Cases: LAPUA, trim-to length 38.30 mm

Bullet					Powder	Starting load			Maximum load		
Weight [g]	[grs]	Type	Mfg.	C.O.L. [mm]	Type	Weight [g]	[grs]	Velocity [m/s]	Weight [g]	[grs]	Velocity [m/s]
4.5	70	HPBT	Sierra	53.0	N133	1.54	23.7	821	1.83	29.2	946
					N135	1.73	26.7	852	2.15	33.2	997
5.0	77	Silver Jacket Scenar	LAPUA	60.0	N133	1.85	28.5	882	2.01	31.0	962
					N140	2.05	31.7	898	2.20	33.9	980
					N540	2.14	33.1	912	2.31	35.6	997
					N140	1.51	23.3	723	1.89	29.2	856
5.8	90	FMJ	LAPUA	60.0	N540	1.58	24.3	711	2.11	32.6	918
					N135	1.85	28.6	828	2.04	31.5	904
5.8	90	Silver Jacket Scenar	LAPUA	60.0	N140	1.96	30.2	845	2.12	32.7	920
					N540	2.02	31.2	852	2.19	33.9	934
					N140	1.50	23.2	685	1.85	28.5	813
6.5	100	Mega	LAPUA	55.3	N540	1.65	25.5	709	1.98	30.6	845
					N140	1.53	23.6	685	1.84	28.4	805
6.8	105	Scenar	LAPUA	60.0	N540	1.59	24.5	684	1.93	29.8	828
					N140	1.83	28.2	761	2.02	31.1	841
6.8	105	Silver Jacket Scenar	LAPUA	60.0	N150	1.85	28.5	767	2.05	31.6	839
					N540	1.88	29.0	775	2.08	32.2	859

.243 Winchester

Test barrel: 580, 1 in 10" twist
 Primers: Large Rifle
 Cases: LAPUA, trim-to length 51.80 mm

Bullet					Powder	Starting load			Maximum load		
Weight [g]	[grs]	Type	Mfg.	C.O.L. [mm]	Type	Weight [g]	[grs]	Velocity [m/s]	Weight [g]	[grs]	Velocity [m/s]
4.5	70	SXSP	Hornady	67.0	N133	2.16	33.3	940	2.39	36.9	981
					N135	2.36	36.4	901	2.62	40.4	1009
					N140	2.51	38.7	915	2.80	43.2	1033
					N150	2.57	39.7	920	2.86	44.1	1031
					N160	2.99	46.1	916	3.32	51.2	1052
5.2	80	FMJ	Hornady	67.0	N135	2.18	33.6	865	2.40	37.0	928
					N140	2.30	35.5	870	2.55	39.4	942
					N150	2.27	35.0	877	2.52	38.9	935
					N160	2.83	43.7	874	3.15	48.6	982
5.6	87	HPBT	Hornady	68.0	N140	2.22	34.3	835	2.48	38.3	907
					N150	2.19	33.8	840	2.46	38.0	898
					N160	2.72	42.0	836	3.02	46.6	940
					N560	2.80	43.2	881	3.11	48.0	960
5.8	90	FMJ	LAPUA	68.3	N150	1.51	23.3	712	2.13	32.8	886
					N550	1.98	30.6	791	2.53	39.0	959
					N160	2.02	31.1	794	2.65	40.9	953

BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!
 LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

.243 Winchester

Bullet				Powder	Starting load			Maximum load			
Weight		Type	Mfg.	C.O.L.	Type	Weight		Velocity	Weight		Velocity
[g]	[grs]					[g]	[grs]		[g]	[grs]	
6.2	95	X	Barnes	68.8	N560	1.85	28.5	679	2.44	37.7	831
6.5	100	Mega	LAPUA	68.3	N150	1.53	23.6	693	2.10	32.4	874
					N550	2.13	32.8	782	2.76	42.0	975
					N160	2.33	35.9	809	2.78	42.8	940
					N160	2.65	40.9	797	2.94	45.4	885
6.5	100	SPBT	Hornady	67.3	N560	2.68	41.4	822	2.96	45.7	903
					N165	2.85	44.0	807	3.19	49.2	894
					N160	2.28	35.2	744	2.54	39.2	803
6.8	105	Spitzer	Speer	68.5	N560	2.28	35.2	758	2.52	38.9	829
					N550	2.24	34.6	786	2.62	40.4	891
6.8	105	Scenar	LAPUA*	68.3	N160	2.36	36.4	786	2.77	42.8	895
					N165	2.74	42.2	803	3.14	48.5	918
*) The test barrel rifle twist 1 in 8"											

*) The test barrel rifle twist 1 in 8"

6mm Remington

Test barrel: 570 mm, 1 in 9" twist

Primers: Large Rifle

Cases: Remington, trim-to length 56.50 mm

Bullet					Powder	Starting load			Maximum load		
Weight [g] [grs]		Type	Mfg.	C.O.L. [mm]	Type	Weight [g]	[grs]	Velocity [m/s]	Weight [g]	[grs]	Velocity [m/s]
4.5	70	HPBT	Sierra	71.4	N135	2.37	36.6	944	2.62	40.4	1012
					N140	2.57	39.7	960	2.81	43.4	1036
					N150	2.54	39.2	959	2.81	43.4	1029
					N160	3.06	47.2	951	3.39	52.3	1073
5.2	80	FMJ	Hornady	71.5	N135	2.12	32.7	852	2.33	36.0	904
					N140	2.30	35.5	889	2.54	39.2	941
					N150	2.22	34.3	869	2.46	38.0	925
					N160	2.86	44.1	924	3.17	48.9	989
5.6	87	SP	Hornady	71.5	N140	2.23	34.4	836	2.46	38.0	889
					N150	2.20	34.0	836	2.42	37.3	882
					N160	2.88	44.4	877	3.18	49.1	957
					N165	3.08	47.5	899	3.41	52.6	948
6.5	100	SPBT	Hornady	71.5	N160	2.70	41.7	832	2.97	45.8	892
					N165	2.81	43.4	837	3.12	48.1	896
6.8	105	Spitzer	Speer	71.5	N165	2.74	42.3	831	3.01	46.5	880

BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!

LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

.240 Weatherby Magnum

Test barrel: 600 mm, 1 in 10" twist
 Primers: Large Rifle Magnum
 Cases: Norma, trim-to length 63.25 mm

Bullet					Powder	Starting load			Maximum load		
Weight [g] [grs]		Type	Mfg.	C.O.L. [mm]	Type	Weight [g] [grs]		Velocity [m/s]	Weight [g] [grs]		Velocity [m/s]
4.9	75	HPFB	Hornady	78.1	N150	2.73	42.1	939	3.20	49.3	1088
					N550	3.02	46.6	968	3.41	52.7	1123
					N160	3.17	48.9	949	3.54	54.7	1106
5.0	77	HP	LAPUA	78.1	N150	2.79	43.0	932	3.18	49.1	1080
					N550	3.03	46.7	956	3.39	52.3	1106
					N160	3.17	48.9	948	3.53	54.5	1095
5.8	90	Scenar	LAPUA	78.1	N550	2.74	42.3	881	3.25	50.2	1024
					N160	2.98	46.0	879	3.44	53.1	1025
					N165	3.24	50.1	885	3.74	57.7	1043
6.5	90	Mega	LAPUA	78.1	N550	2.73	42.1	839	3.19	49.2	977
					N160	2.86	44.1	846	3.29	50.8	865
					N165	3.18	49.1	853	3.64	56.1	995
6.8	105	Spitzer	Speer	77.8	N160	2.52	38.9	785	3.20	49.4	947
					N560	3.00	46.3	828	3.50	54.0	973
					N165	3.08	47.5	837	3.61	55.8	980

.25-06 Remington

Test barrel: 580 mm, 1 in 10" twist
 Primers: Large Rifle
 Cases: Sako, trim-to length 63.10 mm

Bullet				Powder	Starting load			Maximum load			
Weight [g] [grs]		Type	Mfg.	C.O.L. [mm]	Type	Weight [g] [grs]		Velocity [m/s]	Weight [g] [grs]		Velocity [m/s]
5.6	87	SPBT	Speer	79.3	N140	2.11	32.6	889	2.73	42.1	959
					N150	2.27	35.1	840	2.90	44.7	978
					N160	2.92	45.0	885	3.54	54.6	1017
6.5	100	SPBT	Speer	81.2	N165	3.27	50.4	907	3.93	60.7	1046
					N140	2.49	38.4	844	2.88	44.5	925
					N150	2.57	39.7	856	2.97	45.8	930
					N160	3.16	48.8	880	3.55	54.8	966
					N560	2.92	45.0	847	3.58	55.2	988
					N165	3.31	51.1	889	3.80	58.6	979
7.8	120	Spizer	Speer	80.2	N170	3.25	50.2	831	4.04	62.3	973
					N150	1.73	26.7	642	2.31	35.6	774
					N160	2.24	34.6	710	2.93	45.2	842
					N560	2.55	39.4	744	3.23	49.8	888
					N165	2.43	37.5	731	3.12	48.1	850
7.8	120	HPBT	Sierra	80.0	N170	2.92	45.1	759	3.58	55.2	871
					N160	2.55	39.3	745	3.08	47.6	869
					N560	2.73	42.1	769	3.32	51.3	901
					N165	2.83	43.6	774	3.37	52.0	887
					N170	3.08	47.6	766	3.78	58.6	902

BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!
 LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

.260 Remington

Test barrel: 550 mm, 1 in 9" twist
 Primers: Large Rifle
 Cases: Necked-up LAPUA .243 Winchester,
 trim-to length 51.0 mm

Bullet					Powder	Starting load			Maximum load		
Weight [g]	Weight [grs]	Type	Mfg.	C.O.L. [mm]	Type	Weight [g]	Weight [grs]	Velocity [m/s]	Weight [g]	Weight [grs]	Velocity [m/s]
6.5	100	HPFB	Sierra	67.5	N140	2.19	33.8	829	2.57	39.6	940
					N150	2.20	33.9	817	2.59	39.9	925
					N540	2.29	35.3	834	2.65	40.8	933
7.0	108	Scenar	LAPUA	71.0	N150	2.18	33.6	789	2.52	38.9	891
					N540	2.26	34.8	801	2.57	39.6	903
					N160	2.56	39.4	809	2.90	44.8	925
7.8	120	SP	Speer	71.0	N540	2.12	32.8	745	2.46	38.0	850
					N550	2.26	34.8	765	2.62	40.5	861
					N160	2.35	36.3	749	2.78	42.9	863
9.0	139	Scenar	LAPUA	71.0	N550	2.03	31.3	679	2.44	37.7	791
					N160	2.20	33.9	684	2.61	40.2	791
					N560	2.46	38.0	693	2.84	43.8	809
10.0	155	Mega	LAPUA	69.5	N160	2.04	31.5	650	2.39	36.8	732
					N560	2.24	34.1	641	2.70	41.6	757
					N165	2.40	37.1	664	2.81	43.3	778

6.5 x 55 Swedish Mauser

Test barrel: 630", 1 in 8 1/2" twist
 Primers: Large Rifle
 Cases: LAPUA, trim-to length 54.80 mm

Bullet					Powder	Starting load			Maximum load		
Weight [g]	Weight [grs]	Type	Mfg.	C.O.L. [mm]	Type	Weight [g]	Weight [grs]	Velocity [m/s]	Weight [g]	Weight [grs]	Velocity [m/s]
5.0	77	SP	Norma	66.5	N133				2.75	42.4	1030
					N135				2.86	44.1	1030
					N140				2.92	45.1	1035
5.2	80	FMJ	Norma	66.5	N140				2.88	44.4	1000
5.5	85	HP	Sierra	71.1	N150	2.84	43.8	915	2.99	46.1	991
6.5	100	HP	Sierra	72.4	N140	2.59	40.0	839	2.74	42.3	890
					N540	2.58	39.8	823	2.82	43.5	908
					N150	2.64	40.7	832	2.81	43.4	891
6.5	100	HP	Sierra	72.4	N550	2.76	42.6	850	2.99	46.1	932
					N160	3.07	47.4	850	3.28	50.6	916
					N160	2.99	46.1	838	3.30	50.9	922

NOTE!

WHEN ONLY THE MAXIMUM LOADS ARE SHOWN IN THE TABLES ABOVE START LOADING WITH APPROXIMATELY 15 % SMALLER POWDER CHARGE.

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 LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

6.5 x 55 Swedish Mauser

Bullet				Powder	Starting load			Maximum load			
Weight		Type	Mfg.	C.O.L.	Type	Weight		Velocity	Weight		Velocity
[g]	[grs]					[g]	[grs]		[m/s]	[g]	
7.0	108	Scenar	LAPUA	78.0	N140	2.37	36.6	771	2.59	40.0	849
					N540	2.43	37.5	797	2.65	40.9	877
					N150	2.56	39.5	830	2.73	42.1	881
					N550	2.66	41.0	829	2.88	44.4	912
					N160	3.04	46.9	849	3.20	49.4	903
					N560	3.12	48.1	846	3.35	51.7	918
					N165	3.16	48.8	860	3.32	51.2	914
7.0	108	Silver Jacket Scenar	LAPUA	80.0	N140	2.42	37.3	822	2.70	41.7	898
					N540	2.52	38.9	825	2.80	43.1	920
					N150	2.49	38.4	817	2.81	43.4	907
7.8	120	HPBT	Sierra	76.8	N140	2.26	34.9	716	2.56	39.5	800
					N540	2.38	36.7	754	2.64	40.7	833
					N150	2.35	36.3	729	2.63	40.6	809
					N550	2.56	39.5	775	2.81	43.4	863
					N160	2.89	44.6	795	3.14	48.5	860
					N560	3.03	46.8	792	3.20	49.4	854
					N140	2.25	34.7	699	2.61	40.3	810
8.0	123	Scenar	LAPUA	80.0	N540	2.34	36.2	708	2.70	41.7	826
					N150	2.37	36.6	703	2.71	41.8	817
					N150	2.40	37.1	778	2.68	41.3	848
8.0	123	Silver Jacket Scenar	LAPUA	80.0	N550	2.41	37.2	766	2.82	43.5	880
					N160	2.75	42.4	790	2.92	45.1	840
					N140	2.19	33.8	698	2.47	38.1	775
8.4	130	HPBT	Norma	80.0	N540	2.24	34.6	718	2.52	38.9	795
					N150	2.19	33.8	691	2.51	38.7	772
					N550	2.46	38.0	733	2.74	42.3	820
					N160	2.70	41.7	730	2.99	46.1	811
					N560	2.94	45.4	770	3.20	49.4	850
					N150	2.19	33.8	665	2.49	38.4	749
					N550	2.45	37.8	715	2.66	41.0	787
9.0	139	HPBT	Norma	78.0	N160	2.65	40.9	707	2.90	44.8	782
					N560	2.79	43.1	716	3.10	47.8	812
					N165	2.93	45.2	734	3.18	49.1	806
					N150	2.07	31.9	641	2.40	37.0	720
9.0	139	Scenar	LAPUA	79.4	N550	2.38	36.7	693	2.60	40.1	767
					N160	2.67	41.2	720	2.88	44.4	785
					N560	2.80	43.2	735	3.04	46.9	809
					N165	2.88	44.4	731	3.15	48.6	803

BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!
LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

6.5 x 55 Swedish Mauser

Bullet					Powder	Starting load			Maximum load		
Weight [g] [grs]		Type	Mfg.	C.O.L. [mm]	Type	Weight [g] [grs]		Velocity [m/s]	Weight [g] [grs]		Velocity [m/s]
9.0	139	Silver Jacket Scenar	LAPUA	80.0	N550	2.37	36.6	710	2.68	41.3	822
					N160	2.54	39.2	746	2.88	44.4	807
					N560	2.73	42.1	734	3.10	47.8	837
9.1	140	HPBT	Sierra	78.5	N150	2.15	33.2	664	2.45	37.8	737
					N550	2.41	37.2	700	2.65	40.9	776
					N160	2.74	42.3	730	2.96	45.7	794
					N560	2.86	44.1	748	3.08	47.5	818
					N165	2.92	45.1	735	3.18	49.1	807
9.3	144	FMJBT	LAPUA	79.0	N150	2.08	32.1	670	2.24	34.6	713
					N160	2.68	41.4	727	2.86	44.1	769
					N560	2.80	43.2	725	3.08	47.5	807
					N165	2.75	42.4	731	2.94	46.0	775
					N170	2.98	46.0	679	3.31	51.1	770
10.0	155	HPBT	Sierra	76.0	N150	2.02	31.2	624	2.27	35.0	684
					N550	2.28	35.2	658	2.54	39.2	727
					N160	2.54	39.2	666	2.82	43.5	740
10.0	155	HPBT	Sierra	79.0	N560	2.57	39.7	668	2.86	44.1	749
					N165	2.65	40.9	657	3.00	46.3	739
					N170	2.77	42.7	638	3.21	49.5	742
10.0	155	Mega	LAPUA	73.0	N560	2.61	40.3	660	3.00	46.3	748
					N165	2.62	40.4	655	3.05	47.1	733
10.4	160	RN	Hornady	77.1	N140				2.39	36.9	715
					N160				2.91	44.9	765

6.5 - .284 Norma

Test barrel: 625 mm, 1 in 8½" twist

Primers: Large Rifle

Cases: Lapua, trim-to length 55.00 mm

Bullet					Powder	Starting load			Maximum load		
Weight [g] [grs]		Type	Mfg.	C.O.L. [mm]	Type	Weight [g] [grs]		Velocity [m/s]	Weight [g] [grs]		Velocity [m/s]
7.0	108	Scenar	LAPUA	79.0	N160	3.30	50.9	939	3.56	54.9	992
					N560	3.63	56.0	941	3.85	59.4	997
					N165	3.70	57.1	935	3.90	60.2	982
7.0	108	Silver Jacket Scenar	LAPUA	79.0	N550	3.08	47.5	911	3.40	52.5	988
					N160	3.31	51.1	933	3.64	56.2	1001
					N560	3.61	55.7	912	3.87	59.7	974

NOTE!

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BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!

LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

6.5 - .284 Norma

Test barrel: 625 mm, 1 in 8½" twist
 Primers: Large Rifle
 Cases: Lapua, trim-to length 55.00 mm

Bullet				Powder	Starting load			Maximum load			
Weight		Type	Mfg.	C.O.L.	Type	Weight		Velocity	Weight		Velocity
[g]	[grs]			[mm]		[g]	[grs]	[m/s]	[g]	[grs]	[m/s]
8.0	123	Scenar	LAPUA	79.0	N160	2.80	43.2	812	3.40	52.5	918
					N560	3.42	52.8	871	3.57	55.1	942
					N165	3.14	48.5	848	3.74	57.7	931
8.0	123	Silver Jacket Scenar	LAPUA	79.0	N160	2.98	46.0	828	3.43	52.9	921
					N560	3.54	54.6	881	3.79	58.5	963
					N165	3.61	55.7	848	3.88	59.9	946
9.0	139	Scenar	LAPUA	79.0	N160	2.87	44.3	804	3.07	47.4	852
					N560	3.28	50.6	850	3.50	54.0	892
					N165	2.89	44.6	791	3.26	50.3	847
9.0	139	Silver Jacket Scenar	LAPUA	79.0	N160	2.78	42.9	776	3.27	50.5	855
					N560	3.31	51.1	813	3.57	55.1	901
					N165	3.12	48.1	798	3.68	56.8	881

6.5 x 57

Test barrel: 600 mm, 1 in 8" twist
 Primers: Large Rifle
 Cases: RWS, trim-to length 56.50 mm

Bullet				Powder	Starting load			Maximum load		
Weight [g]	Type	Mfg.	C.O.L. [mm]	Type	Weight [g]	Velocity [m/s]		Weight [g]	Velocity [m/s]	
5.5	85	HP	Sierra	73.0	N135			2.80	43.2	1025
6.5	100	SP	Hornady	76.6	N135			2.70	41.7	950
8.1	125	Partition	Nosler	81.0	N140			2.67	41.2	840
9.1	140	SP	Speer	81.5	N140			2.64	40.7	820
10.1	156	SP	Norma	81.5	N160			2.89	44.6	780
10.4	160	RN	Hornady	78.1	N160			2.85	44.0	730

6.5 x 57R

Test barrel: 600 mm, 1 in 8" twist
 Primers: Large Rifle
 Cases: RWS, trim-to length 56.50 mm

Bullet				Powder	Starting load			Maximum load		
Weight [g]	Type	Mfg.	C.O.L. [mm]	Type	Weight [g]	Velocity [m/s]		Weight [g]	Velocity [m/s]	
5.5	85	HP	Sierra	73.0	N135			2.69	41.5	955
6.5	100	SP	Hornady	76.6	N135			2.62	40.4	880
8.1	125	Partition	Nosler	81.0	N140			2.53	39.0	800
9.1	140	Spitzer	Speer	81.5	N140			2.49	38.4	765
10.1	156	SP	Norma	81.5	N160			2.79	43.1	730

NOTE!

WHEN ONLY THE MAXIMUM LOADS ARE SHOWN IN THE TABLES ABOVE START LOADING WITH APPROXIMATELY 15 % SMALLER POWDER CHARGE.

BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!
 LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

6.5 x 68

Test barrel: 650 mm, 1 in 9½" twist
 Primers: Large Rifle
 Cases: RWS, trim-to length 67.30 mm

Bullet				Powder	Starting load			Maximum load		
Weight [g] [grs]	Type	Mfg.	C.O.L. [mm]	Type	Weight [g] [grs]	Velocity [m/s]		Weight [g] [grs]	Velocity [m/s]	
6.8 8.1	105 125	SP Partition	Nosler Nosler	82.5 86.5	N160 N160			4.34 4.15	67.0 64.0	1020 955

.264 Winchester Magnum

Test barrel: 610 mm, 1 in 9" twist
 Primers: Large Rifle Magnum
 Cases: Remington, trim-to length 63.30 mm

Bullet				Powder	Starting load			Maximum load		
Weight [g] [grs]	Type	Mfg.	C.O.L. [mm]	Type	Weight [g] [grs]	Velocity [m/s]		Weight [g] [grs]	Velocity [m/s]	
5.5 9.1 9.1 10.4	85 140 140 160	HP FMJ HPBT FMJ	Sierra Hornady Sierra Norma	78.7 82.7 84.8 84.5	N140 N160 N140 N160 N560 N160			3.72 4.35 3.10 3.70 3.54 3.72 3.65	57.4 67.1 47.8 57.1 54.6 57.4 56.3	1080 1150 920 910 858 888 820

.270 Winchester

Test barrel: 620 mm, 1 in 10" twist
 Primers: Large Rifle
 Cases: Remington, trim-to length 64.30 mm

Bullet				Powder	Starting load			Maximum load			
Weight		Type	Mfg.	C.O.L.	Type	Weight		Velocity	Weight		Velocity
[g]	[grs]					[g]	[grs]		[m/s]	[g]	
6.5	100	Spitzer	Speer	80.0	N150	2.95	45.5	910	3.22	49.7	960
					N160	3.68	56.8	927	4.09	63.1	1018
					N165	3.77	58.2	921	4.20	64.8	1005
8.4	130	SP	Remington	82.0	N160	3.34	51.5	847	3.60	55.6	905
					N560	3.56	54.9	856	3.85	59.4	925
8.4	130	SPBT	Speer	83.0	N165	3.48	53.7	838	3.84	59.3	907
9.7	150	Spitzer	Speer	82.0	N160	2.86	44.1	731	3.20	49.4	794
9.7	150	SP	Remington	82.0	N560	3.30	50.9	803	3.60	55.6	856
					N165	3.11	48.0	750	3.45	53.2	808
10.4	160	Partition	Nosler	84.6	N160	3.02	46.6	743	3.31	51.1	795
					N165	3.10	47.8	747	3.44	53.1	803

NOTE!

WHEN ONLY THE MAXIMUM LOADS ARE SHOWN IN THE TABLES ABOVE START LOADING WITH APPROXIMATELY 15 % SMALLER POWDER CHARGE.

BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!

LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

.270 Weatherby Magnum

Test barrel: 600 mm, 1 in 10" twist
 Primers: Large Rifle Magnum
 Cases: Norma, trim-to length 63.25 mm

Bullet				Powder	Starting load			Maximum load			
Weight [g]	[grs]	Type	Mfg.	C.O.L. [mm]	Type	Weight [g]	[grs]	Velocity [m/s]	Weight [g]	[grs]	Velocity [m/s]
6.5	100	PSP	Remington	79.0	N550	4.19	64.7	1006	4.69	72.4	1134
					N160	4.49	69.4	1019	4.89	75.4	1122
					N165	4.97	76.6	1019	5.42	83.7	1130
8.4	130	PSPCL	Remington	82.2	N160	4.18	64.5	912	4.65	71.7	1010
					N165	4.49	69.3	903	4.97	76.6	1006
					N560	4.60	71.0	923	5.02	77.5	1012
8.7	135	HPBT	Sierra	83.0	N160	4.12	63.6	874	4.46	68.8	971
					N165	4.49	69.3	892	4.72	72.8	995
					N560	4.53	69.9	929	4.84	74.6	1018
9.7	150	Partition	Nosler	82.5	N560	4.29	66.2	874	4.63	71.5	960
					N165	4.20	64.9	848	4.73	73.0	952
					N170	4.61	71.2	853	5.16	79.7	962

NOTE: LOADS LESS THAN ABOVE LISTED STARTING LOADS MAY GENERATE EXCESSIVE CHAMBER PRESSURE AND MUST NOT BE USED!

7mm-08 Remington

Test barrel: 610 mm, 1 in 9 1/2" twist
 Primers: Large Rifle
 Cases: Remington, trim-to length 51.50 mm

Bullet					Powder	Starting load			Maximum load		
Weight [g] [grs]		Type	Mfg.	C.O.L. [mm]	Type	Weight [g] [grs]		Velocity [m/s]	Weight [g] [grs]		Velocity [m/s]
6.5	100	HP	Hornady	69.0	N130	2.40	37.0	870	2.64	40.7	945
					N133	2.53	39.0	886	2.80	43.2	955
					N135	2.68	41.4	877	2.95	45.5	971
					N140	2.75	42.4	869	3.06	47.2	971
					N150	2.88	44.4	890	3.20	49.4	982
7.8	120	Spitzer	Sierra	69.6	N135	2.51	38.7	798	2.77	42.7	882
					N140	2.66	41.0	807	2.94	45.4	897
					N150	2.73	42.1	818	3.04	46.9	904
9.1	140	Ballistic Tip	Nosler	69.6	N135	2.30	35.5	707	2.53	39.0	781
					N140	2.50	38.6	734	2.76	42.6	810
					N150	2.54	39.2	737	2.82	43.5	808
10.4	160	SPBT	Sierra	71.0	N140	2.36	36.4	690	2.61	40.3	753
					N150	2.38	36.7	691	2.64	40.7	747
					N160	2.97	45.8	738	3.25	50.2	813
10.9	168	HPBT	Sierra	71.0	N150	2.27	35.0	670	2.53	39.0	731
					N550	2.42	37.3	696	2.72	42.0	772
					N160	2.78	42.9	700	3.04	46.9	764
11.3	175	Mag-Tip	Speer	71.0	N140	2.13	32.9	615	2.35	36.3	669
					N150	2.07	31.9	595	2.28	35.2	647
					N160	2.55	39.4	640	2.79	43.1	700

BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!
 LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

7 x 57

Test barrel: 550 mm, 1 in 9 1/2" twist
 Primers: Large Rifle
 Cases: Sako, trim-to length 56.80 mm

Bullet					Powder	Starting load			Maximum load		
Weight [g]	[grs]	Type	Mfg.	C.O.L. [mm]	Type	Weight [g]	[grs]	Velocity [m/s]	Weight [g]	[grs]	Velocity [m/s]
7.8	120	Spitzer	Sierra	76.5	N135	2.55	39.4	776	2.81	43.4	861
					N140	2.72	42.0	793	2.99	46.1	876
					N150	2.75	42.4	798	3.02	46.6	878
9.1	140	Ballistic Tip	Nosler	77.5	N140	2.47	38.1	708	2.75	42.4	783
					N150	2.58	39.8	729	2.83	43.7	792
10.4	160	SPBT	Sierra	77.5	N150	2.43	37.5	673	2.69	41.5	736
					N160	2.92	45.1	687	3.20	49.4	774
11.3	175	Mag-Tip	Speer	77.0	N160	2.63	40.6	630	2.97	45.8	707
					N165	2.89	44.6	655	3.21	49.5	719

7 x 57R

Test barrel: 550 mm, 1 in 9 1/2" twist
 Primers: Large Rifle
 Cases: RWS, trim-to length 56.80 mm

Bullet					Powder	Starting load			Maximum load		
Weight [g]	[grs]	Type	Mfg.	C.O.L. [mm]	Type	Weight [g]	[grs]	Velocity [m/s]	Weight [g]	[grs]	Velocity [m/s]
7.8	120	Spitzer	Sierra	76.5	N135	2.45	37.8	743	2.70	41.7	826
					N140	2.57	39.7	745	2.86	44.1	836
					N150	2.63	40.6	764	2.89	44.6	840
9.1	140	Ballistic Tip	Nosler	77.5	N140	2.39	36.9	687	2.62	40.4	747
					N150	2.41	37.2	688	2.69	41.5	757
10.4	160	SPBT	Sierra	77.5	N150	2.31	35.6	642	2.54	39.2	701
					N160	2.78	42.9	646	3.08	47.5	739
11.3	175	Mag-Tip	Speer	77.0	N160	2.54	39.2	609	2.81	43.4	670
					N165	2.72	42.0	620	3.00	46.3	677

7 x 64

Test barrel: 610 mm, 1 in 10" twist
 Primers: Large Rifle
 Cases: Sako, trim-to length 63.80 mm

Bullet					Powder	Starting load			Maximum load		
Weight [g]	[grs]	Type	Mfg.	C.O.L. [mm]	Type	Weight [g]	[grs]	Velocity [m/s]	Weight [g]	[grs]	Velocity [m/s]
5.1	79	SP	Sako	75.4	N120				2.70	41.7	1050
7.8	120	SP	Hornady	82.8	N140				3.31	51.1	970
					N160				3.88	59.9	985
8.0	123	SP	RWS	80.4	N140				3.30	50.9	950
					N160				3.85	59.4	935

NOTE!

WHEN ONLY THE MAXIMUM LOADS ARE SHOWN IN THE TABLES ABOVE START LOADING WITH APPROXIMATELY 15 % SMALLER POWDER CHARGE.

BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!

LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

7 x 64

Bullet					Powder	Starting load			Maximum load		
Weight [g] [grs]		Type	Mfg.	C.O.L. [mm]	Type	Weight [g] [grs]		Velocity [m/s]	Weight [g] [grs]		Velocity [m/s]
9.0	139	SP	Hornady	84.0	N140				3.15	48.6	880
10.0	155	SP	Hornady	83.8	N160				3.76	58.0	880
10.4	160	SP	Nosler	84.0	N160				3.71	57.3	885
11.0	170	SP	Sako	84.0	N160				3.66	56.5	860
11.3	175	SP	Hornady	82.8	N160				3.68	56.8	840

7mm Remington Magnum

Test barrel: 610 mm, 1 in 9" twist

Primers: Large Rifle Magnum

Cases: LAPUA, trim-to length 63.30 mm

Bullet					Powder	Starting load			Maximum load		
Weight [g] [grs]		Type	Mfg.	C.O.L. [mm]	Type	Weight [g] [grs]		Velocity [m/s]	Weight [g] [grs]		Velocity [m/s]
6.5	100	HP	Hornady	81.0	N160	4.44	68.5	995	4.86	75.0	1088
					N560	4.29	66.2	954	5.02	77.4	1081
7.8	120	Spitzer	Sierra	83.0	N160	4.22	65.1	916	4.64	71.5	1004
					N165	4.48	69.2	909	4.94	76.3	1005
					N560	4.09	63.1	900	4.77	73.6	1012
9.4	145	SPBT	Speer	83.0	N160	3.64	56.2	809	4.06	62.6	884
					N560	3.80	58.6	850	4.22	65.2	931
					N165	3.98	61.4	827	4.39	67.7	902
10.4	160	Grand Slam	Speer	82.0	N160	3.32	51.3	751	3.65	56.3	806
					N560	3.43	53.0	794	3.81	58.8	860
					N165	3.57	55.1	767	3.93	60.7	825
10.4	160	Spitzer	Sierra	82.0	N160	3.42	52.7	743	3.91	60.3	828
					N165	2.71	41.8	655	3.97	61.2	825
					N560	3.21	49.6	737	4.18	64.4	870
10.9	168	HPBT	Sierra	83.5	N165	3.57	55.2	740	4.21	65.0	822
					N170	4.02	62.0	743	4.54	70.1	828
					N560	3.57	55.1	754	4.14	63.9	852
11.3	175	SBT	Sierra	83.5	N165	3.03	46.7	685	3.81	58.8	787
					N170	3.59	55.4	717	4.30	66.4	800
					N560	3.17	48.9	703	3.82	59.0	815

NOTE!

WHEN ONLY THE MAXIMUM LOADS ARE SHOWN IN THE TABLES ABOVE START LOADING WITH APPROXIMATELY 15 % SMALLER POWDER CHARGE.

BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!

LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

7mm Weatherby Magnum

Test barrel: 660 mm, 1 in 9" twist
 Primers: Large Rifle Magnum
 Cases: Norma, trim-to length 64.50 mm

Bullet					Powder	Starting load			Maximum load		
Weight [g] [grs]		Type	Mfg.	C.O.L. [mm]	Type	Weight [g] [grs]		Velocity [m/s]	Weight [g] [grs]		Velocity [m/s]
6.5	100	HP	Hornady	81.5	N160	4.62	71.3	1037	5.10	78.7	1149
					N560	4.84	74.7	1049	5.30	81.9	1170
7.8	120	Siptzer	Sierra	82.5	N160	4.39	67.7	960	4.83	74.6	1057
					N165	4.76	73.5	973	5.20	80.3	1072
10.4	160	Spitzer	Sierra	82.5	N560	4.67	72.0	979	5.07	78.3	1079
					N160	3.96	61.1	828	4.39	67.8	912
					N165	4.29	66.2	838	4.69	72.4	924
					N560	4.14	63.9	842	4.53	69.9	927
10.9	168	HPBT	Sierra	81.5	N160	3.90	60.2	812	4.23	65.3	879
					N165	4.22	65.2	819	4.51	69.6	888
					N560	4.06	62.6	817	4.42	68.1	909

NOTE: LOADS LESS THAN ABOVE LISTED STARTING LOADS MAY GENERATE EXCESSIVE CHAMBER PRESSURE AND MUST NOT BE USED!

.30 Carbine

Test barrel: 460 mm, 1 in 10" twist
 Primers: Small Rifle
 Cases: Federal, trim-to length 32.60 mm

Bullet				Powder	Starting load			Maximum load			
Weight		Type	Mfg.	C.O.L.	Type	Weight		Velocity	Weight		Velocity
[g]	[grs]			[mm]		[g]	[grs]	[m/s]	[g]	[grs]	[m/s]
6.5	100	Plinker	Speer	42.5	N110	0.86	13.3	595	0.94	14.5	647
7.1	110	Spire Point	Speer	42.5	N110	0.77	11.9	537	0.86	13.3	582

.30-30 Winchester

Test barrel: 510 mm, 1 in 12" twist
 Primers: Large Rifle
 Cases: Remington, trim-to length 51.60 mm

Bullet					Powder	Starting load			Maximum load		
Weight [g] [grs]		Type	Mfg.	C.O.L. [mm]	Type	Weight [g] [grs]		Velocity [m/s]	Weight [g] [grs]		Velocity [m/s]
6.8	105	HP	Speer	64.5	N130	1.90	29.4	742	2.11	32.5	813
					N133	2.11	32.6	775	2.35	36.3	843
8.5	130	FSP	Speer	64.7	N120	1.60	24.7	655	1.79	27.6	714
					N130	1.77	27.3	669	1.98	30.6	738
					N133	1.91	29.5	682	2.13	32.9	752
					N135	2.02	31.2	683	2.24	34.6	748
9.7	150	FSP	Speer	64.5	N120	1.42	21.9	556	1.57	24.2	605
					N130	1.60	24.7	583	1.78	27.5	641
					N133	1.66	25.6	590	1.85	28.5	645
					N135	1.90	29.3	610	2.10	32.4	669
					N140	2.04	31.5	613	2.25	34.7	683

BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!
 LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

.30-30 Winchester

Bullet				Powder	Starting load			Maximum load			
Weight [g] [grs]		Type	Mfg.	C.O.L. [mm]	Type	Weight [g] [grs]		Velocity [m/s]	Weight [g] [grs]		Velocity [m/s]
11.0	170	FSP	Speer	64.5	N130	1.54	23.8	553	1.71	26.4	602
					N133	1.63	25.2	548	1.79	27.6	594
					N135	1.75	27.0	556	1.95	30.1	614
					N140	1.83	28.2	550	2.05	31.6	617

.300 Savage

Test barrel: 600 mm, 1 in 12" twist

Primers: Large Rifle

Cases: Remington, trim-to length 47.30 mm

Bullet				Powder	Starting load			Maximum load			
Weight [g] [grs]		Type	Mfg.	C.O.L. [mm]	Type	Weight [g] [grs]		Velocity [m/s]	Weight [g] [grs]		Velocity [m/s]
6.5	100	HP	LAPUA	62.5	N120	2.13	32.9	862	2.45	37.7	985
					N130	2.36	36.5	903	2.59	40.0	996
					N133	2.52	38.9	883	2.85	44.0	983
8.1	125	TNT-HP	Speer	65.5	N120	2.01	31.0	745	2.27	35.1	837
					N130	2.16	33.3	776	2.42	37.4	863
					N133	2.49	38.4	806	2.71	41.8	884
9.7	150	Mega	LAPUA	61.5	N130	1.82	28.1	665	2.18	33.7	750
					N135	2.18	33.7	687	2.50	38.5	771
					N140	2.37	36.5	699	2.72	42.0	792
10.7	165	SBT	Sierra	66.0	N133	2.14	33.0	670	2.42	37.3	756
					N135	2.30	35.5	691	2.53	39.0	761
					N140	2.40	37.0	692	2.68	41.4	784
12.0	185	Mega	LAPUA	66.0	N135	2.08	32.1	611	2.44	37.6	704
					N140	2.23	34.5	631	2.59	40.0	714
					N540	2.28	35.2	623	2.66	41.0	719

.308 Winchester

Test barrel: 610 mm, 1 in 12" twist

Primers: Large Rifle

Cases: LAPUA, trim-to length 51.00 mm

Bullet				Powder	Starting load			Maximum load			
Weight		Type	Mfg.	C.O.L.	Type	Weight		Velocity	Weight		Velocity
[g]	[grs]			[mm]		[g]	[grs]	[m/s]	[g]	[grs]	[m/s]
3.7	57	ALS*)	LAPUA	67.0	N110	1.45	22.4	911	2.20	33.9	1197
6.5	100	HP	LAPUA	67.0	N120	2.09	32.3	848	2.33	36.0	930
					N130	2.35	36.3	892	2.64	40.7	976
					N135	2.68	41.4	906	3.03	46.8	1002

*) Note: A muzzle velocity exceeding 1000 m/s may lead to severe barrel fouling!

BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!
LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

.308 Winchester

Bullet					Powder	Starting load			Maximum load		
Weight [g] [grs]		Type	Mfg.	C.O.L. [mm]	Type	Weight [g] [grs]		Velocity [m/s]	Weight [g] [grs]		Velocity [m/s]
7.1	110	HP	Sako	67.5	N120	2.35	36.3	853	2.59	38.6	935
					N130	2.59	40.0	881	2.86	44.1	959
					N133	2.80	43.2	895	3.08	47.5	978
8.0	123	FMJ	LAPUA	66.9	N130	2.30	35.5	793	2.66	41.0	891
					N135	2.75	42.4	837	2.98	46.0	900
					N130	2.46	38.0	836	2.70	41.7	908
8.1	125	Ballistic Tip	Nosler	70.0	N133	2.66	41.0	848	2.91	44.9	923
					N135	2.77	42.7	852	3.06	47.2	929
					N140	2.93	45.2	855	3.23	49.8	936
					N135	2.05	31.7	659	2.53	39.1	779
9.7	150	Mega	LAPUA	71.0	N140	2.09	32.2	648	2.65	40.8	781
					N540	2.26	34.9	666	2.76	42.6	797
					N133	2.45	37.8	770	2.72	42.0	832
9.7	150	SPBT	Sierra	70.0	N135	2.62	40.4	780	2.87	44.3	846
					N140	2.74	42.3	776	3.03	46.8	858
					N150	2.86	44.1	785	3.12	48.1	850
					N540	2.78	42.9	780	3.07	47.4	864
9.7	150	Lock Base HPBT	LAPUA	71.0	N140	2.65	40.9	761	2.96	45.7	842
					N540	2.73	42.1	755	3.04	46.9	860
					N150	2.75	42.4	770	3.05	47.1	843
					N550	2.90	44.8	769	3.22	49.7	852
10.0	155	Scenar	LAPUA	71.0	N135	2.23	34.4	680	2.64	40.7	797
					N140	2.38	36.7	679	2.81	43.3	800
					N150	2.53	39.0	712	3.03	46.8	817
10.0	155	Silver Jacket Scenar	LAPUA	71.0	N140	2.66	41.1	761	3.00	46.3	853
					N150	2.71	41.9	773	3.04	46.9	858
					N540	2.70	41.7	775	3.05	47.0	868
10.0	155	HPBT	Sierra	71.0	N135	2.40	37.0	734	2.68	41.4	806
					N140	2.54	39.2	741	2.86	44.1	817
					N540	2.60	40.1	741	2.93	45.2	829
					N150	2.76	42.6	773	3.02	46.6	841
					N550	2.90	44.8	784	3.23	49.8	871
10.1	156	SPBT	Sako	68.2	N135	2.54	39.2	737	2.79	43.1	813
					N140	2.67	41.2	736	2.94	45.4	821
					N150	2.83	43.7	765	3.13	48.3	845
10.7	165	SPBT	Speer	71.0	N133	2.41	37.2	722	2.64	40.7	787
					N135	2.51	38.7	732	2.77	42.7	801
					N140	2.63	40.6	737	2.91	44.9	813
					N150	2.69	41.5	743	3.00	46.3	817
					N550	2.87	44.3	754	3.12	48.1	821
10.9	167	Scenar	LAPUA	71.0	N140	2.59	40.0	719	2.85	44.0	794
					N540	2.58	39.8	726	2.85	44.0	804

BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!

LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

.308 Winchester

Bullet				Powder	Starting load			Maximum load			
Weight		Type	Mfg.	C.O.L.	Type	Weight		Velocity	Weight		Velocity
[g]	[grs]					[g]	[grs]		[m/s]	[g]	
10.9	167	Scenar	LAPUA	71.0	N150	2.71	41.8	740	2.98	46.0	810
					N550	2.88	44.4	756	3.17	48.9	829
10.9	167	Silver Jacket Scenar	LAPUA	71.0	N140	2.65	40.9	754	2.89	44.7	826
					N150	2.69	41.5	749	2.97	45.8	826
10.9	168	HPBT	Sierra	71.0	N540	2.68	41.4	746	3.00	46.3	835
					N140	2.48	38.3	704	2.78	42.9	779
					N540	2.58	39.8	717	2.89	44.6	800
					N150	2.62	40.4	727	2.88	44.4	794
11.0	170	FMJBT	LAPUA	71.0	N550	2.81	43.4	749	3.07	47.4	823
					N135	2.45	37.8	717	2.70	41.7	784
					N140	2.59	40.0	723	2.86	44.1	797
					N540	2.63	40.6	714	2.91	44.9	810
					N150	2.68	41.4	737	2.97	45.8	807
11.3	175	HPBT	Sierra	71.0	N550	2.81	43.4	732	3.14	48.5	845
					N140*	2.41	37.2	684	2.68	41.4	753
					N540*	2.55	39.4	708	2.79	43.1	779
					N150*	2.52	38.9	704	2.83	43.7	776
					N550*	2.69	41.5	720	2.97	45.8	793
11.7	180	SP	Hornady	71.0	N135	2.36	36.4	669	2.62	40.4	741
					N140	2.50	39.6	678	2.77	42.7	755
					N150	2.62	40.4	708	2.88	44.4	766
11.7	180	X	Barnes	71.0	N540	2.23	34.4	629	2.55	39.4	715
					N550	2.44	37.7	657	2.75	42.4	734
12.0	185	FMJBT	LAPUA	71.0	N135	2.33	36.0	667	2.58	39.8	739
					N140	2.47	38.1	683	2.74	42.3	754
12.0	185	Scenar	LAPUA	71.0	N540	2.56	39.5	706	2.77	2.77	765
					N150	2.54	39.2	690	2.82	43.5	750
					N550	2.74	42.3	702	3.01	46.5	773
12.0	185	Silver Jacket Scenar	LAPUA	71.0	N140	2.51	38.8	700	2.77	42.8	774
					N150	2.53	39.1	707	2.85	44.0	780
					N550	2.77	42.8	702	3.06	47.2	809
12.0	185	Forex	LAPUA	69.5	N540	2.33	36.0	632	2.72	42.0	734
					N150	2.30	35.6	629	2.81	43.3	742
					N550	2.53	39.0	643	2.98	46.0	762
12.3	190	HPBT	Sierra	71.0	N140	2.43	37.5	670	2.69	41.5	736
					N540	2.45	37.8	667	2.75	42.4	752
					N150	2.50	38.6	669	2.76	42.6	738
13.0	200	SP	Speer	71.0	N550	2.65	40.9	690	2.96	45.7	767
					N140	2.34	36.1	625	2.58	39.8	688
					N150	2.39	36.9	638	2.62	40.4	689

BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!
LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

7.62 x 53R (7.62 Russian)

Test barrel: 660 mm, 1 in 10" twist

Primers: Large Rifle

Cases: LAPUA, trim-to length 53.30 mm

Bullet					Powder	Starting load			Maximum load		
Weight [g] [grs]		Type	Mfg.	C.O.L. [mm]	Type	Weight [g] [grs]		Velocity [m/s]	Weight [g] [grs]		Velocity [m/s]
8.0	123	FMJ	LAPUA	68.5	N130	2.72	42.0	863	3.03	46.8	932
					N133	2.99	46.1	882	3.27	50.5	946
					N135	3.04	46.9	862	3.37	52.0	950
9.7	150	Mega	LAPUA	70.9	N133	2.10	32.3	643	2.78	43.0	813
					N135	2.46	37.9	696	3.01	46.4	839
					N140	2.63	40.6	710	3.15	48.5	851
10.0	155	Scenar	LAPUA	75.5	N135	2.54	39.2	726	2.99	46.2	852
					N140	2.73	42.2	747	3.16	48.7	870
					N150	2.88	44.5	770	3.28	50.6	872
10.1	156	SPBT	Sako	70.5	N135	2.76	42.6	753	3.06	47.2	834
					N140	2.87	44.3	757	3.19	49.2	845
					N150	3.02	46.6	771	3.33	51.4	857
10.9	167	Scenar	LAPUA	75.0	N540	2.74	42.3	711	3.12	48.1	812
					N140	2.88	44.4	752	3.18	49.1	830
					N150	2.97	45.8	745	3.27	50.5	834
10.9	168	HPBT	Sierra	75.5	N550	3.99	46.2	729	3.40	52.5	840
					N140	2.75	42.5	715	3.12	48.2	804
					N540	2.83	43.6	722	3.22	49.7	826
12.0	185	Scenar	LAPUA	75.0	N150	2.90	44.8	730	3.24	50.0	823
					N550	3.07	47.4	741	3.45	53.3	845
					N135	2.59	40.0	686	2.88	44.4	767
12.0	185	Mega	LAPUA	70.0	N540	2.65	40.9	679	3.01	46.4	772
					N140	2.71	41.8	698	3.03	46.8	783
					N150	2.82	43.5	699	3.13	48.3	785
12.0	185	Forex	LAPUA	71.5	N550	2.86	44.2	693	3.27	50.5	802
					N140	2.59	39.9	646	2.99	46.1	745
					N540	2.68	41.4	658	3.06	47.2	757
12.0	185	HPBT	Sierra	77.0	N150	2.74	42.3	658	3.08	47.6	752
					N550	2.93	45.2	678	3.32	51.3	789
					N140	2.48	38.3	675	2.93	45.3	783
12.0	185	HPBT	Sierra	77.0	N540	2.68	41.3	698	3.04	46.8	800
					N150	2.67	41.3	703	3.09	47.7	793
					N140	2.50	38.6	635	2.93	45.2	736
13.0	200	D166 FMJBT	Lapua	76.0	N540	2.54	39.2	642	2.93	45.2	738
					N150	2.62	40.4	646	3.01	46.4	740
					N550	2.84	43.8	667	3.19	49.2	762
14.3	220	HPBT	Sierra	77.0	N140	2.37	36.6	641	2.60	40.1	694
					N150	2.43	37.5	656	2.62	40.4	709
					N540	2.48	38.3	663	2.63	40.6	711
14.3	220	HPBT	Sierra	77.0	N540	2.46	37.9	600	2.77	42.8	685
					N150	2.40	37.0	573	2.81	43.3	677
					N550	2.66	41.0	613	3.02	46.6	710

BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!

LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

7.5 x 55 Swiss GP31

Test barrel: 600 mm, 1 in 10" twist
 Primers: Large Rifle
 Cases: Norma, trim-to length 55.40 mm

Bullet				Powder	Starting load			Maximum load			
Weight	Type	Mfg.	C.O.L.	Type	Weight	Velocity	Weight	Velocity			
[g]	[grs]		[mm]		[g]	[grs]	[m/s]	[g]	[grs]	[m/s]	
10.0	155	Scenar	LAPUA	75.5	N140	3.15	48.6	808	3.23	49.8	838
					N150	3.18	49.1	811	3.30	50.9	844
					N540	3.20	49.4	829	3.31	51.1	877
10.9	167	Scenar	LAPUA	75.5	N140	2.95	45.5	755	3.13	48.3	817
					N150	3.05	47.1	772	3.19	49.2	836
					N540	3.01	46.5	888	3.16	48.8	838
12.0	185	Scenar	LAPUA	75.5	N140	2.70	41.7	724	3.01	46.5	755
					N150	2.92	45.1	726	3.03	46.8	757
					N540	2.86	44.1	729	3.05	47.1	764

.30-06 Springfield

Test barrel: 620 mm, 1 in 10" twist
 Primers: Large Rifle
 Cases: LAPUA, trim-to length 63.10 mm

Bullet				Powder	Starting load			Maximum load			
Weight [g] [grs]		Type	Mfg.	C.O.L. [mm]	Type	Weight [g] [grs]		Velocity [m/s]	Weight [g] [grs]		Velocity [m/s]
3.7 6.5	57 100	ALS*) HP	LAPUA Lapua	79.0 79.8	N110	1.72	26.5	948	2.45	37.8	1201
					N130	2.58	39.8	869	3.15	48.6	998
					N133	3.07	47.4	911	3.49	53.9	1016
					N135	3.25	50.2	927	3.66	56.5	1033
					N140	3.50	54.0	926	3.96	61.1	1044
6.8	105	HP	LAPUA	81.0	N540	3.59	55.4	939	4.08	63.0	1058
					N133	3.02	46.6	914	3.32	51.2	988
					N135	3.23	49.8	928	3.57	55.1	1010
					N140	3.46	53.4	932	3.83	59.1	1025
7.1	110	RN	Hornady	74.0	N133	3.15	48.6	873	3.48	53.7	983
					N135	3.14	48.5	864	3.47	53.5	964
					N140	3.38	52.2	881	3.74	57.7	977
					N150	3.57	55.1	905	3.94	60.8	1002
8.0	123	FMJ	Lapua	79.8	N133	2.95	45.5	825	3.31	51.1	922
					N135	3.19	49.2	852	3.48	53.7	937
					N140	3.35	51.7	853	3.73	57.6	952
					N540	3.49	53.9	863	3.83	59.1	958
8.1	125	Ballistic Tip	Nosler	84.0	N150	3.59	55.4	880	3.91	60.3	976
					N135	3.10	47.8	865	3.40	52.5	935
					N140	3.31	51.1	878	3.64	56.2	958
					N540	3.49	53.9	880	3.91	60.3	994
					N150	3.44	53.1	882	3.81	58.8	966
					N550	3.70	57.1	895	3.91	60.3	950

*) Note: A muzzle velocity exceeding 1000 m/s may lead to severe barrel fouling!

BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!
 LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

.30-06 Springfield

Test barrel: 620 mm, 1 in 10" twist

Primers: Large Rifle

Cases: LAPUA, trim-to length 63.10 mm

Bullet					Powder	Starting load			Maximum load		
Weight		Type	Mfg.	C.O.L.	Type	Weight		Velocity	Weight		Velocity
[g]	[grs]			[mm]		[g]	[grs]	[m/s]	[g]	[grs]	[m/s]
9.7	150	Mega	LAPUA	76.9	N135	2.60	40.1	711	3.09	47.7	835
					N140	2.83	43.7	732	3.32	51.2	857
					N540	2.94	45.3	742	3.47	53.5	893
9.7	150	Lock Base	LAPUA	84.0	N135	2.93	45.2	789	3.23	49.8	851
					N140	3.13	48.3	802	3.45	53.2	872
					N540	3.16	48.8	792	3.54	54.6	882
					N150	3.25	50.2	803	3.58	55.2	877
					N550	3.51	54.2	819	3.87	59.7	917
					N140	3.08	47.5	798	3.42	52.8	871
9.7	150	HPBT	Sierra	84.0	N540	3.27	50.5	809	3.64	56.2	906
					N150	3.29	50.8	807	3.65	56.3	895
					N550	3.54	54.6	833	3.87	59.7	916
					N140	2.78	42.9	755	3.23	49.8	850
10.0	155	Scenar	LAPUA	84.0	N150	2.79	43.0	767	3.30	50.9	863
					N540	3.05	47.0	774	3.45	53.2	886
					N135	2.97	45.8	776	3.29	50.8	851
10.1	156	SPBT	Sako	80.5	N140	3.10	47.8	775	3.42	52.8	859
					N150	3.18	49.1	781	3.53	54.5	863
					N140	2.95	45.5	737	3.25	50.2	812
10.9	167	Scenar	LAPUA	84.0	N540	2.94	45.4	737	3.37	52.0	836
					N150	3.06	47.2	748	3.38	52.2	821
					N550	3.22	49.7	779	3.57	55.1	855
					N160	3.60	55.6	749	4.00	61.7	842
					N140	2.91	44.9	717	3.24	50.0	799
11.0	170	FMJBT	LAPUA	84.0	N540	2.96	45.7	729	3.34	51.5	821
					N150	3.06	47.2	735	3.41	52.6	815
					N550	3.17	48.9	746	3.61	55.7	842
					N160	3.65	56.3	765	4.05	62.5	853
					N160	3.39	52.3	730	3.73	57.6	793
11.7	180	Spitzer	Speer	84.0	N550	3.15	48.6	704	3.53	54.5	791
11.7	180	X	Barnes	84.0	N540	2.86	44.1	688	3.16	48.8	771
12.0	185	Scenar	LAPUA	84.0	N150	2.88	44.4	696	3.26	50.3	778
					N550	3.02	46.6	701	3.36	51.9	792
					N160	3.48	53.7	724	3.85	59.4	809
					N560	3.52	54.3	724	4.01	61.9	816
					N150	2.74	42.2	681	3.12	48.1	781
					N550	3.02	46.7	707	3.31	51.1	822
12.0	185	Forex	LAPUA	81.0	N160	3.22	49.7	736	3.49	53.8	811

BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!

LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

.30-06 Springfield

Bullet				Powder	Starting load			Maximum load		
Weight [g] [grs]		Type	Mfg.	C.O.L. [mm]	Type	Weight [g] [grs]	Velocity [m/s]	Weight [g] [grs]	Velocity [m/s]	
12.3	190	HPBT	Sierra	84.0	N150	2.90 44.8	695	3.20 49.3	767	
					N550	3.07 47.4	708	3.49 53.8	812	
					N160	3.42 52.7	724	3.81 58.8	795	
					N560	3.57 55.1	721	4.04 62.4	825	
13.0	200	Partition	Nosler	84.0	N150	2.79 43.0	669	3.08 47.5	724	
					N160	3.38 52.1	704	3.73 57.6	765	
14.3	220	RN	Hornady	84.0	N160	3.29 50.7	654	3.63 56.0	722	
					N560	3.47 53.5	672	3.97 61.3	767	

.300 H&H Magnum

Test barrel: 610 mm, 1 in 10" twist

Primers: Large Rifle Magnum

Cases: Winchester, trim-to length 72.20 mm

Bullet				Powder	Starting load			Maximum load		
Weight [g]	Type	Mfg.	C.O.L. [mm]	Type	Weight [g]	Velocity [m/s]		Weight [g]	Velocity [m/s]	
8.1	125	FMJ	Sako	88.5	N160			5.00	77.2	1100
9.7	150	Spitzer	Speer	91.0	N160			4.87	75.2	950
10.0	155	SP	Sako	91.0	N160			4.69	72.4	915
10.7	165	Spitzer	Speer	91.2	N160			4.55	70.2	885
11.7	180	SP	Sako	91.2	N160			4.40	67.9	875
14.3	220	RN	Hornady	90.9	N160			4.22	65.1	775

.300 Winchester Magnum

Test barrel: 620 mm, 1 in 10" twist

Primers: Large Rifle Magnum

Cases: LAPUA, trim-to length 66.30 mm

Bullet					Powder	Starting load			Maximum load		
Weight		Type	Mfg.	C.O.L.	Type	Weight		Velocity	Weight		Velocity
[g]	[grs]					[g]	[grs]		[g]	[grs]	
7.1	110	SP HP Ballistic Tip	Hornady	83.0	N160	4.96	76.5	959	5.40	83.3	1063
8.5	130		LAPUA	84.2	N160	4.61	71.1	881	5.14	79.3	997
8.5	150		Nosler	84.8	N160	4.47	69.0	850	4.95	76.4	944
					N165	4.88	75.3	883	5.39	83.2	974
10.0	155	Scenar	LAPUA	84.5	N160	4.13	63.7	833	4.66	71.8	958
					N560	4.48	69.1	849	5.00	77.2	969
					N165	4.69	72.4	864	5.31	81.9	992
10.9	167	Scenar	LAPUA	84.8	N160	4.47	69.0	830	4.83	74.5	910
					N165	4.76	73.5	839	5.18	79.9	924

NOTE!

WHEN ONLY THE MAXIMUM LOADS ARE SHOWN IN THE TABLES ABOVE START LOADING WITH APPROXIMATELY 15 % SMALLER POWDER CHARGE.

BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!

LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

.300 Winchester Magnum

Bullet					Powder	Starting load			Maximum load		
Weight [g] [grs]		Type	Mfg.	C.O.L. [mm]	Type	Weight [g] [grs]		Velocity [m/s]	Weight [g] [grs]		Velocity [m/s]
11.7	180	Partition	Nosler	84.8	N160	4.23	65.3	791	4.70	72.5	874
					N165	4.58	70.7	800	5.03	77.6	883
12.0	185	Forex	LAPUA	84.0	N560	4.13	63.7	776	4.71	72.7	892
					N165	4.15	64.0	771	4.91	75.8	902
12.3	190	HPBT	Sierra	84.8	N170	4.50	69.5	761	5.22	80.6	877
					N560	4.30	66.4	818	4.84	74.7	893
					N165	4.45	68.7	811	4.97	76.7	877
					N170	4.35	67.1	783	5.01	77.3	856
13.0	200	HPBT	Sierra	84.8	N160	3.98	61.4	755	4.52	69.8	830
					N560	3.90	60.2	764	4.55	70.2	846
					N165	4.10	63.3	762	4.74	73.1	840
					N170	3.99	61.6	737	4.79	73.9	822
14.3	220	HPBT	Sierra	84.8	N560	3.35	51.7	688	4.07	62.8	776
					N165	3.20	49.4	659	4.17	64.4	764
					N170	3.60	55.6	682	4.26	65.7	761

.300 Weatherby Magnum

Test barrel: 660 mm, 1 in 10" twist

Primers: Large Rifle Magnum

Cases: Weatherby, trim-to length 71.50 mm

Bullet					Powder	Starting load			Maximum load		
Weight		Type	Mfg.	C.O.L.	Type	Weight		Velocity	Weight		Velocity
[g]	[grs]					[g]	[grs]		[g]	[grs]	
8.1	125	Ballistic Tip	Nosler	90.0	N160	5.20	80.2	969	5.75	88.7	1101
	9.7	150	Ballistic Tip	Nosler	90.1	N160	4.90	75.6	895	5.42	83.6
10.7	165	SPBT	Speer	90.3	N165	5.31	81.9	904	5.89	90.9	1006
					N160	4.85	74.8	859	5.37	82.9	973
					N165	5.24	80.9	860	5.80	89.5	980
11.7	180	SP	Hornady	90.3	N160	4.71	72.7	834	5.19	80.1	926
					N165	5.09	78.5	840	5.62	86.7	939
13.0	200	HPBT	Sierra	90.3	N560	4.70	72.5	821	5.17	79.8	903
					N165	4.58	70.7	795	5.24	80.9	888
					N170	4.59	70.8	781	5.51	85.0	890

NOTE: LOADS LESS THAN ABOVE LISTED STARTING LOADS MAY GENERATE EXCESSIVE CHAMBER PRESSURE AND MUST NOT BE USED!

BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!
LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

.300 LAPUA Magnum

Test barrel: 690 mm, 1 in 9½" twist
 Primers: Large Rifle Magnum
 Cases: LAPUA, trim-to length 68.95 mm

Bullet				Powder	Starting load			Maximum load			
Weight [g] [grs]		Type	Mfg.	C.O.L. [mm]	Type	Weight [g]	Velocity [m/s]	Weight [g]	Velocity [m/s]	Weight [g]	Velocity [m/s]
10.0	155	Scenar	LAPUA	93.0	N160	4.89	75.4	970	5.29	81.6	1025
					N560	5.24	80.9	970	5.81	89.7	1068
					N170	6.01	92.7	990	6.48	100.0	1073
11.0	170	Lock Base	LAPUA	93.0	N560	5.12	78.9	938	5.55	85.7	1010
					N170	5.40	83.3	889	5.97	92.1	970
					24N41	6.15	94.8	941	6.63	102.3	1024
12.0	185	Scenar	LAPUA	93.0	N560	4.82	74.4	875	5.39	93.2	964
					N170	5.40	83.3	889	5.97	92.1	971
					24N41	5.93	91.6	912	6.36	91.6	980
13.0	200	HPBT	Sierra	93.0	N170	5.09	78.6	847	5.64	87.0	916
					24N41	5.56	85.8	862	6.09	93.9	934
					20N29	6.40	98.7	888	6.80	104.9	955
14.3	220	Sierra	HPBT	93.0	24N41	5.10	78.6	799	5.76	88.8	882
					20N29	6.06	93.5	851	6.52	100.6	912

.300 Remington Ultra Magnum

Test barrel: 655 mm, 1 in 11" twist
 Primers: Large Rifle Magnum
 Cases: Remington, trim-to length 71.50 mm

Bullet				Powder	Starting load			Maximum load			
Weight [g] [grs]		Type	Mfg.	C.O.L. [mm]	Type	Weight [g] [grs]		Velocity [m/s]	Weight [g] [grs]		Velocity [m/s]
10.7	165	Partition	Nosler	89.5	N160	5.20	80.2	919	5.37	82.9	951
					N560	5.45	84.1	917	5.80	89.5	976
					N165	5.67	87.5	930	5.89	90.9	973
11.7	180	"X"	Barnes	89.5	N560	4.82	74.4	887	5.23	80.7	920
					N165	4.69	72.4	858	5.02	77.5	901
					N170	5.22	80.6	871	5.69	87.8	914
12.0	185	Scenar	LAPUA	91.4	N560	5.53	85.3	912	5.73	88.4	908
					N165	5.35	82.6	900	5.76	88.9	918
					N170	6.00	92.6	898	6.25	96.5	932

BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!
 LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

.30-.378 Weatherby Magnum

Test barrel: 660 mm, 1 in 10" twist
Primers: Large Rifle Magnum
Cases: Weatherby, trim-to length 71.75 mm

Bullet				Powder	Starting load			Maximum load			
Weight [g] [grs]		Type	Mfg.	C.O.L. [mm]	Type	Weight [g] [grs]		Velocity [m/s]	Weight [g] [grs]		Velocity [m/s]
10.0	155	Scenar	LAPUA	93.0	N160	6.10	94.1	1001	6.41	99.0	1052
					N165	6.68	103.1	1014	6.94	107.1	1072
					N170	7.23	111.6	1005	7.54	116.4	1066
11.0	170	Lock Base	LAPUA	93.0	N165	6.33	97.7	953	6.67	102.9	999
					N170	6.94	111.1	953	7.20	111.1	1005
					24N41	7.31	112.8	977	7.83	120.9	1057
12.0	185	Scenar	LAPUA	93.0	N170	6.69	103.3	942	7.12	109.8	999
					24N41	7.16	110.5	955	7.58	117.0	1020
					20N29	7.94	122.5	968	8.18	126.2	1000
13.0	200	HPBT	Sierra	93.0	24N41	6.90	106.5	939	7.20	111.1	973
					20N29	7.52	116.0	914	7.88	121.6	976
14.3	220	Sierra	HPBT	93.0	20N29	7.14	110.1	869	7.64	117.9	933

NOTE: LOADS LESS THAN ABOVE LISTED STARTING LOADS MAY GENERATE EXCESSIVE CHAMBER PRESSURE AND MUST NOT BE USED!

7.62 x 39

Test barrel: 415 mm, 1 in 9 1/2" twist
Primers: Large Rifle
Cases: LAPUA, trim-to length 38.50 mm

Bullet				Powder	Starting load			Maximum load			
Weight		Type	Mfg.	C.O.L.	Type	Weight		Velocity	Weight		Velocity
[g]	[grs]					[g]	[grs]		[g]	[grs]	
3.7	57	FMJ	LAPUA	55.7	N110	1.31	20.2	855	1.60	24.7	952
8.0	123	FMJ	Sako	55.7	N120				1.72	26.5	740
8.0	123	SP	Sako	54.2	N120				1.73	26.7	720
8.0	123	Mega	LAPUA	52.4	N120	1.42	22.0	602	1.66	25.7	703
					N130	1.58	24.4	634	1.77	27.3	719

.303 British

Test barrel: 610 mm, 1 in 10" twist
Primers: Large Rifle
Cases: Remington, trim-to length 56.20 mm

Bullet				Powder	Starting load			Maximum load			
Weight [g] [grs]		Type	Mfg.	C.O.L. [mm]	Type	Weight [g] [grs]		Velocity [m/s]	Weight [g] [grs]		Velocity [m/s]
11.7	180	SP	Sako	73.6	N140				2.70	41.7	775

NOTE!
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LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

8 x 72R

Test barrel: 610 mm, 1 in 9 1/2" twist
 Primers: Large Rifle
 Cases: Necked-down RWS 9.3 x 72R,
 trim-to length 71.80 mm

Bullet				Powder	Starting load			Maximum load		
Weight [g]	Type	Mfg.	C.O.L. [mm]	Type	Weight [g]	Velocity [m/s]		Weight [g]	Velocity [m/s]	
12.7	196	SP	RWS*)	90.4	N140			2.68	41.4	700

*) Note: Max. bullet diameter 8.09 mm (.318").

8mm Mauser (8 x 57 JS)

Test barrel: 620 mm, 1 in 9 1/2" twist
 Primers: Large Rifle
 Cases: LAPUA, trim-to length 56.80 mm

Bullet				Powder	Starting load			Maximum load		
Weight [g]	Type	Mfg.	C.O.L. [mm]	Type	Weight [g]	Velocity [m/s]		Weight [g]	Velocity [m/s]	
8.1	125	SP	Hornady	74.0	N130	2.80	43.2	3.12	48.1	950
					N133	3.14	48.5	3.50	54.0	979
					N135	3.22	49.7	3.57	55.1	974
9.7	150	Spitzer	Speer	76.0	N135	2.97	45.8	3.31	51.1	880
					N140	3.13	48.3	3.49	53.9	892
11.0	170	SP	Speer	77.0	N135	2.86	44.1	3.18	49.1	829
					N140	2.99	46.1	3.33	51.4	838
					N150	3.13	48.3	3.48	53.7	853
13.0	200	Spitzer	Speer	79.5	N140	2.77	42.7	3.08	47.5	759
					N150	2.86	44.1	3.19	49.2	763
13.0	200	Partition	Nosler	81.0	N160	3.27	50.5	3.64	56.2	785

8 x 57 JRS

Test barrel: 610 mm, 1 in 9 1/2" twist
 Primers: Large Rifle
 Cases: RWS, trim-to length 56.80

Bullet				Powder	Starting load			Maximum load		
Weight [g]	Type	Mfg.	C.O.L. [mm]	Type	Weight [g]	Velocity [m/s]		Weight [g]	Velocity [m/s]	
9.7	150	Spitzer	Speer	72.5	N140			3.46	53.4	870
11.0	170	SP	RWS	73.5	N140			3.18	49.1	810
11.7	180	KS	RWS	73.5	N140			3.28	50.6	800
12.1	187	HMK	RWS	77.2	N140			3.15	48.6	795

NOTE!

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8 x 68 S

Test barrel: 650 mm, 1 in 11" twist
 Primers: Large Rifle Magnum
 Cases: RWS, trim-to length 67.30 mm

Bullet				Powder	Starting load			Maximum load		
Weight [g] [grs]	Type	Mfg.	C.O.L. [mm]	Type	Weight [g] [grs]	Velocity [m/s]		Weight [g] [grs]	Velocity [m/s]	
12.1	187	SG	RWS	86.0	N160			5.05	77.9	935
12.7	196	TMR	RWS	86.4	N160			5.00	77.2	925
13.0	200	Spitzer	Speer	86.5	N160			4.68	72.2	880

.338 Winchester Magnum

Test barrel: 620 mm, 1 in 10" twist
 Primers: Large Rifle
 Cases: LAPUA, trim-to length 63.30 mm

Bullet				Powder	Starting load			Maximum load		
Weight [g] [grs]	Type	Mfg.	C.O.L. [mm]	Type	Weight [g] [grs]	Velocity [m/s]		Weight [g] [grs]	Velocity [m/s]	
13.0	200	SP	Hornady	85.0*	N160	4.71	72.7	5.23	80.7	905
14.6	225	SP	Hornady	84.0	N160	4.50	69.4	5.02	77.5	848
					N560	4.41	68.0	4.98	76.8	843
16.2	250	Scenar	LAPUA	84.0	N550	3.86	59.6	4.25	65.5	800
					N160	3.92	60.5	4.52	69.8	803
					N560	4.42	68.1	5.00	77.2	833
16.2	250	SBT	Sierra	84.8	N160	3.95	60.9	4.42	68.2	775
					N560	3.99	61.6	4.57	70.5	792
					N165	4.25	65.6	4.83	74.5	796
16.2	250	Grand Slam	Speer	83.8	N160	4.18	64.5	4.66	71.9	781
					N165	4.50	69.4	5.00	77.2	794
16.8	250	Forex	LAPUA	85.1*	N160	3.88	59.9	4.63	71.4	803
					N560	4.40	67.9	5.06	78.1	724
					N165	4.63	71.4	5.39	83.2	848
17.8	275	SP	Speer	85.0*	N165	4.35	67.1	4.82	74.4	758
19.4	300	HPBT	Sierra	84.8	N160	3.73	57.6	4.24	65.4	707
					N560	3.84	59.3	4.41	68.0	718

*) The CIP maximum cartridge overall length is exceeded.

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.338 LAPUA Magnum

Test barrel: 700 mm, 1 in 10" twist
 Primers: Large Rifle Magnum
 Cases: LAPUA, trim-to length 69.00 mm

Bullet					Powder	Starting load			Maximum load		
Weight [g]		Type	Mfg.	C.O.L. [mm]	Type	Weight [g]		Velocity [m/s]	Weight [g]		Velocity [m/s]
13.0	200	SP	Hornady	91.0	N160	5.51	85.0	878	6.13	94.6	979
					N165	5.94	91.7	885	6.57	101.4	990
14.6	225	SP	Hornady	91.0	N160	5.34	82.4	839	5.95	91.8	923
					N560	5.28	81.5	855	6.01	92.7	954
					N165	5.71	88.1	839	6.28	96.9	933
					N170	5.67	87.5	837	6.49	100.2	937
16.2	250	Scenar	LAPUA	93.5	N560	4.61	71.1	766	5.51	85.0	881
					N165	4.68	72.3	757	5.57	85.9	858
					N170	5.52	85.1	792	6.29	97.1	887
					N560	4.98	76.9	802	5.71	88.1	898
16.2	250	Lock Base	LAPUA	91.5	N165	4.75	73.3	769	5.79	89.4	877
					N170	5.09	78.5	775	6.10	94.1	879
					N560	4.84	74.7	772	5.59	86.2	886
					N165	4.83	74.6	771	5.57	85.9	883
16.8	270	Forex	LAPUA	91.0	N170	5.48	84.8	793	6.25	96.4	896
					N165	4.29	66.2	663	5.37	82.8	785
					N560	4.39	67.8	687	5.55	85.6	820
					N170	4.82	74.4	686	6.05	93.3	812
19.4	300	HPBT	Sierra	91.5	24N41	5.18	79.9	702	6.33	97.7	814

9.3 x 57

Test barrel: 610 mm, 1 in 14" twist
 Primers: Large Rifle
 Cases: Norma, trim-to length 56.60 mm

Bullet					Powder	Starting load			Maximum load		
Weight [g]		Type	Mfg.	C.O.L. [mm]	Type	Weight [g]		Velocity [m/s]	Weight [g]		Velocity [m/s]
16.5	255	SP	Sako	74.3	N140				3.30	50.9	690

NOTE: This cartridge is not supported by CIP or by SAAMI. The maximum load does not exceed 280 MPa.

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9.3 x 62

Test barrel: 610 mm, 1 in14" twist
 Primers: Large Rifle
 Cases: LAPUA, trim-to length 61.80 mm

Bullet				Powder	Starting load			Maximum load		
Weight [g] [grs]	Type	Mfg.	C.O.L. [mm]	Type	Weight [g] [grs]	Velocity [m/s]		Weight [g] [grs]	Velocity [m/s]	
16.7	258	HMK	RWS	81.7	N135			3.73	57.6	765
17.5	270	Forex	LAPUA	80.6	N135	2.94	45.4	3.52	54.3	700
					N140	2.98	46.0	3.61	55.7	710
					N150	3.40	52.5	3.91	60.4	728
18.5	285	TMR	RWS	82.1	N135			3.53	54.5	710
18.5	285	Mega	LAPUA	83.4	N135	3.01	46.5	3.50	54.0	700
					N140	3.30	50.9	3.69	56.9	675

9.3 x 64 Brenneke

Test barrel: 650 mm, 1 in 14" twist
 Primers: Large Rifle
 Cases: RWS, trim-to length 63.80 mm

Bullet				Powder	Starting load			Maximum load		
Weight [g] [grs]	Type	Mfg.	C.O.L. [mm]	Type	Weight [g] [grs]	Velocity [m/s]		Weight [g] [grs]	Velocity [m/s]	
16.7	258	HMK	RWS	85.5	N140			4.40	67.9	815
18.5	285	TMR	RWS	84.5	N140			4.34	67.0	770
19.0	293	TUG	RWS	85.5	N160			4.92	75.9	777

9.3 x 74R

Test barrel: 610 mm, 1 in 14" twist
 Primers: Large Rifle
 Cases: RWS, trim-to length 74.50 mm

Bullet				Powder	Starting load			Maximum load		
Weight [g] [grs]	Type	Mfg.	C.O.L. [mm]	Type	Weight [g] [grs]	Velocity [m/s]		Weight [g] [grs]	Velocity [m/s]	
15.0	231	SP	Norma	92.1	N140	3.72	57.4	4.10	63.3	779
16.5	256	SP	Sako	92.2	N140	3.50	54.0	3.86	59.6	723
17.5	270	Forex	LAPUA	91.5	N135	3.24	50.0	3.76	58.0	702
					N140	2.23	49.9	3.52	54.4	699
18.5	285	Mega	LAPUA	92.2	N140	3.22	49.7	3.57	55.1	669
18.5	285	X	Barnes	97.6*	N140	3.11	48.0	3.42	52.8	660
19.0	293	TUG	RWS	95.5*	N140	3.24	50.0	3.59	55.4	670

*) The CIP maximum cartridge overall length is exceeded.

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.375 H&H Magnum

Test barrel: 620 mm, 1 in 12" twist

Primers: Large Rifle Magnum

Cases: Remington, trim-to length 72.20 mm

Bullet				Powder	Starting load			Maximum load			
Weight		Type	Mfg.	C.O.L.	Type	Weight		Velocity	Weight		Velocity
[g]	[grs]					[g]	[grs]		[m/s]	[g]	
15.2	235	Spitzer	Speer	91.0	N140				4.95	76.4	880
					N160				5.62	86.7	885
17.5	270	RN	Hornady	91.5*	N140				4.75	73.3	840
				N160	5.45				84.1	850	
19.4	300	RN	Hornady	90.5	N140				4.51	69.6	770
				N160	5.30				81.8	780	

*) The CIP maximum cartridge overall length is exceeded.

.444 Marlin

Test barrel: 560 mm, 1 in 38" twist

Primers: Large Rifle

Cases: Remington, trim-to length 56.30 mm

Bullet				Powder	Starting load			Maximum load			
Weight	Type	Mfg.	C.O.L.	Type	Weight	Velocity	Weight	Velocity			
[g]	[grs]		[mm]		[g]	[grs]	[m/s]	[g]	[grs]	[m/s]	
13.0	200	HP/XTP	Hornady	64.4	N110	2.66	41.0	720	2.92	45.1	771
					N120	3.25	50.2	777	3.59	55.4	840
15.6	240	JTC-SIL	Hornady	64.5	N120	2.94	45.4	689	3.26	50.3	748
					N130	3.28	50.6	706	3.53	54.5	752
17.2	265	FP	Hornady	65.0	N120	2.82	43.5	649	3.12	48.1	707
					N130	3.03	46.2	645	3.33	51.4	707

.45-70 Government

Test barrel: 560 mm, 1 in 20" twist

Primers: Large Rifle

Cases: Remington, trim-to length 53.30 mm

WARNING: These loads are to be used only in modern rifles like Ruger #1 or .45-70's chambered on Mauser type bolt actions. They must NOT be used in old rifles with weaker actions like Trapdoor and old Marlin mod. 1895. The listed maximum loads do not exceed 195 MPa.

Bullet				Powder	Starting load			Maximum load			
Weight	Type	Mfg.	C.O.L.	Type	Weight	Velocity	Weight	Velocity			
[g]	[grs]		[mm]		[g]	[grs]	[m/s]	[g]	[grs]	[m/s]	
19.4	300	HP	Hornady	64.5	N120	2.63	40.6	568	2.92	45.1	618
					N130	3.16	48.8	594	3.38	52.2	637
					N133	3.81	58.8	624	4.10	63.3	683
19.4	300	HP	Sierra	64.1	N120	2.52	38.9	558	3.01	46.5	624
					N133	3.74	57.7	627	3.89	60.0	667
					N135	3.80	58.6	604	4.00	61.7	650
25.9	400	SP	Speer	64.7	N120	2.06	31.8	444	2.32	35.8	489
					N133	3.02	46.6	517	3.33	51.4	565
					N135	3.02	46.6	490	3.34	51.5	543

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.458 Winchester Magnum

Test barrel: 635, 1 in 14" twist

Primers: Large Rifle

Cases: Remington, trim-to length 63.30

Bullet				Powder	Starting load			Maximum load			
Weight [g] [grs]		Type	Mfg.	C.O.L. [mm]	Type	Weight [g] [grs]		Velocity [m/s]	Weight [g] [grs]		Velocity [m/s]
19.4	300	HP	Sierra	74.5	N120	4.19	64.7	740	4.54	70.1	792
22.7	350	SP	Speer	78.5	N120	4.12	63.3	697	4.48	69.1	751
					N130	4.47	69.0	723	4.78	73.8	767
32.4	500	RN	Hornady	84.5	N135	4.24	65.4	588	4.56	70.4	628
32.4	500	AGS	Speer	84.5	N135	4.38	67.6	585	4.70	72.5	626
32.4	500	RN	Hornady	84.5	N140	4.54	70.1	604	4.83	74.5	640

.50 BMG

Test barrel: 1140 mm, 1 in 16½" twist

Primers: CCI 35

Cases: TZZ, trim-to length 99.00 mm

Bullet				Powder	Starting load			Maximum load			
Weight [g] [grs]		Type	Mfg.	C.O.L. [mm]	Type	Weight [g] [grs]		Velocity [m/s]	Weight [g] [grs]		Velocity [m/s]
41.9	647	FMJBT	Speer	137.5	N170	12.80	197.5	789	14.30	220.6	869
					24N41	13.74	212.1	810	14.49	223.6	870
					20N29	15.39	237.5	825	16.32	251.9	899
45.4	700	Solid		137.5	24N41	13.51	208.5	798	14.65	226.0	866
					20N29	15.09	232.9	807	16.25	250.7	884
48.6	750	A-MAX	Hornady	137.5	N170	12.09	186.6	748	13.54	209.0	820
					24N41	12.82	197.9	754	13.82	213.2	822
					20N29	14.41	222.2	768	15.60	240.7	840
48.6	750	Solid		137.5	24N41	13.09	202.0	756	14.20	218.7	834
					20N29	14.43	222.7	770	15.81	244.1	847
51.8	800	Solid		137.5	24N41	11.65	179.7	713	12.56	193.8	772
					20N29	13.97	215.6	770	15.43	238.0	831
55.1	850	Solid		137.5	24N41	12.19	188.8	707	13.19	203.6	766
					20N29	13.71	211.6	735	15.02	231.8	806

BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!

LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

HANDGUN RELOADING DATA

DISCLAIMER

All of this reloading information has been provided by Nexplo Vihtavuori Oy and Nammo Lapua Oy. The data given here were obtained in laboratory conditions following strictly the CIP (Commission Internationale Permanente) June 13, 1990, November 9, 1993 and August 6, 1998 rules. The listed maximum loads have been determined according to the respective CIP/SAAMI maximum pressure specifications, whichever is lower.

These test methods have been deemed to be safe throughout the world. Pressure is measured at the case mouth or from inside the case according to the CIP. The loads published here do not exceed the maximum pressure introduced by the CIP. DO NOT ATTEMPT ANY EXTRAPOLATIONS. PLEASE FOLLOW THE DATA AS WRITTEN.

Before starting the reloading process see the Reloading Safety Rules. Because Nammo Lapua Oy has no control over either handling or storage of the reloading components as well as over the entire reloading process, Nammo Lapua Oy cannot accept any liability for the possible effects of the use of Lapua and/or Vihtavuori reloading components.

The load development is done according to the methods described in Vihtavuori Reloading Manual. For that as well as further reloading information see Vihtavuori Reloading Manual.

7mm TCU

Test barrel: 360 mm, 1 in 10" twist

Primers: Small Rifle

Cases: Fireformed LAPUA .223 Remington,
trim-to length 44.50 mm

Bullet				Powder	Starting load			Maximum load			
Weight [g] [grs]		Type	Mfg.	C.O.L. [mm]	Type	Weight [g] [grs]		Velocity [m/s]	Weight [g] [grs]		Velocity [m/s]
6.5	100	HP	Hornady	62.5	N120	1.48	22.8	667	1.64	25.3	744
					N130	1.62	25.0	672	1.79	27.6	753
					N133	1.77	27.3	695	1.96	30.2	774
7.8	120	SSSP	Hornady	63.5	N120	1.32	20.4	606	1.45	22.4	655
					N130	1.45	22.4	610	1.61	24.8	673
					N133	1.62	25.0	630	1.81	27.9	701
8.4	130	Spitzer	Speer	65.0	N120	1.24	19.1	542	1.38	21.3	596
					N130	1.40	21.6	573	1.55	23.9	626
					N133	1.46	22.5	576	1.62	25.0	633
9.7	150	SBT	Sierra	65.0	N120	1.17	18.1	513	1.30	20.1	562
					N130	1.31	20.2	535	1.45	22.4	586
					N133	1.38	21.3	542	1.53	23.6	599
10.4	160	SBT	Sierra	66.0	N135	1.44	22.2	538	1.60	24.7	597
					N120	1.12	17.3	480	1.25	19.3	531
					N130	1.26	19.4	505	1.41	21.8	558
					N133	1.31	20.2	511	1.45	22.4	559
					N135	1.45	22.4	531	1.61	24.8	582
					N540	1.48	22.8	544	1.63	25.2	598

NOTE: This cartridge is not supported by CIP or SAAMI. The maximum loads does not exceed 320 MPa.

BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!
LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

7mm BR Remington

Test barrel: 375 mm, 1 in 10" twist

Primers: Small Rifle

Cases: Remington, trim-to length 38.40 mm

Bullet					Powder	Starting load			Maximum load		
Weight [g] [grs]		Type	Mfg.	C.O.L. [mm]	Type	Weight [g] [grs]		Velocity [m/s]	Weight [g] [grs]		Velocity [m/s]
6.5	100	HP	Hornady	56.0	N120	1.74	26.9	737	1.93	29.8	829
					N130	1.89	30.6	746	2.10	32.4	838
7.8	120	SSSP	Hornady	56.6	N120	1.61	24.8	662	1.80	27.8	738
					N130	1.74	26.9	668	1.94	29.9	784
9.1	140	Ballistic Tip	Nosler	60.3	N133	1.90	29.3	700	2.11	32.6	771
					N120	1.43	22.1	588	1.58	24.4	640
					N130	1.58	24.4	595	1.73	26.7	661
9.7	150	Ballistic Tip	Nosler	60.3	N133	1.66	25.6	607	1.84	28.4	671
					N120	1.40	21.6	569	1.54	23.8	619
					N130	1.51	23.3	577	1.67	25.8	635
10.4	160	HPBT	Sierra	59.7	N133	1.60	24.7	587	1.77	27.3	642
					N135	1.69	26.1	584	1.87	28.9	650
					N120	1.29	19.9	536	1.42	21.9	580
					N130	1.40	21.6	552	1.55	23.9	602
					N133	1.52	23.5	560	1.69	26.1	619
					N135	1.61	24.8	567	1.79	27.6	630

7 x 49 GJW

Test barrel: 380 mm, 1 in 9" twist

Primers: Small Rifle

Cases: MFT, trim-to length 48.75 mm

Bullet				Powder	Starting load			Maximum load			
Weight [g] [grs]		Type	Mfg.	C.O.L. [mm]	Type	Weight [g] [grs]		Velocity [m/s]	Weight [g] [grs]		Velocity [m/s]
9.7	150	Ballistic Tip	Nosler	73.5	N130	1.52	23.4	592	1.67	25.7	642
					N133	1.59	24.6	591	1.74	26.9	644
					N135	1.72	26.6	608	1.86	28.7	658
10.9	168	HPBT	Sierra	73.5	N130	1.47	22.8	562	1.63	25.1	611
					N133	1.56	24.1	565	1.71	26.5	617
					N135	1.70	26.3	585	1.83	28.2	631
					N140	1.77	27.3	585	1.91	29.5	636

BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!

LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

.30 Luger

Test barrel: 200 mm, 1 in 11" twist
Primers: Small Pistol
Cases: LAPUA, trim-to length 21.40 mm

Bullet				Powder	Starting load			Maximum load		
Weight	Type	Mfg.	C.O.L.	Type	Weight	Velocity	Weight	Velocity		
[g]	[grs]		[mm]		[g]	[grs]	[m/s]	[g]	[grs]	[m/s]
6.0	93	FMJ	Sako	29.7	N340			0.35	5.4	390

.32 S.&W. Long N.P.

Test barrel: 175 mm, 1 in 18½" twist
Primers: Small Pistol
Cases: Remington, trim-to length 23.20 mm

Bullet				Powder	Starting load			Maximum load			
Weight		Type	Mfg.	C.O.L.	Type	Weight		Velocity	Weight		Velocity
[g]	[grs]			[mm]		[g]	[grs]	[m/s]	[g]	[grs]	[m/s]
5.4	83	LWC	LAPUA	24.6	N310	0.09	1.4	231	0.11	1.7	258
6.4	98	LWC	LAPUA	24.6	N310	0.07	1.1	186	0.08	1.2	208
6.4	98	LRN	LAPUA	32.3	N310	0.12	1.9	256	0.14	2.2	277

.32 S.&W. Long Wadcutter

Test barrel: 175 mm, 1 in 18½" twist
Primers: Small Pistol
Cases: LAPUA, trim-to length 23.20 mm

Bullet				Powder	Starting load			Maximum load			
Weight		Type	Mfg.	C.O.L.	Type	Weight		Velocity	Weight		Velocity
[g]	[grs]			[mm]		[g]	[grs]	[m/s]	[g]	[grs]	[m/s]
5.35	83	LWC	LAPUA	24.6	N310	0.11	1.7	230	0.13	2.0	280
6.35	98	LWC	LAPUA	24.6	N310	0.10	1.5	230	0.12	1.8	260

NOTE: THE LOADS LISTED ABOVE ARE SAFE ONLY IN MODERN TARGET PISTOLS AND REVOLVERS, IF USED TOGETHER WITH LAPUA HEADSTAMPED BRASS!

.380 ACP

Test barrel: 90 mm, 1 in 10" twist
Primers: Small Pistol
Cases: Sako, trim-to length 17.20 mm

Bullet				Powder	Starting load			Maximum load		
Weight	Type	Mfg.	C.O.L.	Type	Weight	Velocity	Weight	Velocity		
[g]	[grs]		[mm]		[g]	[grs]	[m/s]	[g]	[grs]	[m/s]
5.8	90	HP-XTP	Hornady	24.9	N310			0.18	2.8	308
					N320			0.23	3.5	327
6.2	95	TMJ	Speer	24.9	N310			0.18	2.8	303
					N320			0.23	3.6	325
6.5	100	FMJ	Hornady	24.9	N310			0.16	2.5	278
					N320			0.21	3.3	307

NOTE!

WHEN ONLY THE MAXIMUM LOADS ARE SHOWN IN THE TABLES ABOVE START LOADING WITH APPROXIMATELY 15 % SMALLER POWDER CHARGE.

BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!
LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

9mm Luger

Test barrel: 100 mm, 1 in 10" twist

Primers: Small Pistol

Cases: Remington, trim-to length 19.00 mm

Bullet					Powder	Starting load			Maximum load		
Weight		Type	Mfg.	C.O.L.	Type	Weight		Velocity	Weight		Velocity
[g]	[grs]			[mm]		[g]	[grs]	[m/s]	[g]	[grs]	[m/s]
5.8	90	HP-XTP	Hornady	27.0	N310	0.26	4.0	373	0.28	4.3	388
					N320	0.32	4.9	406	0.35	5.4	426
					N330	0.37	5.6	425	0.40	6.2	443
					N340	0.37	5.7	430	0.41	6.4	460
					N350	0.43	6.6	432	0.48	7.4	464
6.5	100	HP	Speer	27.5	3N37	0.43	6.6	443	0.48	7.4	467
					N320	0.31	4.8	379	0.34	5.3	405
					N330	0.36	5.5	399	0.39	6.0	422
					N340	0.38	5.9	402	0.43	6.6	438
					3N37	0.43	6.7	407	0.49	7.5	443
7.5	115	HP-XTP	Hornady	29.0	N320	0.27	4.1	346	0.30	4.6	368
					N330	0.32	5.0	362	0.36	5.5	388
					N340	0.35	5.5	373	0.39	6.1	404
					3N37	0.40	6.2	377	0.45	6.9	405
					N350	0.39	6.0	379	0.43	6.6	402
7.5	115	RN	Rainier	29.0	N320	0.26	4.1	331	0.29	4.5	353
					N330	0.31	4.7	347	0.33	5.2	366
					N340	0.33	5.1	358	0.36	5.6	380
					N350	0.38	5.8	371	0.42	6.5	397
					3N37	0.40	6.2	369	0.43	6.6	387
7.8	120	CEPP	LAPUA	28.7	N320	0.26	4.0	314	0.28	4.4	336
					N330	0.31	4.8	345	0.34	5.3	368
					N340	0.33	5.1	352	0.37	5.7	376
					N350	0.39	6.0	364	0.42	6.5	389
					3N37	0.37	5.7	345	0.40	6.2	368
8.0	124	LSWC	Intercast	29.0	N320	0.25	3.8	331	0.27	4.2	347
					N330	0.29	4.5	348	0.31	4.9	362
					N340	0.31	4.8	352	0.34	5.3	375
					3N37	0.36	5.5	357	0.39	6.0	376
					N350	0.33	5.1	350	0.36	5.6	367
8.0	124	FMJ/FP	Hornady	29.0	N320	0.26	4.0	316	0.28	4.4	340
					N330	0.32	5.0	343	0.34	5.3	365
					N340	0.35	5.3	353	0.37	5.8	376
					3N37	0.40	6.1	362	0.43	6.6	382
					N350	0.36	5.6	354	0.40	6.1	376
8.0	124	RN	Rainier	29.0	3N38	0.42	6.5	337	0.49	7.6	377
					N320	0.25	3.8	310	0.27	4.2	331
					N330	0.28	4.4	329	0.31	4.8	349
					N340	0.31	4.7	334	0.34	5.3	357
					N350	0.35	5.5	346	0.39	6.1	371
					3N37	0.36	5.5	351	0.40	6.1	370

BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!

LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

9mm Luger

Bullet				Powder	Starting load			Maximum load			
Weight [g] [grs]		Type	Mfg.	C.O.L. [mm]	Type	Weight [g] [grs]		Velocity [m/s]	Weight [g] [grs]		Velocity [m/s]
8.4	130	FMJ	Sierra	29.0	N320	0.24	3.7	304	0.26	4.1	324
					N330	0.27	4.2	319	0.30	4.6	338
					N340	0.29	4.4	329	0.31	4.9	345
					N350	0.34	5.2	334	0.36	5.6	350
					3N37	0.33	5.1	330	0.37	5.7	349
					3N38	0.39	6.0	310	0.44	6.8	355
9.4	145	LRN	Intercast	29.0	N105	0.46	7.2	357	0.48	7.5	382
					N330	0.23	3.5	290	0.25	3.9	310
					N340	0.26	4.0	304	0.28	4.4	323
					N350	0.28	4.3	302	0.31	4.8	325
					3N37	0.30	4.6	305	0.33	5.1	327
					9.5	147	HP/XTP	Hornady	29.0	N330	0.26
N340	0.26	4.1	294	0.28						4.4	314
3N37	0.31	4.8	304	0.34						5.3	326
N350	0.30	4.7	308	0.33						5.1	332
3N38	0.36	5.5	303	0.40						6.2	334
N105	0.40	6.2	322	0.42						6.5	343
9.5	147	RN	Rainier	29.0	N330	0.23	3.6	276	0.25	3.9	291
					N340	0.25	3.9	277	0.27	4.2	298
					N350	0.28	4.3	291	0.31	4.8	315
					3N37	0.30	4.6	291	0.32	5.0	313
9.7	150	CEPP	Lapua	28.7	N330	0.23	3.5	269	0.25	3.8	288
					N340	0.25	3.9	280	0.27	4.2	299
					N350	0.28	4.4	290	0.30	4.7	308
					3N37	0.28	4.4	281	0.31	4.8	303

9 x 21

Test barrel: 140 mm, 1 in 10" twist

Primers: Small Pistol

Cases: Tanfoglio, trim-to length 21.00 mm

Bullet				Powder	Starting load			Maximum load			
Weight		Type	Mfg.	C.O.L.	Type	Weight		Velocity	Weight		Velocity
[g]	[grs]					[g]	[grs]		[m/s]	[g]	
6.5	100	HP	Speer	29.0	N340	0.39	6.0	419	0.43	6.6	447
					3N37	0.44	6.8	430	0.49	7.5	456
					N350	0.46	7.0	436	0.50	7.7	462
7.5	115	FMJ	Sierra	29.5	N340	0.35	5.4	383	0.38	5.9	403
					3N37	0.39	6.0	378	0.43	6.6	405
					N350	0.39	6.1	391	0.43	6.6	413
					N105	0.53	8.2	413	0.57	8.8	441

BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!

LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

9 x 21

Bullet					Powder	Starting load			Maximum load		
Weight [g] [grs]		Type	Mfg.	C.O.L. [mm]	Type	Weight [g] [grs]		Velocity [m/s]	Weight [g] [grs]		Velocity [m/s]
8.0	123	FMJ	LAPUA	29.5	N340	0.31	4.8	350	0.34	5.3	366
					3N37	0.35	5.4	356	0.39	6.0	375
					N350	0.35	5.5	351	0.38	5.9	372
					N105	0.45	6.9	375	0.48	7.5	400
9.5	147	HP-XTP	Hornady	29.5	3N37	0.32	4.9	312	0.35	5.3	331
					N350	0.30	4.6	326	0.33	5.0	340
					N105	0.38	5.9	329	0.41	6.4	350

.357 SIG

Test barrel: 130 mm, 1 in 16" twist

Primers: Small Pistol

Cases: Starline, trim-to length 21.85 mm

Bullet					Powder	Starting load			Maximum load		
Weight [g] [grs]		Type	Mfg.	C.O.L. [mm]	Type	Weight [g] [grs]		Velocity [m/s]	Weight [g] [grs]		Velocity [m/s]
6.2	95	FMJ	Speer	28.5	N340	0.53	8.1	482	0.60	9.2	482
					3N37	0.59	9.2	491	0.67	10.3	534
					N350	0.60	9.3	492	0.68	10.5	539
7.5	115	FMJ	Sierra	28.5	N340	0.44	6.9	423	0.52	8.0	466
					3N37	0.51	7.8	434	0.58	8.9	474
					N350	0.50	7.7	431	0.58	9.0	478
8.0	123	FMJ	LAPUA	28.5	N340	0.42	6.5	398	0.50	7.6	441
					3N37	0.49	7.5	409	0.56	8.6	451
					N350	0.49	7.5	404	0.56	8.7	454
8.0	123	Megashock	LAPUA	28.5	N340	0.42	6.5	398	0.50	7.7	423
					3N37	0.48	7.5	411	0.56	8.6	453
					N350	0.48	7.4	409	0.57	8.8	449
8.4	130	RN B	Rainier	28.5	N340	0.42	6.5	385	0.48	7.4	423
					3N37	0.48	7.5	391	0.54	8.4	414
					N350	0.47	7.3	400	0.55	8.5	443

BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!

LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

.38 Super Auto

Test barrel: 140 mm, 1 in 16" twist

Primers: Small Pistol

Cases: Remington +P, trim-to length 22.70 mm

Bullet				Powder	Starting load			Maximum load			
Weight		Type	Mfg.	C.O.L.	Type	Weight		Velocity	Weight		Velocity
[g]	[grs]					[g]	[grs]		[m/s]	[g]	
7.5	115	HP-XTP	Hornady	31.5	N320	0.33	5.1	362	0.38	5.9	402
					N340	0.39	6.0	381	0.45	6.9	426
					3N37	0.42	6.5	385	0.51	7.9	436
					N350	0.36	5.5	357	0.46	7.1	415
7.5	115	FMJ	Sierra	32.4	N350	0.51	7.9	414	0.59	9.1	463
					3N37	0.48	7.5	395	0.54	8.4	443
7.5	115	RN	Rainier	31.5	N320	0.31	4.8	357	0.37	5.7	394
					N340	0.39	6.0	382	0.45	7.0	426
					N350	0.43	6.6	388	0.52	7.9	438
					3N37	0.44	6.9	390	0.51	7.9	432
8.0	124	FMJ-FP	Hornady	32.0	N340	0.39	6.0	368	0.46	7.1	413
					3N37	0.46	7.1	374	0.50	7.7	401
					N350	0.41	6.4	366	0.49	7.5	411
					3N38	0.52	8.0	388	0.60	9.3	446
					N105	0.64	10.0	429	0.71	10.9	486
					N340	0.35	5.4	367	0.41	6.4	405
8.0	124	LSWC	Intercast	32.0	N350	0.39	6.0	371	0.46	7.1	415
					3N37	0.41	6.3	377	0.48	7.4	417
					N340	0.36	5.5	349	0.41	6.3	384
8.4	130	FMJ	Sierra	32.0	3N37	0.41	6.3	360	0.47	7.3	399
					3N38	0.54	8.3	387	0.58	9.0	424
					N105	0.60	9.3	402	0.65	10.1	444
					N340	0.35	5.4	344	0.40	6.2	375
8.4	130	RN	Rainier	32.0	N350	0.38	5.9	347	0.45	6.9	388
					3N37	0.41	6.3	355	0.47	7.2	392
					N340	0.28	4.3	315	0.33	5.2	350
					3N37	0.36	5.5	329	0.41	6.3	368
9.4	145	LRN	Intercast	32.0	N350	0.33	5.1	319	0.39	6.0	358
					N340	0.33	5.1	315	0.38	5.9	354
					3N37	0.38	5.9	334	0.44	6.8	372
					N350	0.37	5.7	327	0.42	6.5	364
9.5	147	HP/XTP	Hornady	32.0	3N38	0.50	7.7	366	0.52	8.0	373
					N105	0.51	7.8	360	0.55	8.4	394
					N340	0.32	5.0	321	0.37	5.7	348
					N350	0.34	5.3	307	0.40	6.1	345
					3N37	0.36	5.5	316	0.41	6.3	349

BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!
LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

.38 Super Lapua

Test barrel: 140 mm, 1 in 16" twist
 Primers: Small Pistol
 Cases: LAPUA, trim-to length 22.70 mm

Bullet				Powder	Starting load			Maximum load		
Weight		Type	Mfg.	C.O.L.	Type	Weight		Velocity	Weight	
[g]	[grs]			[mm]		[g]	[grs]	[m/s]	[g]	[grs]
7.5	115	FMJ	LAPUA	31.5	N340	0.36	5.6	363	0.41	6.3
					3N37	0.44	6.8	383	0.48	7.4
					3N38	0.56	8.6	413	0.63	9.7
8.0	124	FMJ	LAPUA	32.0	N340	0.36	5.6	361	0.40	6.2
					3N37	0.44	6.8	382	0.47	7.3
					3N38	0.54	8.3	386	0.59	9.1
8.4	130	FMJ	Sierra	32.0	N340	0.34	5.2	356	0.39	6.0
					3N37	0.42	6.5	364	0.46	7.1
					3N38	0.50	7.7	380	0.57	8.8

.38 Special

Test barrel: 170 mm, 1 in 18" twist
 Primers: Small Pistol
 Cases: Sako, trim-to length 29.10 mm

Bullet				Powder	Starting load			Maximum load		
Weight		Type	Mfg.	C.O.L.	Type	Weight		Velocity	Weight	
[g]	[grs]			[mm]		[g]	[grs]	[m/s]	[g]	[grs]
7.1	110	HP/XTP	Hornady	36.5	N320	0.37	5.7	362	0.41	6.3
					N340	0.42	6.5	363	0.46	7.1
					3N37	0.50	7.7	373	0.55	8.4
					N350	0.46	7.1	374	0.52	8.0
8.0	124	LSWC	Inter cast	36.5	N320	0.31	4.8	329	0.35	5.4
					N340	0.39	6.0	343	0.43	6.6
					3N37	0.43	6.6	346	0.47	7.3
					N350	0.41	6.4	351	0.46	7.2
8.1	125	FP/XTP	Hornady	36.5	N320	0.34	5.3	318	0.38	5.9
					N340	0.40	6.2	336	0.45	6.9
					3N37	0.46	7.2	340	0.50	7.7
					N350	0.45	7.0	345	0.51	7.9
8.1	125	FP	Rainier	36.5	N320	0.31	4.7	310	0.35	5.4
					N340	0.37	5.7	325	0.43	6.6
					N350	0.41	6.3	326	0.47	7.2
					3N37	0.43	6.6	333	0.49	7.5
9.1	140	HP	Speer	36.5	N320	0.32	5.0	291	0.36	5.6
					N340	0.38	5.8	299	0.42	6.4
					3N37	0.43	6.6	308	0.48	7.4
					N350	0.42	6.4	306	0.46	7.1
9.4	145	LSWC	Inter cast	37.5	N320	0.27	4.1	286	0.31	4.7
					N340	0.35	5.3	315	0.39	6.0
					3N37	0.37	5.6	305	0.40	6.2
					N350	0.38	5.8	318	0.44	6.7

BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!
 LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

.38 Special

Bullet				Powder	Starting load			Maximum load			
Weight [g] [grs]		Type	Mfg.	C.O.L. [mm]	Type	Weight [g] [grs]		Velocity [m/s]	Weight [g] [grs]		Velocity [m/s]
9.5	147	JHP	Speer	35.0	N340	0.32	5.0	281	0.37	5.7	321
					3N37	0.37	5.7	284	0.41	6.3	326
					N350	0.36	5.6	284	0.40	6.2	322
9.6	148	LWC	Sako	30.0	N320	0.21	3.2	250	0.24	3.7	277
					N330	0.23	3.6	256	0.26	4.1	290
					N340	0.25	3.9	263	0.28	4.4	294
					N350	0.28	4.3	272	0.31	4.8	307
					N340	0.34	5.2	267	0.38	5.9	319
					3N37	0.40	6.1	279	0.44	6.8	320
					N350	0.38	5.9	282	0.43	6.7	325
10.2	158	FP	Rainier	37.5	N320	0.28	4.3	257	0.33	5.1	298
					N340	0.34	5.3	268	0.39	6.1	311
					N350	0.38	5.9	281	0.43	6.7	321
					3N37	0.39	6.1	282	0.44	6.9	326
10.4	158	LFN	Intercast	37.5	N340	0.35	5.4	315	0.39	6.0	351
					3N37	0.37	5.7	298	0.42	6.5	340
					N350	0.37	5.7	309	0.41	6.3	340

.357 Magnum

Test barrel: 175 mm, 1 in 18½" twist

Primers: Small Rifle

Cases: Remington, trim-to length 32.60 mm

Bullet				Powder	Starting load			Maximum load			
Weight [g] [grs]		Type	Mfg.	C.O.L. [mm]	Type	Weight [g] [grs]		Velocity [m/s]	Weight [g] [grs]		Velocity [m/s]
7.1	110	HP/XTP	Hornady	40.0	N310	0.40	6.2	395	0.44	6.7	417
					N320	0.48	7.4	424	0.52	8.0	449
					N340	0.55	8.5	444	0.61	9.4	481
					3N37	0.61	9.5	468	0.69	10.7	502
					N350	0.64	9.9	472	0.70	10.8	502
8.0	124	LSWC	Intercast	41.0*)	N110	1.20	18.5	523	1.30	20.1	582
					N340	0.51	7.9	419	0.57	8.8	448
					N350	0.54	8.3	423	0.60	9.3	451
					N110	1.02	15.7	471	1.13	17.4	518
8.1	125	FP/XTP	Hornady	40.0	N310	0.36	5.5	346	0.40	6.1	376
					N320	0.40	6.2	375	0.46	7.1	405
					N340	0.51	7.8	412	0.57	8.8	446
					N350	0.57	8.7	431	0.63	9.7	461
					N110	1.09	16.8	488	1.19	18.4	540

*) The CIP maximum cartridge overall length is exceeded.

BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!
LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

.357 Magnum

Bullet					Powder	Starting load			Maximum load		
Weight		Type	Mfg.	C.O.L.	Type	Weight		Velocity	Weight		Velocity
[g]	[grs]			[mm]		[g]	[grs]	[m/s]	[g]	[grs]	[m/s]
9.1	140	HP	Speer	40.0	N340	0.49	7.6	381	0.54	8.3	409
					3N37	0.54	8.3	390	0.60	9.3	422
					N350	0.53	8.2	390	0.59	9.1	421
					N110	1.02	15.7	457	1.11	17.1	502
9.4	145	LSWC	Intercast	41.0*)	N320	0.38	5.8	358	0.42	6.4	380
					N340	0.43	6.6	377	0.48	7.4	402
					3N37	0.49	7.5	387	0.55	8.5	417
					N350	0.44	6.8	375	0.52	8.1	410
					N110	0.91	14.0	450	0.99	15.3	485
					N320	0.37	5.7	312	0.41	6.3	340
10.2	158	HP	Speer	40.0	N340	0.44	6.7	340	0.48	7.4	365
					3N37	0.48	7.4	351	0.54	8.3	382
					N350	0.49	7.6	366	0.55	8.5	389
					N105	0.71	10.9	402	0.77	11.9	432
10.2	158	FP/XTP	Hornady	40.0	N110	0.91	14.1	417	0.99	15.3	458
10.2	158	HP	Speer	40.0	N340	0.41	6.3	360	0.46	7.1	379
					3N37	0.47	7.3	358	0.52	8.0	388
					N350	0.43	6.6	363	0.49	7.6	387
					N110	0.85	13.2	428	0.93	14.4	462
					N340	0.38	5.8	283	0.42	6.4	301
					3N37	0.40	6.2	281	0.46	7.1	313
11.7	180	TERA	LAPUA	42.6*)	N350	0.39	6.0	273	0.45	7.0	310
					N110	0.77	11.9	360	0.83	12.8	397
					N340	0.41	6.3	296	0.46	7.1	326
					3N37	0.45	7.0	309	0.51	7.9	341
					N350	0.42	6.4	293	0.48	7.4	331
					N105	0.58	8.9	352	0.66	10.3	384
11.7	180	TMJ	Speer	42.6*)	N110	0.82	12.7	382	0.91	14.0	425
					3N37	0.41	6.4	272	0.47	7.2	302
					N350	0.40	6.2	255	0.46	7.1	295
					N105	0.55	8.4	311	0.61	9.4	342
					N110	0.74	11.4	337	0.80	12.4	367
					N340	0.41	6.4	272	0.47	7.2	302

*) The CIP maximum cartridge overall length is exceeded.

BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!
LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

.357 Remington Maximum

Test barrel: 300 mm, 1 in 18¹/₂" twist

Primers: Small Rifle

Cases: Remington, trim-to length 40.60 mm

Bullet				Powder	Starting load			Maximum load			
Weight [g] [grs]		Type	Mfg.	C.O.L. [mm]	Type	Weight [g] [grs]		Velocity [m/s]	Weight [g] [grs]		Velocity [m/s]
10.2	158	FP/XTP	Hornady	48.0	3N37	0.66	10.1	439	0.73	11.3	476
					N350	0.56	8.6	409	0.70	10.7	466
					N105	0.85	13.1	485	1.02	15.7	549
					N110	1.14	17.5	529	1.26	19.4	575
10.2	158	FP	Rainier	48.0	N350	0.63	9.7	399	0.77	11.8	467
					3N37	0.62	9.5	409	0.74	11.4	469
					N105	0.86	13.3	490	1.04	16.0	551
					N110	1.21	18.6	530	1.31	20.2	578
10.4	160	LFN	Intercast	48.0	3N37	0.59	9.1	444	0.71	10.9	479
					N350	0.62	9.5	440	0.69	10.6	471
					N105	0.87	13.4	517	1.05	16.2	572
11.7	180	Silhoutte	Nosler	48.1	N105	0.79	12.2	443	0.92	14.2	499
					N110	1.00	15.5	475	1.12	17.2	517
					N120	1.32	20.4	489	1.45	22.4	534
13.0	200	TMJ	Speer	50.8*)	N110	0.92	14.2	415	1.04	16.0	457
					N120	1.23	18.9	426	1.35	20.8	479

*) The CIP maximum cartridge overall length is exceeded.

.40 S.&W.

Test barrel: 140 mm, 1 in 16" twist

Primers: Small Pistol

Cases: Remington, trim-to length 21.40 mm

Bullet					Powder	Starting load			Maximum load		
Weight [g] [grs]		Type	Mfg.	C.O.L. [mm]	Type	Weight [g] [grs]		Velocity [m/s]	Weight [g] [grs]		Velocity [m/s]
10.0	155	HP-XTP	Hornady	28.6	N320	0.34	5.2	337	0.38	5.9	363
					N330	0.39	6.0	348	0.43	6.7	376
					N340	0.39	6.0	345	0.45	6.9	381
					3N37	0.47	7.3	357	0.53	8.1	392
					N350	0.43	6.6	351	0.50	7.6	385
10.0	155	FP	Rainier	28.6	N320	0.34	5.3	331	0.38	5.9	357
					N330	0.39	6.0	344	0.43	6.7	373
					N340	0.41	6.4	352	0.47	7.3	389
					N350	0.46	7.2	357	0.52	8.1	395
					3N37	0.49	7.5	359	0.55	8.5	394
11.0	170	HP	Hornady	28.6	N340	0.34	5.3	313	0.40	6.1	346
					3N37	0.39	6.0	322	0.45	7.0	355
					N350	0.38	5.8	322	0.44	6.8	354

BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!

LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

.40 S.&W.

Bullet				Powder	Starting load			Maximum load			
Weight [g] [grs]		Type	Mfg.	C.O.L. [mm]	Type	Weight [g] [grs]		Velocity [m/s]	Weight [g] [grs]		Velocity [m/s]
11.7	180	HP	Speer	28.6	N340	0.35	5.5	305	0.40	6.1	338
					3N37	0.38	5.8	303	0.44	6.8	340
					N350	0.38	5.9	319	0.44	6.7	348
13.0	200	TMJ	Speer	28.6	N340	0.30	4.7	267	0.35	5.4	298
					3N37	0.33	5.1	265	0.39	6.0	301
					N350	0.34	5.3	272	0.39	6.0	302
					N105	0.49	7.5	321	0.52	8.0	345

10mm AUTO

Test barrel: 140 mm, 1 in 16" twist

Primers: Large Pistol

Cases: Winchester, trim-to length 25.00 mm

Bullet				Powder	Starting load			Maximum load			
Weight [g] [grs]		Type	Mfg.	C.O.L. [mm]	Type	Weight [g] [grs]		Velocity [m/s]	Weight [g] [grs]		Velocity [m/s]
10.0	155	HP-XTP	Hornady	31.9	N340	0.43	6.7	355	0.49	7.6	392
					3N37	0.47	7.2	359	0.56	8.6	401
					N350	0.46	7.1	359	0.55	8.4	401
10.0	155	FP	Rainier	31.9	N340	0.47	7.2	369	0.52	8.0	403
					N350	0.52	8.0	379	0.58	8.9	420
					3N37	0.53	8.2	373	0.58	9.0	410
11.7	180	HP	Speer	31.9	N340	0.39	6.0	312	0.44	6.9	352
					3N37	0.43	6.6	333	0.50	7.8	366
					N350	0.38	5.9	328	0.47	7.2	361
13.0	200	FMJ/FP	Hornady	31.9	N105	0.60	9.3	372	0.68	10.5	408
					N340	0.32	5.0	267	0.37	5.7	309
					3N37	0.38	5.9	291	0.44	6.8	327
					N350	0.34	5.3	284	0.41	6.3	319
					N105	0.50	7.7	325	0.56	8.6	352

BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!

LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

.41 Remington Magnum

Test barrel: 150 mm, 1 in 18¾" twist
 Primers: Large Pistol
 Cases: W-W Super, trim-to length 32.65 mm

Bullet				Powder	Starting load			Maximum load			
Weight [g] [grs]		Type	Mfg.	C.O.L. [mm]	Type	Weight [g] [grs]		Velocity [m/s]	Weight [g] [grs]		Velocity [m/s]
11.0	170	JHC	Sierra	40.1	N350	0.72	11.1	417	0.84	13.0	465
					N105	0.99	15.3	469	1.13	17.5	515
					N110	1.41	21.7	504	1.53	23.5	547
13.6	210	HP/XTP	Hornady	40.1	N350	0.67	10.4	372	0.76	11.8	408
					N105	0.84	13.0	405	0.98	15.1	448
					N110	1.20	18.5	436	1.31	20.3	476

.44 S.&W. Special

Test barrel: 150 mm, 1 in 18" twist
 Primers: Large Pistol
 Cases: Remington, trim-to length 29.30 mm

Bullet					Powder	Starting load			Maximum load		
Weight [g] [grs]		Type	Mfg.	C.O.L. [mm]	Type	Weight [g] [grs]		Velocity [m/s]	Weight [g] [grs]		Velocity [m/s]
11.7	180	HP-XTP	Hornady	37.3	N320	0.44	6.8	285	0.49	7.5	315
					N330	0.50	7.7	308	0.56	8.6	338
					N340	0.57	8.8	319	0.62	9.5	349
					N350	0.64	9.9	318	0.68	10.5	350
13.0	200	HP-XTP	Hornady	37.3	N320	0.41	6.4	270	0.45	7.0	294
					N330	0.50	7.7	287	0.55	8.5	315
					N340	0.54	8.3	293	0.59	9.1	325
					N350	0.59	9.1	296	0.64	9.9	329
14.3	220	FPJ-Match	Sierra	37.3	N320	0.34	5.2	221	0.39	5.9	255
					N330	0.40	6.2	232	0.46	7.0	271
					N340	0.43	6.6	248	0.48	7.4	278
					N350	0.50	7.7	254	0.56	8.6	289
15.6	240	JTC-Sil	Hornady	37.6	N320	0.31	4.9	193	0.36	5.6	223
					N330	0.35	5.5	206	0.40	6.2	234
					N340	0.41	6.3	222	0.46	7.1	252
					N350	0.49	7.5	239	0.53	8.2	271
16.2	250	FPJ-Match	Sierra	37.3	N320	0.31	4.7	193	0.36	5.5	226
					N330	0.32	5.0	191	0.39	6.0	228
					N340	0.36	5.5	197	0.42	6.5	237
					N350	0.44	6.7	229	0.49	7.6	260
17.3	267	LFN	Inter cast	39.1	N320	0.34	5.3	242	0.39	6.0	262
					N330	0.41	6.3	261	0.45	7.0	281
					N340	0.42	6.5	256	0.46	7.1	278
					N350	0.47	7.3	259	0.52	8.0	282

BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!
 LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

.44 Remington Magnum

Test barrel: 175 mm, 1 in 20" twist

Primers: Large Pistol

Cases: Remington, trim-to length 32.40 mm

Bullet				Powder	Starting load			Maximum load			
Weight	Type	Mfg.	C.O.L.	Type	Weight	Velocity	Weight	Velocity			
[g]	[grs]		[mm]		[g]	[grs]	[m/s]	[g]	[grs]	[m/s]	
11.7	180	HP-XTP	Hornady	40.7	N320	0.66	10.2	396	0.76	11.7	434
					N340	0.81	12.5	427	0.91	14.0	469
					N350	0.85	13.2	436	0.98	15.2	478
					N110	1.60	24.7	483	1.70	26.2	514
13.0	200	HP-XTP	Hornady	40.7	N320	0.62	9.6	371	0.73	11.2	406
					N340	0.73	11.3	400	0.84	12.9	435
					3N37	0.86	13.2	423	0.97	15.0	459
					N350	0.79	12.1	402	0.94	14.5	450
					N105	1.03	15.9	444	1.24	19.2	497
					N110	1.53	23.7	481	1.70	26.2	527
					N320	0.56	8.6	341	0.67	10.3	373
					N340	0.69	10.7	372	0.79	12.2	403
					N350	0.78	12.1	388	0.95	14.6	436
					N320	0.56	8.7	323	0.63	9.7	352
					N340	0.64	9.9	350	0.74	11.4	378
					3N37	0.75	11.6	361	0.86	13.2	399
					N350	0.75	11.6	366	0.82	12.7	397
					N105	0.90	13.9	392	1.07	16.4	434
					N110	1.28	19.8	422	1.42	21.9	467
					N320	0.52	8.1	303	0.62	9.6	342
16.2	250	FPJ-Match	Sierra	40.7	N340	0.62	9.6	331	0.72	11.1	367
					N350	0.71	11.0	356	0.84	13.0	392
					N340	0.66	10.1	350	0.74	11.4	374
					3N37	0.74	11.4	355	0.85	13.1	389
17.3	267	LFN	Inter cast	42.7*)	N350	0.71	10.9	351	0.82	12.6	382
					N110	1.29	19.8	412	1.40	21.7	447
					N340	0.60	9.2	297	0.67	10.4	322
					N350	0.65	10.1	305	0.75	11.6	341
19.4	300	HP-XTP	Hornady	43.6	N110	1.17	18.1	371	1.30	20.1	416
					N340	0.59	9.1	288	0.66	10.1	317
					3N37	0.62	9.6	295	0.72	11.1	330
					N350	0.61	9.4	285	0.71	10.9	324
19.4	300	JSP	Sierra	43.6	N105	0.79	12.2	332	0.89	13.7	366
					N110	1.12	17.3	359	1.23	18.9	395

*) The CIP maximum cartridge overall length is exceeded.

BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!
LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

.45 AUTO

Test barrel: 150 mm, 1 in 16" twist

Primers: Large Pistol

Cases: Remington, trim-to length 22.70 mm

Bullet				Powder	Starting load			Maximum load			
Weight [g] [grs]		Type	Mfg.	C.O.L. [mm]	Type	Weight [g] [grs]	Velocity [m/s]	Weight [g] [grs]	Velocity [m/s]		
10.0	154	LSWC	Intercast	31.5	N320	0.39	5.9	320	0.42	6.5	346
					N340	0.50	7.7	349	0.54	8.3	374
11.7	180	LSWC	Intercast	31.6	N320	0.36	5.5	301	0.40	6.1	326
					N340	0.45	6.9	316	0.49	7.5	342
13.0	200	FN	Rainier	30.5	N320	0.38	5.9	296	0.43	6.6	331
					N340	0.48	7.4	309	0.54	8.3	351
					N350	0.58	9.0	331	0.63	9.7	376
12.0	185	TMJ-SWC	Speer	32.2	N320	0.37	5.7	283	0.40	6.2	306
					N340	0.47	7.2	308	0.51	7.8	335
13.0	200	LSWC	Intercast	31.5	N320	0.31	4.8	275	0.34	5.2	296
					N340	0.40	6.2	299	0.44	6.7	321
13.0	200	FMJ-CT	Hornady	31.5	N320	0.33	5.0	265	0.36	5.5	287
					N340	0.41	6.3	281	0.45	6.9	305
					N350	0.44	6.8	284	0.48	7.5	308
14.9	230	FMJ-RN	Hornady	32.0	N320	0.32	4.9	243	0.34	5.3	263
					N340	0.39	6.0	258	0.42	6.5	283
					N350	0.44	6.8	262	0.48	7.3	285

.45 Colt

Test barrel: 150 mm, 1 in 16" twist

Primers: Large Pistol

Cases: Remington, trim-to length 32.50 mm

Bullet				Powder	Starting load			Maximum load			
Weight		Type	Mfg.	C.O.L.	Type	Weight		Velocity	Weight		Velocity
[g]	[grs]					[g]	[grs]		[m/s]	[g]	
11.7	180	LSWC	Intercast	40.5	N320	0.55	8.5	341	0.60	9.3	367
					N330	0.66	10.2	362	0.71	11.0	389
					N340	0.69	10.6	362	0.74	11.4	391
					N350	0.75	11.6	363	0.83	12.8	399
12.0	185	FN	Rainier	40.5	N320	0.57	8.8	328	0.62	9.6	358
					N330	0.67	10.3	333	0.73	11.3	367
					N340	0.72	11.1	343	0.78	12.0	383
					N350	0.80	12.3	346	0.88	13.6	389
12.0	185	HP/XTP	Hornady	40.5	N320	0.57	8.8	334	0.62	9.6	360
					N340	0.71	11.0	342	0.76	11.7	377
					N350	0.80	12.3	346	0.86	13.3	382
13.0	200	FMJ-CT	Hornady	40.5	N320	0.52	8.0	317	0.58	9.0	342
13.0	200	LSWC	Hornady	40.5	N320	0.56	8.6	326	0.61	9.4	347
					N340	0.70	10.8	341	0.75	11.6	364

BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!
LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

.45 Colt

Bullet				Powder	Starting load			Maximum load			
Weight		Type	Mfg.	C.O.L.	Type	Weight		Velocity	Weight		Velocity
[g]	[grs]					[g]	[grs]		[m/s]	[g]	
13.0	200	FMJ-CT	Hornady	40.5	N320	0.52	8.0	317	0.58	9.0	342
13.0	200	LSWC	Hornady	40.5	N320	0.56	8.6	326	0.61	9.4	347
					N340	0.70	10.8	341	0.75	11.6	364
14.9	230	FMJ-Match	Sierra	40.5	N320	0.49	7.6	286	0.54	8.3	306
					N340	0.63	9.7	301	0.68	10.5	330
16.2	250	HP/XTP	Hornady	40.5	N320	0.47	7.3	257	0.51	7.9	280
					N340	0.60	9.3	281	0.64	9.9	307
					N350	0.69	10.6	297	0.72	11.1	321
					N105	0.91	14.0	296	0.97	15.0	344

.45 Winchester Magnum

Test barrel: 300 mm, 1 in 16" twist

Primers: Winchester WLP

Cases: Winchester, trim-to length 30.30

Bullet				Powder	Starting load			Maximum load			
Weight		Type	Mfg.	C.O.L.	Type	Weight		Velocity	Weight		Velocity
[g]	[grs]					[g]	[grs]		[m/s]	[g]	
12.0	185	HP/XTP	Hornady	38.5	3N37	0.97	15.0	520	1.09	16.8	547
					N350	0.90	13.9	481	1.08	16.7	542
					N105	1.23	19.0	549	1.43	22.1	602
13.0	200	TMJ-SWC	Speer	38.5	3N37	0.95	14.7	500	1.04	16.0	526
13.0	200	FMJ-CT	Hornady	39.5	N105	1.15	17.7	507	1.31	20.2	556
13.0	200	TMJ-SWC	Speer	38.5	N110	1.56	24.1	551	1.71	26.4	598
14.9	230	FMJ-RN	Hornady	39.5	3N37	0.87	13.4	430	0.97	15.0	471
					N110	1.48	22.8	513	1.62	25.0	550
16.2	250	HP/XTP	Hornady	38.2	N350	0.71	11.0	341	0.84	13.0	405
					3N37	0.79	12.2	377	0.87	13.4	424
					N105	0.96	14.8	412	1.09	16.8	450
					N110	1.28	19.8	461	1.45	22.4	500

BOLD TEXT INDICATES MAXIMUM LOAD - USE WITH CAUTION!

LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

.454 Casull

Test barrel: 190 mm, 1 in 24" twist
Primers: Small Rifle
Cases: Starline, trim-to length 35.05

Bullet				Powder	Starting load			Maximum load			
Weight [g] [grs]		Type	Mfg.	C.O.L. [mm]	Type	Weight [g] [grs]		Velocity [m/s]	Weight [g] [grs]		Velocity [m/s]
12.0	185	HP/XTP	Hornady	41.7*	3N37	1.14	17.6	534	1.36	21.0	598
					N350	1.18	18.2	540	1.39	21.4	597
					N105	1.72	26.6	610	1.90	29.3	658
14.6	225	JHP	Speer	42.7	3N37	1.09	16.8	475	1.27	19.6	524
					N105	1.59	24.6	538	1.73	26.7	583
					N110	2.00	30.8	568	2.17	33.5	611
16.2	250	HP/XTP	Hornady	42.8	3N37	1.01	15.6	438	1.18	18.2	488
					N105	1.39	21.4	483	1.57	24.3	538
					N110	1.82	28.1	524	1.99	30.7	571
19.4	300	UCHP	Speer	44.5	3N37	0.99	15.2	395	1.10	17.0	431
					N105	1.28	19.7	429	1.49	23.0	484
					N110	1.71	26.3	474	1.86	28.7	514

*) The bullet crimp is over the ogive.

.50 AE

Test barrel: 150 mm, 1 in 19" twist
Primers: Large Pistol
Cases: Speer, trim-to length 32.40

Bullet				Powder	Starting load			Maximum load			
Weight [g] [grs]		Type	Mfg.	C.O.L. [mm]	Type	Weight [g] [grs]		Velocity [m/s]	Weight [g] [grs]		Velocity [m/s]
19.4	300	JHP	IMI	40.0	N105	1.26	19.5	395	1.38	21.3	437
					N110	1.64	25.3	396	1.86	28.6	457
					N120	2.11	32.5	362	2.33	36.0	417
21.1	325	UCHP	Speer	40.0	N105	1.15	17.7	356	1.26	19.5	407
					N110	1.56	24.1	387	1.75	27.0	445
					N120	1.99	30.7	347	2.23	34.5	408

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LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

NOTES

This image shows a single page of white paper with horizontal blue or grey ruling lines. The lines are evenly spaced and run across the width of the page, leaving small margins at the top and bottom. There are no vertical margin lines, no text, and no other markings on the page.

Vihtavuori Smokeless Loads for Cowboy Action Shooting

About the Data

These loads are developed to give the velocities required for the cowboy action shooting using revolvers with lead bullets. The maximum load is determined by the velocity limit about 300 m/s, or by the maximum pressure limit according to the CIP October 1, 1992 rules. The bold text in the tables indicate the maximum load according to CIP pressure level. **The maximum loads must never be exceeded.**

All the listed loads are intended to be used in modern firearms, which are according to the SAAMI requirements. Please use a competent gunsmith to evaluate that the condition of your gun is adequate to be used with the pressures indicated in the tables. The starting loads are the lowest charges which appeared to give clean burning, i.e. no unburned residues in the barrel or in the case, in our test shooting. This limit may, however vary according to the revolver used.

There are some special features, which must be considered, when using reduced loads like the ones presented in the tables bellow. The same facts are equally valid always when using any smokeless powder in such loads.

1) Double charges

Some of these loads are so small that throwing the load twice in the same case is possible because of the large case volume. Doubling the charge accidentally causes most probably truly lethal chamber pressures. Therefore, **it is a must for everyone using this data to check visually every single load for the double charge before seating the bullet.**

2) Free space in the case

When using charges which leave large amount of free space in the case, the shooting characteristics may vary largely depending on where the powder is located in the case. If the powder lies totally in the bottom of the case (i.e. in the end where primer is), the muzzle velocity and especially the maximum pressure become much higher. The maximum pressure may even be doubled when same powder charge is moved from the bullet end to the primer end of the case. This can

simply be demonstrated by shaking the revolver barrel upwards or barrel downwards just before turning it smoothly in horizontal position, aiming and shooting. Also the recoil may transfer the powder in either end of the case. This is sometimes seen as a velocity change between the first shot and the following shots.

The shot to shot deviations in velocity and pressure are normally increased when using load which leaves the cases half empty. For this reason such loads are not recommended for target loads. The data below is tested in a way that the powder is as much as possible in the primer side before firing, and therefore, the pressures and the velocities represent the maximum values which were obtained using our test equipment and cartridge components indicated in the table.

3) Risk for underload detonation

This risk is always present when using highly reduced loads of any smokeless powder. The large free space in the case may generate a pressure wave which can cause, in the worst case, powder to burn as a shock wave, i.e. to detonate, instead of normal fast burning process. The extremely sharp pressure peaks involved in detonation can destroy the weapon and may lead to serious injury.

All these loads given here are extensively pressure tested and no sings of underload detonation were found. We strongly recommend everyone to follow strictly these tables to minimize the risk for underload detonation.

Warnings

Smokeless powder differs considerably in its burning characteristics from common "black powder". Black powder burns essentially at the same rate in the open (unconfined) as when in a gun. The burning rate of smokeless powder increases with increasing pressure. If burning smokeless powder is confined, gas pressure will rise and eventually can cause the container or chamber to burst. A slight increase in smokeless powder charge after maximum load causes sharp increase in maximum pressure in the chamber. **Never exceed the maximum loads.**

.38 Special

Test barrel: 125mm, 1 in18" twist

Primers: Small Pistol

Cases: Remington, trim-to length 29.1 mm

Bullet				Powder	Starting load			Maximum load		
Weight [g]	Type [grs]	Mfg.	C.O.L. [mm]	Type	Weight [g]	Velocity [m/s]	Weight [g]	Velocity [m/s]	Weight [g]	Velocity [m/s]
10.3	158	LSWC/HP	36.5	N320	0.21	3.3	230	0.25	3.8	256
				N330	0.23	3.6	240	0.27	4.1	269

.357 Magnum

Test barrel: 150 mm, 1 in 18½" twist

Primers: Small Rifle

Cases: Remington, trim-to length 32.6 mm

Bullet				Powder	Starting load			Maximum load		
Weight [g] [grs]	Type	Mfg.	C.O.L. [mm]	Type	Weight [g] [grs]	Velocity [m/s]		Weight [g] [grs]	Velocity [m/s]	
10.3	158	LSWC/HP	40.0	N330	0.25	3.9	241	0.32	5.0	304
				N340	0.29	4.5	245	0.38	5.9	320

.44 S.&W. Special

Test barrel: 165 mm, 1 in 18" twist

Primers: Large Pistol

Cases: Remington, trim-to length 29.3 mm

Bullet				Powder	Starting load			Maximum load		
Weight [g] [grs]	Type	Mfg.	C.O.L. [mm]	Type	Weight [g] [grs]	Velocity [m/s]		Weight [g] [grs]	Velocity [m/s]	
15.6	240	SWC/HP	39.1	N320	0.30	4.7	214	0.38	5.9	260
				N330	0.36	5.5	229	0.41	6.3	270
17.3	267	LFN	39.1	N320	0.25	3.8	193	0.34	5.3	242
				N330	0.32	4.9	216	0.38	5.9	254
				N340	0.43	6.6	261	0.47	7.3	282

.44 Remington Magnum

Test barrel: 175 mm, 1 in 20" twist

Primers: Large Pistol

Cases: Remington, trim-to length 32.4 mm

Bullet				Powder	Starting load			Maximum load		
Weight [g] [grs]	Type	Mfg.	C.O.L. [mm]	Type	Weight [g] [grs]	Velocity [m/s]		Weight [g] [grs]	Velocity [m/s]	
17.3	267	LFN	40.0	N340	0.38	5.9	224	0.49	7.5	288

.45 Colt

Test barrel: 6", 1 in 16" twist

Primers: Large Pistol

Cases: Remington, trim-to length 32.5 mm

Bullet				Powder	Starting load			Maximum load		
Weight [g] [grs]	Type	Mfg.	C.O.L. [mm]	Type	Weight [g] [grs]	Velocity [m/s]		Weight [g] [grs]	Velocity [m/s]	
13.0	200	RN	40.5	N320	0.44	6.8	259	0.56	8.7	318
				N330	0.52	8.0	267	0.56	8.6	298
16.2	250	RN	40.5	N320	0.36	5.6	229	0.45	6.9	279
				N330	0.41	6.3	238	0.49	7.5	293

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LOADS LESS THAN MINIMUM CHARGES SHOWN ARE NOT RECOMMENDED

Unit Conversions

$$1 \text{ g} = 15.43 \text{ grains}$$

$$1 \text{ grain} = 0.0648 \text{ g}$$

$$1 \text{ MPa} = 145.036 \text{ psi}$$

$$1 \text{ psi} = 0.00689 \text{ MPa}$$

$$1 \text{ m/s} = 3.2808 \text{ fps}$$

$$1 \text{ fps} = 0.3048 \text{ m/s}$$

$$1 \text{ mm} = 0.03937 \text{ in.}$$

$$1 \text{ in.} = 25.4 \text{ mm}$$

$$1 \text{ m} = 1.0936 \text{ yds}$$

$$1 \text{ yd.} = 0.9144 \text{ m}$$

$$1 \text{ J} = 0.73757 \text{ ft. lbs}$$

$$1 \text{ ft. lbs} = 1.3558 \text{ J}$$

NOTES

[illegible]

Dear Customer,

The **Vihtavuori Powders** are available worldwide through our distributors listed below:

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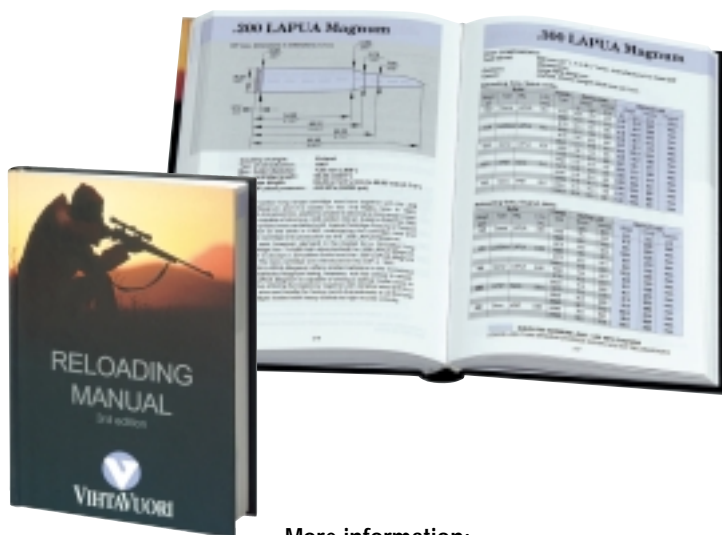
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