

BIOMASS CHANGE LIVES

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CONTENT

3



4

Industrial
Transformation

5



6

About
GS BIOMATS

7



8

Core
Technologies

9



20

Product
Solutions

21



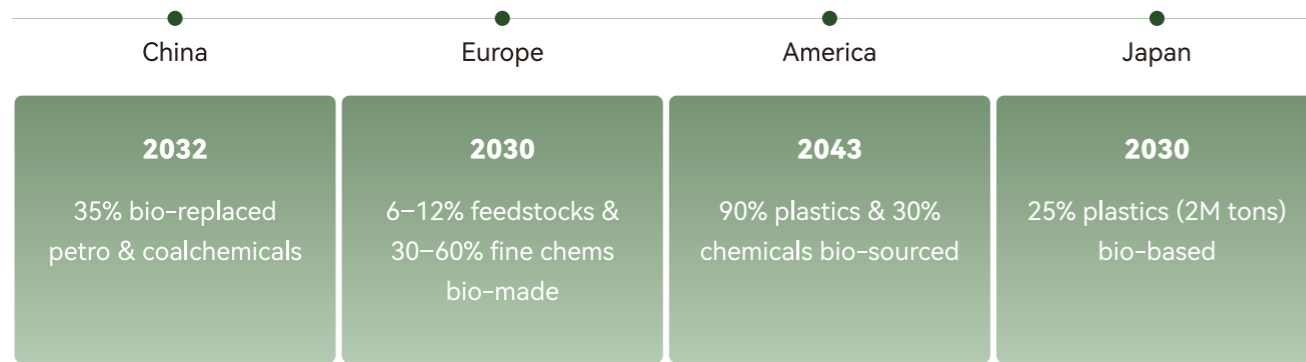
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Nature-Reborn

INDUSTRIAL TRANSFORMATION

Driven by Advantages, Aligned with Global Trends

With the rapid development of the global green economy, bio-based materials have become a key driver of industrial transformation. Major countries are rolling out impactful policies to fast-track the substitution of fossil-based materials.



Chemical Leaders Compete to Shape the Industry Landscape

Leading global chemical companies are accelerating investments to drive bio-based materials to scale.

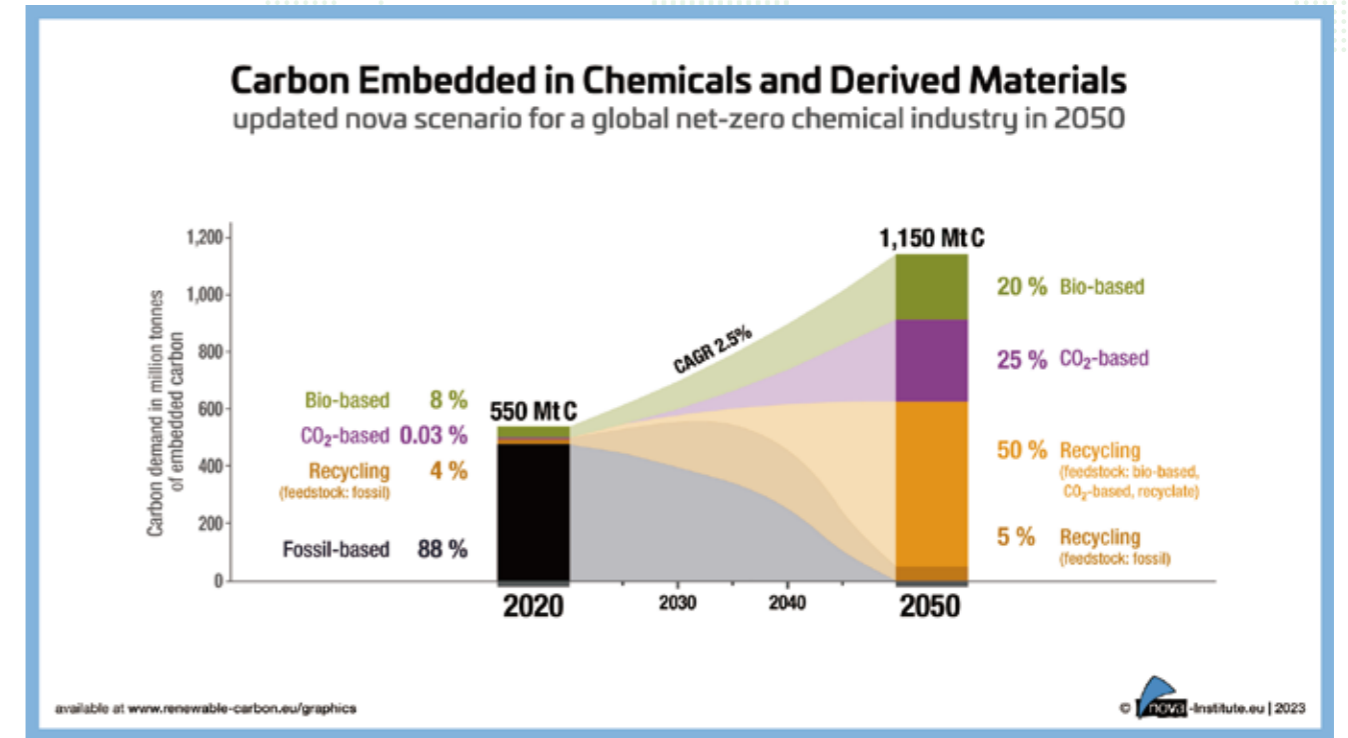


Partial Company Showcase

From Packaging to Products, Green Materials Are the Preferred Choice for Consumer Brands



Source: Public brand sustainability goals

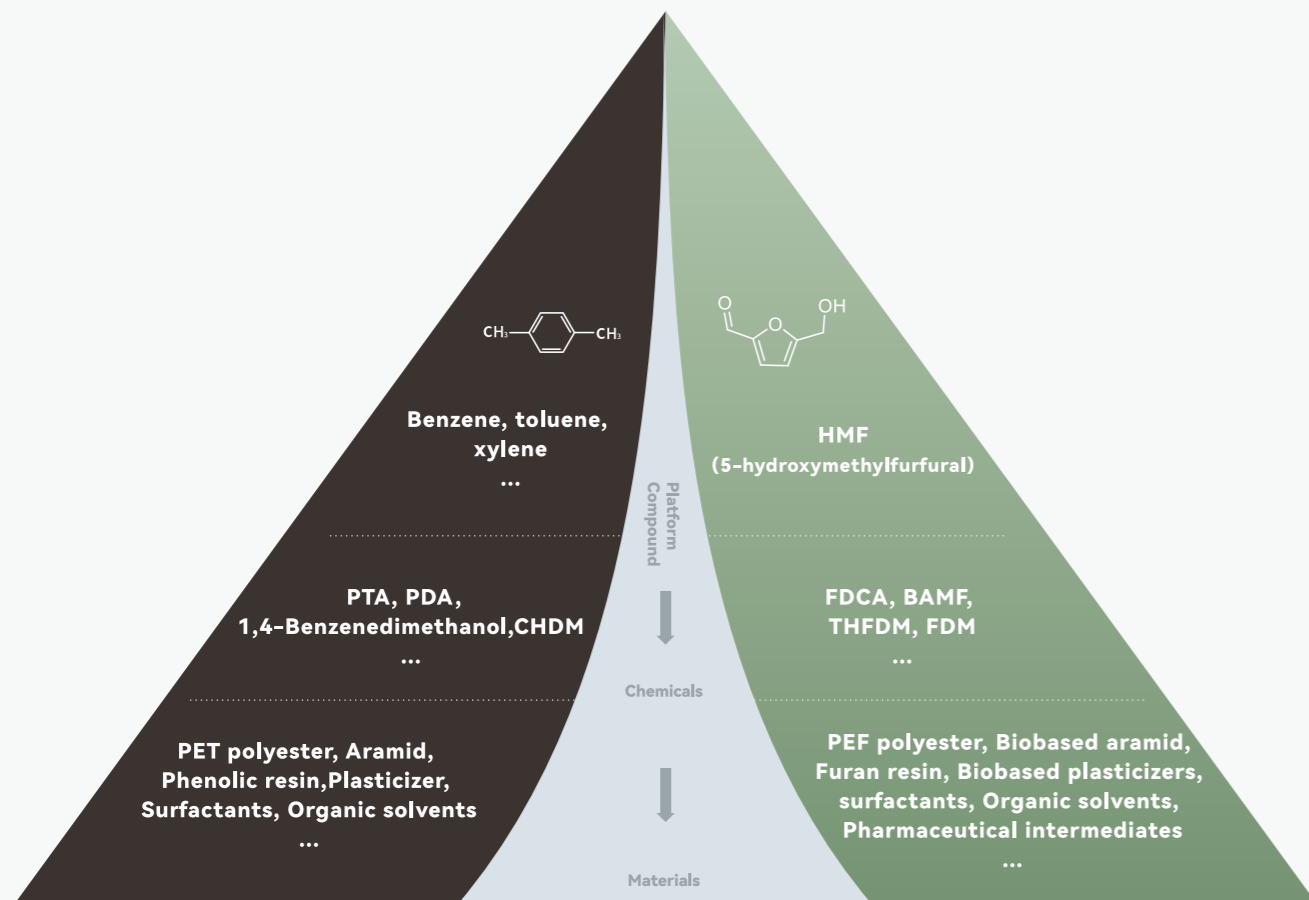


> \$600 Billion
Biobased materials market gap

25%+20%
Organic Chemicals Fossil Fuels
By 2030, biobased product substitution potential

<5%
Current substitution rate

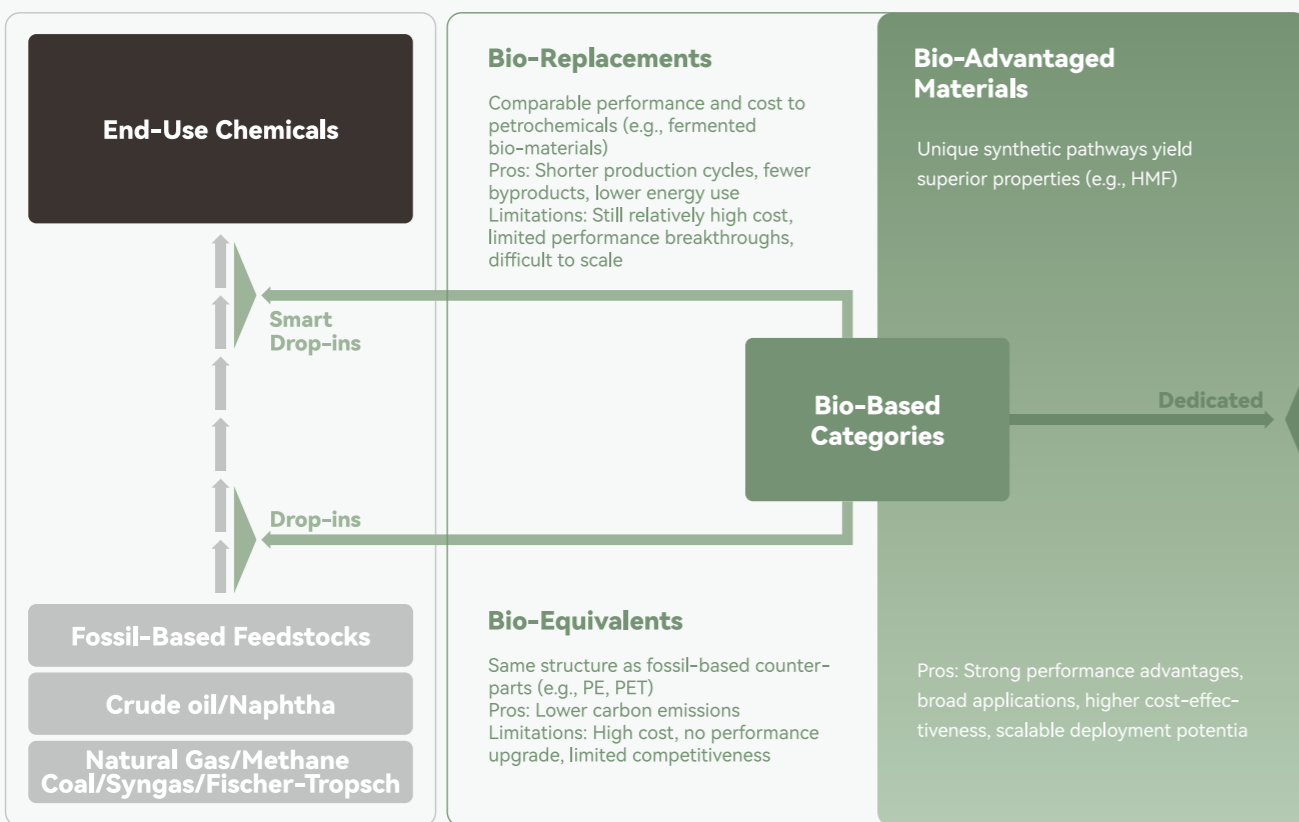
Policy support, brand transformation, and technological maturity are accelerating the arrival of the bio-based materials era.



Fossil based, Benzene ring

VS

Bio-based, Furan ring



5-Hydroxymethylfurfural (HMF) A Flagship of Bio-Advantaged Materials

Under global carbon neutrality goals, fossil-based materials are falling short in meeting the demands for green, high-performance alternatives. HMF, with its innovative structure, is rising as a hallmark of "bio-advantaged" materials, offering a novel solution to the global materials industry.

ABOUT GS BIOMATS

SINCE 2021

GS Biomats is a pioneer in bio-based material manufacturing, specializing in the innovation and industrialization of furan-based chemicals. Leveraging self-developed continuous flow processes and "Short process" solutions, GS Biomats has achieved industrial-scale production of key bio-based compounds including 5-hydroxymethylfurfural (HMF) and furandicarboxylic acid (FDCA). These new materials have been successfully commercialized in packaging, fibers, and aramid sectors. Guided by the mission to "Biomass change lives," GS Biomats aims to deliver high-performance, multifunctional, and sustainable furan-based materials for global clients.

Hangzhou HQ
Operations & Management Center

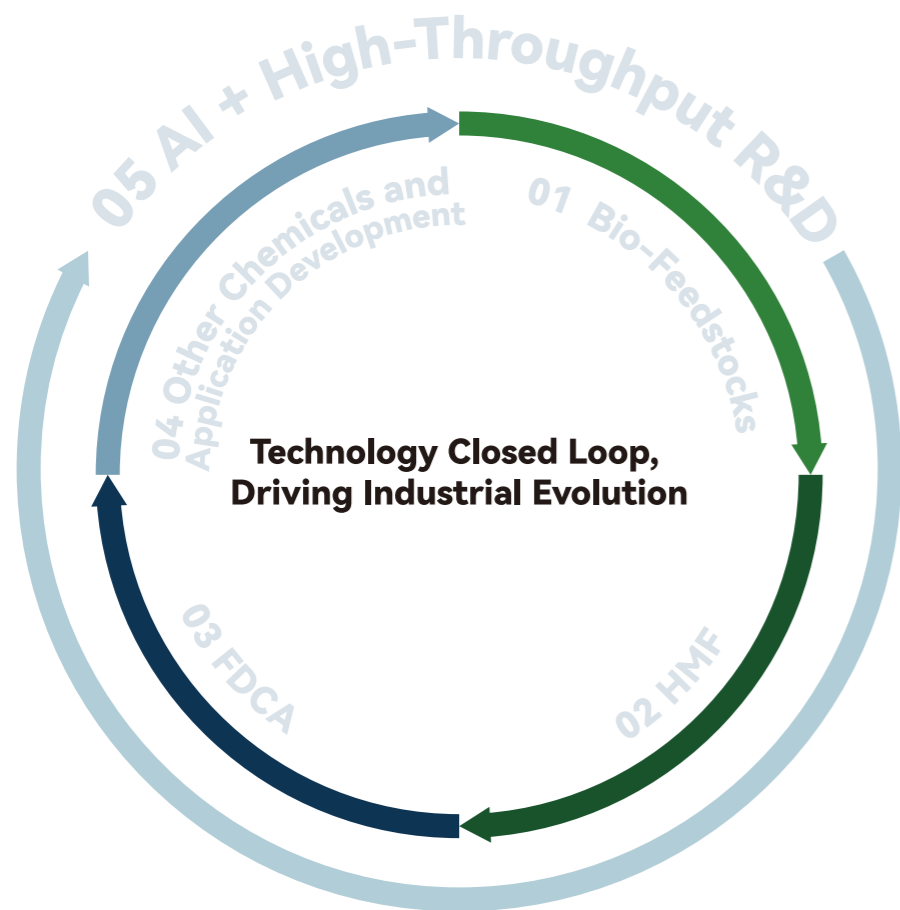
R&D Center
End-to-end bio-feedstock to application

Lishui Plant
FDCA 400t/a

Taixing Plant
FDCA 10kt/a



CORE TECHNOLOGIES



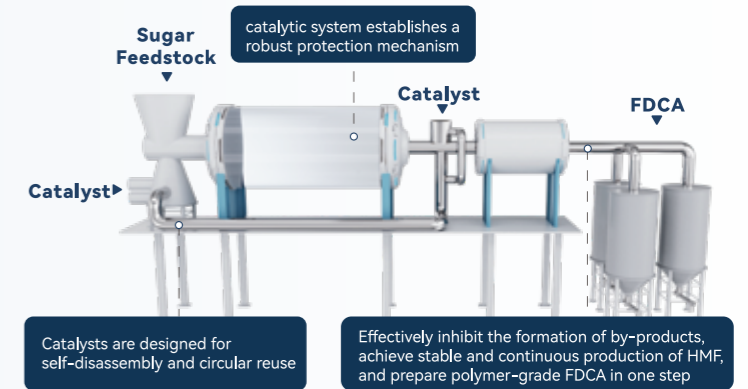
GS Biomats has built a full-chain innovation system from "bio-feedstock → process → application," combining feedstock iteration, process innovation, and scenario adaptation to form a high-value patent moat. Multiple product categories have already achieved commercial validation, positioning GS Biomats as an industry leader in scaling up bio-based materials.

01 Bio-Feedstocks

Fructose	Commercialized	Gen 1
Syrup blends	In application, cost reduction	Gen 2
Non-food biomass	Pilot stage	Gen 3
Biomass waste	Technology verified	Gen 4

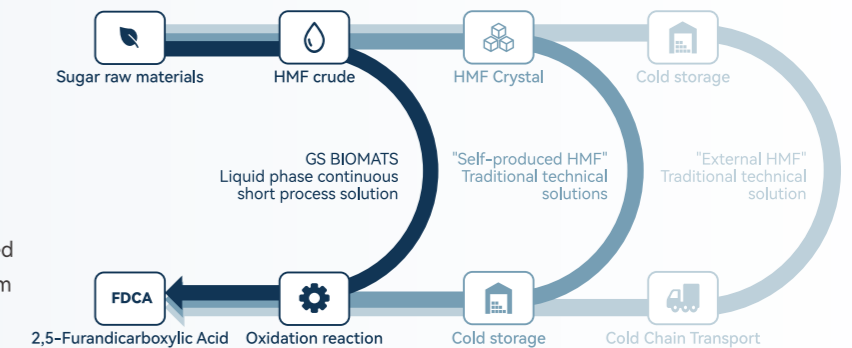
02 SMART Catalysis System

Modular, self-disassembling, and highly efficient catalysts minimize byproducts and enable long-term stable operation in continuous tubular reactors.



03 FDCA Short-Process Technology

Enables direct oxidation of crude HMF into polymer-grade FDCA. Compared to traditional route, the overall cost is reduced by nearly 70%, breaking through the economic barrier of bio-based commercialization and enabling rapid scale-up from lab to 10,000-ton production lines.



04 Other Chemicals and Application Development

Rapid prototyping across diverse application scenarios, with custom development capabilities for client needs.

- Customized Development of Functional Furan Monomers
- Structural Modification and Functional Design
- Forecasting of Downstream Applications
- More

05 AI + High-Throughput R&D

Accelerates catalyst screening, process optimization, and application prediction to build a high-efficiency, intelligent innovation engine.

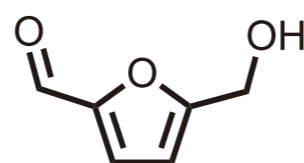
- Feedstock Station
- Reaction Station
- UPLC Analysis Station

PRODUCT SOLUTIONS



HMF

5-hydroxymethylfurfural



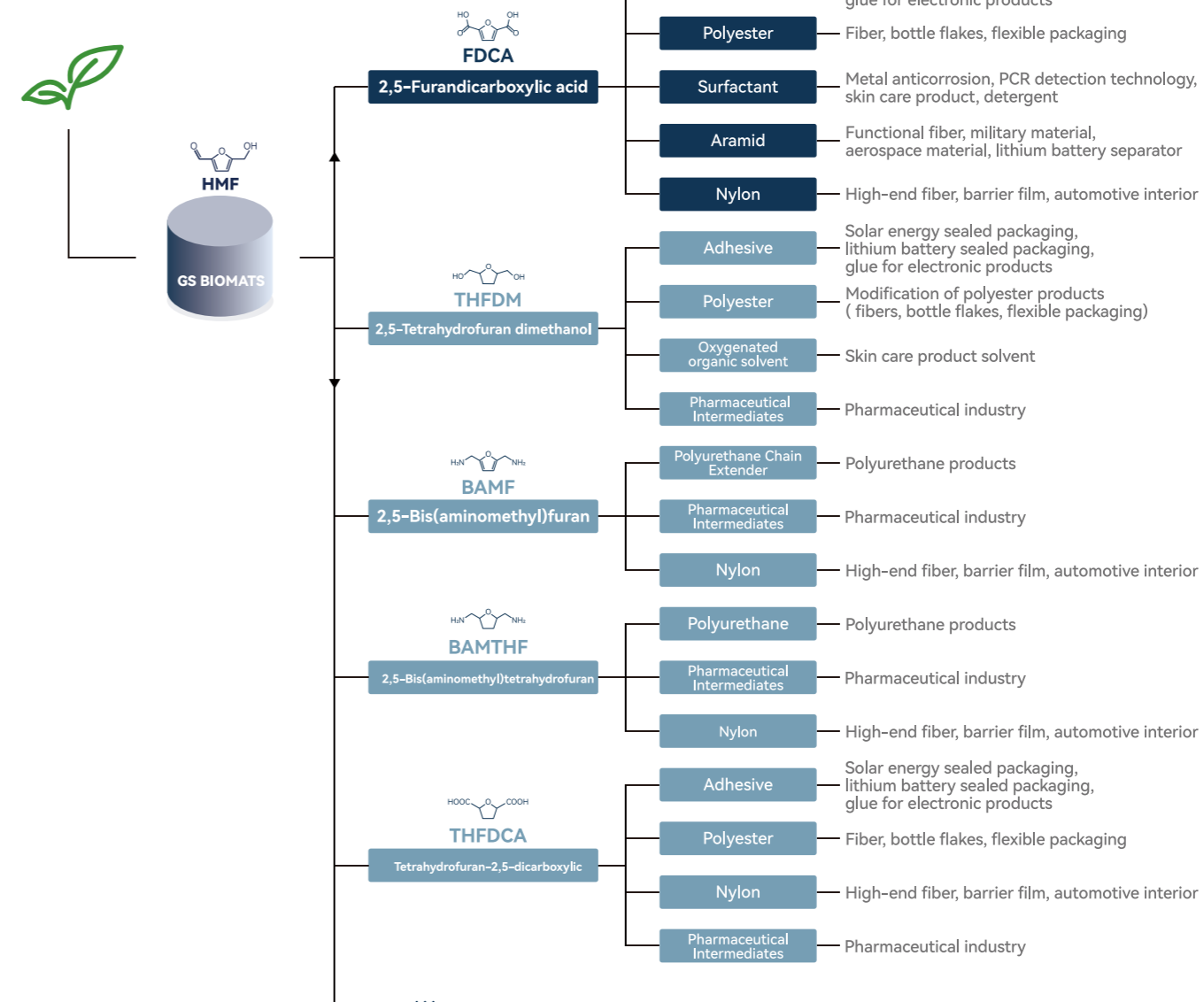
5-Hydroxymethylfurfural (HMF) is the only bio-based platform molecule featuring an aromatic-like furan ring. Through hydrogenation, oxidation, esterification and other functional group transformations, HMF enables the synthesis of high-value derivatives such as: 2,5-Furandicarboxylic Acid (FDCA), 2,5-Bis(hydroxymethyl)tetrahydrofuran (THFDM), Dimethyl Furan-2,5-dicarboxylate (FDME), 2,5-Diformylfuran (DFF). These derivatives possess immense market potential in high-performance and sustainable materials.



Physical and Chemical Properties of the Product

CAS No.	67-47-0	Molecular Formula	C ₆ H ₆ O ₃
Molecular Weight	126.11	Melting Point	28-34°C
Boiling Point	114-116°C at 1mmHg		
Relative Density	1.243 g/cm ³ at 25°C		
Stability	Sensitive to air, light and heat, strong hygroscopicity, sealed storage at low temperature (< 0°C)		

5-Hydroxymethylfurfural (HMF) High value-added derivatives Terminal applications



FDCA



2,5-Furandicarboxylic acid

Recognized by the U.S. Department of Energy as one of the 12 key platform chemicals for "Establishing a Future Green Chemical Industry," FDCA stands out for its high performance, recyclability, and renewability.

With a cyclic structure and reactivity similar to PTA (Purified Terephthalic Acid), FDCA offers excellent equipment compatibility. It serves as a superior replacement or functional complement to benzene-based materials, making it the furan monomer with the highest market demand and most well-defined application roadmap.

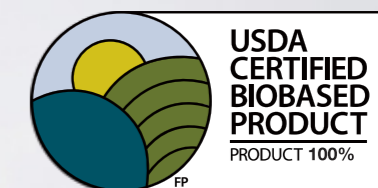
Poly(2,5-furandicarboxylate) (PEF), the polymer of FDCA and ethylene glycol, delivers exceptional gas barrier performance in packaging applications. Without chemical additives, its fiber form offers innate benefits: antibacterial, anti-mite, moisture-wicking, quick-drying, high dye uptake, and wrinkle-resistant shape retention. FDCA also serves as a bio-based building block for nylon (PA), aramid (PPA), rubber, and more.

GS Biomats pioneered the industry with hundred-ton-scale FDCA delivery. In 2024, we launched high-purity FDCA with significantly improved purity, color, and impurity profiles—accelerating downstream adoption.

In 2025, FDCA derived from GS Biomats's materials secured both China's New Chemical Substance Environmental Management Regular Registration and full EU REACH registration for 10–100 tonnes/year.

Physical and Chemical Properties of the Product

CAS No.	3238-40-2	Molecular Formula	C ₆ H ₄ O ₅
Molecular Weight	156.09	Melting Point	> 310°C
Boiling Point	419.2°C		
Relative Density	1.604 g/cm ³ at 25°C		
Stability	Stable at room temperature, place in a cool, dry sealed preservation		



THFDM

2,5-Tetrahydrofurandimethanol



A renewable and multifunctional furan derivative. THFDM serves as a green, low-toxicity, biodegradable solvent and is a precursor for high-performance diesel/gasoline additives and bio-based film-forming aids. Its diverse reactivity opens up a wide application landscape.

Physical and Chemical Properties of the Product

CAS No.	104-80-3	Molecular Formula	C ₆ H ₁₂ O ₃
Molecular Weight	132.16	Melting Point	< -70°C
Boiling Point	230±5°C		
Relative Density	1.130 g/cm ³ at 25°C		
Stability	Easily hygroscopic, sealed and stored at low temperature.		

FDM

2,5-Furandimethanol



FDM, a rigid, thermally stable bio-based diol ideal for the synthesis of high-performance polyesters and polyurethanes. FDM offers a sustainable alternative to traditional petroleum-based polyols in coatings, resins, and plasticizers—an indispensable monomer in the transition to green materials.

Physical and Chemical Properties of the Product

CAS No.	1883-75-6	Molecular Formula	C ₆ H ₈ O ₃
Molecular Weight	128.13	Melting Point	74-77°C
Boiling Point	275°C	Flash Point	120°C
Relative Density	1.283 g/cm ³ at 25°C		
Stability	Sealed and stored at low temperature (2-8 °C)		

BAMF

2,5-Bis(aminomethyl)furan



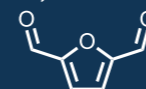
BAMF is a nitrogen-functionalized specialty chemical used as a chain extender/cross linker in polyurethanes and modified nylons. It is also a building block for pharmaceuticals, agrochemicals, surfactants, and curing agents.

Physical and Chemical Properties of the Product

CAS No.	2213-51-6	Molecular Formula	C ₆ H ₁₀ N ₂ O
Molecular Weight	126.16	Flash Point	92.8°C
Boiling Point	229.905°C		
Relative Density	1.124 g/cm ³ at 25°C		
Stability	Sealed storage (2-8°C) in shade		

DFF

Furan-2,5-dicarbaldehyde



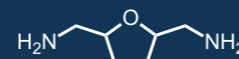
DFF is an essential bio-furan monomer and precursor for high-performance polymers including polyamides, polyimides, and electronic chemicals. Its aromaticity and high reactivity make it highly promising in green fine chemicals and sustainable polymer synthesis.

Physical and Chemical Properties of the Product

CAS No.	823-82-5	Molecular Formula	C ₆ H ₄ O ₃
Molecular Weight	124.0942		
Boiling Point	1276.8±25.0°C		
Relative Density	1.298±0.06 g/cm ³		
Stability	Sealed storage (2-8°C) in shade		

BAMTHF

2,5-Bis(aminomethyl)tetrahydrofuran



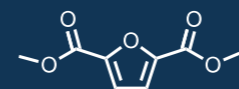
BAMTHF is a versatile chemical intermediate used in plastics, rubber, and specialty materials. It serves as a crosslinking agent to enhance material strength, a catalyst for process acceleration, and a solvent or additive in various formulations. It also acts as an intermediate in pharmaceutical synthesis.

Physical and Chemical Properties of the Product

CAS No.	66918-21-6	Molecular Formula	C ₆ H ₁₄ N ₂ O
Molecular Weight	130.19	Flash Point	100.9°C
Boiling Point	227.798°C		
Relative Density	1.007 g/cm ³ at 25°C		
Stability	Sealed storage (2-8°C) in shade		

FDME

2,5-Furandicarboxylic acid dimethyl ester



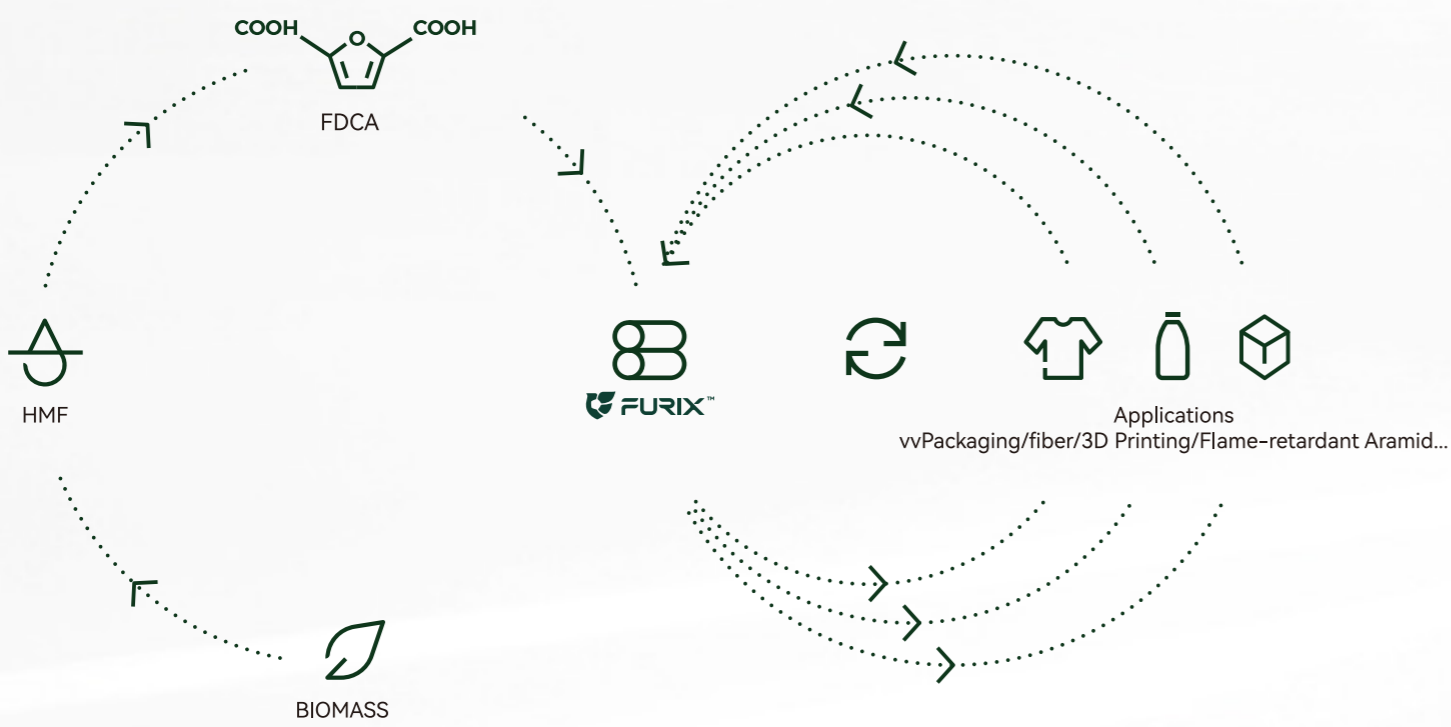
FDME is an esterified derivative of FDCA, featuring outstanding chemical and thermal stability. It serves as a versatile intermediate in the production of pharmaceuticals, coatings, resins, and other high-performance materials. As a key monomer in the synthesis of PEF (polyethylene furanoate) via transesterification, FDME provides a critical building block for the development of next-generation, sustainable polyester solutions.

Physical and Chemical Properties of the Product

CAS No.	4282-32-0	Molecular Formula	C ₈ H ₈ O ₅
Molecular Weight	184.15	Melting Point	112°C
Boiling Point	227.798°C	Relative Density	1.244 g/cm ³
Stability	Store in a shade, sealed (2-8°C)		

High-Performance Polymers Brand BY GS BIOMATS

FURIX™

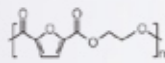


Launched in 2026 and powered by proprietary bio-furan technology, FURIX™ is GS BIOMATS's flagship high-performance polymer brand. We are dedicated to providing global industries with high-performance furanic material solutions that integrate full-lifecycle sustainability.

PRODUCT SERIES

Leveraging the unique structural advantages of furanic materials and our cutting-edge R&D, the FURIX™ series encompasses a diverse range of high-performance products, including PEF, PBF, and bio-based aramids, etc. We offer bespoke development and precision modification to satisfy the most demanding research and industrial applications.

PEF



Key Characteristics

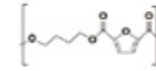
High performance & versatility
Compatible with PET recycling streams

Applications

Packaging
Fiber
3D Printing
.....



PBF



Key Characteristics

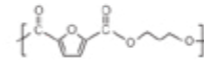
Excellent processability
High thermal stability & toughness
Superior chemical resistance

Applications

Packaging
Fiber
Engineering Plastics
3D Printing
...



PTF



Key Characteristics

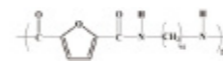
High barrier properties
100% bio-based content
Superior mechanical performance

Applications

Packaging
Fiber
Functional Coatings
...



PA10F

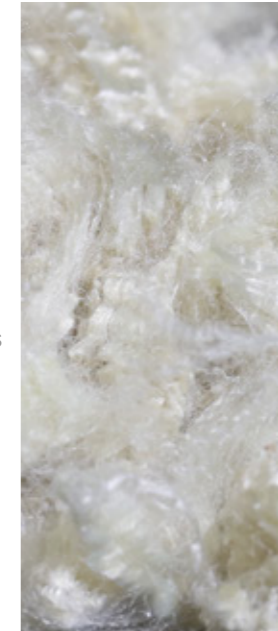


Key Characteristics

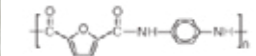
100% bio-based content
High optical transparency

Applications

Engineering Plastics
Sustainable Bio-fibers
High-Performance Films
...



Bio-based Aramid



Key Characteristics

Exceptional flame retardancy
High tensile strength
Anti-static & easy-to-dye

Applications

Firefighting Apparel
Aerospace Flame-Retardant Materials
Chemical & Metallurgical Protective Wear
Technical Outdoor Gear
...



PA6F



Key Characteristics

High Tg
High optical transparency

Applications

Engineering Plastics
Sustainable Bio-fibers
High-Performance Films
...



PFC Poly(furandicarboxylate) copolyester

Key Characteristics

Fully customizable & optimizable
High bio-based content

Applications

Packaging
Fiber
Engineering Plastics
...

PRODUCT SOLUTIONS



HIGH-BARRIER PACKAGING
PEF & Composite Materials

- Beer packaging
- Carbonated beverage bottles
- Dairy and juice containers
- Pharmaceutical packaging

Performance Advantages

- High Barrier**
O₂ Barrier > 7X PET | H₂O Barrier > 2X PET | CO₂ Barrier > 15-20X PET
- UV Blocking**
UV Blocking: Near-Zero UV Transmittance At 1.5 Mm
- Recyclable**
Compatible With Co-Recycling And Same-Line Reprocessing



HIGH-TRANSPARENT PACKAGING
PEF & Modified Materials

- Daily chemical packaging
- Food packaging
- rPET packaging
- Electronic product packaging

Performance Advantages

- Slow Crystallization** **Thick Wall And High Transparency**
20-60 min > PET (3-5 min) Transmittance > 90%, Haze < 1%
- Recyclable And rPET-Compatible**
≤10% PEF Addition In rPET Improves Barrier
Resolves Haze Issues In Thick-Walled rPET Applications
Recyclable With PET: Compatible With Co-Recycling And Same-Line Reprocessing

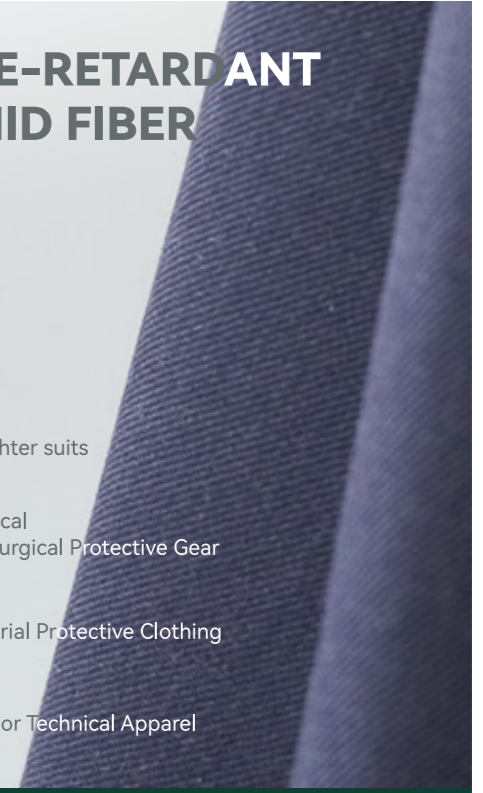


FURAN BIO-BASED FIBERS
PEF & Modified Materials

- Sports & Outdoor
- Business Casual
- Home Textiles
- Innerwear

Performance Advantages

- Natural Antibacterial & Mite-Resistant
- Moisture-Wicking Wrinkle Resistance
- UV-Resistant Anti-pilling Durability
- Superior Dyeability Easy blending with other fibers



FLAME-RETARDANT ARAMID FIBER

- Firefighter suits
- Chemical Metallurgical Protective Gear
- Industrial Protective Clothing
- Outdoor Technical Apparel

Performance Advantages

- Self-extinguishing & Flame Retardant
- Superior Fracture Strain
- Enhanced Hygroscopic Performance
- Soft & Dye-Friendly
- Pilling Resistance
- Customizable (Biomass Ratio/Color)



3D PRINTING

Performance Advantages

- High mechanical properties
- Excellent processability
- Recyclable
- Customizable bio-based content

BIOMASS CHANGE LIVES

