MICHELIN

AT THE 67TH INTERNATIONAL MOTOR SHOW IN FRANKFURT

IAA
Internationale Automobil - Ausstellung

PRESS KIT

SEPTEMBER 2017

MEDIA CONTACT: + 33 1 45 66 22 22
groupe-michelin.service-de-presse@michelin.com

MICHELIN
A BETTER WAY FORWARD

CONTENTS

> **For images please use the following link:**
https://tinyurl.com/y7xay93h

INTRODUCTION FROM JEAN-DOMINIQUE SENARD,
CEO OF THE MICHELIN GROUP

Tomorrow is today.

The Michelin Group's power of innovation has ensured its success and legitimacy for 125 years. It is an essential lever of excellence and one of the foundations of its strategy. Thanks to the curiosity, inventiveness and undeniable know-how of our 6000 researchers worldwide, the Michelin Group is strengthening its status as a technological leader and is not afraid to stand out from the competition. The 2017 Frankfurt International Motor Show (IAA) is a great opportunity to present the range of mobility experiences that Michelin offers motorists from around the world, but also an influential channel to vigorously affirm our desire to maintain high quality standards in the design and manufacture of our products. The professional and public authorities that test the performance of tyres can contribute to this. By publishing test results on worn tyres, we offer our customers the only reliable indicator of the durability of tyre performance throughout the life of the product. To prepare for tomorrow is to refuse today the scheduled obsolescence and give our products the means to last, while ensuring the safety of the driver and passengers.

We are fully committed to accompany our customers in their future mobility experiences. The Paris Agreement concluded in November 2015 by public authorities and private organisations constitutes a formidable impetus for reinventing transport. Industrial and service innovation is the result of solving challenges: one of these is reducing our environmental impact while intelligently nurturing the growing need for mobility. This challenge, the Michelin Group sees as a source worthy of emulation and an opportunity to conquer new markets. Our creative and technologically sound initiatives have only one target: our customers. The Vision concept tyre perfectly illustrates the slogan of the 67th International Motor Show 'Future now'. A future at the forefront of technology that revolutionizes the way we view our mobility. By adding just enough material to a revolutionary alveolar structure and determining its composition according to the use of the motorist, we will reach a new reality in the tyre industry: less material consumed for better service to our customers.

Do better with less.
Today and tomorrow.

THE TRUTH ABOUT WORN TYRES

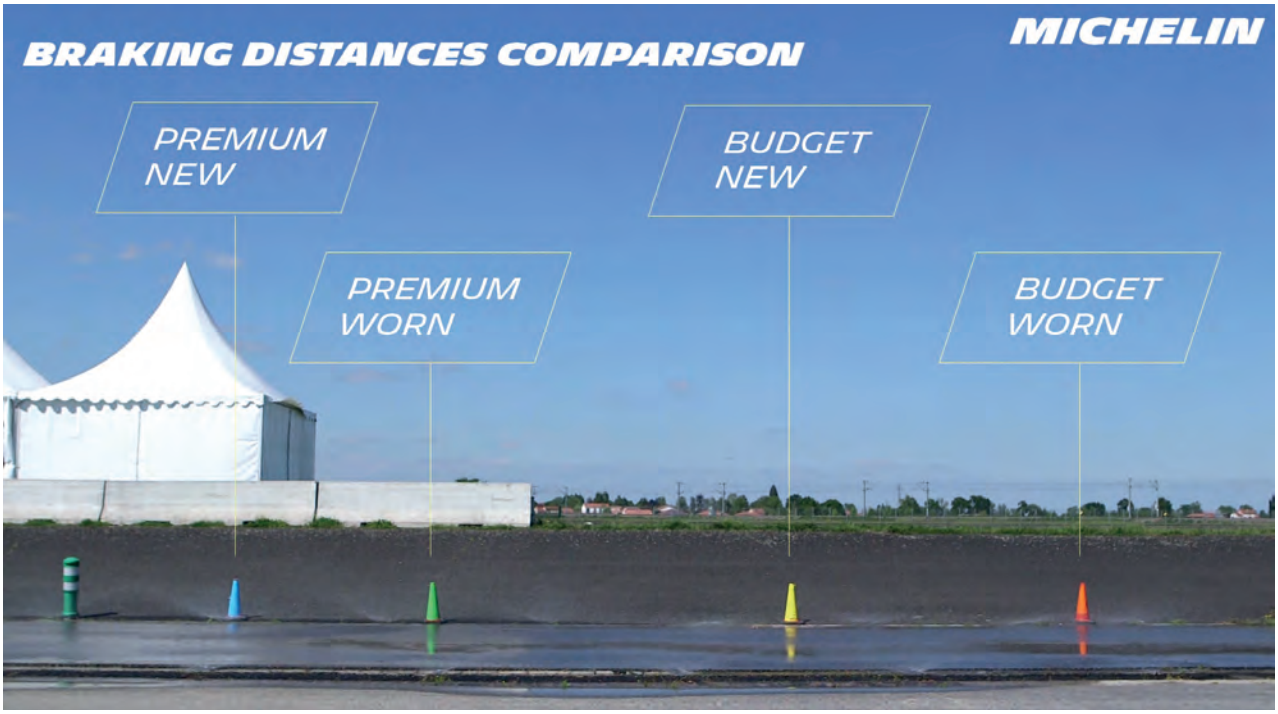
The strategy of the Michelin Group is to develop sustainable mobility solutions to improve its customers' mobility. The Group improves design, manufacturing and management of its product and service offers and minimizes the use of resources to reduce their impact on the environment and society.

An integral part of this approach is to design products that demonstrate very high levels of performance from being fitted, when new, all the way through to removal when worn to the legal tread wear limit of 1.6mm.

All tyres wear out; and as they wear out their performance changes – for example wet braking performance will degrade over time. Tyre manufacturers, car makers, industry test bodies, and consumer organisations all focus on the testing of tyres when new…. and the large differences in performance that exist when new. Tests show that all tyres are not equal when they are new – what Michelin tests have shown is that tyre performance is even less equal when worn! Quite surprisingly we have discovered that some tyres worn to the legal limit have a wet braking distance virtually the same as some new tyres; thus demonstrating that tread depth is not a good indicator of wet braking performance. By the law of averages, every tyre on every vehicle is half worn, but who is doing the testing of these half worn tyres? No one!

Modern tyre technology makes it possible to have high levels of grip right down to the last millimetres of tread and Michelin wants to raise awareness of this. To this end, Michelin believes that all organisations and consumers should start to ask and consider both new and worn performance of tyres before purchase.

The good news for motorists is that as long as tyres are not damaged in any way, their safety on dry roads actually improves as they wear. As seen on race circuits around the world, in dry conditions the 'slick' is the tyre of choice; and similarly for the ordinary motorist a worn tyre will stop a vehicle more quickly in the dry than the same tyre when new. Another benefit of worn tyres is that the fuel economy of the vehicle will improve – the rolling resistance of a tyre at the point of removal at the legal tread limit is 80 per cent of that tyre in a new state. Therefore, keeping a tyre on the vehicle until the legal tread wear limit increases the time when it is in its most fuel efficient state, and reduces the motorist's fuel consumption.



But what about performance on wet roads; surely tread depth is vitally important? Michelin tests have shown that on wet roads, some worn tyres can perform as well as some new tyres, and although the remaining tread depth is a factor in wet braking, the performance of the tyre, at all stages of its life, is more important. Tyre performance is affected by many factors; casing design, materials, rubber compounds, tread design, sipes etc. and these all affect and influence how the tyre performs throughout its life – right down to the legal tread wear limit, particularly on wet roads. All tyres do not perform the same when new – and the differences in performance are more accentuated when that tyre is worn, according to their design.

Reinforcing the Michelin test results, recent independent studies* have reported that there is no demonstrable link between accident rates and tread depth. Additionally, if tyres are changed early, before the legal limit, this reduces the useful life of the product, and consumers would make unnecessary purchases which would have an adverse impact on the environment. Changing tyres too early would result in 128 million additional tyres being used a year in Europe, i.e. 9 million tons of additional CO_2 emissions every year. In addition to the environmental impact, replacing tyres before they are fully worn also represents a significant and unjustified increase in costs for consumers; Ernst and Young estimates an extra 6 billion euros in Europe alone. So, early tyre removal has a huge environmental impact and also represents a significant and unjustified increase in costs for consumers.

You may be asking – why is Michelin doing this; if tyres are removed earlier they would sell more? It's a good question, and certainly many manufacturers in many industries play the card of 'programmed obsolescence', that is to say an ever shorter life of their products. However Michelin has made the opposite choice, the one of 'programmed longevity'. Sustainable performance is the key to Michelin's business strategy because we consider customer satisfaction with our products is paramount; our focus is not the disposable but on the durable! Today we want to encourage the tyre industry to commit to the same voice: responsibility, sustainability and performance... for all of our customers around the world.

For decades at Michelin, innovation has consistently improved both the new and the worn tyre performance, and this is demonstrated in the new MICHELIN PRIMACY 4 and CrossClimate+ on show at Frankfurt IAA. Additionally, these new products demonstrate that the only criteria for safety is the tyre's performance, NOT its tread depth.

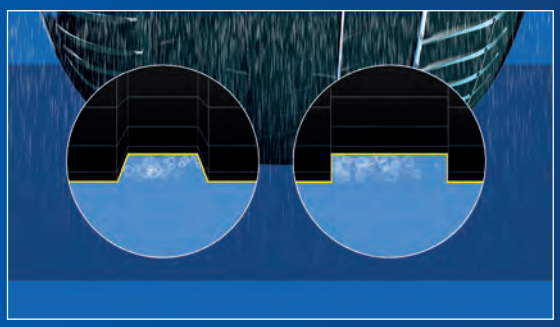
**EY Report - Planned obsolescence is not inevitable; May 2017*

"The accident data used in the current study however indicates no benefit in terms of reducing the number of accidents by increasing the minimum tread depth. [...] The results of the study suggest that 1.6 mm could be a suitable level based on existing national legislation in member states." TNO report for the European Commission, Study on Some Safety-Related Aspects of Tyre Use, 2014

*"IIn case of an increase of the minimum tread depth, tyres have to be replaced more often. The resulting increase in costs can lead vehicles owners to not invest in tyres with a long-term performance due to budget constraints. If tyres with a short-term performance are preferred due to cost considerations this will negatively impact driving and traffic safety." Prof. Dr. Lars Hannawald, Vufo *, newsletter of February 16th 2017, translated from German*

MICHELIN REVEALS THE NEW **MICHELIN PRIMACY 4** – SAFE WHEN NEW, SAFE WHEN WORN

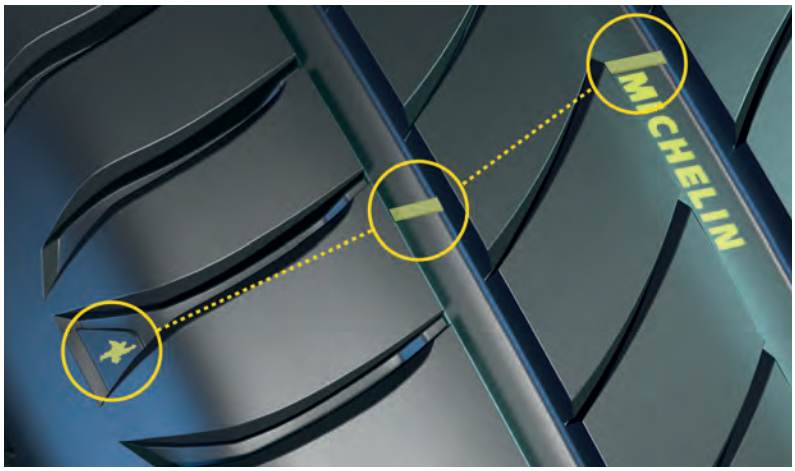
True to its Mission of sustainably improving customer mobility, Michelin presents at the Frankfurt IAA the latest update to its PRIMACY range: the new **MICHELIN PRIMACY 4** tyre, a reference for safety. After three years of development, this tyre provides a high level of performance on wet roads, from the first use until worn to the legal wear indicator (1.6mm). This tyre, thus responds to the need to perform at a high level when worn; a long lasting performance.



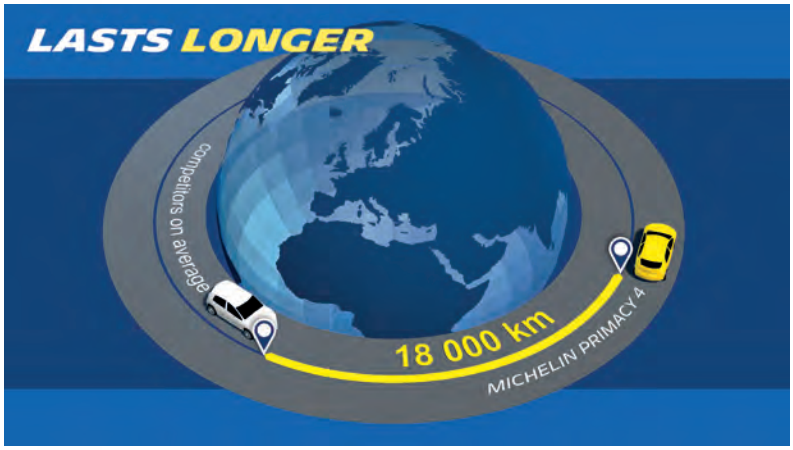
Thanks to the use of latest generation elastomers, the new **MICHELIN PRIMACY 4** tyre delivers a very high level of wet grip, from the first to the last kilometre, without compromising longevity. To achieve this level of grip, the tread pattern has been optimised: it has a new design that reveals squarer and less tapered grooves, to help improve water clearance even when the tyre is worn.

Thus, both when new and worn, **MICHELIN PRIMACY 4** offers an excellent level of performance in braking on wet roads. When compared to competitor tyres in the 205/55 R16 91V size the new **MICHELIN PRIMACY 4** tyre brakes, on average, 0.9m shorter than its direct competitors. And when worn, the **MICHELIN PRIMACY 4** brakes 2.8m shorter than the average of the competitor tyres [1] [2].

The new **MICHELIN PRIMACY 4** tyre also simplifies the reading of its wear level. In addition to the presence of a traditional wear indicator on the shoulder, it also has a Michelin marking at the bottom of the tread grooves. These two methods allow users to quickly and simply identify the level of wear of their tyres.



Compared to its direct competitors, the new **MICHELIN PRIMACY 4** lasts an average of 18,000 kilometres [3] more; confirming the long lasting performance of the new tyres designed by Michelin. The new **MICHELIN PRIMACY 4** tyre is a concrete demonstration of the Michelin Group's strategy: consumers must be able to drive safely, throughout the life of the tyre, right down to the legal wear indicator of 1.6 mm.



MICHELIN PRIMACY 4 will be launched in 64 sizes from January 2018.

- **7 sizes in 15"**
- **17 sizes in 16"**
- **30 sizes in 17"**
- **10 sizes in 18"**

[1] New and Worn (worn means 2 mm tread depth), on 205/55 R16 91V MICHELIN PRIMACY 4, is above the R117 European regulation wet grip threshold.

[2] Wet braking test, between 80 and 20 kph, conducted by TÜV SÜV product service, at Michelin's request, between June and July 2017, on dimension 205/55 R16 91V on VW Golf 7 comparing MICHELIN PRIMACY 4 versus BRIDGESTONE TURANZA T001 EVO ; CONTINENTAL PREMIUM CONTACT 5 ; DUNLOP BLURESPONSE ; GOODYEAR EFFICIENT GRIP PERFORMANCE ; PIRELLI CINTURATO P7 BLUE competitors.

[3] Test conducted by DEKRA TEST CENTRE, at Michelin's request, between June and July 2017, on dimension 205/55 R16 91V on VW Golf 7 comparing MICHELIN PRIMACY 4 versus BRIDGESTONE TURANZA T001 EVO ; CONTINENTAL PREMIUM CONTACT 5 ; DUNLOP BLURESPONSE ; GOODYEAR EFFICIENT GRIP PERFORMANCE ; PIRELLI CINTURATO P7 BLUE competitors. Longevity test run in average real usage (D50) with 10,000 km run and estimated longevity at 1.6mm.

THE MICHELIN CROSSCLIMATE+ A LONG LASTING, HIGH LEVEL OF PERFORMANCE AND SAFETY, IN ALL WEATHER CONDITIONS

Michelin has always innovated to offer the best tyre performance to its customers, from the first use of the tyre until reaching the legal wear indicator (1.6mm). The MICHELIN CrossClimate+ tyre, having validated the results of tyre performance tests when worn (carried out in May 2017 on the Michelin test tracks in Ladoux), is technological proof.

Available since February 2017, the **MICHELIN CrossClimate+** combines the best of summer and winter tyre technology, while guaranteeing a high level of performance over time. The performance of all tyres evolves over time, and if it is true that some tyre performance characteristics can improve as a tyre wears, such as rolling resistance, but most degrade over time, and this is especially true of grip on wet or snowy ground. The **MICHELIN CrossClimate+** confirms its performance on dry ground and its positioning as a premium summer tyre. It goes even further in terms of winter performance, ensuring an excellent level of traction on snow, from the first to the last kilometre. When new, the traction of the **MICHELIN CrossClimate+** on snow is the same level as the main premium competitors' tyres. When worn, its performance changes very little, when that of its premium competitors falls significantly.

Drivers benefiting from **MICHELIN CrossClimate+** will be able to take full advantage of the long life of their tyres, their mobility in winter conditions being preserved from the first to the last kilometre. The **MICHELIN CrossClimate+** tyre is capable of climbing a snowy slope where the same vehicle fitted with summer tyres will skate inexorably. The **MICHELIN CrossClimate+**, with the 3 PMSF* marking, can be fitted on the vehicle all year and are usable by motorists in all weather conditions. Not only does the **MICHELIN CrossClimate+** meet these requirements, it also offers high-performance on dry roads with external temperatures above 7 °C where a winter tyre's performance will degrade.

With the **MICHELIN CrossClimate+ tyre**, Michelin is opposed to the programmed obsolescence, desired by manufacturers advocating the replacement of tyres with a 3mm tread depth, and supports long-term performance for the consumer.

The **MICHELIN CrossClimate+ tyre** has been available since February 2017 for 15 to 18 inch wheels. It is complemented by the **MICHELIN CrossClimate** offer for the 14" dimensions and the **MICHELIN CrossClimate SUV** offer.

Michelin intends with its CrossClimate range to provide all consumers with more safety and performance, longer, and in all weather conditions.

** Marking 3 Peak Mountain Snow Flake, Winter certification.*


MICHELIN
CROSSCLIMATE
MICHELIN
235/45R17

MAXION FLEXIBLE WHEEL WITH MICHELIN ACORUS TECHNOLOGY

REINVENTING THE WHEEL – BENDS BUT DOES NOT BREAK

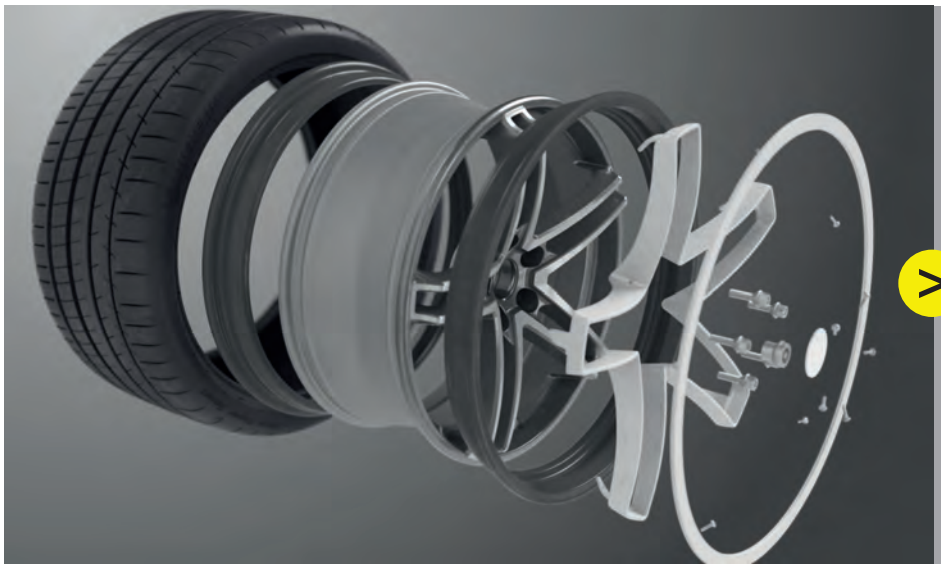
Innovation has always been part of Michelin's genetic code – driving mobility and tyre developments for more than 100 years. Now with MICHELIN ACORUS Technology, in partnership with Maxion Wheels, Michelin is reinventing the wheel to help eliminate road-based damage to tyres and rims.

The patented new technology, developed by Michelin and Maxion Wheels for the passenger car wheel market, incorporates two flexible rubber flanges mounted on a special wheel body to create a flexible wheel that improves the ride and comfort and also absorbs impacts from potholes and kerbs. The new wheel is compatible with all tyres on the market and comprises an alloy rim – which is narrower than normal, two rubber flanges and an optional cosmetic insert to protect the alloy wheel.

Talking about this new innovation, Michelin Chief Operating Officer, Florent Menegaux said: "Car wheels have been getting bigger and bigger, as they contribute to making cars look more premium, and large shiny alloys are an integral part of all modern car designs. However, the resulting low profile tyres with short sidewalls are much more susceptible to damage on today's deteriorating roads with myriad potholes."

Pieter Klinkers, Maxion Wheels CEO stated: "This is a game changer for wheels; a standard wheel driven through a pothole can damage the tyre and potentially crack the alloy rim, putting the safety of driver and passengers at risk. When the Maxion Flexible Wheel hits a pothole, the MICHELIN ACORUS Technology flange flexes and protects the tyre and the wheel."

In tests with a 285/30R21 tyre driven through a pothole*, the standard rim version punctured the tyre at 28kph whereas the Flexible Wheel with the MICHELIN ACORUS Technology did not puncture, or sustain damage at any speed.



Exploded view of the MAXION Flexible Wheel with MICHELIN ACORUS Technology

In addition to damage reduction, safety and improved mobility, the MAXION Flexible Wheel with **MICHELIN ACORUS** Technology has other benefits for the driver. It helps overcome other shortcomings associated with low profile tyres with short sidewalls – comfort and noise levels are both improved due to the flexible rubber flange which sits between the wheel and the tyre. There is also an environmental benefit in using **MICHELIN ACORUS** Technology; the Flexible Wheel is designed to work with any brand of tyre, including low rolling resistance tyres – meaning lower CO_2 emissions and better fuel economy. The innovative wheel solution also means fewer damaged tyres and wheels are being thrown away following pothole damage.

MICHELIN ACORUS Technology is the product of Michelin's research Group. The Michelin Incubator Program shortened the time to market by showing and testing it with customers. Having designed and developed this unique patented technology, Michelin started to work in partnership with Maxion Wheels, a leader in the wheel business, to bring the Flexible Wheel to market.

The name ACORUS is taken from Acorus Calamus, a wetland plant that looks like a reed, which features in a famous French fable 'the oak and the reed' with the wisdom that "a reed bends but does not break". The flexible wheel not only safeguards against potholes and poor roads, but marks an end to the compromise in passenger car wheel design between robustness and premium look.

The MAXION Flexible Wheel with **MICHELIN ACORUS** Technology, launched at the Frankfurt IAA, will initially be sold in 19" and above sizes to the OE premium automakers.

Normal state

Loaded state

Fully deflected state

**80mm deep, 700mm long, 70° impact angle*

MICHELIN SAFE-&-DRIVE

SAFETY FIRST, 24/7

Michelin introduces **MICHELIN Safe-&-Drive**, a connected mobility solution allowing European motorists to benefit from improved safety and additional services, thus enriching their daily travel.

MICHELIN Safe-&-Drive operates as an embedded system, and comprises two main functions. The first is that of an intelligent device detecting collisions by means of acceleration sensors, and the second is a multitasking application connected to a Michelin assistance platform. This package provides several safety and mobility services including:

- *An automatic or manual emergency call service, allowing immediate emergency assistance in the event of an accident or medical emergency*
- *Personal assistance by phone or chat: indication of the nearest gas station or car park, road traffic, weather forecasts, advice and restaurant reservations...*
- *A "find my car" feature that records the last position of the vehicle when the phone and the device disconnect, and guides to find it.*
- *Telephone support, if needed, for information and technical questions, especially concerning the tyre.*

Safety first

In 2016, road accidents claimed 25,500 lives in the European Union. To curb this phenomenon, the European Parliament has ruled that by 31 March 2018 that all new models of cars and light commercial vehicles must be equipped with emergency calling devices (eCall) which will automatically alert the services in the event of an accident. With the widespread use of such devices, it is hoped that European road deaths can be reduced by 10% a year.

But what about vehicles manufactured before March 31, 2018? There are nearly 300 million cars in Europe, so many consumers will not be able to benefit from such a device because they do not own a new car registered after March 31, 2018. With **MICHELIN Safe-&-Drive**, these drivers will also benefit from an emergency call solution that they can easily install in a vehicle built before April 2018.

Ongoing assistance

MICHELIN Safe-&-Drive also offers users access to many services that will be available to them on their journeys throughout Europe, 7 days a week and 24 hours a day. They will save time with a Michelin assistant on the phone to guide them to the nearest petrol station, tell them a car park nearby, warn them of traffic jams or weather, and so on. In addition, the "find my car" function saves the last position of the vehicle and allows finding it all the more easily.

How is it activated?

All that is required is to plug the connected device into the car's cigarette lighter socket, and then download the **MICHELIN Safe-&-Drive** application and activate the account. The application will automatically connect to the device with Bluetooth and from this moment all services are active.

The **MICHELIN Safe-&-Drive** application is free and available for Android and IOS – it can be downloaded from the AppStore and the Google Play Store.

Will my car be compatible?

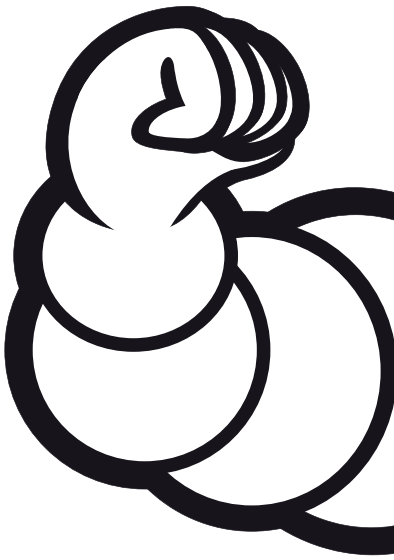
MICHELIN Safe-&-Drive works with any car equipped with a 12 volt (cigarette lighter) socket and when connected to an Android or iOS smartphone.

How does Collision Detection and Emergency Service work?

The connected **MICHELIN Safe-&-Drive** solution is equipped with a three-dimensional acceleration sensor capable of detecting sudden changes in vehicle speed. Once the device is plugged into the car, it detects any collision and uses an integrated algorithm to determine the severity of the accident. The device then transmits the collision data via Bluetooth to the **MICHELIN Safe-&-Drive** application of the phone, which transmits it to the Michelin emergency call centre along with the GPS location. The application then automatically contacts a Michelin assistant. The latter collects and verifies all necessary information that will assist local emergency services in determining the appropriate type of assistance (Police, Ambulance, Fire services). If the phone does not respond, back-ups are sent automatically.

How do the other services work?

The other services (guide to the nearest service station, indicate a parking lot nearby, avoid traffic jams or weather, advise and book a restaurant, and so on) are all provided by a Michelin assistant from the application **MICHELIN Safe-&-Drive**, who can be contacted by phone, by chat or by email 24 hours a day, 7 days a week.

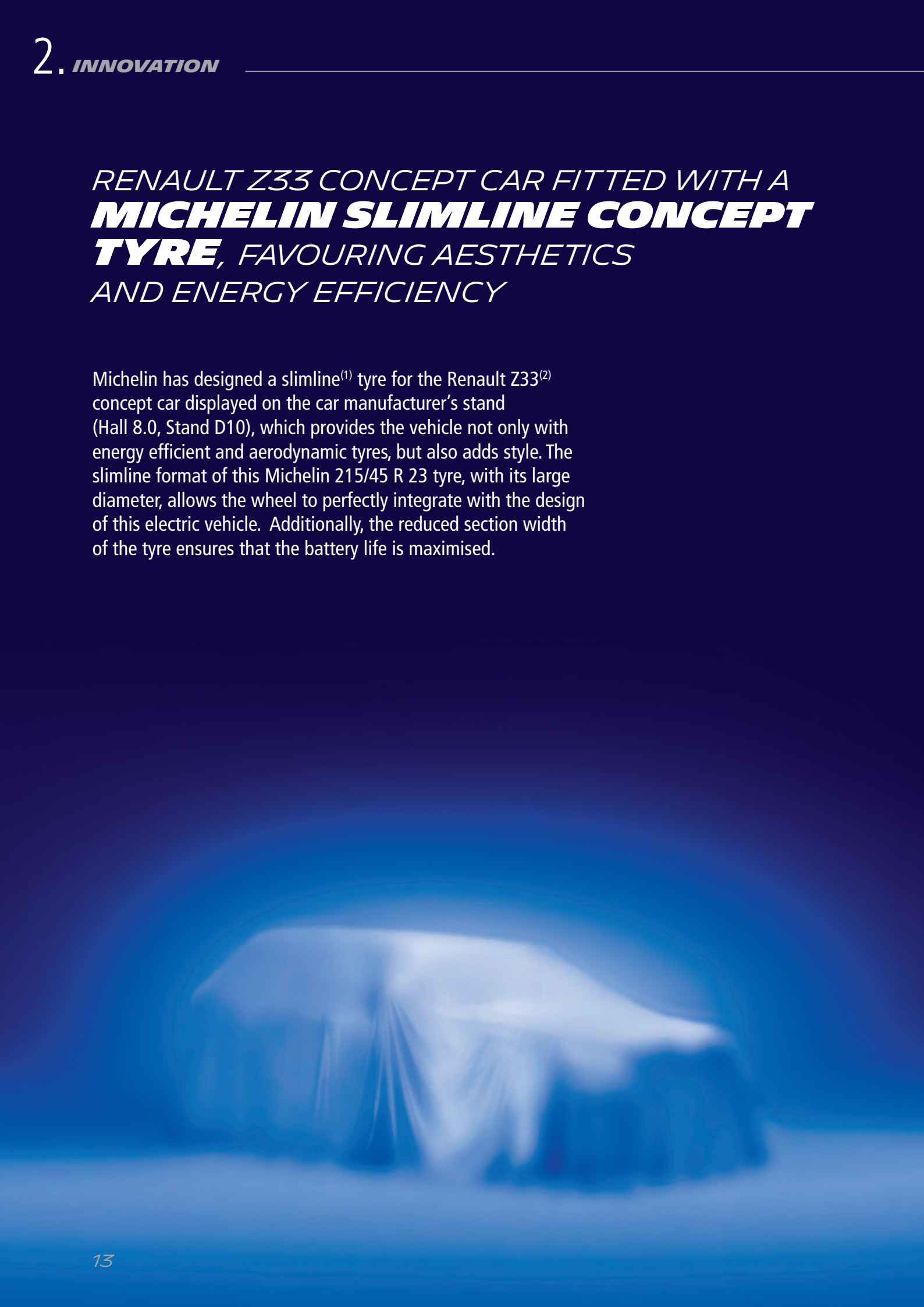


Where can you buy MICHELIN Safe-&-Drive?

MICHELIN Safe-&-Drive has been available since 21 August 2017 in the Euromaster centers and on www.euromaster.fr, on the AlloPneus website, www.allopneus.com, and on the MICHELIN eshop, eshop.michelin.fr. **MICHELIN Safe-&-Drive** is sold as a pack containing the connected device and one year subscription to all services.

RENAULT Z33 CONCEPT CAR FITTED WITH A **MICHELIN SLIMLINE CONCEPT TYRE**, FAVOURING AESTHETICS AND ENERGY EFFICIENCY

Michelin has designed a slimline[1] tyre for the Renault Z33[2] concept car displayed on the car manufacturer's stand (Hall 8.0, Stand D10), which provides the vehicle not only with energy efficient and aerodynamic tyres, but also adds style. The slimline format of this Michelin 215/45 R 23 tyre, with its large diameter, allows the wheel to perfectly integrate with the design of this electric vehicle. Additionally, the reduced section width of the tyre ensures that the battery life is maximised.



With the Z33 concept car, Michelin and Renault are continuing their collaboration on the theme of energy efficiency. This led in particular to the Renault EOLAB prototype vehicle fitted with MICHELIN 145/70 R17 tyres in 2014; and in 2016, the launch of the new Renault Scenic, fitted with MICHELIN PRIMACY 3 slimline tyres (195/55 R20).

Unique design

Valuing the overall aesthetics of the vehicle was one of the challenges proposed by Renault to the engineers of the Michelin Group. They then presented a larger and narrower tyre, offering the designer the possibility of using large diameter wheels. This possibility is particularly advantageous for SUV or family-sized vehicles such as the Renault Scenic.

Improved energy efficiency

The **slimline** tyre also helps to reduce energy consumption compared to a conventional tyre of the same size. Generally speaking, for a given tyre width, the larger the tyre the lower the rolling resistance, which improves energy efficiency. The larger circumference of the tyre allows it to undergo less deformations, and therefore to dissipate less energy. The increase in the tyre width, which usually accompanies that of its diameter, usually reduces its energy efficiency. The slender size of the **slimline** tyre does not have this disadvantage, and additionally, its narrower tread improves the aerodynamics of the tyre.

The **slimline** tyre dimensions, which is a larger diameter and narrower section width than the vehicle's reference tyre, therefore improves fuel efficiency while maintaining excellent grip, longevity and driving comfort.

The development opportunities for **slimline** tyres are mainly in the segments of general road and urban cars rather than high performance cars.

(1) The Slimline format
When a vehicle is designed, the size of the tyre (diameter and width) results from the mass and volume of the vehicle. A tyre in slimline format is a tyre with more slender proportions than a traditional tyre. Compared to a standard tyre adapted to the vehicle, a slimline tyre can be substantially less wide for the same wheel size or larger without increasing its width. It can also combine these two characteristics, that is to say both larger and smaller than the reference tyre of the vehicle.

(2) Code name

MICHELIN'S MOVIN'ON, SUMMIT SHAPES SUSTAINABLE MOBILITY FUTURE

Sustainable mobility is at the very heart of Michelin and everything it does, shaping its products, its services, its research and development - and its vision for the future.

This year that vision entered an important new phase when Michelin launched its ground-breaking 'Movin'On' summit, in Montreal.

Movin'On is not only a world-class arena where Michelin can share its own innovations – but also a world-class platform where global leaders and experts in sustainable mobility can come together to present and develop their innovations, too.

Movin'On follows Michelin's famous **'Challenge Bibendum'** conference which, for nearly 20 years, has been the world's leading conference on mobility solutions, with major events held in cities across the globe.

Re-born as **Movin'On**, the focus has transitioned towards nurturing a bold new vision; a roadmap that sets out and promotes the development of cutting-edge sustainable transport solutions right across the mobility sector, for road, rail, aviation, freight, cycling – even communications.

The aim? Enabling the world to adapt to the fast pace of change – and to help create a better world by proposing innovative new mobility solutions that benefit the planet and the economy.

Chief Executive Officer, Jean-Dominique Senard, set out Michelin's vision at the inaugural **Movin'On** event, in Montreal, this spring. Addressing 4,000 participants, he said: "The Michelin Group has always been at the cutting edge of its industry; born from innovation in 1896, the company has grown with it.

"From its origins up to the present, the Michelin Man has supported an image and a promise of facilitating mobility. That's why, proud of our open innovation strategy and the networking of our expertise, we

wanted to renew the Michelin Challenge Bibendum by transforming it into **Movin'On**, the leading global rendezvous for sustainable mobility."

Mr Senard added: "This is a call to action; collective, optimistic, technologically demanding action in phase with the 21st century and the challenges we must meet."

Responding to that call to action, over 100 active partners including 79 speakers comprising scientists, entrepreneurs, visionaries and creatives, took part in 49 workshops and masterclasses, amounting to 5,223 hours of collaboration between 4,000 participants, over two and a half days.

In addition to presentations from world-renowned speakers, **Movin'On** showcased a diverse range of exhibits and demonstrations, at Michelin's 'Start-Up Village' and at the future-probing 'Innovations Centre'.

The Start-Up Village presented 34 start-ups. They included innovators specialising in lidar for drones, robotics and self-driving cars, technology developed to root out NVH (Noise Vibration and Harshness) in cars, computerised algorithms that match freight supply with demand, specialised plates to reduce the aerodynamic drag of vehicles, advanced electric-car charge-points and a new electric-car rental app.

Other Start-Up companies included firms developing smart sensors for self-driving vehicles, regenerative braking systems for trailers, smart parking solutions for air travellers, apps to make bus travel simpler for commuters, and a car-share app aimed at boosting mobility in cities, for short trips.

Other exhibitors at **Movin'On's Innovation** stands included an advanced 'plug and play' solution enabling ordinary bicycles to be fitted with an electric motor, developed jointly by Michelin and a French cycle firm, and a major renewable energy firm specialising in advanced, integrated hubs connecting different forms of transport.

The Innovation Centre also showcased Michelin's new sustainable, airless Vision tyre concept that doubles up as a wheel, and which will last the lifetime of the car.

The latest 'green' race-car technology was on show, while **Movin'On** also gave visitors hands-on experience with a wide range of cutting edge road cars including electric, semi-autonomous and connected cars from leading manufacturers, alongside the latest electric bicycles and stand-up scooters – even a three-wheeled delivery van propelled by a combination of pedal-power and electricity.

Key **Movin'On** presentations explored the role of artificial intelligence in mobility, the transition from fossil fuels to sustainable fuels, mobility breakthroughs such as the futuristic Hyperloop and solar-powered aircraft, the effect of transport on climate change and new methods for financing intelligent freight solutions. Self-driving also came under the microscope.

Workshops at **Movin'On** covered intensely-debated subjects such as road safety, air quality in smart cities, how to improve freight efficiency, the role of artificial intelligence in urban transport, carbon compensation and how fuel savings could be made through the platooning and automation of trucks.

Masterclasses involved collaborative experiences during which experts presented thought-provoking new material, sharing their expertise and insights into delivering smart and sustainable mobility for all.

MICHELIN'S

MOVIN'ON

RETURNS TO MONTREAL IN MAY, 2018.

REINVENTING THE WHEEL
MICHELIN'S VISION
FOR THE FUTURE OF MOTORING

Some of the biggest developments in tyre technology for over a century are showcased in Michelin's new 'Vision' - the tyre concept that doubles up as a wheel.

Airless, made only from sustainable materials, connected, intelligent, customisable and entyrely biodegradable, the concept takes centre-stage on Michelin's stand at Frankfurt.

Designed to meet the exacting demands of future generations of motorists, the concept is at the very core of Michelin's vision for the future of sustainable mobility – and is already driving the development of products being refined by Michelin's industry-leading R&D teams today.

One of **Vision's most important advances** is that it is entyrely airless, using instead a revolutionary 'alveolar' (or honeycomb) structure inspired by nature to support the vehicle, offering unique, advanced levels of safety, comfort, sustainability and longevity.

This breakthrough was made possible through the cutting edge development of new, high-performance ingredients derived from a range of natural products including straw, wood chips, sugar residue, re-cycled household products and even orange peel. All were chosen for their low environmental impact and sustainability.

The new world-first **Vision concept** is also entyrely customisable, allowing motorists to have their tyre's tread pattern speedily and expertly reconfigured at drive-in 3D printing centres – adapting it for winter snow, summer highways or for off-road driving.

Using Michelin's bespoke app, motorists will simply book an immediate appointment at their local 'Print&Go' centre, before having their tyre quickly adapted for the journey ahead. And because new layers can be added to the tyre as it ages, it lasts just as long as the car itself.

"You might think it's a dream and you're right; it's a long term dream, but a realistic dream," said Terry K Gettys, executive Vice President, R&D at Michelin. "It will take 10-20 years for us to develop the whole tyre, which will be totally recyclable, and biodegradable."

Other breakthroughs on the Vision concept, which is protected by 19 different patents covering the production process right through to materials, are that its organic core does away with the need for a wheel altogether and that being airless, it will be 100 per cent puncture-proof.

Thanks to high-tech sensors built into Vision – similar to those already fitted to some Michelin tyres – it will also be connected, informing motorists in advance, in real time via app or email, when the tread needs re-configuring through everyday wear and tear, to optimise safety and comfort.

Because of Michelin's revolutionary 3D printing process, manufacturing and re-configuring of Vision will use the minimum amount of rubber, massively reducing the amount of materials and energy needed in these processes.

Vision is also the result of extensive focus groups with over 90 global contributors from the worlds of racing, agriculture and motoring, and calling on the experience of airline pilots, heavy plant drivers and even children to discover what they will demand from the ultimate tyre of the future.

The unique result is **Michelin's Vision**, maximising safety, grip, performance, handling, ride and braking in all conditions, along with convenience, longevity and ease of use, and all while being kind to the environment and future generations.

Vision sits at the pinnacle of **Michelin's vision** of smart and sustainable mobility for all.


MICHELIN
A BETTER WAY FORWARD