

# Leaf Bio-Presentation Abstract

Leaf Bio a global innovative enterprise pioneering in the R&D and large-scale production of plant-based materials. Our core technologies focus on **furan-based high-performance bio-materials**. This material does not just offer ESG benefits; they also provide **superior performance** compared to many fossil-based polymers. Our materials can be applied across **fashion and textiles, food and beverage packaging**, and a wide range of **platform chemical applications**, each addressing a multi-billion-dollar petroleum-based market.

## LEAF BIO: World-leading bio-based aromatic material company



### ABOUT LEAF

01

Leaf Bio is a high-tech enterprise specializing in bio-based aromatic materials. Leading the way in their applications across the food & beverage, textile & apparel, 3C, automotive industries and chemical, Leaf Bio has established strategic partnerships with 15+ Fortune 500 companies.

### PRODUCT PORTFOLIO

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Leaf Bio's core products PEF and FDCA, are recognized as the 'next-gen polyester' and 'the most promising bio-based platform chemical.' As the only commercially viable bio-based materials structurally comparable to PET and PTA, they are among the few high-performance bio-based materials available today.

### LEAF ADVANTAGE

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As one of the earliest teams globally to research bio-based aromatic materials, Leaf Bio successfully launched the world's first kiloton-scale production line in 2022. Its 15,000-ton-per-year commercial production line, the first of its kind, is expected to complete construction in 2026, placing Leaf Bio at the forefront of industrial commercialization.



Our innovation starts with plant-based aromatic structures, because approximately 30% of the fossil-based materials currently used by humans belong to the aromatic category. Our furan materials have a ring structure similar to benzene, which is the basic structure of most petroleum plastics. This means our materials can work like traditional materials but are made from biomass, not oil, and with high performance in related application areas.

Our key furan monomer FDCA was named by the U.S. Department of Energy as one of the top 12 bio-based chemicals. Particularly, we're the first team in China studying furan-based materials and this material is currently the only aromatic material derived from non-food biomass that can be massively produced at commercial level. Our goal, through our products, is to enable

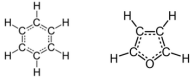
humanity to significantly reduce or even potentially break free from dependence on fossil-based materials in the future.

**Furan Materials: The only industrializable aromatic bio-based materials**

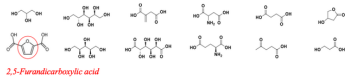


- Furan materials are the only bio-based aromatic monomers, possessing similar structure and properties to benzene ring monomers.
- In 2004, the U.S. Department of Energy identified twelve platform chemicals from over 300 bio-based materials for their potential. FDCA was distinguished as the only bio-based molecule with a conjugated aromatic ring structure, making it ideal for creating bio-based materials with enhanced thermal, mechanical, optical, and electrical properties.

Molecular structures of benzene rings and furan rings



The U.S. DOE's 12 Top Bio-based Molecules



2,5-Furandicarboxylic acid

- Beyond reducing carbon emissions (with a Life Cycle Assessment (LCA) showing a decrease of 45-60%), polymers made from furan materials demonstrate superior core performance in numerous applications.

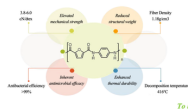
Properties of PET Bottles

Performance	PET	PEF	Reduction
Tg (°C)	76	89	+12%
Tm (°C)	250-259	250-259	-
CO <sub>2</sub> barrier (cm <sup>3</sup> μm/m <sup>2</sup> day atm)	20-25 (at 25°C)	1.2-2.0 (at 25°C)	-90%
O <sub>2</sub> barrier (cm <sup>3</sup> μm/m <sup>2</sup> day atm)	2.1 (at 25°C)	0.2 (at 25°C)	-90%
Water absorption (g/100g)	0.07	0.04	-43%
Modulus of Elasticity (GPa)	2.1-2.2	3.4	+60-70%

Properties of Furan-based Polyamide Nylon

Performance	Furan Nylon (PA6)	Furan Nylon (PA66)	PA66
Tg (°C)	100	130	66
Tm (°C)	230	240	260
Thermal Resistance	Excellent	Excellent	Average
Mechanical Properties	Average	Excellent	Average
Water Absorption	Low	Low	High

Properties of Furan-based Aramid

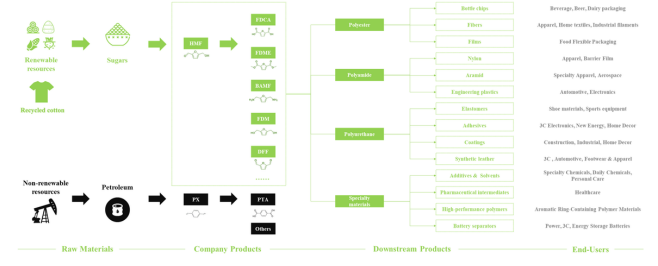


To be continued...

**FDCA: Platform monomer with broad application potential**



- Leading consumer and chemical companies are actively expanding the applications of furan-based materials, represented by FDCA, across various sectors, including polyester (bottle-grade resin, fiber, film), polyamide (nylon, engineering plastics), polyurethane (elastomers, adhesives, foams), and specialty chemicals.



Our first core application is **ECOPEF™**, which is the only food-safe plant-based packaging resin that can fully replace PET. **ECOPEF™** consistently delivers **superior barrier performance when applied to existing PET packaging applications. Over 10 times of oxygen and CO<sub>2</sub> barrier performance compared to PET**, which makes better taste protection for beer, dairy, coffee, and sparkling drinks, better aroma barrier — flavors can stay fresh longer, which makes **ECOPEF™** the only polymer that meets beer packaging requirements with this single material. Why does it matter? Because **ECOPEF™ is a truly high-performance material** and it can be used in packaging applications where PET simply cannot meet the requirements — for example, **beer, dairy products, and other oxygen-sensitive or freshness-critical categories**. More importantly here is that **ECOPEF™** is compatible with the existing PET production line and recycling system, but it has much lower carbon footprint during production and recycling process.

Our second main application is **BioFlex™**, which is currently the **only mass-producible, bio-based synthetic polyester fiber** in the world. BioFlex™ offers strong performance advantages. Most notably, it has **excellent moisture-wicking and fast-drying capabilities** — about **3-4 times of moisture regain rate better than standard PET fibers**. Moreover, **BioFlex™** also carries **inherent natural functions**, like UV resistance, antibacterial properties and **superior dyeability** without additional chemical additives.

Beyond packaging and textiles, The FDCA monomer, as a platform chemical, can be used to create a wide range of high-performance polymers — including **polyesters, polyamides, polyurethanes, and other high-performance materials** and can be applied in areas including 3C electronics, new energy systems, building materials, aerospace components, and specialty chemicals and those high-value industries.

**Core Application : ECOPEF™ high-performance packaging**



Developed from cellulose-based raw materials, ECOPEF™ is currently the only food-grade packaging material that can chemically replace PET. It delivers 10 times the barrier performance of fossil-based PET, and is already being used in packaging for beer, dairy products, juice, soda, coffee, and cosmetics.

**ECOPEF™ Resin**

**Beer Packaging**

**Dairy Packaging**

**Beverage Packaging**

**Cosmetics Packaging**

- Meets O<sub>2</sub> and CO<sub>2</sub> barrier requirements to ensure product freshness
- Provides excellent O<sub>2</sub> and aroma barrier for extended shelf life
- Prevents CO<sub>2</sub> loss to preserve carbonation and taste
- 100% Bio-based
- Recyclable

**ECOPEF™ Packaging Properties**

Property	ECOPEF™
Tg	88°C
Tm	210-230°C
CO <sub>2</sub> Barrier Properties	28x PET
O <sub>2</sub> Barrier Properties	11x PET
H <sub>2</sub> O Barrier Properties	2.5x PET
Modulus of Elasticity	3.4 GPa

**Core Application : BioFlex™— Next-Gen Fossil-Free Synthetic Fiber**



BioFlex™ is the only 0% polyester currently produced at commercial scale. BioFlex™ runs seamlessly on existing synthetic fiber lines—delivering moisture-wicking, inherent UV resistance, and natural antibacterial benefits.

**BioFlex™ Filament**

**BioFlex™ Staple Fiber**

**BioFlex™ Key Properties**

Property	BioFlex™
Fossil-Based Content	0%
Moisture Regain	1.1%-2.1%
Tensile Strength	>3.5cN/dtex
Antibacterial Property	99.98% (48h/100°C/100%)
Recyclability	Recyclable

**BioFlex™ Apparel**

Note: The plant-based feedstock route has already achieved production at the 10-ton scale. The waste cotton-based pathway has reached TRL-3.

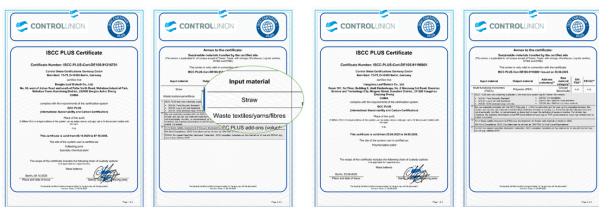
**Leaf Bio’s Core Advantages in the Furan-Based Materials Area:**

- 1. Top-Tier R&D & Team Support:** Backed by China’s premier R&D and market development teams specialized in furan-based materials. Our core technology is derived from the research team of the University of Science and Technology of China (USTC)—the first team in China dedicated to the research of furan-based platform materials, enabling our materials to achieve a purity of 99.99%.
- 2. Industry-Leading Production Capacity:** As the only company worldwide with kiloton-scale FDCA production capacity, we are advancing the construction of a 15,000-ton-scale production line, which is expected to be completed in 2026.
- 3. Transparent and Traceable Production Route:** Leaf Bio achieved the **world’s first-ever ISCC PLUS certification** for FDCA and PEF materials. This means every step—from feedstock to final product, is tracked, verified, and aligned with global sustainability standards.
- 4. Strategic Cooperation & Commercialization Progress:** We have established in-depth strategic partnerships with many well-known domestic and international brands. The commercialization of PEF applications is scheduled to be realized in the near future.

**LEAF BIO: The World’s First ISCC PLUS Certification for FDCA/PEF**



Leaf Bio successfully obtained the world’s first ISCC PLUS authoritative certification for FDCA and PEF, setting an industry benchmark as the global first case certified with non-food feedstock.



**LEAF BIO: World’s 1-st kiloton-level furan materials production line**



To sum up: Leaf Bio turns non-food biomass into high-performance, fossil-free materials that outperform petroleum-based alternatives in textiles and packaging, and scale to meet industry demand. We’re not just innovating for sustainability; we’re redefining how the world sources its most essential materials for a greener lifestyle.