

15th Edition Reloader's Manual

What's it take to manufacture the world's finest ammunition? The world's finest components. Winchester understands the demands of shooters and hunters wanting to develop the "perfect load." You can rest assured that every Winchester ammunition component is made to meet and exceed the most demanding requirements and performance standards in the world—yours.

Winchester is the only manufacturer which backs up its data with over 125 years of experience in manufacturing rifle, handgun and shotshell ammunition. The data in this booklet are the culmination of very extensive testing which insures the reloader the best possible results. This 15th edition contains **more than 150 new recipes**, including AA Plus® Ball Powder® propellant, WAA12L wad, 9x23 Winchester and 454 Casull.

This information is presented to furnish the reloader with current data for reloading shotshell and centerfire rifle and handgun ammunition. It is not a textbook on how to reload, but rather a useful reference list of recommended loads using Winchester® components.

TABLE OF CONTENTS

Warnings Read Before using Data	2
Components Section	6
Shotshell Reloading	12
Shotshell Data	17
Powder Bushing Information	25
Metallic Cartridge Reloading	33
Rifle Data	35
Handgun Data	42
Ballistic Terms and Definitions	51

TRADEMARK NOTICE

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WARNINGS

Read before using data

The shotshell and metallic cartridge data in this booklet supersede all previous data published for Ball Powder® smokeless propellants.

The data shown in this booklet has been verified by tests fired in our laboratory under controlled conditions and found to produce safe cartridges. Since we have no control over the actual loading procedures and methods used, or the condition or choice of firearms and components used and assembled, no responsibility for the use or safety in use of these data is assumed or implied.

Where data contained in this booklet list specific components, no changes or substitutions for these components can be made. The exception to this is substitutions of bullets of the same type, diameter, and weight from reputable manufacturers, without risking significant changes in the level of ballistic performance and/or safety of the loads shown.

WARNING - All smokeless powders are extremely flammable. Keep them stored in their original containers in locked cabinets, out of the reach of children or incompetent persons, and away from exposure to the sun's rays, heating equipment, electrical equipment, or any source of heat, flame or sparks.

WE MAKE NO WARRANTIES EXPRESS OR IMPLIED, LIMITED OR FULL; SPECIFICALLY DISCLAIM ANY AND ALL WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE AND MERCHANTABILITY; AND SPECIFICALLY DISCLAIM ANY AND ALL LIABILITY FOR CONSEQUENTIAL DAMAGES OF ANY KIND WHATSOEVER.

FAILURE TO COMPLY WITH THESE WARNINGS OR TO USE THIS DATA EXACTLY AS SHOWN MAY RESULT IN ACCIDENTS WITH SERIOUS INJURY AND/OR DEATH TO THE SHOOTER AND/OR RELOADER AND/OR BYSTANDERS.

Black Powder - WARNING

Never substitute smokeless powder for black powder or Pyrodex or mix smokeless powder with black powder or Pyrodex. Never use smokeless powder in black powder firearms or in saluting cannons. Smokeless powder has much more energy than black powder or Pyrodex. Substituting or mixing powders may cause the firearm to blow up resulting in personal injury, property damage, or death.

Lead - WARNING

Discharging firearms in poorly ventilated areas, cleaning firearms, or handling ammunition may result in exposure to lead, and other substances known to cause birth defects, reproductive harm, and other serious physical injury. Have adequate ventilation at all times. Wash hands thoroughly after exposure.

Dram Equivalent - WARNING

Never use the dram equivalent measure as a weight for smokeless powders in reloading. Dangerously high pressures can occur and result in personal injury, property damage, or death.

Powder Storage - WARNING

The following information has been extracted from a pamphlet entitled "Properties and Storage of Smokeless Powder" issued by the Sporting Arms and Ammunition Manufacturers Institute (SAAMI) at Flintlock Ridge Office Center, 11 Mile Hill Rd., Newtown, CT 06470-2359/203-426-1320; FAX: 203-426-1087. For a free copy of the complete pamphlet send a self-addressed, stamped envelope to the above address and request the pamphlet by title.

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 insulation 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 wall 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 laws, regulations and recommendations of the National Fire Protection Association (reprinted at end of SAAMI pamphlet).

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 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 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 CABINETS TO CLOSE CONFINEMENT.

STORAGE CABINETS SHOULD BE CONSTRUCTED OF INSULATING MATERIALS AND WITH A WEAK WALL, SEAMS OR JOINTS TO PROVIDE AN EASY MEANS OF SELF-VENTING.

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

OBEY ALL LAWS AND 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 surrounding area is free of trash or other readily combustible materials.

How to Check Smokeless Powder for Deterioration

Powder deterioration can be checked by opening the cap on the container and smelling the contents. Powder undergoing deterioration has an irritating odor. (Don't confuse this with common solvent odors such as alcohol, ether and acetone.)

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 the person may retreat to a safe distance before powder is ignited.

Primer - WARNING

Instructions & Warning for the Safe Storage and Handling of Primers

It is the responsibility of all persons who receive, store and use primers to be aware of the hazards and to know and follow all approved safety procedures. It is your responsibility to strictly comply with all applicable federal, state and local laws, regulations and ordinances.

Properties of Primers - DANGER

BULK STORAGE OF PRIMERS IS EXTREMELY DANGEROUS!!

Primers should never be stored, handled or used in bulk; i.e. piled or poured together. The energy of one exploding primer is sufficient to cause mass detonation of the surrounding primers. This could result in property damage and serious injury or death to operators and/or bystanders.

Note: Primers Should Always Be Kept In Their Original Factory Containers.

Primers contain mixtures of chemical ingredients designed to explode and provide the necessary energy in the form of hot particles, heat, & gas to ignite propellant powders.

Primers are sensitive to the following:

- Impact
- Friction
- Heat
- Flame
- Static Electricity
- Mishandling abuses

Conditions which may cause misfires or poor ignition:

- Exposure to water
- Exposure to organic solvents such as paint thinner, gasoline, oil, grease, penetrating lubricants, etc.

- Exposure to temperatures above 140 degrees Fahrenheit
Primers subjected to shaking, vibration, jolting, etc. may separate small particles of priming compound. This is referred to as “dusting”. Accumulation of primer dust in primer feeds, on machine surfaces, in loading areas, etc. is extremely dangerous. Primer dust may cause fires and/or explosions due to heat, impact, friction, flame or static electricity. These areas must be kept very clean.

Storage of Primers– Store in a Cool Dry Place

BULK STORAGE OF PRIMERS IS EXTREMELY DANGEROUS!!

Primers should never be stored, handled or used in bulk; i.e. piled or poured together. The energy of one exploding primer is sufficient to cause mass detonation of the surrounding primers. This could result in property damage and serious injury or death to operators and/or bystanders.

Note: Store Primers in a Cool Dry Place Away From Heat, Sparks & Flame.

Cabinets designated for primers only are recommended. They should be constructed of materials designed to provide a substantial delay in the transmissions of heat in case of fire.

The storage area should be clean and free of other combustible materials such as propellant powders, solvents, flammable gases, etc. Avoid areas which may be subjected to high temperatures, open flames, furnaces, water heaters, direct sunlight, gunfire and bullet impact, the operation of mechanical or electrical equipment and static electricity.

Primers should be stored in original factory containers only. The packaging has been designed to minimize accidental ignition and to protect the consumers as well as the primers.

NEVER SMOKE IN PRIMER STORAGE AREAS.

Observe all federal, state and local laws, regulations and ordinances regarding quantities of primers stored and conditions of storage.

Handling of Primers - Handle with Care

BULK HANDLING OF PRIMERS IS EXTREMELY DANGEROUS!!

Primers should never be stored, handled or used in bulk; i.e. piled or poured together. The energy of one exploding primer is sufficient to cause mass detonation of the surrounding primers. This could result in property damage and serious injury or death to operators and/or bystanders.

Safety glasses should be worn at all times. Additional protection such as face shields and machine guards are also recommended for personal safety.

NEVER SMOKE WHILE HANDLING PRIMERS.

Primers are extremely sensitive and should always be handled with care.

Primers should be handled individually with adequate safeguards. The use of primer feeds for reloading is not recommended. Adequate protection from the danger of explosion must be provided by machine guards, barriers, etc.. Primer feeds allowing contact between or among individual primers cause a potentially dangerous condition and are to be avoided. One exploding primer could cause detonation of all primers in the area.

Do not decap live primers. It is recommended live primers be destroyed by firing the empty shell or cartridge in a suitable firearm.

Areas designated for the storage and/or handling of primers should require equipment and wiring methods suitable for hazardous locations (National Electrical Code, Class II, Div. I). Persons responsible for these areas should also observe and comply with all applicable federal, state and local laws, regulations and ordinances pertinent to their location.

Precautions should be taken to prevent the accumulation of static electricity on persons handling primers or conducting handloading procedures. Cotton clothing, conductive shoes & floors, individual ground straps, static bars, leg stats, and proper electrical/mechanical grounds all help to reduce, dissipate and/or eliminate the buildup of static electricity. Atmospheric conditions, especially low humidity, will increase the potential of static accumulation. The working area should be maintained at a comfortable temperature with a relative humidity of at least 60% to minimize static buildup and/or discharge.

Good housekeeping is a must for safe cartridge loading and primer handling. Equipment and work areas should be kept clean and free of loose primers, primer dust, propellant powder, and/or abra-

sive materials. A damp cloth or sponge should be used to clean contaminated areas and be thoroughly rinsed after use. Do not use a vacuum cleaner because fire or explosion may result.

Loading operations should be conducted with a minimum quantity of primers. Unused primers should be returned to the original package and placed in a designated safe storage area.

It is common sense to make primers unavailable to children, household pets, and any individuals that are not familiar with the potential danger of primers.

Never smoke or allow open flames, spark sources or hot particles near primers or loading areas.

Additional References:

- Sporting Arms & Ammunition Manufacturer's Institute (S.A.A.M.I.)
- National Electrical Code (NEC)
- National Fire Protection Association (NFPA) 495, Explosive Materials Code
- Occupational Safety & Health Administration (OSHA)

WARNING: DO NOT INTERCHANGE FEDERAL 209 AND FEDERAL 209A PRIMERS

Reloading Precautions – WARNING

Follow these precautions to assure maximum enjoyment and safety in reloading and uniform performance of your reloads. Remember you can suffer severe burns, be badly injured, or killed if the strictest safety precautions and housekeeping rules are not enforced.

1. Exercise care at all times. Wear safety glasses while reloading.
2. Never smoke while handling powder or primers or during any reloading operation.
3. Keep powder and primers away from heat, sparks and open flames.
4. Store powder in a cool, dry place at all times.
5. Never use a powder unless you are certain of its identity.
 - Always read warnings on powder and component container labels.
 - Always read and understand the instruction manual for your reloading machine/tools.
 - Always reload in strict compliance with instructions in current reloading manuals.
6. Do not mix powders.
7. Devote full attention to reloading operations— avoid distractions.
8. Keep powder and primers out of reach of children.
9. Use components as recommended; don't take shortcuts.
10. Never exceed maximum recommended loads.
11. Examine every shell or cartridge before loading to insure good condition.
12. Double check every operation for safety and uniformity.
13. Check powder charge level in shells to avoid double charges.
14. On centerfire loads, start with charge weights 10% below recommended maximum loads.
15. Always watch for indications of excessive pressure.
16. Do not decap live primers; it is safer to destroy them by firing the empty shell or cartridge in a firearm.
17. Do not substitute components, except bullets of the same type and weight from reputable manufacturers. It could result in a significant change in ballistics, and unsatisfactory or even dangerous load.
18. Observe all local fire regulations and codes with respect to quantities of powders and primers stored and conditions of storage.
19. Store powder in its original container. Never transfer it from one storage container to another since this increases the possibility of becoming mislabeled.
20. Do not use the shotshell data contained in this handbook with steel shot; to do so would cause an extremely dangerous condition. Steel shot requires the use of special data, wads and powders. When such components become available, Winchester will develop data specifically for steel shot.

COMPONENTS



COMPONENTS SECTION BALL POWDER® Propellant

BALL POWDER smokeless propellant is the product of an exclusive manufacturing process introduced commercially by **Olin Corporation** in 1933. Today, BALL POWDER is a product of Primex Technologies, Inc. Although it is made from conventional propellant materials, plus other compounds which control ignition and burning rates, its method of manufacture makes it entirely different in appearance and performance and produces powder with excellent ballistic uniformity. Smooth flowing for precision metering, cleaner and cooler burning— these are just some of the advantages you'll have when you use Ball Powder propellant. It fulfills the specific requirements of the most discriminating reloader. Ball Powder propellant duplicates the exact same high standards and quality of Winchester factory loads.

The advantages of BALL POWDER propellant are many. Here are a few:

- 11 different BALL POWDER propellants—for shotguns, rifles and handguns—for a wide range of calibers and gauges.
- High energy, clean burning.
- All powders are double-based for maximum energy.
- BALL POWDER propellant exhibits the greatest chemical stability ever attained in a small arms propellant.
- Very high grain density.
- Low barrel erosion due to lower flame temperature for a given speed of powder.
- Less muzzle flash.
- High accuracy (and ballistic uniformity).
- Excellent and uniform flow and packing qualities in powder measures result in more uniform "thrown" charges.

A brief description of the line of BALL POWDER propellants follows (each powder has a color-coded label distinct to itself):

WAAP Newest product in the BALL POWDER propellant line, AA Plus® is the cleanest, lowest charge weight powder Winchester markets for reloading target shotshells. This is the powder used by Winchester in many factory AA loads.

WST Super-Target® propellant Target shotshell and standard velocity handgun propellant. Ideal for use in 45 Auto match applications. Consistent, clean, low flash and smoke are benefits to the shooter.

WSL Super-Lite® propellant is the propellant of choice for Winchester Super-Lite Target Loads. WSL burns at lower pressures to reduce felt recoil without reducing velocity performance. Super-Lite propellant works well in 9mm and 40 S&W as a low charge weight propellant. Combine Winchester components with WSL to duplicate factory load ballistics.

231 As the most popular reload propellant, 231 is a pistol powder ideally suited to the 38 Special, 45 auto, and 9mm standard loads. Consistency, clean burning, low flash, and a broad range of applications make this a powder of choice on any pistol cartridge reloaders' shelf.

WSF Super-Field® propellant is the propellant of choice for Winchester 20 gauge AA® Target Load and 12 gauge 3 3/4 dram equivalent Super-X® load. WSF is an ideal choice to maximize velocities in 12 gauge 1 1/8 oz. and 1 1/4 oz. loads. Super-Field also performs well in 38 Super, 9mm and 40 S&W pistol loads.

WAP Action Pistol® propellant is the ammunition industry's powder of choice for 9mm, 40 S&W, 38 Super, and the new Winchester 9x23mm. Years of development led to this high velocity, clean burning, low muzzle flash, highly consistent powder for Factory loads and your reloads. WAP has a lower flame temperature than competitive products which extends barrel life. Ideal for use in competitive action pistol applications and high performance Law Enforcement and self defense applications.

540 A versatile propellant that works well as a handgun propellant in 38 Super, 9mm, 40 S&W and 10mm loads.

296 This propellant was developed for Winchester factory loaded ammunition for 357 magnum, 44 magnum and 410 bore. Its high loading density provides optimal velocity and powder positioning performance. 296 is also the powder type used by Winchester for factory loaded 410 bore AA loads. However, 296 is not suitable for most rifle cartridges.

748 748 is the powder of choice by Winchester and the U.S. military for 5.56mm and 223 Rem. ammunition. The low flame temperature of 748 extends barrel wear versus other similar speed powders. It can be used in a wide variety of centerfire rifle loads including 222 Rem, 30-30 Win and 308 Win. Combine Winchester components with 748 to duplicate 308 Win factory load ballistics. 748 is recommended for use with the new 308 Fail Safe® bullets.

760 Combine Winchester components with 760 to duplicate 30-06 factory load ballistics. 760 has ideal flow characteristics which give it an advantage over other propellants with similar burn rates. 760 is recommended as an excellent choice for 7mm-08 as well as with the new 30-06 Fail Safe bullet.

WMR Magnum Rifle™ propellant is the propellant of choice for 270 Win, 243 Win and 300 Win Mag Winchester factory loaded ammunition. WMR brings to the marketplace a propellant with low flame temperature and ideal flow characteristics. It is an excellent magnum rifle propellant that can also be used in 257 Roberts, 25-06, 280 Rem and 338 Win Mag.

NOTE: 452AA, 473AA, 571 and 680 powders have been discontinued. 571 and 680 have no replacements. 452AA & 473AA are superseded by the "Super" line of powders.

BALL POWDER® Smokeless Propellants									
Symbol	Type	Unit	Units Per Case	Net Case Wt. Lbs	Symbol	Type	Unit	Units Per Case	Net Case Wt. Lbs
231					Super-Lite®				
W2311BP	Handgun	1 Lb.	10	10	WSL1BP	Shotshell & Handgun	1 Lb.	10	10
2313	Handgun	3 Lbs.	6	18	WSL3	Shotshell & Handgun	3 Lbs.	6	18
2318	Handgun	8 Lbs.	4	32	WSL8	Shotshell & Handgun	8 Lbs.	2	16
Action Pistol®					Super-Field®				
WAP1BP	Handgun	1 Lb.	10	10	WSF1BP	Shotshell & Handgun	1 Lb.	10	10
WAP3	Handgun	3 Lbs.	6	18	WSF3	Shotshell & Handgun	3 Lbs.	6	18
WAP8	Handgun	8 Lbs.	2	16	WSF8	Shotshell & Handgun	8 Lbs.	2	16
296					540				
W2961BP	Mag. Handgun & .410 Shotshell	1 Lb.	10	10	5401BP	Shotshell & Handgun	1 Lb.	10	10
2963	Mag. Handgun & .410 Shotshell	3 Lbs.	6	18	5403	Shotshell & Handgun	3 Lbs.	6	18
2968	Mag. Handgun & .410 Shotshell	8 Lbs.	4	32	5408	Shotshell & Handgun	8 Lbs.	4	32
AA Plus®					748				
WAAP1BP	Shotshell & Handgun	1 Lb.	10	10	7481BP	Rifle	1 Lb.	10	10
WAAP4BP	Shotshell & Handgun	4 Lbs.	6	24	7488	Rifle	8 Lbs.	4	32
WAAP8BP	Shotshell & Handgun	8 Lbs.	4	32	760				
Super-Target®					7601BP	Rifle	1 Lb.	10	10
WST1BP	Shotshell & Handgun	1 Lb.	10	10	7608	Rifle	8 Lbs.	4	32
WST3	Shotshell & Handgun	3 Lbs.	6	18	Magnum Rifle				
WST8BP	Shotshell & Handgun	8 Lbs.	4	32	WMR1BP	Magnum Rifle	1 Lb.	10	10
					WMR8	Magnum Rifle	8 Lbs.	2	16

*Note: The 1, 3, 4, or 8 in the symbol denotes weight only.

Number of Shells That Can Be Loaded With One Pound Of Powder On Various Grains Per Load
(The term grain is a measure of weight: 7,000 grains equal one pound)

Grains/ Load	Loads/ Pound	Grains/ Load	Loads/ Pound	Grains/ Load	Loads/ Pound	Grains/ Load	Loads/ Pound	Grains/ Load	Loads/ Pound	Grains/ Load	Loads/ Pound
12	583	23	304	34	205	45	156	56	125	67	104
13	538	24	291	35	200	46	152	57	123	68	103
14	500	25	280	36	194	47	149	58	121	69	101
15	466	26	269	37	189	48	146	59	119	70	100
16	437	27	259	38	184	49	143	60	117	71	99
17	411	28	250	39	179	50	140	61	115	72	97
18	388	29	241	40	175	51	137	62	113	73	96
19	368	30	233	41	170	52	135	63	111	74	95
20	350	31	225	42	166	53	132	64	109	75	93
21	333	32	218	43	162	54	130	65	108	76	92
22	318	33	212	44	159	55	127	66	106	77	90

Winchester® Primers

You can't buy a more reliable primer than Winchester. Ignition is instant and precise. In Winchester testing labs, primers are constantly and rigorously tested for consistency and sensitivity at temperatures and conditions far beyond the range of normal usage. Ignition reliability is assured when you use Winchester primers.

- Better sensitivity for more positive firing in all guns.
- Large rifle magnum primer for those heavy charges of slow powder where extra ignition is required. Use only where magnum primers are specified.
- 7 different primers cover your reloading needs for shotshells, rifle and handgun cartridges.
- Non-corrosive, non-mercuric.
- Weight of the primer mixture is carefully controlled.
- Every Winchester primer is consistent in size and quality.
- Anvil heights are measured to precise tolerances to assure perfect ignition.
- Winchester primers maintain stability in extremes of temperature and humidity.

WARNING– Primers may explode if subjected to impact, shock, or intense heat. Store in original factory container only. Primers in bulk are capable of mass explosion. Do not use in primer feed devices for reloading.

Winchester Primers			
Centerfire primers are recommended for use as follows:			
Large Rifle-WLR			
220 Swift	270 Winchester	300 H&H Magnum	348 Winchester
22-250 Remington	284 Winchester	300 Savage	35 Remington
225 Winchester	7mm Mauser	303 Savage	356 Winchester
243 Winchester	280 Remington	303 British	358 Winchester
6mm Remington	7mm Express Rem.	308 Winchester	350 Remington Magnum
25-35 Winchester	7mm Remington Magnum	32 Winchester Special	375 Winchester
250 Savage	7.62 x 39mm	32 Remington	375 H&H Magnum
25-06 Remington	30-30 Winchester	32-40 Winchester	38-55 Winchester
257 Roberts +P	30 Remington	8mm Mauser	416 Remington
6.5 Remington Magnum	30-06 Springfield	8mm Remington Magnum	444 Marlin
264 Winchester Magnum	30-40 Krag	338 Winchester Magnum	45-70 Government
7mm-08 Remington	300 Winchester Magnum		458 Winchester Magnum
Small Rifle-WSR	Small (Reg) Handgun-WSP		Large (Reg) Handgun-WLP
218 Bee	25 Automatic	9mm Winchester Mag.	38-40 Winchester
22 Hornet	30 Luger	38 S&W	10mm Automatic
222 Remington	32 Automatic	38 Special	41 Magnum
222 Remington Magnum	32 S&W	38 Short Colt	44 S&W Special
223 Remington	32 S&W Long	38 Long Colt	44-40 Winchester
25-20 Winchester	32 Short Colt	38 Colt New Police	44 Magnum
256 Winchester Magnum	32 Long Colt	38 Super Auto +P	45 Colt
30 Carbine	32 Colt New Police	38 Automatic	45 Automatic
357 Remington Maximum	9mm Luger	380 Automatic	45 Winchester Magnum
9x23 Winchester		40 S&W	
454 Casull			
			Small (Mag) Handgun-WSPM
			357 Magnum

Packed 100 per box				
Symbol	Primer	Type	Case Contains	Case Wt. Lbs. (approx.)
W209	#209	Shotgun Shells	5,000	15
WLR	#8 1/2 - 120	Large Rifle	5,000	7
WLRM	#8 1/2M - 120	Large Rifle (Magnum)	5,000	7
WSR	#6 1/2 - 116	Small Rifle	5,000	5
WSP	#1 1/2 - 108	Small (Regular) Handgun	5,000	5
WLP	#7 - 111	Large (Regular) Handgun	5,000	7
WSPM	#1 1/2M - 108	Small (Magnum) Handgun	5,000	5

Shellcases for Rifles and Handguns

Winchester brass cases have to take a lot. The 30-06 case, for example, is hit with approximately 24 tons of pressure at every firing. Yet our cases can be resized. Again and again.

The reason? Precise engineering, meticulous attention to small details, and custom formulation in our own brass mill. The brass in the cartridges, made especially for our components, is carefully annealed to meet the stresses incurred in firing, resizing and bullet seating. Winchester's annealing process gives the right degrees of hardness in neck, body and base.

- Cases made in most popular calibers.
- Exact tolerances provide dependable functioning and reliability for rifle and handgun reloading.

Winchester® Wads

Reloaders seldom give wads the same critical attention given to other components. Often the result is poor performance—due entirely to the wad. Take a moment to review the high quality features of Winchester wads. For consistent, dependable performance shot after shot, ask for Winchester AA® wads.

- Available in 12, 16, 20, 28, and 410, for all kinds of loads: target and field.
 - Designed for the proper rate of collapse.*
 - Forms the right shape cup over the powder for proper obturation.
 - Cushions the initial shock, designed to take the bite out of recoil.
 - Petal design protects the shot against flat-spotting, minimizes flyers in the pattern.
 - The uniform ballistics obtained with brand name wads may not be achieved with lower cost substitutes.
- * Wad must collapse at pre-determined rate in order to insure the proper pressure curve from the burning powder.

Winchester shot-protector wads of the AA® type are available to the handloader in eleven types in five different gauges. All wads are packed 250 per container, except the WT12 which is 500. The 12, 16 and 20 gauge wads are packed 5,000 per case. The 28 gauge and 410 wads are packed 2,500 per case.

1. **WT12**— orange one-piece wad. Economical substitute for WAA12. Can also be used anywhere WAA12 is called out.
2. **WAA12L**— gray one-piece wad especially designed to duplicate the 24 gram Olympic load. Can also be used for one ounce load.
3. **WAA12**— white one-piece wad for use in 12 gauge compression formed cases for 1 to 1 5/8 ounce loads for trap, skeet and field loads and other loads as shown in the data.
4. **WAA12R**— red one piece wad for use in a wide variety of cases, including compression formed cases, and for heavy field loads. Also for use in paper cases for trap, skeet and field loads
5. **WAA12F114**— a yellow flared petal AA type wad designed specifically for 12 gauge field loads with 1 1/4 ounce and 1 3/8 ounce shot charges.
6. **WAA12SL**— pink one piece wad used in 12 gauge for 1 to 1 1/8 ounce loads. A tight crimp offers the best performance. Duplicate the length of factory Super-Lite® loads for top performance.
7. **WAA16**—blue one-piece wad used in 16 gauge compression formed cases for 1 ounce to 1 1/8 ounce trap, skeet skeet and field loads.
8. **WAA20**—white one-piece wad for use in 20 gauge compression formed cases for skeet and field loads for 7/8 to 1 1/4 ounce loads. Also useful in other applications as specified in the data.
9. **WAA20F1**— a yellow flared petal AA type wad designed specifically for 20 gauge field loads with 1 ounce to 1 1/8 ounce shot charges.
10. **WAA28**— pink one-piece wad for use in 28 gauge compression formed cases for skeet and field loads.
11. **WAA41**— white one-piece wad for use in 410 bore compression formed cases for skeet and field loads.



WT12 (orange) WAA12L (gray) WAA12F114 (yellow) WAA12 (white) WAA12SL (pink) WAA12R (red) WAA16 (blue) WAA20F1 (yellow) WAA20 (white) WAA28 (pink) WAA41 (white)

Winchester® Shot

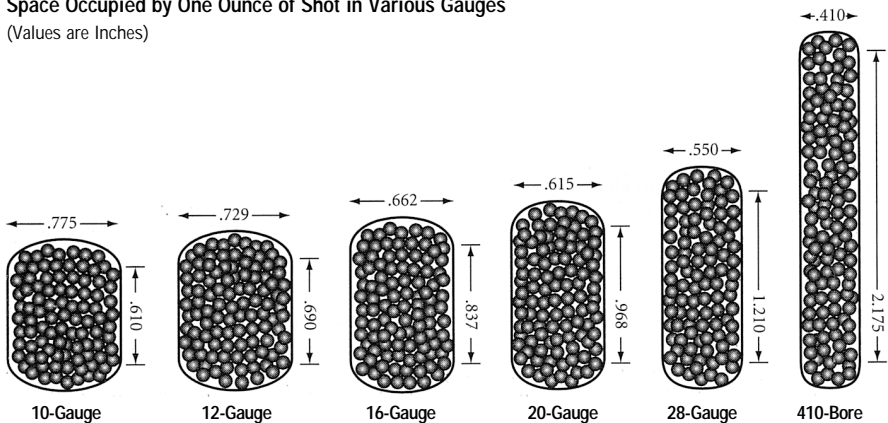
High-quality lead shot made the old-fashioned best way—dropped from a seven-story shot tower continuously screened and rolled across multiple glass tables to insure only the best, roundest shot is bagged. Offered in regular chilled and AA® special hard shot.

Shot Charge	Standard Shot Size							
	Shot Size							
	#2	#4	#5	#6	#7 1/2	#8	#8 1/2	#9
1/2 oz.	45	67	85	112	175	205	242	292
3/4 oz.	67	101	127	168	262	308	363	439
7/8 oz.	79	118	149	197	306	359	425	512
1 oz.	90	135	170	225	350	410	485	585
1 1/8 oz.	101	152	191	253	393	461	545	658
1 1/4 oz.	112	169	213	281	437	513	605	731
1 3/8 oz.	124	186	234	309	481	564	665	804
1 1/2 oz.	135	202	255	337	525	615	730	877
1 5/8 oz.	146	220	276	366	569	666	790	951
1 7/8 oz.	169	253	319	422	656	769	850	1097
2 oz.	180	270	340	450	700	820	970	1170
2 1/4 oz.	202	304	382	506	786	922	1090	1316

This tabulation gives the approximate number of pellets per shotshell load for shot sizes 2 through 9. The exact number of pellets will vary, depending on exact alloy content. For example, chilled shot vs. soft shot. Variations in shot pellet diameter will also affect the exact number of pellets per load when shot charge is thrown by volume rather than by weight.

Space Occupied by One Ounce of Shot in Various Gauges

(Values are Inches)



Internal Diameter of the Barrel in Several Shotgun Gauges

10-Gauge—0.775-Inch

16-Gauge—0.662-Inch

28-Gauge—0.550-Inch









12-Gauge—0.729-Inch

20-Gauge—0.615-Inch

.410-Bore—0.410-Inch



Component Shot Chart– Diameter In Inches

Winchester uniform, chilled lead shot provides consistent shot patterns and better penetration. Strict quality control throughout the manufacturing process assures the ultimate in performance. All Winchester shot available in 25 pound bags.

9	8	7 1/2	6	5	4	2	BB
							
.08	.09	.095	.11	.12	.13	.15	.18
APPROXIMATE NUMBER OF PELLETS TO THE OUNCE							
600	405	345	220	170	135	90	50

Chilled Shot	
Symbol	Description
SS00BY	00 Buck
SC4BY	4 Buck
SC2Y	#2 Chilled
SC4Y	#4 Chilled
SC5Y	#5 Chilled
SC6Y	#6 Chilled
SC75Y	#7 1/2 Chilled
SC8Y	#8 Chilled
SC9Y	#9 Chilled

Hard Shot	
Symbol	Description
SC75YH	#7 1/2 Hard
SC8YH	#8 Hard
SC9YH	#9 Hard

No. 4 Buck	No. 00
	
.24	.33
APPROXIMATE NO. TO THE POUND	
340	130

Component Bullets

Winchester Silvertip® Hollow Point handgun bullets and Fail Safe® rifle bullets are available in popular calibers and bullet weights to achieve the same high-performance, on-target results delivered by the factory loads.

Fail Safe bullets feature Lubalox® coating and delivers phenomenal penetration and expansion. It is a 5 piece bullet covered by 6 U.S. patents. These bullets are available in boxes of 25.

Silvertip Hollow Point bullets deliver reliable feeding, optimum penetration, and maximum expansion and energy release. These bullets are available in boxes of 100.

Fail Safe Rifle Bullets	
Symbol	Description
FS270	270 Caliber (140) FS
FS7MAG	7mm Caliber (160) FS
FS30A	30 Caliber (150) FS
FS30B	30 Caliber (165) FS
FS30	30 Caliber (180) FS [Velocity up to 2700 fps]
FS300	30 Caliber (180) FS [Velocity up to 3000 fps]
FS338	338 Caliber (230) FS
FS375	375 Caliber (270) FS
FS375A	375 Caliber (300) FS

Silvertip Hollow Point Handgun Bullets	
Symbol	Description
SHP9	9mm Caliber (115) STHP
SHP9A	9mm Caliber (147) STHP
SHP357	38/357 Caliber (145) STHP
SHP10	40/10 Caliber (175) STHP
SHP40	40/10 Caliber (155) STHP
SHP44	44 Caliber (210) STHP

SHOTSHELL



SHOTSHELL RELOADING

Source of Empty Cases

All Winchester® cases used in shotshell reloading are obtained as a result of first firing of factory loaded ammunition.

In a great many instances, once-fired AA® cases and other Winchester shotshells can be purchased from local skeet and trap ranges, gun clubs, and dealers catering to the shotshell reloaders. If this service is not available, the only means of obtaining these cases would be as the result of firing factory ammunition.

Powder Bushings and Scales

Shotshell reloading tool powder bushings do not throw the exact charge specification in many cases. The reasons are many and include:

1. Variations in gravimetric density of powders from lot to lot. The tolerance is plus or minus .025 grams per cubic centimeter. This tolerance applies to most canister powders.
2. Usually a bushing chart lists the nominal weight of a powder charge based on normal packing as a result of free flow and gravimetric density of a powder or on a bushing volume and the nominal gravimetric powder density at 100% packing.
3. Various operators of a tool will get various powder weight from an identical tool and bushing. This is due to the change in force of operation and the amount of vibration transmitted to the tool with resultant amount of packing of powder.
4. The amount of sizing force required on cases being loaded can cause a change in powder drop due to the change in tool vibration.
5. Bushing manufacturing tolerances.
6. Tool manufacturing tolerances.
7. Mismarked bushings.

A bushing listing chart cannot be interpreted as an absolute. It can represent what the manufacturer believes to be the nominal charge thrown with the listed bushing and powder.

A reloading scale is an absolute must. Charges thrown must be carefully checked and changes in bushing sizes made where required.

Do not try to determine the powder charge thrown by simply metering the powder bar back and forth and weighing charges. The tool must be cycled through the complete loading cycle to insure the same amount of vibration and powder packing as will take place in a normal loading cycle. Powder charges measured under the two conditions could vary as much as several grains.

For your reference, bushing charts are on the pages following load data.

WARNING—Steel Shot

With reference to the repeated inquiries on the reloading of steel shotshells, Winchester's advice, at this time, is:
"DON'T DO IT!"

Wait until suitable components and tested data are available from the ammunition makers.

At this time, key components, for acceptable steel shot loads, are not widely available to reloaders. This includes "soft" steel shot, the special plastic wads and shot sleeves designed for use with such shot, and the special powder required.

Some steel shot pellets have a diamond pyramid hardness of up to 270, as compared to the desired DPH of about 90 for the soft steel shot being used in commercial shot loads.

In some cases, available steel pellets are harder than the gun barrel in which they would be fired and can severely score barrel walls and distort barrel chokes.

Commercial steel shot loads have special wads and thick plastic shot sleeves helping to shield the barrel wall from the shot pellets. The shot sleeves used in lead shot loads are not sufficient to protect gun barrels from damage due to steel shot.

The reloading of steel shot loads, entirely different than loading lead shot ammunition, requires all new components and data. The attempt to load steel shot loads, with current components, would damage your gun and could injure the shooter or bystander.

Basically, when reliable data is available, the recommendations are as follows:

1. DO NOT RELOAD STEEL SHOTSHELLS WITH ANY COMPONENT OTHER THAN THOSE SPECIFICALLY RECOMMENDED BY THE MANUFACTURER AS SUITABLE FOR SUCH LOADS.
2. DO NOT USE STEEL SHOT COMPONENTS IN LEAD SHOT LOADS UNLESS THE MANUFACTURER RECOMMENDS SUCH DUAL APPLICATION.

Steel shot components are not currently available from Winchester.

WARNING—Bismuth Shot

The reloading of Bismuth shot requires data developed specifically for Bismuth shot. Please refer to Bismuth Cartridge Company for appropriate load data for Bismuth shot. Do not reload Bismuth shotshells with any component other than those specifically recommended by the manufacturer as suitable for such loads. Bismuth Cartridge Company can be contacted at 1470 Reverchon Plaza, 3500 Maple Avenue, Dallas, TX 75219.

Buffered Shot Cautions

The use of any buffering material in a shot column will significantly alter the ballistics for any given shotshell load. Also, if not carefully tested, buffering materials can produce dangerously high pressures. The development of loading data for any buffered load requires extensive pressure and velocity testing to insure the proper speed propellant powder and propellant charge weight are being used for the specific buffering material.

The use of talc, flour, and similar non-compressible materials should not be considered as buffering materials as they can produce dangerously high, erratic pressures in an unpredictable manner.

The rate with which shotshell propellant burns within a shotshell is governed to a great extent by the uniform compressibility of the wadding and the shot itself. Changes in the compressibility, such as is the case with buffering materials, can drastically change the burn rate of the propellant. Careful testing is required to assure the load will not result in a damaged gun, personal injury or death. We do not suggest the use of buffered shot reloads without lab testing.

Slow Burning Shotshell Powders

Slow burning powders always leave more residue than fast burning powders, all other things being equal. This can be verified by comparing the results of firing a box of factory 1 ounce loads with a box of factory 1 1/2 ounce loads. The heavier loads will leave behind considerably more residue. The reloader can take certain steps to help eliminate, as much as possible, the amount of residue left in his firearm.

The first step would be with the case itself. Do not use cases loaded more than two or three times for these loads. You need a good firm crimp to offer the proper amount of resistance to the initial burning of slow powders. A case loaded a number of times simply does not afford the firm crimping required.

Secondly, the primer selection is limited on these loads. If the cleanest possible burning is to be obtained, we suggest only Winchester 209s. Be sure to use the specific primer listed for the load and do not make substitutions from data listings.

The third item is wad pressure. A wad pressure of 60 to 70 lbs. seems to help. **Great care must be taken** to insure the lips of the over powder cup section are not damaged or torn when seating the wad. (Wad guide fingers should be in good condition.) Do not substitute wads, use data only as listed.

Fourth, powder charges and shot weights must be checked with a scale. Do this while the loading machine is being cycled. This is very important.

Fifth, every effort must be made to make as firm a crimp as practical. It is important the finished shell length not exceed a factory loaded round and the depth of crimp be as deep as a factory round. Also, put a good bevel on the shell mouth when crimping. This tends to strengthen the crimp. No sealers should be used on the crimp.

If the maximum of each of the foregoing points is built into heavy reloads, it will reduce the amount of fouling to a minimum. However, heavy reloads will always leave some fouling. Semiautomatics are prone to the most fouling. Clean guns carefully after each hunting trip if more than 25 rounds have been fired. Most firearms will function with a good amount of fouling present but a good cleaning after each trip is proper maintenance to insure the maximum in reliability from the firearm.

Shotshell Loading Instructions

CAUTION: Carefully read the information on the powder can label and follow the recommended loading instructions and precautions contained herein, before using the reloading data.

Winchester suggested loads are based on results obtained in our laboratory under carefully controlled conditions. They are offered without fee as an aid to handloaders, to be employed at their own discretion and risk. Since Winchester has no control over the circumstances of loading, Winchester assumes no liability for the results obtained.

The handloading of shotshells should be undertaken only by those familiar with all safety precautions and observe conservative practices in reloading operations. The powder charges shown are maximum and must not be exceeded.

Cases

Exercise extreme care in determining use of the exact case listed in the data. Be certain to select the exact case being loaded. Substitution could be dangerous and data is not interchangeable from one case type to another. **When in doubt contact the manufacturer of the case.**

Primers

Winchester® Ammunition has a long-standing tradition of providing shooters and hunters with the finest ammunition products available. The company continues that tradition with the announcement of improvements in the performance of the Winchester 209 component shotshell primer.

Winchester component primers have been the standard by which others have been measured for years. The improved 209 primer uses the same time-proven priming mix that has made the Winchester primers so popular among reloaders. The difference and improvement comes in the surface finish of the primer cup and battery cup of the 209 primer.

Specifically, Winchester is changing the copper plated battery cup to a zinc plated battery cup. In addition, they are changing the nickel plated primer cup to a plain brass primer cup. These surface finish changes have resulted in an increase in the sensitivity of the primer with a more positive ignition of the primer even with off-center firing pin hits. Consumers should note that the new primer contains the exact primer mix as the old primer. No changes in existing load recipe data for the Winchester 209 primer are required. New packaging and graphics will feature a banner to highlight the improved primer. For the immediate future, the Winchester 209 package will feature the words "NEW Surface Finish for Improved Sensitivity" on both the outside of the package and on the sleeve inside. The new improved Winchester 209 primer will be available through Winchester dealers late spring, 1997.

Use only those primers which are specifically shown in the data: do not substitute one primer for another. To do so could result in a significant change in ballistics, and could result in an unsatisfactory or even dangerous load. Never use shotshell primers having uncovered flash holes with BALL POWDER® smokeless propellants. To do so could be dangerous.

Powder

Check all powder charges with a scale. Check about 10 shells to determine the average weight of charges thrown and the uniformity of the charge. Powder bushing charts are shown in this book to assist you in the selection of bushings. The information contained in these charts has been supplied by the manufacturer of the bushings.

Such charts do not represent loading tables and list only the approximate powder charge dropped by the listed bushing. Variations in how the loading tool is handled, in the bushings themselves and in the specific components used, will alter the charges thrown. **It is essential to check charge weight with a scale** and go to the next larger or smaller bushing when and where required.

Wads

Use only those wads as specifically shown in the data; do not substitute one wad for another. To do so could result in a significant change in ballistics and could result in an unsatisfactory or even dangerous load. The uniform ballistics obtained with brand name wads may not be achieved with lower cost substitutes.

Wad Seating Pressure

Wad pressure, when using BALL POWDER propellant, is not critical. Pressures from 0 lbs. to 100 lbs. may be appropriate. The only criterion is enough pressure must be used to insure a good crimp. A safe level to use is 40 pounds, from which the loader may vary at his own choice to get the best crimp. Wads must be seated on the powder (no air space should exist between wad and powder).

Do not load any components that require more than 100 pounds wad pressure.

Shot Bushing Diameters

.424-1/2 Oz.	.565-7/8 Oz.	.664-1 1/4 Oz.	.750-1 5/8 Oz.
.477-5/8 Oz.	.596-1 Oz.	.695-1 3/8 Oz.	.780-1 3/4 Oz.
.517-3/4 Oz.	.641-1 1/8 Oz.	.721-1 1/2 Oz.	.809-1 7/8 Oz.

Velocity

Velocities quoted in the data are averages of a series of shots fired in accordance with equipment and techniques used throughout the American arms and ammunition industry. Listed loads have given uniform velocity results in tests.

Shotshell velocity barrels used conform to the following lengths as approved by SAAMI*

10 ga.-3 1/2"	Full Choke 32"	20 ga.-3"	Full Choke 30"
12 ga.-3"	Full Choke 30"	20 ga.-2 3/4"	Full Choke 26"
12 ga.-2 3/4"	Full Choke 30"	28 ga.-2 3/4"	Full Choke 26"
16 ga.-2 3/4"	Full Choke 28"	410 bore-2 1/2" or 3"	Full Choke 26"

*Sporting Arms and Ammunition Manufacturers Institute

Pressure Data

All pressure data listed as psi has been measured with the latest Piezo electric system showing actual pounds per square inch (psi) and **cannot** be compared directly to the old data which used the copper crusher method (cup) or lead crusher method (LUP).

Black Powder Warning: Never substitute smokeless powder for black powder or Pyrodex or mix smokeless powder with black powder or Pyrodex. Never use smokeless powder in black powder firearms or in saluting cannons. Smokeless powder has much more energy than black powder or Pyrodex. Substituting or mixing powders may cause the firearm to blow up resulting in personal injury, property damage, or death.

Ballistics of shotshells are affected not only by the type and amount of powder, but also by the pellet size and charge weight of shot, the type of crimp, the type of shotshell case, and the type of wads used. Follow loading data instructions and do not deviate from recommended combinations.

It should be noted that low chamber pressures do not necessarily mean low recoil. Recoil is a function of the velocity of the ejecta from the muzzle and the weight of the ejecta. It is basic physics. For every action there is an equal and opposite reaction. Kick, or felt recoil however can be reduced by lower pressure, everything else being equal.

Patterning

Typical Percentage of Pellets in a 30-inch Circle at 40 yards (Pattern) for Various Choke Sizes.

(Choke is a Constriction at the Muzzle of a Shotgun Barrel.)

Full Choke-70% Improved Modified Choke-65-70% Modified Choke-55%
Improved Cylinder-55% True Cylinder-40%

Selection of Shotshell Loads

Shotshell loads in this data reference are listed in order of gauge, shell length, case type and shot weight. Be certain to select the data for the exact case being loaded. Data is not interchangeable from one case type to another. The load velocity may require some additional explanation. Factory ammunition packages normally make no reference to velocity but rather to dram equivalent.

Winchester offers, for reference, the following dram equivalent table according to industry standards. For load selection, select the load that meets or most nearly meets the velocity of the dram equivalent of the load to be duplicated. In general, higher velocity will increase the effective range of a load while also increasing recoil.

10 Gauge	
3 1/2 " Shells	Velocity
4 1/4 drams equivalent, 2 ounce shot	1210 fps
4 1/2 drams equivalent, 2 1/4 ounce shot	1210 fps

12 Gauge	
2 3/4 " Shells	Velocity
2 3/4 drams equivalent, 1 ounce shot	1180 fps
3 1/4 drams equivalent, 1 ounce shot	1290 fps
2 3/4 drams equivalent, 1 1/8 ounce shot	1145 fps
3 drams equivalent, 1 1/8 ounce shot	1200 fps
3 1/4 drams equivalent, 1 1/8 ounce shot	1255 fps
3 1/4 drams equivalent, 1 1/4 ounce shot	1220 fps
3 1/2 drams equivalent, 1 1/8 ounce shot	1300 fps
3 3/4 drams equivalent, 1 1/4 ounce shot	1330 fps
3 3/4 drams equivalent, 1 1/2 ounce shot	1260 fps
3 " Shells	Velocity
3 3/4 drams equivalent, 1 3/8 ounce shot	1295 fps
4 drams equivalent, 1 5/8 ounce shot	1280 fps
4 drams equivalent, 1 7/8 ounce shot	1210 fps
Max drams equivalent, 2 ounce shot	1125 fps

16 Gauge	
2 3/4 " Shells	Velocity
2 1/2 drams equivalent, 1 ounce shot	1165 fps
2 3/4 drams equivalent, 1 1/8 ounce shot	1185 fps
3 drams equivalent, 1 1/8 ounce shot	1240 fps
3 1/4 drams equivalent, 1 1/8 ounce shot	1295 fps
3 1/4 drams equivalent, 1 1/4 ounce shot	1260 fps

20 Gauge	
2 3/4 " Shells	Velocity
2 1/2 drams equivalent, 7/8 ounce shot	1210 fps
2 1/2 drams equivalent, 1 ounce shot	1165 fps
2 3/4 drams equivalent, 1 ounce shot	1220 fps
2 3/4 drams equivalent, 1 1/8 ounce shot	1175 fps
3 " Shells	Velocity
3 1/2 drams equivalent, 1 3/16 ounce shot	1195 fps
3 drams equivalent, 1 1/4 ounce shot	1185 fps

28 Gauge	
2 3/4 " Shells	Velocity
2 drams equivalent, 3/4 ounce shot	1200 fps
2 1/4 drams equivalent, 3/4 ounce shot	1295 fps
Max drams equivalent, 1 ounce shot	1125 fps

410 Bore	
2 1/2 " Shells	Velocity
Max. drams equivalent, 1/2 ounce shot	1200 fps
3 " Shells	Velocity
Max. drams equivalent, 11/16 ounce shot	1135 fps

The selection of shotshell loads can be further clarified by grouping, according to gauge, the weight of the shot charge and the velocity. These can be applied to general applications. Other specifications are of course possible.

Shot Weight	Velocity	Application
10 Ga. 3 1/2"		
All loads	1210 fps	Magnum, turkey

12 Ga. 2 3/4"		
7/8 oz.	1200 fps	Light target
1 oz.	1150-1290 fps	Light target, light field
1 1/8 oz.	1145-1200 fps	Trap, skeet and field
1 1/8 oz.	1255-1400 fps	Field
1 1/4 oz.	1150-1305 fps	Field
1 1/4 oz.	1330 fps	Heavy field
1 3/8 oz.	1250-1295 fps	Heavy field
1 3/8 oz.	1330 fps	Magnum
1 1/2 oz.	1095 fps	Field
1 1/2 oz.	1240-1260 fps	Magnum, turkey

12 Ga. 3"		
1 3/8 oz.	1295 fps	Heavy field
1 5/8 oz.	1205 fps	Turkey
1 7/8 oz.	1100-1140 fps	Turkey
2 oz.	1125 fps	Turkey

16 Ga. 2 3/4"		
1 oz.	1165-1220 fps	Trap, skeet, field
1 1/8 oz.	1185 fps	Trap, skeet, field
1 1/8 oz.	1240-1290 fps	Field
1 1/4 oz.	1230 fps	Field (magnum)

Shot Weight	Velocity	Application
20 Ga. 2 3/4"		
3/4 oz.	1145-1200 fps	Light target
7/8 oz.	1200 fps	Skeet, field
1 oz.	1165-1250 fps	Field
1 1/8 oz.	1150-1185 fps	Field (magnum)

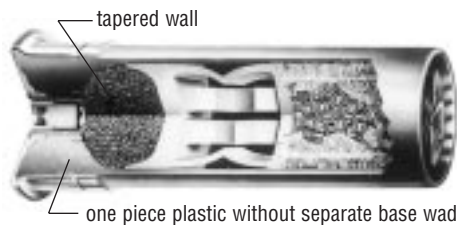
20 Ga. 3"		
1 1/8 oz.	1220 fps	Field
1 3/16oz.	1195 fps	Field
1 1/4 oz.	1135-1220 fps	Field

28 Ga. 2 3/4"		
3/4 oz.	1200 fps	Skeet, field
3/4 oz.	1260 fps	Field
1 oz.	1125 fps	Field

410 Bore		
All Loads	1135-1200 fps	Skeet
11/16 oz. Loads	1135 fps	Very light field

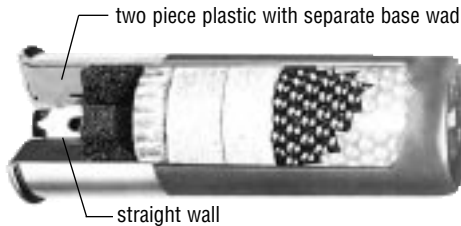
Wads Used in Various Loads						
Winchester		Remington				Federal
WT12	WAA16	SP10	R12L	RXP12	SP410	12S0
WAA12L	WAA20	FIG 8	R12H	SP16		12S3
WAA12	WAA20F1	TGT12	SP12	RXP20		12S4
WAA12R	WAA28			SP20		20S1
WAA12F114	WAA41			R20		410SC
WAA12SL						

Winchester Case Identification



Winchester Compression-Formed Cases

Regardless of whether the compression-formed case has high or low outside brass, it may be used for data listed for this case.



Winchester 12 Ga. Polyformed Plastic Tube with Plastic Base wad

Regardless of whether this case has high or low brass it may be used with data listed for this case.

SHOTSHELL DATA

10 Gauge 3 1/2" Case Winchester Polyformed Plastic						
Shot Wgt.	Primer	Powder	Charge (grains)	Wad Column	Velocity (fps)	Pressure
2 oz.	Win. 209	540	44.0	Rem. SP 10 with a 16 ga. 1/4" fiber filler	1210	8,700 LUP
2 oz.	Win. 209	540	44.0	Pacific plastic with a 20 ga. 3/8" fiber filler	1210	8,600 LUP
2 1/4 oz.	Win. 209	571	47.0	Rem. SP10	1210	9,900 LUP
2 1/4 oz.	Win. 209	571	48.0	Pacific Plastic	1210	10,000 LUP

12 Gauge 2 3/4" Case Winchester Compression-Formed						
Shot Wgt.	Primer	Powder	Charge (grains)	Wad Column	Velocity (fps)	Pressure
NEW 7/8-oz. *	Win. 209	WST	22.0	Win. WAA12L	1325	7,900 psi
NEW 7/8-oz. *	Win. 209	WAAP	21.0	Win. WAA12L	1325	7,400 psi
NEW 7/8-oz.	Fed. 209A	WAAP	21.5	Win. WAA12L	1325	8,100 psi
NEW 7/8-oz.	CCI 209	WAAP	21.0	Win. WAA12L	1325	7,200 psi
NEW 7/8-oz.	Fed. 209A	WST	23.5	Win. WAA12L	1355	7,400 psi
NEW 7/8-oz.	CCI 209	WST	23.5	Win. WAA12L	1355	7,200 psi
NEW 7/8-oz.	Win. 209	WST	23.5	Win. WAA12L	1400	8,200 psi
NEW 7/8-oz.	Win. 209	WSL	22.0	Win. WAA12L	1400	9,500 psi
NEW 7/8-oz.	CCI 209	WSL	22.0	Win. WAA12L	1400	10,000 psi
NEW 7/8-oz.	Win. 209	WAAP	23.0	Win. WAA12L	1400	8,600 psi
NEW 7/8-oz.	Fed. 209A	WAAP	23.5	Win. WAA12L	1400	9,200 psi
NEW 7/8-oz.	CCI 209	WAAP	23.0	Win. WAA12L	1400	8,400 psi
NEW 1 oz. **	Win. 209	WAAP	18.0	Win. WAA12SL	1180	7,300 psi
NEW 1 oz.	Fed. 209A	WAAP	18.5	Win. WAA12SL	1180	9,200 psi
1 oz. **	Win. 209	WST	19.5	Win. WAA12SL	1180	7,400 psi
1 oz.	Win. 209	WST	19.0	Fed. 12S0	1180	8,000 psi
1 oz.	CCI 209	WST	19.0	Fed. 12S0	1180	8,300 psi
1 oz.	Fed. 209	WST	19.5	Fed. 12S0	1180	7,900 psi
1 oz.	Fed. 209A	WST	19.0	Win. WAA12SL	1180	7,900 psi
NEW 1 oz.	Win. 209	WST	19.5	Win. WAA12L	1200	8,500 psi
NEW 1 oz.	Win. 209	WAAP	19.0	Win. WAA12SL	1235	8,300 psi
NEW 1 oz.	Fed. 209A	WAAP	20.0	Win. WAA12SL	1235	8,700 psi
1 oz.	Win. 209	WST	21.0	Win. WAA12SL	1235	8,100 psi
1 oz.	Win. 209	WST	20.5	Fed. 12S0	1235	9,500 psi
1 oz.	CCI 209	WST	21.5	Win. WAA12SL	1235	7,900 psi
1 oz.	CCI 209	WST	20.5	Fed. 12S0	1235	9,500 psi
1 oz.	Fed. 209	WST	21.0	Win. WAA12SL	1235	7,400 psi
1 oz.	Fed. 209	WST	21.0	Fed. 12S0	1235	9,300 psi
1 oz.	Fed. 209A	WST	20.0	Win. WAA12SL	1235	8,900 psi
NEW 1 oz.	Win. 209	WST	21.0	Win. WAA12L	1255	9,600 psi
NEW 1 oz.	Fed. 209A	WST	21.5	Win. WAA12L	1255	8,800 psi
NEW 1 oz.	CCI 209	WST	21.0	Win. WAA12L	1255	8,400 psi

* This load will duplicate the ballistics of the factory Winchester AA International load.

** This load will duplicate the ballistics of the factory Winchester AA Xtra-Lite target load.

CAUTION: DO NOT INTERCHANGE FED 209 AND FED 209A PRIMERS

**12 Gauge 2 3/4" Case
Winchester Compression-Formed**

	Shot Wgt.	Primer	Powder	Charge (grains)	Wad Column	Velocity (fps)	Pressure
NEW	1 oz.	Win. 209	WAAP	20.5	Win. WAA12SL	1290	9,700 psi
NEW	1 oz.	Fed. 209A	WAAP	21.5	Win. WAA12SL	1290	9,900 psi
	1 oz.	Win. 209	WST	22.0	Win. WAA12SL	1290	9,000 psi
	1 oz.	Win. 209	WST	22.0	Fed. 12S0	1290	10,900 psi
	1 oz.	CCI 209	WST	22.5	Win. WAA12SL	1290	9,400 psi
	1 oz.	CCI 209	WST	21.5	Fed. 12S0	1290	10,700 psi
	1 oz.	Fed. 209	WST	22.5	Win. WAA12SL	1290	8,400 psi
	1 oz.	Fed. 209	WST	22.5	Fed. 12S0	1290	10,700 psi
	1 oz.	Fed. 209A	WST	21.0	Win. WAA12SL	1290	9,800 psi
	1 oz.	Win. 209	WSL	21.0	Win. WAA12SL	1290	9,500 psi
	1 oz.	Win. 209	WSL	21.5	Fed. 12S0	1290	10,100 psi
	1 oz.	CCI 209	WSL	21.0	Win. WAA12SL	1290	9,400 psi
	1 oz.	CCI 209	WSL	21.0	Fed. 12S0	1290	10,400 psi
	1 oz.	Fed. 209	WSL	21.0	Win. WAA12SL	1290	9,300 psi
	1 oz.	Fed. 209	WSL	21.5	Fed. 12S0	1290	9,600 psi
	1 oz.	Fed. 209A	WSL	19.5	Win. WAA12SL	1290	10,300 psi
NEW	1 oz.	Win. 209	WST	22.5	Win. WAA12L	1325	11,100 psi
NEW	1 oz.	Fed. 209A	WSL	21.0	Win. WAA12L	1325	10,400 psi
NEW	1 oz.	CCI 209	WST	22.5	Win. WAA12L	1325	10,200 psi
NEW	1 oz.	CCI 209	WSL	21.5	Win. WAA12L	1325	10,700 psi
NEW	1 1/8 oz.*	Win. 209	WAAP	17.5	Win. WAA12	1145	9,400 psi
NEW	1 1/8 oz.	Fed. 209A	WAAP	18.0	Win. WAA12	1145	9,600 psi
NEW	1 1/8 oz.	CCI 209	WAAP	18.0	Win. WAA12	1145	9,400 psi
	1 1/8 oz.	Win. 209	WSL	18.5	Win. WAA12SL	1145	8,000 psi
	1 1/8 oz.	Win. 209	WSL	19.0	Rem. Fig-8	1145	8,400 psi
	1 1/8 oz.	CCI 209	WSL	18.5	Win. WAA12SL	1145	8,800 psi
	1 1/8 oz.	CCI 209	WSL	18.5	Rem. Fig-8	1145	8,500 psi
	1 1/8 oz.	Fed. 209	WSL	18.5	Win. WAA12SL	1145	7,800 psi
	1 1/8 oz.	Fed. 209	WSL	19.0	Rem. RXP12	1145	8,000 psi
	1 1/8 oz.	Fed. 209	WSL	19.0	Rem. Fig-8	1145	8,200 psi
	1 1/8 oz.	Fed. 209	WSL	19.0	Fed. 12S3	1145	8,000 psi
	1 1/8 oz.	Fed. 209A	WSL	17.0	Win. WAA12SL	1145	9,800 psi
	1 1/8 oz.*	Win. 209	WST	18.5	Win. WAA12	1145	8,600 psi
	1 1/8 oz.	Win. 209	WST	19.0	Rem. RXP12	1145	8,700 psi
	1 1/8 oz.	Win. 209	WST	19.0	Rem. Fig-8	1145	8,400 psi
	1 1/8 oz.	Win. 209	WST	19.0	Fed. 12S3	1145	9,800 psi
	1 1/8 oz.	CCI 209	WST	19.0	Win. WAA12	1145	9,100 psi
	1 1/8 oz.	CCI 209	WST	19.5	Rem. RXP12	1145	8,800 psi
	1 1/8 oz.	CCI 209	WST	19.0	Rem. Fig-8	1145	9,000 psi
	1 1/8 oz.	CCI 209	WST	19.0	Fed. 12S3	1145	9,500 psi
	1 1/8 oz.	Fed. 209	WST	19.0	Win. WAA12	1145	9,000 psi
	1 1/8 oz.	Fed. 209	WST	19.5	Rem. Fig-8	1145	8,100 psi
	1 1/8 oz.	Fed. 209	WST	19.5	Fed. 12S3	1145	10,000 psi
	1 1/8 oz.	Fed. 209A	WST	18.5	Win. WAA12	1145	10,700 psi
	1 1/8 oz.	Fed. 209A	WSF	21.5	Win. WAA12SL	1145	7,200 psi
NEW	1 1/8 oz.**	Win. 209	WAAP	19.0	Win. WAA12	1200	10,400 psi
NEW	1 1/8 oz.	Fed. 209A	WAAP	19.5	Win. WAA12	1200	10,600 psi
NEW	1 1/8 oz.	CCI 209	WAAP	19.5	Win. WAA12	1200	10,400 psi
	1 1/8 oz.**	Win. 209	WST	20.0	Win. WAA12	1200	9,800 psi
	1 1/8 oz.	Win. 209	WST	20.0	Rem. RXP12	1200	9,700 psi
	1 1/8 oz.	Win. 209	WST	20.5	Rem. Fig-8	1200	10,000 psi
	1 1/8 oz.	Win. 209	WST	20.0	Fed. 12S3	1200	10,900 psi
	1 1/8 oz.	CCI 209	WST	20.5	Win. WAA12	1200	10,300 psi
	1 1/8 oz.	CCI 209	WST	20.5	Rem. RXP12	1200	10,300 psi
	1 1/8 oz.	CCI 209	WST	20.5	Rem. Fig-8	1200	10,000 psi
	1 1/8 oz.	CCI 209	WST	20.5	Fed. 12S3	1200	10,800 psi
	1 1/8 oz.	Fed. 209	WST	20.5	Win. WAA12	1200	10,000 psi
	1 1/8 oz.	Fed. 209	WST	21.0	Rem. RXP12	1200	10,000 psi

* This load will duplicate the ballistics of the factory AA Winchester Light 2 3/4 dram eq. target load.

** This load will duplicate the ballistics of the factory AA Winchester Heavy 3 dram eq. target load.

CAUTION: DO NOT INTERCHANGE FED 209 AND FED 209A PRIMERS

**12 Gauge 2 3/4" Case
Winchester Compression-Formed**

Shot Wgt.	Primer	Powder	Charge (grains)	Wad Column	Velocity (fps)	Pressure
1 1/8 oz.	Fed. 209	WST	21.0	Rem. Fig-8	1200	9,200 psi
1 1/8 oz.	Fed. 209	WST	21.0	Fed. 12S3	1200	10,900 psi
1 1/8 oz.	Win. 209	WSL	20.0	Win. WAA12SL	1200	9,000 psi
1 1/8 oz.	Win. 209	WSL	20.0	Win. WAA12	1200	10,100 psi
1 1/8 oz.	Win. 209	WSL	19.5	Rem. RXP12	1200	9,800 psi
1 1/8 oz.	Win. 209	WSL	20.0	Rem. Fig-8	1200	9,400 psi
1 1/8 oz.	Win. 209	WSL	20.0	Fed. 12S3	1200	10,200 psi
1 1/8 oz.	CCI 209	WSL	19.5	Win. WAA12SL	1200	9,800 psi
1 1/8 oz.	CCI 209	WSL	19.5	Win. WAA12	1200	10,800 psi
1 1/8 oz.	CCI 209	WSL	19.5	Rem. Fig-8	1200	9,700 psi
1 1/8 oz.	CCI 209	WSL	19.5	Rem. R12L	1200	9,200 psi
1 1/8 oz.	CCI 209	WSL	19.5	Fed. 12S3	1200	10,400 psi
1 1/8 oz.	Fed. 209	WSL	20.0	Win. WAA12SL	1200	9,100 psi
1 1/8 oz.	Fed. 209	WSL	20.0	Win. WAA12	1200	10,700 psi
1 1/8 oz.	Fed. 209	WSL	20.0	Rem. RXP12	1200	9,700 psi
1 1/8 oz.	Fed. 209	WSL	20.0	Rem. Fig-8	1200	9,600 psi
1 1/8 oz.	Fed. 209	WSL	20.0	Fed. 12S3	1200	10,500 psi
1 1/8 oz.	Fed. 209A	WSL	18.5	Win. WAA12SL	1200	11,100 psi
1 1/8 oz.	Fed. 209A	WSF	23.0	Win. WAA12SL	1200	8,400 psi
1 1/8 oz.	Win. 209	WSL	21.5	Win. WAA12SL	1255	10,800 psi
1 1/8 oz.	Win. 209	WSL	21.0	Win. WAA12	1255	10,900 psi
1 1/8 oz.	Win. 209	WSL	21.0	Rem. RXP12	1255	10,900 psi
1 1/8 oz.	Win. 209	WSL	21.0	Rem. Fig-8	1255	10,800 psi
1 1/8 oz.	Win. 209	WSL	21.5	Rem. R12L	1255	10,800 psi
1 1/8 oz.	CCI 209	WSL	21.0	Win. WAA12SL	1255	10,900 psi
1 1/8 oz.	CCI 209	WSL	21.0	Rem. RXP12	1255	10,700 psi
1 1/8 oz.	CCI 209	WSL	21.0	Rem. Fig-8	1255	10,900 psi
1 1/8 oz.	CCI 209	WSL	21.0	Rem. R12L	1255	10,600 psi
1 1/8 oz.	Fed. 209	WSL	21.5	Win. WAA12SL	1255	10,300 psi
1 1/8 oz.	Fed. 209	WSL	21.0	Rem. RXP12	1255	10,700 psi
1 1/8 oz.	Fed. 209	WSL	21.5	Rem. Fig-8	1255	10,900 psi
1 1/8 oz.	Fed. 209	WSL	21.5	Rem. R12L	1255	10,500 psi
1 1/8 oz.	Fed. 209A	WSF	24.0	Win. WAA12SL	1255	9,100 psi
1 1/8 oz.	Win. 209	WSF	27.5	Win. WAA12	1310	8,700 psi
1 1/8 oz.	Win. 209	WSF	27.5	Fed. 12S3	1310	8,500 psi
1 1/8 oz.	Fed 209A	WSF	25.5	Win. WAA12SL	1310	9,800 psi
1 1/8 oz.	Win. 209	WSF	29.0	Win. WAA12	1365	9,900 psi
1 1/8 oz.	Win. 209	WSF	28.5	Fed. 12S3	1365	9,500 psi
1 1/8 oz.	Win. 209	WSF	30.0	Win. WAA12	1400	10,600 psi
1 1/8 oz.	Win. 209	WSF	29.5	Fed. 12S3	1400	10,800 psi
1 1/4 oz.	Win. 209	WSF	26.0	Fed. 12S4	1220	9,000 psi
1 1/4 oz.	Win. 209	WSF	28.0	Win. WAA12F114	1275	9,700 psi
1 1/4 oz.	Win. 209	WSF	27.5	Fed. 12S4	1275	10,900 psi
1 1/4 oz.	CCI 209	WSF	29.0	Rem. RXP12	1275	10,400 psi
1 1/4 oz.	Fed. 209A	WSF	27.0	Win. WAA12F114	1310	10,700 psi
1 1/4 oz.	Win. 209	WSF	29.5	Win. WAA12F114	1330	10,600 psi
1 1/4 oz.	CCI 209	WSF	28.0	Rem. SP12	1330	9,800 psi
1 3/8 oz.	Fed. 209A	571	32.0	Win. WAA12R	1215	11,000 psi
1 3/8 oz.	Win. 209	571	36.0	Win. WAA12F114	1285	10,300 LUP
1 3/8 oz.	Fed. 209	571	35.5	Win. WAA12R	1285	10,500 LUP
1 3/8 oz.	Fed. 209	571	35.5	Rem. RP12	1285	10,100 LUP
1 1/2 oz.	Win. 209	571	36.5	Win. WAA12R	1260	10,300 LUP
1 1/2 oz.	Win. 209	571	36.5	Rem. RP12	1260	9,800 LUP
1 1/2 oz.	CCI 109	571	35.5	Win. WAA12R	1260	10,500 LUP

CAUTION: DO NOT INTERCHANGE FED 209 AND FED 209A PRIMERS

12 Gauge 2 3/4" Case Winchester Polyformed Plastic, Low or High Brass Head-Plastic Basewad						
Shot Wgt.	Primer	Powder	Charge (grains)	Wad Column	Velocity (fps)	Pressure
NEW 1 1/8 oz.	Win. 209	WAAP	19.0	Fed. 12S3	1145	7,600 psi
NEW 1 1/8 oz.	Fed. 209A	WAAP	18.5	Fed. 12S3	1145	8,000 psi
NEW 1 1/8 oz.	CCI 209	WAAP	18.5	Fed. 12S3	1145	7,300 psi
NEW 1 1/8 oz.	Win. 209	WAAP	20.5	Fed. 12S3	1200	8,400 psi
NEW 1 1/8 oz.	Fed. 209A	WAAP	20.0	Fed. 12S3	1200	8,600 psi
NEW 1 1/8 oz.	CCI 209	WAAP	20.0	Fed. 12S3	1200	8,800 psi
NEW 1 1/8 oz.	Win. 209	WAAP	22.0	Fed. 12S3	1255	9,900 psi
NEW 1 1/8 oz.	Fed. 209A	WAAP	21.5	Fed. 12S3	1255	9,600 psi
NEW 1 1/8 oz.	CCI 209	WAAP	21.5	Fed. 12S3	1255	9,600 psi
NEW 1 1/8 oz.	Win. 209	WAAP	23.0	Fed. 12S3	1290	10,400 psi
NEW 1 1/8 oz.	Fed. 209A	WAAP	22.5	Fed. 12S3	1290	10,500 psi
NEW 1 1/8 oz.	CCI 209	WAAP	22.5	Fed. 12S3	1290	10,100 psi

12 Gauge 2 3/4" Case Remington RTL, STS & Nitro 27 Hulls						
Shot Wgt.	Primer	Powder	Charge (grains)	Wad Column	Velocity (fps)	Pressure
NEW 7/8 oz.	Win. 209	WST	21.0	Win. WAA12L	1325	8,200 psi
NEW 7/8 oz.	Win. 209	WSL	20.0	Win. WAA12L	1325	8,200 psi
NEW 7/8 oz.	CCI 209	WST	21.5	Win. WAA12L	1325	8,100 psi
NEW 7/8 oz.	CCI 209	WSL	20.0	Win. WAA12L	1325	8,400 psi
NEW 7/8 oz.	Fed. 209A	WST	21.0	Win. WAA12L	1325	8,300 psi
NEW 7/8 oz.	Fed. 209A	WSL	20.0	Win. WAA12L	1325	8,400 psi
NEW 7/8 oz.	Win. 209	WST	23.0	Win. WAA12L	1400	10,300 psi
NEW 7/8 oz.	Win. 209	WSL	21.5	Win. WAA12L	1400	9,300 psi
NEW 7/8 oz.	CCI 209	WST	23.0	Win. WAA12L	1400	9,000 psi
NEW 7/8 oz.	CCI 209	WSL	21.5	Win. WAA12L	1400	9,700 psi
NEW 7/8 oz.	Fed. 209A	WST	23.0	Win. WAA12L	1400	9,700 psi
NEW 7/8 oz.	Fed. 209A	WSL	21.5	Win. WAA12L	1400	9,400 psi
NEW 1 oz.	Win. 209	WAAP	18.0	Win. WAA12SL	1180	8,500 psi
NEW 1 oz.	Fed. 209A	WAAP	17.5	Win. WAA12SL	1180	9,400 psi
NEW 1 oz.	CCI 209	WAAP	17.5	Win. WAA12SL	1180	8,600 psi
NEW 1 oz.	Win. 209	WST	19.0	Fed. 12S0	1180	8,200 psi
NEW 1 oz.	CCI 209	WST	19.0	Win. WAA12SL	1180	8,000 psi
NEW 1 oz.	CCI 209	WST	18.5	Fed. 12S0	1180	8,800 psi
NEW 1 oz.	Fed. 209	WST	19.0	Win. WAA12SL	1180	8,100 psi
NEW 1 oz.	Fed. 209	WST	19.0	Fed. 12S0	1180	8,500 psi
NEW 1 oz.	Win. 209	WAAP	19.5	Win. WAA12SL	1235	9,700 psi
NEW 1 oz.	Fed. 209A	WAAP	19.0	Win. WAA12SL	1235	10,400 psi
NEW 1 oz.	CCI 209	WAAP	19.0	Win. WAA12SL	1235	9,400 psi
NEW 1 oz.	Rem. 209	WAAP	19.5	Win. WAA12SL	1235	9,000 psi
NEW 1 oz.	Win. 209	WST	19.5	Win. WAA12SL	1235	8,000 psi
NEW 1 oz.	Win. 209	WST	20.0	Fed. 12S0	1235	8,900 psi
NEW 1 oz.	CCI 209	WST	20.0	Win. WAA12SL	1235	9,000 psi
NEW 1 oz.	CCI 209	WST	19.5	Fed. 12S0	1235	9,800 psi
NEW 1 oz.	Fed. 209	WST	20.5	Win. WAA12SL	1235	9,000 psi
NEW 1 oz.	Fed. 209	WST	20.0	Fed. 12S0	1235	9,700 psi
NEW 1 oz.	Win. 209	WAAP	21.0	Win. WAA12SL	1290	10,600 psi
NEW 1 oz.	Fed. 209A	WAAP	20.5	Rem TGT12	1290	10,400 psi
NEW 1 oz.	CCI 209	WAAP	20.5	Win. WAA12SL	1290	10,600 psi
NEW 1 oz.	Rem. 209	WAAP	21.0	Win. WAA12SL	1290	10,200 psi
NEW 1 oz.	Win. 209	WST	21.0	Win. WAA12SL	1290	10,000 psi
NEW 1 oz.	Win. 209	WST	21.0	Fed. 12S0	1290	9,700 psi
NEW 1 oz.	CCI 209	WST	21.0	Win. WAA12SL	1290	10,100 psi
NEW 1 oz.	CCI 209	WST	20.5	Fed. 12S0	1290	10,800 psi
NEW 1 oz.	Fed. 209	WST	21.5	Win. WAA12SL	1290	9,700 psi
NEW 1 oz.	Fed. 209	WST	21.0	Fed. 12S0	1290	10,900 psi
NEW 1 oz.	Win. 209	WSL	20.5	Win. WAA12SL	1290	10,100 psi
NEW 1 oz.	Win. 209	WSL	21.0	Fed. 12S0	1290	9,800 psi
NEW 1 oz.	CCI 209	WSL	20.5	Win. WAA12SL	1290	10,800 psi
NEW 1 oz.	CCI 209	WSL	21.0	Fed. 12S0	1290	10,300 psi
NEW 1 oz.	Fed. 209	WSL	20.5	Win. WAA12SL	1290	10,100 psi
NEW 1 oz.	Fed. 209	WSL	21.0	Fed. 12S0	1290	9,700 psi

CAUTION: DO NOT INTERCHANGE FED 209 AND FED 209A PRIMERS

12 Gauge 2 3/4" Case Remington RTL, STS & Nitro 27 Hulls (cont'd)

	Shot Wgt.	Primer	Powder	Charge (grains)	Wad Column	Velocity (fps)	Pressure
NEW	1 1/8 oz.	Win. 209	WAAP	17.5	Win. WAA12	1145	10,000 psi
NEW	1 1/8 oz.	Fed. 209A	WAAP	17.5	Win. WAA12	1145	10,400 psi
NEW	1 1/8 oz.	CCI 209	WAAP	17.5	Win. WAA12	1145	10,000 psi
NEW	1 1/8 oz.	Rem. 209	WAAP	17.5	Win. WAA12	1145	9,700 psi
	1 1/8 oz.	Win. 209	WSL	18.5	Win. WAA12	1145	8,300 psi
	1 1/8 oz.	CCI 209	WSL	18.0	Win. WAA12	1145	8,900 psi
	1 1/8 oz.	CCI 209	WSL	18.0	Fed. 12S3	1145	8,600 psi
	1 1/8 oz.	Fed. 209	WSL	18.5	Win. WAA12SL	1145	8,000 psi
	1 1/8 oz.	Fed. 209	WSL	18.0	Win. WAA12	1145	8,500 psi
	1 1/8 oz.	Fed. 209	WSL	18.5	Fed. 12S3	1145	8,300 psi
	1 1/8 oz.	Win. 209	WST	19.0	Rem. RXP12	1145	10,500 psi
	1 1/8 oz.	Win. 209	WST	19.0	Rem. Fig-8	1145	10,400 psi
	1 1/8 oz.	CCI 209	WST	18.0	Win. WAA12	1145	10,800 psi
	1 1/8 oz.	CCI 209	WST	18.5	Rem. RXP12	1145	10,800 psi
	1 1/8 oz.	CCI 209	WST	18.5	Rem. Fig-8	1145	10,200 psi
	1 1/8 oz.	Fed. 209	WST	18.5	Rem. RXP12	1145	10,000 psi
	1 1/8 oz.	Fed. 209	WST	18.5	Rem. Fig-8	1145	10,000 psi
NEW	1 1/8 oz.	Win. 209	WAAP	18.5	Win. WAA12	1200	10,900 psi
NEW	1 1/8 oz.	Fed. 209A	WAAP	19.0	Rem. TGT12	1200	10,500 psi
NEW	1 1/8 oz.	CCI 209	WAAP	19.0	Rem. TGT12	1200	10,600 psi
NEW	1 1/8 oz.	Rem. 209	WAAP	19.0	Win. WAA12	1200	10,600 psi
	1 1/8 oz.	Win. 209	WSL	19.5	Win. WAA12SL	1200	9,400 psi
	1 1/8 oz.	Win. 209	WSL	19.5	Win. WAA12	1200	9,700 psi
	1 1/8 oz.	Win. 209	WSL	19.5	Rem. RXP12	1200	9,500 psi
	1 1/8 oz.	Win. 209	WSL	19.5	Rem. Fig-8	1200	9,400 psi
	1 1/8 oz.	Win. 209	WSL	19.5	Fed. 12S3	1200	10,200 psi
	1 1/8 oz.	CCI 209	WSL	19.0	Win. WAA12SL	1200	9,800 psi
	1 1/8 oz.	CCI 209	WSL	19.0	Win. WAA12	1200	10,800 psi
	1 1/8 oz.	CCI 209	WSL	19.0	Rem. RXP12	1200	10,000 psi
	1 1/8 oz.	CCI 209	WSL	19.0	Rem. Fig-8	1200	9,600 psi
	1 1/8 oz.	Fed. 209	WSL	20.0	Win. WAA12SL	1200	9,000 psi
	1 1/8 oz.	Fed. 209	WSL	19.0	Win. WAA12	1200	8,700 psi
	1 1/8 oz.	Fed. 209	WSL	19.5	Rem. RXP12	1200	8,800 psi
	1 1/8 oz.	Fed. 209	WSL	20.0	Rem. Fig-8	1200	8,100 psi
	1 1/8 oz.	Fed. 209	WSL	19.0	Fed. 12S3	1200	9,200 psi
	1 1/8 oz.	Win. 209	WSL	20.5	Win. WAA12SL	1255	10,600 psi
	1 1/8 oz.	Win. 209	WSL	20.5	Win. WAA12	1255	10,900 psi
	1 1/8 oz.	Win. 209	WSL	20.5	Rem. RXP12	1255	10,500 psi
	1 1/8 oz.	Win. 209	WSL	20.5	Rem. Fig-8	1255	10,700 psi
	1 1/8 oz.	CCI 209	WSL	20.0	Win. WAA12SL	1255	10,900 psi
	1 1/8 oz.	CCI 209	WSL	20.0	Rem. RXP12	1255	10,900 psi
	1 1/8 oz.	CCI 209	WSL	20.0	Rem. Fig-8	1255	10,600 psi
	1 1/8 oz.	Fed. 209	WSL	21.0	Win. WAA12SL	1255	10,400 psi
	1 1/8 oz.	Fed. 209	WSL	20.5	Win. WAA12	1255	9,900 psi
	1 1/8 oz.	Fed. 209	WSL	21.0	Rem. RXP12	1255	9,900 psi
	1 1/8 oz.	Fed. 209	WSL	21.0	Rem. Fig-8	1255	9,180 psi
	1 1/8 oz.	Fed. 209	WSL	20.5	Fed. 12S3	1255	10,400 psi
	1 1/8 oz.	Win. 209	WSF	27.0	Win. WAA12	1310	9,700 psi
	1 1/8 oz.	Win. 209	WSF	28.5	Win. WAA12	1365	10,700 psi
	1 1/8 oz.	Win. 209	WSF	28.0	Fed. 12S3	1365	8,900 psi
	1 1/8 oz.	Win. 209	WSF	29.0	Fed. 12S3	1400	9,500 psi
	1 1/4 oz.	Fed. 209	WSF	26.5	Win. WAA12F114	1220	8,800 psi
	1 1/4 oz.	CCI 209	WSF	25.5	Win. WAA12F114	1220	9,100 psi
	1 1/4 oz.	Win. 209	WSF	27.5	Win. WAA12F114	1275	9,700 psi
	1 1/4 oz.	Fed. 209	WSF	28.0	Win. WAA12F114	1275	9,500 psi
	1 1/4 oz.	Fed. 209	WSF	28.0	Rem. RXP12	1275	9,500 psi
	1 1/4 oz.	CCI 209	WSF	27.0	Win. WAA12F114	1275	10,200 psi
	1 1/4 oz.	Win. 209	WSF	29.5	Win. WAA12F114	1330	10,400 psi
	1 1/4 oz.	Fed. 209	WSF	29.5	Win. WAA12F114	1330	10,200 psi
	1 1/4 oz.	Fed. 209	WSF	29.5	Rem. RXP12	1330	10,700 psi
	1 1/4 oz.	CCI 209	WSF	28.5	Win. WAA12F114	1330	10,900 psi

CAUTION: DO NOT INTERCHANGE FED 209 AND FED 209A PRIMERS

**12 Gauge 2 3/4" Case
Federal Gold Medal Hull**

Shot Wgt.	Primer	Powder	Charge (grains)	Wad Column	Velocity (fps)	Pressure
1 oz.	Win. 209	WST	20.5	Fed. 12S0	1180	7,400 psi
NEW 1 oz.	Win. 209	WAAP	20.0	Fed. 12S0	1235	7,800 psi
NEW 1 oz.	Fed. 209A	WAAP	20.0	Fed. 12S0	1235	8,100 psi
NEW 1 oz.	CCI 209	WAAP	20.0	Fed. 12S0	1235	8,100 psi
1 oz.	Win. 209	WST	22.0	Fed. 12S0	1235	8,500 psi
1 oz.	CCI 209	WST	21.0	Fed. 12S0	1235	8,500 psi
NEW 1 oz.	Win. 209	WAAP	21.5	Fed. 12S0	1290	9,000 psi
NEW 1 oz.	Fed. 209A	WAAP	21.5	Fed. 12S0	1290	9,200 psi
NEW 1 oz.	CCI 209	WAAP	21.5	Fed. 12S0	1290	9,300 psi
1 oz.	Win. 209	WST	23.0	Fed. 12S0	1290	9,300 psi
1 oz.	CCI 209	WST	22.5	Fed. 12S0	1290	9,500 psi
1 oz.	Fed. 209	WST	23.0	Fed. 12S0	1290	8,400 psi
NEW 1 1/8 oz.	Win. 209	WAAP	19.0	Fed. 12S3	1145	8,200 psi
NEW 1 1/8 oz.	Fed. 209A	WAAP	19.0	Fed. 12S3	1145	8,800 psi
NEW 1 1/8 oz.	CCI 209	WAAP	18.5	Fed. 12S3	1145	8,500 psi
1 1/8 oz.	CCI 209	WST	19.5	Fed. 12S3	1145	8,500 psi
1 1/8 oz.	Fed. 209	WST	20.0	Fed. 12S3	1145	7,700 psi
NEW 1 1/8 oz.	WIN 209	WAAP	20.0	Fed. 12S3	1200	9,300 psi
NEW 1 1/8 oz.	Fed. 209A	WAAP	20.0	Fed. 12S3	1200	9,800 psi
NEW 1 1/8 oz.	CCI 209	WAAP	20.0	Fed. 12S3	1200	9,200 psi
1 1/8 oz.	Win. 209	WST	21.0	Fed. 12S3	1200	9,500 psi
1 1/8 oz.	CCI 209	WST	21.0	Fed. 12S3	1200	10,300 psi
1 1/8 oz.	Fed. 209	WST	21.5	Fed. 12S3	1200	9,000 psi
NEW 1 1/8 oz.	Win. 209	WAAP	21.5	Fed. 12S3	1255	10,300 psi
NEW 1 1/8 oz.	Fed. 209A	WAAP	21.5	Fed. 12S3	1255	10,600 psi
NEW 1 1/8 oz.	CCI 209	WAAP	21.5	Fed. 12S3	1255	10,500 psi
1 1/4 oz.	CCI 209	WSF	27.0	Fed. 12S4	1275	9,200 psi
1 1/4 oz.	Win. 209	WSF	31.5	Fed. 12S4	1330	9,500 psi
1 1/4 oz.	CCI 209	WSF	29.5	Fed. 12S4	1330	10,600 psi

**12 Gauge 3" Case
Winchester Compression-Formed**

Shot Wgt.	Primer	Powder	Charge (grains)	Wad Column	Velocity (fps)	Pressure
1 5/8 oz.	Win. 209	571	36.0	Win. WAA12	1205	10,500 LUP
1 5/8 oz.	Win. 209	571	36.0	Rem. R12H	1205	10,100 LUP
1 7/8 oz.	Win. 209	571	33.0	Win. WAA12R	1100	10,500 LUP
1 7/8 oz.	Win. 209	571	34.0	Rem. RP12	1100	10,100 LUP

**16 Gauge 2 3/4" Case
Winchester Compression-Formed**

Shot Wgt.	Primer	Powder	Charge (grains)	Wad Column	Velocity (fps)	Pressure
1 oz.	Win. 209	WSF	20.0	Win. WAA16	1165	8,400 psi
1 oz.	Win. 209	571	25.0	Win. WAA16	1165	8,500 psi
1 oz.	Fed. 209	571	25.0	Win. WAA16	1165	8,500 psi
1 oz.	CCI 209	571	25.0	Win. WAA16	1165	8,400 psi
1 oz.	Win. 209	WSF	21.0	Win. WAA16	1220	9,000 psi
1 oz.	Fed. 209	WSF	21.5	Win. WAA16	1220	8,600 psi
1 oz.	CCI 209	WSF	21.0	Win. WAA16	1220	8,800 psi
1 oz.	Win. 209	571	26.5	Win. WAA16	1220	9,300 psi
1 oz.	Fed. 209	571	26.0	Win. WAA16	1220	9,400 psi
1 oz.	CCI 209	571	26.5	Win. WAA16	1220	9,100 psi

CAUTION: DO NOT INTERCHANGE FED 209 AND FED 209A PRIMERS

**16 Gauge 2 3/4" Case
Winchester Compression-Formed
(cont'd.)**

Shot Wgt.	Primer	Powder	Charge (grains)	Wad Column	Velocity (fps)	Pressure
1 1/8 oz.	CCI 209	WSF	20.5	Win. WAA16	1185	10,800 psi
1 1/8 oz.	Win. 209	571	26.0	Win. WAA16	1185	10,200 psi
1 1/8 oz.	Fed. 209	571	25.5	Win. WAA16	1185	10,200 psi
1 1/8 oz.	CCI 209	571	26.0	Win. WAA16	1185	10,000 psi
1 1/8 oz.	Win. 209	571	27.0	Win. WAA16	1240	10,900 psi
1 1/8 oz.	Fed. 209	571	26.5	Win. WAA16	1240	10,900 psi
1 1/8 oz.	CCI 209	571	27.5	Win. WAA16	1240	10,800 psi
1 1/4 oz.	Win. 209	571	30.5	Rem. SP16	1230	10,500 LUP

**20 Gauge 2 3/4" Case
Winchester Compression-Formed**

Shot Wgt.	Primer	Powder	Charge (grains)	Wad Column	Velocity (fps)	Pressure
7/8 oz. *	Win. 209	WSF	16.5	Win. WAA20	1200	11,200 psi
7/8 oz.	Win. 209	WSF	17.0	Rem. RXP20	1200	10,700 psi
7/8 oz.	Fed. 209	WSF	16.5	Win. WAA20	1200	11,400 psi
7/8 oz.	Fed. 209	WSF	17.0	Rem. RXP20	1200	10,500 psi
7/8 oz.	Fed. 209	WSF	16.5	Fed. 20S1	1200	11,400 psi
7/8 oz.	CCI 209	WSF	16.5	Win. WAA20	1200	11,300 psi
7/8 oz.	CCI 209	WSF	17.5	Rem. RXP20	1200	10,500 psi
7/8 oz.	CCI 209	WSF	16.5	Fed. 20S1	1200	11,400 psi
1 oz.	Win. 209	571	23.5	Win. WAA20F1	1165	9,300 LUP
1 oz.	Win. 209	571	23.5	Rem. SP20	1165	9,800 LUP
1 oz.	Win. 209	571	24.5	Rem. SP20	1220	10,300 LUP
1 1/8 oz.	Win. 209	571	24.5	Rem. RP20	1175	10,200 LUP
1 1/8 oz.	Fed. 209	571	24.0	Rem. RP20	1175	11,000 LUP
1 1/8 oz.	CCI 109	571	24.5	Rem. RP20	1175	10,500 LUP

* This load will duplicate the ballistics level of the factory Winchester 2 1/2 dram eq. AA Target Load

** This load will duplicate the ballistics level of the factory Winchester 2 1/2 dram eq. AA Target Load

20 Gauge 2 3/4" Case— Remington-Peters "RXP" Plastic

Shot Wgt.	Primer	Powder	Charge (grains)	Wad Column	Velocity (fps)	Pressure
7/8 oz.	Win. 209	WSF	17.0	Win. WAA20	1200	10,500 psi
7/8 oz.	Win. 209	WSF	17.5	Rem. RXP20	1200	10,600 psi
7/8 oz.	Win. 209	WSF	17.0	Fed. 20S1	1200	11,300 psi
7/8 oz.	Fed. 209	WSF	17.0	Win. WAA20	1200	10,700 psi
7/8 oz.	Fed. 209	WSF	17.5	Rem. RXP20	1200	10,300 psi
7/8 oz.	Fed. 209	WSF	17.0	Fed. 20S1	1200	10,800 psi
7/8 oz.	CCI 209	WSF	17.0	Win. WAA20	1200	10,500 psi
7/8 oz.	CCI 209	WSF	17.5	Rem. RXP20	1200	9,700 psi
7/8 oz.	CCI 209	WSF	17.5	Fed. 20S1	1200	11,100 psi
1 oz.	Win. 209	571	23.0	Win. WAA20F1	1165	9,700 LUP
1 oz.	Win. 209	571	25.0	Win. WAA20F1	1240	10,900 LUP
1 1/8 oz.	Win. 209	571	23.5	Win. WAA20F1	1150	11,100 LUP

CAUTION: DO NOT INTERCHANGE FED 209 AND FED 209A PRIMERS

20 Gauge 3" Case - Winchester Compression-Formed						
Shot Wgt.	Primer	Powder	Charge (grains)	Wad Column	Velocity (fps)	Pressure
1 1/8 oz.	Win. 209	571	27.0	Win. WAA20	1220	11,000 LUP
1 1/8 oz.	CCI 109	571	27.0	Win. WAA20	1220	11,100 LUP
1 3/16 oz.	Win. 209	571	27.5	Rem. R20	1195	10,600 LUP
1 1/4 oz.	Win. 209	571	24.0	Win. WAA20	1135	10,800 LUP
1 1/4 oz.	CCI 109	571	24.0	Win. WAA20	1135	11,000 LUP

28 Gauge 2 3/4" Case Winchester Compression-Formed						
Shot Wgt.	Primer	Powder	Charge (grains)	Wad Column	Velocity (fps)	Pressure
3/4 oz.	Win. 209	571	19.0	Win. WAA28	1200	10,200 LUP
3/4 oz.	CCI 109	571	19.0	Win. WAA28	1200	10,300 LUP
3/4 oz.	Win. 209	571	20.5	Win. WAA28	1260	11,000 LUP
3/4 oz.	CCI 109	571	20.5	Win. WAA28	1260	11,100 LUP

410 Bore 2 1/2" Case Winchester Compression-Formed						
Shot Wgt.	Primer	Powder	Charge (grains)	Wad Column	Velocity (fps)	Pressure
1/2 oz.	Win. 209	296	13.5	Win. WAA41	1150	9,100 LUP
1/2 oz.	CCI 109	296	13.5	Win. WAA41	1150	8,500 LUP
1/2 oz.	Win. 209	296	14.0	Win. WAA41	1200	9,800 LUP
1/2 oz.	Win. 209	296	14.0	Fed. 410SC	1200	10,300 LUP
1/2 oz.	CCI 109	296	14.0	Win. WAA41	1200	9,100 LUP
1/2 oz.	CCI 109	296	14.0	Fed. 410SC	1200	9,900 LUP

410 Bore 2 1/2" Case Remington-Peters "SP" Plastic (New style for 209 size primer)						
Shot Wgt.	Primer	Powder	Charge (grains)	Wad Column	Velocity (fps)	Pressure
1/2 oz.	Win. 209	296	15.0	Rem. SP410	1200	9,500 LUP

410 Bore 3" Case Winchester Compression-Formed						
Shot Wgt.	Primer	Powder	Charge (grains)	Wad Column	Velocity (fps)	Pressure
11/16 oz.	Win. 209	296	13.5	Win. WAA41	1135	10,800 LUP
11/16 oz.	Win. 209	296	13.5	Fed. 410SC	1135	10,800 LUP
11/16 oz.	Fed. 410	296	14.0	Win. WAA41	1135	10,000 LUP
11/16 oz.	Fed. 410	296	14.0	Fed. 410SC	1135	10,600 LUP

POWDER BUSHINGS AND SCALES

Caution- Read instruction manual for the reloading machine/tools.

Shotshell reloading tool powder bushings do not throw the exact charge specification in many cases. Some reasons include:

1. Variations in gravimetric density of powders from lot to lot. The tolerance is plus or minus .025 grams per cubic centimeter. This tolerance applies to most canister powders.
2. Usually a bushing chart lists the nominal weight of a powder charge based on normal packing as a result of free flow and gravimetric density of a powder or on a bushing volume and the nominal gravimetric powder density at 100% packing.
3. Various operators of a tool will get various powder weights from an identical tool and bushing. This is due to the change in force of operation and the amount of vibration transmitted to the tool with resultant amount of packing of powder.
4. The amount of sizing force required on cases being loaded can cause a change in powder drop due to the change in tool vibration.
5. Bushing manufacturing tolerances.
6. Tool manufacturing tolerances.
7. Mismarked bushings.

A bushing listing chart cannot be interpreted as an absolute. It simply represents what the manufacturer believes to be the nominal charge thrown with the listed bushing and powder.

A reloading scale is an absolute must. Charges thrown must be carefully checked and changes in bushing sizes made where required.

Do not try to determine the powder charge thrown by simply metering the powder bar back and forth and weighing charges. The tool must be cycled through the complete loading cycle to insure the same amount of vibration and powder packing as will take place in a normal loading cycle. Powder charges measured under these two conditions could vary as much as several grains.

Ponsness Warren Bushing Chart						
Bushing #	WSL	AA-Plus & WST	WSF	296	571	540
1A	10.2			13.6		
2A	11.2			15.0		
3A	11.8			16.0		
A	13.5		14.0	18.2	17.2	16.7
B	14.3		15.1	19.3	18.1	17.7
C	14.9		15.7	20.0	18.8	18.4
C1	15.7		16.7		19.9	19.4
D	16.3		17.0		20.4	19.9
D1	16.6		17.8		21.3	20.7
E	18.7		20.0		24.1	23.5
E1	19.6		21.1		25.0	24.4
E2	20.4	15.0	22.1		26.5	25.8
F	22.0	15.9	23.2		28.0	27.3
F1	22.1	16.0	23.5		28.1	27.4
F2	22.7	16.5	24.6		29.4	28.6
G	24.5	17.7	26.0		31.2	30.4
G1	24.7	17.9	26.3		31.6	30.7
H	26.2	19.1	28.0		33.6	32.8
I	27.2	19.8	29.0		35.0	34.1
J	28.2	20.5	30.0		36.2	35.2
J1	29.0	21.3	31.0		37.3	36.4
K	29.4	21.6	31.4		37.7	36.8
L	30.6	22.5	32.7		39.4	38.4
M	32.6	23.8	35.0		41.8	40.7
N	34.8	25.5	36.8		44.5	43.4
O	35.0		37.4		44.8	43.7
P	36.5				46.7	45.6
Q	37.7				46.8	
R	38.1				48.7	
S	38.6					
T	41.3					
U	44.0					
V	45.0					

NOTE- IMPORTANT CAUTION: These tables are not loading recommendations. Read "Powder Bushings and Scales" before using these tables. This information has been supplied by the tool manufacturers and is not a result of Winchester testing.

MEC Bushing Chart						
Bushing #	WSL	AA-Plus & WST	WSF	296	571	540
10	10.6	7.9	10.9	13.7	13.4	13.0
11	11.2	8.3	11.5	14.6	14.2	13.8
12	11.9	8.8	12.2	15.4	15.0	14.6
12A	12.5	9.3	12.9	16.3	15.8	15.4
13	13.2	9.8	13.6	17.2	16.7	16.3
13A	13.9	10.4	14.3	18.1	17.6	17.1
14.	14.6	10.9	15.0	19.0	18.5	18.0
15	15.4	11.4	15.8	20.0	19.5	19.0
16	16.2	12.0	16.6	21.0	20.4	19.9
17	16.9	12.6	17.4	22.0	21.4	20.8
18	17.7	13.2	18.2	23.0	22.4	21.8
19	18.5	13.8	19.0	24.1	23.4	22.8
20	19.4	14.4	19.9	25.1	24.5	23.9
21	20.2	15.0	20.8	26.2	25.6	24.9
22	21.1	15.7	21.6	27.4	26.7	26.0
23	22.0	16.3	22.6	28.5	27.8	27.1
24	22.9	17.0	23.5	29.7	28.9	28.2
25	23.8	17.7	24.4	30.9	30.1	29.3
26	24.8	18.4	25.4	32.1	31.3	30.5
27	25.7	19.1	26.4	33.4	32.5	31.7
28	26.7	19.8	27.4	34.6	33.8	32.9
29	27.7	20.6	28.4	35.9	35.0	34.1
30	28.7	21.3	29.5	37.3	36.3	35.4
31	29.7	22.1	30.5	38.6	37.6	36.6
32	30.8	22.9	31.6	40.0	38.9	37.9
33	31.9	23.7	32.7	41.4	40.3	39.2
34	33.0	24.5	33.8	42.8	41.7	40.6
35	34.1	25.3	35.0	44.2	43.1	42.0
36	35.2	26.2	36.1	45.7	44.5	43.3
37	36.3	27.0	37.3	47.1	45.9	44.7
38	37.5	27.9	38.5	48.7	47.4	46.2
38A	38.7	28.8	39.7	50.2	48.9	47.6
39	39.9	29.7	40.9	51.7	50.4	49.1
39A	41.1	30.6	42.2	53.3	52.0	50.6
40	42.3	31.5	43.4	54.9	53.5	52.1
40A	43.6	32.4	44.7	56.6	55.1	53.7
41	44.9	33.4	46.0	58.2	56.7	55.2
41A	46.2	34.3	47.4	59.9	58.4	56.8
42	47.5	35.3	48.7	61.6	60.0	58.4
42A	48.8	36.3	50.1	63.3	61.7	60.1
43	50.1	37.3	51.5	65.0	63.4	61.7
43A	51.5	38.3	52.9	66.8	65.1	63.4
44	52.9	39.3	54.3	68.6	66.9	65.1
44A	54.3	40.4	55.7	70.4	68.6	66.8
45	55.7	41.4	57.2	72.3	70.4	68.6
45A	57.1	42.5	58.0	74.1	72.3	70.4
46	58.6	43.6	60.1	76.0	74.1	72.2

NOTE- IMPORTANT CAUTION: These tables are not loading recommendations. Read "Powder Bushings and Scales" before using these tables. This information has been supplied by the tool manufacturers and is not a result of Winchester testing.

Hornady 366 and 91 Bushing Chart						
Grains	Bushing No.					
	WSF	WSL	AA-Plus WST	296	540	571
10						
11						
12						
13				256		
14				266		
15						
15.5	327					
16	330	333				
16.5	336	339				
17	342	345	405		300	
17.5	348	348	411			
18	351	354	417		309	
18.5	354	360	423			
19		363	429		318	318
19.5		366	435			
20		372	438		327	330
20.5		378	444			
21		381	450		336	339
21.5		387	456			
22		390	459		345	348
22.5		396	465			
23		402	471		351	357
23.5		405	477			
24			480		360	363
25	411				366	369
25.5	414					
26	420				375	378
26.5	423					
27	426				381	384
27.5	429					
28	432				387	390
28.5	438					
29	441				393	396
29.5	447					
30	450				402	405
30.5	453					
31	456				408	411
31.5	459					
32	462				414	417
33					423	423
34					429	429
35					435	438
36					441	444
37					444	450
38					450	456
39					459	462
40					465	468
41					471	474
42					477	480
43					483	486
44					489	492

Hornady Pistol Measure Bushing Chart				
Bushing Number	WSL	AA-Plus & WST	231	296
1	3.1	2.3	3.0	
2	3.3	2.5	3.3	
3	3.7	2.7	3.6	
4	4.1	3.0	4.1	
5	4.5	3.3	4.5	
6	4.6	3.4	4.6	
7	4.9	3.7	4.8	
8	5.4	4.0	5.3	
9	5.5	4.1	5.5	
10	6.3	4.6	6.3	
11	6.4	4.8	6.4	
12	6.9	5.1	6.9	
13	7.6	5.6	7.6	10.3
14	8.2	6.0	8.1	11.0
15	8.6	6.3	8.5	11.6
16	9.0	6.6	8.9	12.2
17	10.0	7.3	9.9	13.6
18	10.4	7.5		14.0
19	10.6	7.9		14.7
20	11.5	8.4		15.6
21	12.6	9.2		17.1
22	13.2	9.6		17.9

NOTE- IMPORTANT CAUTION: These tables are not loading recommendations. Read "Powder Bushings and Scales" before using these tables. This information has been supplied by the tool manufacturers and is not a result of Winchester testing.

Lee Precision-Load-All/Fast									
Bushing (Cu. In.)	Grains								
	WSF	WSL	AA-Plus WST	231	296	540	571	748	760
.095	18.5	18.4	12.9	16.7	23.7	22.8	22.9	23.8	23.4
.100	19.5	19.3	13.6	17.6	25.0	24.0	24.1	25.0	24.6
.105	20.5	20.3	14.3	18.5	26.2	25.2	25.3	26.3	25.8
.110	21.5	21.3	15.0	19.4	27.5	26.4	26.5	27.5	27.1
.116	22.6	22.4	15.8	20.4	29.0	27.8	28.0	29.0	28.5
.122	23.8	23.6	16.6	21.5	30.5	29.3	29.4	30.5	30.0
.128	25.0	24.8	17.4	22.5	32.0	30.7	30.8	32.0	31.5
.134	26.1	25.9	18.2	23.6	33.5	32.2	32.3	33.5	33.0
.141	27.5	27.3	19.2	24.8	35.2	33.8	34.0	35.3	34.7
.148	28.9	28.6	20.1	26.0	37.0	35.5	35.7	37.0	36.4
.151	29.4	29.2	20.5	26.6	37.7	36.2	36.4	37.8	37.1
.155	30.2	30.0	21.1	27.3	38.7	37.2	37.4	38.8	38.1
.163	31.8	31.5	22.2	28.7	40.7	39.1	39.3	40.8	40.1
.171	33.3	33.1	23.3	30.1	42.7	41.0	41.2	42.8	42.1
.180	35.1	34.8	24.5	31.7	45.0	43.2	43.4	45.0	44.3
.189	36.9	36.5	25.7	33.3	47.2	45.4	45.6	47.3	46.5
.198	38.6	38.3	26.9	34.8	49.5	47.5	47.7	49.5	48.7

Lee Precision- Auto Disk										
Disk (cc)	Grains									
	WSF	WSL	AA-Plus WST	231	296	540	571	748	760	WAP
0.30	3.6	3.5	2.5	3.2	4.6	4.4	4.4	4.6	4.5	3.7
0.32	3.8	3.8	2.7	3.4	4.9	4.7	4.7	4.9	4.8	4.0
0.34	4.0	4.0	2.8	3.7	5.2	5.0	5.0	5.2	5.1	4.2
0.37	4.4	4.4	3.1	4.0	5.6	5.4	5.4	5.6	5.6	4.6
0.40	4.8	4.7	3.3	4.3	6.1	5.9	5.9	6.1	6.0	4.9
0.43	5.1	5.1	3.6	4.6	6.6	6.3	6.3	6.6	6.5	5.3
0.46	5.5	5.4	3.8	4.9	7.0	6.7	6.8	7.0	6.9	5.7
0.49	5.8	5.8	4.1	5.3	7.5	7.2	7.2	7.5	7.4	6.1
0.53	6.3	6.3	4.4	5.7	8.1	7.8	7.8	8.1	8.0	6.5
0.57	6.8	6.7	4.7	6.1	8.7	8.3	8.4	8.7	8.6	7.0
0.61	7.3	7.2	5.1	6.6	9.3	8.9	9.0	9.3	9.2	7.5
0.66	7.9	7.8	5.5	7.1	10.1	9.7	9.7	10.1	9.9	8.2
0.71	8.4	8.4	5.9	7.6	10.8	10.4	10.4	10.8	10.7	8.8
0.76	9.0	9.0	6.3	8.2	11.6	11.1	11.2	11.6	11.4	9.4
0.82	9.8	9.7	6.8	8.8	12.5	12.0	12.1	12.5	12.3	10.1
0.88	10.5	10.4	7.3	9.5	13.4	12.9	12.9	13.4	13.2	10.9
0.95	11.3	11.2	7.9	10.2	14.5	13.9	14.0	14.5	14.3	11.7
1.02	12.1	12.0	8.5	11.0	15.6	14.9	15.0	15.6	15.3	12.6
1.09	13.0	12.9	9.0	11.7	16.6	16.0	16.0	16.6	16.4	13.5
1.18	14.0	13.9	9.8	12.7	18.0	17.3	17.4	18.0	17.7	14.6
1.26	15.0	14.9	10.5	13.5	19.2	18.5	18.5	19.2	18.9	15.6
1.36	16.2	16.0	11.3	14.6	20.7	19.9	20.0	20.7	20.4	16.8
1.46	17.4	17.2	12.1	15.7	22.3	21.4	21.5	22.3	21.9	18.0
1.57	18.7	18.5	13.0	16.9	24.0	23.0	23.1	24.0	23.6	19.4

Lee Precision- Dippers							
Dippers (cc)	Grains						
	WSF	WSL	AA-Plus WST	231	296	540	571
0.30	3.6	3.5	2.5	3.2	4.6	4.4	4.4
0.50	6.0	5.9	4.2	5.4	7.6	7.3	7.4
0.70	8.3	8.3	5.8	7.5	10.7	10.3	10.3
1.00	11.9	11.8	8.3	10.7	15.3	14.6	14.7
1.30	15.5	15.3	10.8	14.0	19.8	19.0	19.1
1.60	19.0	18.9	13.3	17.2	24.4	23.4	23.5
1.90	22.6	22.4	15.8	20.4	29.0	27.8	27.9
2.20	26.2	26.0	18.3	23.6	33.6	32.2	32.4
2.50	29.8	29.5	20.8	26.8	38.1	36.6	36.8
2.80	33.3	33.0	23.2	30.1	42.7	41.0	41.2
3.10	36.9	36.6	25.7	33.3	47.3	45.4	45.6
3.40	40.5	40.1	28.2	36.5	51.9	49.8	50.0
3.70	44.0	43.7	30.7	39.7	56.4	54.2	54.4
4.00	47.6	47.2	33.2	43.0	61.0	58.6	58.8
4.30	51.2	50.7	35.7	46.2	65.6	63.0	63.2

\$1²⁵ CASH REBATE

WITH THE PURCHASE OF ANY TWO BOXES OF WINCHESTER® SILVERTIP® HOLLOWPOINT BULLETS (LIMIT 4 BOXES)



\$2²⁵ CASH REBATE

WITH THE PURCHASE OF ANY TWO BOXES OF WINCHESTER® FAIL SAFE® BULLETS (LIMIT 4 BOXES)



\$1²⁵ CASH REBATE

WITH THE PURCHASE OF ANY FOUR BAGS OF WESTERN® TARGET WADS OR SIX BAGS OF WINCHESTER® AA® WADS (LIMIT 12 BAGS)



UP TO \$9⁰⁰ CASH REBATE

WITH THE PURCHASE OF ANY TWO CANISTERS OF WINCHESTER® BALL POWDER® PROPELLANT (LIMIT 2 CANISTERS)

\$1.25 REBATE ON 2 ONE POUND CANISTERS

\$3.50 REBATE ON 2 THREE POUND OR FOUR POUND CANISTERS

\$9 REBATE ON 2 EIGHT POUND CANISTERS

Ball Powder is a registered trademark of Primex Technologies, Inc.



\$2²⁵ CASH REBATE

**WITH THE PURCHASE OF ANY
TWO BOXES OF WINCHESTER®
FAIL SAFE® BULLETS
(LIMIT 4 BOXES)**

Name _____

Address _____

City _____ State _____ Zip _____

**Mail to: Winchester® Ammunition
(BP Rebate 1)
P.O. Box 1629
Maryland Heights, MO 63046**

Mail in UPC, cash register receipt dated between 4-1-98 and 3-31-99, this certificate including your complete name and address and receive a rebate check for up to \$4.50. Offer void if correct proofs of purchase are not included. Allow 6-8 weeks for receipt of rebate. Photo copies of this certificate will not be accepted. Offer rights not assignable or transferrable and offer void where prohibited, taxed, or restricted by law. Offer good only in U.S.A. Offer limited to one per household.

\$1²⁵ CASH REBATE

**WITH THE PURCHASE OF ANY TWO
BOXES OF WINCHESTER® SILVERTIP®
HOLLOWPOINT BULLETS
(LIMIT 4 BOXES)**

Name _____

Address _____

City _____ State _____ Zip _____

**Mail to: Winchester® Ammunition
(BP Rebate 2)
P.O. Box 1629
Maryland Heights, MO 63046**

Mail in UPC, cash register receipt dated between 4-1-98 and 3-31-99, this certificate including your complete name and address and receive a rebate check for up to \$2.50. Offer void if correct proofs of purchase are not included. Allow 6-8 weeks for receipt of rebate. Photo copies of this certificate will not be accepted. Offer rights not assignable or transferrable and offer void where prohibited, taxed, or restricted by law. Offer good only in U.S.A. Offer limited to one per household.

UP TO \$9⁰⁰ CASH REBATE

**WITH THE PURCHASE OF ANY
TWO CANISTERS OF WINCHESTER® BALL
POWDER® PROPELLANT
(LIMIT 2 CANISTERS)**

\$1.25 REBATE ON 2 ONE POUND CANISTERS

**\$3.50 REBATE ON 2 THREE POUND OR
FOUR POUND CANISTERS**

\$9 REBATE ON 2 EIGHT POUND CANISTERS

Ball Powder is a registered trademark of Primex Technologies, Inc.

Name _____

Address _____

City _____ State _____ Zip _____

**Mail to: Winchester® Ammunition
(BP Rebate 3)
P.O. Box 1629
Maryland Heights, MO 63046**

Mail in UPC, cash register receipt dated between 4-1-98 and 3-31-99, this certificate including your complete name and address and receive a rebate check for up to \$9.00. Offer void if correct proofs of purchase are not included. Allow 6-8 weeks for receipt of rebate. Photo copies of this certificate will not be accepted. Offer rights not assignable or transferrable and offer void where prohibited, taxed, or restricted by law. Offer good only in U.S.A. Offer limited to one per household.

\$1²⁵ CASH REBATE

**WITH THE PURCHASE OF ANY FOUR
BAGS OF WESTERN® TARGET WADS OR
SIX BAGS OF WINCHESTER® AA® WADS
(LIMIT 12 BAGS)**

Name _____

Address _____

City _____ State _____ Zip _____

**Mail to: Winchester® Ammunition
(BP Rebate 4)
P.O. Box 1629
Maryland Heights, MO 63046**

Mail in UPC, cash register receipt dated between 4-1-98 and 3-31-99, this certificate including your complete name and address and receive a rebate check for up to \$3.75. Offer void if correct proofs of purchase are not included. Allow 6-8 weeks for receipt of rebate. Photo copies of this certificate will not be accepted. Offer rights not assignable or transferrable and offer void where prohibited, taxed, or restricted by law. Offer good only in U.S.A. Offer limited to one per household.

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FOR

A SPLIT SECOND

THE ENTIRE

UNIVERSE IS

ONLY A FEW INCHES

IN DIAMETER.



There is no sound. No motion. No thought. Just the small metal plate before you. It is a moment of perfect clarity. A moment that requires the most accurate and consistent load in

the world. At Winchester® Ammunition, we've been supplying that load for over 125 years. So you keep concentrating on your shooting. We'll concentrate on your ammunition.



WINCHESTER
AMMUNITION

THE SPORT REQUIRES
YOU HOLD YOURSELF TO A
STANDARD
OF PERFECTION.
WE ASSUME IT EXPECTS THE SAME OF US.



More often than not, a perfect score is the difference between winning and losing. And like you, we don't play to lose. Which is why this year (and for every year as long as we can remember) more shooters chose AA[®] shotshells over any other at the Grand American, the NSCA National Championship and the NSSA World Skeet Shoot. Like we said, we don't play to lose.



WINCHESTER
AMMUNITION

METALLIC



METALLIC CARTRIDGE RELOADING

Data Generation

Data tested for the current handbook included not only the various tests for pressure and velocity at ambient 70 degrees F, but also tests with powder positioned at the primer and the bullet to simulate muzzle up, muzzle down conditions. Further, the same kind of tests are run at +140 degrees F and -40 degrees F. A criterion for all these tests was the data listed for handloading provide results which would meet the stringent criteria which Winchester applied to factory ammunition. Such stringent testing resulted in not listing some calibers and/or bullet weights with Winchester's current line of powders because Winchester was not satisfied with the results. It is possible the reloader would never have noticed the difference, but Winchester wants to supply only the very best data possible. In some cases, certain loads were not included for safety reason.

For the present, this data book represents all the applications of BALL POWDER® Propellant Winchester has been able to qualify.

Under no circumstances would Winchester presume to suggest data which exceeds the Sporting Arms and Ammunition Manufacturers Institute's suggested recommended loading limit.

Powder Burning Rates

Do not use any burning rate chart as a guide to reloading.

Burning rate charts are developed in closed bomb tests. The closed bomb test results merely serve as a very vague guide to the laboratory technician equipped with the necessary pressure testing equipment. Closed bomb charts as developed by a powder manufacturer include only powder of their manufacture. So-called "burning rate charts" are usually the result of estimates of where powders would fit if they were to develop a closed bomb test list for all brand powders.

When powders are used in cartridge cases of varying sizes and shapes, the so-called burning rates can and do vary depending upon the exact set of loading circumstances. One can easily discover this by carefully examining a manufacturer's loading data.

Such changes in apparent burning rates come as no surprise to the ballisticians who regards closed bomb test results as merely a very crude guide. The same changes, however, have resulted in more than one reloader having trouble when attempting to extrapolate data from a burning rate chart.

Reloading data should never be extrapolated and since burning rate charts tend to be misleading, and are often the source of grief to the reloader, Winchester does not suggest the positioning of Winchester® powders on any burning rate chart.

Old Brass

Most of the older, obsolete cartridge cases were designed for use with Black Powder, the only available propellant at the time. The primers used contained a mercury fulminate mixture as the initiator. The mercury, by itself, is ruinous to the brass case, if it comes in direct contact with it, causing embrittlement and weakening of the brass structure. Fortunately for the old-timers using black powder, the powder fouling itself tended to dilute the effect of the mercury on the brass case.

The advent of smokeless powder greatly magnified the mercuric effect upon the brass cases, particularly these cases which were reloaded and re-fired. The cleaner burning propellant and the stronger primers used allowed the mercury to be driven deeper into the brass, causing serious weakening of the case.

The use of mercury in commercial priming mixtures continued in the U.S. until the early 1930s, when lead styphnate replaced mercury in priming. An exception to this was the continued use of a mildly mercuric priming mixture by Winchester for Super-Match® 30-06 Springfield and 300 H&H Magnum cartridges. This primer was discontinued in 1960.

Since it would be unusual for a present day handloader to acquire old and/or obsolete brass cartridge cases and be able to identify the period of manufacture, it is not worth the risk of injuring a shooter or damaging his gun to attempt to load such cases. Therefore, Winchester suggests not reloading old brass cartridge cases.

Loading Instructions

CAUTION: Carefully read the information on the powder can label and follow the recommended loading instructions and precautions contained herein before using the reloading data.

These suggested loads are based on results obtained in the Winchester laboratory under carefully controlled conditions. They are offered without a fee as an aid to handloaders, to be employed at their own discretion and risk. Since Winchester has no control over the circumstances of loading, Winchester assumes no liability for the results obtained.

The handloading of centerfire metallic cartridges should be undertaken only by those who are familiar with all safety precautions and who observe conservative practices in reloading operations. The powder charges shown are maximum and must not be exceeded.

Cases

Exercise extreme care in inspection of cases. Be sure cases are kept trimmed to the required length. Excess case length is a common cause of difficulty in reloading. Cases should be discarded prior to the fifth trimming.

Primers

All primers used for testing of the data were standard Winchester primers of the applicable size. Use caution against the substitution of any component as it can alter the ballistic level of the load. The only magnum primer used in the data testing was for 357 magnum cartridges.

Powder

Check all powder charges with a good scale. All loads listed are maximum loads. **You must start 10% below the suggested load and work up to the maximum load carefully, except as follows:**

The loads for 8mm Mauser and 338 Winchester Magnum must be used exactly as shown. No reductions in powder charge or change in components should be made because such changes can cause dangerous pressures.

BLACK POWDER WARNING: Never substitute smokeless powder for black powder or Pyrodex or mix smokeless powder with black powder or Pyrodex. Never use smokeless powder in black powder firearms or in saluting cannons. Smokeless powder has much more energy than black powder or Pyrodex. Substituting or mixing powders may cause the firearm to blow up resulting in personal injury, property damage, or death.

Pressure

All new pressure data has been measured with the latest piezo electric system showing actual pounds per square inch (psi) and cannot be compared directly to the old data which used the copper crusher pressure measurement method. This data replaces all previously published load data.

CENTERFIRE RIFLE LOADING DATA

The data for metallic cartridges contained in this handbook were obtained using Winchester cases and primers unless otherwise noted. Substitution of components other than bullets of the same size and weight from reputable manufacturers could alter the ballistic level and safety of these loads. Winchester strongly urges when using this information you use the components as shown.

Extrapolation of additional loads from this data should not be attempted. Such practice can be dangerous. Winchester has strived to show those applications for which BALL POWDER® smokeless propellant is most ideally suited. While other loads are certainly possible, the only way such loads can be developed is in a ballistic laboratory. Winchester cautions against the use of any other loads with BALL POWDER smokeless propellant except where such loads have been adequately proven with the proper testing.

Velocity

Velocities quoted in the tables are averages of a series of shots fired in accordance with equipment and techniques universally used throughout the American arms and ammunition industry. Listed loads have given uniform velocity results in our tests.

All rifle velocities quoted have been measured in standard SAAMI* barrels of 24-inch length, except the 30 carbine data which was obtained in a 20" barrel.

*Sporting Arms and Ammunition Manufacturers Institute.

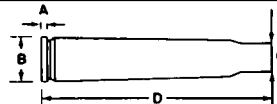
Bullet Descriptions			
Abbreviation	Description	Abbreviation	Description
FMJ	Full Metal Jacket	HSP	Hollow Soft Point
FMJBT	Full Metal Jacket Boattail	OPE	Open Point Expanding
FS	Fail Safe	PSP	Pointed Soft Point
HP	Hollow Point	SP	Soft Point
HPBT	Hollow Point Boattail	ST	Silvertip

WARNING: Fail Safe® bullets are longer than many other bullets of the same weight. To avoid excessive pressure, DO NOT load Fail Safe bullets to the same powder charge recommended for other bullets of the same weight. Handload only in strict compliance with load data for Winchester Fail Safe bullets. Incorrect use of these components or incorrectly handloaded ammunition can cause serious injury or damage. Wear eye protection when handloading.

Nominal Bullet Diameters (Jacketed)			
Caliber	Dia.	Caliber	Dia.
22 Hornet	.224"	30 Carbine	.308"
222 Remington	.224"	30 Remington	.308"
223 Remington & 5.56	.224"	30/30 Winchester	.308"
222 Remington Magnum	.224"	300 Savage	.308"
225 Winchester	.224"	30/40 Krag	.308"
22/250 Remington	.224"	308 Winchester	.308"
220 Swift	.224"	30/06 Springfield	.308"
243 Winchester	.243"	300 Winchester Magnum	.308"
6mm Remington	.243"	307 Winchester	.308"
25/20 Winchester	.257"	303 Savage	.311"
25/35 Winchester	.257"	303 British	.311"
250/3000 Savage	.257"	32 Winchester Special	.321"
257 Roberts +P	.257"	8mm Mauser	.322"
25/06 Remington	.257"	338 Winchester Magnum	.338"
264 Winchester Magnum	.264"	35 Remington	.358"
270 Winchester	.277"	356 Winchester	.358"
7mm Mauser	.284"	358 Winchester	.358"
284 Winchester	.284"	375 H&H Magnum	.375"
280 Remington	.284"	375 Winchester	.376"
7mm Remington Mag.	.284"	44/40 Winchester	.426"
7mm/08 Remington	.284"	458 Winchester Magnum	.458"

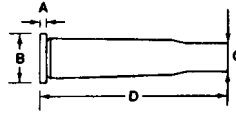
Rifle Case Dimensions

Rimless Rifle Cases					
Caliber	Maximum Dimensions				Trim To Length
	A	B	C*	D	
222 Remington	.045"	.378"	.253"	1.700"	1.690"
223 & 5.56 Remington	.045	.378	.253	1.760	1.750
222 Remington Magnum	.045	.378	.253	1.850	1.840
22/250 Remington	.049	.473	.254	1.912	1.902
220 Swift	.049	.473	.260	2.205	2.195
243 Winchester	.054	.473	.276	2.045	2.035
6mm Remington	.048	.472	.276	2.233	2.225
250/3000 Savage	.049	.473	.285	1.912	1.902
257 Roberts +P	.049	.473	.290	2.233	2.223
25/06 Remington	.049	.473	.290	2.494	2.484
270 Winchester	.049	.473	.308	2.540	2.530
284 Winchester	.054	.473	.320	2.170	2.160
7mm Mauser	.049	.473	.320	2.235	2.225
7mm/08 Remington	.054	.473	.315	2.035	2.025
280 Remington	.048	.472	.315	2.540	2.530
30 Carbine	.050	.360	.336	1.290	1.286
30 Remington	.049	.422	.331	2.050	2.040
300 Savage	.049	.473	.339	1.871	1.860
308 Winchester	.054	.473	.343	2.015	2.005
30/06 Springfield	.049	.473	.339	2.494	2.484
8mm Mauser	.049	.473	.349	2.240	2.235
35 Remington	.050	.460	.383	1.920	1.910
358 Winchester	.054	.473	.388	2.015	2.005



*This dimension is with bullet seated

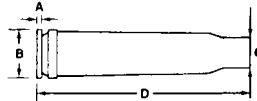
Rimmed Rifle Cases



Maximum Dimensions					Trim To Length
Caliber	A	B	C*	D	
218 Bee	.065"	.408"	.242"	1.345"	1.393"
22 Hornet	.065	.350	.242	1.403	1.393
225 Winchester	.049	.473	.260	1.930	1.920
25/20 Winchester	.065	.408	.273	1.330	1.320
25/35 Winchester	.063	.506	.282	2.043	2.033
303 Savage	.063	.505	.333	2.015	2.010
303 British	.064	.540	.338	2.222	2.212
30/30 Winchester	.063	.506	.330	2.039	2.028
30/40 Krag	.064	.545	.338	2.314	2.304
307 Winchester	.063	.506	.343	2.010	2.005
32 Winchester Special	.063	.506	.343	2.040	2.035
348 Winchester	.070	.610	.376	2.255	2.245
356 Winchester	.063	.506	.388	2.010	2.005
375 Winchester	.063	.506	.400	2.020	2.015
44/40 Winchester	.065	.525	.443	1.305	1.300

*This dimension is with bullet seated

Belted Rifle Cases



Maximum Dimensions					Trim To Length
Caliber	A	B	C*	D	
264 Winchester Magnum	.050"	.532"	.298"	2.500"	2.490"
7mm Remington Magnum	.050	.532	.315	2.500	2.490
300 Winchester Magnum	.050	.532	.340	2.620	2.610
338 Winchester Magnum	.050	.532	.369	2.500	2.490
375 H&H Magnum	.050	.532	.404	2.850	2.840
458 Winchester Magnum	.050	.532	.480	2.500	2.495

*This dimension is with bullet seated.

Maximum Overall Lengths with Bullet Seated

Caliber	Length	Caliber	Length
218 Bee	1.680"	30 Carbine	1.680"
22 Hornet	1.723	30 Remington	2.525
222 Remington	2.130	303 Savage	2.520
223 & 5.56 Remington	2.260	303 British	2.915
222 Remington Magnum	2.280	30/30 Winchester	2.550
225 Winchester	2.500	300 Savage	2.600
22/250 Remington	2.350	30/40 Krag	3.089
220 Swift	2.680	307 Winchester	2.560
243 Winchester	2.710	308 Winchester	2.800
6mm Remington	2.825	30/06 Springfield	3.340
25/20 Winchester	1.592	300 Winchester Magnum	3.340
25/35 Winchester	2.550	32 Winchester Special	2.565
250/3000 Savage	2.515	8mm Mauser	3.250
257 Roberts +P	2.775	338 Winchester Magnum	3.340
25/06 Remington	3.250	348 Winchester	2.795
264 Winchester	3.340	35 Remington	2.525
270 Winchester	3.340	356 Winchester	2.560
7mm Mauser	3.065	358 Winchester	2.780
284 Winchester	2.800	375 Winchester	2.560
280 Remington	3.330	375 H&H Magnum	3.600
7mm Remington Magnum	3.290	44/40 Winchester	1.592
7mm/08 Remington	2.800	458 Winchester Magnum	3.340

Rifle Data				
Caliber Bullet Weight & Type	Powder	Charge Weight in Grains	Velocity fps	Pressure
222 Remington				
45 grains SP	748	25.5	3210	41,000 C.U.P.
46 grains OPE	748	25.3	3125	38,000 C.U.P.
50 grains PSP	748	24.0	2980	38,000 C.U.P.
52 grains HPBT	748	22.6	2815	34,500 C.U.P.
53 grains HP	748	22.9	2855	36,000 C.U.P.
55 grains SP	748	24.0	2900	38,000 C.U.P.
55 grains FMJ	748	22.6	2750	33,800 C.U.P.
223 & 5.56 Remington				
50 grains PSP*	748	26.0	3200	40,000 C.U.P.
52 grains HPBT	748	25.5	3160	40,500 C.U.P.
53 grains HP	748	26.0	3200	43,500 C.U.P.
55 grains PSP	748	26.3	3150	39,000 C.U.P.
55 grains FMJ	748	26.2	3170	41,000 C.U.P.
NEW 62 grains FMJ	748	25.5	2985	49,200 psi
NEW 69 grains HPBT	748	24.5	2870	51,500 psi
222 Remington Magnum				
50 grains PSP	748	27.2	3220	43,000 C.U.P.
52 grains HPBT	748	27.2	3270	45,500 C.U.P.
53 grains HP	748	27.2	3270	45,500 C.U.P.
55 grains PSP	748	27.2	3215	42,500 C.U.P.
55 grains FMJ	748	27.0	3215	44,000 C.U.P.
225 Winchester				
46 grains OPE	760	37.0	3650	46,000 C.U.P.
50 grains PSP	760	36.0	3570	49,000 C.U.P.
55 grains SP	760	35.8	3410	49,000 C.U.P.
55 grains FMJ	760	35.2	3480	47,500 C.U.P.
22/250 Remington				
46 grains OPE	748	36.8	3815	50,000 C.U.P.
46 grains OPE	760	41.0	3850	49,000 C.U.P.
50 grains PSP	748	35.0	3660	50,000 C.U.P.
50 grains PSP	760	39.5	3700	49,200 C.U.P.
52 grains HPBT	760	38.6	3595	46,500 C.U.P.
53 grains HP	760	38.6	3565	46,500 C.U.P.
55 grains SP	748	34.8	3500	49,500 C.U.P.
55 grains FMJ	748	35.6	3665	50,000 C.U.P.
55 grains SP	760	39.0	3675	49,000 C.U.P.
55 grains FMJ	760	39.5	3700	47,500 C.U.P.
243 Winchester				
75 grains HP	760	43.0	3320	49,000 C.U.P.
80 grains PSP	760	43.5	3280	51,000 C.U.P.
80 grains PSP	WMR	47.5	3250	54,700 psi
85 grains HP	760	40.5	3150	49,000 C.U.P.
100 grains PSP	WMR	44.7	3000	55,500 psi
105 grains SP	WMR	43.7	2890	56,500 psi
25/20 Winchester				
60 grains OPE	680	13.0	2300	26,000 C.U.P.
86 grains Lead	680	11.1	1895	25,500 C.U.P.
86 grains SP	680	11.0	1800	23,500 C.U.P.
NEW 6mm Remington				
NEW 80 grains SP	760	42.8	3190	54,500 psi
NEW 80 grains SP	WMR	48.0	3105	48,000 psi
NEW 100 grains SP	WMR	46.1	2960	53,900 psi
25/35 Winchester				
117 grains SP	760	28.5	2200	34,500 C.U.P.
250/3000 Savage				
60 grains OPE	748	40.8	3470	40,500 C.U.P.
60 grains OPE	760	44.0	3330	39,000 C.U.P.
87 grains SP	748	36.0	2940	41,000 C.U.P.
87 grains SP	760	39.5	2985	43,500 C.U.P.
100 grains SP	748	35.5	2820	43,500 C.U.P.
100 grains SP	760	38.8	2820	42,000 C.U.P.
257 Roberts +P				
75 grains HP	760	47.8	3420	42,500 C.U.P.
90 grains OPE	WMR	48.7	2990	45,200 psi
100 grains ST	WMR	48.7	2935	48,300 psi
120 grains BT	WMR	45.6	2795	55,000 psi

*Note: Maximum overall length on this load is 2.120".

Rifle Data (cont'd)					
Caliber Bullet Weight & Type	Powder	Charge Weight in Grains	Velocity fps	Pressure	
25/06 Remington					
90 grains OPE	WMR	58.1	3340	52,700 psi	
100 grains ST	WMR	58.1	3280	55,600 psi	
120 grains BT	WMR	54.3	3055	60,100 psi	
NEW 6.5x55 Swedish					
140 grains PSP	760	39.6	2405	44,100 CUP	
140 grains PSP	WMR	44.7	2405	43,800 CUP	
160 grains SP	760	40.0	2285	43,700 CUP	
160 grains SP	WMR	44.5	2310	43,700 CUP	
270 Winchester					
100 grains SP	WMR	59.5	3120	45,500 psi	
100 grains PSP	760	56.0	3335	48,000 C.U.P.	
130 grains SP	760	52.0	2990	49,500 C.U.P.	
130 grains SP	WMR	58.9	3000	53,500 psi	
140 grains SP	WMR	57.6	2930	57,800 psi	
140 grains FS	WMR	56.7	2805	54,300 psi	
150 grains SP	760	49.0	2725	48,500 C.U.P.	
150 grains SP	WMR	57.5	2850	58,200 psi	
280 Remington					
120 grains SP	760	56.3	3125	57,500 psi	
120 grains SP	WMR	60.4	3045	50,100 psi	
145 grains SP	WMR	60.4	2930	53,500 psi	
160 grains ST	WMR	57.8	2795	56,800 psi	
284 Winchester					
125 grains SP	748	50.8	3075	50,000 C.U.P.	
125 grains SP	760	57.0	3180	50,000 C.U.P.	
150 grains SP	748	48.5	2770	49,000 C.U.P.	
150 grains SP	760	54.0	2890	49,000 C.U.P.	
175 grains SP	760	49.6	2545	53,300 psi	
7mm Mauser					
125 grains SP	760	48.7	2885	43,500 C.U.P.	
150 grains SP	760	46.5	2660	43,500 C.U.P.	
160 grains FS	WMR	45.2	2345	48,500 psi	
175 grains SP	760	44.0	2400	44,500 C.U.P.	
7mm-08 Remington					
120 grains SP	760	48.0	2990	56,600 psi	
139 grains BT	760	45.4	2725	50,800 psi	
150 grains SP	760	45.6	2645	49,900 psi	
160 grains FS	760	41.0	2520	58,200 psi	
175 grains SP	760	42.6	2515	58,300 psi	
162 grains BT	760	43.0	2605	58,100 psi	
162 grains BT	WMR	43.8	2290	40,400 psi	
30 Carbine					
110 grains HSP	296	15.0	1980	36,000 C.U.P.	
30 Remington					
170 grains SP	748	30.0	2000	34,000 C.U.P.	
170 grains SP	760	35.0	2095	35,000 C.U.P.	
303 Savage					
170 grains SP	748	33.5	2090	32,000 C.U.P.	
NEW 303 British					
123 grains SP	748	47.3	2720	34,000 psi	
150 grains PSP	748	45.4	2565	37,700 psi	
180 grains SP	748	39.8	2345	46,600 psi	
180 grains SP	760	46.3	2435	46,550 psi	
30/30 Winchester					
110 grains HSP	296	18.7	2155	36,000 C.U.P.	
110 grains HSP	748	36.8	2595	33,000 C.U.P.	
150 grains SP	748	34.5	2310	36,000 C.U.P.	
150 grains SP	760	35.9	2090	30,000 C.U.P.	
170 grains SP	748	32.0	2145	36,000 C.U.P.	
170 grains SP	760	33.6	1975	30,000 C.U.P.	
300 Savage					
110 grains HSP	748	45.2	2930	41,500 C.U.P.	
150 grains SP	748	42.0	2600	41,000 C.U.P.	
150 grains SP	760	45.5	2580	42,000 C.U.P.	
150 grains FS	748	40.9	2505	42,000 psi	
165 grains FS	748	39.5	2340	39,900 psi	
180 grains FS	748	38.8	2350	45,600 psi	
180 grains SP	748	40.0	2375	43,000 C.U.P.	
180 grains SP	760	44.5	2410	41,000 C.U.P.	

Rifle Data (cont'd)

	Caliber Bullet Weight & Type	Powder	Charge Weight in Grains	Velocity fps	Pressure
	307 Winchester				
	130 grains SP	748	45.2	2720	38,000 C.U.P.
	130 grains SP	760	45.2	2470	33,000 C.U.P.
	150 grains SP	748	44.0	2625	44,500 C.U.P.
	150 grains SP	760	44.0	2305	34,000 C.U.P.
	170 grains SP	748	41.2	2455	44,000 C.U.P.
	170 grains SP	760	41.2	2260	39,000 C.U.P.
	308 Winchester				
	110 grains SP	748	53.2	3300	46,000 C.U.P.
	125 grains SP	748	52.0	3175	50,000 C.U.P.
	150 grains SP	748	48.5	2865	48,000 C.U.P.
	150 grains SP	760	50.1	2700	40,500 C.U.P.
NEW	150 grains FS	748	43.0	2540	45,100 psi
NEW	165 grains FS	748	42.0	2400	43,800 psi
	180 grains FMJBT	748	45.5	2600	50,500 C.U.P.
	180 grains SP	748	46.5	2610	48,500 C.U.P.
	180 grains FMJBT	760	46.6	2535	43,000 C.U.P.
	180 grains SP	760	48.0	2580	43,000 C.U.P.
	180 grains FS	748	41.3	2420	54,900 psi
	190 grains HPBT	748	42.0	2445	49,000 C.U.P.
	200 grains SP	748	43.0	2435	50,000 C.U.P.
	200 grains SP	760	45.7	2430	46,500 C.U.P.
NEW	300 H&H Magnum				
NEW	150 grains FS	WMR	72.4	2920	44,500 C.U.P.
NEW	165 grains FS	WMR	71.3	2895	47,400 C.U.P.
NEW	180 grains FS	WMR	70.0	2820	48,600 C.U.P.
NEW	200 grains SP	WMR	70.6	2780	52,000 C.U.P.
NEW	220 grains SP	WMR	67.0	2595	51,500 C.U.P.
	30/40 Krag				
	180 grains SP	760	44.5	2380	37,000 C.U.P.
	220 grains SP	760	40.5	2070	36,000 C.U.P.
	30/06 Springfield				
	110 grains PSP	748	52.7	3230	47,000 C.U.P.
	110 grains PSP	760	59.0	3210	45,500 C.U.P.
	125 grains SP	748	51.0	3060	46,000 C.U.P.
	125 grains SP	760	57.8	3125	45,000 C.U.P.
	150 grains SP	748	48.0	2810	46,000 C.U.P.
	150 grains SP	760	54.0	2900	48,000 C.U.P.
NEW	150 grains FS	760	55.1	2810	52,100 psi
NEW	165 grains FS	760	54.6	2690	53,300 psi
	168 grains HP	760	52.5	2665	47,000 C.U.P.
	180 grains FMJBT	748	44.0	2530	47,000 C.U.P.
	180 grains SP	748	45.0	2540	48,500 C.U.P.
	180 grains FMJBT	760	52.5	2700	48,500 C.U.P.
	180 grains SP	760	53.0	2725	50,000 C.U.P.
	180 grains FS	760	51.4	2625	57,100 psi
	190 grains HPBT	760	52.0	2605	47,500 C.U.P.
	200 grains SP	760	49.0	2470	46,000 C.U.P.
	200 grains SP	WMR	55.7	2435	48,200 psi
	220 grains SP	760	49.0	2370	48,000 C.U.P.
	220 grains SP	WMR	55.7	2380	51,100 psi
NEW	300 Winchester Magnum				
NEW	150 grains SP	WMR	77.7	3205	55,900 psi
NEW	150 grains FS	WMR	76.1	3095	53,000 psi
NEW	165 grains FS	WMR	75.4	3050	59,200 psi
	165 grains SP	760	67.1	2995	60,800 psi
	165 grains SP	WMR	76.0	3010	53,800 psi
	180 grains SP	WMR	74.0	2960	60,300 psi
	190 grains SPBT	WMR	74.0	2920	59,500 psi
	200 grains SP	WMR	69.0	2750	59,000 psi
	220 grains SP	WMR	68.2	2665	59,800 psi
	32 Winchester Special				
	170 grains SP	748	36.2	2240	32,500 C.U.P.
	8mm Mauser*				
	170 grains SP*	748*	46.0	2410	37,000 C.U.P.
	170 grains SP*	760*	48.0	2240	32,000 C.U.P.
	338 Winchester Magnum				
	200 grains SP*	760*	70.0	2900	51,000 C.U.P.
	200 grains SP	WMR	71.7	2660	43,400 psi
	220 grains SP	WMR	72.2	2640	41,800 psi
	230 grains FS	WMR	66.8	2450	44,900 psi
	250 grains SP*	760*	63.2	2545	50,500 C.U.P.
	250 grains SP	WMR	72.0	2550	51,600 psi
	275 grains SP	WMR	67.1	2390	50,800 psi
	300 grains SP*	760*	59.8	2285	51,500 C.U.P.

Rifle Data (cont'd)				
Caliber Bullet Weight & Type	Powder	Charge Weight in Grains	Velocity fps	Pressure
35 Remington 200 grains SP	748	39.0	2130	33,000 C.U.P.
356 Winchester 220 grains SP	748	42.1	2015	31,000 C.U.P.
220 grains SP	760	42.1	1805	27,500 C.U.P.
358 Winchester 200 grains SP	748	50.6	2500	50,000 C.U.P.
250 grains SP	748	46.2	2250	50,500 C.U.P.
375 H&H Magnum 270 grains SP	760	77.5	2660	51,000 C.U.P.
300 grains SP	760	77.5	2560	51,500 C.U.P.
300 grains FMJ	760	77.5	2560	51,500 C.U.P.
44/40 Winchester 200 grains Lead	231	6.7	1100	12,000 C.U.P.
458 Winchester Magnum 500 grains FMJ	748	73.0	2040	39,000 C.U.P.
510 grains SP	748	75.0	2065	41,000 C.U.P.

CAUTION: Loads marked with asterisk (*) must be used approximately as shown. Reductions in powder charge not to exceed 10% or change in components should be made because such changes can cause dangerous pressures.

Additional Rifle Data for Fail Safe® Bullets						
Caliber & Bullet	Primer	Shell Case	Powder Type	Charge Weight in Grains	Velocity fps	Pressure
270 Winchester 140 grains Fail Safe Bullet	Win. WLR	Win.	Varget™	44.5	2795	50,200 psi
	Win. WLR	Win.	H4350	52.5	2869	49,700 psi
	Win. WLR	Win.	H450	57.0	2862	50,800 psi
	Win. WLR	Win.	H4831	56.5	2890	50,300 psi
308 Winchester 180 grains Fail Safe Bullet	Win. WLR	Win.	Reloader® 12	36.0	2285	55,380 psi
	CCI 200	Rem.	Accurate® 2495BR	36.0	2335	51,000 CUP
	CCI 200	Rem.	Accurate 2230™	38.5	2430	49,900 CUP
	CCI 200	Rem.	Accurate 2700™	45.5	2440	49,200 CUP
	CCI 200	Rem.	Accurate 2460™	39.0	2465	50,200 CUP
	Win. WLR	Win.	Reloader 15	41.5	2495	56,910 psi
	CCI 200	Rem.	Accurate 2520™	41.5	2520	48,600 CUP
300 Winchester Magnum 180 grains Fail Safe Bullet	CCI 200	Rem.	Accurate 2700	65.0	2795	61,700 psi
	CCI 200	Rem.	Accurate 3100™	69.0	2840	60,300 psi
	Win. WLR	Win.	Reloader 19	72.3	2845	55,680 psi
	Win. WLR	Win.	Reloader 22	76.0	2865	54,490 psi
	CCI 200	Rem.	Accurate 4350™	65.0	2880	61,900 psi
	Win. WLRM	Win.	H4831®	76.5	2929	51,600 CUP
	Win. WLRM	Win.	H4350®	70.0	2954	52,600 CUP
30-06 Springfield 180 grains Fail Safe Bullet	CCI 200	IMI	Accurate 2015BR™	39.5	2400	50,000 CUP
	CCI 200	IMI	Accurate 2495BR™	43.5	2450	50,000 CUP
	CCI 200	IMI	Accurate 2230	42.5	2460	49,300 CUP
	CCI 200	IMI	Accurate 2460	43.5	2500	50,000 CUP
	Win. WLR	Win.	Reloader 12	45.3	2510	56,840 psi
	CCI 200	IMI	Accurate 2520	46.0	2545	48,000 CUP
	CCI 200	IMI	Accurate 2700	52.0	2570	49,100 CUP
	CCI 200	IMI	Accurate 4350	53.0	2575	48,800 CUP
	Win. WLR	Win.	Reloader 15	47.0	2595	56,510 psi
	Win. WLR	Win.	H414®	51.0	2621	48,800 CUP
	Win. WLR	Win.	H4895®	47.0	2638	48,500 psi
	Win. WLR	Win.	Reloader 22	59.0	2665	51,980 psi
	Win. WLR	Win.	Reloader 19	57.2	2685	55,270 psi
	Win. WLR	Win.	H4350	55.0	2725	49,100 CUP
300 Weatherby Magnum 180 grains Fail Safe Bullet	Fed. 215	Rem.	Accurate 4350	74.5	3034	60,200 CUP
	Fed. 215	Rem.	Accurate 3100	80.0	3030	60,400 CUP
338 Winchester Magnum 230 grains Fail Safe Bullet	CCI 250	Win.	Accurate 2495BR	53.0	2525	48,900 CUP
	CCI 250	Win.	Accurate 2700	67.0	2695	47,200 CUP
	Win. WLR	Win.	Reloader 22	73.0	2750	56,360 psi
	Win. WLRM	Win.	H4350	74.0	2780	51,300 CUP
	Win. WLR	Win.	Reloader 19	72.0	2785	60,460 psi
	CCI 250	Win.	Accurate 4350	70.0	2805	49,500 CUP

Reloader Data developed by Hercules Powder Co. Accurate Data developed by Accurate Arms Co. Hodgdon Data developed by Hodgdon Powder Co. Winchester has no control over the user's actual loading procedures and methods, or the condition of firearms and components used and assembled, no responsibility for the use or safety in use of these data is assumed or implied.

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CENTERFIRE HANDGUN LOADING DATA

The data for the metallic cartridges contained in this handbook were obtained using Winchester® cases, primers and bullets unless otherwise noted. Any substitution of components other than bullets of the same size and weight from reputable manufacturers could alter the ballistic level and safety of these loads. However, Silvertip® Hollow Point bullets can be used with reload data published for jacketed bullets of the same caliber and weight. We strongly urge when using this information use the components as shown.

Extrapolation of additional loads from this data should not be attempted. Such practice can be dangerous.

Warning– Loads using 296 powder require heavy bullet pull (heavy crimp). 296 powder is not suitable with light bullets. The use of 296 powder with light bullet pull (light crimp) or lightweight bullets can cause squib loads. Such loads create a hazard to both the shooter and bystander as a bullet lodged in the barrel may cause the gun to burst if not removed before the next round is fired.

We have endeavored to show those applications for which BALL POWDER® smokeless propellant is most ideally suited. While other loads are certainly possible, the only way such loads can be developed is in a ballistic laboratory. We caution against the use of any other loads with Ball Powder smokeless propellant except where such loads have been adequately proven with the proper testing.

BLACK POWDER WARNING– Never substitute smokeless powder for black powder or Pyrodex or mix smokeless powder with black powder or Pyrodex. Never use smokeless powder in black powder firearms or in saluting cannons. Smokeless powder has much more energy than black powder or Pyrodex. Substituting or mixing powders may cause the firearm to blow up resulting in personal injury, property damage, or death.

Velocity

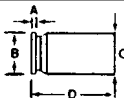
Velocities quoted in the tables are averages of a series of shots fired in accordance with equipment and techniques universally used throughout the American arms and ammunition industry. Listed loads have given uniform velocity results in our tests.

Handgun velocities quoted were measured in SAAMI* barrel lengths as listed.

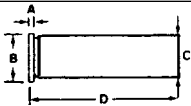
*Sporting Arms and Ammunition Manufacturers Institute, Inc.

Barrel Lengths			
Caliber	Barrel Length	Caliber	Barrel Length
256 Winchester	8 1/2"	38 ACP	5"
30 Luger	4 1/2"	38 Super Auto +P	5"
32 Auto	4"	40 S&W	4"
32 S&W	3"	10mm Auto	5"
32 S&W Long	4"	41 Magnum	8 3/8"
357 Magnum	8 3/8"	44 S&W Special	6 1/2"
38 Special	4"	44 Magnum	6 1/2"
9mm Luger	4"	45 Auto	5"
9mm Winchester Magnum	5"	45 Colt	5 1/2"
9x23 Winchester	4"	45 Winchester Magnum	5"
38 S&W	4"	454 Casull	5 3/4"
380 Auto	3 3/4"		

Handgun Case Dimensions

Rimless Handgun Cases					
					
Caliber	Maximum Dimensions				Trim To Length
	A	B	C*	D	
30 Luger	.048"	.393"	.332"	.850"	.845"
32 Auto	.045	.358	.336	.680	.672
9mm Luger	.050	.394	.380	.754	.751
9 x 23 Winchester	.050	.394	.381	.900	.895
9mm Winchester Magnum	.050	.394	.379	1.161	1.155
38 ACP and Super Auto +P	.050	.406	.384	.900	.895
380 Auto	.045	.374	.373	.680	.677
40 S&W	.055	.424	.423	.850	.847
10mm Auto	.035	.425	.423	.992	.989
45 Auto	.049	.480	.473	.898	.895
45 Winchester Magnum	.049	.480	.473	1.198	1.193

*This dimension is with bullet seated.

Rimmed Handgun Cases					
					
Caliber	Maximum Dimensions				Trim To Length
	A	B	C*	D	
256 Winchester	.060"	.440"	.285"	1.281"	1.275"
32 S&W	.055	.378	.339	.605	.600
32 S&W Long	.055	.375	.337	.920	.915
357 Magnum	.060	.440	.379	1.290	1.285
357 Remington Max.	.060	.440	.379	1.605	1.600
38 S&W	.055	.440	.385	.775	.765
38 Special	.058	.440	.379	1.155	1.149
41 Magnum	.059	.442	.434	1.290	1.285
44 S&W Special	.060	.514	.456	1.160	1.152
44 Magnum	.060	.514	.456	1.285	1.280
45 Colt	.060	.512	.480	1.285	1.280
454 Casull	.060	.512	.480	1.383	1.380

*This dimension is with bullet seated.

Maximum Overall Lengths with Bullet Seated			
Caliber	Length	Caliber	Length
256 Winchester Magnum	1.590"	38 Super Auto +P	1.280
30 Luger	1.175	38 Special	1.550
32 S&W	.930	38 S&W	1.180
32 Auto	.984	40 S&W	1.135
32 S&W Long	1.280	10mm Auto	1.260
9 x 23 Winchester	1.300	41 Magnum	1.590
9mm Luger	1.169	44 S&W Special	1.615
9mm Winchester Magnum	1.575	44 Remington Magnum	1.610
357 Magnum	1.590	45 Auto	1.275
357 Remington Max.	1.990	45 Colt	1.600
380 Auto	.984	45 Winchester Magnum	1.575
38 ACP	1.280	454 Casull	1.765

Bullet Descriptions			
Abbreviation	Description	Abbreviation	Description
JSP	Jacketed Soft Point	HSP	Hollow Soft Point
FMJ	Full Metal Jacket	JSWC	Jacketed Semi-Wad Cutter
FPJ	Full Plated Jacket	SWC	Lead Semi-Wad Cutter
WC	Wad Cutter	JHP	Jacketed Hollow Point

Nominal Bullet Diameters			
Jacketed	Dia.	Lead	Dia.
256 Winchester	.257"	32 S&W	.314"
30 Luger	.309"	32 S&W Long	.314"
32 Auto	.312"	9mm Luger	.355"
9mm Luger	.355"	357 Magnum	.358"
9x23 Winchester	.355"	38 S&W	.358"
9mm Winchester Magnum	.355"	38 Special	.358"
357 Magnum & Remington Max.	.356"	40 S&W	.400"
38 Special	.356"	10mm Auto	.400"
380 Auto	.356"	44 S&W Special	.430"
38 ACP and Super Auto +P	.356"	44 Remington Magnum	.430"
41 Magnum	.410"	45 Auto	.452"
44 Remington Magnum	.430"	45 Colt	.455"
45 Auto	.451"		
45 Winchester Magnum	.452"		
454 Casull	.452"		

COWBOY ACTION LOADS						
Caliber	Bullet Weight & Type	Powder	Charge Weight in Grains	Velocity (fps)	Pressure	Barrel Length
	38 Special					
NEW	158 grains Lead	231	4.1	900	16,000 psi	6-1/8"
	44 S&W Special					
NEW	240 grains Lead	231	4.9	800	13,000 psi	6-1/2"
	45 Colt					
NEW	250 grains Lead	231	5.5	750	10,000 psi	5-1/2"
	44-40 Winchester					
NEW	225 grains Lead	231	5.8	1000	10,000 psi	24"

Handgun Data				
Caliber Bullet Weight & Type	Powder	Charge Weight in Grains	Velocity (fps)	Pressure
30 Luger				
93 grains FMJ	231	4.2	1085	25,500 cup
32 S&W				
85 grains Lead	231	1.4	595	9,500 cup
32 Auto				
71 grains FMJ	231	2.5	865	14,000 cup
32 S&W Long				
98 grains Lead	231	2.4	765	11,000 cup
38 Smith & Wesson				
145 grains Lead	231	2.6	675	11,500 cup
380 Auto				
95 grains FMJ	231	3.2	860	15,000 cup
38 Auto				
130 grains FMJ	231	4.4	875	20,000 cup

Handgun Data-38 Super Auto +P															
	231			540			WSL			WSF			WAP		
Bullet Wt. and Type	Chg. Wt. (grs.)	Velocity (fps)	Pressure (psi)	Chg. Wt. (grs.)	Velocity (fps)	Pressure (psi)	Chg. Wt. (grs.)	Velocity (fps)	Pressure (psi)	Chg. Wt. (grs.)	Velocity (fps)	Pressure (psi)	Chg. Wt. (grs.)	Velocity (fps)	Pressure (psi)
115 gr.	5.0	1080	25,500	7.8	1185	26,400	4.8	1090	25,300	6.0	1185	28,100	6.6	1190	26,500
JHP	5.9	1230	34,200	8.5	1320	34,300	5.9	1260	34,500	7.1	1320	34,400	7.8	1340	34,300
124 gr.	4.9	1060	27,500	7.3	1110	26,200	4.6	1040	25,600	5.2	1060	25,800	6.2	1150	27,500
FMJ	5.7	1185	34,600	8.3	1260	34,600	5.6	1210	34,200	6.6	1245	34,600	7.3	1270	34,300
130 gr.	4.8	1020	26,300	6.8	1065	25,600	4.6	1030	25,300	5.4	1065	26,100	6.3	1120	27,600
FMJ	5.6	1145	34,800	8.0	1225	34,600	5.6	1160	34,100	6.3	1200	34,400	7.3	1250	34,600
147 gr.	4.4	930	28,500	6.3	975	26,400	4.3	930	27,300	4.8	960	27,300	5.5	990	27,200
JHP	4.9	1010	34,900	7.2	1115	34,000	4.8	1020	34,400	5.6	1070	34,400	6.3	1110	34,500
160 gr.	3.5	860	27,300	5.1	905	26,000	3.6	900	29,100	3.8	875	25,300	4.6	930	26,100
Lead	4.2	955	34,400	6.0	1030	34,300	4.2	975	34,800	4.9	1010	34,600	5.5	1035	34,200

Handgun Data-38 Special												
	231			540			571			WST		
Bullet Wt. and Type	Chg. Wt. (grs.)	Velocity (fps)	Pressure (psi)	Chg. Wt. (grs.)	Velocity (fps)	Pressure (psi)	Chg. Wt. (grs.)	Velocity (fps)	Pressure (psi)	Chg. Wt. (grs.)	Velocity (fps)	Pressure (psi)
148 gr. Lead	2.9	690	12,400	4.6	720	12,100	-	-	-	2.5	680	13,000
Hollow Base WC	3.3	770	16,100	5.1	800	15,300	-	-	-	2.8	735	16,000
148 gr. Lead	3.0	690	13,600	4.7	700	13,100	-	-	-	2.5	665	13,100
Bevel Base WC	3.4	760	16,400	5.2	785	16,300	-	-	-	2.7	700	16,300
158 gr.	4.0	745	12,600	6.2	805	13,200	6.7	795	13,300	3.3	705	12,800
Lead SWC	4.5	830	15,800	6.8	880	15,900	7.4	875	16,000	3.7	770	15,700

Handgun Data-38 Special (+P)*												
	231			540			571			WST		
Bullet Wt. and Type	Chg. Wt. (grs.)	Velocity (fps)	Pressure (psi)	Chg. Wt. (grs.)	Velocity (fps)	Pressure (psi)	Chg. Wt. (grs.)	Velocity (fps)	Pressure (psi)	Chg. Wt. (grs.)	Velocity (fps)	Pressure (psi)
110 gr. JHP	5.3	935	14,700	8.2	1005	14,900	-	-	-	-	-	-
	5.7	1015	17,600	8.7	1070	17,800	-	-	-	-	-	-
125 gr. JHP	4.8	840	14,100	7.8	945	15,800	-	-	-	-	-	-
	5.3	935	17,200	8.2	1000	17,500	-	-	-	-	-	-
140 gr. JHP	4.3	685	13,900	7.0	785	15,200	7.4	785	14,600	-	-	-
	4.8	785	17,200	7.4	875	17,300	8.0	890	17,300	-	-	-
158 gr. JHP	4.0	635	13,900	6.1	750	15,300	6.6	700	14,100	-	-	-
	4.4	720	17,200	6.6	800	17,400	7.3	800	17,400	-	-	-
158 gr. Lead/SWC	-	-	-	-	-	-	-	-	-	-	-	-
	4.7	860	17,100	7.1	915	17,300	7.7	910	17,300	3.9	800	17,300

* Designated (+P) loads are higher pressure loads to give greater velocities. These loads should be used only in firearms recommended for (+P) type cartridges by the firearms manufacturer. Continuous use of (+P) loads in firearms with aluminum frames or cylinders or with light weight steel frames or cylinders is not recommended. If doubt exists check with the gun manufacturer.

Handgun Data-9x23mm Winchester					
Bullet Weight & Type		Powder	Charge Weight in Grains	Velocity (fps)	Pressure
NEW	125 grains JHP	231	5.3	1180	38,000 psi
NEW	125 grains JHP	231	6.3	1300	46,000 psi
NEW	125 grains JHP	WAP	6.3	1180	34,000 psi
NEW	125 grains JHP	WAP	8.4	1435	46,000 psi

Handgun Data- 9mm Luger										
	231			540			571			
Bullet Wt. and Type	Chg. Wt. (grs.)	Velocity (fps)	Pressure (psi)	Chg. Wt. (grs.)	Velocity (fps)	Pressure (psi)	Chg. Wt. (grs.)	Velocity (fps)	Pressure (psi)	
95 gr. FMJ	4.6	1145	27,100	6.6	1145	28,600	7.3	1165	26,400	
	5.1	1235	32,600	7.1	1245	33,100	8.3	1290	33,200	
114 gr. Lead Cast Conical Nose	3.8	1010	26,900	5.6	1050	28,400	-	-	-	
	4.2	1115	32,500	6.2	1125	33,000	-	-	-	
115 gr. FMJ	4.4	1045	25,900	6.1	1040	28,300	7.0	1080	27,100	
	-	-	-	-	-	-	-	-	-	
	4.9	1135	32,600	6.7	1135	33,400	7.6	1180	33,000	
115 gr. JHP	4.3	1010	25,800	6.1	1050	28,600	6.9	1060	27,000	
	4.8	1120	32,100	6.6	1130	33,400	7.7	1185	32,900	
124 gr. Lead Round Nose	3.3	910	23,800	5.0	950	28,400	-	-	-	
	4.0	1035	32,900	5.7	1050	33,500	-	-	-	
124 gr. FMJ	4.2	1005	28,800	5.6	1000	29,200	6.8	1035	27,800	
	-	-	-	-	-	-	7.2	1085	30,600	
	4.5	1060	32,700	6.1	1065	32,900	7.5	1125	32,900	
147 gr. Lead Cast Flat Point	3.3	865	29,000	4.5	840	26,900	5.4	895	27,500	
	3.5	905	32,100	5.0	925	32,500	5.9	970	32,700	
147 gr. FMJ	-	-	-	4.7	855	30,600	5.5	880	27,200	
	-	-	-	5.1	890	33,300	6.0	960	33,000	
147 gr. JHP	-	-	-	4.3	800	30,200	5.5	900	29,800	
	-	-	-	4.8	885	33,300	5.8	935	32,800	

Handgun Data- 357 Magnum				
Bullet Weight & Type	Powder	Charge Weight in Grains	Velocity (fps)	Pressure
110 grains JHP	231	8.8	1575	42,500 cup
125 grains JHP	231	8.1	1460	42,500 cup
125 grains JHP*	296*	18.5	1800	32,500 cup
148 grains WC	231	3.4	880	19,500 cup
150 grains Lead	231	6.9	1305	42,000 cup
150 grains Lead*	296*	14.0	1510	32,000 cup
158 grains JHP	231	6.9	1260	42,000 cup
158 grains Lead	231	6.7	1275	42,500 cup
158 grains Lead*	296*	14.5	1560	38,000 cup
158 grains JHP*	296*	16.6	1610	39,500 cup
170 grains FMJ*	296*	14.3	1390	42,000 cup
200 grains Lead	231	5.5	1060	42,500 cup
200 grains Lead*	296*	12.4	1335	35,000 cup

Handgun Data- 357 Remington Maximum				
Bullet Weight & Type	Powder	Charge Weight in Grains	Velocity (fps)	Pressure
(Note: Use small rifle primers with these loads)				
180 grains FMJ	296*	19.0	1670	46,900 cup

*Note: 296 powder is considered to be one of the best powders for use in magnum handgun cartridges. Recommended for these loads are the use of a Winchester or Winchester magnum primer and a very heavy crimp (high bullet pull). Failure to follow this procedure could result in poor ignition and/or squib loads under extreme circumstances, particularly in loads where less than 90% of the available powder space is being used (low loading density). Do not reduce powder charges with 296 powder. Any further reduction in powder charge or change in components can cause dangerous pressures.

Handgun Data- 9mm Luger									
Bullet Wt. and Type	WSL			WSF			WAP		
	Chg. Wt. (grs.)	Velocity (fps)	Pressure (psi)	Chg. Wt. (grs.)	Velocity (fps)	Pressure (psi)	Chg. Wt. (grs.)	Velocity (fps)	Pressure (psi)
95 gr. FMJ	4.3	1100	27,700	-	-	-	5.6	1140	29,100
	4.8	1195	32,700	-	-	-	6.4	1285	33,000
114 gr. Lead Cast Conical Nose	3.8	965	28,500	-	-	-	4.8	1040	26,200
	4.1	1050	32,700	-	-	-	5.7	1160	33,200
115 gr. FMJ	4.2	985	29,500	4.9	1060	24,200	5.3	1055	27,200
	-	-	-	5.3	1135	28,300	-	-	-
	4.6	1075	33,200	5.7	1195	31,900	6.0	1155	33,100
115 gr. JHP	4.1	1050	29,500	5.2	1095	28,700	5.3	1065	28,500
	4.5	1105	33,600	5.7	1165	32,100	5.8	1150	33,200
124 gr. Lead Round Nose	3.4	920	29,200	4.0	945	22,200	4.4	955	25,900
	3.8	985	33,500	4.7	1055	27,300	5.1	1080	33,200
124 gr. FMJ	3.8	970	29,200	4.7	1015	27,700	4.9	1005	28,000
	-	-	-	-	-	-	-	-	-
	4.1	1025	32,600	5.3	1115	32,700	5.6	1105	33,300
147 gr. Lead Cast Flat Point	-	-	-	3.7	905	28,500	3.9	845	24,600
	-	-	-	4.1	965	32,800	4.7	985	33,100
147 gr. FMJ	-	-	-	3.9	895	28,400	4.2	880	29,200
	-	-	-	4.3	950	32,300	4.6	940	33,200
147 gr. JHP	-	-	-	4.0	900	30,100	4.0	865	29,300
	-	-	-	4.3	935	32,300	4.4	920	33,300

Handgun Data- 40 Cal. Smith & Wesson									
Bullet Wt. and Type	231			540			571		
	Chg. Wt. (grs.)	Velocity (fps)	Pressure (psi)	Chg. Wt. (grs.)	Velocity (fps)	Pressure (psi)	Chg. Wt. (grs.)	Velocity (fps)	Pressure (psi)
150 gr. JHP	5.2	970	21,800	7.7	1055	26,100	9.5	1130	27,200
	6.3	1150	33,200	8.6	1175	33,000	10.4	1230	33,200
155 gr. JHP	5.1	950	23,200	7.7	1040	26,700	8.5	1020	24,700
	6.0	1100	33,200	8.5	1140	33,100	10.0	1180	33,200
170 gr. JHP	4.5	860	24,000	7.0	970	26,200	7.6	900	22,500
	5.3	1000	33,200	7.7	1075	33,400	8.8	1080	33,200
170 gr. Lead	4.0	850	22,800	6.3	945	25,800	7.0	900	24,100
	5.2	1030	33,200	7.2	1060	33,200	8.4	1070	33,200
180 gr. JHP	4.0	790	23,700	6.2	895	26,300	6.8	830	23,200
	-	-	-	-	-	-	7.8	950	29,500
	5.0	950	33,200	6.9	985	32,800	8.3	1015	33,200
200 gr. FMJ	4.0	750	26,600	5.7	835	27,200	6.6	790	26,000
	4.7	850	33,200	6.4	905	32,800	7.5	910	33,200
200 gr. Lead	3.0	700	21,100	4.7	775	26,300	5.0	740	20,600
	4.0	850	33,200	5.3	855	32,900	6.5	900	33,200

Handgun Data- 44 Remington Magnum				
Bullet Weight & Type	Powder	Charge Weight in Grains	Velocity (fps)	Pressure
210 grains JHP	231	11.7	1385	38,000 cup
240 grains Lead SWC	231	11.0	1285	38,000 cup
240 grains HSP	231	11.2	1280	38,000 cup
240 grains Lead SWC*	296*	25.0	1560	37,500 cup
240 grains HSP*	296*	24.0	1430	38,000 cup

*Note: 296 powder is considered to be one of the best powders for use in magnum revolver cartridges. Recommended for these loads are the use of a Winchester or Winchester magnum primer and a very heavy crimp (high bullet pull).

Failure to follow this procedure could result in poor ignition and/or squib loads under extreme circumstances, particularly in loads where less than 90% of the available powder space is being used (low loading density).

Do not reduce powder charges with 296 powder. Any further reduction in powder charge or change in components can cause dangerous pressures.

Handgun Data- 10mm Auto									
Bullet Wt. and Type	231			296*			540		
	Chg. Wt. (grs.)	Velocity (fps)	Pressure (psi)	Chg. Wt. (grs.)	Velocity (fps)	Pressure (psi)	Chg. Wt. (grs.)	Velocity (fps)	Pressure (psi)
150 gr. JHP	6.0	1090	29,000	-	-	-	8.7	1105	25,000
	7.0	1210	35,600	-	-	-	10.6	1330	35,600
155 gr. JHP	5.8	1040	23,300	-	-	-	9.3	1165	25,600
	7.3	1250	35,600	-	-	-	10.8	1355	35,400
170 gr. Lead	4.8	980	26,400	-	-	-	8.2	1120	25,500
	5.6	1100	35,600	-	-	-	9.3	1245	35,400
170 gr. JHP	4.7	880	20,600	-	-	-	8.7	1105	25,500
	6.3	1120	35,600	-	-	-	9.9	1265	35,500
180 gr. JHP	5.2	950	29,600	-	-	-	8.0	1040	25,100
	5.8	1050	35,600	12.6	990	22,400	9.3	1190	35,500
190 gr. FMJ	4.6	800	22,000	-	-	-	8.0	1030	25,900
	5.9	1030	35,600	12.6	970	22,200	9.3	1175	35,400
200 gr. Lead	4.2	870	24,200	-	-	-	6.6	960	26,300
	5.5	1030	35,600	-	-	-	7.6	1085	35,600
200 gr. FMJ	4.6	840	24,600	-	-	-	7.5	960	26,600
	5.6	1000	35,600	11.6	940	23,600	8.6	1090	35,600

* See note above.

Handgun Data- 40 Cal. Smith & Wesson

Bullet Wt. and Type	WST			WSL			WSF			WAP		
	Chg. Wt. (grs.)	Velocity (fps)	Pressure (psi)	Chg. Wt. (grs.)	Velocity (fps)	Pressure (psi)	Chg. Wt. (grs.)	Velocity (fps)	Pressure (psi)	Chg. Wt. (grs.)	Velocity (fps)	Pressure (psi)
150 gr. JHP	5.5	990	23,900	4.6	930	20,600	6.7	1100	26,200	7.0	1110	27,300
	6.3	1050	27,100	5.8	1140	33,200	7.7	1200	33,200	7.5	1190	32,800
155 gr. JHP	5.5	980	24,000	4.5	930	21,600	6.0	1010	21,600	6.9	1100	28,300
	6.0	1040	27,900	5.6	1100	33,200	7.3	1180	33,200	7.4	1170	33,500
170 gr. JHP	4.2	830	22,100	4.2	860	24,000	5.5	920	23,300	6.2	1020	28,000
	5.5	970	30,100	5.0	1000	33,200	6.5	1080	33,200	6.7	1085	33,500
170 gr. Lead	4.0	870	22,800	4.3	940	28,700	5.2	950	23,500	5.7	980	25,700
	5.0	970	30,000	4.8	1030	33,200	6.2	1090	33,200	6.4	1075	33,400
180 gr. JHP	4.0	780	21,800	4.0	830	26,300	5.0	860	22,900	5.5	920	25,000
	-	-	-	-	-	-	5.6	950	28,300	6.2	1020	33,200
	5.0	900	28,100	4.8	950	33,200	6.2	1040	33,200	-	-	-
200 gr. FMJ	3.8	740	24,200	3.8	760	27,600	4.9	840	25,600	4.8	800	23,800
	4.5	810	29,900	4.4	850	33,200	5.7	930	33,200	5.6	920	32,600
200 gr. Lead	-	-	-	3.0	710	21,800	3.9	785	21,800	4.2	795	25,600
	3.5	760	25,200	3.9	860	33,200	5.0	920	33,200	4.9	900	33,000

Caliber Bullet Weight & Type	Powder	Charge Weight in Grains	Velocity (fps)	Pressure
41 Magnum				
210 grains Lead	231	7.4	1125	28,000 cup
210 grains JSP	231	8.8	1220	38,000 cup
210 grains JSP*	296*	20.4	1460	24,000 cup
44 S & W Special				
246 grains Lead	231	5.4	795	12,500 cup
45 Colt				
255 grains Lead	231	7.1	875	13,000 cup
454 Casull				
NEW 260 grains JSP	296*	34.0	1830	40,000 psi
NEW 260 grains JSP	296*	36.0	1965	50,000 psi
NEW 300 grains JSP	296*	29.5	1600	38,000 psi
NEW 300 grains JSP	296*	31.5	1750	50,000 psi

* See note on previous page.

Handgun Data- 10mm Auto

Bullet Wt. and Type	571			WST			WSL			WSF			WAP		
	Chg. Wt. (grs.)	Velocity (fps)	Pressure (psi)	Chg. Wt. (grs.)	Velocity (fps)	Pressure (psi)	Chg. Wt. (grs.)	Velocity (fps)	Pressure (psi)	Chg. Wt. (grs.)	Velocity (fps)	Pressure (psi)	Chg. Wt. (grs.)	Velocity (fps)	Pressure (psi)
150 gr. JHP	9.5	1130	25,200	5.5	1080	30,200	5.5	1110	28,200	6.5	1090	24,700	8.7	1290	28,700
	11.4	1330	35,600	7.0	1190	34,000	6.3	1210	35,600	8.1	1310	35,600	9.8	1395	35,500
155 gr. JHP	9.7	1110	23,100	5.0	1000	23,100	5.4	1050	23,500	6.8	1100	23,000	8.8	1265	29,800
	12.0	1350	35,300	8.0	1220	31,900	6.9	1250	35,600	8.4	1320	35,600	9.7	1355	35,400
170 gr. Lead	8.5	1040	23,600	-	-	-	3.5	830	20,000	5.5	1020	25,700	7.4	1180	29,200
	10.5	1250	35,600	5.0	1020	32,100	5.2	1100	35,600	6.6	1170	35,600	8.4	1270	35,300
170 gr. JHP	9.0	1060	25,300	4.5	940	26,200	4.1	850	20,000	6.0	1020	24,000	7.9	1165	27,800
	10.8	1240	35,600	5.5	1020	29,500	6.0	1130	35,600	7.5	1210	35,600	9.1	1285	34,600
180 gr. JHP	8.3	950	23,100	5.0	950	30,500	4.8	950	28,400	5.7	950	25,000	7.5	1110	27,200
	10.2	1170	35,600	5.5	1010	35,200	5.6	1060	35,600	7.1	1150	35,600	8.4	1210	34,400
190 gr. FMJ	8.5	940	24,100	-	-	-	4.5	860	24,400	5.5	880	22,000	7.4	1100	27,800
	10.1	1140	35,600	4.5	850	26,700	5.7	1040	35,600	7.1	1120	35,600	8.3	1185	34,700
200 gr. Lead	7.5	950	24,200	3.8	830	23,900	3.8	850	23,600	5.0	920	23,500	5.8	975	27,500
	9.0	1110	35,600	5.0	940	32,400	4.9	990	35,600	6.3	1080	35,600	6.9	1080	35,200
200 gr. FMJ	8.3	960	27,500	-	-	-	4.0	800	25,000	5.2	880	26,200	6.9	1025	27,200
	9.3	1070	35,600	4.6	890	35,600	5.0	960	35,600	6.2	1020	35,600	7.8	1115	35,700

Handgun Data- 45 ACP									
Bullet Wt. and Type	231			540			571		
	Chg. Wt. (grs.)	Velocity (fps)	Pressure (psi)	Chg. Wt. (grs.)	Velocity (fps)	Pressure (psi)	Chg. Wt. (grs.)	Velocity (fps)	Pressure (psi)
154 gr. Lead	-	-	-	8.5	940	14,700	-	-	-
	-	-	-	9.6	1060	19,800	-	-	-
180 gr. Lead	5.3	885	15,300	8.0	880	15,900	-	-	-
Cast SWC	6.3	1020	20,000	9.0	980	20,300	-	-	-
185 gr. JSWC	5.1	760	13,300	8.0	825	15,700	-	-	-
	6.1	920	18,600	9.0	950	20,000	-	-	-
185 gr. JHP	6.2	915	17,200	9.1	905	16,800	10.3	935	16,800
	6.8	990	19,500	10.0	1015	20,300	11.3	1045	19,400
200 gr. Lead	4.8	800	14,900	7.2	805	15,600	8.5	835	15,300
Cast SWC	5.5	910	19,600	8.3	925	20,000	9.5	945	19,500
200 gr. FPJ	5.4	815	16,200	8.1	825	16,600	9.2	850	15,600
	6.1	920	19,900	8.9	925	20,000	10.2	960	19,900
200 gr. JHP	5.3	830	16,200	7.8	810	16,600	9.0	860	16,600
	5.8	905	19,500	8.5	895	19,900	9.8	945	20,000
230 gr. Lead	4.5	765	15,500	6.9	750	14,300	7.7	800	15,900
Round Nose	5.1	870	19,800	7.6	860	19,700	8.7	890	19,800
230 gr. FMJ	4.9	695	14,900	7.4	745	16,100	-	-	-
	5.7	830	19,200	8.1	830	19,800	-	-	-
230 gr. JHP	4.8	740	18,000	6.9	715	17,200	8.4	795	18,400
	5.1	785	20,000	7.6	800	19,900	8.9	845	19,900

Handgun Data- 45 ACP												
Bullet Wt. and Type	WST			WSL			WSF			WAP		
	Chg. Wt. (grs.)	Velocity (fps)	Pressure (psi)	Chg. Wt. (grs.)	Velocity (fps)	Pressure (psi)	Chg. Wt. (grs.)	Velocity (fps)	Pressure (psi)	Chg. Wt. (grs.)	Velocity (fps)	Pressure (psi)
154 gr. Lead	-	-	-	5.5	940	14,800	-	-	-	8.2	1035	15,900
	-	-	-	6.4	1085	19,900	-	-	-	9.0	1135	19,700
180 gr. Lead	4.6	880	16,200	5.0	865	14,800	6.6	960	15,900	7.5	940	14,900
Cast SWC	5.4	1000	20,000	5.9	990	19,800	7.4	1060	20,000	8.3	1055	20,000
185 gr. JSWC	4.3	745	13,400	4.9	775	14,400	6.0	775	12,800	7.2	865	14,900
	5.3	890	19,000	5.9	935	20,000	7.0	950	17,600	8.1	1000	20,000
185 gr. JHP	5.1	875	17,100	5.8	900	16,900	7.2	920	15,600	8.3	970	17,100
	5.6	935	19,800	6.5	980	19,700	7.9	1035	19,700	8.9	1045	19,900
200 gr. Lead	4.4	830	15,400	4.3	755	13,700	6.0	870	15,200	6.6	850	14,900
Cast SWC	5.1	910	19,900	5.4	910	19,800	6.7	970	19,400	7.6	970	19,700
200 gr. FPJ	4.7	825	16,400	5.0	790	15,600	6.5	870	15,500	7.0	825	15,000
	5.3	890	20,000	5.9	920	20,100	7.3	980	19,400	8.0	965	19,400
200 gr. JHP	4.7	820	16,900	4.7	770	15,500	6.6	870	15,500	7.0	855	15,200
	5.2	885	19,900	5.4	875	19,600	7.1	970	19,500	7.7	965	20,100
230 gr. Lead	4.0	750	16,200	4.2	745	15,100	5.5	820	15,200	6.6	845	16,600
Round Nose	4.5	805	20,100	4.8	840	19,800	6.2	910	19,600	7.3	915	19,600
230 gr. FMJ	4.1	710	15,500	4.7	735	15,900	5.7	755	14,900	6.8	820	16,800
	4.9	800	19,900	5.3	835	19,800	6.6	885	19,200	7.4	885	19,600
230 gr. JHP	-	-	-	4.4	705	16,800	5.7	780	16,500	6.1	760	16,200
	-	-	-	4.8	770	19,900	6.1	850	19,600	6.6	835	20,200

BALLISTIC TERMS AND DEFINITIONS

ACCURACY In firearms using single projectiles, the measure of the dispersion of the group fired. The optimum would be one hole no larger in diameter than a single projectile.

ACTION The combination of the receiver or frame and breech bolt together with the other parts of the mechanism by which a firearm is loaded, fired and unloaded.

AUTOMATIC A term commonly used for a self-loading firearm. A firearm is truly automatic only when it continues to fire as long as the trigger is held back.

BALLISTIC, EXTERIOR The theory of the motion of the projectile from the gun to the target.

BALLISTICS, INTERIOR The theory of the motion of the projectile in the firearm.

BALLISTICS, TERMINAL That branch of ballistics which deals with the effects of projectiles at the target.

BORE The hole through the barrel of a firearm. In a rifle the bore is the hole after it has been drilled and reamed, and before rifling; that is, the bore diameter measuring to the top of the opposite lands. The groove diameter is the diameter to the bottom of opposite grooves. See Choke.

BREECH The rear end of the bore of a firearm where the cartridge is inserted into the chamber.

BULLET The projectile fired from a rifle or handgun.

CALIBER The nominal diameter of the bore of a rifle or handgun. In America and England it is expressed in decimals of an inch, and in Europe it is expressed in millimeters.

CANNELURE A groove around the circumference of a bullet or case such as the lubrication groove of a lead bullet, the expansion groove of an open point expanding bullet or the extractor groove around the head of a rimless cartridge case.

CHAMBER The enlarged portion of the bore, at the breech, in which the cartridge rests when in position to be fired.

CHOKE The constriction in the muzzle end of a shotgun bore by means of which control is exerted upon the shot charge in order to throw its pellets into a definite area or predetermined concentration. Degree of choke is measured by the approximate percentage of pellets in a shot charge which hit within a 30 inch circle at 40 yards. The following table give the accepted percentages obtained with various chokes:

Full Choke	65-75%
Improved Modified	55-65%
Modified	45-55%
Improved Cylinder	35-45%
Cylinder Bore	25-35%

CHRONOGRAPH The instrument used to determine the velocity of a projectile in flight.

CONE The slope of the forward end of the chamber of a shotgun which decreases the chamber diameter to bore diameter. Also called forcing cone.

CRIMP In shotgun shells the fold-over of the end of the shell to hold the shot in position within the shell. In rifle or handgun cartridges, the slight bending in of the mouth of the case so it enters the cannulure on the bullet, thus securing the bullet in the case.

CUP or C.U.P. Copper Unit of Pressure. A pressure value determined by means of copper crusher cylinders using SAAMI recommended procedures and equipment.

DRAM EQUIVALENT A dram is a measure used for black powder and is normally used as a volume measure (although strictly speaking it is a weight measure equivalent to 1/16 oz. or 1/256 lb). A certain dram charge of black powder imparts a certain velocity to a given weight of shot. For example, three drams of black powder with 1 1/8 oz. shot in 12 gauge gives about 1200 ft./sec. muzzle velocity. When the change to smokeless powder was made, the dram equivalent designation was used as a measure of the approximate velocity and shot weight of commercial loads to the dram equivalent system, but modern loadings depart from the system in a number of instances.

Some shooters mistakenly believe a low dram equivalent is synonymous with low pressure. This is not so, as all modern shotshells regardless of dram equivalent marking, gauge, brand, powder or shot charge are loaded to approximately the same pressure level. Therefore, those who attach significance to the term "dram equivalent" in respect to chamber pressure are in error.

The main problem is that people still confuse a "dram equivalent" designation with a "dram measure" of powder and this may be serious in the case of modern fast burning shotshell powders. Taking the density of black and smokeless powders into account, a volumetric 3-dram measure of such modern fast powders is approximately 40 grains (where a grain equals 1/7000 lb.) or about a double charge.

Dram Equivalent - WARNING Never use the dram equivalent measure as a weight for smokeless powders in reloading. Dangerously high pressures can occur and result in personal injury, property damage, or death.

ENERGY The measure of the work performed by a bullet, expressed in foot pounds. Energy depends upon the weight of the bullet and the square of the velocity, hence it is less at long range than at the muzzle because the velocity has fallen off at long range. Energy is easily calculated. Simply multiply the velocity by itself, then by the weight of the bullet, and divide 450240 into the result. Thus 2390 x 2390 x 150 divided by 450240 = 1903 ft. lbs., the muzzle energy of the 30-30 Winchester 150 grain cartridge.

GAUGE, SHOTGUN The unit of measure of the bore diameter of a shotgun. The gauge is the number of lead balls, of the diameter of the gun bore, that make a pound. Thus, a 12-gauge, or 12 bore means that 12 pure lead balls of such a diameter will weigh one pound. The standard diameters of shotgun bores of various gauges are as follows:

4 gauge935 inch
8 gauge835 inch
10 gauge775 inch
12 gauge730 inch
16 gauge670 inch
20 gauge615 inch
28 gauge550 inch
410 bore (67 gauge)410 inch

GRAIN 1. A unit of weight (avoirdupois), 7000 grains per pound. **2.** The grain unit is commonly used in American and English ammunition practice to measure the weight of components. **3.** A term applied to a single particle of propellant powder.

LUBALOY® A trademark for Winchester copper-coated shot and bullets.

LUBALOX® A trademark for Winchester black chemical conversion coating of bullets. Reduces in-barrel friction, improves velocity pressure relationship and a reduced engraving force leaves a smoother rifled surface causing less drag, and improved exterior ballistics.

LUBRICATION OF BULLETS Most lead bullets have to be lubricated with a grease or wax placed on their surface or in their grooves to prevent their leading the bore. Outside-lubricated cartridges have the lubricant placed on the surface of the bullet outside the case. Inside-lubricated bullets have the lubricant placed in grooves or cannulures on the bullet where it is covered by the neck of the case.

LUP Lead Unit of Pressure. A pressure value determined by means of lead crusher cylinders. Now generally obsolete – replaced by Piezo electric measurements of actual pressure.

MUZZLE The end of the gun barrel from which the bullet or shot emerges.

PATTERN The distribution of a charge of shot fired from a shotgun. See Choke.

PRESSURE In a gun, the force developed by the expanding gases generated by the combustion of the propellant. When gases expand in a confined space they exert pressure. When smokeless powder burns, it forms gases that occupy many times the volume of the solid propellant. The heat of burning expands these gases even more.

When a cartridge is fired in a rifle or shotgun, the gas pressure is exerted equally in all direction. The area where this pressure not easily results in the expansion of the gas volume is on the base of the bullet or wad column. The bullet or shot is free to move and the expanding gases rapidly push it down the barrel and out the muzzle.

If pressure is too low, non-uniform ignition will result and with it non-uniform velocities and poor accuracy. In extreme cases, there will not be enough gas pressure to push the bullet or shot out the barrel. An obstruction will be left that will result in damage to the barrel on the next shot.

If pressure is too high, gas pressure builds up to a point that damage to the firearm and/or personal injury can result.

Follow the loading data given and avoid trouble.

Pressures are designated by "CUP", "LUP" and "psi" meaning "Copper Units of Pressure", "Lead Units of Pressure" and "pounds per square inch".

PROJECTILE A ball, shot or bullet fired from a firearm.

PUMP GUN Common name for a slide action repeating firearm.

RANGE The distance measured from the firing point of the firearm to the target. Also a place where rifle and pistol shooting is conducted.

RIFLING The spiral groove cut in the bore of a rifle or pistol barrel. The object of these grooves is to rotate the elongated projectile so that it will fly point-on to the target. A rotating projectile has a gyroscopic stability which causes it to resist any force tending to deflect it from the direction it takes as it departs from the muzzle of the rifle. The longer the bullet and the lower the velocity, the faster the twist must be to cause the bullet to travel with point to the front.

SEMI-AUTOMATIC A type of firearm which, by pulling the trigger, utilizes the energy of recoil or the powder gases, together with a heavy counter-balanced bolt and strong bolt spring, to eject the fire case, load a fresh cartridge from magazine into chamber, and close the breech ready to fire another round. The trigger must be pulled for each shot.

SHOT Spherical pellets used in loading shotshells. Commonly formed from lead or steel. (See Steel Shot warning on Page 11.)

THROAT The forward portion of the rifle chamber where it tapers to meet the bore diameter.

TRAJECTORY The course described by a projectile in flight. It forms an arc due to the effect of gravity on the bullet. Usually measured in terms of height above the line of sight at midrange and below the point of aim at longer range.

VELOCITY The speed of the bullet or shot charge, measured in feet per second (fps) at or near the muzzle.

