VOXAN WATTMAN

WORLD SPEED RECORD
IN ELECTRIC MOTORCYCLE

PRESS KIT

THE HISTORY OF VOXAN MOTORS

Voxan is a French motorcycle manufacturer founded in 1995. Over the course of its history, the firm forged a distinctive reputation that truly set it apart from its rivals, with iconic models including the Roadster, Cafe Racer, Scrambler, Charade Racing and Black Magic. Voxan Motors quickly became known for producing motorcycles with unmatched aesthetic appeal and innovative mechanical design, none more so than its 72° V-twin cylinder (996 cc) engine. Between 1995 and 2009, at its factory in the French town of Issoire, the firm created more than ten models or derivatives, all combustion-powered.

In June 2010, Voxan was bought by Gildo Pastor, President of Venturi. At the time, Venturi already had a decade's experience specialising in high-performance electric vehicles. Following the takeover, Voxan Motors embarked on a new technological course, signing up to the Monegasque group's electric-focused philosophy. Its new objective was to focus purely on electric mobility, acting as an incubator for cutting-edge ideas and pushing the envelope with a series of "zero emissions" world record attempts.

Gildo PASTOR,
President of Venturi Group

VOXAN WATTMAN CONCEPT, 2013

SACHA LAKIC: THE COMMON DENOMINATOR

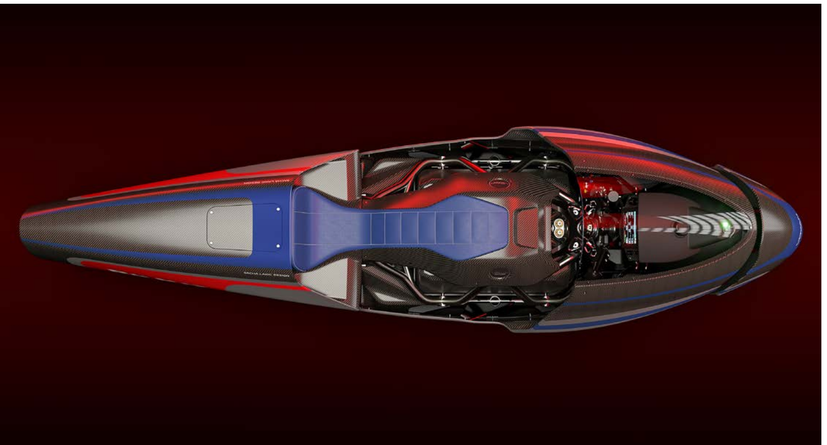
World-renowned designer Sacha Lakic has been overseeing the styling of Venturi Automobiles' creations since the year 2000. But he also designed the first Voxan, the Roadster (1995), and the legendary Black Magic, unveiled in 2003.

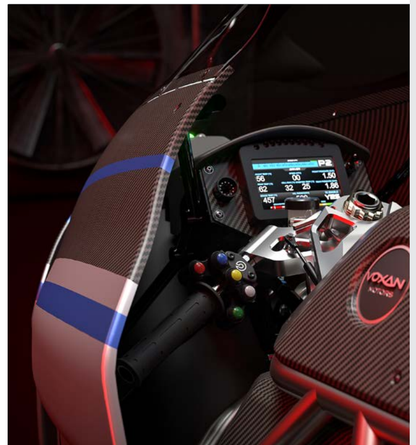
Following Gildo Pastor's purchase of Voxan Motors, Sacha Lakic was the natural choice to take over responsibility for the brand's styling. It was he who designed Voxan's first electric concept motorbike, the Wattman*, which made its debut at the Paris Motorcycle Show in 2013. The name continues to go from strength to strength with the Wattman now looking to set new world records!

* Technical specs of the concept Voxan Wattman unveiled in 2013:
Power 150 kW (204 HP), Torque 200 Nm, Acceleration: 0 to 100 km/h (62 miles/h) in 3.4 s.
See the technical specifications of the record-attempting Voxan Wattman on page 20-21.

WATTMAN

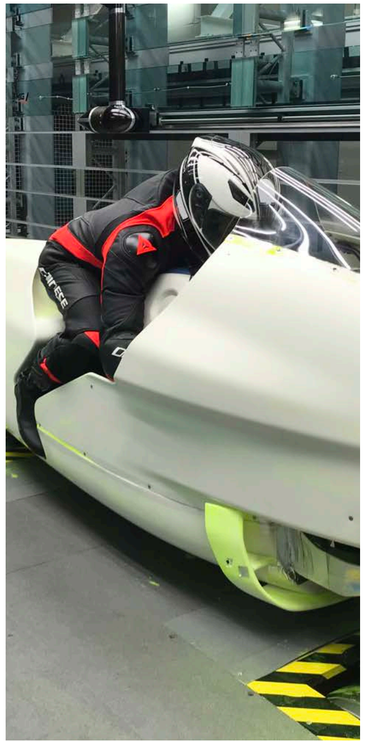
THE MOTORCYCLE OF ALL RECORDS

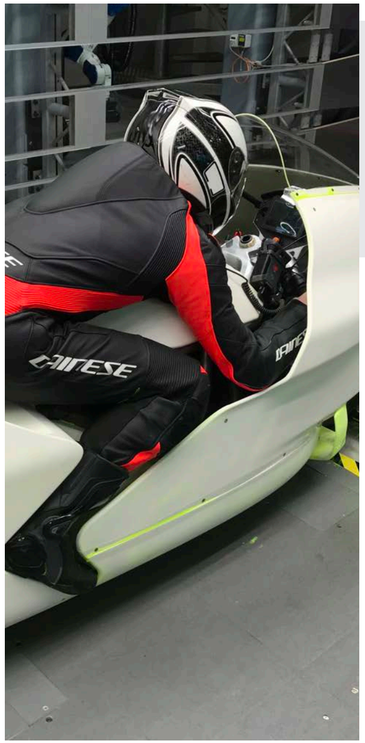




VOXAN WATTMAN, FOCUS ON HIGH PERFORMANCE

Like every vehicle manufactured by the Venturi Group, the Voxan Wattman is the product of a pioneering development process, in terms both of its design and the technology behind it.
Uniquely, the Wattman is an entirely new concept, not based on any existing vehicle. When the teams at Voxan Motors first began working on the project in the autumn of 2018, they started totally from scratch with a blank page. From there, everything quickly snowballed: "We were keen to move fast", explains Louis-Marie Blondel, who both oversaw the project's development and personally test-rode the motorcycle. "So we focused on two main points: drag (aerodynamics) and stability at high-speed. We were aiming to have the smallest possible projected area, but with a long wheelbase and a large rake, so the rider would be positioned as low as possible. We then identified a target speed, based on the existing record, which was originally 327.6 km/h (203.56 miles/h), but which was set at just over 329 km/h (204.48 miles/h) (by Ryuji Tsuruta, riding a MOBITEC EV-02A) in the autumn of 2019. That made no difference to our roadmap, as we were already aiming for a minimum of 330 km/h (205.05 miles/h)."



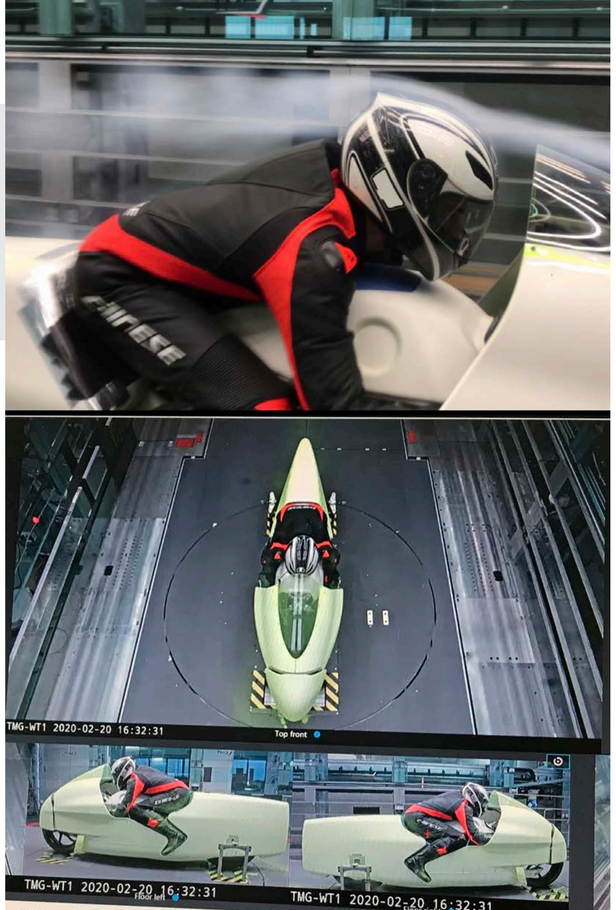


Instructive aerodynamic tests

To get a closer look at how the record-targeting Wattman behaved, Voxan's engineers began by testing a prototype in a wind tunnel.

"The aim of the test was to confirm the machine's aerodynamics, and study its behaviour at the simulated speed", says Franck Baldet, the project's technical director.

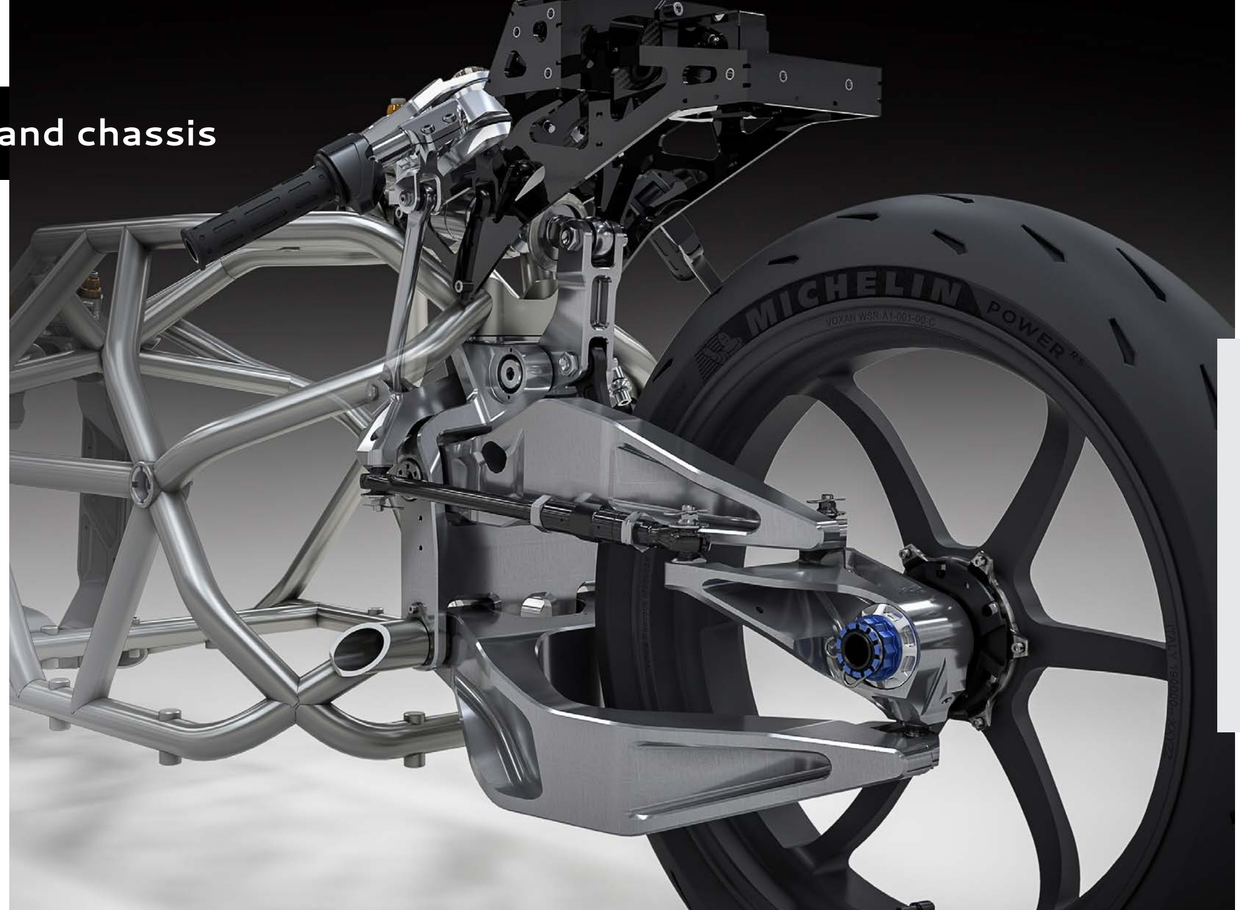
"We were able to do aerodynamic calculations up to more than 240 km/h (149.1 miles/h), which provided us with a wealth of information. Above that speed, we were getting into uncharted territory, but we learned other things from our track testing, and the thousands of computer simulations we did. On a very low-grip track, the slightest deviation can have very significant implications for stability. That's why the design and aerodynamic profile of the motorcycle are so important."



Ground-breaking front axle and chassis

In addition to its futuristic carbon fairing designed specifically for the task at hand, the Voxan Wattman boasts some special technical characteristics that set it apart from conventional motorcycles.

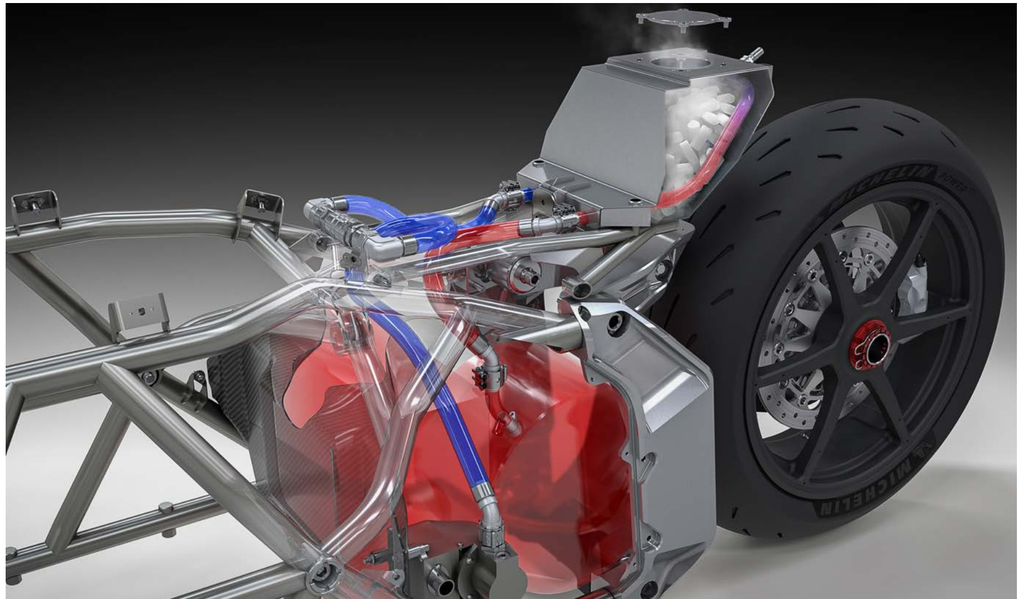
To maximise the distance between the front and rear wheels (a longer wheelbase provides more stability), Voxan's engineers designed the motorcycle with a double-wishbone front suspension, rather than a telescopic fork. This keeps both sides of the wheel clear, a practical solution that helps lower drag while allowing for quicker and easier replacement. The bike is steered by a link and swingarm, allowing the rider to sit further back and lowering the machine's centre of gravity. The chassis is made from aerospace-grade steel, while the running gear and wheel rims are aluminium.



"There is no front brake, for several reasons", continues Franck Baldet. "Firstly, it's better aerodynamically at high speed, but also on the vast salt flats it takes quite a while to accelerate (due to the low grip surface) and we have plenty of room to slow down. Last, but most importantly, front wheel braking at very high speed on a salt flat can unbalance the motorcycle and cause a fall. We aren't using a parachute, but the rider does have a rear-wheel brake, which he controls with the left handlebar grip, and also engine-braking controlled by a small lever on the right handlebar grip."

Dry ice cooling

Unlike other motorcycles, the Voxan Wattman has no conventional cooling system. This means it is able to dispense with a radiator, something that is seen as an aerodynamic disadvantage. To prevent overheating, the fluid present in the circuit is cooled by dry ice (carbon dioxide compressed to the solid state, "dry" ice that does not become water when it melts), contained in a tank mounted under the seat. The cooled fluid is then pumped through the cooling circuit which runs through the heart of the powertrain.



Proprietary battery design

In conventional industrial settings, the battery is usually sourced off-the-shelf from a partner manufacturer. However, the unique nature of this motorcycle, the limitations posed by the battery's weight (nearly 50% of the Wattman's total mass) and the required level of performance, all meant that there was simply no battery on the market that fit the bill. So Voxan Motors' engineers decided to design the record-targeting Wattman's power unit themselves. To do so, the team based in Monaco enlisted the help of Venturi North America, the Group's subsidiary based in Columbus, Ohio, at the campus of Ohio State University (OSU). It was there that the Voxan Wattman's battery was created and built.

The engineering students selected the most powerful cells on the market, put them through a series of bench tests, then assembled them in numbers before shipping them to Voxan Motors' workshop in Monaco, where the teams incorporated the unique battery into the heart of the machine. The challenge was to find the parts that offered the best possible power-to-size ratio, since range is not a priority for a world speed record attempt. With 1,470 cells (and a weight of 140 kg), the Voxan Wattman's battery delivers 317 kW of nominal power, with a capacity of 15.9 kWh.

Engine: from Formula E to electric motorcycle

Since 2000, the Venturi Group has created several high-performance electric engines for various types of vehicles. The Monegasque constructor is also responsible for the Venturi VBB-3, which currently holds the world speed record for an electric vehicle (officially timed average speed of 549.43 km/h, with a peak speed of 576 km/h).

In 2014, four years after buying Voxan, Venturi also became the first team to commit to the new all-electric Formula E Championship. In addition to manufacturing its own electric engines, Venturi also supplied a powertrain to the HWA RaceLab team. It was from this electric engine that Voxan Motors' engineers worked to develop the Voxan Wattman.

Louis-Marie Blondel, head of development, and Franck Baldet, technical director of Voxan Motors, both previously worked in Formula E for Venturi, helping the team to achieve a number of podium finishes and its maiden race win in the category. Prior to that, they also worked on the firm's record-breaking vehicles, giving them a comprehensive vision of electric automotive performance, both in competition settings and as part of world record attempts.

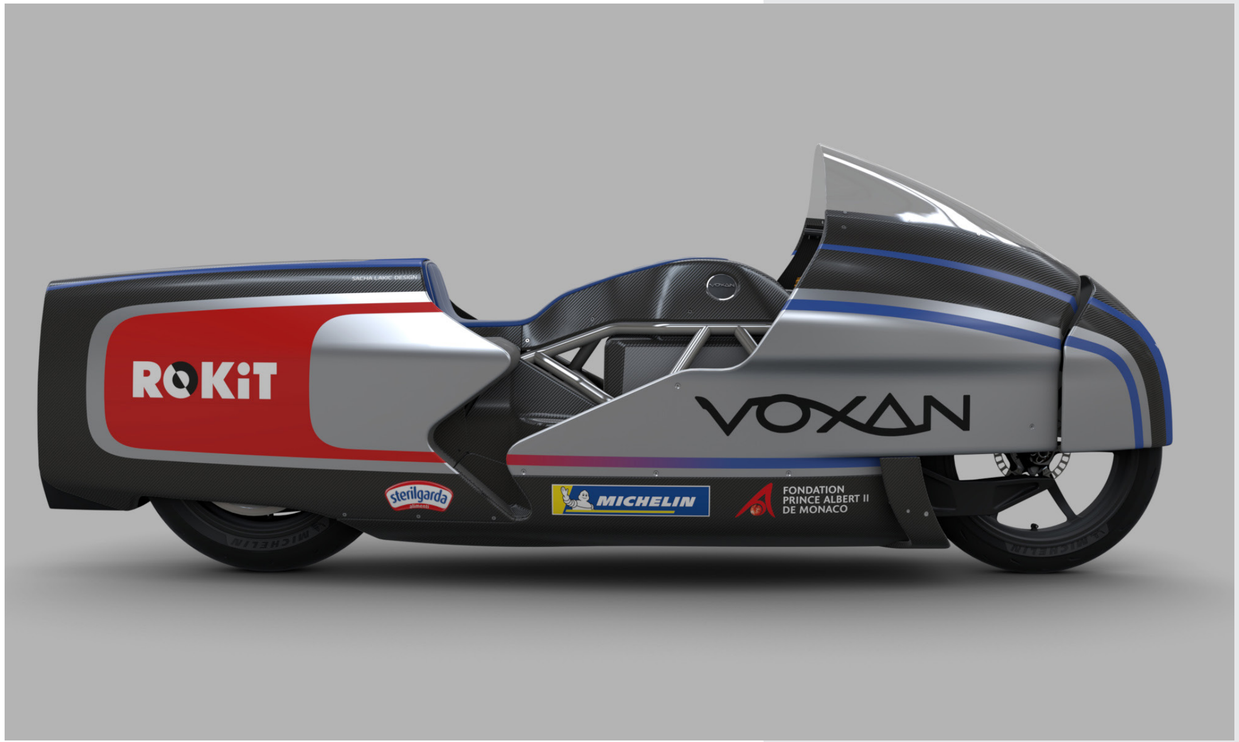
"We have poured all of the Venturi Group's accumulated experience into this motorcycle world speed record project", explains Franck Baldet. "It has proved valuable, particularly for the process of optimising the Wattman's electronics, which we have had to develop completely, whether in terms of energy management or power management. Like Venturi vehicles, and also our first Formula E powertrains, the Voxan Wattman is entirely Made in Monaco."

Standard tyres tested in extreme conditions

For this first world record attempt, and despite the Voxan Wattman's weight, both Voxan Motors' own engineers and their counterparts at Michelin, the Monegasque constructor's technical partner for its world speed record attempts, concluded that there was no need to develop a custom tyre.
The tyres used are Michelin Pilot RS+, 190x55R17 for the rear wheel, and 120x70R17 for the front. They are both grooved, as required under FIM rules for record attempts. Officially approved for a maximum speed of 350 km/h, the tyres were tested to determine their true limits.

To do that, the teams from Voxan Motors and Michelin used test benches normally reserved for aircraft tyres! This enabled them to work with higher loads and speeds, and verify that the tyres selected for the Voxan Wattman were capable of withstanding speeds of up to 450 km/h, providing a sufficient margin of safety for the 2020 testing programme.

MEET IN JULY 2021 FOR THE SPEED WORLD RECORD ATTEMPT WITH THE VOXAN WATTMAN



TECHNICAL SPECIFICATIONS
Voxan Wattman – Semi Streamliner

Engine:
- Technology: permanent magnet motor
- Power: 270 kW (367 HP)

Dimensions:
- Length: 2700 mm
- Width: 710 mm
- Height: 1030 mm
- Seat height: 610 mm
- Wheelbase: 1850 mm
- Ground clearance: 70 mm

Battery:
- Technology: Lithium-Ion
- Voltage: 756 V
- Energy: 15 kWh

Weight:
- Battery: 140 kg
- Moto: 300 kg

Transmission:
- Direct drive with timing belt

Cooling:
- Liquid, via water/ice exchanger

Cycle :
- Chassis: 25CD4S steel tube + 7075 T6 aluminium
- Front suspension: dual swingarm with central shock absorber + offset handlebar with link rods
- Rear suspension: dual swingarm with central shock absorber
- Rims: custom forged aluminium 6082 T6 (Front: 3.5" x 17" / Rear: 6" x 17")
- Tyres: Michelin Power RS+ (Front: 120/70 ZR17 / Rear: 190/55 ZR17)
- Front brake: none
- Rear brake: 305mm disc - 4-piston calliper

ABOUT VOXAN MOTORS

In 2010, the iconic motorcycle manufacturer Voxan Motors was bought by Venturi. Its President, Gildo Pastor, immediately refocused the constructor on a new core business: electric engines.

In 2013, Venturi unveiled the Voxan Wattman, a symbol of the brand's rebirth and its radically new technical direction and styling.

In 2019, the teams began work on a new, high-performance version of the Wattman, specially designed to set new world speed records.

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ABOUT THE ROKiT GROUP

The ROKiT Group is a global media company founded by Jonathan Kendrick and John Paul DeJoria.

Headquartered in the United Kingdom and Southern California, the company offers a diverse portfolio of products and services including mobile phones, Wi-Fi services and ROKiT Drinks.

The company is also engaged in multiple aspects of content production and distribution in music and movies.

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