



USER MANUAL

Version 1.1

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VULCAN - is the ancient Roman god of **FIRE**.

1. Introduction

Congratulations on your purchase of your own Vulcan Annealer Machine. You opted to buy the best frustration-free cartridge case annealing machine available on the market. What sets this advanced machine apart from the rest is the fact that you will not have to “fight” the machine with timing, feeding or operation. Competitor machines are frustrating to operate at best, and requires a lot of manual “baby-sitting”. The Vulcan Annealer requires minimal human interaction or intervention to operate. We trust you will enjoy this extraordinary tool.

This machine will provide you with years of service provided that you take good care of it and only use it as instructed.

Please read these operation instructions carefully.



IMPORTANT DISCLAIMER: even though we endeavour to provide you with the best possible advice on usage of your machine, using this machine remains 100% your own responsibility.

Using flammable materials are inherently dangerous, and as such safe and responsible use thereof remains your own responsibility.

2. Compatibility

The Vulcan Annealing Machine has the following compatibilities:

2.1. Electrical



110V AC - 240V AC INPUT using female C14M Euro connector




2.1. Gas

This machine uses a Bernzomatic UL2317 Pencil Flame Torch, which can be connected to the following gas fuel sources:

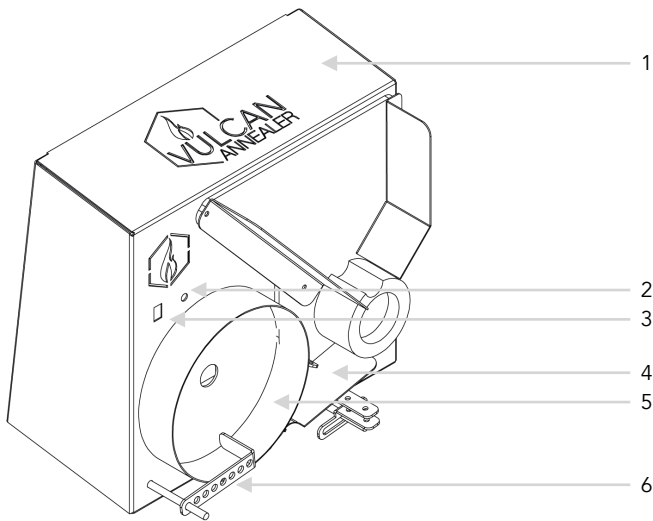


	<p>Propane</p>	<p>Use either a genuine Bernzomatic 400g/14.1oz (non-refillable) Propane canister (blue bottle) - SOLD SEPARATELY.</p>
	<p>MAP-Pro</p>	<p>Use a genuine Bernzomatic 400g/14.1oz (non-refillable) MAP-Pro canister (yellow bottle). Note that MAP-Pro burns significantly hotter than Propane, so take care when calibrating your machine as the brass will heat up much faster - SOLD SEPARATELY.</p>

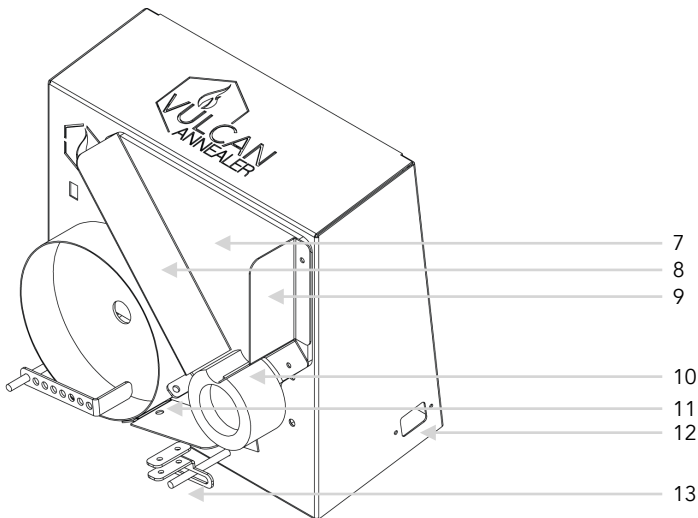
	LP Gas	Use any LP Gas ("liquid petroleum") gas canister, connected to the machine using the gas hose supplied. LP Gas (also "LPG") is mostly Propane (C ₃ H ₈), Butane (C ₄ H ₁₀), or a mix of both. SOLD SEPARATELY.
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NOTE: even though the machine is compatible with MAP-Pro gas (yellow bottle), we suggest to rather use Propane of LP gas options, due to the fact that MAP-Pro will heat up the case much faster, making it difficult to calibrate and get the exact temperature right before destroying the case.

3. Machine Components



1	Vulcan Annealer Enclosure
2	Burner Motor Speed Control
3	Power Switch
4	Feeder Ramp
5	Burner Wheel
6	Case Position Bracket



7	Case Hopper
8	Case Hopper Left Guide
9	Case Hopper Right Guide
10	Case Feeder
11	Case Beam Sensors
12	Power Socket
13	Pencil Flame Attachment Bracket

3.1. Included Package Contents

The following items are included with your purchase:

- Vulcan Annealing Machine
- Bernzomatic Pencil Flame Torch (UL2317)
- User Manual *
- C14M Power Cable *

3.2. **Required and NOT Included**

The following items are REQUIRED to operate the machine, and sold separately:

- **Propane/LPG Gas bottle** - see compatibility table above in §2.1.
- **Tray** (to catch annealed brass) - a kitchen baking tray or bread pan works well.
- **Lighter** (to start the gas flame) - a long-stemmed outdoor type lighter is ideal.
- **#10 Metric Wrench** (for making adjustments to the Pencil Flame angle).

PROPANE



* *Only available in certain countries.*

4. Brass Annealing Basic Theory

Brass, like most metals, will become 'work hardened' and brittle with repeated use. This happens as you repeatedly stretch and then resize brass (by shooting, then reloading the case again). Over time it becomes even harder, more brittle and more resistant to being worked. Eventually, the case will split and crack instead of expand in the chamber.

Much like a thin piece of steel – if you bend brass back and forth enough times, the metal will eventually snap. Not ideal when we are talking about a controlled explosion happening very close to your face. Brass Annealing is the process of 'rejuvenating' the brass which has the result of prolonging brass life and increasing consistency.

The critical time and temperature at which the brass metal grain structure reforms into something suitable for case necks is 662 degrees (F) for 15 minutes. A higher temperature, around 750 to 800 degrees, will do the same job in a few seconds. If brass is allowed to reach temperatures higher than this (regardless of the time), it will be made irretrievably and irrevocably too soft - effectively destroying the case.

Colour Change seems to be one of the most common methods of identifying the point where you go from the correct amount of annealing to over annealing. Colour changes occur at two points when annealing brass – both really indicating you are over annealing your brass. The first, the flame coming off the top of the brass will change colour to an orange – essentially, this means you are burning off material from the metal alloy, this might be zinc, it might be tin, depending on the exact composition of the brass (differs between manufacturers, even brass batches from same manufacturer). The second colour change is the brass itself. If your brass is glowing, you have over annealed your brass. Simple. Throw it away, you have potentially made it dangerous to shoot.

Another more accurate and consistent method to use is a chemical indicator in the form of heat sensitive paint – **Tempil** makes a couple of different heat sensitive options, such as Tempilaq and Tempilstik and are most commonly used. This paint melts at specific temperatures depending on which version/level you have. It's a great indicator – but again, it needs to be remembered, that different brass is going to have a different optimal temperature. Therefore, observing the specific brass as it's annealed seems the best method to get the perfect level of annealing.

When annealing, we only want to be heating the neck and shoulder. These are the two areas we want to be a touch more pliable – not the whole case.

5. Setup

Your Vulcan Annealing Machine is fully assembled, but does require some setup and checking before you should use it. Follow these steps to prepare your machine for use:

- Carefully unbox, and remove all packaging materials.
- Clear an area on a sturdy table where you want to use the machine. Place the machine on the front edge so that the case drop clears the table edge.

- **IMPORTANT:** do not operate an open flame anywhere near explosive or flammable materials (such as propellant, primers, gun oil/cleaner etc)!
- Make sure the Power Switch is in the OFF position, then plug in a power cord in the C14M connector.
- Place your cartridge catch tray under the case drop. An oven baking tray works well for this.
- Place a couple of cartridge cases in the case feeder (open-end facing you, primer side towards the machine)
- Do a "cold run" to check basic operation by switching on the Power switch (do not ignite the flame yet). The case feeder should take one case from the hopper, and place it in the queue. Then the burner should take that case from the queue, and spin it in the burn position. The feeder should place another case in the queue while the first one is in the burner. The case should fall freely from the burner into your tray, and the queued case should move into the burner. Check the burner speed control. This process should be repeated until the feeder is empty. Switch off the power switch.
- Securely connect the gas hose to the Pencil Flame burner.
- Securely connect the other end of the gas hose to your propane bottle. **NOTE:** do NOT add a gas pressure regulator to the hose. The Pencil Flame Torch requires direct connection to the propane gas bottle.
- Check that the burner end of the Pencil Flame Torch clears the feeding ramp, and points toward the edge of the case-position bracket (adjust if necessary).
- Open the gas tap/gas key on your propane bottle to start the flow to the machine.
- While holding a (burning) lighter in front of the Pencil Flame Torch, gently open the gas tap on the Pencil Flame Torch until the flame starts up. **CAREFUL:** take care not to burn your fingers. A long-stemmed "outdoor" lighter works much easier and safer .
- Adjust the pencil flame size using the tap, to get a feel for the adjustment range. You typically want a "sharp pencil" shape on the flame when using it.
- Close off the tap, and also close the propane gas bottle tap as well.

You have now successfully checked basic functionality. Next is to calibrate the machine for use.

6. Calibration and Usage

DISCLAIMER: we endeavour to provide you with the best possible advice to calibrate and use your machine successfully , however, the outcome remains solely your own responsibility.

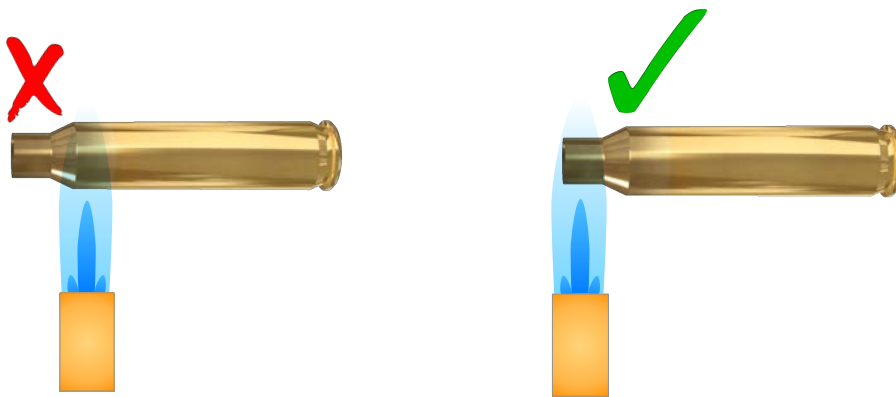
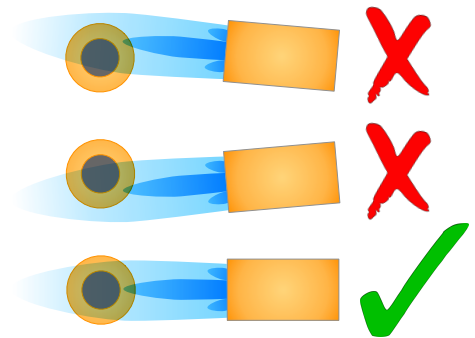
The best and most consistent results are achieved when you group your brass cartridge cases (of same caliber) by headstamp (brand), and re-check your calibration when you move from one brand to the next, as the metallurgical brass quality may differ slightly from one manufacturer to the next.

Also for best results, always use cartridge cases that are clean and free from dirt and/or fouling. The cleaner your cases, the easier it is to see and adjust the calibration of your machine.

6.1. Position of the Pencil Flame

The hottest point of the Pencil Flame Torch is just in front of the very tip of the blue “pencil” shape. Thus, you want to position the pencil flame to be just not touching the case mouth. This will be the most energy efficient with the least amount of waste.

The Bernzomatic Pencil Flame Torch comes with a mounting kit, already attached to the Torch and the Machine. To adjust, simply loosen the lock nuts using a standard metric #10 wrench, and make the necessary adjustments. The Torch can be moved in any direction, so getting the angle of the flame on the brass perfect is very possible. Adjustment will be necessary when you change calibers.



6.2. Temperature and Duration Calibration

To under-anneal a case has no benefit to the case at all, and to over-anneal it will completely ruin it and render it useless. It is thus critical to get the case temperature just right when annealing.

The temperature of the case will be determined by the distance of the flame to the case, the heat setting of the pencil flame (adjust by using the gas tap on the Torch), as well as the Duration the case will spend in front of the flame. The duration is adjusted using the speed control knob on the machine.

For best and most consistent results, we recommend using a temperature indicating product. We will also explain how to calibrate using colour change.

Generally speaking, the ideal annealing temperature is **750°F (±399°C)** for the case mouth for a few seconds, while the rest of the case body does not go over 475°F (±246°C). This temperature may differ between manufacturers and batches, and we recommend you experiment using this as a good starting point and finding a calibration that works for you.



- **Calibrate using Tempilaq / Tempilstik:** When using Tempilaq, paint a small amount of 750

rated on the inside of the case mouth (thus avoiding the direct flame - remember you need to measure the brass temperature and not the flame temperature). When the paint just starts to melt, it is perfectly on temperature. Some suggest using Tempilaq 650 and paint it on the base side of the case shoulder. Tempilstik is a "crayon" type indicator, which you simply push against a hot surface to test (such as the case mouth just as it comes out of the flame): if it starts to melt then it is on the desired temperature.



- **Calibrate using Colour Change:** Even though this is the least accurate/consistent, good results can still be achieved. This technique requires you to work in a dimly lit room, so you can visually inspect the colour of the brass while in the flame. It is suggested that the ideal colour of the brass (case mouth part) is a "dim cherry red" when on the ideal temperature. You will have to experiment yourself to get this temperature just right.

6.3. To Quench or Not to Quench?

There is no gain **and** no harm in rapid cooling brass from a metallurgical sense. Brass can be quenched ("cooled very quickly") without losing the affects of the softening that comes from annealing the cases. Rapid cooling does nothing to the annealed soft brass - it stays soft. What rapid cooling can add is the convenience of touch and handling of the annealed case without burning your fingers.

7. General Usage Tips

Here are some general tips and tricks that may help with operation the machine:

- To prevent inconsistencies in case feeding, do not overload the case feeder. The case feeder can take approximately 100 cases of 223REM. Loading more cases than that may be possible, but may lead to inconsistent feeding.
- Place the machine close to the edge of the table, so that the annealed cases can freely drop out without hitting the table edge.

8. Care and Cleaning

Your Vulcan Annealing Machine should generally run very clean, provided that you use clean cartridge cases to anneal. Use a damp cleaning cloth with a mild detergent soap to wipe off the exterior of the machine. Do not use any harsh chemicals!

The Vulcan Annealing Machine uses Infrared beam sensors to detect a cartridge case in the queue. It is important to keep the sensors clean for consistent operation. If cleaning is needed, gently wipe them off with a soft non-abrasive cloth. NEVER use any chemicals on the sensors!

9. Warranty and Repairs

This machine carries a 12 month manufacturers warranty, from the date of purchase. The terms and conditions are as follows:

- Please retain your proof of purchase (Invoice with machine serial number) from your official reseller.
- In case of a manufacturer's defect or DoA (Dead on Arrival), within 7 days of purchase, the defect machine will be replaced with a new one.
- In case of a manufacturer's defect, after 7 days of purchase, the machine will be sent to the manufacturer for repairs (or replacement at the sole discretion of the manufacturer).
- All warranty replacement and repairs are subject to stock and parts availability.
- All shipping/freight costs related to warranties and repairs to get the machine to the manufacturer will be for the customer's account. If the machine is then replaced or repaired under warranty, the costs of shipping it back to the customer will be carried by the manufacturer. For out of warranty machines: all shipping/freight costs will be for the customer's account.
- In case of an out of warranty repair, the manufacturer will provide the customer with a quotation for repair costs (also an estimation of the time required to perform the repair). Repairs will only start once the customer accepts the quotation by means of payment.

IMPORTANT: your warranty will be null and void when:

- The machine has been tampered with, or modified in any way,
- If the tamper seal is broken or violated,
- If your machine shows any signs of abuse.