

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.

$$\frac{\text{Micrometer setting}}{\text{Grains weight of sample}} = \text{setting for one grain (cc) (VMD)}$$

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.

$$\text{grams} \times 15.432 = \text{grains}$$

$$\text{grains} / 15.432 = \text{grams}$$

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	ACCUR #9	VMD	ACCUR 2460	VMD	ACCUR 4064	VMD
A NITRO100	.1349	ACCUR #9	.0657	ACCUR 2460	.0656	ACCUR 4064	.0755
ACC MAG PRO	.0663	ACCUR 1680	.0655	ACCUR 2495	.0748	ACCUR 4350	.0740
ACCUR #2	.0838	ACCUR 2015	.0730	ACCUR 2520	.0683	ACCUR 5744	.0752
ACCUR #5	.0623	ACCUR 2200	.0694	ACCUR 2700	.0685	ACCUR 8700	.0688
ACCUR #7	.0653	ACCUR 2230	.0657	ACCUR 3100	.0748		
ALLIANT	VMD	ALLIANT STEEL	VMD		VMD		VMD
ALNT 300 MP	.0667	ALLIANT STEEL	.1063	HERC 2400	.0742	RELODER12	.0691
ALNT 4000 MR	.0722	ALNT 410	.0804	HERCO	.1122	RELODER15	.0706
ALNT AR-COMP	.0753	ALNT E3	.1489	POWER PISTOL	.0889	RELODER19	.0706
ALNT VARMINT	.0651	AMER-SELECT	.1341	RED DOT	.1413	RELODER22	.0697
RELODER 17	.0697	BLUE DOT	.0865	RELODER 10	.0746	UNIQUE	.1092
SOLO 1000	.1331	BULLSEYE	.1064	RELODER 25	.0707		
SOLO 1500	.1099	GREEN DOT	.1262	RELODER 7	.0728		
HODGDON	VMD		VMD		VMD		VMD
BENCHMARK	.0715	H380	.0691	TITEWAD	.1300	IMR7828	.0725
BL-C(2)	.0645	H414	.0661	UNIVERSAL	.1099	SR4756	.1100
CLAYS	.1462	H4198	.0750	IMR 4007 SSC	.0725	SR4759	.0993
H 50 BMG	.0694	H4350	.0725	IMR 700X	.1343	SR7625	.1046
H LIL GUN	.0678	H4831	.0725	IMR 800X	.1071	AUTOCOMP	.0787
H RETUMBO	.0721	H4895	.0728	IMR PB	.1205	SUPRM780	.0684
H-LVR	.0653	HO US869	.0651	IMR TRAIL BOSS	.2172	WIN 231	.0931
H-PYRDX RS	.0811	HP38	.0926	IMR3031	.0762	WIN 296	.0656
H-PYRDX P	.0823	HS6	.0712	IMR4064	.0745	WIN 748	.0655
H-SUPRFORM	.0658	HYBRID100	.0726	IMR4198	.0792	WIN 760	.0666
H-VARGET	.0731	IMR 8208	.0710	IMR4227	.0769	WIN AA LITE	.1266
H1000	.0713	INTERNATIONAL	.1266	IMR4320	.0716	WIN SUPER HANDI	.0859
H110	.0656	LONGSHOT	.0824	IMR4350	.0735	wSUPER-FLD	.0840
H322	.0725	PYRODEX CTG	.1015	IMR4831	.0735	wSUPER-LIT	.0847
H335	.0645	TITEGROUP	.0848	IMR4895	.0728	wSUPER-TAR	.1205
RAMSHOT	VMD		VMD		VMD		VMD
R COMPETITION	.1278	R SILHOUETTE	.0796	RAM MAGNUM	.0661	X-TERMINATOR	.0681
R ENFORCER	.0693	R TRUE BLUE	.0684	RAM TAC	.0671		
R HUNTER	.0667	RAM BIG GAME	.0708	RAM ZIP	.0816		
NORMA	VMD		VMD		VMD		VMD
NORMA 200	.0677	NORMA 2010	.1434	NORMA 203	.0691	NORMA 205	.0672
NORMA 201	.0691	NORMA 2020	.1208	NORMA 204	.0677		
SOUTH AFRICA	VMD		VMD		VMD		VMD
MP200	.0892	MS200	.1061				
VECTAN	VMD		VMD		VMD		VMD
VEC AO	.1196	VEC SP10	.0668	VEC SP8	.0682	VEC TU5000	.0720
VEC BA10	.1350	VEC SP3	.0682	VEC SP9	.0682	VEC TU7000	.0704
VEC BA9	.0919	VEC SP7	.0658	VEC TU2000	.0762	VEC TU8000	.0704
VIHTAVUORI	VMD		VMD		VMD		VMD
v-3N37	.0913	v-N133	.0770	v-N165	.0712	v-N340	.1066
v-N105	.0900	v-N135	.0777	v-N170	.0713	v-N350	.0977
v-N110	.0833	v-N140	.0733	v-N310	.1214	v-N540	.0701
v-N120	.0776	v-N150	.0746	v-N320	.1210	v-N550	.0692
v-N130	.0754	v-N160	.0734	v-N330	.1079	v-N560	.0690

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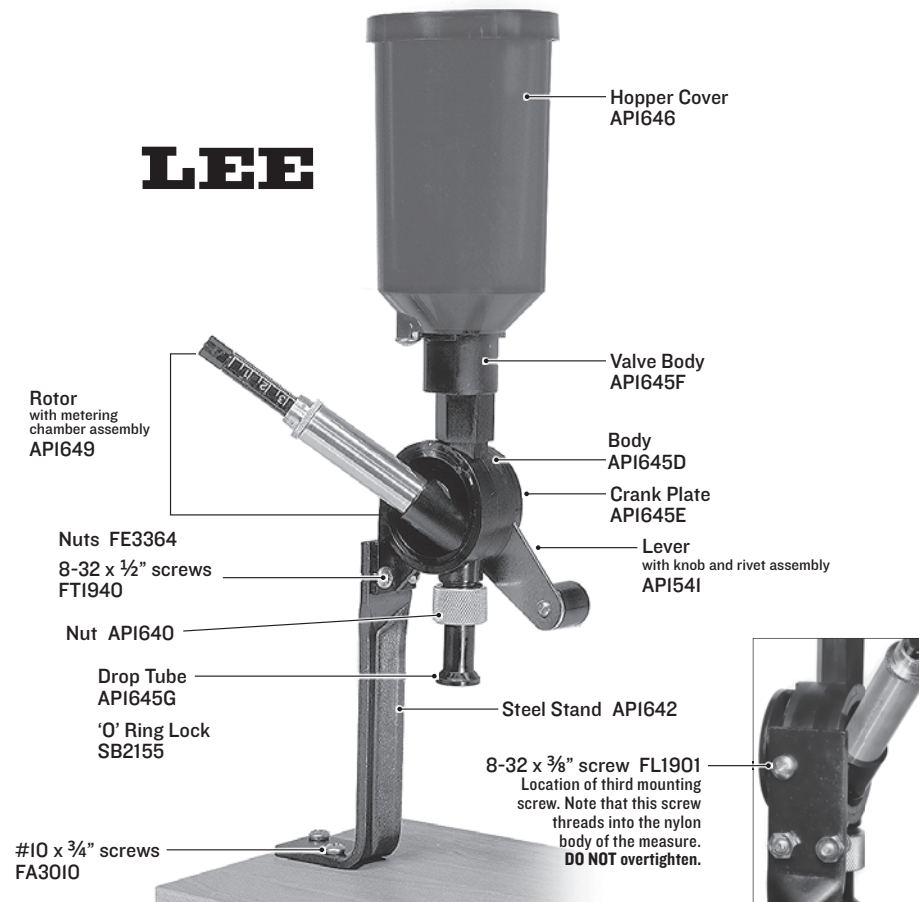
These numbers are approximate. To find out the exact volume of any powder see **CALIBRATING YOUR POWDER**. It is so very easy to do and saves a great deal of time when setting your measure.

LEE

4275 Hwy. U · Hartford WI 53027
www.leeprecision.com

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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.

AP1704

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 smokeless powder. Because black powder explodes in bulk, it should not be used in this powder measure. 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.



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.

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.

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 "0" 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 $\frac{1}{10}$ 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.

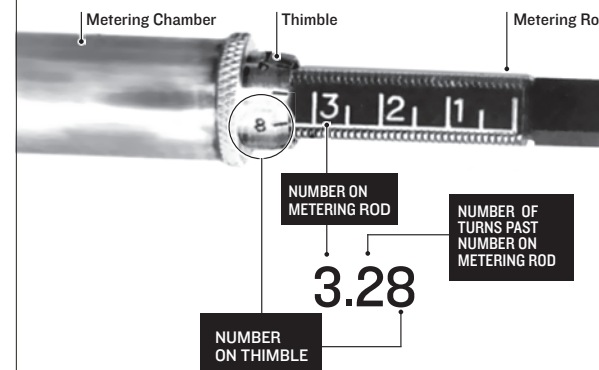
Example: Desired charge is 43 grains of IMR3031.

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.

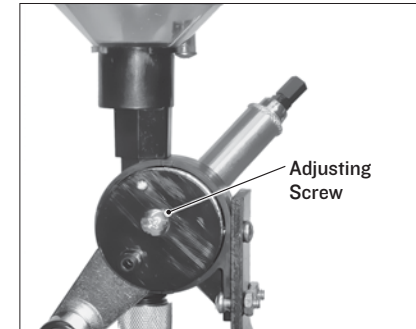


Empty The Measure

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 (for Progressive Presses only)

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. 90273

