

# **FREDERIQUE CONSTANT**

## FREDERIQUE CONSTANT - Manufacture Tourbillon Grand Feu

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Celebrating the fifth anniversary of the Frederique Constant Manufacture in Plan-les-Ouates, Geneva

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Enameling is an ancient technique where finely powdered colored glass is applied to a metal plate. The metal plate with the glass powder is then backed in an oven, hot enough to melt the glass. This enameling process produces a beautiful deep, shiny surface.

Only few of the applied plates will survive the 900+ degree Celsius fire in the oven and produce an even surface. The slightest imperfection in the mixed powder, the supporting metal plate or a dust speckle will ruin the dial and the enameller has to start all over again.

### Manufacture Tourbillon Caliber

Based on its award-winning Heart Beat Manufacture Calibre, Frédérique Constant developed its Tourbillon fully in-house with a number of unique features:

- Silicium (or Silicon) Escapement Wheel and lever
- Smart Weight Balancing
- Fast Oscillation at 28'800 BpH
- Tourbillon Cage individually numbered

### Silicium (or Silicon) Escapement Wheel

The Silicium Escapement Wheel and Lever have the following three main advantages:

- Lubricant-free running
- 1. Age-related thinning and drying of lubrication will no longer occur
- 2. An escapement wheel without oiling avoids the risk that oil spreads to other parts of the movement.

- Very light (low inertia)

The escapement wheel is accelerated and stopped at each tick and tock of the watch. The lower weight silicium escapement wheel has lower inertia, increasing energy efficiency.

- Good friction properties

Lower friction reduces loss of energy, hence the energy requirement for the calibre is lower.

With its three main advantages compared to a regular escapement wheel, a Silicium escapement wheel is particularly useful in a Tourbillon mechanism. The reduced weight of the Silicium escapement wheel and the better friction properties result in a substantially higher energy efficiency. As a result, the Frédérique Constant Tourbillon with Silicium escapement wheel has an amplitude of over 300 degrees in dial-up and dial-down positions. Even in the crown-down position, the amplitude is over 275 degrees, which is substantially better than the performance of other high-end tourbillons.

### Smart Weight Balancing

The Frédérique Constant Tourbillon Cage consists of 80 individual parts. Each of these parts is produced to the highest possible tolerance, with a precision of 1-2 micron (0.001-0.002 mm). Many of the parts are produced on Frédérique Constant's ultra precise CNC machines in Plan-les-Ouates. These CNC machines of the latest custom-made generation have a tolerance of 1 micron on the X and Y axes and 2 micron on the Z axis. Even with such a high degree of precision, it is impossible to have a 100% equal distribution of weight in the individual parts; for a Tourbillon to run accurately, an equal distribution of weight is essential. Frédérique Constant solved this problem by the patented "Smart Screw" system on the outer edge of the Tourbillon cage. At first, the Tourbillon cage is constructed with a slight over-weight opposite the Smart Screw system on the main Cage Wheel. Thereafter, a highly skilled watchmaker is able to balance the weight into the center of the Tourbillon cage by adding or exchanging tiny metal rings under the two screws on the main cage wheel. Typically, 8 hours are required for a watchmaker to adjust the tiny rings and balance the weight perfectly for the entire Tourbillon cage.

### Fast Oscillation

The Frédérique Constant Tourbillon runs at 4 Hertz whereby the balance wheel beats 28'800 times per hour. Hence, in a Frédérique Constant Tourbillon, the balance wheel swings 28,800 times an hour and the gear train moves forward 691,200 times in 24 hours. In four years, this represents over one billion(!) impulses.

Most competing Tourbillons run at 3 Hertz only. The higher 'Beats per Hour' (BpH) enable a higher accuracy of the Tourbillon caliber. The higher oscillation also makes the caliber less susceptible to gyration effects.

### Individually Numbered

Each Tourbillon cage is individually numbered to show the Limited Edition of 188 pieces. The minuscule top plate in the center of the Tourbillon cage is sequentially numbered during production on the Frédérique Constant CNC machine. The number on the cage will match the Limited Edition number on the case, making the combination of calibre and case unique.

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### Technical Specifications:

Reference: FC-980EGF4H9 - Limited Edition 188 pieces

Movement: Automatic, Calibre FC-980. One minute Tourbillon, balance-cock on dial side. Diameter 30.50mm (1 3/4"), 28.800 BpH, 33 jewels, Incabloc anti-shock system, Glucydur balance, Nivarox No. 1 balance spring, power reserve 48 hours, bridges decorated with Côtes de Genève and perlage, finished anglage and rhodiage. 188 components; each movement individually numbered.

Functions: Hours, Minutes, Seconds, Day-Night Indicator

Case: 18K Rose Gold, round shape, three-pieces case, diameter 42mm, thickness 11 mm, antireflective convex sapphire crystal, antireflective sapphire crystal case back, case back secured with 6 screws, water-resistant to 3 atm. Each case individually numbered.

Dial: Genuine Enameled. Fine black Roman numerals, black steel hands, rose gold and blued steel day-night indicator.

Strap: Genuine hand-stitched Alligator leather with water-resistant lining; additional folding buckle included.