MICHELIN AND THE 2022 LE MANS 24 HOURS

90e EDITION

PRESS KIT JUNE 2022

MICHELIN

MICHELIN TAKES ANOTHER STEP TOWARDS A MORE SUSTAINABLE FUTURE WITH A NEW RACING TYRE THAT CONTAINS 53 PERCENT BIO-SOURCED OR RECYCLED RAW MATERIALS

LAST YEAR, MICHELIN ANNOUNCED THAT THE TYRES IT WAS DEVELOPING FOR GREENGT'S LMPH2G HYDROGEN-POWERED PROTOTYPE WOULD BE COMPOSED OF 46 PERCENT SUSTAINABLE MATERIALS. TWELVE MONTHS ON, THE FRENCH MANUFACTURER HAS TAKEN ON A NEW CHALLENGE, PRESENTING FOR THE FIRST TIME AT LE MANS A TYRE INCORPORATING AN UNPRECEDENTED 53 PERCENT OF BIO-SOURCED OR RECYCLED MATERIALS.

This ultra-high-performance tyre is further proof of Michelin's ability to continuously integrate an increasingly higher proportion of sustainable materials into products conceived to withstand extreme conditions in motor racing without compromising in any way on performance or adversely affecting the manufacturer's environmental impact.

Michelin has already outlined its ambition for all of its tyres to be 100 percent sustainable by 2050. The aim is for the first stage of this objective to be achieved by 2030, when the plan is for all of the Group's products to be made from 40 percent bio-sourced or recycled raw materials, in line with the Michelin In Motion plan.

In accelerating the introduction of sustainable innovations, Michelin Motorsport is in fact ahead of the Group's timetable for 2030 – as evidenced by this new tyre made up of 53 percent sustainable materials.

Thanks to a unique process developed by the firm's partner Enviro, end-of-life tyres are transformed by pyrolysis technology into high-quality raw materials by recovering certain original elements, such as carbon black, which can then be re-employed to manufacture new products.

Amongst the other sustainable materials incorporated into this prototype tyre are orange and lemon peel, pine tree resin, sunflower oil and recycled steel from industrial waste.

For Michelin, the increasing use of sustainable materials in its tyres must comply with the following key principles:

- *No slowing down of the brand's ongoing **progress with regard to the quality and performance of its tyres**, particularly when it comes to safety.*
- *The assurance that the inclusion of these new materials will yield real improvements in the tyre's overall environmental impact, be that in terms of its design, its production or the way in which it is distributed, used and recycled – in other words, the tyre's Life Cycle Assessment (LCA).*
- *Finally, Michelin only commits to projects after carefully considering the feasibility of incorporating these materials on a large scale and rolling them out across all of its commercial ranges.*

WHAT ARE SUSTAINABLE MATERIALS?

MICHELIN CONSIDERS SUSTAINABLE MATERIALS TO BE THOSE THAT ARE RECYCLED MATERIALS, OR BIO-SOURCED MATERIALS THAT ARE RENEWABLE OVER THE SCALE OF A HUMAN LIFETIME, AND WHICH DO NOT COME INTO COMPETITION WITH THE FOOD INDUSTRY. EXAMPLES:

Recycled materials:

styrene regenerated from waste polystyrene (yoghurt pots, food trays, packaging, etc.), textiles regenerated from PET* waste (plastic bottles, dispensers, etc.), carbon black recycled from end-of-life tyres.

Renewable bio-sourced materials:

natural rubber from a responsible industry, butadiene (or bio-butadiene), products made from biomass (plant waste).

PET : Polyethylene Terephthalate

MOTORSPORT PLAYS A VITAL ROLE IN ACCELERATING THE DEVELOPMENT OF SUSTAINABLE SOLUTIONS AIMED AT MAKING MOBILITY INCREASINGLY SAFER, CLEANER, MORE EFFICIENT AND ACCESSIBLE TO ALL

Motorsport has been an intrinsic feature of the MICHELIN philosophy and in the brand's DNA right from the outset. Some 130 years of winning technological breakthroughs bear testament to an illustrious history, but Michelin's commitment to competition extends far beyond mere on-track success. Most importantly of all, the manufacturer leverages its motorsport activities to accelerate the development of new sustainable solutions for all, without detracting in any way from the acclaimed performance of its products.

> Safer mobility

In trialling advanced technologies designed to enhance the grip, longevity and strength of its tyres – most notably through its participation in the FIA World Endurance Championship (WEC) – Michelin is able to exploit their potential in extreme conditions. Once perfected and proven in this ultra-competitive environment, these technologies can be carried over to the brand's road-going tyres, thereby providing all motorists with the same high level of safety.

> More efficient mobility

Michelin is committed to manufacturing tyres that are safe and perform consistently from the start to the end of their life cycle – right up to the moment when the chequered flag falls at the racetrack, or until the tread wears down to the legal limit on the road. Endurance racing serves as a perfect test and development laboratory in this perpetual pursuit of lasting performance.
In addition to improving safety, the brand's approach in this field reduces its environmental footprint in both motorsport and everyday life, by guaranteeing excellent performance throughout the life cycle of its tyres. This means they need replacing less frequently, which requires fewer tyres to be produced, while saving on raw materials and energy and reducing CO_2 emissions.

> Cleaner mobility

Alongside the development of tyres that are safe and perform consistently from the start to the end of their useful life, Michelin works on simulation systems that enable tyres to be developed virtually, resulting in a significant reduction in the number of physical tyres needed for test purposes. This is true of the brand's new Le Mans Hypercar range, which was designed entirely on a simulator.
Michelin is a pioneer in this domain and has implemented procedures to expand these practices for the development of its road-going products. The calibre of its motorsport-honed simulation systems and the expertise of its engineers mean new tyre ranges can be designed and brought to market more quickly, while limiting physical on-track tests and, in so doing, yielding evident benefits in terms of decarbonisation.

MICHELIN TYRES DEVELOPED ENTIRELY IN VIRTUAL FORM

Michelin's current range of Hypercar endurance racing tyres was the first to be developed exclusively by simulator. These tyres did not take part in any physical tests before being fitted to the race cars for the first time. In this way, **the brand was able to demonstrate that it is possible to combine virtual development and outstanding on-track performance** with a better environmental approach. Ordinarily, the development of a new tyre requires a series of real-life circuit tests, with all of the human, logistical, material and manufacturing organisation that entails. Michelin's digital expertise duly avoided the requirement to manufacture multiple tyres, while simultaneously eliminating several logistical challenges. Utilising this technology means there is no longer the need for a physical circuit, for trucks to transport the tyres, for associated equipment or for technicians and engineers to travel to tests, not to mention all of the energy that would otherwise have been consumed in the process. Not only that, but since no 'test' tyres are physically produced, **no recycling is necessary.** This saving in terms of raw materials, energy, time and human resources perfectly embodies **Michelin's Everything Sustainable plan.**

MISSIONH24: MICHELIN INVESTING IN FUTURE MOTORSPORT TECHNOLOGIES BY EMBRACING HYDROGEN

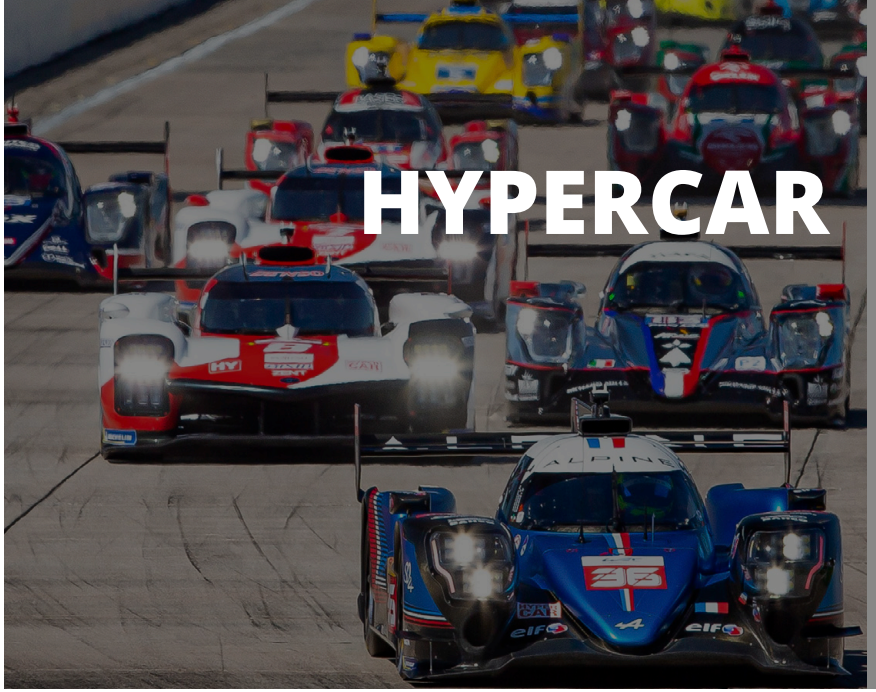
Michelin's involvement in the **MissionH24** project forms part of its efforts to promote z**ero-emission mobility**, via the creation of a new class for hydrogen-powered prototypes – such as the LMPH2G and, more recently, GreenGT's H24 – at the Le Mans 24 Hours by 2025.

This initiative perfectly illustrates the Group's commitment – via its subsidiary Symbio, a joint-venture between Michelin and Faurecia – to using hydrogen technologies to advance electro-mobility and the energy transition.

Symbio designs and develops hydrogen fuel-cell kits that can be integrated into numerous types of vehicle, including vans, buses and trucks.

Their participation in the **MissionH24** project grants Michelin and Symbio access to a real-life high-tech test laboratory, which is vital to speeding up the development of new, hydrogen-based sustainable solutions that will ultimately become available to the general public.

THE MICHELIN PILOT SPORT RANGE FOR THE 2022 LE MANS 24 HOURS



HYPERCAR

The headlining Hypercar class was introduced in 2021 and features both hybrid (Peugeot Sport, Toyota Gazoo Racing) and internal combustion-engined (Alpine Elf Team, Glickenhaus Racing) prototypes. From 2023, the majority of the LMH and LMDh cars will be hybrid. At the beginning of last year, Michelin inaugurated a new portfolio of tyres to cover the different technology, weight and performance characteristics of these new prototypes. They were also the first racing tyres to be developed entirely virtually, on a simulator, without using an actual car to finetune their specification.

"The results we obtained in 2021 speak volumes for the outstanding work accomplished by the engineers at Michelin Motorsport who developed our new Hypercar tyres using digital tools alone," says Pierre Alves, the manager of Michelin's FIA WEC programme. ***"In consultation with the championship's organisers and the FIA, the decision was taken to carry them over to 2022, in spite of the numerous changes that have been introduced concerning the Hypercar class."***

NEW IN THE HYPERCAR CLASS FOR 2022

Toyota Gazoo Racing: new tyre sizes

The Toyota GR010-Hybrids have traded their 31/71-18 tyres all-round for the fitment that will be used in the future by the LMDh prototypes, namely **29/71-18 at the front and 34/71-18 at the rear** (i.e. wider at the rear). **Michelin worked closely with the Japanese carmaker** to provide it with tyres that are ideally suited to the performance characteristics of its cars.

Glickenhaus Racing: no changes

The cars fielded by the American film producer and director James Glickenhaus also run **29/71-18 and 34/71-18 Michelin tyres front and rear** respectively, a decision founded on the results obtained in 2021 by the team's internal-combustion, biturbo V8-powered prototype.

Alpine Elf Team: from LM P1 to Hypercar tires

Although the Alpine A480 Gibson continues to be equipped with 31/71-18 tyres all-round, **it has switched to Hypercar tyres** instead of the LM P1 covers it ran in 2021, which themselves dated from 2020. **A test programme with Michelin enabled Alpine Elf Team** to optimise the set-up of its car in its 2022 configuration.

WET WEATHER TIRES

In accordance with the regulations, all the Hypercar protypes will be able to choose between the two types of wet weather tyre Michelin introduced for the 2021 world championship.

The first is an Intermediate which covers a wide range of temperatures and conditions, from damp to drying.

In the case of heavier rain, or standing water, the drivers can opt for the Wet which features a compound developed specifically for these conditions.

Together, these two types of wet weather tyre cover all the situations drivers can expect to encounter at the FIA WEC's European and non-European rounds.

LM GTE Pro and LM GTE Am

Michelin has developed a range of all-new tyres for the highly-competitive LM GTE cars.

"Given how much the LM GTE Pro and LM GTE Am cars have evolved in recent years, we wanted to provide our partners in both classes with something new," explains Pierre Alvès. *"Our work focused chiefly on the delivery of consistent performance with a view to providing the best balance possible as our tyres wear. For 2020, we introduced three types of compound that took into account the characteristics of the different circuits visited in the course of the season. Our partners asked us to do the same for 2022. As in the Hypercar class, the manufacturers involved are original-equipment customers for Michelin, so we enjoy strong working relationships with them all and provide them with a very high level of service."*

TYRES AVAILABLE FOR THE LM GTE PRO AND LM GTE AM CARS:

> **COLD-**weather soft
> **HOT-**weather soft
> **HOT-**weather medium

The wet weather tyres available for these cars (DRYING WET and FULL WET) are identical to those raced last season.

All the Le Mans GTE Pro and Le Mans GTE Am cars run the same sizes, i.e. 30/68-18 and 31/71-18 at the front and rear respectively.

MICHELIN'S PARTNER TEAMS AT THE 2022 LE MANS 24 HOURS

At this year's Le Mans 24 Hours, 35 cars in 3 different classes are racing at Le Mans on Michelin tyres.

HYPERCAR

All 5 of the prototypes racing in the Hypercar class are on Michelin tyres.

Toyota Gazoo Racing

The only hybrid Le Mans Hypercar prototypes.

- **N°7 Toyota GR010-Hybrid:** *Mike Conway/Kamui Kobayashi/José María López*
- **N°8 Toyota GR010-Hybrid:** *Sébastien Buemi/Brendon Hartley/Ryo Hirakawa*

Glickenhaus Racing

The American team is running the same biturbo V8-powered car as last year.

- **N°708 Glickenhaus:** *Romain Dumas/Olivier Pla/Felipe Derani*
- **N°709 Glickenhaus:** *Ryan Briscoe/Richard Westbrook/Franck Mailleux*

Alpine Elf Team

Ahead of a programme with a Hypercar prototype, Alpine is back this year with the A480-Gibson.

- **N°36 Alpine A480:** *André Negrão/Nicolas Lapierre/Matthieu Vaxivière*

To enable these cars of differing technologies to compete together in the Hypercar class on an equal footing, the regulations include a so-called Balance of Performance (BoP) adjustment process.

LE MANS GTE PRO AND LE MANS GTE AM

Michelin tyres have been chosen for 7 and 23 cars respectively in the fiercely-competitive Le Mans GTE Pro and Le Mans GTE Am classes.

LM GTE Pro

Ferrari AF Corse

- **N°51 Ferrari 488 GTE EVO:** *Alessandro Pier Guidi/James Calado/Daniel Serra*
- **N°52 Ferrari 488 GTE EVO:** *Miguel Molina/Antonio Fuoco/Davide Rigon*

Porsche GT Team

- **N°91 Porsche 911 RSR-19:** *Gianmaria Bruni/Richard Lietz/Frédéric Makowiecki*
- **N°92 Porsche 911 RSR-19:** *Michael Christensen/Kevin Estre/Laurens Vanthoor*

Corvette Racing

- **N°63 Corvette C8.R:** *Antonio Garcia/Jordan Taylor/Nicky Catsburg*
- **N°64 Corvette C8.R:** *Tommy Milner/Nick Tandy/Alexander Sims*

Riley Motorsports

- **N°74 Ferrari 488 GTE EVO:** *Felipe Fraga/Sam Bird/Shane Van Gisbergen*

LM GTE Am

- **N°21 Ferrari 488 GTE EVO (AF Corse):** *Simon Mann/Christoph Ulrich/Toni Vilander*
- **N°33 Aston Martin Vantage AMR (TF Sport):** *Ben Keating/Enrique Chaves/Marco Sorensen*
- **N°46 Porsche 911 RSR-19 (Team Project 1):** *Matteo Cairoli/Mikkel Pedersen/Nicolas Leutwiler*
- **N°54 Ferrari 488 GTE EVO (AF Corse):** *Thomas Flohr/Francesco Castellacci/Nicholas Cassidy*
- **N°55 Ferrari 488 GTE EVO (Spirit of Race):** *Duncan Cameron/Matthew Griffin/David Perel*
- **N°56 Porsche 911 RSR-19 (Team Project 1):** *Brendan Iribe/Oliver Millroy/Ben Barnicoat*
- **N°57 Ferrari 488 GTE EVO (Kessler Racing):** *Takeshi Kimura/Frederik Shandorff/Mikkel Jensen*
- **N°59 Ferrari 488 GTE EVO (Inception Racing):** *Alexander West/ Come Ledogar/ Marvin Kelin*
- **N°60 Ferrari 488 GTE EVO (Iron Linx):** *Claudio Schiavoni/Alessandro Balzan/Raffaele Gianmaria*
- **N°61 Ferrari 488 GTE EVO (AF Corse):** *Louis Prette/Conrad Grunewald/Vincent Abril*
- **N°66 Ferrari 488 GTE EVO (JMW Motorsport):** *Renger Van Der Zande/Mark Kvamme/Jason Hart*
- **N°71 Ferrari 488 GTE EVO (Spirit of Race):** *Franck Dezoteux/Pierre Ragues/Gabriel Aubry*
- **N°75 Ferrari 488 GTE EVO (Iron Linx):** *Pierre Ehret/Christian Hook/Nicolas Varrone*
- **N°77 Porsche 911 RSR-19 (Dempsey-Proton Racing):** *Christian Ried/Sebastian Priaulx/Harry Tincknell*
- **N°79 Porsche 911 RSR-19 (Weather Tech Racing):** *Cooper MacNeil/Julien Andlauer/Gianluca Giraudi*
- **N°80 Ferrari 488 GTE EVO (Iron Linx):** *Matteo Cressoni/Giancarlo Fisichella/Richard Heistand*
- **N°85 Ferrari 488 GTE EVO (Iron Dames):** *Rahel Frey/Michelle Gatting/ Sarah Bovy*
- **N°86 Porsche 911 RSR-19 (GR Racing):** *Michael Wainwright/Ricardo Pera/Benjamin Barker*
- **N°88 Porsche 911 RSR-19 (Dempsey-Proton Racing):** *Fred Poordad/Patrick Lindsey/Jan Heylen*
- **N°93 Porsche 911 RSR-19 (Proton Competition):** *Michael Fassbender/Matt Campbell/Zacharie Robichon*
- **N°98 Aston Martin Vantage AMR (Northwest AMR):** *Paul Dalla Lana/David Pittard/Nicki Thiim*
- **N°99 Porsche 911 RSR-19 (Hardpoint Motorsport):** *Rob Ferriol/Katherine Legge/Adrien De Leener*
- **N°777 Aston Martin Vantage AMR (D'Station Racing):** *Satoshi Hoshino/Tomonobu Fujii/Charles Fagg*

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