

Calibrate Your Powder

It would be difficult to measure the volume of one grain of powder and not very precisely. However, it is very easy to weigh a large sample of known volume and calculate the volume of a single grain.

To find the exact volume of a single grain of your powder, set your powder measure to any setting, preferably a large whole number such as 4.00 or 5.00.

Weigh a sample. Divide the micrometer setting by this weight to find volume of a single grain of the powder you’re testing. Mark this number on the powder container and you’ll have it for reference in the future. Average of several samples increases accuracy and confidence.

Micrometer setting / Grains weight of sample = setting for one grain (cc) (VMD)

In a perfect world you would never again have to weigh a charge for this container of powder. However, if anything can go wrong it will at the worst possible time. For this reason, we strongly urge you to check your charge with a scale every time you reset your measure.

Grain, Granules and Cubic Centimeters

The grain, as used to measure gunpowder, should not be confused with a granule or kernel of powder.

A **grain** was so named because it was the weight measure equal to one plump grain of wheat. A grain is a grain is a grain whether using avoirdupois, troy or apothecaries weight. The reloader uses the avoirdupois system where there are 7,000 grains or 16 ounces to one pound. The same system we use daily in the USA to buy and sell gunpowder, steak, potatoes, etc.

A **centimeter** is **.3937 of an inch**. There are over 16 cubic centimeters to one cubic inch.

A **liter** is **1000 cubic centimeters** and will hold 1 kilo of water. A cubic centimeter of water weighs one gram or 15.432 grains.

grams x 15.432 = grains  
grains / 15.432 = grams

Lee Safety Powder Scale  
Magnetically damped and Approach-to-weight



Safety and accuracy are the most important features. Easy to read and set. Calibrated with weights traceable to the UNITED STATES BUREAU OF STANDARDS. Even if you already own a combination bullet and powder scale, you will want a Lee Safety Powder Scale. 90681

Volume Measure Density (VMD) Volume of 1 Grain of Powder

This is a term we use to describe the average volume of one grain of a specific powder when metered by the average reloader.

The chart below is that part of a cubic centimeter that is needed to hold one grain of the powder specified. Cubic centimeter was selected as a standard not only because that is what the powder companies use, but a cubic inch is a comparatively large unit. To obtain the same degree of accuracy, it would be necessary to carry the number out two extra places.

To find the volume needed for any charge, simply multiply the charge in grains by the number behind the powder you are using. It is then easy to set your measure to that number.

| ACCURATE      | VMD   |              | VMD   |               | VMD   |               | VMD   |
|---------------|-------|--------------|-------|---------------|-------|---------------|-------|
| A NITRO100    | .1349 | A-XMR-2015   | .0730 | A-XMR-2495    | .0748 | A-XMR-3100    | .0748 |
| A-XMR-4064    | .0755 | A-XMR-4350   | .0740 | ACC MAG PRO   | .0663 | ACC XMP5744   | .0751 |
| ACCUR #2      | .0838 | ACCUR #5     | .0623 | ACCUR #7      | .0653 | ACCUR #9      | .0657 |
| ACCUR 1680    | .0655 | ACCUR 2200   | .0694 | ACCUR 2230    | .0657 | ACCUR 2460    | .0656 |
| ACCUR 2520    | .0683 | ACCUR 2700   | .0685 | ACCUR 8700    | .0688 | PEARL SCOT    | .1333 |
| ROYAL SCOT    | .1587 | SOLO 1000    | .1331 | SOLO 1250     | .1220 | SOLO 1500     | .1099 |
| ALLIANT       | VMD   |              | VMD   |               | VMD   |               | VMD   |
| ALLIANT STEEL | .1063 | ALNT 410     | .0804 | ALNT E3       | .1489 | AMER-SELECT   | .1341 |
| BLUE DOT      | .0865 | BULLSEYE     | .1064 | GREEN DOT     | .1262 | HERC 2400     | .0742 |
| HERCO         | .1122 | POWER PISTOL | .0889 | RED DOT       | .1413 | RELODER 10    | .0746 |
| RELODER 25    | .0707 | RELODER 7    | .0728 | RELODER12     | .0691 | RELODER15     | .0706 |
| RELODER19     | .0706 | RELODER22    | .0697 | UNIQUE        | .1092 |               |       |
| HODGDON       | VMD   |              | VMD   |               | VMD   |               | VMD   |
| BENCHMARK     | .0715 | BL-C(2)      | .0645 | CLAYS         | .1482 | H 50 BMG      | .0694 |
| H LIL GUN     | .0678 | H RETUMBO    | .0721 | H TRAP100     | .1171 | H-PYRDX RS    | .0811 |
| H-PYRODX P    | .0823 | H-VARGET     | .0731 | H1000         | .0713 | H110          | .0656 |
| H322          | .0725 | H335         | .0645 | H380          | .0691 | H414          | .0661 |
| H4198         | .0750 | H4227        | .0769 | H4350         | .0725 | H450          | .0653 |
| H4831         | .0725 | H4895        | .0728 | H870          | .0686 | HO US869      | .0651 |
| HP38          | .0926 | HS6          | .0712 | HS7           | .0680 | HYBRID100     | .0726 |
| INTERNATIONAL | .1266 | LONGSHOT     | .0824 | PYRODEX CTG   | .1014 | TITEGROUP     | .0847 |
| TITWAD        | .1300 | UNIVERSAL    | .1099 |               |       |               |       |
| IMR           | VMD   |              | VMD   |               | VMD   |               | VMD   |
| IMR 4007 SSC  | .0725 | IMR 700X     | .1343 | IMR 800X      | .1071 | IMR PB        | .1205 |
| IMR TRAIL BOS | .2172 | IMR3031      | .0762 | IMR4064       | .0745 | IMR4198       | .0792 |
| IMR4227       | .0769 | IMR4320      | .0716 | IMR4350       | .0735 | IMR4831       | .0735 |
| IMR4895       | .0728 | IMR7828      | .0725 | SR4756        | .1100 | SR4759        | .0993 |
| SR7625        | .1046 |              |       |               |       |               |       |
| MULWEX        | VMD   |              | VMD   |               | VMD   |               | VMD   |
| AR2205        | .0741 | AR2206       | .0714 | AR2207        | .0759 | AR2208        | .0725 |
| AR2209        | .0713 | AR2213       | .0686 | AS50          | .1208 |               |       |
| NORMA         | VMD   |              | VMD   |               | VMD   |               | VMD   |
| NORMA 200     | .0677 | NORMA 201    | .0691 | NORMA 2010    | .1434 | NORMA 2020    | .1208 |
| NORMA 203     | .0691 | NORMA 204    | .0677 | NORMA 205     | .0672 |               |       |
| RAM SHOT      | VMD   |              | VMD   |               | VMD   |               | VMD   |
| R COMPETITION | .1278 | R ENFORCER   | .0693 | R SILHOUETTE  | .0796 | R TRUE BLUE   | .0684 |
| RAM BIG GAME  | .0708 | RAM MAGNUM   | .0661 | RAM TAC       | .0671 | RAM ZIP       | .0816 |
| X-TERMINATER  | .0681 |              |       |               |       |               |       |
| SOUTH AFRICA  | VMD   |              | VMD   |               | VMD   |               | VMD   |
| MP200         | .0892 | MS200        | .1061 |               |       |               |       |
| VECTAN        | VMD   |              | VMD   |               | VMD   |               | VMD   |
| VEC AO        | .1196 | VEC BA10     | .1350 | VEC BA9       | .0919 | VEC SP10      | .0668 |
| VEC SP3       | .0682 | VEC SP7      | .0658 | VEC SP8       | .0682 | VEC SP9       | .0682 |
| VEC TU2000    | .0762 | VEC TU5000   | .0720 | VEC TU7000    | .0704 | VEC TU8000    | .0704 |
| VIHTAVUORI    | VMD   |              | VMD   |               | VMD   |               | VMD   |
| v-3N37        | .0913 | v-N105       | .0900 | v-N110        | .0833 | v-N120        | .0776 |
| v-N130        | .0754 | v-N133       | .0770 | v-N135        | .0777 | v-N140        | .0733 |
| v-N150        | .0746 | v-N160       | .0734 | v-N165        | .0712 | v-N170        | .0713 |
| v-N310        | .1214 | v-N320       | .1210 | v-N330        | .1079 | v-N340        | .1066 |
| v-N350        | .0977 | v-N540       | .0701 | v-N550        | .0692 | v-N560        | .0690 |
| WINCHESTER    | VMD   |              | VMD   |               | VMD   |               | VMD   |
| AUTOCOMP      | .0787 | SUPRM780     | .0684 | WIN 231       | .0931 | WIN 296       | .0656 |
| WIN 452AA     | .1171 | WIN 473AA    | .0975 | WIN 540       | .0683 | WIN 571       | .0680 |
| WIN 630       | .0666 | WIN 680      | .0655 | WIN 748       | .0655 | WIN 760       | .0666 |
| WIN AA LITE   | .1266 | WIN AA PLUS  | .1296 | WIN ACTION PI | .0810 | WIN MAG RIFLE | .0718 |
| WIN SUPER HAN | .0859 | wSUPER-FLD   | .0840 | wSUPER-LIT    | .0847 | wSUPER-TAR    | .1205 |

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These numbers are approximate. To find out the exact volume of any powder see **CALIBRATING YOUR POWDER**. It is so very easy to do and saves a great deal of time when setting your measure.

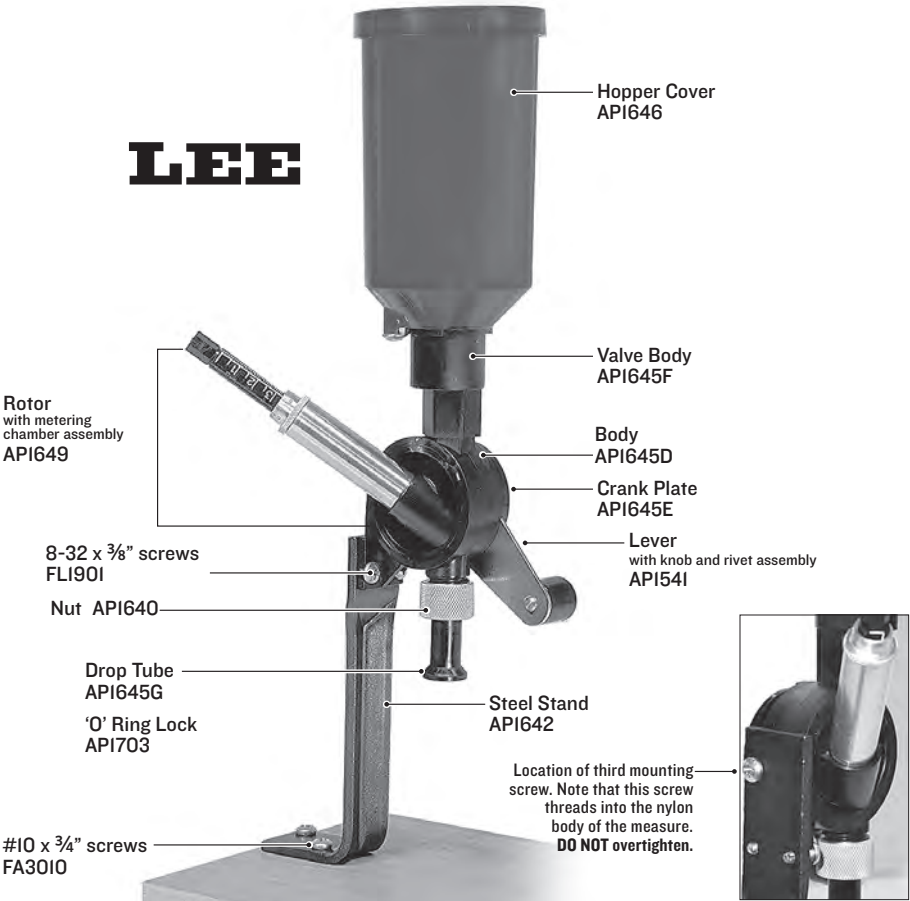


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COMPLETE INSTRUCTIONS FOR THE

LEE PERFECT POWDER MEASURE



LEE Guarantee

LEE RELOADING PRODUCTS are guaranteed not to wear out or break from normal use for two full years or they will be repaired or replaced at no charge if returned to the factory. Any Lee product of current manufacture, regardless of age or condition, will be reconditioned to new, including a new guarantee, if returned to the factory with payment equal to half the current retail price.

## IMPORTANT! YOU MUST DO THIS BEFORE USE

If using the measure for the first time, you must process at least one hopper full of powder through the measure to coat the nylon parts with graphite from the powder. This conditioning is important so static electricity will be bled off. Otherwise, you'll find the measure continues to dispense charges progressively heavier. This need only be done once.

The lever should be turned at a uniform, slow to moderate speed to a full stop in both directions. If using a large charge you must pause in both directions to permit the metering tube to fill and empty. You will be able to see the powder move in the hopper while the tube is filling.

You have purchased the best powder measure made. Don't let the bargain price fool you. There has never been a powder measure made with as many features as the **Lee Perfect Powder Measure**. It is built to give you a lifetime of unmatched accuracy. Unlike other powder measures, you can use any type of powder. Most powders will be dispensed in such uniform charges that you will think your scale is stuck. Extruded powders, such as most IMR powders, work just fine. They do not meter quite as well but you can expect charges more uniform than possible with any other measure. This is possible because of the elastomer wiper which levels the metering chamber without cutting the powder. The charge is more uniform and the measure operates much smoother.

The housing, rotor and adapter are all made from nylon. The metering tube is aluminum. These materials are non sparking, low friction and light weight so the measure is easily case operated with the optional charging die.

## CAUTION

Ammunition reloading can be dangerous if done improperly and should not be attempted by persons not willing and able to read and follow instructions exactly. Children should not be permitted to reload ammunition without strict parental supervision. Always wear safety glasses when reloading and shooting. Ammunition loaded with these tools and data should only be used in modern guns in good condition. We do not accept responsibility for ammunition loaded with these tools or data as we have no control over the manufacture and storage of components or the loading procedure and techniques. Primers and gun powders, like gasoline and matches, can be dangerous if improperly handled or misused.

### Mounting Your Powder Measure

For bench mounting, attach the powder measure to the stand with the screws supplied. Attach the base to your bench or suitable base for portable use. Use an ample size base. You may also "C" clamp the stand to your bench.

The hopper has a valve which can be closed by turning the hopper clockwise. Fill the hopper with whichever powder you will be using.

### Adjusting The Micrometer

Loosen the thimble so the metering rod can be turned freely to any setting you desire. Snug up the thimble after setting and the "O" ring within will hold the setting with no fear of it moving when in use.

### Reading The Micrometer

The metering bar is calibrated in cubic centimeters. Don't worry if you hate the metric system, this is simply a volume measurement that is convenient to work with. If you prefer, think of them as cubic powder units.

On the metering rod you'll be able to see one through a little over seven and one half. If you have been loading with Lee Dippers you can easily set the powder measure to your favorite load by setting to the dipper number.

It requires 10 full turns to move one cc., therefore one turn is  $\frac{1}{10}$  (.1) cc.

The micrometer thimble has 10 graduations. Each is 1/10 of a turn so it is  $\frac{1}{100}$  (.01) cc. You can see that a very precise adjustment is standard.

A typical powder such as 4895 needs more than one full line to change the charge by  $\frac{1}{10}$  (.1) grain.

### Setting The Micrometer

Multiply the charge in grains by the volume of 1 grain (see chart on rear) of the powder you are using. The answer is in cubic centimeters and this is the setting for your measure.

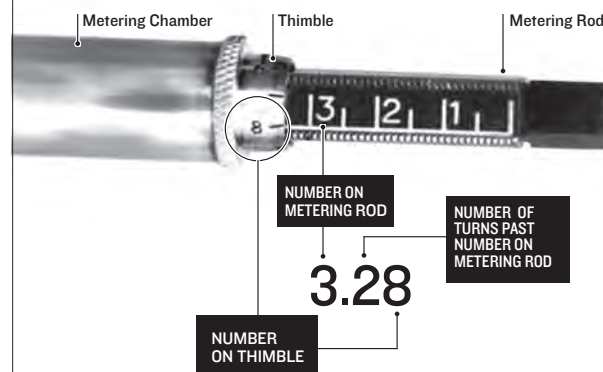
**Example: Desired charge is 43 grains of IMR3031.**

**Check the chart to find the volume of 1 grain is .0762.**

**Then .0762 x 43 grains = 3.28 (rounded off) cubic centimeters.**

- Turn the thimble to the number **3** on the metering rod for the whole number to the left of the decimal point. The #3 indicator line must be visible when the thimble is at zero.
- Turn two extra turns for the first number to the right of the point.
- Turn **8** marks on the thimble for the second number to the right of the point.

Now weigh your charge and you'll be very close to the correct charge. Chances are that it is not exact because the volume of one grain is not precisely the same for your particular batch of powder as that which we tested. This is because the powder manufacturer can't make every batch exactly the same.

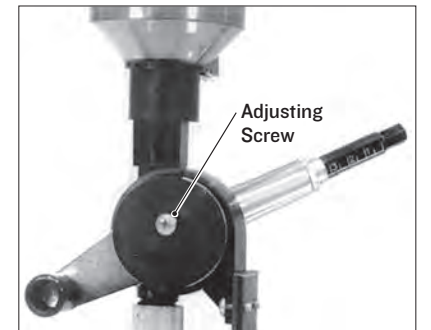


### Empty The Measure

This is one of the nicest features of the Lee Perfect Powder Measure. Simply rotate the hopper to the left to turn off the powder flow. Then work the lever a few times to empty the powder below the valve. Be sure to catch the powder. Now you can pull off the hopper and empty into the original powder can. Don't forget to turn the valve on before starting to reload the next time. The powder valve is positioned to also act as a powder baffle to enhance the accuracy of your measure.

### Rotor Tension Adjustment

When the measure leaves the factory the adjusting screw is set so 16 oz. of pressure is required to operate the lever. This setting is optimum for most powders. Extremely fine powders may leak very slightly at this setting. This causes no harm. Should you find it objectionable you may tighten the adjusting screw slightly. The rotor should never be so tight that more than four pounds are required to rotate the lever.



### Universal Powder Charging Die

This die permits the case to operate the measure, which not only makes the charging operation automatic, but prevents powder spilling if no case is present. It will work with most cases from the 218 Bee to the large 300 Win. Magnum. It will also work for pistol cases 380 ACP and longer. It will not expand the case mouth so the regular expanding die must still be used.

Because of the long travel needed to operate the rotor, this measure will not work with the Lee Powder Through Expanding dies that are supplied with Lee pistol dies. The Lee Auto-Disk Powder Measure should be used with these dies.

