The Nuova Simonelli Aurelia is the official espresso machine of the World Barista Championship.

The Aurelia is a technologically advanced piece of equipment that was designed to solve the five major problems of espresso machines. Nuova Simonelli’s engineering department used it’s 101 years of experience, several universities, and the largest ever research and development budget ever for a traditional espresso machine to solve these five problems. The five problems identified were:

1. Producing consistently good espresso was difficult and susceptible to human error.
2. Traditional espresso machines were not ergonomic for baristi and could cause repetitive injuries.
3. The steaming of milk was too slow, cumbersome, and the bottleneck of coffee operations.
4. Many espresso machines were unreliable, difficult to repair, and had a short useful life expectancy.
5. Machines consumed high amounts of energy, which made them ecologically unfriendly.
PROBLEM #1 - INCONSISTENT ESPRESSO EXTRACTION

Solved by Temperature Stability

One of the main reasons espresso extraction is inconsistent is because the temperature of brewing water on many espresso machines can vary by up to 30 degrees. It is impossible to brew a consistent shot of espresso when a machine’s brew temperature varies so widely. In fact, many people mistakenly attribute shot time inconsistency to the grind being effected by changes in humidity, when in actuality the machine temperature instability is the cause of inconsistent shot times. To solve this problem of inconsistent espresso extraction, the engineers had to develop a system that brewed espresso at a consistent temperature. If the Aurelia was to achieve its objective, it had to have an extremely high level of temperature stability. In order to solve the problem, the Aurelia had to be designed in collaboration with the science and engineering departments of leading universities to apply computed theoretical models to achieve temperature stability. The result is a truly remarkable system that self stabilizes and maintains thermal equilibrium using only its own water, and a single heat source. This has never been achieved before as most companies have been forced to use multiple boilers and multiple heat sources to achieve temperature stability. By their nature, multiple boiler machines are less reliable and more expensive to maintain due to the existence of multiple heating elements and added circuitry to run all of the boilers and heating elements. The temperature of the brew water of the Aurelia is stable to 0.5 of 1 degree Celsius so there is no logical reason to add more boilers. In order to achieve its high level of temperature stability, every aspect of the machine had to be perfectly balanced, and each component had to be weighed and measured to exacting standards.
Another reason espresso extraction is inconsistent is because standard espresso machines deliver high pressure water instantly, on top, and in the center of the coffee cake. This method of water delivery causes the top and center portion to be over extracted while the bottom and outer edges of the coffee cake are less extracted. The instantaneous blast of high pressure water directly onto the coffee cake also forces the barista to always apply a firm, consistent and even tamp to achieve even a modestly consistent espresso extraction. Furthermore, high pressure water is unforgiving if the ground coffee particle distribution is not homogeneous in the portafilter.

The Nuova Simonelli engineers solved these problems by developing the Soft Infusion System (SIS). The Soft Infusion System (SIS) is a special extraction method that increases espresso extraction efficiency and consistency when combined with temperature stable brew water. Soft infusion mitigates human error and compensates for different tamping pressures, grind dimensions, and particle distribution. This is achieved by an innovative system that delays the arrival of full pump pressure by up to 10 seconds, arrives at indirect angles, and injects that water...
in eight precise points perfectly bisecting the diameter of the coffee cake. The Soft Infusion System (SIS) guarantees a perfect and uniform extraction because it pre-wets 85 percent of the depth of coffee cake and pre-wets 100 percent of the diameter of the coffee cake before extraction. This pre-extraction process greatly reduces channeling and fines migration, which are the cause of inconsistent, incomplete, and inferior espresso extractions characteristic of standard espresso machines. The Soft Infusion System (SIS) is also totally adjustable in terms of length of pre-infusion, and flow rates to accommodate any blend of coffee or dosing method. The pre-infusion is also automatic and has not risk of user error.

Although tamping the coffee is still recommended with the Soft Infusion System (SIS), we can demonstrate its effectiveness by pulling a shot without tamping at all. This demonstration proves with temperature stability, Soft Infusion, proper dosage and distribution of coffee, tamping pressure is less relevant to a consistent espresso extraction than previously thought.

**PROBLEM #2 - ERGONOMICS**

**Solved by Better Design**

The European Institute of Psychology and Ergonomics determined that most espresso machines were not ergonomically correct for baristi and that prolonged used the these machines could cause the following conditions: burns, arthrosis of the spine, backache, lumbo-sciatica, slipped
disc, and carpal tunnel syndrome. The Simonelli engineers solved all of these problems and the Aurelia is now the only espresso machine in the world certified as ergonomic for baristi. The key aspects of the machine that make it ergonomic are:

1. Back lit silicone touch pads with gold-bathed magnetic circuitry
2. Cool touch steam wands
3. Smooth locking portafilters
4. Visually exposed group head design
5. Wide visual field
6. Push pull steam system

**Back Lit Silicone Touch Pads**

The backlit silicone touch pads with magnetic switches utilize the finest gold bathed circuitry. The light intensity of the buttons can be adjusted based on lighting conditions, and they illuminate appropriately to guide baristi. The buttons are made of a non-slip soft silicone and they give the barista a positive feedback without being too hard to depress. The non-slip material, also ensures precise activation if either the barista’s hand or buttons are wet. The silicone material is also very durable to assure a long life expectancy of the touch pad. The gold bathed circuitry also has an instantaneous reaction time, and the magnetic switches are resistant to corrosion from steam or moisture.

**Cool Touch Steam Wands**

The unique Cool Touch feature is very important and is much safer for the operator. Standard steam wands heat up to 250 degrees, and can cause 3rd degree burns. The Cool Touch feature
also has the added sanitary benefit that the milk will not burn and bake onto the steam wand, which makes cleaning very quick and easy.

**Smooth Locking Portafilters**

The precise engineering of the scientifically designed 12 pound group head also contributes to the smooth locking portafilters, which is one of the most important ergonomic features of the Aurelia. This is very important because the locking and unlocking of portafilters on the average group head can be stressful on a barista’s hands and wrists. The precision of the group heads design, and special long lasting conical group gaskets allow the Aurelia to have both the smoothest and easiest coupling, and uncoupling of portafilters for baristi.

Assisting in portafilter engagement ergonomics is the 10-degree inclination of the portafilter handle, and the fact that the group head has a large, visually exposed chrome portion. The exposed chrome portion makes it easily visible to the barista, even from the corner of the eye. Many espresso machines have sunken or non-visible group heads, which is not ergonomically correct. Non-visible group heads make portafilter engagement more difficult, and increases lower back stress by forcing baristi to contort to view the pour or engage the portafilter.
Wide Visual Field

The intelligent design of the Aurelia also incorporates the perfect and widest visual field, which is evident from the angles incorporated into the working space. This allows baristas of all sizes, whether they are standing near or far from the machine, to always be able to see the group head and the espresso pour. These proper proportions and inclinations of the controls allow the barista to do their job without encountering uncomfortable positions and over burden of the backbone and cervical column.

Push Pull Steam System

The Push Pull Steam System is a major advantage for all Nuova Simonelli machines. It is the fastest, most reliable, easiest to use, most comfortable, and ergonomic system for baristi.

The first aspect of the Push pull Steam System is that the steam lever is ergonomically correct to the human hand. Absolutely no stress is placed on the wrist when activating the valve since the handle is perfectly curved to fit the finger. A slight downward motion with no twisting or turning is all that is required to access the machines impressive steam power.

Turning off the steam valve is just as easy, and requires only a light touch to instantly stop the flow of steam. Pushing the steam valve forward with the thumb is also ergonomically correct and can be used to purge the wand, or to provide a reduced steam flow.
The design of the steam wand and its accessibility also make the push pull system unique. The steam wand is extra long so that it can accommodate both large and small steaming pitchers. The wide range of motion and large deck space can accommodate any size of steaming pitcher, and allows the steam wand to tuck perfectly into the drain tray for cleaning and purging. The angles and curves of the steam wand are also perfect so that the steam tip is always perpendicular to the milk surface, which is the ideal angle for producing the best steamed milk. The high quality stainless steel steam wands have a very long life expectancy and the rounded corners, and soft shapes make cleaning very easy when combined with the cool touch feature. Each Aurelia espresso machine comes with an authentic ergonomic certificate from the European institute of Psychology and Ergonomics. The certificate can also be viewed on our website www.nuovadistribution.com.

PROBLEM #3 - SLOW MILK STEAMING

Solved by the Push Pull Steaming System

While being a key ergonomic feature, the Aurelia’s innovative push pull steam system also solves the slow milk steaming problem. With most coffee operations, the most time-consuming task in making an espresso drink is the steaming of the milk. Many studies have concluded that steaming milk is the bottleneck in workflow of a coffee operation. Simonelli engineers determined that by increasing the steaming production of the espresso machine, they could decrease the time it takes to make a drink and therefore increase the barista’s productivity.

The Aurelia’s Push Pull Steaming System has been proven 40% faster in bringing milk to temperature. It can bring a 32oz pitcher of milk, which is enough for two 20oz drinks, to
temperature in 45 seconds. The speed gains of the Aurelia are attributable to the impressive steam power generated by the massive and highly-efficient steam boilers. The excellent steam valve, steam wand design, and ideal angle steam tips also contribute to the gains in milk steaming production and steamed milk quality.

Generally, a two group Aurelia will out produce most other 3-group machines on the market in terms of steam production. This is an important fact as many coffee operations use 3-group espresso machines to access the milk steaming production but do not necessarily need an extra coffee brewing group, or the extra size of a 3-group machine. Although the Aurelia’s boilers are very large and produce virtually unlimited steam, they are also very efficient and conserve energy and water. The Aurelia’s high tech insulation system, advanced boiler technology, and 12 pound group head heat reserve are the components that make this possible. It is nice to know that the Aurelia is ready to give you high steaming performance when it is called on to work, but is responsibly efficient while at rest waiting for your next customers. This translates into lower energy bills for the operator and a cleaner environment for all of us.

With the Aurelia you will never run out of steam, they are so powerful and efficient that they actually build steam pressure while you are using the steam wand.

**PROBLEM #4 - UNRELIABLE, DIFFICULT TO REPAIR, & SHORT USEFUL LIFE EXPECTANCY**

**Solved by the highest quality components and rebuildable platform**

It is easy for espresso machine companies to make claims about the performance and reliability of their products, but only Nuova Simonelli backs their products up with the industry’s longest warranty. Nuova Simonelli offers more than double the industry’s standard warranty with a full 2 years against manufacturing defects and the
only lifetime warranty on boilers. Historically, espresso machines were very complex pieces of equipment that required a specialized technician to perform even the most basic maintenance task. The useful life of these machines was very short, even when they were properly maintained, and while they were useful, they were not very reliable.

The Aurelia is engineered to be extremely reliable, easy to maintain, and rebuildable. This gives the Aurelia the longest useful life expectancy of any espresso machine on the market, which is estimated between 10 and 20 years. The precise engineering, strong build quality, and high quality components make the Aurelia relatively maintenance free. The true cost of any piece of equipment must take into account maintenance costs and useful life expectancy to determine the true total cost of ownership. Since the Aurelia has the longest useful life expectancy and has the lowest maintenance costs, it has the lowest total cost of ownership of any espresso machine on the market.

**Rebuildable Steam Valves**

The two most common components on an espresso machine that need periodic maintenance are the steam valves and the group heads. Nuova Simonelli designed both the steam valves and the group heads to be easy and inexpensive to maintain. They are also rebuildable so that they have an indefinite life.

Some steam valves on espresso machines require frequent maintenance, as often as every 3 months. The Aurelia’s Push Pull Steam System is designed to last 2 years between maintenance intervals. When it is finally time to rebuild the Push Pull Steam Valve, it is quick, easy, and inexpensive. All that is needed is a few rubber O-rings, and the steam valve is as good as new.

The valve body is built in the superior manor of being machined precisely, as opposed to the inaccurate casting of many steam valves. This is one of the reasons that the
valves last up to 2 years before they need servicing, as the machined portion of the valve creates a perfect seal with the O-rings. This is not possible with the inaccurate, and less expensive casting method in which most steam valves are made.

The other unique aspect of the Push Pull Steam Valve design is that there is no wear and tear on the metal parts of the valve. The only parts subject to wear and tear are the rubber O-rings. The reason that there is no wear and tear is because there is no twisting and turning or metal to metal friction, like on many other steam valves. All the twisting, turning, and friction of rotating steam valves cause the actual metal valve to wear out (not to mention the operator’s wrist), and require expensive replacement of the whole steam valve. The Push Pull Steam System of the Aurelia requires only inexpensive rubber O-rings to be replaced infrequently. Now you can see why the Push Pull Steam System is the best to use for its speed, ergonomics, and design. It is also the longest lasting, and easiest to maintain.

Rebuildable Group Heads

The other component of an espresso machine that requires periodic maintenance is the group head. The Aurelia’s 12 pound scientifically designed group head has a unique 2-piece design, which makes the group head very easy to maintain, and totally rebuildable. Inside the group head is what is called the group gasket. Group gaskets generally need to be replaced every 6 months. Nuova Simonelli has developed special long life group gaskets that can last up to 2 years. Due to the 2-piece design of the group head, it is very quick and easy to change the group gasket. This is because when you remove the chrome group ring collar, the group gasket becomes totally visible and accessible.

Digging, chiseling, or prying out, baked in group gaskets is a thing of the past. Simply remove the chrome ring collar, and changing the group gasket becomes a quick and easy task. The other
benefit of the 2-piece design of the Aurelia’s group head is that it makes the group head totally rebuildable. The group ring collar is chromium plated which makes it stronger and last longer. After hundreds of thousands of espresso shots, engaging and disengaging the portafilter, both the portafilter and group head experience wear. In the past eventually both the portafilter and the group head would have to be replaced.

Due to the cost of these components and labor involved to change them, it was more cost effective to just replace the whole espresso machine. With the two-piece group head design, after many years you can simply replace the chrome group ring collar, and the Aurelia group head will be as good as new. This 2-piece group head design greatly increases the life expectancy of the machine, and keeps maintenance costs low.

**Boilers Built to Last**

The boiler on the Aurelia is a key component in its thermal stability. As any great chef will tell you, copper is the finest material to use for any cooking tools as it guarantees thermal transmission and a more homogenous heat exchange. For this reason, the Aurelia’s boiler is composed of 100% pure copper. Using copper for the boiler instead of steel also makes the Aurelia much safer since copper will not explode. A little known fact is that copper is an antibacterial material, which is even more sanitary than stainless steel. An additional benefit to the Aurelia’s boiler system is that water used to make coffee is always fresh and never comes in contact with the heating element, eliminating the risk of alkalinity spikes, and stagnation associated with water stored in boilers and hot water heaters. Water delivered to the coffee is always fresh, controllable and pH balanced. Simonelli is so confident in its boilers - it is the only company to offer a lifetime guarantee on its 100 percent pure copper boilers.
Amazing Accessibility

The intelligent engineering of the Aurelia and “frame off design” make it extremely easy and accessible to perform routine maintenance or even major interventions. This accessibility makes service calls faster, and keeps maintenance costs low. The removal of six screws gives you access to any part of the machine.

PROBLEM #5 – ECOLOGICALLY UNFRIENDLY WITH HIGH ENERGY CONSUMPTION

Solved by Product Line and Corporate Environmental Initiatives

In an effort to make espresso machine perform better, most companies made them more powerful, with more heating elements and more electronic circuits. The problem with these systems is they rely on huge amounts of energy and electricity, they use more unrecyclable material, and they do not last as long. Many espresso machines also require frequent “flushing”, or “purging”, of the group head to achieve temperature stability which wastes our Earth’s most precious resource: water. Also, the inefficient high energy loss of most espresso machines wastes energy and water just to maintain steam pressure. All of these characteristics result in a machine that is not ecologically responsible and costs the operator more to use.
Nuova Simonelli engineers were determined to find a better way and build a machine that was consistent with one of our core company values of environmental responsibility. Our engineers were determined to produce a machine that had top performance, consumed less energy, used more recyclable material, used less water, and lasted longer. We are delighted that our engineers were successful in achieving all of their goals and the Aurelia is now the most ecologically friendly machine on the market.

These advancements were only possible through the relentless pursuit of improvement and a commitment to science, technology, research and development. Our pursuit of improvement is constant and we are currently developing systems and products that further reduce our environmental impact.

Our factory is located in the beautiful Comunita Montana Dei Monti Azzurri in the Marche region of Italy. For centuries this land has fed us and we are proud to have the strictest environmental laws in all of Italy. Far away from Italy’s industrial centers, we take a special pride in our region’s beauty and pristine environment. It is with this pride and true love of our Mother Earth, that we developed product specific environmental initiatives, as well as corporate initiatives.

Product and Corporate Environmental Initiatives

1. Energy Savings: Energy savings is accomplished through advanced boiler technology and high-tech thermal insulation. The Aurelia’s body is not only a work of art, but is also a functional part of the hydraulic system. By having the highest R factor of any machine, it consumes less energy while at rest by trapping the heat inside the machines chassis. These improvements enable the machine to achieve a weekly power consumption reduction of roughly 50% from conventional machines.
2. Water Saving: The Aurelia’s scientifically designed 12 pound group head, and the thermally insulting body work combine to save water in two different ways. The group heads mass has an enormous heat reserve which is always at ideal brew temperature. Excessive flushing, purging and wasting of water is not required to make an excellent espresso. The thermal insulted body work allows the machines to use minimal energy to maintain steam pressure while at rest. This greatly reduces water evaporation and, therefore, total daily water consumption.

3. More Recyclable Material: When possible Simonelli uses recyclable material on all components and uses recycled material when possible. From the development and design stages Simonelli strives to attain 85% recyclability and 95% recoverability. This is superior to the European Union’s Waste Electrical and Electronic Equipment Directive (WEEE Directive).

4. Long Life Expectancy: The most environmentally friendly machine is the one that does not need replacing. Thanks to high quality components and a rebuildable platform, the Aurelia has the longest life expectancy of any machine on the market.

5. Factory Rebuild Program: Nuova Simonelli is the only company to offer factory rebuilds in both our Italian and US facilities. Most companies would find this practice counter productive, but we see it as an invaluable service to our customers and the environment.

OTHER FEATURES

While the design and technology of the Aurelia solved the major problems with espresso machines, the Simonelli engineers included additional features to make the Aurelia even more user friendly.

Custom Americano Tap

The Aurelia has a custom Americano tap. The height of the tap is increased so that it can accommodate up to a 20oz cup. The large and highly efficient boilers of the Aurelia have plenty of hot water on reserve to accommodate Americanos and steam production. Furthermore, the
Americano tap has a cold water blending mechanism. This is an excellent feature as most Americano taps release water at 250 degrees, which is much too hot to consume. The cold water-blending feature also eliminates the splashing and sputtering of hot water, which can burn operators. You will notice how smooth and controlled the water flow is. The other advantage of the cold water blending system is that it causes less hot water to be removed from the steam boiler when making Americanos. Since less hot water is being removed from the steam boiler, less cold water is needed to refill the boiler and optimal steam pressure is maintained.

Adjustable Group Height

Each brew group on the Aurelia can be adjusted to the tall setting, or the standard height setting. The tall setting is what we call “Group Height Optimization”. The tall setting is just high enough to place a 20 oz cup under the brew group with the portafilter engaged. It is also low enough to drop shots directly into a shot glass. Many tall cup espresso machines are too tall, and do not allow the barista to drop shots directly into shot glasses. Furthermore, the excessive height of these tall cup machines causes the actual espresso machine to be very large, tall, and disproportionate. An excessively large espresso machine on the front counter of a coffee bar can impede visual contact with customers, and act as an undesirable barrier wall. The Aurelia’s intelligent design allows you to have tall cup functionality in a sleek low profile design.

Smart Wand System

Optional on the Aurelia is a third steam wand called the Smart Wand. The Smart Wand is a special steam wand that automatically froths and stretches the milk then turns off at the correct temperature. All the barista has to do is place milk in the steaming pitcher, and press a button.
The smart wands design is also very functional and reliable. The cool touch system is incorporated into the Smart Wand, which helps keep it clean and contributes to the reliability. All that is needed to keep the smart wand functioning properly is periodic cleaning with a cloth. There are no chemical solutions, or cleaning regimes required. The Smart Wand is also very fast and can bring a 32 oz of milk to temperature in 45 seconds. The stretching or air induction is also adjustable so that the desired froth consistency can be achieved.

**Automatic Cleaning**

Each Aurelia is equipped with the Automatic Cleaning feature. This excellent feature makes cleaning the Aurelia simple and automatic. The barista needs only to load the portafilters with a Back Flush disk and detergent, and the Aurelia does the rest. The machine will automatically cycle the brew groups on and off for an optimal and thorough cleaning. This feature allows the barista to be more productive and do other things while the machine is cleaning itself.

**Interactive Digital Features**

The Aurelia can be equipped with an on board computer interface accessible from the touch pad. This computer interface allows the following functions:

1. Shot timers for each brew group
2. Digital programming of shot doses
3. Grind particulate measurement for coarse or fine grind
4. Shot counts and inventory control
5. Mechanical failure diagnostics
6. Maintenance schedule programming
7. Automatic on/off programming for energy savings
CONCLUSION

Producing the absolute best espresso beverages creates tremendous value for your company that is priceless. The technology in the Aurelia makes achieving this goal possible. Now that you know the design philosophy and technology incorporated into the Aurelia, it should come as no surprise that it retains its value better than any other espresso machine and represents a wise investment in product quality and hardware. In addition to the obvious value created by making the best espresso drinks, the long useful life expectancy and low maintenance costs go directly to your operation’s bottom line. The Aurelia will help you produce the best espresso drinks which your customers will appreciate and keep coming back for. Please contact Nuova Distribution at 360-366-2226 or info@nuovadistribution.com to find a dealer near you. Nuova Simonelli is proud to work with only the finest service companies, dealers, and high quality coffee roasters.