

The balance wheel, a supreme discipline

The part that transforms energy into seconds in a mechanical wristwatch: the balance wheel. Only a few manufacturers worldwide are able to produce it. NOMOS, a manufactory in Glashütte, is one of them.

GLASHÜTTE, MAY 2023. Watch manufacturers who produce their own pinions and wheels are an exception. But what is very unusual and one of the supreme disciplines, even in the world of fine mechanical watches, is when they manufacture their own balance wheels as well—an exceedingly complex procedure. At NOMOS Glashütte, this component is produced in series; one for each watch.

The balance (consisting of the balance wheel, balance staff, plateau and balance spring) is an essential component of the lever escapement—which in turn is responsible for dividing the energy stored by a mainspring in a mechanical watch into the smallest units, ticks and tocks—or semi-oscillations. These in turn become seconds (six semi-oscillations), minutes (360 semi-oscillations) and hours (21,600 semi-oscillations). The escapement thus regulates the flow of energy and, ideally, ensures that the watch runs highly precisely.

To get the balance wheel exactly right, NOMOS Glashütte uses seven different tools in a CNC automatic lathe. The material, called Declafor, is a particularly high-quality brass alloy of copper, nickel and tin. It has exactly those properties that are required for the important movement component—high elasticity and good machinability, while also being non-magnetic and highly resistant to corrosion. The shavings that fall off during the manufacture of the balance wheel are melted down and reused; the alloy is non-toxic and recyclable.

The balance wheel is produced in the lathing shop with the utmost precision. Nevertheless, it is still not possible to achieve an exact mass distribution. Finally, each balance wheel needs to be individually balanced. You might be familiar with this from car tires, where weights are added. In the case of the balance wheel, on the other hand, tiny amounts of material are removed to ensure that it turns perfectly—millionths of a gram. This is done by a high-precision measuring device, the Balance-O-Matic. This robot measures the balance wheel and removes the imbalance through one or more milling operations.

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About NOMOS Glashütte:

NOMOS Glashütte is one of the few owner-operated watch manufacturers in the world, and creates its mechanical timepieces in Glashütte, Germany. Watch models such as the Tangente, Ludwig, Orion, Club or Metro are world-famous—just like the place where they are made. Glashütte is a legally protected designation of origin. Only manufacturers who work according to strict rules in the 175-year-old tradition of the watchmaking town are permitted to use this denomination for their wristwatches. NOMOS Glashütte is the manufacturer that produces the most mechanical watches in Glashütte.