

PRECISION ACCORDING TO LAURENT FERRIER

The philosophy of Laurent Ferrier is based on developing exclusive mechanical movements that are assembled and adjusted in their Geneva workshops in complete harmony with watchmaking tradition.



The purpose of this approach is to create the most reliable mechanical timepiece.

Reliability is based on two pillars:

- Flawless operation
- High-precision rating

Precision depends on a number of factors, notably during the conception phase. Nonetheless, the quality of the rating of the regulating organ remains a key element in guaranteeing that the oscillations are as regular as possible.

This extremely delicate stage of rating (also known as timing or adjustment) is performed in the Laurent Ferrier workshops by experienced watchmakers.

HOW IS PRECISION MEASURED?

The ISO-3159 international standards establish a list of criteria and tolerances serving as the basis for certifying precision.

The Swiss Official Chronometer Testing Institute (COSC) is an independent organism which verifies, among other aspects, the precision of (non cased-up) movements by submitting them to a series of tests to match these norms.

The criteria and tolerances are as follows:

Eliminatory criteria		Minimum requirements (s/d)	
		Categories	
		1 (Ø>20mm)	2 (Ø≤20mm)
Mmoy	Average daily rate	-4 +6	-5 +8
Vmoy	Mean variation in rates	2	3.4
Vmax	Greatest variation in rates	5	7
D	Difference between rates in horizontal and vertical positions	-6 +8	-8 +10
P	Largest variation in rates	10	15
C	Thermal variation	±0.6	±0.7
R	Rate resumption	±5	±6

The measurements are conducted on a movement in various positions and at different temperatures.

DAY	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Pos.	6H		3H		9H		FH				CH				6H	
T°C	23	23	23	23	23	23	23	23	23	23	23	8	23	38	23	23
M (s/d)	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13	M14	M15	

Mechanisms in operation

Only movements that have successfully passed the tests according to the precision criteria and tolerances stipulated by the standard are granted an official chronometer certificate.

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Laurent Ferrier has decided to set itself even more ambitious goals than those laid down by the standard in the industry. As a result, it performs tests in its workshops during a two-week period and in six different positions.

- For the LF619.01 (Galet Classic Tourbillon Double Spiral) and LF619.02 (Galet Secret) calibres, Laurent Ferrier allows a maximum variation in rate of three seconds per day.
- For the calibres FBN229.01 (Galet Micro-Rotor) and FBN230.01 (Galet Traveller) calibres, the maximum permissible variation is five seconds per day.

In addition to these in-house tests, Laurent Ferrier has decided to obtain certification for one of the Galet Classic Tourbillon Double Spiral and Galet Micro-Rotor calibres. It appealed to an independent state-operated body: Besançon Observatory, which issues a “Chronometer rating bulletin” for “watch heads” (meaning the cased-up watch without its strap or bracelet, and not just the movement) having successfully passed the tests which also meet the ISO-3159 standards. The results are then compared with the Observatory’s atomic clock.

The Besançon Observatory hallmark has been certifying to the precision and good rating of duly controlled “watch heads” since 1897. The Galet Classic Tourbillon Double Spiral was the most accurate chronometer tested in 2012.



PRECISION AND MECHANICAL WATCHES

All mechanical movements are inherently subject to variations in rate, the goal naturally being to keep these to a minimum.

Time measuring instruments are specific in that they operate without interruption.

It is possible to calculate that a balance oscillating at a frequency of 21,600 vibrations per hour covers a distance of 6.5 km in 24 hours – a genuine performance for a mobile component measuring 8.80 in diameter.

New materials and cutting-edge technologies have led to significant improvements in the reliability and precision of mechanical horology.

THE CASE OF THE DOUBLE DIRECT-IMPULSE ESCAPEMENT FITTED DIRECTLY ON THE BALANCE OR NATURAL ESCAPEMENT (ÉCHAPPEMENT NATUREL)

The *échappement naturel* with its three impulses by direct oscillation on the balance, calls for a correspondingly shaped lever and two escape-wheels.

In terms of materials, Laurent Ferrier has opted for a lever in silicon for its lightness and self-lubricating properties; as well as escape-wheels in a nickel-phosphorous alloy for its extreme hardness.

The precision of the Micro-Rotor models with *échappement naturel* cannot be established using a traditional Witschi test and measurement machine.

STANDARD PRECAUTIONS

Laurent Ferrier models are ready to leave the workshops only after successfully passing the testing phase. External events such as extreme temperatures, strong magnetic fields of overly strong vibrations may lead to variations in rate.

For these reasons, the precision of its models cannot be contractually guaranteed.