



Made in USA
Patent pending

This **BERSIN Ammunition Measuring and Adjustment Device** is a revolutionary invention in precision shooting. The device diagnoses and eliminates errors in the longitudinal axis in rifle ammunition (**concentricity flaws**).

Unlike other tools, the device allows each cartridge to be solidly fixed within a replica of a rifle cartridge chamber for measuring purposes. Its accuracy of measurement - particularly of repeat functions - is unique. Furthermore, this device is the only existing tool available today which allows you an exact adjustment of cartridges containing concentricity flaws with respect to uneven alignments of the projectile within the cartridge case. In addition, the device discovers **uneven cartridge case surfaces** and irregularities in the **seating depth** (total length) of your ammunition.

Many different types and calibers of ammunition contain concentricity flaws. **Industrially manufactured** ammunition generally contains errors of 4/1,000" to 20/1,000" (measured in the region of the projectile's tip). Flaws of up to 40/1,000" are not uncommon. A shot at a distance of 300 yards with such a shell will forcibly miss its target by approximately a foot due to the provoked rotational imbalances.

Even carefully **reloaded** cartridges may contain errors of 4/1,000" or more, caused by minor mistakes in the reloading process, such as a bad angle of insertion of the projectile in the case mouth. The device generally reduces these errors to 1/1,000" or less.

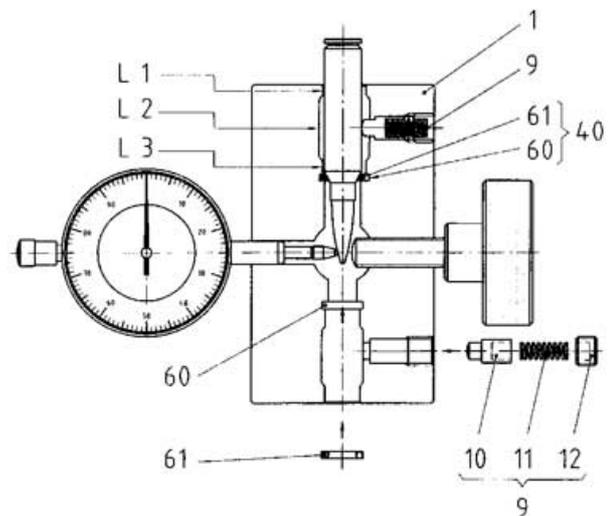
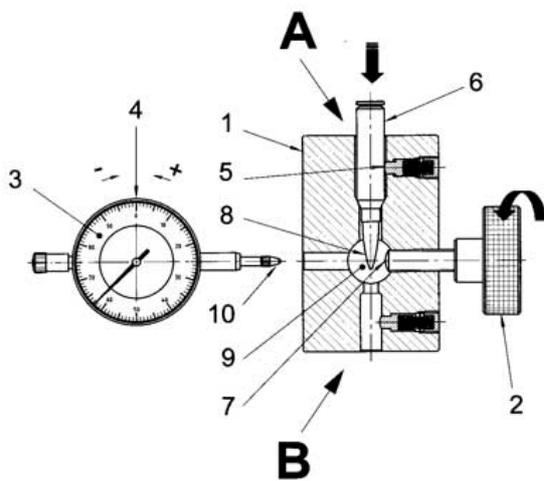
Through the alignment of the projectile's axis with the axis of the cartridge case, while firing the cartridge, the projectile is pressed in a precise manner into the barrel throat. This avoids rotational imbalances of the projectile in the barrel and in the trajectory.

Rigorous testing in different atmospherically neutralized facilities has confirmed the efficiency of the BERSIN device and has demonstrated, that by means of a simple process of manual measuring and adjustments of the new or reloaded ammunition, the **precision** of your rifle shot can be **improved by up to 50%**.

Whether you are a marksman using industrially manufactured ammunition or you are a reloader, this device is designed for you. It will ascertain and minimize flaws which occur in serially produced ammunition, as well as alleviate many problems of eccentricity in reloaded cartridges.

The device allows for the **quick measurement** of the accuracy of the cartridge, and if needed, for an **instant adjustment** of the projectile with the axis of the cartridge case, all of this being accomplishable within seconds. It can be used for all types of shooting - particularly sport and precision shooting, bench rest shooting, or for hunting and security purposes.

More precise ammunition means an improvement in your shooting accuracy and a **decisive reduction of your target diameter**.



A/B Bores appropriate to individual calibres

(All explanations and plans under US, Canadian, European Union and Swiss patent protection.)

- 1 Main body
- 2 Adjustment knob
- 3 Dial indicator
- 4 Adjustable indicator
- 5 Diameter compensator
- 6 Inserted cartridge
- 7 Tip of adjustment knob
- 8 Projectile
- 9 Sight hole
- 10 Indicator measuring tip

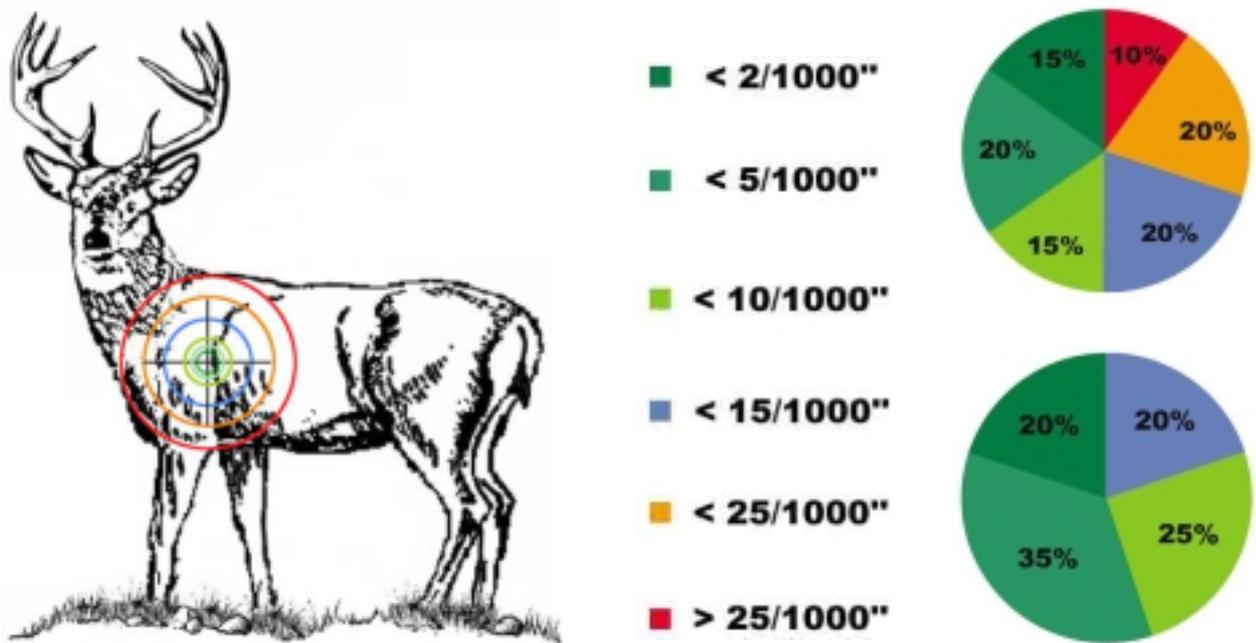
- 1 Main body
- 9 spring loaded diameter compensator
- 10 inside plastic element
- 11 compression spring
- 12 outside brass part
- 40 throat
- 60 groove
- 61 shoulder insert
- L1 vertical fixation area # 1
- L2 clearance zone
- L3 vertical fixation area # 2

In the most accurate way of measurement ever, the BERSIN device confirms the quality of your cartridge right away, and further improves reloaded ammunition with respect to concentricity to a level of up to 1/10,000 of an inch.

Industrially manufactured and over the counter ammunition is generally used for a wide array of shooting purposes such as power and sports shooting, hunting, as well as security in the private and public sector. The BERSIN device helps everywhere.

Test and improve, and thereby achieve better targeting!

Ammunition purchased randomly in North America and Europe gives, on average, the following typical eccentricity dimensions:



This easily leads to enlargement of the target diameter and to drastic consequences to your hunting success. The illustrated target diameter is shown for hunting purposes at 300 yards, based only on technical insufficiency of out of round ammunition (leaving out atmospheric, weapon technical and human errors).

Measures and adjusts cartridge concentricity – up to 1/10,000 of an inch

Decisive reduction of group size – by up to 50%

Pinpoints cartridges with irregular length and case surface

Brings industrially manufactured ammunition within tolerances of reloading

Helps reloaders measure and improve their high precision reloading

Easy and fast handling

Top quality dial indicator (1/10,000" reading)

Extensive testing has shown dramatic accuracy improvement

The device weighs under one pound and comes packaged in a plastic foam lined box for easy transporting to the field or to the shooting range.

Verify and align your rounds immediately before shooting them. Measuring and aligning is easy and fast, just a few seconds per cartridge, or five minutes for a box of 20 cartridges.

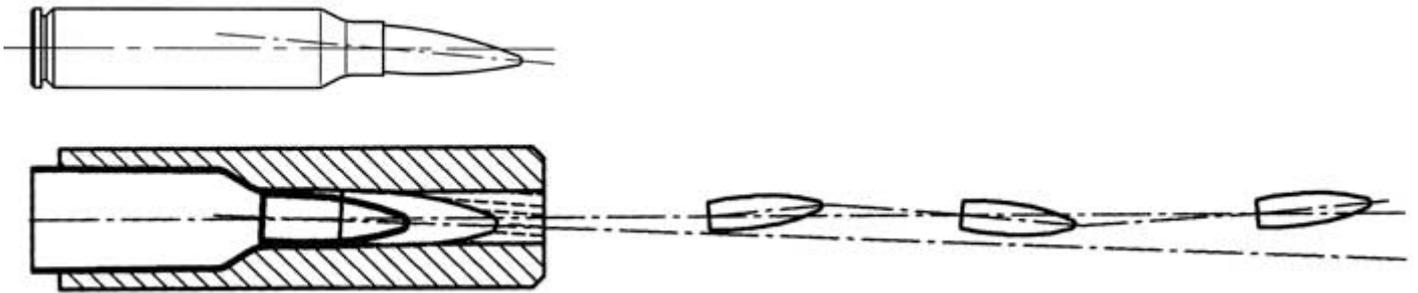
Improve the accuracy of every round. No more flyers. This is a must for anyone who buys commercially manufactured ammunition and wants the best results on every shot.

Even reloaders will experience better results.

Serious reloaders are particularly concerned with the problem of concentricity of their carefully reloaded ammunition. Even with the use of high precision tooling — promising a seating accuracy of the projectile within a 1/1,000 of an inch angle, there may be cartridges with wider flaws. This is primarily related to a non-uniformity of the brass and the resulting lack of concentricity of the neck to the body of the case. Other reasons may be a lack of experience or skill in the reloading process itself.

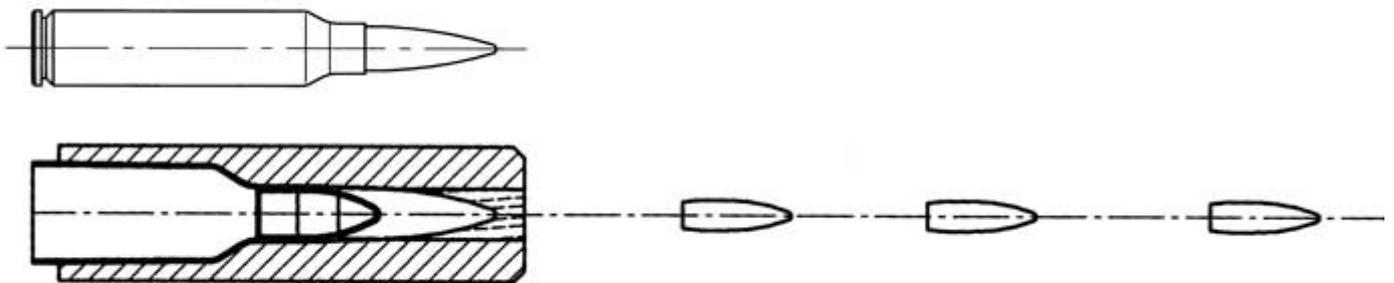
THE PROBLEM: Concentricity and Eccentricity

Many different types and calibers of ammunition contain concentricity flaws. Industrially manufactured ammunition generally contains errors of $4/1,000''$ to $20/1,000''$ (measured in the region of the projectile's tip), although flaws of up to $40/1,000''$ can also occur. A shot at a distance of 300 yards with such a shell will forcibly miss its target by up to a foot due to the provoked rotational imbalances.



Even carefully reloaded bullets may easily contain errors of several $1/1,000''$, often caused by minor mistakes in the reloading process, such as a slight misalignment of the projectile during its insertion in the case mouth or the use of uneven brass. The BERSIN device generally allows the detection and even reduction of these errors to under $1/1,000''$ (0.025 mm). In reloaded high precision ammunition produced with the most recent highly sophisticated reloading equipment, the targeted $0.001''$ accuracy can be controlled and will be improved to within a few $1/10,000''$.

The result of measuring and adjustment of the rifle cartridge is a much closer target diameter.

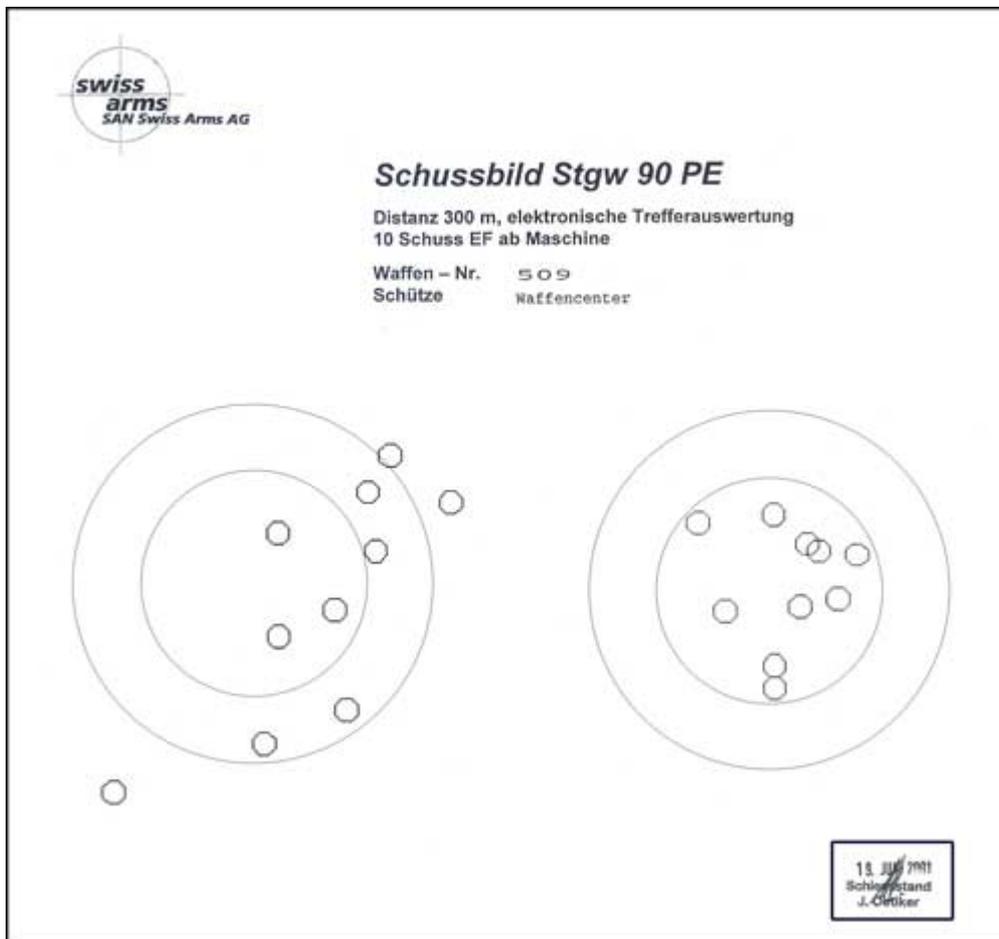


By means of a simple process of manual measuring and adjustment of industrially manufactured or reloaded ammunition, the eccentricity flaws can be corrected dramatically increasing the accuracy of your shot by up to 50%.

By aligning the projectile's axis with the axis of the cartridge case, the projectile is pressed more accurately into the barrel throat. This avoids rotational imbalances in the projectile before and after the bullet leaves the barrel. A misaligned projectile in the cartridge case enters the barrel of the rifle on angle and slightly deformed. The lands and grooves of the barrel will further deform the projectile as it enters the barrel causing it to rotate nonuniformly down the barrel. This creates what is generally called a flyer or erratic shot.

Rigorous testing in different atmospherically neutralized facilities at a 335 yard distance confirm the efficiency of the BERSIN device. Numerous shot patterns were established for ammunition set up using the BERSIN ammunition tester by the following: Industry (SIG Swiss Industry Union; Swiss Arms, a branch of SIG; Gruenig & Elmiger, Switzerland), as well as independent or governmental organizations (e.g. Austrian Ammunition Office Vienna). Other tests were executed by some top athletes in precision shooting. The shot patterns below depict the results that can be obtained by using the BERSIN device.

Please note that all patterns were established in a tunnel, at a distance of 335 yards, with a fixed barrel, and different calibers and ammunition types. The scale is slightly reduced, the actual circle diameter of the inner target circle is four inches. The left side shows the test results without the use of the BERSIN device, the right side proves the very obvious improvement after measuring and aligning the cartridges.



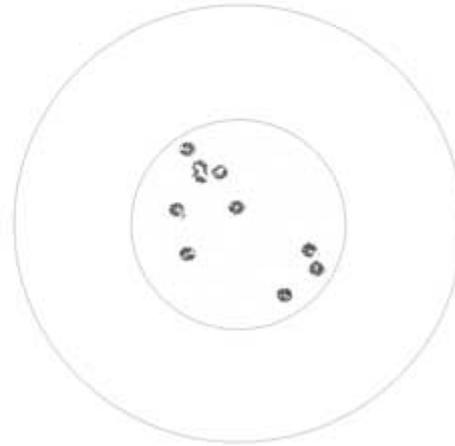
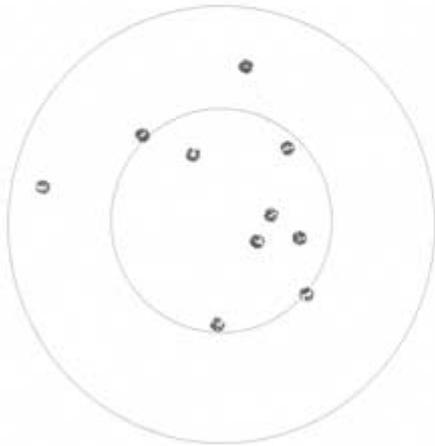


*Grünig
+
Elmiger AG*
Switzerland

Schussbild mit:
Waffennummer:
Kaliber:
Munition:
Schlesstand:
Distanz:
Anzahl Schüsse:
Schussbild:

Standardgewehr FT 300
01.011
7,5 x 55
GP 11 (gewacht mit Hybag Wachmaschine)
Emmen, Hüslimmoos
300 m
10
Nummer 1

Edale



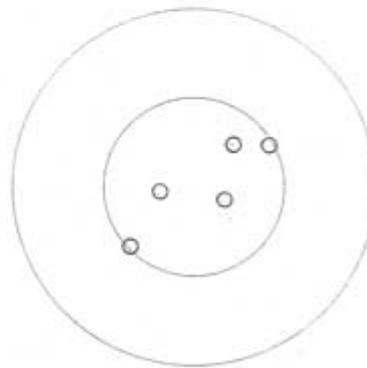
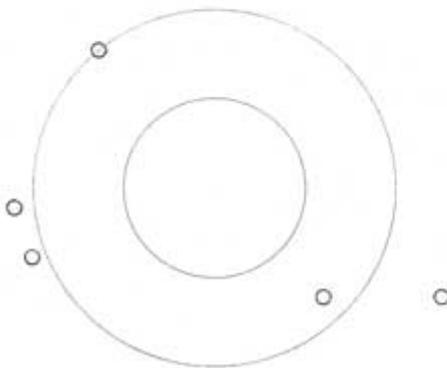
14. Juni 2002



Schussbild SIG SAUER 205

Distanz 300 m, elektronische Trefferauswertung
5 Schuss ab Maschine

Schütze Waffencenter



02. Juni 2002
Schwyz
Schützen

Frequently asked questions

What is the meaning of “Measuring”?

“Measuring” with respect to the BERSIN device is defined as turning a rifle cartridge around its longitudinal axis inside a replica of a cartridge chamber, the tip of the dial indicator touching the cartridge in the area of the projectile’s tip. During a full turn of the cartridge (360 °), flaws in the longitudinal axis of the cartridge (projectile with respect to the cartridge case) can easily be detected by reading the indicator deviation.

Is there an obvious need for “Measuring”?

Ideally the longitudinal axis of the cartridge case and the projectile are precisely equal and aligned. In such case, the deviation of the indicator’s needle is 0. In fact, it is not uncommon that with industrially manufactured ammunition one observes deviations between 4/1,000” and 25/1,000”. Reloaded ammunition has decisively lesser flaws, provided they are produced by an experienced person with the utmost care, using high precision reloading tools. However, even under such circumstances, one can very often observe deviations between 2/1,000” and 8/1,000”.

What is the meaning of “Adjustment”?

By turning the alignment knob, detected mistakes in the longitudinal axis of the projectile with respect to the cartridge case will be corrected. The alignment tip, rounded off or equipped with a ball joint and touching the projectile in the area close to its tip, thereby moves the projectile sideways, until both axes are perfectly aligned. The entire process is controlled and dosed by a high precision dial indicator, displayed into subdivided 1/100 mm (4/10,000”) units (or for particular tools in bench rest and varmint hunting, into 5/1,000 mm (2/10’000”) units). The contact of the adjustment tip with that of the projectile tip is carefully chosen to guarantee an equal distribution of the aligning forces on the projectile.

Can you loosen the projectile in the cartridge case by adjusting it?

Basically there is no risk of loosening the projectile in its seat in the case throat, provided the user follows the instructions in the manual. The stability of the projectile in the cartridge case is maintained. However, there is a minor risk of loosening the projectile when:

- there has been an inappropriate adjustment made (this can occur when pushing the projectile several times from one end to the other — applying exceeded pressure and then pushing back the projectile); or
- there is poor quality brass or porous cartridge cases with exorbitant concentricity flaws.

However, the thus resulting slight reduction in neck tension of the projectile will not have any negative impact on the precision of the shot.

What are the consequences of the adjustment process on the projectile?

At an initial stage, there is lateral pressure applied on the projectile with the help of the adjustment knob. The contact area is chosen in a way to ensure that there is an even pressure concentration on the projectile in its entire length and positioning. Projectiles with a thin coating may require a more sophisticated alignment - specially manufactured alignment tips protect against any kind of deformation or damage on the projectile’s surface.

The initially executed pressure moves the projectile in its position in the case neck. Cartridges with minor concentricity flaws are then aligned, without further adjustment. Where a cartridge does have major deviations, there is a first move of the projectile in the case neck, followed by a second move of the case neck as a whole in its transition zone into the case shoulder. This area of the cartridge case is often reason for major concentricity problems. At that weakest area of the case, the pressure applied concentrates itself and brings the desired improvement in concentricity to the whole cartridge.

What are the consequences of the adjustment on the neck tension?

The minimal reduction of the neck tension ascertained with aligned ammunition does not have any negative effects on precision and targeting. On the contrary, testing has revealed that a slightly reduced neck tension can have a positive effect with respect to precision. For example, in the case of an industrially manufactured competition ammunition - these relatively precise competition cartridges have a decisively reduced neck tension (i.e., up to 70%) compared to regular over the counter ammunition.

How about damaging the projectile by alignment pressure?

This question addresses a serious problem. Each damage or torsion on the coating of the projectile causes similar out of round problems in the same manner as eccentricity of the cartridge.

As a matter of fact, there are a number of relatively thin or soft-coated cartridges. The concentration of alignment pressure executed, by a rounded off alignment tip, damaging of the projectile cannot always be excluded. The manufacturing of certain models, such as Bench Rest, Varmint Hunting, as well as Large Rifle and Ultra Magnum, carefully consider these circumstances. A highly sophisticated alignment tip equipped with a ball joint and a relatively large touching zone to the projectile makes any damage to the coating virtually impossible.

Measuring and alignment of cartridges with uneven case surfaces

With the help of diameter compensators opposite the dial indicator, it is very possible to measure, as well as align, cartridges with uneven cartridge cases. What is important to note is that out of round cases with uneven exterior surfaces will be identified by an irregular deviation of the indicator needle. Sudden movements in opposite directions indicate, an out of round or damaged case (another important function of the Bersin device).

How can flaws in the seating depth (total length) be identified?

In particular, after the adjustment process, an uneven seating depth of the projectile can be identified by a differing deviation of the needle compared to other cartridges of the same type and/or calibre - when comparing different cartridges, the deviation of the indicator should be somewhat even within a few 1/100 mm (4/10,000"). Once you experience a particular move of the indicator in a positive or negative direction with a certain cartridge (compared to other cartridges), this will imply a flaw in the seating depth of the projectile (total length of the cartridge).

At this point and time it must be emphasized that this verification in practice is often done with a couple of specific devices without initial control of the axis (i.e. a verification of the alignment of the projectile with the cartridge case). Such results are unreliable, in particular when measuring is executed in a lateral manner on the projectile. Under such circumstances, the Bersin device is of great assistance.

What are the technical consequences of eccentricity of a cartridge?

A few technical details are necessary in order to understand the following explanations with respect to concentricity/eccentricity: After igniting the load of the cartridge, the projectile is subjected to huge forces and tremendously accelerated. It then leaves the neck of the case and passes the relatively short transition zone to be pressed into the base of the barrel. This passage of the projectile from the acceleration to the entrance into the actual barrel is called "rotationless" (there is no grip by the lands and grooves of the barrel at this stage), the stage between leaving the case mouth and being pressed into the barrel is called "free movement".

In ideal circumstances, i.e. with a perfect alignment of the cartridge and thereby a fully round movement of the projectile, the projectile is pressed into the barrel throat and into the barrel in a precisely centric way. This means, any deformation and/or rotational imbalance of the projectile can be excluded.

On the other hand, if there is an eccentricity between the projectile and the cartridge case, you will note a relevant deformation of the projectile before it is even pressed into the barrel, which will inevitably lead to a rotational imbalance of the projectile. This imbalance is not, as one might assume, dampened or neutralized by the fields and grooves of the barrel, but may even be accentuated during the stage of passing through the barrel. At the very end, the projectile will, once it leaves the end of the barrel, continue and enhance itself during the entire trajectory.

By the mere fact that there is an uneven deformation of the projectile during the firing process, before its actual entrance into the barrel, the exactitude and precision of targeting is seriously hampered - the technical diameter of group size (target diameter) of a fixed barrel widens to astonishing dimensions.

Utility of the device for the reloader

Although the device most visibly (physical reduction of group size) yields to the consumer of industrially manufactured ammunition, the use for reloaders is (percentage wise) none the less efficient and highly recommended.

Nowadays a couple of high precision reloading tools promise, particularly with respect to seating depth accuracy, precision dimensions of up to 1/1,000 of an inch (0.025 mm). Whether or not these manufacturers can keep their promise is a question we will not discuss - this question can only be answered by conducting an inspection with a similar precision measuring device. Regardless, it does not make sense to address high precision seating depth without keeping a close eye on the concentricity of your cartridge at the same time - doing so, will undoubtedly falsify the accuracy of your results as they pertain to seating depth of your projectile.

As mentioned above the real problem in this context lies in the fact that there are no reliable measuring devices available. In particular repeat-functions are often very unsatisfying, and hazardous dial indicators have scale units which are never at a level of 1/10'000". The Bersin device makes up for all hazards in this regard. In addition, the device allows you to align your cartridge to the utmost possible concentricity dimension.

Even the most experienced reloaders admit that, on a regular basis, mistakes such as a slightly bad angle occurs while inserting the projectile. These mistakes are so minor that they hardly are noticeable and therefore very difficult to avoid. Nevertheless, in practice it is exactly these flaws which make the difference between the championship and a bad day. Even the best high precision reloading tools are not a reliable weapon against these annoying flaws.

In addition it is well known that a major percentage of flaws in concentricity are not even caused by reloading inaccuracy, but by lacks of concentricity in the brass. Unevenness in the brass reacts on pressure and other physical influence during the reloading process with in turn either provoke eccentricity or out of round problems of

the cartridge case — both of which are taken along into the loaded cartridge. These mistakes can only be identified in a reliable way once the reloading process is finalized. Condition for a precise establishment is a highly precise measuring device with an absolute accuracy of repeat functions.

To date, only the Bersin device offers you the capacity to measure, control and align all at once— thus it is highly recommended.

What am I supposed to do with a damaged and/or unsuitable device (i.e., size of the cartridge doesn't match the size of the device bore)?

If the device is flawed with defects in material and/or workmanship, the manufacturer of the device offers a three-month operating warranty from the original purchase date and you may return it to the manufacturer. The manufacturer will honour said warranty provided that the guidelines for operating and care mentioned in the Owner's Manual have been followed.

It is important to note that each device, including the dial indicators, are tested several times before leaving the manufacturer's facilities. Therefore, as a result of such rigorous testing, and given that each device is wrapped in shock proof packaging, a lack in operating ability is highly improbable provided the plastic foil welding is untouched.

This being said, if for any reason, you are unhappy with your device, because it does not fulfill its intended usage, please contact the manufacturer (imachine@localnet.com).

The bores for the cartridges (replicas of cartridge chambers) are specified by different calibre groupings of different dimensions. All bores (whatever size the device) are based on international SAAMI-specifications for weapon (cartridge chambers) and ammunition (cartridge case) manufacturing. Therefore, a reloaded cartridge (which is slightly widened) will still fit within the bore of the Bersin device, provided the cartridge chamber of the used weapon was manufactured in keeping with the international SAAMI-specifications as they relate to tolerances. Accordingly, the slightly widened reloaded cartridge (i.e. the case) can still be inserted into the appropriate bore with no problem.

It is important to note that during the manufacturing process, the bore's tolerances cannot be overstretched to address this potential imperfection in the cartridge chamber of the weapon: addressing such rare and explicit imperfections (i.e., unsuitable rifle manufacturing or oversized cartridge chambers) by excessive widening of tolerances would impede the exactitude/precision of the bore's device for the vast majority of users.

This being said, if your reloaded cartridge does not fit into the appropriate bore, despite the fact that the size of the cartridge is intended for this specified bore size, you most likely are faced with an oversized cartridge chamber of your rifle - . Under such circumstances, the applicable warranty would not apply. However, you are most welcome to contact the manufacturer at imachine@localnet.com who will attempt to assist you in resolving this issue by widening the bore of your device. Such adjustments do not carry any warranty, and all ensuing costs are to be paid in full by the customer.