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ABB FIA FORMULA E WORLD CHAMPIONSHIP

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THE MICHELIN PILOT SPORT EV: THE TYRE THAT STARS IN THE ABB FIA FORMULA E WORLD CHAMPIONSHIP, and more



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FORMULA E: AN INCUBATOR FOR INNOVATION THAT DOVETAILS WITH MICHELIN'S EVERYTHING SUSTAINABLE PLAN

A founding partner of Formula E from the outset in 2014, Michelin sees the series as a means to accelerate the development of new technologies for the benefit of sustainable mobility.

Michelin effectively seeks to use the smallest possible quantity of raw materials in the production of its tyres, without in any way compromising their safety or performance, irrespective of the tread's level of wear. This strategy minimises the impact on the planet's resources and favours low rolling resistance, lower fuel consumption and reduced CO2 emissions. At the same time, Michelin is working on the sustainability of the materials and ingredients that go into its tyres, in compliance with the 'Everything Sustainable' plan that is core to its strategic vision.

Since the inaugural FIA Formula E Championship in 2014/2015, Michelin has developed three distinct generations of its tyre for the competition's all-electric single-seaters. During this time, its performance, consistency and versatility have all been improved, while its rolling resistance has been reduced by almost 20 percent, and nine kilograms have been shaved off the weight of a set of four.

Michelin Motorsport's engineers achieved all this while working to an increasingly challenging brief as the cars became more and more powerful, and more demanding of their tyres. The use of lighter, more efficient tyres that cover complete race days confirms Michelin's commitment to protecting the environment. The technological improvements introduced in the course of Formula E's first six seasons have enabled the French firm to accelerate the development of the **MICHELIN Pilot Sport EV** road tyre.

THE MICHELIN PILOT SPORT EV: THE FIRST ROAD TYRE FOR ELECTRIFIED HIGH-PERFORMANCE CARS

Formula E provides Michelin with a high-tech laboratory and an invaluable proving ground for new technologies that can potentially be carried over to the firm's road tyres. Following in the footsteps of the MICHELIN Pilot Sport 4, the tread pattern of which was inspired by the tyre raced in Formula E, **the MICHELIN Pilot Sport EV is the first road tyre for plug-in hybrid and full-electric high-performance cars.**

The electrified vehicle segment is currently enjoying exponential growth (from 2.1 million units in 2019 to estimated annual sales of 18 million vehicles by 2030). It is also predicted that more than a third of all sportscars sold in the next five years will be 100% electric, while the majority of the rest will be plug-in hybrids.

Meanwhile, more than eight high-performance electrified cars in 10 are expected to be equipped with 20-inch or bigger wheels in the future.

It is with these figures in mind that **Michelin has invented this new tyre segment** and, as things stand, it is the only manufacturer to be active in this fledgling market at both the original-equipment and replacement levels.





TECHNOLOGIES DERIVED FROM FORMULA E

The original racing MICHELIN Pilot Sport EV designed by Michelin Motorsport's engineers for Formula E's debut in 2014 revolutionised single-seater racing. Not only did its size (similar to that of a road tyre: 18 inches, compared with 13 inches in Formula 1) set it apart, but its patterned

tread and compound enabled it to race in dry and wet conditions alike. On top of that, it stood out as the first tyre to be capable of covering free practice, qualifying and races. That initial tyre and the two generations that have succeeded it have allowed Michelin's engineers to harvest valuable data and evaluate new technologies employed by today's **MICHELIN Pilot Sport EV** road tyre.

Thanks to both its vast experience of motor racing and the proven record of its Research and Development department when it comes to innovation, Michelin has succeeded in designing the first tyre to combine sustainable mobility and high performance. In addition to the low road-and cabin-noise it generates thanks to bespoke technology, the new **MICHELIN Pilot Sport EV**'s very low rolling resistance provides extended range. These exceptional qualities combine with the key performance characteristics that have long been a signature of Michelin tyres, from outstanding road holding on all types of road, to driving enjoyment, steering precision, short stopping distances and long life, all of which contribute to optimising safety, whatever the level of wear.

As creator of this new market segment, Michelin has provided further evidence of its ability to renew itself ceaselessly in the industry it has operated in for more than 130 years. In its role as world leader, the French firm continues to deliver increasingly clean performance tyres that address motorists' needs, both now and in the future.

The new **MICHELIN Pilot Sport EV** also meets the demands of vehicle manufacturers who have been won over by its environmental credentials, performance and durability. It is currently available in a choice of 16 sizes, and more than 70 original-equipment projects are under consideration.



MICHELIN TRACK CONNECT: A HIGHLY POSITIVE DEBUT SEASON

The 2019/2020 FIA Formula E Championship saw Michelin innovate with the introduction of its connected Michelin Track Connect system which provides reliable information about tyre pressures in real time at race meetings, whether the covers are hot or cold.



Michelin Track Connect uses a Michelin-developed sensor embedded in a specific casing located inside the **MICHELIN Pilot Sports** that feature in the series. The data it collects is transmitted in encrypted form to the FIA and Michelin who are the only recipients, making it possible to check that minimum tyre-pressure requirements are complied with. Its results lived up to expectations and, **for the first time in the championship's history, not a single penalty was issued for tyre-pressure-related infractions.**

True to its vision of motorsport, Michelin uses racing's potential as a high-tech laboratory to serve mobility and took advantage of Formula E's regulations to incubate and accelerate the development of its connected technology in extreme conditions. The feedback and data collected in the series have contributed to the development of connected products for the motoring public.

The four sensors that make up the publicly-available **Michelin Track Connect** communicate with a smartphone application which analyses the data it receives to recommend tyre pressures as a function of the type of vehicle, type of use (road, circuit), weather and road conditions. It uses a colour-code system to display precise tyre-pressure and temperature-window information that makes it possible to check in real time that tyres are functioning optimally. The data produced by the app can be viewed, compared and shared at any time.



FORMULA E'S 2021 REGULATIONS CUT TYRE ALLOCATIONS BY 25 AND 50 PERCENT!

From the outset, Michelin has worked closely with the FIA and Formula E's organisers to curb the number of tyres consumed at races. This process has seen Michelin contribute to a reduction of the championship's environmental footprint, with no detriment to the MICHELIN Pilot Sport's performance, consistency or versatility. Michelin's successive Formula E tyres have effectively been designed to be capable of competing in dry and wet conditions alike, while covering meetings from start to finish, from free practice and qualifying to the e-prix themselves.

During the first four seasons, drivers had two cars each and a total allocation of eight tyres per race, a figure that was far lower than the quotas seen in other world-class championships. The beginning of Season 5 (2018/2019) saw the introduction of the new, so-called 'Gen2' cars, the batteries of which had the capacity to cover entire races. Drivers had a single car each, but the tyre allocation remained unchanged, despite the superior power outputs and longer distances involved. Michelin had pursued its development work, however, and the MICHELIN Pilot Sport that superseded the **MICHELIN Pilot Sport EV2** – which made its debut in 2016/2017 – was not only lighter but also delivered enhanced performance and lower rolling resistance during Seasons 5 and 6.

For Season 7 (2021), which celebrates Formula E's promotion to official FIA world championship status, the regulations have evolved in favour of the environment and cost savings. Drivers are now allocated six tyres per e-prix instead of eight (three fronts, plus three rears), which equates to a reduction of 25 percent. In the case of double-header meetings (i.e. back-to-back races at the same venue), they will be authorised to use just two sets instead of four previously, a reduction of 50 percent. This change comes after attentive observation of the performance, versatility, longevity and outstanding resistance to wear of Michelin's Formula E tyre these past two seasons.





INTERVIEW

Jérôme Mondain
(Formula E Manager, Michelin)

What are the logistical and human challenges you face this season?

We always plan our shipping arrangements well in advance, with the aim of favouring

means of transport that have the smallest environmental impact, like boats instead of planes. That doesn't mean we never have to adapt to unforeseen circumstances, though. For example, the Santiago E-Prix was initially scheduled for January and our tyres were already on their way to South America by sea when the race's postponement until June was announced. Thanks to our partners in Chile, we succeeded in finding a place to store our tyres and equipment rather than bring everything back to France and then ship it back out again. At the same time, a separate shipment was on its way to Saudi Arabia for what will now be the first meeting of the 2021 season. As for the team, we travel as a group, although some staff arrive slightly later than the others in order to minimise the risks associated with the Covid situation. The new regulations mean we have fewer tyres to fit, but we also have less time to get everything done.

How will the smaller allocations affect the teams' tyre strategies?

Either six or eight tyres are now effectively available per car depending on whether there's just one-race or if it's a double-header meeting. That said, teams will be free to employ their respective allocations as they see fit. For example, they might prefer to run all their tyres in practice and qualifying in order to have tyres that have been bedded in for the race. It will also be important to switch tyres around in order to ensure consistent wear and counter the fact that wear-rates on the left- and right-hand sides of the cars can be different at some tracks, like Mexico and Santiago.

What is your take on the new-look calendar?

There is a great deal at stake for us because the new regulations have reduced tyre allocations by up to 50 percent, which is not without consequences. The MICHELIN Pilot Sport EV was developed in compliance with the brief for Seasons 5 and 6 which visited street circuits we had previous knowledge of. This year, we don't know what the full calendar will be, but the weather is likely to be very different at some venues because we go there at a different time of the year, yet the FIA has carried over the same tyre specification, with smaller allocations. We will consequently monitor how the early part of the season plays out to see if it might not be judicious to seek changes to the measures that have been taken.

12 TEAMS, 24 DRIVERS AND A SINGLE TYRE SUPPLIER – MICHELIN

Since 2014, Michelin has provided the tyres used by all the teams involved in the ABB FIA Formula E Championship. The MICHELIN Pilot Sport EV that will star this season made its debut at the start of the 2018/2019 campaign, although the sidewalls of the 2021 tyre feature Michelin's official colours – blue and yellow. All 24 drivers will benefit from the exceptional performance and versatility of this unique tyre, as well as from the expert advice provided by Michelin Motorsport staff at races.



Audi Sport Abt Schaeffler:
Lucas di Grassi and René Rast

BMW i Andretti:
Maximilian Günther and Jake Dennis

Dragon Racing:
Sérgio Sette Câmara and Nico Müller

DS Techeetah:
António Félix Da Costa and Jean-Eric Vergne

Envision Virgin Racing:
Robin Frijns and Nick Cassidy

Mahindra Racing:
Alexander Sims and Alex ander Lynn

Mercedes-Benz EQ:
Stoffel Vandoorne and Nick de Vries

NIO 333:
Oliver Turvey and Tom Blomqvist

Nissan e.dams:
Sébastien Buemi and Oliver Rowland

Jaguar Racing:
Mitch Evans and Sam Bird

Tag Heuer Porsche Motorsport:
André Lotterer and Pascal Wehrlein

Rokit Venturi Racing:
Edoardo Mortara and Norman Nato



A CALENDAR OF TWO HALVES FOR THE 2021 ABB FIA FORMULA E WORLD CHAMPIONSHIP

▷ February 26-27
AD-DIRIYAH, SAUDI ARABIA

▷ April 10
ROME, ITALY

▷ April 24
VALENCIA, SPAIN

▷ May 8
MONACO

▷ May 22
MARRAKESH, MOROCCO

▷ June 5-6
SANTIAGO, CHILE

For the moment, only the first six venues have been confirmed owing to the pandemic situation. The calendar kicks off in Saudi Arabia with a number of innovations, including Formula E's first night-time races. The sandy top-coating of the track in Diriyah might prove less hard-wearing in the cooler temperatures expected after sunset when the circuit will be lit by powerful floodlights powered exclusively by clean, renewable energy.

The season's third race will take teams to Rome's historic EUR district on April 10. This undulating street circuit presents no difficulties of note for tyres and was an immediate hit with the drivers who will get their third taste of it this year.

Next up will be the championship's first visit to Circuito Ricardo Tormo, near Valencia, on April 24. The venue has already hosted Formula E action in the past in the form of pre-season tests, but the actual circuit layout will be different this time around. This will also be the first e-prix to be held in Spain. It will be unknown territory for tyres since the weather is sure to be much hotter than it has ever been for the collective tests in late-November.

On May 8, Formula E will travel for the fourth time to Monaco where drivers will compete on all or part of the Formula 1 loop. Like Michelin's Formula E tyre, the drivers enjoy the Principality's impeccable asphalt!

A fortnight later (May 22), teams will head for Marrakesh's Circuit Moulay El Hassan in Morocco. Marrakesh hosted the last race to be held before the first lockdown of 2020 and has featured on the calendar since the 2016/2017 campaign. It consequently holds no secrets for either the teams or Michelin, although the weather will be an unknown parameter at this later time of the year.

The first part of the championship will conclude on June 5-6 with a double-header in Santiago, Chile, where the chief question mark will be the heat. In January, the track temperature can soar to as high as 60°C, but it is more likely to be around 10°C in June.

The rest of the calendar will be published in the coming weeks.



THE MICHELIN PILOT
SPORT EV – TECHNICAL DATA

SIZES

front: 24/64-18 / rear: 27/68-18
(equivalent to 235/40R18 and 305/40R18)

INTERIOR DIAMETER

18 inches

ASPECT RATIO

40%, i.e. sidewall heights of 98mm (front)
and 122mm (rear)

TREAD PATTERN

asymmetric, non-directional

CONDITIONS

dry or wet track surface



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