PRESS RELEASE

GROUP

Paris, May 23, 2025

A global first: Michelin announces the construction of an industrial demonstrator in France for the 5-HMF molecule, an essential component of green chemistry.

- Investments of EUR 60 million to develop a bio-sourced and non-toxic molecule that can replace ingredients derived from fossil fuels in a wide variety of industrial fields.
- Already used in the Michelin ResiCare resins, its availability on an industrial scale will allow a potential market of over 40,000 metric tons to open by 2030, through the creation of a European industry.
- A new demonstration of Michelin's power to innovate and its ability to develop other ultra-innovative applications beyond the tire.

Concept for the MICHELIN ResiCare 5-HMF industrial demonstrator - © 2025 Oriane Dambrune Design.

Michelin announces the construction of an initial industrial demonstration unit for the 5-HMF molecule. This bio-sourced and non-toxic molecule can replace ingredients derived from fossil fuels in a wide variety of industrial fields. This unit, which will be located on the Osiris platform in Péage en Roussillon, France, will have an annual production capacity of 3,000 metric tons, making this site the largest production site in the world for this molecule. This project represents a total investment of EUR 60 million, partly subsidized by the ADEME in France and

the CBE JU[1] at European level. It will allow for the creation of approximately 30 direct jobs and should begin its activities during 2026.

A molecule with extremely promising properties

5-HMF, also known as 5-Hydroxymethylfurfural, is a platform molecule with multiple possible derivatives. It is bio-sourced and non-toxic, allowing it to replace ingredients sourced from oil or those of concern. It is known as the "Sleeping Giant" due to its versatility and its ability to replace a wide range of conventional molecules. This molecule is obtained from fructose that has been transformed using green chemistry processes.
5-HMF will therefore be one of the rare monomers that meet the following characteristics: bio-sourced, non-toxic, available on an industrial scale in thousands of metric tons, and produced in Europe using European raw materials.

A potential market of over 40,000 metric tons by 2030

This project, entitled CERISEA[2], was developed within the framework of a partnership bringing together multiple industrial, institutional, and academic stakeholders.
Supported by the ADEME[3], it forms part of the France 2030 program, which aims to support industrial innovation and the ecological transition. It also benefits from support from the CBE JU[1] at European level.

The European 5-HMF market is still emerging, as the molecule is produced solely in Asia, in very small quantities, and it remains prohibitive for industrial uses.
Already used in the manufacture of non-toxic adhesive resins developed by Michelin ResiCare, this molecule allows these resins to reduce operator and consumer exposure to harmful products. The production of this initial industrial scale unit will allow for safeguarding Michelin ResiCare's supply and for lowering costs. It also paves the way for the marketing of new materials in a variety of sectors, such as cosmetics, agriculture, industry, construction, transport, aeronautics, or electronics, as well as in many other fields of application. The projects launched demonstrate a potential market of over 40,000 metric tons by 2030.

Provision has been made for 20,000-metric ton units to be duplicated via a license system, in order to develop a production network for this bio-sourced molecule, in conjunction with the project's industrial partners.

Another illustration of the Group's capacity to grow in composite solutions that create value

This ambitious project, a global first, is an additional illustration of the Group's cutting-edge skill in terms of its ability to introduce breakthrough innovations in composite solutions.

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Formulated at a scale smaller than the micrometer, and developed to ensure critical functions, these technical composite materials are openings onto markets with a high potential for growth.

"The launch of this initial unit in France, to produce a bio-sourced molecule essential for green chemistry, is a major milestone for taking Resicare's activities to an industrial scale. Created at Michelin in 2016, this start-up at the cutting edge of innovation will be able to speed up the development of its high-performance and non-toxic resin offers for manufacturers. This new demonstration of the Group's innovative power, the fruit of years of joint research with our partners, also heralds the creation of a new European industry", stated Maude Portigliatti, Director of the Polymer Composite Solutions division at Michelin and a Member of the Group's Executive Committee.

Michelin ResiCare: its history with 5-HMF

Michelin began to explore alternatives to formaldehyde and resorcinol in the adhesive resins intended for its tires as of 2008. In 2013, a technology for tire applications was developed, without using 5-HMF.
In 2016, 5-HMF was integrated into the Michelin ResiCare formulae for resins intended for uses other than tires, and initially for plyboard, after identifying a source at a small volume and a high price. After an initial attempt with another partner, Michelin joined forces with the IFPEN in 2021 to develop a more robust production process from fructose, with tests on various scales and engineering studies until the end of 2023.
Today, although it is not currently used in tires, 5-HMF is in all the new Michelin ResiCare formulations, including for plyboard, abrasives, and molded components.
The prospect of 5-HMF production on a much larger scale opens the way to even wider industrial uses of this bio-sourced molecule.

Photos and/or attachments available on:
https://contentcenter.michelin.com:443/dam/wedia/shared-board/c9650a2e-4546-4c7c-b0f8-b4674d45296a

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About Michelin:
Michelin is building a world-leading manufacturer of life-changing composites and experiences. Pioneering engineered materials for more than 130 years, Michelin is uniquely positioned to make decisive contributions to human progress and to a more sustainable world. Drawing on its deep know-how in polymer composites, Michelin is constantly innovating to manufacture high-quality tires and components for critical applications in demanding fields as varied as mobility, construction, aeronautics, low-carbon energies, and healthcare. The care placed in its products and deep customer knowledge inspire Michelin to offer the finest experiences. This spans from providing data- and AI-based connected solutions for professional fleets to recommending outstanding restaurants and hotels curated by the MICHELIN Guide. Headquartered in Clermont-Ferrand, France, Michelin is present in 175 countries and employs 129,800 people.

MICHELIN GROUP MEDIA RELATIONS
+33 (0) 1 45 66 22 22
7 days a week
112, Avenue Kléber, 75016 Paris
www.michelin.com

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