VBM

2B system
overview

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1. Safety Warnings and Cautions

To get the most out of your new Vibiemme espresso machine and for your own personal safety it is highly recommended that you take the time to read this manual in its entirety.

CAUTION: This quick start guide is meant for those more familiar with the operation of an espresso machine. If this is your first espresso machine, or if it is your first machine, we recommend reading the manual thoroughly before beginning. Damage done to the machine due to improper operation is not covered by the warranty.

• All Vibiemme espresso machines are heavy. Take care when lifting or moving them. Place them on a suitable surface which can support their weight.

• Place power cord where it cannot be tripped over. The use of an extension cord with this machine is not recommended.

• This machine draws a lot of electrical current. Be sure that the circuit into which it is plugged can handle the draw and is protected by a GFCI (consult an electrician if in doubt). If the circuit breaker is repeatedly tripped or the circuit's fuse repeatedly blows, consult an electrician to determine the cause. A possible solution may be to use a different circuit or to be sure that the Vibiemme espresso machine is the only device using that circuit.

• Even the manual model contains an electronic control for the boiler auto-fill system. Additionally, the heating element can be burned out from a power surge. Breakdowns caused by power surges are not covered by the warranty.

• There are a number of outer surfaces and components that present a serious burn hazard while this machine is in operation, and for some time even after it has been turned off. Areas like the grouphead, steam wand, and hot water are hot enough to cause second degree burns.

• All Vibiemme espresso machine machines are designed to be left on all day. This can create a safety hazard because of hot outer surfaces and easy access to hot water and steam wand valves as well as the brew switches. If there are children, elderly, pets, or others in the home to whom these may be a hazard it is important to assess the level of danger to them and act accordingly to mitigate the danger. Possibilities include placing the machine in a room or location that will not be accessible to them or to turn the machine off when not in use.

• The steam from this machine can quickly cause deep and serious burns. Use great care when steaming.

• The hot water from this machine can be at or very near the boiling point. Use caution whenever dispensing hot water.

• Some of the chemicals necessary to maintain this machine can present a safety hazard. Thoroughly read all directions, warnings, and cautions on all products before use. Be absolutely sure that the products you are using are appropriate for this machine. Misuse of a product or using the wrong product for some procedures can cause severe damage to the machine.

• The massive **Grouphead** will remain quite hot for some time after turning the machine off. The thermosyphon will continue to circulate hot water through the internal parts of the **Grouphead** for a while even with the machine unplugged.

• When shutting the machine down, aim the steam wand and the hot water wand over the drip tray so if the machine is turned on with a valve open the steam or hot water will be less likely to cause burns to anyone nearby.

• Never immerse the machine in any liquid, and do not allow liquids or other foreign matter to drip or pour through the top of the machine.

• If a puddle of water appears under the machine, immediately unplug it from the outlet, and turn the power switch on the machine to position 0. Check to see if the **Drip Tray** is overfilled. If not, contact your reseller/retailer for diagnosis and technical support (solo sui modelli Domobar junior e super).

• On the instruction manual are missing, incomplete or incorrectly reported the following information / instructions:

• This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.

• If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.

• This appliance is intended to be used in household and similar applications such as:
  – staff kitchen areas in shops, offices and other working environments;
  – farm houses;
  – by clients in hotels, motels and other residential type environments;
  – bed and breakfast type environments.

2. Welcome and Thank You!

Congratulations on your choice of a Vibiemme espresso machine (in Italian the name is pronounced "Vee•Be•Em-may Dough•Mow•Bar"). Regardless of which model you purchased, we regard these machines as the top of the line in home espresso machines and we think you will as well. We want you to be successful in your espresso making endeavors, and to that end we have provided this guide to help you get started.
Although this guide was created with the new barista* in mind, it also contains lots of useful information about your new Vibiemme espresso machine for those experienced in the art of espresso.
We highly recommend reading this manual in its entirety before using your Vibiemme espresso machine! Keep this manual handy and refer to it often.
Patience is, indeed, a virtue, and it is so with making espresso. The machine you have just purchased will last many years with proper care, and your skills will improve over time as well. Don't expect the very first espresso you create to be perfect, and if your early efforts are delicious, don't be surprised if you make a few drinks sometime later that are not up to that standard. This guide is designed to help you make as many of the former and as few of the later as possible. It is written to give you an understanding of the machine, the process, and how to diagnose and overcome some of the more common problems associated with creating espresso. To help you enjoy your machine as long as possible we have also included a chapter on maintenance.
The process of getting an espresso machine and its grinder and all the variables involved in making espresso aligned is called "dialing it in." Just because you bought a good cut of beef and have a nice stove, it does not mean that you are about to cook a great steak. Just because you have one of the finest espresso machines available does not guarantee that the espresso is going to be great every time. It takes attention to detail and the right ingredients, combined with some skill and finesse to make great espresso. It is a difficult skill to master.
As you begin learning how to make fine coffee beverages, the best advice we can give is that your early efforts should be aimed at consistency. Mastery of the machine as well as the process comes from repetition. The best skill to hone as you begin is the ability to do all the various steps the same way each time. When that happens, small changes can be made in experiments to improve the flavor of the espresso. That is the difference between being a person who makes espresso and becoming a barista, or, if you will, between a cook and a chef! We want to help you go from a person who makes coffee to a person who creates fine espresso. Follow this guide and practice, practice, practice, and soon you will have all your friends, family and neighbors clamoring for you to throw yet another espresso party!

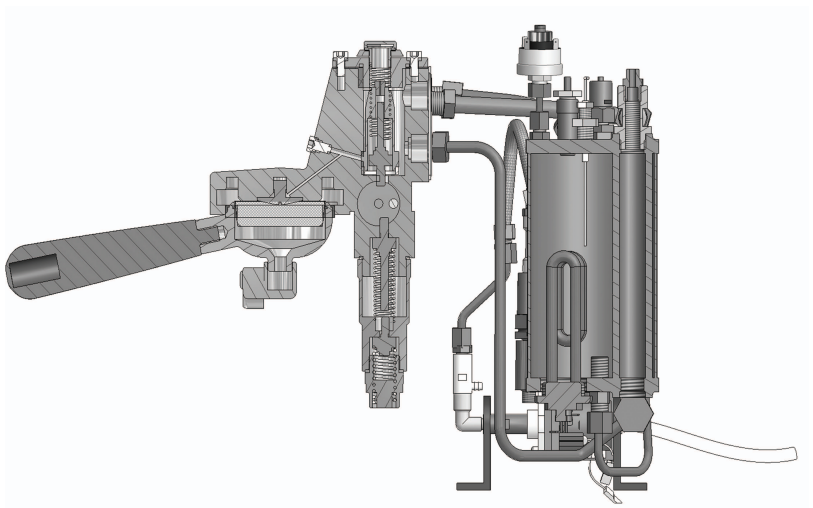
*** In Italian, a barista means bar keeper, but here the term is more often used to identify a person experienced in making espresso.**

3. How it Works

We feel that before you begin using your new Vibiemme espresso machine that it would be a good idea to give you a basic understanding on its inner workings. This knowledge will give you a better understanding of the rest of this guide.

3.1. Double boiler general concept

Double boiler technology is conceived to separate the two functions 1) brew espresso) and 2) steam milk by separating the two boilers dedidated to each function. The coffee boiler temperature setting is made through a heating part driven by an electronic probe (**PID push-button**); whereas the steam-hot water boiler setting is made using another heating part mechanically driven by a pressure stat (pressure stat screw).



The large rectangle represents the case of the Vibiemme espresso machine. It houses all the mainly working elements of the machine as shown above: Brew boiler, Steam boiler , Boiler pressure gauge, Brew gauge and Grouphead

3.1.1 Coffee Boiler: hydraulic principle

The coffee boiler works following the recessed surface principle (same quantity of water in and out) so there will always be only water without steam.
The water inlet is previously heated by passing through a heater placed inside the steam boiler: when it is on, the heated water will arrive inside the coffee boiler at the constant temperature of approx. 88 °C, so assuring a thermic stability during all working conditions.
When it is off (only on Domobar super – double boiler version), thermic stability will be assured by a boost of coffee boiler element driven by the electronic box in case the probe feels temperature decrease of more than 2 °C.
Note: from our tests, even when steam boiler is off, the boost never lighted; in case this should happen, an electronic check on the rated powers will always assure a power consumption below 15 AMP (only on Domobar super – double boiler version).

3.1.2. Coffee boiler: temperature checking (PID)

Coffee boiler temperature is electronically driven through the PID technology: When the desired temperature value is inserted, the electronically driven probe will activate the heating element; once the setted value is reached, the electronic box will disengage the heating element.
Temperature values can be setted by 1°C or 1 F step.
Only on the Domobar Junior 2B version, the coffee boiler temperature is mechanically adjusted by means of a thermostat.

3.1.3. Coffee Boiler and offset technology

There is heat energy lost between the boiler through the copper thermosyphon pipes as the water is pumped out of boiler, and again in the grouphead, so there is a difference (in terms of °C) in the temperature read by the probe in the coffee boiler and the temperature out of the grouphead : this is the OFFSET.
This parameter is strictly linked to the manufacturing features of the machine and it must be considered a default value (factory parameter). The idea is to have the correct temperature at the coffee, so to compensate for the loss of thermal energy the designers compensate with a higher boiler temperature.
In the Vibiemme espresso machines the offset parameter is adjusted by means of the electronic box, so the displayed temperature (during setting as well as shown on the display) is already taking this difference into consideration. Besides, since the peculiarity of coffee boiler inlet water pre-heating (see 3.1.1.), the OFFSET values differ in the different configuration phases; Steam boiler On – Steam boiler OFF.
Don't worry: the electronic box is preset to the automatic change of that value, relating to the selected machine configuration. (only on Domobar Super model).

3.2. Steam boiler

Differently from the coffee boiler, the steam boiler is not fill in with water, because it has to respect a certain proportion (approx. 2:1 or 3:2) between water and steam quantity; this ratio is determined by the water sensor level. The water level sensor is a special wire that is passed through the outside of the boiler. It sends a small electrical current through the water to the boiler's inside surface. If the sensing wire is not touching the water it cannot send the electricity through the water. An electrical wire is connected to the end of the sensor to the control unit. If the water level is too low the control circuit turns the pump on and at the same time a valve opens to direct the water into the boiler. How far this sensor is pushed into the boiler determines the level of water in the boiler. Pushing it in further maintains a lower water level. Pulling it out creates a higher water level in the boiler. Among other things, the water level determines the amount of steam stored in the boiler.
Inside the case the boiler is the largest single component. In normal operation the boiler will be about one half to two-thirds filled with water. Immersed near the bottom of the boiler is the heating element. When the heating element is energized and the water begins to heat, some of the water turns to steam, and the pressure inside this closed vessel begins to increase.
To control the temperature of that water there is a device called a pressurestat- a pressure-controlled switch. When the pressure in the boiler reaches a certain level the pressurestat turns off the element. This cycling can be seen through the activity of the **Heating Element Indicator Lamp** on the front panel.

But why sense pressure in the boiler when it is temperature in which we are interested? Pressure is an indirect measurement, but one that is easy to control and yet accurate without using more complicated electronics. Heated water at a given pressure is always at a predictable temperature. That is indicated by the left-hand gauge on the front panel of the Vibiemme espresso machine. As the temperature changes in the boiler you will see the **Boiler Pressure Gauge** rise and fall.

3.3. Boiler Pressure Gauge

The **Boiler Pressure Gauge** on the front left of the machine is calibrated in "BAR"(scale 0,5 to 2,5); that is barometric pressure. The boiler works like a pressure cooker in that as the pressure in the boiler increases the boiling point of water in the boiler increases:

Boiler bar	Boiler temp.
1.0	253 F. (123 C.)
1.1	255 F. (124 C.)
1.2	257 F. (125 C.)
1.3	259 F. (126 C.)

A Quick Science Lesson (no homework required)
Gauge readings can be confusing. Let us try to make a bit more sense of it. The **Boiler Pressure Gauge** is reading the pressure above the outside pressure, so a reading of 1 BAR is actually a pressure of 2 BAR in the boiler.
The laws of physics teaches us that at a constant volume, as the pressure of a gas increases or decreases, by the same factor does its temperature increase or decrease. In plain English, as the pressure in the boiler rises so does the temperature in the boiler.
Just like in a pressure cooker, the rising pressure of the steam in the boiler allows us to actually raise the temperature of the water without having it boil. This temperature which is above the boiling point of water also allows so temperature drop between the boiler and the grouphead so that when the water reaches the coffee it is at the correct brew temperature.

3.4. Brew Pressure Gauge

The information that **Brew Pressure Gauge** (on the front right of the machine calibrated in "BAR"scale 0 to 16) displays can actually be confusing. When the machine is at idle (or actually at any time other than when brewing espresso) the readings of this gauge should be ignored. Its only function is to report brew force and at any other time the reading is not reporting anything of note at all. During the brew cycle the reading should be in the range of about 9 to 9.5 bar if rotary pump Vibiemme version or 11.5 to 12.5 bar if vibration pump Vibiemme. That statement is only accurate if all other factors are right. More on that later in this manual.

3.5. Back to the Machine

When you need steam you open the steam valve and steam is drawn off the top of the boiler. This will cause a drop in pressure in the boiler which will again trigger the pressurestat to turn on the heating element to help maintain the boiler's temperature. You may also hear the pump occasionally cycle if the boiler's water level goes below the sensing wire..

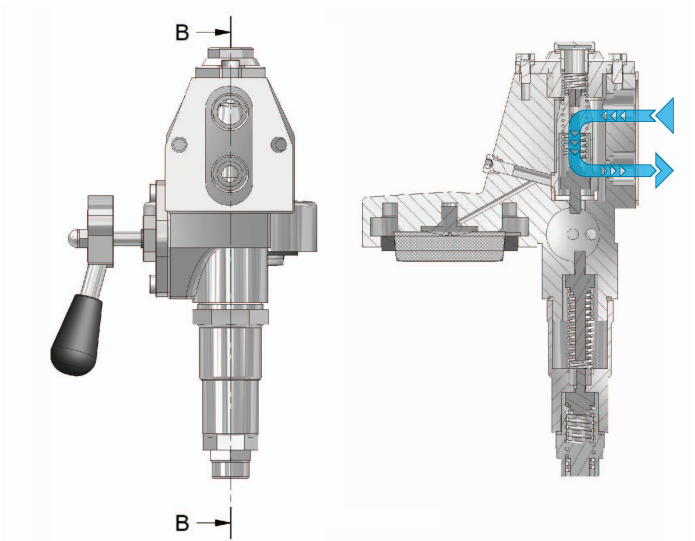
WARNING: The steam comes out with a lot of force and can cause serious burns. Use great care when using the steam function.

When you need hot water, you open the hot water valve and the pressure of the steam as well as the pump pushing water into the boiler force hot water through the wand. The machine automatically routes the water to the boiler or on what mode the machine is in at the time. Limit the dispensing of hot water to no more than about six ounces at a time. After drawing water allow the pump to refill the boiler and the boiler to come back up to temperature before further use.

WARNING: The water which is being dispensed can be very near the boiling point, please use great care when dispensing hot water.

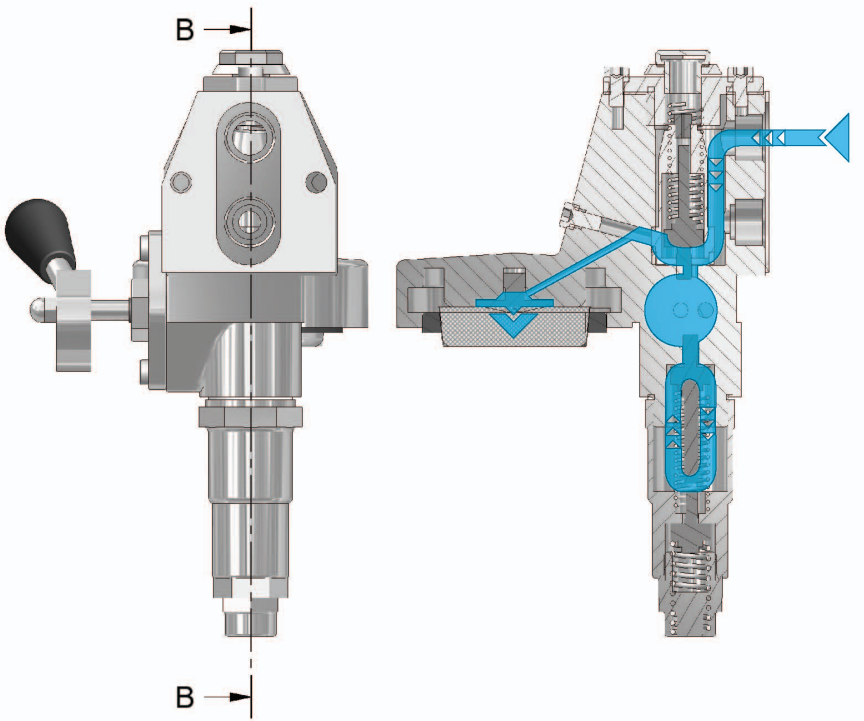
3.6 The grouphead

The E-61 grouphead, originally designed by Faema in 1961 (reportedly a year that had an Eclipse, thus creating the components of the name “E” and “61”) has a thermosyphon design. The Thermosyphon is a water path from the brew boiler, through the grouphead, and back to the brew boiler. The upper connection channels hot water into the grouphead (hot water rises) where it transfers heat energy to the massive amount of metal there. The water cools just a little as it leaves its heat energy in the metal. This water becomes ‘heavier’ as it cools, and the cooler water “sinks” back into the brew boiler. This convection current continues to heat the grouphead while the machine is on (and even for a time after it is turned off). This helps create a consistent brew temperature throughout the brewing path- a critical component for quality espresso.
When at rest (as in this first image) the water circulates from the brew boiler, through the grouphead, and then back through the brew boiler. This flow is indicated by the arrows.
This is a passive system, powered through convection. Note that the brew valve is closed, and the coffee is isolated from the water flow at this time.



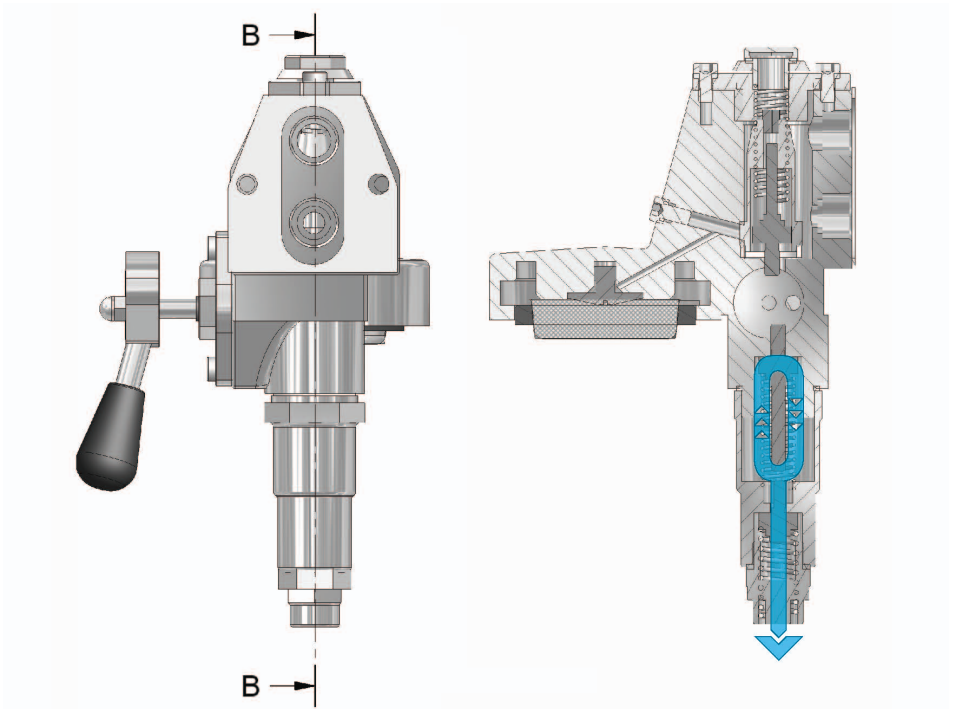
3.6.1. Brewing

When in brewing mode the valve opens and the pump is activated. Hot water, under the force of pressure created by the pump, forces water through the coffee which comes out the as espresso.
The only path the water can take is through the coffee.



3.6.2. Way Valve Operation

When the brewing process is stopped, the valve is returned to its off position. There is still some water, under pressure, trapped above the coffee. When the brew path was closed to stop the flow of water from the brew boiler to the coffee, it opened a path from the coffee, through the grouphead, and through the 3-way valve which leads to the drip tray. A "woosh" of pressure is relieved sending the excess water and coffee into the drip tray. This relieves all pressure on the brewing area so that the portafilter can be immediately removed without fear of being sprayed by hot water or coffee grounds.



4. It's About The Coffee

Let's take a break just for a bit and talk about coffee. Whatever the beverage you intend to make with your new Vibiemme espresso machine, they all start with two things- water and coffee. It should be apparent that the coffee taste of the beverage, whether it be a strait espresso, an Americano, latte, or cappuccino, comes from the coffee beans that you use.

First and foremost, it is critically important that the coffee you use be fresh. Whatever the brewing method, fresh coffee is always important, but never more so than when making espresso. If you buy coffee in bags or cans that say, "Best if Used By...," followed by a date that is months away, you can just about be sure that it is not fresh.

These beans, if properly packed, may be drinkable for the first day or so after opening, but it doesn't take long for them to begin to taste stale. For espresso, coffee that is more than about two or three weeks old from the time it was roasted will probably not make the best possible beverage. The first time that you are fortunate to pull some shots using coffee that is just a day or two old you will immediately notice the difference. If you are not roasting coffee at home, the best source of whole-bean, freshly-roasted coffee might be in your local community. Find a local coffee roaster that can supply you with fresh beans. Ask them when they roast and try to pick up your beans as close to the roasting date as possible. If you cannot find a local roaster look for an online reseller who can supply fresh beans. Don't be afraid to experiment. Order beans from various suppliers until you find something you like.

We mentioned "whole beans" in the previous paragraph. We recommend that you never use pre-ground coffee in your Vibiemme espresso machine. When making espresso, the size of the coffee particles is critical and so grinder adjustment is a huge part of making espresso. Beyond that, once coffee is ground it should be used within in a few minutes. Whole beans, ground per use in a quality grinder, is the only way to get the best tasting espresso from your new machine. In many ways the grinder is more important than the espresso machine!

The roast is also very important. One of the most widely-held misconceptions is that coffee beans used for espresso need to be very dark roasted. If you look at the bins of stale coffee at the supermarket you will actually see nearly-black beans in a bin marked "Espresso Roast." That couldn't possibly be much further from the truth. There is no such thing as "Espresso Roast." Very dark and oily beans are almost always over-roasted for most any coffee making method, especially espresso. If you like the taste that dark-roasted coffee gives then that is fine, but give yourself the opportunity to experience the taste of properly roasted coffee which should only exhibit a few drops if oil here and there, and have a dark oak or mahogany color to

them. If there is a rule about roasting and espresso, we can say that the darker the beans the less they will taste like coffee and the more they will taste of the roast alone. Additionally, if we risk a generalization once again, the darker the roast the more bitter the espresso.

If you are in a situation where you need to store beans for more than a week or ten days, the best solution is as follows: divide the coffee into a number of two or three day portions. Place these in glass canning jars of a volume that allows each jar to be filled as fully as possible so that as much air as possible is displaced. Seal the jars tightly (vacuum packing is not necessary) and place them in your freezer- the colder the better. Remove one jar the evening before you need more coffee, in order to allow them to come up to room temperature before being opened. This eliminates condensation on the beans. When that jar is nearly empty, take out the next jar to repeat the process.

5. Cooling Flush

One of the benefits of the Vibiemme espresso machine is the thermosyphon built into the E-61 **Grouphead**. Convection acts to recirculation hot water through the **Grouphead** which helps create thermal stability throughout the brewing path which goes a long way to helping you get consistent results. But under certain circumstances that same system can cause the **Grouphead** and heat exchanger to become overheated, and if you do not act to control or mitigate that situation, when you pull a shot the coffee may be subjected to steam and over-heated water which will create a bitter beverage. What to do? If the machine has been left on and has not been used for more than about three to five minutes to brew espresso, before preparing to make an espresso it is important to do a cooling flush. This involves turning on the machine as if you were going to make espresso, but without the **Portafilter** and you don't need to use a cup. Just pull a shot and when the sputtering of the steam ends and a stream of water without steam comes from the **Grouphead**, count an amount of time, then turn the brew cycle off. This cooling flush will pull the excess heat from the brew boiler and **Grouphead**, returning these parts closer to a 'normal' brewing temperature.

The second part of the cooling flush involves a short wait for the temperature of the brew boiler to stabilize. This happens fairly quickly- figure between about fifteen to forty-five seconds. Coincidentally, that's about the amount of time it will take you to get ready. Once the cooling flush has been accomplished go about making coffee as usual- wipe the **Portafilter** dry, grind, dose, tamp, lock the **Portafilter** and pull the shot (this process is explained in detail in the next chapter).

As you get more accustomed to making espresso and your results become more consistent, you will be able to use this cooling flush and wait time to fine tune the process to match your tastes, the coffee you are using, and the type of drink you are making. As an example, making a cappuccino or latte you can use a slightly higher temperature so you would use a shorter cooling flush. If you are going to have a straight espresso, a slightly longer flush is required to get a smoother taste from the slightly lower brew temperature. The difference can be as little as one or two degrees, but in the world of espresso, two degrees is a lot of degrees.

How long is a "shorter" or "longer" cooling flush? That is something your taste buds will teach you as you get more and more adept at using your Vibiemme espresso machine. If you find you get the same taste every time with a ten second flush, try an eight second flush for a while. Not working for you? Try a twelve second flush for a few days.

These sorts of little experiments are all part of the learning process. Remember that it takes patience, practice, and attention to detail to become consistent enough to be able to tell how these little changes affect the taste of the espresso! For now, just try to do everything the same way until you get a taste that is the same every time.
That might take weeks or even months. Not to worry. The skills you are learning will last a lifetime- much like your Vibiemme espresso machine

*1 If you are researching the E-61 **Grouphead** and the cooling flush you will find data that suggests a flush time as low as two or three seconds all the way up to about thirty seconds. Although there are a lot of E-61 groupheads out there, the E-61 Grouphead of the Vibiemme espresso machine is unique as it tends to not overheat quite as much as some of its competitors. The general rule is, the longer the machine has been idle the longer the cooling flush needs to be. Start with a flush of about ten seconds and work from there. As you get more experienced you will be able to adjust your cooling-flush-and-wait procedure by taste.

6. Grind, Dose, Tamp

Let's put it to work! If this is your first time making espresso, don't worry if things do not go quite as planned. Even the most confident and respected of baristas will pull a bad shot once in a while. There are a lot of variables that can turn what might have been a good beverage into something that should be tossed down the sink. With patience and practice you will get a feel for the process and become more and more successful in your efforts.
As we outline what you need to do to prepare coffee for pulling a shot of espresso please be aware that there is no one correct or best way to do this. Debates over this procedure continue to this day (and will likely continue for decades) and many people have written articles, and even books on this process. These simple instructions are meant to give you a starting point. Over time you will create and refine your own procedure. Think of the following as a foundation from which to build.
Your goal at this point, as we have mentioned, is consistency. You are trying to do all these tasks the same way each time. The one variable that you should be adjusting at this point is the grind which is discussed in the next chapter in greater detail.

WARM UP You should have already chosen the **Portafilter** and basket for your current needs (a double basket for a two ounce shot or a single basket for a one ounce shot). It should have been locked into the **Grouphead** while the Vibiemme espresso machine was warming up. At the same time, place your cups on the cup warming tray (the top of the machine, near the front). Pre-warmed cups will allow the espresso to hold its crema and taste longer.

COOLING FLUSH (if necessary): As described on the previous page, if the machine has been left on and has not been used for a while, this is the time to do a cooling flush. This signals the beginning of the procedure for making espresso.

GRIND and DOSE Since we are about to grind coffee, let's take a brief aside to discuss the importance of the grinder itself. A huge part of espresso is a very finely ground coffee with as little dust as possible, and with particles in a controlled size range. We cannot emphasize too strongly that your choice of grinder is critical for quality espresso. You have purchased a very fine espresso machine and to get the most from it you need to use a grinder of equal quality. A high-quality grinder specifically designed to be used for espresso is highly recommended.
The best of these are designed to have an infinite range of adjustment so that fine-tuning of the grind can be accomplished. For best performance, we recommend a stepless grinder. If you are shopping for a grinder or are not sure whether your grinder is up to the task at hand, please give your reseller/retailer a call to discuss what grinder will best fit your needs.

Remove the pre-heated **Portafilter** from the **Grouphead** and use a clean towel to wipe the inside of the basket dry. Perform the cooling flush, and then following the directions for your grinder, set it for espresso (a very fine grind, almost like flour), and grind your fresh coffee beans, slightly over-filling the basket. As you fill the basket with ground coffee try to move the **Portafilter** just enough to help the grounds fall from the grinder in such a way so no voids are left. Getting the grind exactly correct will be discussed in detail in the next chapter.

LEVEL Level off the mound of coffee in the **Portafilter** using a suitable tool. The straight handle of a plastic coffee scoop works well. With some practice, even the backside of a bent finger can be used. Try to accomplish two things- the first is to not compact or compress the coffee. Work across the coffee and not downwards. The second goal is to try to fill all voids that may remain. Do that by working the coffee across in one direction and then change direction and push the coffee across again another to accomplish that goal.

TAMP The coffee needs to be physically compressed now. A proper-sized tamper is necessary to do that. The material, handle length, and even the shape are less important than having a proper fit. It should be as large in diameter as possible without binding in the basket. The Vibiemme espresso machine use a 58mm tamper. The handle of the tamper should match your hand well enough that it allows you to press downwards without tipping the base.

Place the **Portafilter** on a firm surface that is protected from the metal tips of the spout and press downward with about thirty pounds of force. For your first few attempts it is advised to use a scale to measure the amount of force it takes to accomplish that. If you are new to this process, the amount of force needed is probably a lot less than you might think!

A more advanced tamping technique would be as follows: Start by tamping with about 20 pounds of force. Remove the tamper and CAREFULLY and GENTLY, tap the top of the tamper handle against the outside of the **Portafilter** body. The goal is to knock off any loose coffee trapped around the sides inside of the basket. Finally, tamp straight down once again with about 25-35 pounds of force. Giving a twist to the handle to "polish" off the coffee can help create a consistent surface to the coffee.
Whichever tamping method you used, the next step is to place the tamper off to the side and use your hand to wipe off the loose coffee from the edge of the basket where it will seat up against the grouphead gasket. Many baristas will invert the **Portafilter** over the grinder's doser to clear it of loose coffee (if you have a doserless model, do this over a small bowl). This is also a good test to assure that you have properly tamped the coffee. Do this carefully because every once in a while all the coffee will fall out of the basket!

Another variable not yet mentioned is the dose- that is, just how much coffee is the right amount? One method is to weigh the coffee. Record the weight of the complete **Portafilter** before adding the coffee, and then weight it again after you finish the tamping. You will need an accurate gram scale with a resolution of one gram (or less) to do this accurately. Figure about 16 or 17 grams of coffee for a double and about nine grams for a single as a good starting point.
If you do not have a gram scale handy, another method is to finish tamping the coffee as before and then lock the **Portafilter** into the **Grouphead**, then remove it before pulling the shot. The coffee should not have been disturbed or marked by the shower screen. If it was marked or disturbed then you need to dose a bit less coffee into the basket next time.
Move the **Portafilter** over to the **Grouphead** and carefully lock it into place. Use caution so as not to bump the **Portafilter** which can dislodge the coffee in the **Portafilter** and cause a poor shot.
We are ready to make espresso!

7. The Espresso Speedometer

It's time to actually make espresso! The coffee has been ground and tamped into the **Portafilter**, and the **Portafilter** locked into place. All that is left to do is to place a cup under the spout(s) and switch the machine into brewing mode (see Chapter 3 for details on how to operate the various models).
Espresso has speeds- more accurately, it has rates of flow while being created. When you switched the machine to brew, the pump pushed fresh water into the brew boiler which displaced hot water and forced the hot water through the **Grouphead**, through the coffee, and out of the **Portafilter** into your cup. How it emerged, what it looks like, and hot fast it flows are all indications as to how well the previous steps were performed.

How Much, How Fast?

There is a range of volume of espresso that should take a certain amount of time to be created. Whether it is a double or single, the "pull" should be about 25 seconds. The term "Pull" comes from the original espresso machines that were lever operated and the barista had to "pull" the lever to push the water through the coffee.
As the espresso issues forth from the **Portafilter** spouts you will notice that some pulls issue forth too slowly and other pulls it might flow much too fast. There is a "sweet spot" that is sometimes referred to as the "Golden Rule of Espresso." The general parameters that define this (for a double espresso) are about two ounces of espresso in about 25 seconds. For a single it is about one ounce in the same amount of time. We purposely state "about" because this is not so much a rule as it is just a guideline- a starting point. It should be considered just a foundation from which to begin your espresso adventure.
As you get started, don't get too caught up in timing and measuring. Excellent espresso can be made in a range of about twenty to thirty-five seconds. A very tasty double can be as little as 1.25 ounces to as much as 2.5 ounces. Think of these parameters as a bell curve with the greatest percentage of success to be at the central peak of the curve.
Learning what various flow rates look like so that you can visually identify when things are working as they should, as well as when they are not, is a good place to begin. Below you will learn how to differentiate a good pull from bad as well learn solutions to most common problems.

Too fast

A flow of espresso that is issuing forth too quickly will lack viscosity- it is thin and watery. The color of the stream is quite light in color which is a sign of under-extraction.
Causes of a fast, pale flow can include:

• Too coarse of a grind. Set your grinder to a finer grind. How much finer? It depends on the grinder itself. As each brand works differently you will need to experiment to learn just how much to change the grind. The faster the flow the further the grinder will need to be adjusted towards a finer setting.

• Channeling. This is usually caused either by improper distribution of the coffee before tamping or if the coffee was dosed with voids in the mass of grounds. The force of the water can bypass much of the puck and flow through without extracting properly.

• Under-dosing. There was not enough coffee in the basket and so there was not enough resistance to the flow of water.

• Too much force in the flow. This can be caused by steam build up that was not properly bled before pulling the shot. The blast of steam mixed with water disrupts the structure of the puck. This can also be caused by a improperly adjusted overpressure relief valve.

• Faulty basket. If a basket develops a crack it can flex open under brew pressure and allow the puck to be damaged causing a fast flow. If this is suspected, examine the area on the floor of the basket around the outer perimeter of the perforations which is where most cracks occur.

Too slow

A slow pull can either go well over thirty seconds to get even just one ounce from a double basket, or produce very little coffee after as much as twenty seconds or longer. Often this slow flow will be very dark in color and extremely viscous- a sign of over-extraction.
Causes of a slow flow can include:

• Coffee ground too fine. Adjust the grinder one or two clicks (or settings) more coarse and try again.

• Worn or inaccurate grinder burrs. Old, worn grinder burrs or a low-quality grinder can create a lot of dust in the grind. This dust migrates towards the bottom of the basket and clogs the small openings, dramatically restricting the flow of water. This also results in a bitter beverage even under proper conditions.

• Low pump pressure. Although not likely, this can be caused by a improperly adjusted pressure relief valve.

• Clogged filter basket. If enough of the holes in the filter basket are clogged it can slow the flow sufficiently to make proper extraction difficult or impossible. Wash the basket and examine it by holding it up to a strong light source. If clogged, soak it overnight in espresso machine cleaner (See chapter 10). If that does not correct the problem you can try using a pin to clean the holes. If that does not work, replace the basket.

• Clogged shower screen. If the screen in the **Grouphead** is not cleaned regularly it can build up deposits of coffee as well as hard water deposits that can clog it. If a clogged shower screen is suspected try backflushing (see Chapter 13).

At the speed limit

A delicious, proper flow creates a double of about two ounces (or a single of about one ounce) in about twenty-five seconds. It flows from the spouts like warm honey, slow and thick, and although the color may lighten a bit as it nears the end, even at its lightest color it should be a rich, caramel tone The variables involved when choosing a grind, dosing an amount of ground coffee, and tamping can create a wide range of possibilities. A grind that is one step finer on your grinder can create a different taste if combined with a slightly smaller dose of coffee. One step the other direction (coarser) and a harder tamp with a slightly fuller dose may be preferred with the coffee you are using. Add all the other variables such as the age of the coffee, how it was roasted, and various temperatures of the brew water and things can get quite complicated!
The best advice as you begin this journey is to work at getting all these variables as consistent as possible and just change the grind to create the best espresso you can. As you improve your skills you may notice that as a batch of coffee gets older you need to change the grind slightly. You may even notice that when the humidity in the air changes you need a different grind. Don't get locked into a set routine. If something is not right in the taste of the coffee, don't hesitate to modify your technique. Try a different grind. Change the dose. If nothing seems to work, change the coffee. The art and science of making excellent espresso is the journey, enjoying the beverage is the destination, and there are a lot of roads that will lead you to that delicious drink.
Remember that we are preparing a food product. The ultimate indicator of whether a pull is successful or not is how it tastes.

8. Steaming Milk

Making a latte or a cappuccino requires you to "stretch" milk. That involves using the **Steam Wand** to force a stream of air and steam into the milk causing the milk to increase in volume and viscosity. This is a skill that can take time to master. Although making stiff, fluffy foam is not hard, getting the fine microfoam that baristas desire is more difficult. This process is often referred to as "stretching" because the milk can increase from twenty-five to as much as fifty percent in volume, or even more! When properly done the process gives the milk an increased sweetness and adds a delightful flavor to espresso. Adding about four ounces to a double espresso creates a cappuccino and adding about six ounces to a double creates a latte. Of course, there are no rules you need to follow- add as much or as little as you like, or make it as thick and stiff as you desire to create the beverage that pleases you or your guests. That's the benefit of owning your own espresso machine!
If you have previously owned one of the basic, consumer-oriented machines, it may have been equipped with an enhancing attachment to the steam wand. These devices suck extra air into the steam and create a stiff foam which is not usually desired. The steam wand on the Vibiemme has two holes and a lot of steam power.
Careful use of this can create excellent microfoam- injudicious use can splatter milk all over!
Another benefit of the Vibiemme espresso machines is the heat exchanger design

How To Stretch Milk

1 - Begin the preparations by pouring desired amount of milk into your steaming pitcher. There should be at least an inch or more of milk. The deeper the better, as long as there is room for the milk to swirl without spilling and to allow room for expansion. Don't want to stretch that much milk? Use a smaller pitcher to achieve a sufficient starting depth. Having a steaming thermometer in the milk will help you learn the process a lot faster.
You also need to have a small towel or dishrag that has a portion of it soaked but not dripping. This is just to wipe off the **Steam Wand** as soon as it is removed from the milk. Not doing so will bake the milk to the **Steam Wand** and over time that can be difficult to remove. Fold the rag in quarters so the layers isolate your hand from the heat.

2 - Start by purging the **Steam Wand** of moisture. Steam condenses back into liquid water in the steam wand's plumbing and this must be removed before placing the wand in the pitcher. Open and close the **Steam Valve** a couple of times so that only steam comes out with no blasts of water. If you do not purge the **Steam Wand**, the blast of water will splash milk all over! Wait for the pressure in the boiler to rise before continuing- it will only take a few seconds.

CAUTION: Steam is very hot and capable of causing very serious burns. The metal **Steam Wand** will also be very hot and even a brief touch can cause burns. Use the rubber safety cover on the wand when moving its position! Steam can easily go through a towel or rag, so use care when wiping the wand!

NOTE: When closing either the **Steam or Hot Water Valve**, close them just tight enough to stop leaks or drips. Over-tightening the valves will shorten the life of the seals inside.

3 - Take the already-filled steaming pitcher in hand and get ready. After the last blast when clearing the Steam Wand, and as soon as the boiler pressure rises, place the pitcher under the wand and lift the pitcher until the tip of the steaming wand is below the surface of the milk, then carefully and slowly open the Steam Valve.
How much should you open the valve? About 1/4 to 1/2 turn. If you are not accustomed to a commercial quality machine you will be surprised at the power of the steam. You do not need to use all that power, and that is particularly true for new users. At this setting you are getting all the steam power you need and opening it up further gives no benefit. It actually will be a detriment because it will take a lot longer to stop the steam when the process has finished and you take the risk of overheating the milk and ruining your efforts.

4 - Within the first few seconds the steam should be moving the milk in a circular action. If the milk is splashing like a boiling pot, reposition and/or change the angle of the pitcher in relation to the Steam Wand. Coordinating the pitcher's angle, the depth of the wand, and the amount to open the steam valve to create an appropriate force takes practice. Don't get discouraged. A good starting position is having the tip right in the center of the pitcher pointing straight down.

5 - Now that the milk is moving, lower the pitcher just far enough so that the Steam Wand is now a little closer to the surface. It should sound a little like ripping cloth. There is a very delicate balance between drawing in a bit of air and a splashing, foamy mess. If done correctly you will hear sounds like "Tshhh.. Tshhhh.. Tssshhh." If the tip of the wand is too close to the surface, the steam force will pull in to much air and you will hear, "BLURBBB BLUBB BLURRB." Watch the surface of the milk- if you are creating large, visible bubbles (like dish-washing suds) on the surface of the milk it means that the air is being drawn in too quickly because the tip is too close to the surface.
Although that sounds easy, finding the balance requires a delicate touch. Relax your hands and arms and let the machine do the work, but be ready to adjust the pitcher. You will learn to predict the milk's behavior over time. As the milk changes in volume and content you will need to continually adjust the height of the pitcher. Do so carefully. Some of the milk on the surface may actually be foam and the power of the steam can push it into the milk causing the milk to cavitate which will bring on the dreaded BLURRBS! Holding the tip at too great of a depth during this part of the procedure will keep the steam from pulling in air, and about all you will get is a pot of very hot milk. Patience and practice will help you prevail.

6 - After about the first five to ten seconds of introducing air in this way the milk will hit the 40 C (100 F) and it will be time to raise the pitcher to more deeply immerse the Steam Wand so that no more air is being drawn in. Now the steam is breaking up the tiny bubbles in the milk and creating micro-foam.

7 - As with any fine art, one of the important lessons to learn is when to stop. When in doubt, it is generally better to stop sooner than later. A steaming thermometer can be a big help here. When you hit about 135 F. (57C.) degrees you need to have your hand on the steam valve because you should not go much past 140 F. (60 C.).
Stopping the steam there you will notice that the thermometer will continue to climb a bit more to about 145-150 F. (63-66 C). If you get the milk too hot it will rapidly lose its stretch and volume. Practice timing when to stop so the milk hits no more than about 150 F. (66 C.).
How can you tell when you have gone far enough and have the right sort of consistency? Besides using the thermometer, if you have good light to enable you to see the surface of the milk, during this final stretching phase you may see the surface of the milk change in the way it reflects light. The milk will go from a flat white like latex paint and it will turn into a shiny, almost iridescent white with the sheen of silk.

8 - When you think it is time to stop, by all means do so, and don't hesitate. It is better to stop just a bit too soon then going a bit too long! Holding the pitcher by the handle in one hand and holding the Steam Valve in the other makes it easier to stop when the time is right.
Are you ready to stop? Close the Steam Valve and while holding the pitcher still, pick up the wet rag with your free hand and then remove the pitcher from under the wand. As soon as it is exposed, use the wet rag to wipe the wand to remove the milk residue. Now give the Steam Valve a quick blast to clear it of any milk residue which may have gotten into the Steam Valve through the holes in the tip.

CAUTION: At this point the milk in the pitcher can be quite hot. Remove the pitcher carefully and only after the flow of steam has nearly stopped. Removing the pitcher from the wand too soon can cause splattering of very hot milk. Use care when wiping the wand as the metal parts it will be very hot.

9 - Examine the milk in the pitcher. If there are any large bubbles try knocking the pitcher downward on the counter to pop them. Do so gently so as not to "bounce" milk out of the pitcher. Now swirl the pitcher by placing its bottom flat on the counter and swirl the pitcher in small circles to homogenize the stretched milk.

10 - Pour yourself a cappuccino or a latte.

Milk Stretching Tips

• It is generally best to pull your espresso shot first and then steam the milk. If milk is allowed to sit for long it loses its texture. For milk-based drinks, whatever flavor might be lost in the espresso from sitting for a minute or two won't be sensed in a milk-laden beverage. As you become more experienced you can simultaneously stretch the milk while the shot of espresso is being created.

• Using a correctly shaped pitcher can help. The best are the ones that look like a bell- wider at the bottom then at the top. The narrowing helps keep the milk contained when the steam tries to force it up out of the pitcher.

• Use a quality milk. The bargain brands are often from cows fed a low-quality feed or silage and the milk is more difficult to stretch and does not hold the stretch as well. Try a good 2%. Once you get better at this you can experiment. For an indulgent treat, try mixing two parts milk with one part cream or half-and-half.

• Soymilk can also be used. Experiment to find one that suits our taste and style of steaming. As with cow milk, soymilk comes in different quality ranges, and some stretch better then others. Try several to find one that works for you. Generally speaking, soymilk will not create the sort of quality microfoam that can be had from cow milk, nor will it hold its stretch as long.

• If things are going too fast as you begin learning, try placing the pitcher as well as the milk in the freezer for about five or ten minutes before use. The colder the milk, the more time you will have to work it.

• A pitcher that is sized to the task helps. A 28 ounce steaming pitcher with only four ounces of milk in it will be impossible to work.

• To practice getting the proper position, "stretch" some water in a clear vessel to get a better idea of what is going on in there. Be sure to use a vessel made from heat-resistant glass! You will need to refill with cold water after about 20 seconds of steaming time, otherwise the water will come to a full boil.

• Somewhat like trying to un-cook an egg, once milk has been steamed it is done, and if it didn't come out right, either live with it or toss it down the sink and try again.

• Take your time. The valve controlling the steaming does not have to be opened all the way. Rushing things does not give the milk time to develop. On the other side of the coin, if done too slowly there will not be enough air drawn into the milk and all you will have is hot milk.

• There is a very small sweet spot where how hot, how much air, and how long did it took, all come together to create perfect microfoam; this is a stretched milk that is not stiff, but is more viscous that milk before it was stretched. There is nothing wrong with stiff, spoonable milk if that is what you like, but this stiff foam does not add the same texture, feel, or sweetness like prefect microfoam.

• When steaming the milk, place your free hand on the side of the pitcher. Watch the thermometer as you feel the temperature of the metal pitcher and you will soon learn what 140 degrees feels like and at that point you will no longer need to use the thermometer.
With practice and patience, you will find your steaming technique improve over time, and you will soon be proud of the drinks you are serving.



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