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Engineered Perfection in Espresso

Author: David Schomer
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As I type this, I am crusted with coffee from head to foot. A happy condition for this coffee roaster.



I have just finished a two hour test on a

new machine made by a new espresso machine manufacturer in Seattle called **TREUH**, founded by Mark Barnett, Eric Perkunder and Dan Urweiler. I could not be more happy as my test results suggest the title: perfection.

Using PID process control technology, and independent boilers dedicated to each group head, the brewing water temperature has been stabilized. (PID technology is a synthesis of process control programs that apply shorter bursts of power to the heating element as you approach your target temperature.) To prepare consistent espresso, stable brewing water temperature is the one factor that has been lacking until this moment in time. (Please see my earlier article series [Engineered Mediocrity Part 1](#) and [Part 2](#) at Espresso Vivace's website).

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Capresso CoffeeTeam Therm

The expertise of the barista and the quality of the espresso blend have all been frustrated by espresso machines that do not offer a stable brewing water temperature, until now. For me, the creation of this machine marks the beginning of coffee espresso as a culinary art.

The machining and materials used on the prototype suggest aerospace equipment, so the look of the thing is a work of art. But, it is what is under the hood that is critical to me. When I applied PID control technology for my own machines **a few years back**, I learned that water entering the boiler needed to be heated to about 205 degrees for the PID controller to work well. As I have said, not pre-heating the water entering the brewing boiler was equivalent to giving Mozart a brick and a stick to compose music with.

Engineer Mark Barnett has taken this to heart. Water entering the coffee boiler is PID controlled, with an easy digital display to monitor. And it is easy to adjust the temperature of the water entering the coffee boiler.

The main coffee water boiler for each group is also controlled in the same manner. A big easy-to-read display tells you the actual brewing water temperature and the “set point” on the controller. With this, the barista can tell if the controller is overshooting very easily and correct it in seconds, even while working a line of customers. With each group-head having its own dedicated boiler, espresso bars offering different roasts can adjust each group-head to the temperature that makes that roast taste the best. The precision, combined with flexibility, raises the design to genius level in my mind.



TRUEH Italia Grouphead

The grouphead looks great but it is what is under the hood that counts. Pump is activated by twisting the metal cap-simple and reliable.

Now, getting all that precision to the coffee bed is the job of the group head and a very thorny problem in espresso machine

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design. The TREUH design is the best group head I have ever tested. I recorded the temperature of the water hitting the surface of the coffee for ten extractions in a row. The machine was set a little high and the readings were 204.5 to 205.1 degrees Fahrenheit during the test.

I can tell you this is phenomenal performance for two reasons. The first is that it is a very high temperature and therefore more inherently unstable. Second, the method of putting the probe into the portafilter and packing coffee around it is highly problematic and prone to creating inconsistent readings.

After doing this method for ten years I would say it is very difficult. (Please see [Measuring your brewing water temperature](#) and [Finding the ideal brewing water temperature](#) in the Vivace archives for more information) Any mistake creates more variation in the readings, never less variation; so this test easily establishes this machine as offering the most stable brewing water temperature in the world, by a factor of almost ten.*

*(To date the best espresso machines I have tested in regards to temperature stability are LaMarzocco semi-automatic (ongoing testing) and the Conti Twin Star (tested in 1995). These machines are stable to about a five degree range of error in the hands of an expert barista, but tend to wander that range during the process of extracting a shot. This changing temperature gives a mish mash of flavors and prevents the creation of a consistent flavor for your espresso. Brewing water temperature must be stable to within one degree F. to preserve the coffee sugars through the brewing process.

Of course, the most important judgment must be the quality of espresso in the cup. I brought my most finicky blend, Espresso Dolce. Barnett dialed the machine down to 203.5 degrees F. as I



got out my seasoned portafilter and a DRM grinder. I cleaned the machine with

detergent, (surprise, surprise) and after about five few minutes for the machine temperature to come down a bit, began to make shots.

TRUEH Italia

This machine is sweet to look at even sweeter to operate.

The heavenly elixir oozed out of the spouts with the thickness and color I knew heralded the true caramel coffee. All varietal nuance, hints of chocolate, and anise, combined with heavy caramel under a toasted crust flavor, were present in the flavor of the espresso. Brewed on the TREUH Italia, my espresso tasted just like the fresh ground blend smells.

Hats off to you at TREUH, espresso lovers all over the world owe you a huge thank you. Espresso is out of its prison of engineered mediocrity - Bravo.

David Schomer is the owner of Espresso Vivace in Seattle and the Author of Espresso Coffee: Professional Techniques.

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