2014: COFFEE IN SPACE

THE ITALIAN ESPRESSO IN ORBIT WITH ARGOTEC, LAVAZZA AND THE ITALIAN SPACE AGENCY

The first capsule-based espresso system able to work in the extreme conditions of space is here. It is called ISSpresso and is the brainchild of two Italian companies — Argotec and Lavazza — in collaboration with the Italian Space Agency

Turin, 13 June 2014 – "An espresso coffee is what I miss most aboard the International Space Station." We have repeatedly heard this comment from the Italian astronauts who for 13 years have been at times working in the International Space Station, and today their *espresso wish* is about to become reality. **In fact, Argotec and Lavazza are working together with the Italian Space Agency (ISA) to actually bring the authentic Italian espresso onto the International Space Station**.
So in the Futura Mission — the second long-term mission of the Italian Space Agency aboard the Space Station — another Italian astronaut of the European Space Agency, Air Force Captain Samantha Cristoforetti, could not only be the first Italian woman to go into space, but also the first astronaut in history to drink an authentic Italian espresso in orbit.

Its name is *ISSpresso*. It takes its name from the International Space Station (ISS), where it is to be installed. It is the **first capsule-based espresso system able to work in the extreme conditions of space**, where the principles that regulate the fluid dynamics of liquids and mixtures are very different from those typical on Earth. *ISSpresso* is the product of a project run by **Argotec**, the Italian engineering company specialised in the design of aerospace systems and European leader in the preparation of healthy and nutritious foods for in-space consumption, and **Lavazza**, the historic Italian coffee brand. *ISSpresso* is a veritable technological and engineering jewel, able to deliver a perfect espresso in weightless environment. This is why it was selected by the Italian Space Agency to be used aboard the ISS, in the framework of the Request for Expression of Interest that the Agency keeps constantly open to public-private partnership projects and activities to be carried out in the ISS.

"Italian coffee is a beverage without borders — comments **Giuseppe Lavazza, Vice President of Lavazza** — *and we have been thinking about taking the espresso into space for some time. Indeed, as far back as ten years ago we launched the espresso into orbit artistically with the photographs taken by Thierry Le Gouès and our Mission to Espresso calendar, which at the time may have looked like a work of science fiction but was actually just a vision of the future. In fact, today we are in a position to overcome the limits of weightlessness and enjoy a good espresso — the indisputable symbol of made in Italy products — on board the International Space Station. We are proud to have worked on this major project with Argotec, through the Lavazza Innovation Center, our division dedicated to research and product innovation: a scientific and engineering challenge which we hope will improve the living and nutrition quality of astronauts engaged on long missions."*

"Our aerospace engineers — stated **David Avino, Managing Director of Argotec** — *have designed a new-concept coffeemaker, which is safe for the astronauts and able to function in microgravity conditions, also thanks to Lavazza's experience as a leader in capsule extraction*

systems. The functional project was already completed in June 2013: Argotec had been working on it for about one year. This is an ultra high-tech project which has led to innovative solutions, applicable with immediate returns on Earth as well. ISSpresso is a technological challenge that meets very stringent requirements, imposed by the Italian Space Agency, in terms of technical functionality and safety.
In addition to the engineering aspect, Argotec is also taking care of the European astronauts' training and nutrition. Food provides an important psychological support and being able to enjoy a good Italian espresso may be just the right way to finish off the menu designed especially for each astronaut, helping him or her to feel closer to home."

Roberto Battiston, President of the Italian Space Agency added: "*ISSpresso is a perfect example of the way ISA's decision to make ISS national usage rights available to public-private partnership initiatives can result in a valorisation of public resources for technological, economic, and social objectives. The ISA will bring ISSpresso aboard the ISS, thanks to bilateral cooperation agreements with the NASA, as it shares with the project partners the objective of improving the quality of life of ISS astronauts, as well as the astronauts who will take part in future long interplanetary exploration missions. At the same time, we are also proud to contribute to the promotion of the image and spreading of the Made-in-Italy brand at international or better "space", level."*

A coffee break in space. A prototype of the space coffee machine is currently being tested at Argotec's laboratories and all the necessary functional and safety checks. In a subsequent phase, Finmeccanica – Selex ES will participate in the assessment activities aimed at launching *ISSpresso* into orbit with the Futura Mission crew, one of whom is the Italian astronaut Samantha Cristoforetti. The 'corner café' on the ISS will be the hub for socialising on board the Station, a sort of **social network in space**, a venue for getting together, chatting and relaxing: an aspect that should not be ignored in missions that keep the astronauts away from home for many months in a very challenging environment. The innovative capsule system will also be able to prepare not only a regular espresso, but also a *caffè lungo* or hot beverages, such as tea, infusions and broth, so that food can also be rehydrated.

Extra-terrestrial technology. Every tiniest detail of *ISSpresso* is designed to respond to a scientific and engineering challenge: in fact, the machine studies have enabled principles of physics and fluid dynamics to be tackled, such as the difficulty of handling liquids at high pressure and high temperature in a space environment. Just think that the plastic tube carrying the water inside a normal espresso machine has been replaced with a special steel tube **designed to withstand pressure of more than 400 bar**. The machine is so complex that it weighs **about 20 kilograms since there are back-ups of all the critical components for safety reasons in accordance with the specifications agreed upon with the Italian Space Agency**.
ISSpresso represents a technologically high-value project which, besides increasing the variety of flavour in the astronauts' menu, will help improve our understanding of the principles of fluid dynamics and conditions in microgravity. Some of the solutions adopted have led to international patents, which will be useful both for future space missions and immediate terrestrial use.

To comment on Twitter: #MissionEspresso, @Lavazza, @argotec_it, @AgenziaSpazial

Argotec is an Italian aerospace company, with headquarters in Turin, that focuses on research, innovation, and development in many sectors: engineering, information technology, systems integration and "human space flights and operations". Argotec trains European ground controllers as well as astronauts at the European Astronaut Centre in Cologne and it is the unique responsible in Europe for their bonus food.

Lavazza established in Turin in 1895, has been owned by the family of the same name for four generations. The world's seventh ranking coffee roaster, today Lavazza is the retail market leader in Italy with a market share by value of over 47% (source: Nielsen), 3,300 employees and sales of EUR 1,340 million (as of December 31, 2013). The company has five production sites, four in Italy and one abroad, and operates through associated companies and distributors in more than 90 countries. Lavazza exports 46% of its production today .Lavazza invented the concept of blending - or in other words the art of combining different types of coffee from different geographical areas - in its early years and this continues to be a distinctive feature of all its products. The company also has 25 years' experience in the production and sale of portioned coffee systems and products and was the first Italian business to offer capsule espresso systems. Today, through ongoing partnerships with an international network of universities and scientific research centers, Lavazza operates four platforms in this segment.Lavazza is the official coffee at the Italy Pavilion, Expo 2015.

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