

ITMF Awards 2022



PROJECT NAME

FENC[®]

TOPGREEN[®] Bio3

Sustainability & Innovation

CONTACT INFOR.

Far Eastern New Century
+886 2-27338000 #2849
elliehou@fenc.com



About Our Company

Far Eastern New Century is a global leader in sustainability, smart textile innovation, design, quality assurance and the only vertically integrated solution provider in the world for both textile and non-textile applications.

Everything from PET monomer production, polymerization, virgin and recycled chip production, PET sheet and film production, staple fiber production, filament extrusion & texturization, spinning, fabric knitting & dyeing to garment assembly.

FENC Sustainability System

- 1988 • Invested the first waste bottle recycling factory in Taiwan.
- 2010 • Developed food grade PET and continuing cooperate with Paley, developing ocean bound plastic to support diverse recycling solutions and realize circular economy from waste.
- 2019 • Invested textile recycling factory to create a closed loop solutions for the textile industry.

ECO Achievements

- 2022 • **ISPO Accelerated Eco Best Product** - ISPO Textrends
- 2020 • **Best Environmental Stewardship** - Haymarket Financial Media
- 2020 • **MSCI ESG Leaders Indexes** - Morgan Stanley Capital International

Summary

Category: Sustainability & Innovation

Project Name : FENC® TOPGREEN® Bio3



01 Approach

An innovative technology both captures carbon emissions and displaces demand for conventional fossil fuel-based polyester.

FENC cooperates with LanzaTech to utilize bio technology which transforms industrial waste gas into low carbon MEG then utilized in polyester production. Fabrics made from polyester that capturing carbon emissions and reusing carbon not only ensure lower pollution levels in the community, but also maximizes sustainability in saving energy and water through FENC waterless dyeing technology for our next generation.

02 Objective

In response to the 2050 carbon neutrality goal, recycling carbon is an essential element of the circular economy, keeping fossil carbon in the ground, reducing pollution and fossil fuel use when used to make polyester even more than 60% clothing today is made of polyester in the textile industry, so how to reduce the dependence on fossil fuels is a top priority for our planet. Developing this innovation could transform textile products and the apparel industry from raw material to manufacturing process.

03 Methodology

Collect waste carbon from Industrial emissions to convert pollution into low carbon raw material(ethanol) through a fermentation process, because biomass absorbs CO₂ as it grows, and this CO₂ is not re-released when it is burned. Instead, it is captured and remove it from the natural carbon cycle. Also, in manufacturing process, using FENC solution dye tech which adopt different pigment master batch with Polyamide chip during spinning yarn, skip dyeing process and provide better color fastness with low environment impact.

04 Results

The world's first yarn and fabric using recycled carbon emissions that would be emitted to the atmosphere as pollution. Through this innovative technical fabric, we can save more energy consumption and recycle hazardous waste gas at the same time to achieve our sustainability goals for leaving a clean earth for next generation.

85%

GHG Reduction

67%

Energy Saving

83%

Water Saving

Exceptional Achievements

a. Which aspects of textile manufacturing does the achievement focus on?

- Solution to overcome the pain points of textile industry and Innovate for a sustainable future
- The carbon footprint of a garment largely depends on the material, 60% of clothing today is made of polyester and most of polyester came from petroleum.

b. Which challenges were taken on, what was the pursued aim?

- From recycling the waste gas to polyester, the whole process has more than three production bases and the transportation process is more restricted by strict conditions. How to make the efficiency of waste gas recovery and production efficiency match each other, plus the series of the industrial chain across production areas. Every step is a new challenge.
- On the other hand, the waste gas polyester is a new eco-friendly raw material, there is no production experience to refer to, ensure FENC® TOPGREEN® Bio3 is consistent with the general polyester made from petroleum.

c. Which was the methodical approach? Is the achievement related to a process or product? What were the key steps to success?

- Collect waste carbon from Industrial emissions, such as those from a steel mill, would otherwise be combusted and emitted as GHGs. The gas stream is fermented by special microorganisms into ethanol.

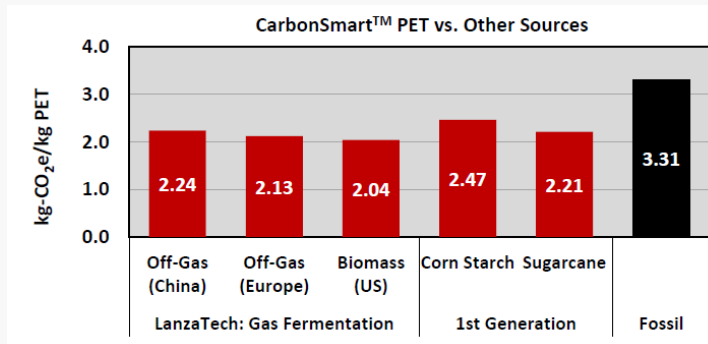


Exceptional Achievements

d. Quantify the benefit of your approach leading to the achievement.

- A CARBONSMART™ SOLUTION

The world's first waste gas reuse technology, thereby directly accomplishing CO₂ negative and provide an emission savings of 1.07 – 1.27 kg-CO₂/kg PET compared to fossil PET, as a result of using LanzaTech MEG with lower emissions than fossil MEG. Additionally, combine Solution Dye Tech to skip dyeing process, **can greatly reduce CO₂ emission 85%, save energy 67%, save water consumption 83%, save chemical consumption 100%.**



e. Describe how your experience will promote further advances in your respective field or beyond.

- A new pathway to recycle carbon emissions to make fabric.

The business world's focus on developing the greenhouse gas emissions-reduction solutions critical to ensuring our continued ability to live.

Sustainable innovation will play a key role in the future of retail and apparel, especially in polyester which is a widely used material. Once these products reach the end of their useful life, they can be fermented by LanzaTech's process, the pathway promotes circularity, keeping the carbon in the material.