

# Testing Ground



How do you know if the watch you intend to buy is a good timekeeper? Well, you have some assurance if it is a certified 'chronometer'. Until recently, the Swiss COSC system (*Contrôle Officiel Suisse des Chronomètres*) has had a monopoly on the certification of watches to chronometer standard. But in 2003, COSC decided that henceforth it would only test movements made in Switzerland, which left the increasingly buoyant German industry with no way of gaining chronometer certification. Until now, that is. *QP* pays a visit to Wempe's new testing observatory in Glashütte.

**Timothy Treffry**

Wempe, which owns watch and jewellery stores throughout Germany and Austria, with branches in Paris, London, New York, Madrid and even the luxury cruiser *MS Europa*, has recently announced its own line of watches, made in Glashütte, and certified to chronometer standard. This has been achieved by the acquisition and restoration of the old observatory and the establishment of a testing facility administered by the relevant German national, state and regional standards authorities. Here, the finished watch, as it will be sold, is tested.

This is clearly of more relevance to the consumer than the COSC system, which tests uncased movements with just the seconds hand in place and with no functional complications such as a date display that may affect performance in the finished watch. Indeed, the COSC certificate simply means: "Once upon a time, the movement now in this watch, which may have been subsequently stored for some time, even dismantled and reassembled, met the requirements of ISO 3159."



(Left) Wempe's newly refurbished observatory near Glashütte. The German family jeweller bought the 620 m<sup>2</sup> plot holding its ruins from the Saxon town in January 2005. The topping-out ceremony was held in June that year, and the cupola was installed the following month - supplied with two telescopes by Baader Planetarium. One year later, the first German chronometer-testing facility was accredited there by the German Calibration Office (DKD).



(Right) Built between 1906 and 1910 on a plot of land donated by chronometrist Hugo Müller, the Glashütte observatory originally served to provide a time standard that was more accurate than that provided by Berlin's observatory, whose astronomical observations were affected by light pollution and whose Morse-code transmission via Dresden added a time delay.

### Early stargazing

Glashütte has been the centre of German watchmaking since the middle of the 19th century, famous for the production not only of high-quality pocket watches (German and Russian bureaucracies had an almost insatiable demand for official gifts), but also of precision clocks and chronometers (for the burgeoning merchant and naval shipping fleets). It also had one of the world's leading horological schools. But the clock- and chronometer-makers received their time via a shaky Morse-code system from Berlin, via Dresden, with an accuracy of just 1/20th second. The signal may have been sufficiently accurate for railroad and postal workers, but not for watchmakers. Indeed, the deck watches adjusted by the chronometrist Hugo Müller were already more accurate than the time signal from Berlin. Hence, Müller himself, who was also Chairman of the local 'Urania' watchmakers' guild, supplied a plot of land on Dittersdorfer Weg, overlooking Glashütte, for an observatory to be built (astronomy still served as the basis for the exact determination of time). The foundation stone was laid on 27th August 1906 and construction lasted four years.

Equipped with a refracting telescope, a marine chronometer, and a precision pendulum clock that had been donated by the Glashütte industrialist Ludwig Trapp, the observatory provided a time standard for the watchmakers in the Müglitz Valley and an educational facility for the local school. Ships' chronometers could also be tested there, in the town where they had been built, saving Glashütte's watchmakers from having to package and send them to the naval observatory in Hamburg for testing.

It was in 1939 that Wempe first hatched its plan for a precision-timekeeping *reglage* institute, founding the 'Glashütte Observatory' group. However, the dawn of World War Two put this scheme on

hold for more than six decades. By the end of the war, the observatory's prime function as a time standard was ceased, when the Allies regarded precision horology as a strategic industry the Germans shouldn't enjoy. The watch industry was degraded, Urania was dissolved and the marine chronometer works were moved to Moscow. From 1960, the observatory continued to operate as a public educational facility in the GDR, but faded away to dereliction in the 1980s.

### DIN 8319

As we all know though, watchmaking in Glashütte has blossomed since the German reunification in 1989, with Glashütte Original, A Lange & Söhne and Mühle, as well as Nomos and now Wempe all making watches in the town. Wempe bought the derelict Observatory at the beginning of last year and has recently completed its €1.5m renovation - virtually a complete rebuild. Appropriate telescopes have even been provided, so that it is once more an educational resource (of course, local observatories are no longer needed to establish a time standard). Of more interest to *QP* though is that the building, now housing new company Wempe Sternwarte Glashütte i/SA, has been extended to accommodate the assembly of the new Wempe watches, and, most importantly, their testing. In collaboration with the offices of weights and measures in Thuringia and Saxony (LMET and SLME), a testing facility satisfying the German industrial standard DIN has been established at the observatory - accredited by the German Calibration Office (DKD). This facility received its official accreditation from the Calibration Office of Germany's national metrology institute (Physikalisch-Technische Bundesanstalt) on 14th July. Although Wempe provides the premises, the equipment and personnel for the chronometer testing are subject to the LMET.



At present, all of Wempe's watches in the new Zeitmeister and Chronometerwerke ranges (the latter made by Wempe and Nomos, who are associated) are being certified in the new facility, as well as some Zeppelin and Junkers models from the German Point-Tec group. It might be worth mentioning at this point that there is something of an identity crisis in German watchmaking at the moment. Chronoswiss (based in Munich) regards its watches as Swiss. As of last year, Mühle, which also uses Swiss movements, had them certified by COSC. Wempe, which uses Swiss movements in its Zeitmeister watches, maintains that the value added in Glashütte exceeds 50%, making them German (not to mention the Chronometerwerke movements, which are virtually 100% Glashütte *manufacture*). Both Lange and Glashütte Original, whose movements, like those of Nomos, are completely made in Glashütte, are watching developments but currently have no plans to seek local certification of their watches.

In the new facility at Glashütte, complete watches are tested on three Witschi machines in three temperature-controlled cabinets (including one for quartz watches). Currently, each machine holds 20 watches, but larger models that will take 50 watches are being developed. The watches must satisfy DIN 8319 - the German equivalent of the ISO 3159 standard used by COSC. Just like COSC, the test takes 15 days to complete and is done with the watch in different orientations ('five positions') and at three temperatures. The rate is checked at each stage of the test and any variation must fall within specified limits.



(Top) Launched this year, Wempe's new Chronometerwerke watches are made entirely in-house by Nomos and all certified at the new observatory. From left: Steel chronometer (£2,750), platinum tourbillon limited to 25 pieces worldwide (£54,850), and yellow-gold chronometer (£5,150).

(Above) Nomos' impressively finished movement for Wempe Chronometerwerke's new chronometer is visible through the caseback. The three-quarter baseplate and engraved balance cock are typical of Saxon watchmaking.

It is not envisaged that the Glashütte system will ever be able to handle more than a few thousand watches a year (charged at €110 per non-Wempe watch). COSC, on the other hand, certified 1.2 million watch movements last year (more than half of them from Rolex). That works out at 50,000 in each 15-day batch - a mind-boggling capacity. Remember, 'certification' refers to the individual movement, not a random selection from a batch series - the basis of the obligatory Swiss Chronofiable test, which as a destructive test necessarily involves a small proportion of the watches seeking certification.

### Raising standards

We are told each year that the UK public examinations for school children must be getting easier as students do better each year. For chronometer testing the standards certainly remain the same, so perhaps watches that pass the test are getting easier to make. It can be argued that there should be a more demanding test than those at COSC and Wempe Sternwarte to establish real merit - especially at the highest end of watchmaking. And this is exactly what the Fleurier Quality Foundation (FQF) has done.



The FQF was founded in 2001 by Chopard, Parmigiani, Vaucher Manufacture and Bovet to develop an Haute Horlogerie Quality Certification (HHQC) that would allow the market and the final customer to have a better definition of quality watchmaking. On top of its three basic requirements (Chronofiable and COSC certifications, with an exclusive aesthetic quality of finish similar to those bearing the Geneva Seal), its extraordinary 'Fleuritest' provides the most novel feature of the HHQC. The Foundation has developed a special machine, currently housed in Fleurier's town hall, which subjects a complete watch to a 24-hour temperature and physical activity cycle likely to be met on the wrist - including teethbrushing and getting dressed, no less! To pass the test, the watch must have gained no more than 5 seconds, with any loss unacceptable - a requirement twice as tight as the COSC test, which allows a daily rate variation from -4 to +6 seconds a day (although, because the tests are carried out in a different way, they are not strictly comparable).

Of the three watch certification schemes, COSC is the most widely known test but is limited to isolated



(Left) One of the Witschi watch testing machines, inside its temperature-controlled cabinet, testing Wempe Zeitmeister chronographs. Unlike at COSC, Wempe Sternwarte tests the accuracy of the complete watches, rather than the bare movements. Dr Olaf Kühn of the offices of weights and measures in Thuringia (LMET) is the appointed Director of Wempe's chronometer testing facility. (Right) One of the three 'Fleuritest' machines at the municipality of Fleurier's town hall - the fourth and most unique part of the Fondation Qualité Fleurier certification. One watch is enclosed in each of the three grey boxes and the unit pivots on two axes to mimic the everyday movements of a wrist - traced from the video of an actor, visible here on the VDU screen.

Here the finished watch is tested. This is clearly of more relevance to the consumer than the COSC system, which tests uncased movements with just the seconds hand in place and with no complications that may affect performance.

movements of Swiss origin. The new German test introduced by Wempe applies to complete watches movements and is therefore more relevant. However, neither test is particularly demanding. The HHQC is certainly a significant addition to the COSC and appears to be more challenging in terms of timekeeping, but winning or losing in a single 24-hour test could have a strong element of luck. The annual SFr.10,000 subscription to FQF, a per-watch fee of SFr.45 and an annual capacity of just 2,000 watches obviously means, however, that many brands will continue to turn to COSC, and hopefully Wempe's new observatory. Having just received a third Fleuritest machine, and with another prestigious brand joining at the start of 2007 (with two others in pre-application phase), FQF could soon be an important standard though. ○



(Right and opposite page) Despite containing Swiss movements, Wempe's new Zeitmeister watches are sufficiently 'German' to be certified at the Glashütte observatory. This chronograph (£1,375), containing a Valjoux 7753, features a caseback engraving of the new observatory.

ISO 3159 and DIN 8319 test procedure															
Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Position															
T °C	23	23	23	23	23	23	23	23	23	23	8	23	38	23	23

(Above) Like at COSC, watches are tested at Wempe Sternwarte for two days in each of five positions at 23°C: dial up, dial down, and the edge positions: crown left, up and down (crown right is not tested). Testing continues for one more day 'dial up' at 8°C, another day in the same position at 23°C, then at 38°C and back to 23° for two days, then another two days 'crown left'. The testing of each watch takes 15 days. The watches are wound every 24 hours.

Minimum requirements of DIN 8319 (s/d)		
	Movement class	
Eliminatory criteria	1 (Ø>20 mm)	2 (Ø≤20 mm)
Average daily rate	-4 +6	-5 +8
Mean variation in rates	≤2	≤2
Greatest variation in rates	≤5	≤7
Difference between rates in horizontal and vertical positions	-6 +8	-8 +10
Largest variations in rate	≤10	≤15
Thermal variation	±0.6	±0.7
Rate resumption	±5	±6

(Above) Like ISO 3159, the minimum requirements for DIN 8319 certification are split into two classes, for movements with diameters of over and under 20 mm respectively. Unlike the DIN standard, the mean variation in rates for the latter class is less than or equal to 3.4 s/d with ISO 3159. This is the only difference between the minimum requirements of each test.

Further information: [www.cosc.ch](http://www.cosc.ch), [www.fqf.ch](http://www.fqf.ch), [www.wempe-sternwarte.de](http://www.wempe-sternwarte.de)