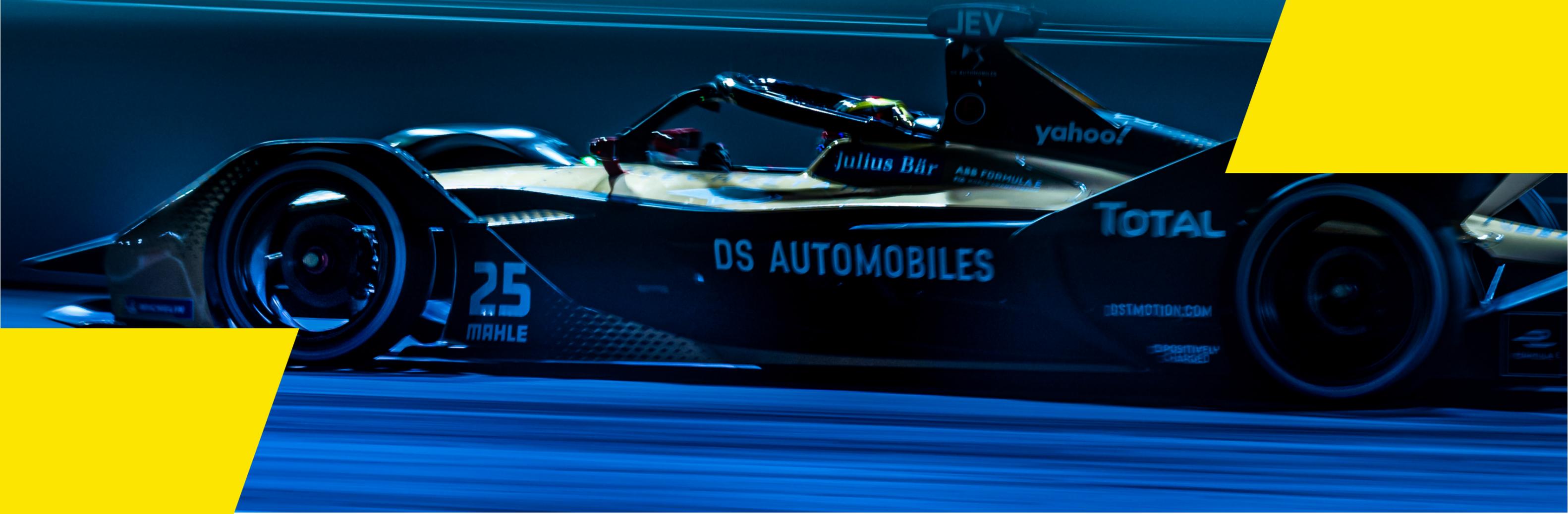


# MICHELIN MEDIA KIT



**2021/2022 ABB FIA Formula E  
World Championship**

Season 8





## **SEASON 8**

**16 E-PRIX - 10 HOST CITIES - 22 PILOTS**

<b>Michelin and Formula E: a founding partner .....</b>	<b>3</b>
<b>Three generations of tyre: three innovative steps forward .....</b>	<b>4</b>
<b>The MICHELIN Pilot Sport EV: from track to street .....</b>	<b>5</b>
<b>The MICHELIN connected tyre .....</b>	<b>6</b>
<b>Swansong campaign: interview with Mirko Pirracchio (Formula E Programme Manager, Michelin) .....</b>	<b>7</b>
<b>Michelin's innovation work in motorsport continues .....</b>	<b>8</b>

# **MICHELIN AND FORMULA E: A FOUNDING PARTNER**



It was from the very outset, in 2013, that Michelin came onboard as a founding partner of the FIA Formula E Championship, the first round of which was organised in September 2014, in Beijing, China. Its decision was guided by two chief reasons. Above all, it was intended to showcase Michelin's work in favour of sustainable mobility, including the development of specific tyres for electric cars. Almost a decade down the line, the automobile industry's electrification has gained considerable momentum, vindicating Michelin's visionary thinking that some may have perceived as a gamble. The company read the trend correctly, however, since the electrified vehicle market is today enjoying two-figure growth rates, and Formula E is now sanctioned by the FIA (Fédération Internationale de l'Automobile) as an official world championship that has attracted a long list of prominent carmakers.

### **Setting new standards in the world of racing tyres**

The other principal motive behind Michelin Motorsport's involvement in Formula E was to demonstrate its ability to design a revolutionary racing tyre and seize the opportunity it offered to introduce a number of solutions it had been championing for some time. These included the use of 18-inch tyres for single-seater race cars, a ground-breaking move geared to assisting the carry-over of technology from the race track to the street. Thanks to its breakthrough philosophy, only Formula E was able to provide a platform for this project. In contrast, Formula 1 and

other feeder series stayed with 13-inch wheels until the end of last season, before finally switching to 18-inch rims for 2022.

In the course of Michelin's first seven seasons in Formula E, its taste for pioneering innovation spawned three generations of bespoke racing tyres which not only featured a new size, but also combined outstanding consistency and longevity in wet and dry conditions alike. In addition to establishing a new benchmark in the world of single-seater racing, they have had repercussions outside of motorsport, too.

### **A tyre that pays attention to the environment**

The technological revolution Michelin sparked through its involvement in Formula E fits perfectly with the Group's plans for protecting the environment, since only a small number of tyres needed to be manufactured for the championship, and that meant fewer covers to transport and recycle after use.

Formula E drivers currently have a maximum allocation of just eight tyres (two sets) per e-prix meeting, with 12 allowed for double-header weekends. These figures make Formula E the FIA world championship that consumes the fewest tyres, while Michelin has taken advantage of its involvement in the series to build for the future and reduce its carbon footprint

# ***THREE GENERATIONS OF TYRE: THREE INNOVATIVE STEPS FORWARD***

Since the inaugural Formula E Championship in 2014, Michelin has used the streets visited by the series as an incubator for the development of new technologies, with its motorsport department working closely with the firm's research and development experts to conceive new tyres for the future. Season after season, Michelin continued to work on its Formula E solution and no fewer than three generations of its tyre for the all-electric championship have taken to the race track.



## ***THE MICHELIN PILOT SPORT EV: A REVOLUTIONARY RACING TYRE***

From the outset, the MICHELIN Pilot Sport EV stood out as a very different type of racing tyre. In addition to being the first 18-inch tyre to appear in a world-class single-seater championship, it closely resembled a mass production road tyre, with a patterned tread and two sizes frequently specified for touring cars, namely 245/40R18 and 305/40R18 front and rear. Yet despite its similarities to a road tyre, the MICHELIN Pilot Sport EV is packed with technologies that enable Formula E drivers to cover complete race meetings, from free practice and qualifying to the e-prix themselves, irrespective of the weather. This disruptive breakthrough meant that Michelin needed to make just 200 tyres (two full sets plus two spares per car) for individual races from the very beginning of the championship. This quantity was exceptionally low in comparison with certain other forms of motorsport which necessitated the production, transport and recycling of several thousand tyres per event!

Again belying its resemblance to a road tyre, the MICHELIN Pilot Sport EV is a high-tech product that is subject to strict confidentiality measures. Its compound, construction and manufacturing process all involve protected technologies, so it is not available for general sale, even to the teams. After every race, Michelin staff effectively recover all their tyres and take them back to their base in Clermont-Ferrand, France, for inspection.

## ***THE MICHELIN PILOT SPORT EV2: AN EXTRA LAP PER RACE THANKS TO SUPERIOR ENERGY EFFICIENCY***

Michelin Motorsport's engineers originally planned to introduce an evolution of their initial Formula E tyre after the inaugural season. Given the level of performance it delivered, however, the FIA asked Michelin to wait another year before making its second-generation tyre available. As a result, it was only in Season 3 that the new MICHELIN Pilot Sport EV2 hit the track. And when it did, it set a new standard for energy efficiency in motorsport.

More than 25 percent of a car's energy consumption is used to overcome rolling resistance. By reducing the latter, therefore, vehicles benefit from additional range, although the gain must not be to the detriment of the tyre's other performance-related qualities.

The MICHELIN Pilot Sport EV2 saw Michelin's engineers successfully square this challenging circle to not only deliver superior performance but also curb rolling resistance by 16 percent in comparison with the original Formula E tyre. This significant improvement equated to an ability to cover an extra lap compared with the championship's first two seasons (same circuit, same conditions)!



# ***THE MICHELIN PILOT SPORT: THE EQUIVALENT OF THREE TYRES INSTEAD OF FOUR!***

The data collected in the course of Formula E's first four seasons allowed Michelin to take its concept further still as the championship switched to new, so-called Gen2 single-seaters for the 2018/2019 campaign. These significantly different cars were more powerful, faster and boasted superior range, so they needed a tyre that would enable them to benefit fully from their upgraded potential. In response to the FIA's brief, Michelin developed the new MICHELIN Pilot Sport which stepped up to the mark to deliver improvements in two key areas, namely low weight and enhanced energy efficiency:

- Extremely lightweight... When it comes to motorsport, weight is an enemy that Michelin's engineers track down ruthlessly, not only with a view to improving performance but also for ecological reasons. Indeed, the fewer raw materials that go into each tyre, the less mass there is to transport and recycle. In comparison with Michelin's first-generation Formula E tyre, the front and rear MICHELIN Pilot Sport tipped the scales at 2 and 2.5 kilograms lighter respectively, for a total saving of approximately 9kg per set of four – equivalent to the weight of a single front tyre!
- Superior energy efficiency... The new MICHELIN Pilot Sport was a development of its predecessor, the Pilot Sport EV2. A result of its new construction design was enhanced rolling resistance which provided the championship's all-electric single-seaters with extra range while maintaining, and even improving on their existing level of performance, not to mention driver safety.

Designed to cover complete race days, this lighter, more efficient tyre confirmed Michelin's commitment to protecting the environment.



# **THE MICHELIN PILOT SPORT EV FOR HIGH-PERFORMANCE ELECTRIC ROAD CARS**

## **The first tyre derived from Michelin's Formula E involvement**

The vast majority of sports cars sold over the next five years will be either all-electric or plug-in hybrids. Having sought to address the shifting needs of motorists for more than 130 years, Michelin continues to stand out as a pioneer with the creation of a new tyre segment for high-performance electrified cars. To date, it is the only brand to be active in both the new market's original equipment and replacement sectors with a range of sizes for rim diameters extending from 18 to 22 inches.

## **From track to street**

Michelin uses the motorsport disciplines in which it is active to carry out research and work on new technologies that may ultimately serve to manufacture mass-produced road tyres. Because of this approach, the MICHELIN Pilot Sport EV is a direct beneficiary of the progress the brand has made during its long involvement in Formula E. The most recent addition to the MICHELIN Pilot Sport catalogue incorporates ElectricGrip Compound™ technology which employs a hard compound for the centre of the tread to provide the grip required to cope with the high torque delivered by electric sports cars. Meanwhile, the MICHELIN Pilot Sport EV's sidewalls carry over the pattern and design of the Formula E tyre, including its velvet-effect finish.

## **Low noise and efficient**

The new MICHELIN Pilot Sport EV cuts road-generated cabin noise by 20 percent<sup>(1)</sup> thanks to Acoustic™ technology which takes the form of a custom-developed polyurethane foam, while its extremely low rolling resistance provides up to 60 kilometres<sup>(2)</sup> of additional range, depending on size. These exceptional characteristics come on top of the hallmark qualities expected of Michelin tyres, from flawless roadholding on all types of road surface, to driving enjoyment, steering precision, short stopping distances and longevity, all of which contribute to optimal safety, irrespective of the level of wear.

## **An eco-responsible tyre and CO<sub>2</sub> neutral<sup>(3)</sup> up to the point of sale**

To achieve carbon neutrality throughout the tyre's life and address the demands of electric sports car owners, Michelin has pledged to neutralise the CO<sub>2</sub> emissions associated with the tyre's production and transport to the point of sale. This process involves the financing of projects aimed at offsetting and absorbing the residual CO<sub>2</sub> emissions associated with tyre production through the Livelihoods carbon fund, until the day comes when it will be possible to eliminate them entirely.

The MICHELIN Pilot Sport EV provides evidence of the brand's capacity to innovate in an increasingly competitive context as it seeks to increase its sales in this high-growth market by a factor of eight by 2024.

(1) Internal noise measurement, done in 2016 on size 245/45 R19 on KIA Cadenza. Results may vary according to vehicle, tire size, speed and road conditions.

(2) Internal study in 10/2020, on dimension 255/45 R19, comparing MICHELIN Pilot Sport EV versus MICHELIN Pilot Sport 4 SUV. Result for an electric vehicle weighing 2,151kg with a range of 540km.

(3) Michelin has cut CO<sub>2</sub> emissions from its industrial sites by 25% since 2010 and aims at their carbon neutrality by 2050. Michelin is engaged in funding projects designed to absorb or avoid CO<sub>2</sub> emissions and draws upon the carbon credits stemming from these projects up to the level of residual emissions linked to the production of MICHELIN Pilot Sport EV tires (from extraction of the raw materials to delivery of the tires to the customer).



# MICHELIN PILOT SPORT EV: BEHIND MOTORSPORT'S FIRST CONNECTED TYRE

Michelin is the only manufacturer that is able to monitor tyre pressures remotely and share the resulting data in encrypted form with Race Control and the FIA.

Tyre pressures have a big influence on tyre performance. In addition to safety considerations, they also affect grip, rolling resistance and wear. The subject is covered by Formula E's regulations and, this season, following dialogue with Michelin, the FIA has effectively set a minimum value of 1.2 bar for cold tyres.

Michelin's solution to make sure teams comply with this rule at all times features. Thanks to Michelin-developed sensor located in a housing glued inside each tyre. This embedded sensor transmits data to a receiver situated in a case that Michelin's engineers can carry anywhere around a track. The encrypted information it provides is only accessible to Michelin and the FIA.

The ability it gives Race Control to monitor the tyre pressures of every car in real time has already reaped benefits, since not a single penalty has yet been handed out for running non-compliant pressures following the system's introduction.





# INTERVIEW

## MIRKO PIRRACCHIO, (FORMULA E PROGRAMME MANAGER, MICHELIN)

### What impact is Formula E's new qualifying format likely to have on tyre strategy?

The new qualifying format promises to make tyre strategy more crucial than ever. During both the group stage [11 cars on-track for 10 minutes] and the subsequent head-to-head duels opposing the four fastest drivers from each group, teams will be authorised to change wheels as they wish. However, given that the drivers have an allocation of just two sets of tyres to cover the entire race day – from free practice and qualifying to the race itself, with three sets allowed for double-header meetings – they will need to use the same tyre several times. This is where the MICHELIN Pilot Sport's versatility and longevity will come into their own by enabling drivers to run different set-ups and different tyre pressures. Our connected technology system will assist in this process by making it possible for us to keep track of tyre pressures in real time and thereby facilitate our dialogue with the teams.

### THE 2021/2022 ABB FIA FORMULA E WORLD CHAMPIONSHIP CALENDAR (SEASON 8 / 10 HOST CITIES / 16 E-PRIX)

**January 28/29:** Ad Diriyah (Saudi Arabia)

**February 12:** Mexico City (Mexico)

**April 9/10:** Rome (Italy)

**April 30:** Monaco

**May 14/15:** Berlin (Germany)

**June 4:** Jakarta (Indonesia)

**July 2:** Vancouver (Canada)

**July 16/17:** New York (USA)

**July 30/31:** London (United Kingdom)

**August 13/14:** Seoul (South Korea)

### What do you think of the new circuits that are due to be visited in Season 8, namely Jakarta, Vancouver and Seoul?

For the moment, the information we have is rather sparse, so we are looking forward to seeing these new street circuits for ourselves. Indonesia [Jakarta] and South Korea [Seoul] are both unaccustomed to hosting motor racing of this level, especially at city-centre venues, so it will be interesting to compete there. Meanwhile, Vancouver [Canada] is expected to run the same track configuration as the IndyCar race it hosts. The weather is likely to be very hot at all these e-prix, but that won't be a first for the MICHELIN Pilot Sport EV which has frequently demonstrated its ability to take very different types of weather in its stride.

### What are the main challenges the new intake of drivers from a variety of backgrounds face this season?

Formula E cars do not generate much aerodynamic downforce and they require a particular braking technique that differs from other racing series. How the car slows as it recovers energy under engine braking is a factor they will need to take onboard. This 'regen' process also has an impact on the temperature of the rear tyres which need to cope with the immediate delivery of the high torque levels that are a feature of electric cars.

They might also be surprised by the characteristics of the 18-inch tyre due to its patterned tread and stiffer steering characteristics around street circuits that may be bumpy and/or soiled early on race day. Even so, they will benefit from a unique tyre that doesn't require warming blankets, that functions perfectly in both dry and wet conditions, whatever the temperature, and which delivers consistent performance from the start to the finish of races. That said, the new intake of drivers will have had a foretaste of all this on their team's respective simulators which are fed with detailed data provided by Michelin.

## ENTRY LIST

TEAMS	PILOTS
<b>Avalanche Andretti</b>	Jake DENNIS Oliver ASKEW
<b>Dragon Penske Autosport</b>	Sergio SETTE CAMARA Antonio GIOVINAZZI
<b>DS Techeetah</b>	António Félix DA COSTA Jean-Eric VERGNE
<b>Envision Racing</b>	Robin FRIJNS Nick CASSIDY
<b>Mahindra</b>	Oliver ROWLAND Alexander SIMS
<b>Mercedes EQ Formula E Team</b>	Nick DE VRIES Stoffel VANDOOORNE
<b>NIO 333 Racing</b>	Oliver TURVEY Dan TICKTUM
<b>Nissan e.dams</b>	Sébastien BUEMI Maximilian GÜNTHER
<b>Jaguar TCS Racing</b>	Sam BIRD Mitch EVANS
<b>Rokit Venturi Racing</b>	Edoardo MORTARA Lucas DI GRASSI
<b>TAG Heuer Porsche</b>	André LOTTERER Pascal WEHRLEIN

## **MICHELIN'S INNOVATION WORK IN MOTORSPORT CONTINUES**

In parallel to its involvement in Formula E's Season 8 as a founding partner of the championship, Michelin continues to invest in exciting new, innovative technologies in other forward-looking forms of motorsport on two wheels and four, in compliance with the Group's All Sustainable plan which seeks to strike the ideal balance between the needs of people, profit and the planet. This work ranges from the increasing use of sustainable materials in the manufacture of its tyres to the development of fuel-cell technology, including its use in motorsport.

At the 2021 Le Mans 24 Hours, for example, Michelin presented its 'Démonstrateur 46' racing tyre, the first racing tyre able to claim that 46 percent of the materials it contains are sustainable. This high proportion was achieved thanks to the quantity of natural rubber that went into its production, as well as the use of carbon black recovered from end-of-life tyres. The list of natural ingredients that make up this tyre also includes orange and lemon peel, sunflower oil, pine resin and steel recovered from tin cans.

This tyre is a concrete example of Michelin's plan to make all of its tyres using sustainable materials only by 2050, with an interim target of 40 percent by 2030.

Meanwhile, the French group continues to work with the FIM Enel MotoETM World Cup, a support series to the MotoGP World Championship and the first championship of this status to star electric motorbikes. It is also active in the development of the first fuel-cell-powered racing car – the Michelin-tyred H24 – in readiness for the introduction of a bespoke class for this type of prototype at Le Mans from 2025.

Last but by no means least, Michelin continues to be involved in the FIA World Endurance Championship in association with prestigious makes like Audi, BMW, Peugeot, Porsche and Ferrari with which it is collaborating actively on sustainable-mobility-related projects.