



# Formula Mille

Richard Mille, whose 21<sup>st</sup> century blend of French *haute couture* design and leading-edge Swiss technology QP profiled in issue 1, is edging closer to the completion of the RM 004, a watch that more than ever embodies the mission for perfection that is his trademark

Theodore Diehl

⌚ It was just a few years ago that a new star shooting across the horological sky made people stop and look up in astonishment. Since then, this luminary – Richard Mille – has found his way into the pantheon reserved for the absolute pinnacle of *haute horlogerie*. He is a man with a mission, out to make what he considers to be the perfect timepiece. But not just one watch, rather a continually growing series, each possessing some new technical concept, material or mechanical development. His newest creation, the RM 004 Chronograph Rattrapante, embodies his principles more than ever.



Even the trademark titanium bolts that hold the cases of Richard Mille's watches together took months of development and a king's ransom to produce, each requiring more than 20 different production steps.

Directly inspired by Formula 1 racing technology (and we are not discussing logo placement here, but technological concepts), the RM 001 Tourbillon laid down the basic approach for Mille's watches. Richard's personal view is that each screw, gear, lever and spring must fulfil its task while operating within precise performance margins, exactly as racing car components do\*. (Even the highly visible, trademark titanium bolts that hold the cases of his watches together took months of development and a king's ransom to produce, each requiring more than 20 different production steps.) Wherever a novel material such as Arcap or titanium performs better than the standard choice, it is used. Every single component is examined in this light.

\*No reference is made to economy or ease of production in the design specification.

### Technology

Along with all Richard Mille watches, the new chronograph was designed in close partnership with Renaud & Papi (a subsidiary of Audemars Piguet) in La Chaux-de-Fonds and Montre Valgine in Les Breuleux. Mille himself is not a watchmaker, but he has worked extensively within the horological industry for many years and in several countries. He is, to use the Swiss term, a *createur*: the person who is responsible for creating and visualising the concept and design principles that a particular watch will embody. And after spending many years with watches, he has a cast-iron idea about the qualities a watch should have. His real genius lies not just in his ability to combine function and design, but also in his talent for finding and nurturing like-minded people who are excited about sharing in his horological adventure and propelling the RM ideas forward.



An example of the modular construction system, this picture shows the independent group of pushers and springs controlling the starting and stopping action of the chronograph's split seconds unit.

The ratrapante "pincers" in their opened position. The split-seconds gear (removed in this view) would be located in the jewel-lined bearing between the two arms.

The escapement of the RM 004 incorporates a specially designed balance-wheel shock-absorption system and unique double bridges containing cutouts to lower their mass.

The chronograph module, showing column wheel, push levers, springs and engagement levers. One scratch on the black baseplate and you have to start all over again – the surface treatment allows no retouching!

The day after the recent opening of the new Renaud & Papi factory, we had the opportunity to view first-hand some technical details of the new RM 004, as well as speak to technical director Giulio Papi and general director Fabrice Dechanel from Renaud & Papi, both of whom have worked alongside Richard Mille from the outset. It was evident from their excitement and eagerness that they find the contact with Richard intensely interesting and rewarding. Indeed, Mille's flaunting of watchmaking convention coincides exactly with their own philosophy regarding the future development of watchmaking. They are pushing to the limit the boundaries of watch mechanics and attention to detail – exactly as their counter-

parts building Formula 1 engines do at the drawing boards and on the track. The machines used by Renaud & Papi are the most state of the art in Switzerland, allowing watchmakers and engineers to push past established frontiers in the search for ever higher tolerances and performance.

### Pushing the boundaries

Giulio Papi explains how the availability of new production techniques and methods has made several advances possible: "One of Richard's main requests was that we should eliminate as far as possible the problems of inertia – ie, the jumping of the *ratrapante* when starting and stopping due to the mass of



(From left) Richard Mille, creative inspiration behind the RM 004; Laurence Donzé, responsible for the technical realization of the watch's movement; and Dominique Guenat, director of Montres Valgine, the company that produces Richard Mille watches.

the hand and gears. We created a 'pincer' made of titanium in which both arms are work simultaneously, engaged from a single point, in order to 'grab' the split-seconds gear in a swift movement just like the claws of a crab. In a standard *rattrapante*, this is done by two separately activated levers, and involves the corresponding problem of needing to adjust them so that they both reach the gear at the same moment." The new system sounds and looks simple enough, but the secret of its perfect functioning lies hidden in the unseen, complicated profiles of just three screws: one for each pincer arm and one in the centre. This little screw has an eccentrically placed head, which allows fine and exact adjustment of the two arms' arrival at the split-seconds gear.

"All of the screws used in this system must, of course, allow movement, but at the same time be stable enough not to displace the slightest bit vertically under the stressful, high-speed envi-

ronment in which they function. These microscopic screws and the copper-alloy sleeves they are held in are tapered in different directions and areas, and must be seated perfectly at the very tip as well as the under the head of the screw, otherwise they will not function. And only our machines can produce them," he says with an impish but matter-of-fact smile.

### Going to pieces

Another noteworthy aspect of the RM philosophy, again taken from the world of Formula 1, is what could be described as "sectional modularity". In high-end racing cars, parts are designed to be removed and replaced within seconds, while larger components such as the gearbox can be exchanged in far less than an hour. This requires that each particular section – such as the motor, brakes and transmission – be independently isolated. Most watches today that contain any kind of complication are built with a

separate module containing the additional functions screwed atop the basic movement, a time-saving, two-piece construction akin to two coins on top of one other. However, in all RM watches *every function* – including even the basic ones such as the escapement, winding mechanism and winding barrel – is in principle an independent unit.

These sections are then set in neighbourly fashion as interconnected units, communicating with one another as required while being otherwise independent. This allows any future repairs to be efficiently dealt with and at the same time allows total and complete customization of parts as desired, since virtually nothing has to function from within the standard Swiss watchmaking supply chain. It is even conceivable in this system's philosophy that "upgrades" such as a new escapement could, if desired, be set in place with little trouble. This offers tremendous freedom for creation and development, something that is almost unheard of in the industry. In more traditional approaches, once you put a standard part of any kind into a watch's system, you start a chain reaction that requires other standard parts to go with it. Before you know it, you are using standard gear ratios, tooth profiles, springs and other parts.

The only "downside" to this philosophy of freedom is that it requires the highest tolerances, best finishes and most unique modifications available anywhere. But the result of customisation down to the last screw thread means that you will have dig deep into your pocket for any RM wristwatch. In real terms, this means that the RM 004 Chronograph Rattrapante is the most expensive chronograph movement ever sold, coming in at a hefty £104,482 including VAT.

### Unfinished business

"You know," says Richard, "I've been in this business for a very long time. Don't get me wrong; I have tremendous respect for the traditions for classical watchmaking, based upon centuries of accumulated knowledge and skill. But the majority of wristwatches manufactured today do absolutely nothing for me, emotionally, visually or intellectually. I love antiques, fine paintings, furniture and all kinds of art, but watchmaking today more closely resembles the expert copying of antiquities. While they are beautifully made, the majority of mechanical movements on the market these days left the drawing board more than 50 years ago! And visually, many styles on today's wristwatches are more than 100 years old!

"My idea is that time is just like racing: it's all about now, today or the upcoming lap – certainly not what I did yesterday or even an hour ago. Timekeeping is by its very nature the seconds of the present and the future. I used to be in total awe of the conventional Swiss watch industry and everything it did. But now I'm older and maybe wiser, only the purest essentials and technical tightrope walking excite me and make me sit up and take notice. That's why I'm so passionate about exactly how things should be, to the point that I sometimes make people crazy with my ideas. But the fact that other people are excited about what we are making here just makes me want to go further and further. There's a lot more in my head still to come!" ◊



**Further information:** Horometrie SA. Tel: +41 32 959 4353, Fax: +41 32 959 4354