



Written on 08 September 2020



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News

Innovation and Industry

Climate, environment and circular economy

Plastics recycling



Axens, IFPEN and JEPLAN have recently signed a joint development and commercialization agreement in order to develop, demonstrate and commercialize an innovative PET monomer recycling process for all types of waste PET-based materials, including bottles, films, trays or textile (polyester).

This new process, called “Rewind™ PET” is involving an optimized - glycolysis based - PET depolymerization combined with specific purification steps aiming at removing all organic and inorganic compounds present in waste PET. The product is a purified BHET (Bis(2-HydroxyEthyl) Terephthalate) monomer, ready to be used in a PET plant and produce again any type of PET, from fibers to food grade resins.

The partners can demonstrate a strong track-record in the field: JEPLAN has operated the first ever industrial PET bottles chemical recycling plant, called Pet Refine Technology (PRT: 22 kTA), in Japan. In 2018 JEPLAN also started-up a 2 kTA demonstration plant, called Kitakyushu Hibikinada Plant (KHP) in Japan, aiming at textile to textile recycling. While in the past 6 years, IFPEN and Axens have developed a process able to recycle and upgrade colored and opaque PET bottles into clear food

grade PET.



KHP (Kitakyushu Hibikinada Plant), a 2 kTA demonstration plant

Now, JEPLAN, Axens and IFPEN are putting together their operating, engineering and technological background and will leverage the 2 kTA demonstration plant of JEPLAN in order to accelerate the development and demonstration of their joint flexible process. With the support of the work at IFPEN facilities in France and the demonstration unit, the partners target to be ready for the worldwide licensing by Axens of the “Rewind™ PET” process within the end of 2022.

In the meantime, the 3 partners will continue to closely work with the actors of PET packaging and textile industries to validate the quality of the recycled PET, ensuring that the full process and logistics chain are safe, robust and economically viable, and set up the first industrial projects.

According to **Pierre-Franck CHEVET**, Chairman and CEO of IFPEN, “This reflects IFPEN’s commitment to address society’s growing expectations in terms of reducing plastics waste in line with public policies and plastics industry commitment. IFPEN strategic approach combine plastics waste recycling with sustainable solutions to maximize renewable bio-based chemical in order to achieve long term target of GHG emissions reduction in the downstream sector.”

Mazaki Takao, CEO of JEPLAN, declares "JEPLAN will continue to enhance the delivery of sustainable recycled finished products through its BRING Technology™, with the involvement of consumers. JEPLAN will also leverage its operational experience at KHP and PRT plants to support the adopters of the Rewind™ PET process and the development of new industrial project. This French/Japanese partnership between our 3 companies will symbolize an important achievement of our 2 countries in the field of circular economy.”

Jean Sentenac, CEO of Axens, is convinced that “this flexible, high-performance process will answer the PET packaging and textile industries needs to reach their ambitious recycling targets at the 2025-2030 horizon. Beyond licensing, Axens will propose to Rewind™ PET customers a global offer, from the delivery of turn-key modular units to a full support for the operation of this new process. Axens is strongly committed to develop efficient solutions for the circular economy.”

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JEPLAN was founded in 2007 aiming to realize the world where there is no waste and everything back into circulation. Since then, JEPLAN had proposed various types of recycling initiatives, **BRING™**. **BRING™** is a brand that asks consumer to “BRING” their unneeded products and aims to realize Circular Economy by “BRING”ing everyone into these activities. In 2018, JEPLAN acquired PET Refine Technology (PRT - www.prt.jp/en.html), which utilizes chemical recycling technology. As far as JEPLAN know, this is the only plant with more than ten years of experience operating PET chemical recycling commercial plant (22 kTA) that has also supplied rPET resins. At the time of the acquisition, the factory had been shut down, but JEPLAN decided to restart it in 2020, and plans to start supplying rPET resin (bottle to bottle) in the summer of 2021.

IFPEN is a major research and training player in the fields of energy, transport and the environment. From research to industry, technological innovation is central to all its activities, based on three strategic priorities: sustainable mobility, new energies and responsible oil and gas. IFPEN is committed to innovation to underpin a sustainable energy mix and supports the fundamental transformation of the energy sector. IFPEN is contributing to this transformation by developing production processes for [advanced biofuels](#), [bio-based products](#) and [plastics recycling processes](#). IFPEN is also working on solutions for [CO₂ capture and storage](#), [ocean energies](#) and [energy storage](#).

Axens is a group providing a complete range of solutions for the conversion of oil and biomass to cleaner fuels, the production and purification of major petrochemical intermediates as well as all of natural gas' treatment and conversion options. The offer includes technologies, equipment, furnaces, modular units, catalysts, adsorbents and related services. Axens is ideally positioned to cover the entire value chain, from feasibility study to unit start-up and follow-up throughout the entire unit cycle life. This unique position ensures the highest level of performance with a reduced environmental footprint. Axens global offer is based on highly trained human resources, modern production facilities and an extended global network for industrial, technical supports & commercial services. Axens is an IFP Group company.

Recycling of PET : Axens, IFPEN and JEPLAN will demonstrate and commercialize an innovative process

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