

# TENTH POWER

*Zenith's marquee model at the 2010 Baselworld watch fair can measure time to the nearest 1/10 second. WatchTime put this innovative chronograph to the test.*

BY ALEXANDER LINZ

PHOTOS BY NIK SCHÖLZEL





ZENITH  
EL PRIMERO  
1/10 OF A SECOND

*Zenith El Primero Striking 10th*

*All the surfaces of the El Primero chronograph movement are nicely decorated or polished.*



The El Primero caliber from Zenith boasts a feature that other watch movements cannot: its balance wheel oscillates at a rate of 36,000 vph, which means that the second hand advances 10 times per second. This high-frequency balance enables a watch with this movement to make precise measurements to the nearest 1/10 second. Zenith introduced the El Primero way back in 1969, but has never made a watch that fulfilled this potential until now. As Zenith's new CEO Jean-Frédéric Dufour puts it, "If you have a watch movement in your repertoire whose balance oscillates at 36,000 vph, then this feature should be brought to the fore and be a visible feature of the watch."

Zenith introduced the watch that Dufour envisioned, the Zenith El Primero Striking 10th (so named because it beats, or "strikes" 10 times per second), at this year's Baselworld watch fair. Dufour explains the concept behind it: "To ensure the best possible legibility of the 1/10 seconds, the central stopwatch hand of the El Primero caliber makes one complete revolution every 10 seconds. Here, our 4052 B caliber uses a Zenith patent from 2002, in which the central chronograph hand turned once every four seconds. However, because it was difficult to read the elapsed time and the performance of the prototype was insufficient, it was impossible to consider putting it into serial production." Zenith experimented with additional speeds for the central chronograph seconds hand, with six- or 12-second revolutions. Dufour says, "If, for example, we had selected the six-sec-

ond option, the numeral '1' on the inner flange would have had to represent seven seconds after one revolution and 13 after two revolutions. With a rotational period of 12 seconds, the '1' would stand for 13, 25, and so on. Apart from a single revolution in one second — a true 'foudroyante,' but designed as a centralized second — which would have been impractical to create, only the 10-second option remained. That way, the legibility of the 1/10-second divisions on the inner flange could be expanded by a factor of six and still keep the counting logic."

What Dufour means is that previously, Zenith divided the space between two second markers into four additional, smaller graduations resulting in markings for 2/10 of a second. If one also includes the spaces between the marks, this gives a division into 1/10 seconds that is barely visible. The second hand moves in 0.6-degree increments over the track. The hand on the new chronograph display now moves in 3.6-degree increments over the track.

*WORN ON THE WRIST WITH  
THE CHRONOGRAPH NOT  
RUNNING, THE WATCH  
IMPRESSED US WITH ALMOST  
PERFECT RATE RESULTS.*

*The retro design is attractive, but part  
of the 60-second counter at 3 o'clock is  
covered and unreadable.*



## SPECS

### ZENITH EL PRIMERO STRIKING 10TH

**Manufacturer:** Zenith, Rue des Billodes 34, CH-2400 Le Locle, Switzerland

**Reference number:** 03.2040.4052/69.M2040

**Functions:** Hours, minutes, small seconds, date, 1/10-second chronograph with central seconds hand, 60-second and 60-minute counters

**Movement:** Caliber 4052 B, automatic; 36,000 vph; 326 parts including 31 jewels; Swiss lever escapement; Glucydur balance; self-compensating Nivarox I flat hairspring; Kif shock absorption; lift angle = 52°; bi-directional heavy metal rotor; Generale Ressorts barrel with Nivaflex M main-spring; 50+-hour power reserve; diameter = 30 mm; height = 6.6 mm

**Case:** Solid, three-part stainless-steel case with four screws fastening the sapphire caseback; both crystals have nonreflective treatment on both sides; water-resistant to 100 meters

**Bracelet and clasp:** Steel bracelet with double-folding clasp

#### Rate results (deviation in seconds/day):

(Without/with chronograph switched on)

Dial up	-2	-5
Dial down	+1	-2
Crown up	0	-12
Crown down	-1	+2
Crown left	0	-7
Crown right	-1	-1
Greatest deviation:	3	14
Average deviation	-0.5	-4.2
Average amplitude:		
Flat positions	266°	191°
Hanging positions	223°	168°

**Dimensions:** Diameter = 42 mm, height = 12.75 mm, weight 176 g

**Variations:** Limited to 1,969 pieces in stainless steel and 500 pieces in rose gold

**Price:** \$11,800 (\$10,900 with leather strap; \$24,800 for rose gold on strap)

**SCORES****ZENITH EL PRIMERO STRIKING 10TH****Bracelet and clasp (max. 10 points):**

Nicely finished, but the gaps between the links are rather large, leading to pulling of the fine hairs on the wrist. The clasp works well but is somewhat difficult to use. **8**

**Operation (5):** Absence of a hack mechanism makes it more difficult to set the time with precision. The chronograph functions work perfectly and the pusher action is good. **4**

**Case (10):** Excellent finishing on the three-piece steel case. **9**

**Design (15):** This attractive, retro design is based on a model from 1969, but has a modern appeal. **13**

**Legibility (5):** Time, date, and the 1/10 seconds track are easy to read; elapsed time counters are partially covered. **5**

**Wearing comfort (10):** A diameter of 42 mm is a perfect size for this watch. It fits snugly against the wrist, and even with a metal bracelet it is not heavy. **10**

**Movement (20):** Interesting and patented design, based on an updated version of Zenith's well-known El Primero chronograph movement. The decorations are well-executed. **17**

**Rate results (10):** Without the chronograph the rate results are almost perfect. Activating the chronograph causes a significant rate loss in some positions. **8**

**Overall value (15):** The first watch that capitalizes on the strength of the El Primero, namely the precise measurement of 1/10s of a second, it is fairly priced. **13**

**TOTAL: 87 points**

**ZENITH'S DESIGNERS** had a clever idea to ensure that the large chronograph hand always matches up with one of the 100 graduations (the 1/10-second scale on the inner flange) when using the chronograph function. They used a chrono-runner that is not stopped by a conventional brake lever. Instead, the lever has a small indexing beak that fits into the grooves of the wheel and precisely aligns the position of its hand. In numerous starts and stops during our test, the red chronograph hand stopped exactly on one of the 100 graduations every time, a testament to the high level of precision of the components.

The watch's power does not come from the second wheel, as is normally the case, but from the more rapidly turning escape wheel. This in turn drives the chrono-runner and the seconds display, which is located at the 3 o'clock position (and which sweeps rather than jumps in order to conserve energy). The bi-level clutch wheel is made of a single piece of silicon and is three and a half times lighter than a conventional wheel, in order to minimize inertia; a small wheel drives it. The clutch wheel remains continuously engaged, even when the chronograph is not running. Once the command comes from the column wheel to engage, the clutch wheel moves forward, where it meshes with the chrono-runner. The second wheel for the seconds counter (located at 3 o'clock) is directly linked to the chrono-runner, so it begins to move as well. To ensure that there is no hesitation in the horizontally arranged clutch mechanism when the chronograph hand begins to move, the disen-

*CALIBER 4052 B HAS A NEWLY  
DESIGNED BIDIRECTIONAL  
ROTOR THAT IS SKELETONIZED  
TO ACCENT THE ZENITH  
"STAR" LOGO IN THE CENTER.*

**PROS**

- + Interesting technical features
- + Exclusive in-house movement
- + 1/10 seconds are easy to read
- + Attractive design

**CONS**

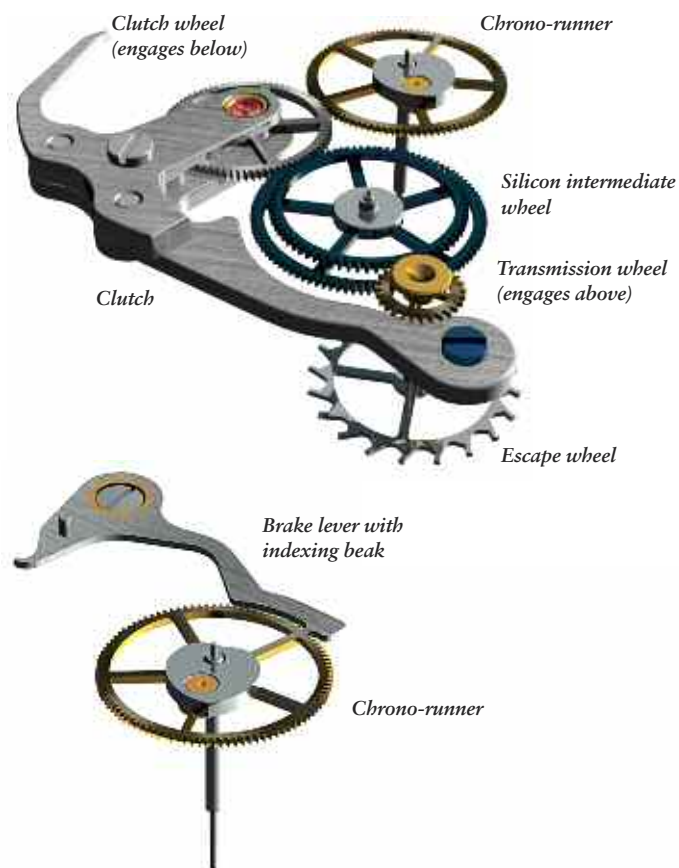
- Double-folding clasp is somewhat difficult to use
- Slower rate when chronograph is running
- 60-minute counter overlaps the 60-second counter



gaging of the brake lever and the friction spring are delayed slightly. When the lever begins to move and the engaging process is started, its friction spring will continue to inhibit the movement of the wheel. Only when there is no more play, and the hand can also move in the opposite direction, will the lever completely release the friction spring. This entire process occurs in the blink of an eye, and at a precisely defined moment, thanks to the column wheel. This means that there is no measurable effect on the amplitude as a result of the momentary increase in friction. What the wearer of the watch sees on the dial is a smooth, immediate startup of the central seconds counter. At the same time, the small 60-second counter at 3 o'clock and the 60-minute counter at 6 o'clock begin to move. The continuous seconds subdial is at 9 o'clock. For aesthetic reasons, and to echo the appearance of the 1969 original El Primero watch as closely as possible, Zenith decided to overlap the subdials on the main dial. (The design is a reverse of the original, on which the subdials at 3 and 9 o'clock partially cover the one at 6 o'clock). Sometimes this complicates the reading of the elapsed time, particularly in the area between 30 and 40 seconds. We would have preferred to see a simpler 60-minute counter that did not impinge on the seconds track. On the other hand, this design provides a clear view of the date display at the 6 o'clock position.

Turn over the three-part, retro-look case and the large sapphire window gives an unobstructed view of the 4052 B caliber.

## KEY ELEMENTS OF THE CHRONOGRAPH MECHANISM



The Zenith "star" logo is found on the chrono seconds hand and on the crown.



TEST  
*Zenith El Primero Striking 10th*

*The metal bracelet is well made, but the clasp presents a bit of a challenge.*



*This original El Primero from 1969 had the two outer counters overlapping the 12-hour counter; in 2010, this is reversed.*

As is typical of Zenith, every surface is nicely decorated or polished and all the edges are beveled. The beautiful movement lures the eye and invites the viewer to discover new details. We particularly appreciated the newly designed bidirectional rotor. It is skeletonized to accent Zenith's "star" logo in the center. Fifty hours of power reserve are provided by a 490-mm Nivaflex M mainspring in a Generale Ressorts barrel, which has an impressive torque of 1,500 mm-g with 7.2 turns. The Swiss lever escapement with Kif shock absorber boasts a Glucydur balance and an automatically compensating Nivarox 1 flat hairspring. The working surfaces of the escapement are coated with a dry lubricant to minimize friction.

**SO MUCH FOR TECHNICAL** details. How did the test watch run? Worn on the wrist with the chronograph not running, the Zenith impressed us with almost perfect rate results — results that were confirmed by the electronic timing machine. When the chronograph was engaged for an extended period of time the watch tended to slow somewhat, both on the wrist and on the timing machine. At such a high rotational speed, this is the result of the inertia of the many different components in the gear train which, despite their light weight and impeccable fine-tuning, affect the amplitude. Generally speaking, this should not be an issue for most people, who do not allow their chronographs to run continuously.

The timing-machine tests required more time and effort than usual. The many secondary sounds caused by the numerous and continuously running wheels interfered with the modern equipment we initially used. We resorted to using an older machine whose microphone was not quite as sensitive, and the "old timer" ended up doing a better job in giving us the results. Zenith uses a laser to measure the rate of the 4052 B caliber in order to save time during the regulating process and also to achieve absolute reliability of the readouts.

The only problem we encountered with the watch's comfort was in the double-folding clasp on the steel bracelet. Releasing it requires moving the push-buttons horizontally without pressing them inwards, a challenge for even the most dexterous fingers. ○