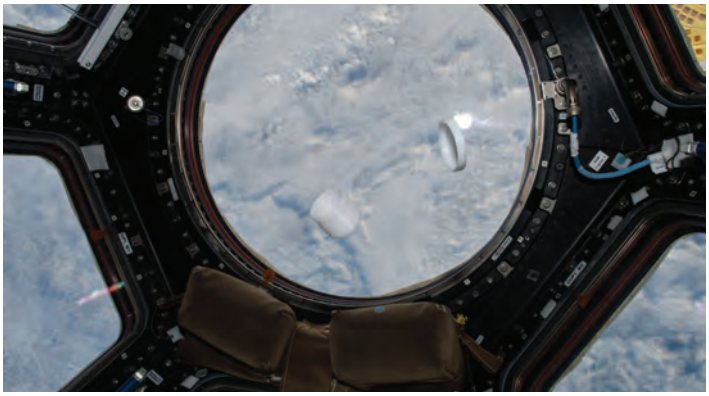
Plastics Recycling Comes to the International Space Station



After the arrival in space of I'm green™ Polyethylene for the 3D printing of tools, astronauts on the International Space Station (ISS) now may start using, by 2018, a recycler of plastic objects and packaging that would improve the autonomy and sustainability of future missions beyond our planet. I'm green polyethylene is made from ethylene derived from sugarcane ethanol. Its major differential is helping to reduce greenhouse gases emissions by capturing carbon dioxide during the production process. It also has the same properties of traditional polyethylene, which means it does not require adaptations to machinery while being 100 percent recyclable.

The initiative represents an expansion of the "Printing the Future" project; a partnership between Braskem and Made In Space, a U.S.-based developer of 3D printers for operation in zero gravity and a supplier to NASA. This will be the first commercial plastic recycling operation in the history of space missions.

Last year, the partnership adopted green plastic, a bio-based resin made from sugarcane, for the printing of tools and spare parts by astronauts. The recycler, which should reach the ISS in the latter half of 2018, is designed to complete the plastic cycle with innovation, efficiency and sustainability. The invention is intended to help cut the costs of space missions and reduce the weight of payloads carried from Earth.

"There is significant potential for plastic recycling on the ISS. For example, food packaging can be used to make objects for use by astronauts instead of being discarded. In the future, the recycler and the 3D printer will form a single package that will increase the autonomy and sustainability of long-duration space missions," said Andrew Rush, Made In Space president and CEO.

The machine consists of a plastic crushing and extrusion system that produces a filament that can be used by the 3D printer already installed on the ISS. The recycler will allow astronauts to — among other applications — use the green Polyethylene tools and parts previously fabricated by the 3D printer, as well as other plastic materials already on the ISS that no longer are being used, such as food packaging.

"Taking the first plastic recycler into space is a massive challenge and a source of great pride for Braskem. This second phase of our partnership with Made In Space will close the plastic cycle sustainably, from the production of green Polyethylene made from sugarcane to the recycling of polymers for other applications," said Patrick Teyssonneyre, director of innovation and technology at Braskem.

Wecycle Platform

Here on Earth, Braskem also develops recycling initiatives and encourages plastic reuse through the Wecycle platform, which was created to foster the development of businesses that add value to post-consumer plastic waste. The initiative reinforces the company's commitment to the plastics chain in Brazil by encouraging the development of products with recycled content, while ensuring technical quality, reliability and environmental and social values for the entire sector.

To strengthen partnerships with clients, recyclers and brand owners, as well as develop new applications for recycled resins, Braskem has a dedicated recycling team and the Wecycle platform. Companies such as Grupo Pão de Açúcar (GPA) and Muzzicycles already have developed new plastics recycling solutions made possible by the integration of various links in the production chain.

Photos courtesy of NASA.