

PRESS KIT

MICHELIN IN FIA FORMULA E 2018/2019



MICHELIN

FIA FORMULA E A LABORATORY FOR INNOVATION AND PROGRESS



Matthieu Bonardel
Director, Michelin Motorsport

Back in 2013, when we decided to commit to the FIA Formula E Championship, our strategy was determined by two key guiding principles – demonstrating our commitment to the promotion of sustainable mobility and the development of tyres specifically for electric vehicles, while rising to the challenge of designing a revolutionary racing tyre for an equally revolutionary car. Formula E has effectively provided Michelin with an opportunity to showcase solutions that we had been championing for some time in the sport, not the least of which was the use of 18-inch tyres for single-seaters, a size that facilitates the carry-over of technology from the racetrack to the street. We also took advantage of our involvement to produce a tyre that was both versatile and durable, capable of lasting an entire race day and tackling the full spectrum of possible track conditions, from dry to wet. The ‘green’ credentials of this ground-breaking,

energy-efficient tyre are impressive, including the employment of fewer raw materials, the need to ship fewer tyres to races around the world and, of course, the fewer tyres to recycle. Developing tyres for the future while simultaneously reducing our environmental footprint is a challenge in which Michelin is well-versed. This season, our Formula E tyre is the MICHELIN Pilot Sport. It was designed for the more powerful, latest-generation ‘Gen2’ cars which have the battery capacity to last full race distances. Season 5’s early e-prix have already provided eloquent pointers to the MICHELIN Pilot Sport’s superior performance. For us, Formula E is a laboratory for progress and technological innovation, as well as a stimulating exercise in competing in the centre of some of the world’s greatest cities and rubbing shoulders with the general public. It is for this reason that we were a founding partner of the championship.

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THE MANAGER OF MICHELIN'S FORMULA E PROGRAMME**

THE MICHELIN PILOT SPORT: DEVELOPED EXCLUSIVELY FOR FORMULA E

Michelin is a founding partner of the FIA's first all-electric racing championship and was active in the decision to use just one type of tyre for the series.



«Since our initial commitment to Formula E, we have worked non-stop to improve the MICHELIN Pilot Sport EV,» says Serge GRISIN, the manager of Michelin Motorsport's Formula E programme. *«The new MICHELIN Pilot Sport is the third generation of this genuinely unique tyre and it sets the bar very high in terms of performance. Never before has a motor racing tyre packed so much technology dedicated to optimising energy efficiency – one of the key pillars of Formula E because it is essential to extending range.»*

Since 1992 and the launch of the pioneering MICHELIN MXN, the rubber compound of which – for the first time – incorporated silica to reduce rolling resistance, Michelin has tirelessly innovated in favour of increasingly energy-efficient and environmentally-friendly mobility. Michelin's 'green' tyres have helped to save millions of litres of fuel

across the planet and curb harmful emissions. And in the world of electric vehicles, low rolling-resistance tyres allow longer distances to be covered between battery charging stops. When the MICHELIN Pilot Sport EV2 was introduced for Formula E's third campaign in 2016/2017, it was calculated that it would have enabled the previous season's cars to complete an extra lap with the same technology package.

Reducing rolling resistance necessitates considerable research and development work, however, since improvements in this field can potentially affect performance in other areas, such as cornering grip or stability under braking. This challenge truly tested Michelin's engineers, but they succeeded in making progress in a number of critical performance-related domains while continuing to significantly reduce rolling resistance.

The new MICHELIN Pilot Sport is the fruit of more than five years of painstaking research, from the development of the initial tyre to the debut of today's third-generation version which stands out in three fundamental ways:

- The lightest version yet. In motorsport, excess weight is hunted down and eliminated whenever possible, in the interests of both performance and the environment. In this respect, reducing the amount of raw materials that need to be processed, transported and recycled is a real mark of progress. Thanks to work carried out by Michelin Motorsport engineers, the new MICHELIN Pilot Sport tips the scales at almost 2kg less at the front and nearly 2.5kg less at the rear compared to the original first-generation tyre. That equates to an overall saving of around 9kg per car – almost 20 per cent of the total weight of the tyres! With the FIA regulations now stipulating that the minimum weight of each car must be 900kg (driver included) – as opposed to 880kg previously – Michelin has effectively freed up valuable extra kilograms for its partners to work on their own technologies.

- The most efficient version yet. Tyres account for between 20 and 25 percent of the energy consumed by road-going vehicles. They consequently have a direct impact on the distance

electric cars can travel. The previous-generation MICHELIN Pilot Sport EV2 had already brought rolling resistance down by 16 percent, enabling Formula E's single-seaters to extend their range by around two kilometres. The new MICHELIN Pilot Sport continues to drive progress in this key area by boosting the cars' energy efficiency with no detriment either to their performance or driver safety.

- The closest version yet to its road-going counterpart. Disregarding its exclusive coloured sidewalls, the MICHELIN Pilot Sport could almost be mistaken for a mass-production tyre. Because of its 18-inch interior diameter – a first in the world of single-seater racing – and patterned tread, it wouldn't look remotely out of place on a standard road car. Yet the construction- and tread-related technologies it packs are strictly confidential and protected by trade secrets. The data that Michelin is consequently able to collect at E-Prix meetings is fed into the development of the firm's future road tyres [see sidebar].

The new MICHELIN Pilot Sport is a technologically-advanced tyre capable of covering complete race distances (its predecessor only covered half of each E-Prix due to the previous mandatory mid-race changes), meaning teams have had to rethink their tyre strategies accordingly.

MICHELIN Pilot Sport – TECHNICAL DATA



SIZE (FRONT / REAR):

24/64-18 / 27/68-18
(equivalent to 235/40R18 / 305/40R18)

INTERIOR DIAMETER:

18 inches

SIDEWALL HEIGHT (FRONT / REAR):

98mm / 122mm

ASPECT RATIO:

40%

TREAD PATTERN:

asymmetric

CONDITIONS:

dry or wet track surfaces

IN THE MOTORING PUBLIC'S INTEREST



In motorsport, gathering data is one of the keys to success to be able to analyse and understand exactly what is going on with the car's engine and electronics, as well as with its tyres, the durability of which plays a crucial role in their overall performance potential. Putting everything through its paces in such extreme conditions provides a first class opportunity to test and evaluate new materials and technologies in order to assess their relevance in everyday situations. This is why Michelin has such a broad involvement across so many forms of motorsport, enabling it to simultaneously address different sets of challenges. The information gleaned from the tyres used over the course of Formula E's first four seasons has already led to technologies being carried over to Michelin road tyre ranges. The MICHELIN Pilot Sport was developed in much the same spirit, drawing upon the expertise that Michelin Motorsport's engineers acquired with the two previous-generation Formula E tyres.

OFFICIAL PARTNER TO THE JAGUAR I-PACE eTROPHY



In addition to its involvement in Formula E with Panasonic Jaguar Racing, Jaguar has launched an all-new single-make championship: the Jaguar I-Pace eTrophy. This curtain-raiser series features electric racing cars based on the brand's road-going I-Pace model takes the form of 25-minute races organised ahead of every FIA Formula E Championship round. The cars are equipped with Michelin tyres derived directly from a 22-inch diameter road tyre. This tyre fully embraces the Formula E ethos, as it has been designed to function whatever the weather. Michelin and Jaguar are already original equipment partners for a number of models and this series will enable the relationship between the two firms to be reinforced.

TEAMS AND DRIVERS

Audi Sport Abt Schaeffler (Germany)

- #11 Lucas Di Grassi, Brazilian, 34, born in Sao Paulo (Brazil)
- #66 Daniel Abt, German, 25, born in Kepten Im Allgäu (Germany)

BMW I Andretti Motorsport (Germany)

- #28 Antonio Felix Da Costa, Portuguese, 27, born in Lisbon (Portugal)
- #27 Alexander Sims, British, 30, born in Peterborough (England)

Nissan-e.dams (Japan and France)

- #222 Sébastien Buemi, Swiss, 30, born in Aigle (Switzerland)
- #22 Oliver Rowland, British, 26, born in Sheffield (England)

Mahindra Racing (India)

- #64 Jérôme d'Ambrosio, Belgian, 32, born in Etterbeek (Belgium)
- #94 Pascal Wehrlein, German/Mauritian, 24, born in Sigmaringen (Germany)

DS-Techeetah (France and China)

- #25 Jean-Eric Vergne, French, 28, born in Pontoise (France)
- #36 André Lotterer, German, 37, born in Duisbourg (Germany)

Venturi Formula E Team (Monaco)

- #19 Felipe Massa, Brazilian, 37, born in São Paulo (Brazil)
- #48 Edoardo Mortara, Italian/Swiss, 30, born in Geneva (Switzerland)

Panasonic Jaguar Racing (Great Britain)

- #3 Alex Lynn, British, 25, born in London (England)
- #20 Mitch Evans, New Zealander, 24, born in Auckland (New Zealand)

Geox Dragon (United States)

- #107 Jose Maria Lopez, Argentine, 35, born in Rio Tercero (Argentina)
- #6 Maximilian Günther, German, 21, born in Oberstdorf (Germany)

Envision Virgin Racing (China and Great Britain)

- #2 Sam Bird, British, 31, born in Roehampton (England)
- #4 Robin Frijns, Dutch, 27, born in Maastricht (Netherlands)

HWA Racelab (Germany)

- #17 Gary Paffett, British, 37, born in Bromley (England)
- #205 Stoffel Vandoorne, Belgian, 26, born in Courtrai (Belgium)

NIO Formula E Team (China and Great Britain)

- #16 Oliver Turvey, British, 31, born in Penrith (England)
- #8 Tom Dillmann, French, 29, born in Mulhouse (France)

THE 2018/2019 VENUES DESCRIBED BY SERGE GRISIN, THE MANAGER OF MICHELIN'S FORMULA E PROGRAMME



« We have already been to several new venues this season, since a third of the circuits on the 2018/2019 calendar are places we have never previously been to. We also have a new tyre, the MICHELIN Pilot Sport, which has showcased its credentials in a wide variety of conditions, including in the wet weather we encountered in Saudi Arabia, Hong Kong and Rome after four seasons without coming across any rain to mention. This championship has also thrown up an exceptionally broad range of temperatures, from 3°C for the first chilly practice session in Marrakech to track temperatures as high as 62°C in Santiago. That's the hottest we've seen since the championship began! From what we have seen so far this season, we feel confident for the races still to come before the finale in New York. »



December 15 - Ad Diriyah (Saudi Arabia) - Circuit length: 2.495km - 21 turns

Serge Grisin: «Saudi Arabia was new to the calendar this season and the circuit turned out to be quite hard on tyres. Following heavy rain during the morning, the conditions were still wet for the race and there was sand on the track, too, but that didn't prevent the new MICHELIN Pilot Sport from providing an early glimpse of its potential.»



January 12 - Marrakech (Morocco) - Circuit length: 2.99km - 12 turns

Serge Grisin: «This is the longest lap on the calendar and, with the exception of Mexico City, it is the closest we get to a conventional circuit in Formula E because of its semi-permanent nature. Compared to the permanent part of the track, the street section offers relatively little grip.»



January 26 - Santiago de Chile (Chile) - Circuit length: 2.4km - 14 turns

Serge Grisin: «There was an e-prix in Chile in 2018 but this season's race took place around a different circuit in one of Santiago's parks. In addition to the track's changing grip levels, the main challenge turned out to be the heat, and ground temperatures soared to as high as 62°C! The MICHELIN Pilot Sport rose to the occasion in style, however, especially given that the drivers now have to contest the races on a single set of tyres!»



February 16 - Mexico City (Mexico) - Circuit length: 2.093km - 17 turns

Serge Grisin: «This is a permanent circuit, which passes through a baseball stadium. Grip levels are not particularly high and the number of turns make big demands on tyres due to the heat they generate. Mexico City is also the highest venue we visit all season, at an altitude of more than 2,200 metres.»



March 10 - Hong Kong (China) - Circuit length: 1.850km - 10 turns

Serge Grisin: «*This is a narrow, bumpy circuit and the track surface features a combination of asphalt and concrete. Hong Kong is one of the shortest laps of the season but it still puts our tyres thoroughly to the test.*»



March 23 - Sanya (China) - Circuit length: 2.236 km - 11 turns

Serge Grisin: «*After two Formula E races in Beijing, this season's Chinese e-prix switched to Sanya, on Hainan Island, where the circuit's surface and the climate were very different. The more recent asphalt was harder-wearing and humidity levels exceeded 90 percent! Sand on the track added to the challenge but the MICHELIN Pilot Sport fulfilled its mission perfectly.*»



April 13 - Rome (Italy) - Circuit length: 2.84 km - 21 turns

Serge Grisin: «*This popular stop on the Formula E schedule features a big elevation change, as well as an interesting blend of fast and slow corners, and good grip in places. This year's race took place in wet weather but that didn't prevent the MICHELIN Pilot Sport from showcasing its versatility.*»



April 27 - Paris (France) - Circuit length: 1.9km - 14 turns

Serge Grisin : «*This is Formula E's fourth visit to the Circuit des Invalides in Paris in as many years. The setting is spectacular and a fresh coating of asphalt is laid on top of the paving stones that are exposed to traffic the rest of the year. As a result, grip is higher around this portion which makes up about a third of the lap, while the contrast in grip levels is much more marked than it is at the other championship's other street circuits. Until now, the successive generations of our Formula E tyre have been designed to cover two complete seasons. So, given that this is Season 5, this will be the current MICHELIN Pilot Sport's first appearance in Paris. It is our third-generation tyre and, as such, illustrates the considerable progress we have achieved on several fronts, notably with regard to its lower rolling resistance, a factor that plays a major role in reducing energy requirements. This improvement is due partly to the new tyre's lower weight. Indeed, four of this season's tyres weigh the same as three 'Season 1/Season 2' tyres, yet they deliver superior performance. Judging by the data we have collected since the 2018/2019 championship's opening round in Saudi Arabia, we feel quietly confident for this year's Paris E-Prix. In 2018, the weather was dry and the drivers took advantage of the former-generation tyre's performance and versatility to provide a spectacular race. This time around, we expect to see big improvements in lap times, as well as another quality race.*»





May 11 - Monaco - Circuit length: 1.765km - 12 turns

Serge Grisin: «*Monaco is the shortest circuit (1.765km) visited by the 2018/2019 FIA Formula E Championship. It takes in part of the track used by the famous Formula 1 grand prix which follows a fortnight later. The asphalt in the Principality is recent but grip levels tend to be moderate.*»



May 25 - Berlin (Germany) - Circuit length: 2.375km - 10 turns

Serge Grisin: «*This is a unique race in Formula E, taking place as it does on the apron of Berlin's former Tempelhof Airport. It is the most abrasive track surface we have ever encountered and also the only time during the season that the cars go through a tunnel.*»



June 22 - Bern (Switzerland) - Circuit length: 2.7km - 13 turns

Serge Grisin: «*Last year, Switzerland's round of the championship in Zurich was the first motor race to be held in the country since 1955. The profile of the anticlockwise circuit in Bern is very different and it looks very fast and hilly. I think the drivers will enjoy it.*»



July 13 and July 14 - New York (United States) - Circuit length: 2.373km - 14 turns

Serge Grisin : «*The 2018/2019 championship concludes at one of the slowest circuits on the calendar, which is also one of the least stressful on tyres. Last year, part of free practice was hit by a downpour, which allowed us to finally reveal the wet-weather qualities of our tyre for the very first time. This season, we have already had several opportunities to demonstrate the performance of*

the versatile new MICHELIN Pilot Sport in both wet and dry conditions. Whatever the weather, this season's finale is sure to be a grand occasion.»

