

# Driven

QP looks at the latest from Richard Mille, whose watches are built to Formula 1 standards

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A combination of vision, creativity, business savvy and stubbornness as allowed Richard Mille to spend the past few years living out a dream, creating wristwatches the way he thinks they should be. His fascination with high-end technology – much of it inspired by the F1 racing world – as well as a no-nonsense ‘what you see is what you get’ aesthetic, has garnered a diehard following. The new RM005 and RM006 models take the brand’s ongoing quest for perfection and innovation to new extremes.

A view of the RM005’s caseback. The sapphire glass allows an unrestricted view of the watch’s revolutionary rotor. Its geometry is altered by swinging the V-shaped wings towards or away from the outer edge and re-attaching the ends to the fan-shaped arm.



## Building a tourbillon on the carbon-fibre baseplate upped the requirement for high tolerances and finishing – a *tour de force* experiment, where fine Swiss watchmaking meets the space age.

A secret to Richard Mille's success is that he chose at a very early stage to connect with other companies that share and understand his vision and ideals; those who, like him, are willing to take chances and, equally, share in the spoils of glory afterwards. His connection with Audemars Piguet (Renaud & Papi) in Le Locle and the work they do in the design and manufacture of the Richard Mille movements is a public affair. Indeed, APR&P have given him the unofficial title of 'icebreaker', creating a pathway through the tough, frozen and conventional Swiss watch-making territory that others can follow later after the pioneering is done.

This relates closely to the philosophy of APR&P, whose young and talented engineers' and developers' greatest desire is to be positioned at the vanguard of the watch industry, whether it be in technical design or the machining of parts. The accuracy and tolerances of their equipment are the highest of all watch-making Switzerland, and they want to apply them to timekeeping in every possible way. They have been involved with Richard Mille from the very beginning and it is there that the tourbillons and chronographs are manufactured and assembled. In the same fashion, Mille has also made an alliance with the well-known manufacture Vaucher in Fleurier for the production of his very first automatic wristwatch, the RM005.

### Spinning around

Though not a tourbillon, the RM005 is every inch a Richard Mille creation and presents technical advances that are, to say the least, unusual. As with all Richard Mille wristwatches, great attention is given to every detail and innovative technique, and this is especially true of the RM005's main talking point: the winding rotor and its variable geometry.

The fact is that the winding rotor, that elegantly simple mechanism that makes self-winding watches possible, does have one basic

problem. Sedentary people – for instance those who work in an office or who go on long car journeys – can sometimes have the unnerving experience of finding that their automatic wristwatch just stops. In fact, even if it does wind, it might not be enough for the escapement to operate optimally. Those who practice sport have the opposite problem: their watches can regularly over-wind, creating unnecessary wear on the winding spring as well as the winding barrel interior, which can in fact seriously damage the rotor itself. But this technical hitch has always been a trade-off for the luxury of not having to remember to wind one's watch. Always, that is, until the RM005 came along.

The titanium arc of the RM005's rotor has two V-shaped wings that form bridges to the weight segment along the special tungsten/cobalt-alloy outer edge. By altering the position of these wings, the rotor's weight displacement can be adjusted to each wearer's personal preference before leaving the workshop. Setting the wings to their innermost position nearest the rotor's axis will displace weight from the outer edge towards the middle, making the rotor turn less aggressively during swinging motions of the arm or torso. Conversely, setting them outwards will increase weight distribution towards the rotor's outer edge, making the rotor spin more easily in reaction to even the smallest movement. This is a neat technical solution to the predicaments posed by sporting and office lifestyles.

### A strong finish

The RM005 is far from a one-trick technological pony though. The dark colour of the titanium baseplate is created by a surface-treatment technique called PVD, or physical vapour deposition, which is normally used for tooling and cutting machines, but also features on Formula 1 racing engines, from where Richard originally got the idea. Through a process of heating the baseplates in a chamber, the molecules are able to join up tightly with the surface (in this case

carbide, which is carbon containing metallic elements) under the influence of metal vapour, creating an unbelievably tough surface (approximately 3,000 HV).

A casing ring is no longer necessary as the movement is seated in the tripartite case on mounting rubbers, thereby ensuring additional isolation from external shock and vibration. The movement was specially manufactured in its entirety to Richard's exacting standards by Vaucher and is exceptionally finished in every way to offer both outstanding timekeeping and aesthetic properties. Add 100m water resistance and you have a stylish watch with high-tech characteristics, perfectly suited for the office, the golf course, swimming, snorkelling and sailing.

### Tough customer

The RM006 is an experiment in the discovery and machining of new materials for watchmaking. With its novel application of technologically innovative materials and forms, Formula 1 racing has always been an inspiration for Richard Mille's creations. Little wonder then that his search for inspiration started there and led to the associated aerospace industry.

In this case, the Mille eye fell on ultra-light yet high-strength carbon fibre. This tough material is also used in the brake linings of cars, aeroplanes and other high-speed machines, so extensive information was already available. But the first results were disappointing, as even this exceptional material was not up to the rigorous standards necessary for fine watchmaking. Extended research through specialised material property databases and search engines finally led the gents at APR&P to high-density carbon-fibre material imported from the USA and originally developed for all kinds of aerospace applications. It is solid enough to cut and mill, and as stable as one could possibly need under the stress of thermal variation and shock.

A return to the tourbillon:  
The new RM006 model is an  
experiment in carbon fibre.





(Above) A series of developmental sketches for the RM006 and its 'world first' *platine*, made of carbon fibre.

(Above right) Machining the holes for the RM006's baseplate required special drill bits that would cut the carbon-fibre nanofibres cleanly.

Such hardness is obviously an important issue for car and aeroplane brakes, but is also, strangely enough, vital for wristwatches: any expansion, contraction or a lack of rigidity in certain areas could easily lead to teeth not engaging with each other and subsequent time-keeping problems, amongst dozens of other irresolvable situations. To put this material to the supreme test, the choice was made to use it to create the *platine* for a Richard Mille wristwatch (the baseplate upon which everything is mounted and therefore where stability is a critical issue). As if this was not enough of a test, the plan was to build a tourbillon on this carbon baseplate, upping the requirement for high tolerances and finishing. It all looks so simple, but this is a real *tour de force* experiment, where fine Swiss watchmaking meets the space age.

### Heavy duty

The high-density carbon used differs from the standard type in that it is composed of nanofibre threads compressed together with a special polymer under a temperature of 2,400°C and 750 ATM, ensuring a light, tight and rigid molecular structure. Nonetheless, cutting and drilling a material that is composed of threads is no easy

task: on the one hand, traditional tools can be used for basic roughing out, but machining smaller holes on the different levels of the baseplate requires special cutting bits able to slice the nanofibres cleanly. Not to mention creating perfect interior threads for microscopic metal screws in a material composed of 'nanofibres'...

The RM006 unwittingly underwent a rigorous test recently, courtesy of one brand ambassador's misfortune. Due to brake failure, the young Brazilian F1 driver Felipe Massa had a terrible 340 kph crash at Montreal in June. Luckily he walked away from it, as did the prototype RM006 on his wrist, which survived these tremendous forces without losing a second.

Somewhat inevitably, all 20 pieces were sold even before they left the drawing board. Coming in at a much higher price than the 'regular' RM002 tourbillon, you will have paid more per gram of watch than any other in the world to own an RM006; the titanium-cased watch, excluding strap, weighs an unbelievable 42 grams. One thing is for sure though: if the watch should fall off your wrist, you should not have to worry about damage! ◯