



SINCE 1886

# RWS RELOADED



*Reloading components by RWS*



# RELOADING

*Do-It-Yourself is Trending*

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There are many reasons to load your own ammunition. Reloading saves money, improves accuracy, and enables shooters and hunters to improve their marksmanship.

Handloading, or reloading, i.e. the tailoring of a cartridge to meet your needs, opens completely new horizons and gives keen insights into the world of ballistics. RWS offers first-class components that enable you to fit the cartridge to your exact application. Regardless whether you are a competitive shooter, long-range marksman or hunter, RWS makes reloading fun and guarantees the highest level of success.

**MORE  
ACCURACY  
& COST  
SAVINGS**



*“Reloading with RWS components means experimenting until you find the very best ballistic performance of a cartridge. This can take a toll on your time and sometimes your nerves! That is why RWS, in addition to producing premium quality components, now increases reloading comfort. The new packaging for RWS premium cases and RWS premium bullets can now be stacked, slide open for easy access and still offer room for personal notes on your loading data. That makes reloading fun.”*

#reloading world



### **BULLETS**

With more than 11 hunting bullet designs and countless others for sporting and government applications, RWS has the widest variety of bullet designs in the world. The manufacture of our specialty bullets involves far more than just joining a jacket with a core. RWS has installed a highly complex machine park in order to manufacture the necessary variety of bullets in outstanding quality. The most modern technology enables the optimal formation of bullet surface and core, while at the same time every manufacturing step is inspected for adherence to tolerances.

### **CASES**

The case is the heart of the cartridge. Dimensional accuracy, safety and reloadabi-

lity are only a few of the criteria that the conscientious reloader should demand from a case in order to achieve maximum performance. RWS cases offer all that and more. The tightest of tolerances, constant quality assurance during manufacture and the highest expectations from ourselves make RWS cases the best in the world. This is reflected in the large number of times a case can be reloaded. With RWS cases, reloading is not only fun but saves money as well.

### **PROPELLANT**

RWS offers an appropriate powder for every application. Whether it is fast- or slow-burning powder, RWS cooperates closely with renowned propellant manufacturers to offer a suitable powder for every application. We devote special attention to testing every

powder lot in our own chemical laboratory to guarantee the highest possible quality.

### **PRIMERS**

The primer is the smallest and most unremarkable component in the entire ammunition system. Yet it earns our very special attention since, without the primer, nothing happens. Primers are produced in an extremely modern manufacturing facility. The primer is formulated to such a fine sensitivity that ignition with a suitably deep and centered firing pin impact is a 100% certainty. For a guaranteed ignition.

The RWS reloading manual has been digitized and contains practical tips and up-to-date load data. You can find it at [www.rws-ammunition.com/reloading](http://www.rws-ammunition.com/reloading).

[German language only]



# QUALITY IS NO COINCIDENCE

*Our bullets*

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RWS is the only important manufacturer of rifle cartridges that produces most of its own hunting bullets. For this, we draw upon our specialized knowledge base, which has continually advanced over the past 100 years.

In addition to the highly complex production, it is also our tight quality control when making bullets into cartridges that ensures that the strict RWS test specifications guarantee the extraordinary accuracy and absolute reliability of our bullets.

In addition, we perform test firings into gelatin blocks whose density most closely simulates that of muscle tissue in game animals. These gelatin tests reveal exactly how our bullets transfer their energy to the game animal.

Only when our high standards are 100% met by these test results do we test these bullets on actual wild game. Afterwards, the game is evaluated so that the internal, external and terminal ballistic effects of the bullet can be judged precisely. High-speed motion pictures of test firings at [rws-ammunition.com](http://rws-ammunition.com) dramatically demonstrate the effectiveness of our specialty bullets.





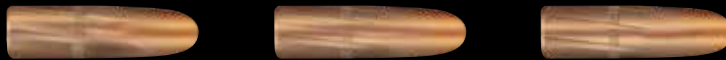
*Simulated wound channel in gelatin block / bullet performance in gelatin*



*Expanding bullet (e.g. Evolution)*



*Partially fragmenting bullet (e.g. Speed Tip Professional)*



*Full metal jacket*

#### **EXPANDING BULLET**

An **expanding bullet** mushrooms upon contact with the game animal and retains a stable mass. It is designed so that it hardly loses any weight in the animal's body. Take the EVOLUTION®, for example: Its effects are achieved mainly through uniform enlargement of the bullet's frontal area and its sub-sequent retained weight.

#### **PARTIALLY FRAGMENTING BULLET**

**Partially fragmenting bullets** are designed for controlled fragmentation that leaves a defined slug behind for penetration. One example of this is the SPEED TIP PROFESSIONAL: This partially fragmenting bullet has a retained weight of 60%. Semi-jacketed soft point bullets like the KS and TM are also partially fragmenting bullets whereby the retained weight varies slightly depending on the target's resistance and the bullet's impact velocity. The function of these types of bullets is based on the controlled fragmentation of the bullet and a defined retained slug that causes mechanical destruction of the organs. The base drag of the slug draws most of the front core fragments through the animal's body upon exit.

#### **FULL METAL JACKET**

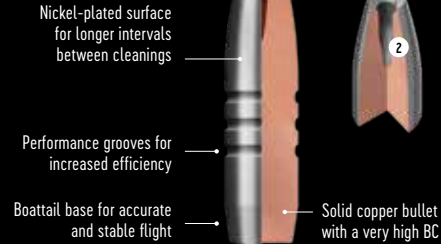
The **full metal jacket** is a type of bullet that retains both its shape and mass. It does not fragment and, depending on the hardness of the target, deforms only minimally. Penetration and energy delivery are achieved through late tumbling of the bullet inside the game animal.

# RWS BULLETS

*For all requirements*



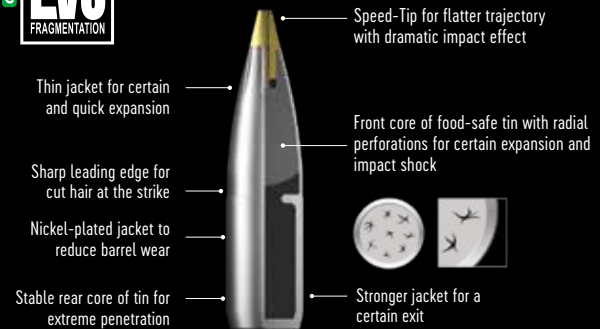
## HIT



- 1** RWS TC-Tip (Twin-Compression-Tip) With 2 hollow cavities for flat trajectory and reliable initial deformation
- 2** RWS ACC (Active-Crater-Cavity) For accelerated expansion with greater shock effect



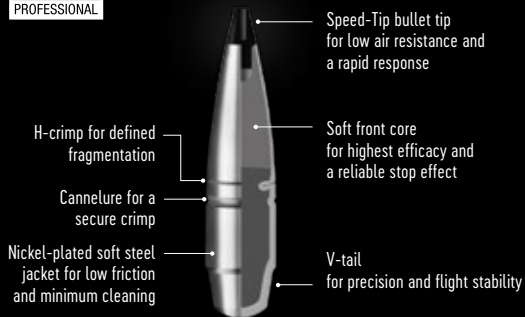
## EVOLUTION GREEN



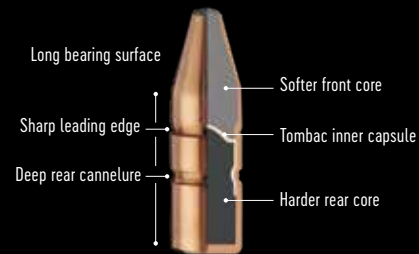




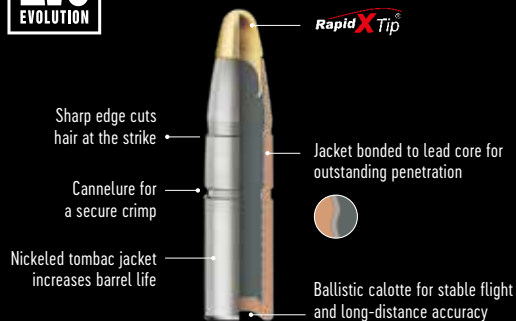
## SPEED TIP PROFESSIONAL



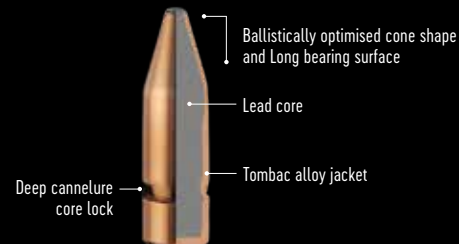
## DOPPELKERN



## EVOLUTION

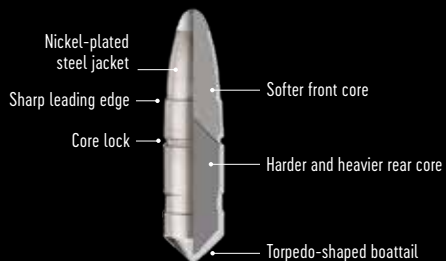


## KEGELSPITZ

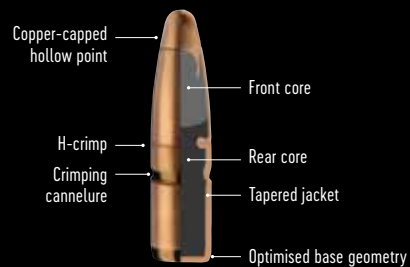




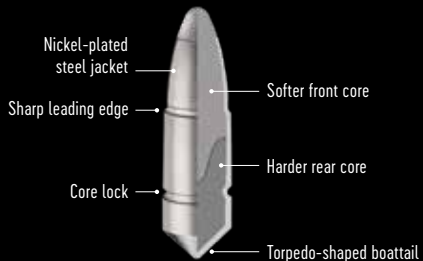
## UNI CLASSIC



## H-MANTEL

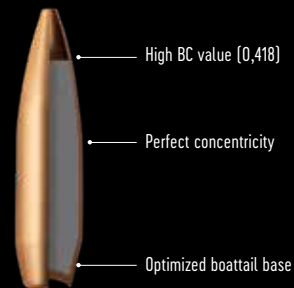


## ID CLASSIC



## SCORION

**NEW**





VOLLMANTEL



TEILMANTEL



MATCH JAGD



More extensive product information about these bullets may be found at [www.rws-ammunition.com](http://www.rws-ammunition.com)



- ❶ Cardboard boxes with sliding drawers
- ❷ Easier access to the cases, even when boxes are stacked atop one another
- ❸ Product is protected by a perforated seal
- ❹ All important data [bullet, caliber, bullet weight] are visible even when boxes are stacked atop one another

CALIBER	ITEM NO.	GRAMM / GRAIN	DIAMETER
<b>CALIBER 5,6 mm</b>			
POINTED SOFTPOINT	214 61 77	3,0g / 46gr	.224
MATCH JAGD 100/1000 St.	214 57 82/214 68 43	3,0g / 46gr	.224
VMS	214 58 47	3,0g / 46gr	.224
POINTED SOFTPOINT	214 56 50	3,24g / 50gr	.224
MATCH JAGD 100/1000 St.	231 33 43/231 33 44	3,4g / 52gr	.224
POINTED SOFTPOINT	214 59 60	3,6g / 55gr	.224
POINTED SOFTPOINT	214 57 90	4,1g / 63gr	.224
KEGELSPITZ	214 62 31	4,8g / 74gr	.224
POINTED SOFTPOINT	214 56 42	4,6g / 71gr	.228
<b>CALIBER 6 mm</b>			
KEGELSPITZ	214 64 36	6,2g / 96gr	.243
POINTED SOFTPOINT	214 56 77	6,5g / 100gr	.243
<b>CALIBER 6,5 mm</b>			
EVOLUTION GREEN ●	240 74 46	6,0g / 93gr	.264
KEGELSPITZ	214 64 60	8,2g / 127gr	.264
DOPPELKERN	231 14 63	9,1g / 140gr	.264
<b>NEW</b> EVOLUTION	241 69 58	10,1g / 156gr	.264
SOFTPOINT	214 56 85	10,3g / 159gr	.264

CALIBER	ITEM NO.	GRAMM / GRAIN	DIAMETER
<b>CALIBER 7 mm</b>			
KEGELSPITZ	214 62 19	8,0g / 123gr	.284
EVOLUTION GREEN ●	231 85 20	8,2g / 127gr	.284
SPEED TIP PROFESSIONAL	241 10 37	9,7g / 150gr	.284
EVOLUTION	231 59 60	10,3g / 159gr	.284
KEGELSPITZ	214 62 58	10,5g / 162gr	.284
ID CLASSIC	214 55 29	10,5g / 162gr	.284
SOFTPOINT	214 57 07	11,2g / 173gr	.284
HMK	214 60 29	11,2g / 173gr	.284
ID CLASSIC	214 55 37	11,5g / 177gr	.284
<b>CALIBER .270</b>			
<b>NEW</b> EVOLUTION GREEN ●	241 69 60	6,2g / 96gr	.277
HMK	214 59 95	8,4g / 130gr	.277
<b>NEW</b> SPEED TIP PROFESSIONAL	241 69 67	9,1g / 140gr	.277
KEGELSPITZ	214 64 28	9,7g / 150gr	.277
<b>NEW</b> EVOLUTION	241 69 59	10,0g / 154gr	.277

CALIBER	ITEM NO.	GRAMM / GRAIN	DIAMETER
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### CALIBER 7,62 mm / .30

EVOLUTION GREEN ●	231 85 21	8,8g / 136gr	.308
<b>NEW</b> SCORION	241 69 66	10,9g / 168gr	.308
KEGELSPITZ	214 63 04	9,7g / 150gr	.308
ID CLASSIC	214 54 80	9,7g / 150gr	.308
SPEED TIP PROFESSIONAL	241 10 35	10,7g / 165gr	.308
KEGELSPITZ	214 63 71	10,7g / 165gr	.308
DOPPELKERN	214 60 45	10,7g / 165gr	.308
HMK	214 60 10	11,7g / 180gr	.308
UNI CLASSIC	214 54 99	11,7g / 180gr	.308
EVOLUTION	231 59 59	11,9g / 184gr	.308
KEGELSPITZ	214 62 07	13,0g / 200gr	.308
UNI CLASSIC	231 47 19	13,0g / 200gr	.308

### CALIBER 8 mm S

EVOLUTION GREEN ●	231 85 22	9,0g / 139gr	.323
<b>NEW</b> SPEED TIP PROFESSIONAL	241 69 62	11,7g / 180gr	.323
KEGELSPITZ	214 64 44	11,7g / 180gr	.323
HMK	214 60 53	12,1g / 187gr	.323
ID CLASSIC	214 55 10	12,8g / 198gr	.323
EVOLUTION	231 74 11	13,0g / 200gr	.323

CALIBER	ITEM NO.	GRAMM / GRAIN	DIAMETER
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### CALIBER 8,6 mm

SPEED TIP PROFESSIONAL	241 10 38	16,2g / 250gr	.338
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### CALIBER 9,3 mm

EVOLUTION GREEN ●	231 85 23	11,9g / 184gr	.366
DOPPELKERN	214 60 02	14,6g / 226gr	.366
KEGELSPITZ	214 64 52	16,0g / 247gr	.366
<b>NEW</b> SPEED TIP PROFESSIONAL	241 69 63	16,7g / 258gr	.366
SOFTPOINT	214 57 74	18,5g / 285gr	.366
EVOLUTION	231 74 12	18,8g / 291gr	.366
UNI CLASSIC	214 55 02	19,0g / 293gr	.366

### CALIBER 10,3 mm

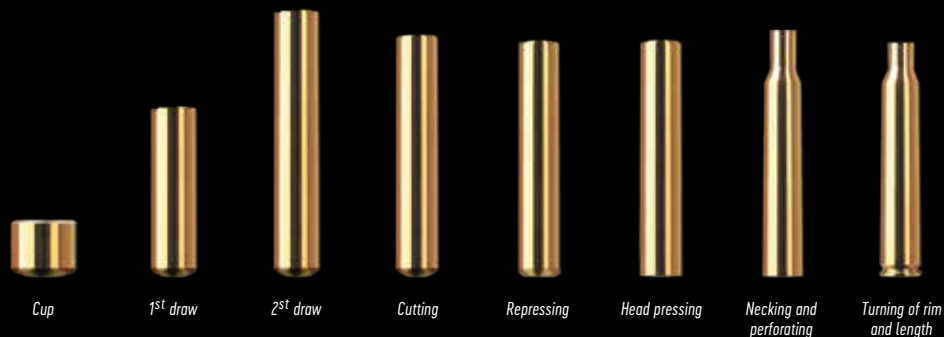
HIT ●	241 69 65	13,0g / 200gr	.413
<b>NEW</b> EVOLUTION GREEN ●	241 69 61	13,5g / 208gr	.413
KEGELSPITZ	214 58 71	16,4g / 253gr	.413
<b>NEW</b> SPEED TIP PROFESSIONAL	241 69 64	18,8g / 285gr	.413

### CALIBER .375

UNI CLASSIC	214 59 28	19,5g / 301gr	.375
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# RWS CASES

*The case, the heart of a cartridge*



## THE FORMATION OF A CASE

Rifle cartridge cases must endure pressures of up to 7000 bar and are considered by experts to be life insurance for the shooter. In order for you to always remain on the safe

side, we have developed the most demanding test in the industry. At the start of production, samples are taken from each manufacturing lot, loaded into cartridges and then subjected to extreme, exaggerated stress tests.

CALIBER	ITEM NO.	CASES/BOX	CALIBER	ITEM NO.	CASES/BOX
.222 Rem.	241 27 01	200	.30-06 NICKEL	241 69 93	100
.223 Rem.	241 27 02	200	.308 Win.	241 23 72	100
5,6 x 57	241 27 05	100	.308 Win. NICKEL	241 69 94	100
6,5 Creedmoor	241 69 92	100	.30 R Blaser	241 23 74	100
6,5 x 55 SE	241 23 55	100	.300 Win. Mag.	241 23 73	100
6,5 x 57	241 23 54	100	8 x 57 JS	241 23 78	100
6,5 x 57 R	241 23 56	100	8 57 JRS	241 23 79	100
6,5 x 68	241 23 69	100	8 x 68 S	241 23 80	100
.243 Win.	241 23 70	100	.338 Lap. Mag.	241 23 88	50
.270 Win.	241 23 71	100	8,15 x 46 R	241 23 81	100
7 x 57	241 26 99	100	9,3 x 62	241 23 82	100
7 x 57 R	241 27 00	100	9,3 x 64	241 23 83	50
7 x 64	241 23 75	100	9,3 x 74 R	241 23 85	50
7 x 65 R	241 23 76	100	.375 H&H Mag.	241 23 86	50
7 mm Rem. Mag.	241 23 77	100	10,3 x 60 R	241 23 87	50
.30-06	241 26 97	100	10,3 x 68 Mag.	241 69 95	50

**THE ADVANTAGES OF THE RWS CASES:**

- **EASY AND EXACT RECALIBRATION** through soft brass at the case mouth
- **PERFECT SEALING** and fit into the chamber due to flexible brass material
- **MAXIMUM RE-USABILITY** with consistent performance thanks to highest demands on raw material and an optimized forming and annealing process
- **BEST PRECISION** of the cartridge as the lowest wall thickness tolerances allow consistent loading
- **HIGHEST SAFETY** and **RELIABLE FUNCTION** through very hard brass at the base
- **EASY MULTIPLE PRIMING** possible due to the hard and undeformable material at the primer hole



**THE ADVANTAGES OF OUR NEW PACKAGING AT A GLANCE:**

- 1 Cardboard boxes with sliding drawers
- 2 Easier access to the cases, even when boxes are stacked atop one another
- 3 Product is protected by a perforated seal
- 4 Two fields for recording current load data
- 5 Caliber designation is visible even when boxes are stacked atop one another
- 6 Ruler with metric (cm) and Imperial (inch) scales
- 7 Table with conversion factors for converting metric data to Imperial data and vice versa

# RWS POWDER

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There is a suitable type of powder for every purpose – it is gelatinized nitrocellulose, partially with special additives. Basic materials, form and final treatment decide whether it burns slowly or fast, and how well it functions with the different calibres and bullets. You differentiate between monobasic, bibasic and tri-basic propellant powders. Powder that is made of pure nitrocellulose is called monobasic. In case of ammunition with relatively low bullet weight but high muzzle velocity, i. e. with high-performance ammunition

with extended trajectory, the energy of pure nitrocellulose is no longer sufficient. It is increased by adding higher energy like nitro-glycerine or similar materials. All propellant powders are without exception subject to the requirements of the law on explosives. We buy our propellant powders from renowned European powder manufacturers. Before their use we test them in the chemistry lab against deterioration whether the specific features of the powder type has been preserved.







PRODUCT	QUANTITY	ITEM NO.
R 901	500 g	240 71 91
<p>Offensive powder, e.g. for the .222 Rem. 5.6 x 50 [R] Magnum cartridges. This powder is primarily suitable for small capacity cases when light bullets are used. In addition, it is also suitable for producing reduced loads with light to medium weight bullets.</p>		
R 902	500 g	240 71 92
<p>This powder burns slower than the R 901 and is therefore suitable for many types of cases ranging from the .222 Rem. to the 9.3 x 74 R. It is generally considered to be suitable for medium cases and light to medium-weight bullets as well as for short barrels.</p>		
R 903	500 g	240 71 93
<p>This is the universal powder for all medium-sized rifle cartridges and bullets of normal weight. It is suitable for calibres ranging from 5.6 x 50 to 9.3 x 74 R. Decisive for the universality of R 903 is not only its adaptability to many different types of case forms, but also its flexibility in terms of the ignition, which still leads to uniform and complete burn-up of the powder even when the load has a low density.</p>		
R 904	500 g	240 71 94
<p>This powder burns more slowly than the R 907 and can possibly cause weaker gas pressure in suitable cases while at the same time exhibiting the same performance. In comparison to the next slower R 905 Rottweil Powder, the extremely progressive powder of the Rottweil product range, the R 904 has the advantage of requiring less volume. Thus, if the case volume is limited, better performance can be achieved.</p>		
R 905	500 g	240 71 95
<p>This is the most progressive powder in the Rottweil product range and is particularly well suited for loading large volume high-performance cartridges when heavy bullets are to be shot from long barrels. The range of application extends from 5.6 x 57 to 8 x 68 S and other Magnum cartridges.</p>		
R 907	500 g	240 71 96
<p>In terms of its burn-up rate, the R 907 is between the R 903 and the R 904. It fills the relatively large void between the two types of powder. Load data has been recorded for several different calibres. It appears to be particularly well suited for 8 mm cartridges (.318 diameter).</p>		





# PRIMERS

*THREE... TWO... ONE... IGNITION*

RWS primers are manufactured in a modern advanced production system and are subject to demanding quality control tests. The production is done in the order of punching, cup drawing, priming compound fill, drying and compression as well as pressing in of the anvil. It is accompanied by integrated automatic quality inspections. With the latest optoelectronic testing equipment the deviations in the construction and dimensional accuracy are checked. The priming sensitivity of our primers is adjusted in a way that the ignition is caused with a 100 % certainty at a sufficiently deep and central impact of the firing pin of the weapon.

ITEM NO.	PRIMER NO.	Ø MM	TYPE	SUITABILITY	CTG./BOX	SALES PACK.
<b>RWS-ANVIL PRIMERS SINOXID (IN SLIDE-OUT PACKAGES)</b>						
210 22 50	4031	4.45	small pistols	6.35; 7.65; 9 mm Luger; .32 S&W long; .38 S&W; .38 Special; .40 S&W; .357 Mag.	250	2500
210 30 60	4047	4.45	small pistols, Magnum	9 mm Luger; .32 S&W long; .38 Special; .40 S&W; .357 Mag.	250	2500
210 23 15	5337	5.33	small pistols	.45 Auto; .45 Colt; .44-40; .44 Mag.; .41 Mag.	250	2500
210 22 85	4033	4.45	small rifle	.22 Hornet; .222 Rem.; 5.6 x 50 5.6 x 50 R; .30 Carbine; .223	250	2500
210 23 58	5341	5.33	large rifle	5.6 x 52 R; 5.6 x 57; .243 Win.; 6.5 x 57; 7 x 57 R; 7 x 64; 8 x 57 IS; .404	250	2500
210 23 90	5333	5.33	large rifle cartridges, Magnum	6.5 x 68; 7 x 64; 7 mm Rem.Mag.; 8 x 68 S	250	2500
<b>RWS-ANVIL PRIMERS - LEAD FREE (IN SLIDE-OUT PACKAGES)</b>						
231 56 19	4066	4.45	small pistols	6.35; 7.65; 9 mm Luger; .40 S&W; .32 S&W long; .38 S&W; .38 Special; .357 Mag.	250	2500
<b>RWS-BERDAN PRIMERS SINOXID (IN COLLAPSIBLE PACKAGES)</b>						
210 43 34	4506	4.50	small pistols	6.35 mm; 7.65 mm; 9 mm short etc.	250	2000
210 43 50	4521	4.50	small pistols	9 mm Luger etc.	250	2000
210 43 85	5005	5.00	large rifle	diverse pistol cartridges, not standardised	250	2000
210 44 23	5620	5.50	large rifle cartridges	from 6.5 to 9.3 mm etc.	250	2000
<b>RWS PERCUSSION CAPS FOR MUZZLE LOADERS SINOXID (IN TINS)</b>						
231 93 54	1075	4.47	ribbed	muzzle-loader	250	2500
231 93 53	1075	4.47	ribbed plus (heightened)	muzzle-loader	250	2500
210 38 93	1218	5.90		firing hammer	200	1000
210 52 76	1081	6.12		muzzle-loader	200	1000
<b>RWS-PRIMER SINOXID (IN SLIDE-OUT PACKAGES)</b>						
210 14 91	7213	6.17	medium ignition 209 S	shotgun cartridges	100	1000
210 16 88	7002	5.68	ignition VI	shotgun cartridges	100	1000





# GLOSSARY

**BALLISTIC COEFFICIENT (BC)** — This describes the ability of a projectile to overcome air resistance, and is expressed as a number, e.g. “0.338” for the 7 mm 10.0 g DK bullet. The drag caused by air resistance is dependent upon the velocity, shape and sectional density of the bullet as well as the density of the air. Projectiles with a high BC have a flat trajectory curve.

**BELTED CASE** — Of English origin, this case format consists of a rimless case with a metal belt around the P1 area of the case that does not mechanically reinforce the area, but rather is used to establish headspace in the chamber. German high velocity cartridges have proven that one can do just as well without a belt. Belted cases can be found on many US magnum cartridges.

**BERDAN PRIMER** — also called an “open” primer. Consists of a primer cup that contains the priming compound.

**BOATTAIL** — promotes the smooth flow of propellant gases behind the bullet as it exits the muzzle while also providing advantages in bullet seating and internal ballistics. The often-men-

tioned exterior ballistic advantages of a streamlined bullet base do not exist at velocities above 500 m/s. That is why the major advantages of the boattail (torpedo base, in German) can also be achieved by a simple chamfered base, as seen in modern bullets.

**BOXER PRIMER** — consists of the primer cup, anvil and priming compound. Although shotgun ignition requires a different construction, shotshells also use “primers”. The term “fuze” is not used for cartridges and is reserved for explosive devices.

**BURNING OF THE POWDER** — Powder “burns up”; is “burnt”. Expressions like “explode” and “detonate” are incorrect.

**CALIBER** — the term for the bullet diameter as well as the inside diameter of the barrel. One might speak of “9mm Luger caliber”, for example, whereby they are referring to the name of the cartridge. Since caliber could mean that one is speaking of the groove diameter, the land diameter, a median between these two figures, the bullet diameter, or even an approximation of the diameter, there is understandably much

confusion surrounding the term. With shotshells, the caliber is called “bore” or “gauge” and is based on lead balls: If a single English pound (453.6 g) of lead is cast into 12 lead balls of exactly the same size, the diameter of one of these balls corresponds to the inside diameter of a 12 bore shotgun. 20 bore is correspondingly smaller (20 balls from 1 pound of lead). The smallest shotgun gauge, 36 bore, is usually expressed as .410 in.

**CASE** — We discern between shotgun shells and metallic cartridge cases. Shotgun shells are made with paper or plastic cases; metallic cartridge cases are used in rifles and handguns. The shape of metallic cartridge cases can take several forms: Rimmed cases for handguns and rifles, rimless cases for handguns and rifles, and belted cases for rifles. The cartridge case is the most important component for the reloader, and it is therefore no wonder that cartridge brass is sometimes referred to as “reloader’s gold”.

**CASE NECK** — the cylindrical section between the shoulder and the mouth of the case that holds the bullet in place.

**CASE SHOULDER** — the section of the case between the case neck and the case body in cartridges that have a “bottleneck” profile. The shoulder angle plays an important role in determining the gas pressure curve.

**CRACK LENGTH METHOD** — a method developed by Dynamit Nobel ballistic laboratories to evaluate the terminal ballistic effects of bullets fired into gelatin blocks

**DIE** — a tool with a negative profile that is an important part of the reloading process. This tool can either be hand-held (hammer-type die, e.g. Lee, Wilson) or screwed into a pressure-producing device (predominantly a loading press but sometimes a device such as a Lyman plier). A normal die set for bottleneck cartridges contains a sizing die and a seating die. The sizing die is used to re-form the case to its original dimensions. During this step, the old (Boxer) primer is pushed out and the case neck is expanded slightly to seat the bullet. The seating die is used to seat the bullet and, if necessary, to crimp it into place. Cylindrical cases require a third die to expand the case mouth for bullet seating. Should handgun cartridges be loaded

for maximum accuracy, then, in addition to the sizing die (preferably with a tungsten carbide insert), the expanding die and the seating die, a fourth die may be desirable for crimping. It may feature either a roll crimp or a taper crimp (preferred). Besides the dies mentioned, other dies may also be used in the forming of cases (trim dies, forming dies, bullet-pulling dies, etc.) The negative profile tools used to manufacture swaged bullets or to size cast bullets are also called dies.

**DOUBLE-BASE POWDER** — this has a nitroglycerine component in addition to nitrocellulose

**ENERGY** of the bullet is calculated from the velocity and mass of the bullet, and should never be the sole criterion in judging the worth of a cartridge.

**FLASH HOLE** — This allows the primer flash to reach the powder charge in the case itself. Boxer-primed cases have one flash hole, while Berdan-primed cases have two. The flash hole or holes must be inspected after removing the spent primer to be sure that they are free of obstructions. Flash holes must never be drilled out, otherwise changes in gas pressure will result.

**FREEBORE** — often confused with leade (a conical transition from the freebore to the rifling), this describes the unrifled section of the bore covered by the bullet after it completely exits the case mouth and before it engages the rifling. Freebore is usually detrimental to accuracy, which is why bullets that are too short do not do well in chambers with a long leade. Experiments attempting to use intentionally excessive freebore to achieve the same performance but with a reduction in gas pressure have been unsuccessful (Weatherby cartridges).

**GRAIN** — American term for the smallest unit of weight in the avoirdupois system, i.e. 1/7000th pound avdp. In the event that the Americans adopt the metric system, the grain unit may one day be a thing of the past.

**HEADSPACE** — Here we must distinguish between a) the actual headspace as the distance between the base of the cartridge and the breech face of the gun when the breech is closed and locked and b) headspace as the dimension measured from the breech face of the firearm to the point where the cartridge lays in the chamber. When firearm technicians speak of headspace, they mean the

actual headspace and not the headspace according to b) which will be different from one cartridge caliber to another. Different contact surfaces will give different headspace dimensions: With rimmed cartridges, it is the distance from the breech face to the front side of the rim; with semi-rimmed and rimless rifle cases it is the distance between the breech face and the case shoulder; and with belted cases it is the distance between the breech face and the front edge of the belt. Finally, many pistol cartridges headspace on the case mouth itself. It is important to know this since the reloader must take this into account when resizing and executing other case manipulations. For example, setting back the shoulder of bottleneck rimless cases can result in split cases or misfires. The same goes for too heavy a roll crimp on cartridges that headspace on the case mouth.

**KINETIC BULLET PULLER** — a simple yet functional hammer-like tool that exploits the law of inertia to remove bullets from loaded metallic centerfire cartridges.

**L3** — Abbreviation for the total length of the empty cartridge case (CIP standard)





1 – Powder funnel, 2 - Primer, 3 – Cartridge case, 4 – Powder scale pan, 5 - Bullet, 6 - Digital caliper, 7 – Laboratory spoon, 8 – Kinetic bullet puller, 9 – Digital powder scale, 10 – Powder trickler, 11 – Case mouth chamfering tool



**LOAD (N.)** – a precisely defined combination of cartridge components

**LOAD (V.)** – verb for developing a particular load (n.), e.g. the “working up” of an accuracy load.

**LOADING DENSITY** – If a powder charge fills the case completely yet without compressing it, one speaks of a loading density of 1. A half-full case would have a loading density of 0.5, etc. The ideal is to have a powder charge that achieves the highest possible velocity yet remains below the maximum allowable gas pressure, thus having a loading density of between 0.95 and 1.0.

**MAGNUM** – ancillary term for loads, cartridges, components, etc. in the sense of “enhanced, stronger”. This is a misleading term which one should avoid using unless it is necessary to emphasize the stark difference between a “magnum” and a “normal” load.

**MUZZLE BLAST** – the noise made due to the violent expansion and combustion of high-pressure gases that takes place when the bullet exits the muzzle. In addition, there may be a sonic boom accompanying the bullet’s exit in cases where the

bullet’s velocity exceeds the speed of sound (ca. 330 m/s at 0° C). Muzzle blast is also a common yet untechnical expression for the collective sound of the report, the noise of the muzzle flash and the sonic boom (if applicable).

**MUZZLE ENERGY** – the function of muzzle velocity and bullet weight; this should in no way be the sole measure for the ballistic performance of a bullet.

**MUZZLE VELOCITY** – Velocity of the bullet or shot load taken at the muzzle of the gun

**NITRO POWDER** – general common term for “smokeless” powder. “Nitro” comes from nitrating, the technical term for introducing nitro groups into organic compounds. We differentiate between nitrocellulose powder (single-base powder), nitroglycerine powder (double-base powder) and multiple-base powders, e.g. triple-base nitroguanidine powder.

**OFFENSIVE POWDER** – propellant powder with a fast burning rate. Offensive powders are used for shotshells and handgun ammunition. On the other hand, one also calls a relatively fast powder for rifle cartridges “offensive rifle powder” so that





we may differentiate the relationship between the entire spectrum of nitro powders and one referring only to a particular group of powders. The opposite of offensive powder is progressive powder.

**POWDER** — the traditional term for gunpowder (propellant powder); this is not to be confused with explosive powder or explosives. (This alone shows the incorrectness of including propellant powders in laws governing explosives.) In general, we distinguish between black powder and nitro powder, whereby here we refer only to nitro powders.

**PRESS (SWAGING PRESS)**. There are also special “lubrisizer” presses used to size and lubricate cast bullets, while others are made for swaging plain or jacketed bullets.

**PRIMER** — one differentiates between the Berdan and the Boxer primer. These primer types are used in metallic cartridges for handguns and rifles. Shotgun primers have a construction that is entirely different from that of the primers used in metallic cartridges.

**PROGRESSIVE POWDER** — used in rifle cartridges, these powders have a relatively slow

burning rate. One may also refer to “progressive pistol powder”, e.g. Rottweil P 806, or “progressive shotgun powder” (Rottweil J 706 as compared to the faster J 710). These powders are the slower powders in their respective classes (cf. Offensive powder).

**PROJECTILE** — term for a single bullet

**REAMING** the case neck, whereby material from the inside of the case neck is removed.

**RIMFIRE CARTRIDGES** — cannot be reloaded because the priming compound is not contained in a separate priming system but rather is pressed into the case rim. Only of interest in .22 (and other smallbore) calibers as a sporting cartridge, e.g. .22 short, .22 long rifle, etc. or in .22 Magnum for hunting use.

**RIMLESS CARTRIDGES** — centerfire cartridges whose cases have no rim and feature an extractor groove (cf. case).

**SEATING DIE** — die used to seat the bullet in the case with or without a crimping shoulder. In the latter case, the crimp must be executed

with a crimping die (only for handgun ammunition). The seating depth (how deeply the bullet must be seated into the case) is determined by firearm-related parameters (length of throat, magazine length, etc.). On the other hand, altering the seating depth can change both internal and external ballistics, which means that depth variations may be worth pursuing if one seeks improvements there. The minimum seating depth is derived from the published overall cartridge length. This dimension may be increased as far as secure seating of the bullet, magazine length or the chamber throat allow it to be, but the bullet must never actually contact the rifling.

**SECTIONAL DENSITY** — calculated from caliber (bullet cross-section) and bullet weight. Bullets with a high sectional density (naturally only up to certain limits, about 30 g/cm<sup>2</sup>) always have better external and terminal ballistic properties than lighter bullets of the same construction and form: a higher pressure with the same powder charge; or, at the same pressure, a lower velocity, thus forcing the reloader to reach some compromise between the two (see also: reloading ballistics).

**SINGLE-BASE POWDER** — ordinary smokeless powder is made from only one major component, nitrocellulose, and is therefore called single-base powder.

**SINOXID** — trademark for non-corrosive priming developed by Dynamit Nobel. It consists mainly of lead styphnate and tetrazene with barium nitrate, lead dioxide, calcium disilicide and other compounds added. After the expiration of the patent, Sinoxid priming was copied the world over and is now found in practically every modern priming compound.

**SIZING DIE** — part of a die set consisting of two to four dies. The sizing die reduces the expanded fired case (resizes it) back to its original dimensions. There are normal sizing dies, which require the use of case lubricant, and tungsten dies, which do not need it.

**SIZING, RESIZING** — The sizing die re-forms the case that has expanded upon firing back to its original dimensions [full-length resizing]. There is also neck sizing, whereby only the case neck is resized enough to hold the bullet in place.

**TRIPLE-BASE POWDER** — smokeless powder that contains not only nitrocellulose (NC) and nitroglycerine (NG) but also nitroguanidine. It is mostly used in artillery and seldom used in small arms.

**TURNING** the case neck — this reduces the thickness of the case neck material when re-forming cases. It also increases the H1 and H2 diameters and achieves maximum uniformity of case necks in a batch of cases.

**TWIST** — the term used for the number of turns of the screw-like rifling grooves and lands inside the barrels of rifles and handguns. As the bullet travels down the barrel, it is engraved by the lands as it spins along its long axis, influencing its stability in flight. Long, heavy bullets require a fast twist; short, light bullets are often no match for fast rifling twists. The reloader should be aware of the limits the rate of twist puts on the selection of potential bullets. Twist is generally expressed by how far down the barrel the rifling extends to make a single revolution, e.g. 1:10" [one revolution in ten inches], 1:300 mm.



Photo: Aleksandra Baraniecka  
lesny.baranek



The RWS reloading manual has been digitized and contains practical tips and up-to-date load data. You can find it at [www.rws-ammunition.com/reloading](http://www.rws-ammunition.com/reloading) [German language only].

## CONVERSION TABLE

### LENGTH

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1 inches (in.) = 25.4 millimeters (mm)

1 feet (ft) = 0.3048 meters (m)

yards (yds.) = 0.9144 meters (m)

millimeters (mm) = 0.03937 inches (in.)

meters (m) = 39.37 inches (in.)

meters (m) = 3.281 feet (ft)

meters (m) = 1.094 yards (yds.)

kilometers (km) = 0.6214 miles

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### VELOCITY

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feet per second (fps) = 0.3048 meters per second (m/s)

meters per second (m/s) = 3.281 feet per second (fps)

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### WEIGHT

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grains = 0.0648 grams(g)

grams(g) = 15.432 grains

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