



A state-of-ARTE experiment for Nespoli

ARTE, an experiment developed by Argotec and coordinated and sponsored by the Italian Space Agency, was successfully conducted by the astronaut Paolo Nespoli onboard the International Space Station.

Turin/Rome, September 14, 2017 – Today, September 14, 2017, at 11.30 Italian time, the Italian astronaut Paolo Nespoli, after a month and half from the start of his new VITA mission, installed and successfully conducted the **ARTE (Advanced Research for passive Thermal Exchange)** experiment onboard the International Space Station (ISS).

The ARTE, project designed and developed entirely by Argotec with the coordination and the sponsorship of the Italian Space Agency (ASI), is a technology demonstrator containing four heat pipes with fluid of low toxicity that allows testing these passive systems in microgravity conditions. Politecnico di Torino, partner in the project, supported the development of the electronics of the ground model. ASI selected ARTE following a notice for the scientific and technological research in microgravity. Moreover, ASI organized the implementation of the experiment onboard the ISS in the framework of existing agreements between NASA and ASI.

Thanks to the significant experimental and innovative component of the project, last July, during the annual “ISS Research and Development Conference” organized by NASA in Washington DC, the American Astronautical Society honored ARTE with the “**2017 Innovation in Technology Development and Demonstration Award**”. The Argotec technology demonstrator was **the only European experiment to be awarded** during the ceremony.

In a view of future missions in which human exploration will always lead further away, there is increasing interest in the research of technological solution in order to reduce the human monitoring and maintenance. In this context, **heat pipes represent a good solution for the heat transfer because they are passive systems** and their use doesn't need human operations so they allow time saving for maintenance. In fact, these devices exploit the phase change of the fluid contained inside the tubes to transfer heat from a hot area to a cold one without using pumps or instruments that involved moving parts. Onboard the International Space Station there are not heat pipes inside the astronauts inhabited modules because the fluids used inside them are toxic and their release would be catastrophic for the crew and the onboard tools. Therefore ARTE represents a turning point because the research was focused on fluids of low toxicity that can ensure the required performance.

The use of **heat pipes is not only for space, but includes many possible terrestrial applications**. Argotec research in the passive heat solutions field with fluids of low toxicity has developed patents in fields of industrial, domestic, aeronautic and renewable energy applications.

“The success of future exploration will be more and more linked to systems able to reduce or totally cancel the human monitoring and maintenance.” – said **David Avino, Argotec Managing Director** – “For years Argotec has been studying passive heat systems able to respond to these new needs. Our engineers took care of all project phases, from the idea that was born inside the company to the assembly of the flight model and finally to the real-time support of the operations from the **Argotec Mission Control Centre** directly connected with NASA and the ISS. We are so proud of this experiment that on the last July was awarded by NASA of an important international award. This experiment represents an emblem, in terms of research and innovation, of the work done in company where the main objective is to obtain solutions in order to improve not only the future of the space explorations but they also interested in potential



terrestrial applications.”

“The future human exploration beyond the low orbit (Moon, Asteroids, Mars...)” – said **Marino Crisconio, Program Manager ASI of the experiment** – “needs innovative technological solutions and ASI, by virtue of its scientific right use of the ISS, preserves its primary role near the major space agencies with the stimulation and the sponsorship of scientific and technologic excellence in microgravity. ARTE is an example of the quality and the innovation technology promote by ASI.”

The ARTE project represents the result of ongoing research and development activity conducted over five years inside the Argotec thermal laboratory in Turin. The experiment was installed inside the Microgravity Science Glovebox (MSG) which is located inside the American module, Destiny. The sequence of the experiment, lasting six hours, took place in normal mode and Argotec engineers supported all operations in real-time from the company Mission Control Centre. The first test of ARTE was successfully conducted onboard the International Space Station in April 2016. Today’s experiment, conducted by the Italian astronaut Paolo Nespoli, will allow the conclusion of the devices qualification.

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