

Cartier

Les Heures Mystérieuses de Cartier

For over a hundred years, Cartier has been mastering mystery. Over time, this watchmaking ideal has led to the creation of Clocks and watches that crystallise the power of enchantment.

This year, Cartier presents two new watchmaking complications that push the frontiers of the mysterious yet further, continuing the founding tradition of the Maison. Inspired by the concept of transparency and hidden complexity, the watchmakers of the Cartier Manufacture confronted the challenge of bringing enthusiasts two new creations with clean lines that seem to glorify time with incredible lightness. The first mysteriously displays the hour and minutes with two hands that seem to float magically in space. The second focuses the attention on a mysterious double tourbillon whose floating cage performs a delicate and spellbinding dance.

Montre Ronde de Cartier Double Mystery Tourbillon

Imagine a watch equipped with a tourbillon that seems to be suspended in space. That was the challenge taken up by Cartier with its new movement, the 9454 MC Double Mystery Tourbillon certified by the Geneva Seal. Slightly closer inspection will reveal the magic concealed in the mechanism. Indeed the flying tourbillon, which turns once on its own axis every 60 seconds, appears to be floating completely free in space, with no visible connection to any gear train. The illusion is complete when the same tourbillon cage starts to perform a second rotation at a rate of one turn every five minutes. This product of Cartier's creative daring and watchmaking know-how, the Double Mystery Tourbillon, is the quintessence of over a century of mystery creations from the Maison.

Magic transformed into science

In its simple elegance, which masks unbelievable complexity, the Ronde de Cartier watch highlights a totally original mechanical construction named "Double Mystery". The watchmakers of the Cartier Manufacture had to demonstrate boundless ingenuity in order for matter and movement to give birth to this fascinating kinetic sequence. When performing a conjuring trick, the magician has to distract the attention of his audience and convince them, by the illusion he produces, of the existence of preternatural forces. In the Ronde Double Mystery Tourbillon, the design team took inspiration from the "tricks" of Jean-Eugène Robert-Houdin, the father of modern magic, to create the illusion of levitation.

Connoisseurs of watchmaking are aware that the mechanism of the tourbillon, in a vertical position, uses the rotation of the cage in a given time to shield the balance (the regulating organ) from the influence of the gravitational attraction of the Earth by smoothing out

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regularity errors (done by causing them to occupy every point on a circle in a given time). This fascinating device, set in the heart of the Ronde Double Mystery Tourbillon, seems to defy the universal laws of gravity, giving the impression that it is floating unsupported in the void, and that its cage, rotating one turn in a minute and performing a complete rotation in its space in 5 minutes, has completely liberated itself from gravity.

Hiding what should not be seen

The watchmakers of the Cartier Manufacture have employed a disc of sapphire crystal with an anti-reflective finish containing an aperture the size of the tourbillon to give the best possible illusion of a cage in a state of levitation. To do this, they set the disc to support the cage in rotation. By doing this and positioning the minute wheel, which propels the oscillator, on the axis designed to limit the “resistance torque” inherent in the mechanism supporting the tourbillon, they succeeded in transmitting its force to the tourbillon, and thus causing the entire device to revolve in space once every 5 minutes. This results in the tourbillon making one full turn of the open, transparent space in 5 minutes, while the cage performs 5 complete revolutions in the same time... The ingenious way of achieving such a result is to place a rack around the edge of this sapphire crystal disc, transforming it into a large gear wheel that performs one revolution every 5 minutes.

Defying the laws of gravity

The 9454 MC Double Mystery Tourbillon movement is the result of long research. For example, numerous calculations were needed to determine the speed of rotation of the different moving parts. To optimise power consumption, the cage of the tourbillon performs one complete rotation in the space dedicated to it over 5 minutes – making it perform one turn per minute would have consumed 25 times as much energy. To improve the mechanical efficiency of this moving organ, the weight of its components had to be reduced to the minimum in order to limit the inertia of the rotating assembly comprising the disc and the titanium tourbillon cage. To compensate for the weight of the regulating organ and the “flying” cage, although the weight of the latter had been reduced to the absolute minimum (0.28 g), a circle segment designed to relieve the tothing has been positioned opposite the tourbillon to restore the equilibrium between the masses, with the effect of creating dynamic balance.

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Rotonde de Cartier Double Mystery Tourbillon, calibre 9454 MC

Case platinum

Diameter 45 mm

Crown beaded, platinum, set with a sapphire cabochon

Crystal sapphire

Case back sapphire

Water-resistance 30 m / 100 feet / 3 bar

Dial slate-coloured, galvanised, guilloché, silvered open-work grill with sunray effect, black transferred Roman numerals

Hands sword-shaped in blued steel

Strap in black alligator skin, double adjustable folding buckle in 18-carat white gold

Movement Manufacture mechanical with manual winding, calibre 9454 MC, certified Geneva Seal, double mystery tourbillon

Casing-up diameter 35 mm

Total diameter 35.5 mm

Thickness 5 mm

Number of jewels 25

Number of parts 242

Balance 21,600 vibrations / hour

Power reserve 52 hours

Montre Ronde de Cartier Mystery

Breathtaking and ethereal, the Ronde de Cartier Mystery watch hypnotises those who gaze on it with its hands that float in space. The purity of its design is such that the extraordinary watchmaking complexity of its mysterious display is forgotten. Indeed, perfecting this new Cartier Manufacture movement forced our watchmakers to rethink the traditional mechanism in its entirety. Their aim: to overcome the specific problems involved in driving large sapphire crystal discs. The paradox presented by an instrument of this kind is that the simplicity of the display conceals a watchmaking complication that demanded hundreds of hours of design calculation.

To bring a mystery wristwatch into being, the watchmakers of the Cartier Manufacture had to overcome all the constraints inherent in perfecting a display by hands whose connection to the movement is completely invisible. Thus, in order to limit friction between the sapphire crystal discs, it was decided that they should turn on fine pivots, like a wheel in a gear train, rather than in guide grooves, the traditional technique adopted for mysterious clocks.

This new concept, which is combined with the wheel of the hour hand, avoids friction and limits the power consumption of the movement. With friction reduced to a minimum, the next task was to reduce the inertia of these large discs of sapphire crystal, weighing just 0.56 g and fashioned using DRIE technology (Deep Reactive Ion Etching). Thanks to this cutting-edge method, the metal parts can be made by three-dimensionally building up material, thus obtaining a gear wheel of extremely high concentric precision in one piece with the sapphire crystal disc. The geometry of the assembly is exact to the nearest micron.

Perfection of design

To facilitate the final assembly of the different components under optimum conditions, Cartier opted for a modular structure. Thus the movement is made up of two separate elements: the movement proper, which occupies a crescent-shaped zone on the baseplate, and an independent display module occupying the circular space left vacant for the purpose. This sub-assembly, comprising four anti-reflective sapphire crystal discs with an antireflective finish, is assembled separately in a laminar-flow hood to prevent all possible presence of dust. When the timepiece is finally assembled, the hands begin to revolve in the void, as if by magic. By allocating 58% of the diameter of the movement to the sapphire crystal discs, Cartier has pushed back the limits of the mystery display and achieved record legibility.

Keeping the mystery alive

Timepieces with a mystery display have always been considered more fragile than other traditional complications, due to the presence of the sapphire crystal discs. The innovative design of the calibre 9981 MC enabled it to pass all the certification tests, including the requirement that it should resist over 500 consecutive impacts, as well as being dropped on to

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a hard floor from a height of one metre. This movement with its spellbinding transparency, slimness and accuracy, with a balance oscillating at 4 Hz (28,000 beats per hour), has a power reserve of 48 hours. The Rotonde de Cartier Mystery watch, with its fascinating balancing act, appears transparent to the last detail. But in truth, if this watch reveals the essential components of its manual-winding, individually numbered mechanical movement through the case-back, it only shows what Cartier is willing to let you see. In the past, Louis Cartier refused to give any explanation of how his mysterious clocks worked to those who sold them, so as not to divulge the secret. Today, the mechanism that connects the movement to the hands of the Rotonde de Cartier Mystery is so designed as to disappear into the structure of the calibre and remain invisible, keeping the magic alive...

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Rotonde de Cartier Mystery, calibre 9981 MC

Case 18-carat pink or white gold

Diameter 42 mm

Crown beaded, 18-carat pink or white gold, set with a sapphire cabochon

Crystal sapphire

Case back sapphire

Water-resistance 30 m / 100 feet / 3 bar

Dial white, galvanised, guilloché, silvered open-work grill with sunray effect, black transferred Roman numerals

Hands sword-shaped in rhodium-coated steel

Strap brown or black alligator skin, double adjustable folding buckle in 18-carat pink or white gold

Movement Manufacture mechanical with manual winding, calibre 9981 MC, mystery display of hour and minute

Casing-up diameter 31.3 mm

Total diameter 31.9 mm

Thickness 4.61 mm

Number of jewels 27

Number of parts 158

Balance 28,800 vibrations / hour

Power reserve 48 hours

A short history of mystery clocks at Cartier

Mystery clocks have their own special chapter in Cartier's history. "Mystery" because their diamond-and-platinum hands seem to float in the clock's transparent body, detached from its movement.

These "clockmaking miracles", as *La Gazette du Bon Ton* called them in 1925, were born from Louis Cartier's collaboration with an exceptional clockmaker, Maurice Couet (1885-1963). He was only 25, but already highly experienced when Cartier noticed his talent. From 1911, he became Cartier's exclusive supplier. The first mystery clock, known as *Model A*, left the workshop in 1912. Maurice Couet took his inspiration from the clocks of the French illusionist and inventor of modern magic, Jean-Eugène Robert-Houdin (1805-1871). The principle that he borrowed and developed was based on a brilliant idea: the hands were not directly linked to the movement but were attached to two glass discs, each fitted into a metal border edged with gear teeth. The movement, which was generally housed in the clock base, turned the two discs – one at the speed of the minute hand and the other at the speed of the hour hand. To complete the illusion, the metal borders of the discs were hidden in the hour circle.

Several versions of the *Model A* were produced with variations, be they in material of the base (which was crafted from onyx, agate, nephrite or gold), the decoration of the dial and the frame (white enamel and mother-of-pearl were most often used) or in the shape of the hands. 1920 saw the birth of the model known as the "*central axis*". Unlike the *Model A*, its two discs were not turned by shafts on either side of the base but by a single shaft. This innovation gave Cartier greater aesthetic freedom. In 1923, the technique evolved even further when the movement was placed in the top of the famous *Portique* mystery clocks.

These were extremely rare objects, some involving over a year of work and several ateliers. They appealed to many prestigious figures such as John Pierpont Morgan Jr., the Queen of Spain, Queen Mary, the wife of King George V, and the Maharaja of Patiala, some of whom owned more than one of these precious clocks.

The Cartier Collection now contains a unique group of 17 priceless mystery clocks, including the first of the six *Portique* clocks and two *Model A* clocks similar to the original creation of 1912.

The production of these mystery clocks has never stopped and new models are developed on the principal themes that inspire the company today. For more than a century, Cartier has been mastering mystery.

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Mystery clock *Model A* Cartier Paris, 1914

Base in moulded and polished white agate containing the movement.
Four bezel-set sapphire cabochons at the corners.
Case in moulded and polished rock crystal; a beaded gold line at the bottom.
Transparent centre, frame with laurel leaf motif in gold and white enamel.
Hour circle in gold and white enamel, Roman numerals and half-hour buds in *réservé* gold.
An inside line of platinum and rose-cut diamonds.
Hands in platinum and rose-cut diamonds.



Designer's drawing of a *Model A* mystery clock in rock crystal, mother-of-pearl, onyx and diamonds, 1929.

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Mystery clocks

An exercise in style; in imagination, freedom and precision: for the SIHH 2013, Cartier draws from its collection to develop around one of its most special creations the full poetry of creativity.

Here we have two mystery clocks, apparently identical, yet caught in the play of reversed reflections in which Cartier has placed them. They are sheathed in the same secret: the mystery of their origins, the enigma that makes them tick.

The first is in white quartz, a soft, milky gem; studded with diamond chips, the mother-of-pearl marquetry radiates around the face. For the second, the jeweller chose an extremely rare stone, obsidian pearl, known as the “celestial stone”. Materials run through its opalescent clarity, teeming with depth. An anomaly, a delightful defect which Cartier transforms into a precious asset.

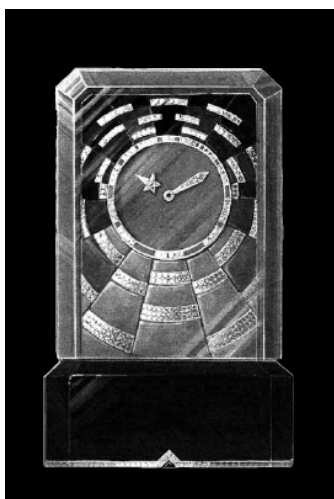
The hands float in weightless suspension; two diamond comets that pass like the hours, barely brushing against the centre of the transparent disc on which they are set.

Around the face, mother-of-pearl or obsidian marquetry combines with diamonds in a gleaming palette of grey to white. On the back, passing stars are woven with flakes of gold. Both are festooned with diamonds around the base, like bejewelled lace.

It took 800 and 1,000 hours to create these two unique timepieces encapsulating the utmost in watchmaking subtlety on the finest rock crystal: a stone as pure as it is fragile.

How beautiful they are, free from the weight of the world, detached from the contingencies of time and its passing. Like cryptic messengers, these mysterious clocks evoke in their harmony the perfection of Cartier’s clockmaking world. A perfection that is conducive to magic and miracles... A harmony for which Cartier holds the closely guarded secret.

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Mystery clock

White gold, rock crystal, silver sheen obsidian, silver sheen obsidian marquetry, brilliant-cut diamonds
Mechanical movement with manual winding 6002 MC, 8-day power reserve
Unique piece



Mystery clock

White gold, rock crystal, white quartz, mother-of-pearl marquetry, onyx, brilliant-cut diamonds
Mechanical movement with manual winding 6002 MC, 8-day power reserve
Unique piece
