

Sinn

SPEZIALUHREN ZU FRANKFURT AM MAIN

PILOT WATCHES

FOR PROFESSIONAL APPLICATIONS



DIN 8330 IS THE NEW STANDARD FOR PILOT WATCHES.

German DIN standards command a high level of respect both nationally and internationally, and represent the very highest level of quality. The new standard DIN 8330 Horology – Aviator watches, which came into force in March 2016, sets a new benchmark for safe, functional and reliable pilot watches. Watches certified in accordance with DIN 8330 are designed to fully assume the functions of the instruments for time measurement in aircraft and helicopters in the event of outages or suspected failures. This means that pilot watches must meet certain requirements in terms of **functionality and reliability, resistance to external stresses, safety and compatibility.**



103 Ti UTC IFR in a centrifuge to test G-force load. It is being tested with a load of six Gs.



Differential pressure testing in a vacuum desiccator: a DIN 8330-certified pilot watch like the **857 UTC VFR** has to be able to withstand several-thousandfold alternating pressure loads.

As a long-established manufacturer of pilot watches, Sinn Spezialuhren took the initiative and played a key role in promoting the development of a recognised DIN standard – the first new German watch standard in decades. It all started with the TESTAF technical standard for pilot watches developed by SINN in collaboration with the Department of Aerospace Technology at Aachen University of Applied Sciences which was presented to the public in 2012. Building on this standard – again on the initiative of SINN, and with the broad participation of the German watchmaking industry – the DIN 8330 Horology - Aviator watches was developed over a period of several years by users, testing institutes and scientists, and introduced in March 2016. Sinn Spezialuhren, Stowa, Glashütte Original, Aachen University of Applied Sciences, Lufthansa Cargo, Airbus Helicopters (formerly Eurocopter), DNV GL (formerly Germanischer Lloyd) and others were all involved in developing DIN 8330.

DIN 8330 defines what a pilot watch must be able to do and which stresses it must be able to withstand. This includes fast, clear readability of the dial both during the day and at night, the ability to operate the watch even while wearing pilot gloves and accuracy not only at room temperature but also at ranges of between -15°C and 55°C .

The DIN tests to determine physical resilience include not only a simple low-pressure test, but also a several-thousandfold pressure change cycle which simulates the stresses on the watch caused by changes in pressure during take-off and



Test facility for testing shock and impact resistance. The **103 Ti IFR** is being tested here.

landing of an aircraft in daily long-haul operation. Resistance to liquids typically found in aircraft (fuel, lubricants, cleaning fluid and de-icing fluid) not only guarantees safety during flight operations but also provides additional protection on the ground. A DIN-certified pilot watch must also be able to withstand clearly defined vibrations, impact and centrifugal force loads, temperature changes and, not least, magnetic fields. The complete watch must prove that it meets the requirements even when placed under these various physical stresses.

The safety features of a DIN-compliant pilot watch include a particularly secure strap fastening and the required compatibility

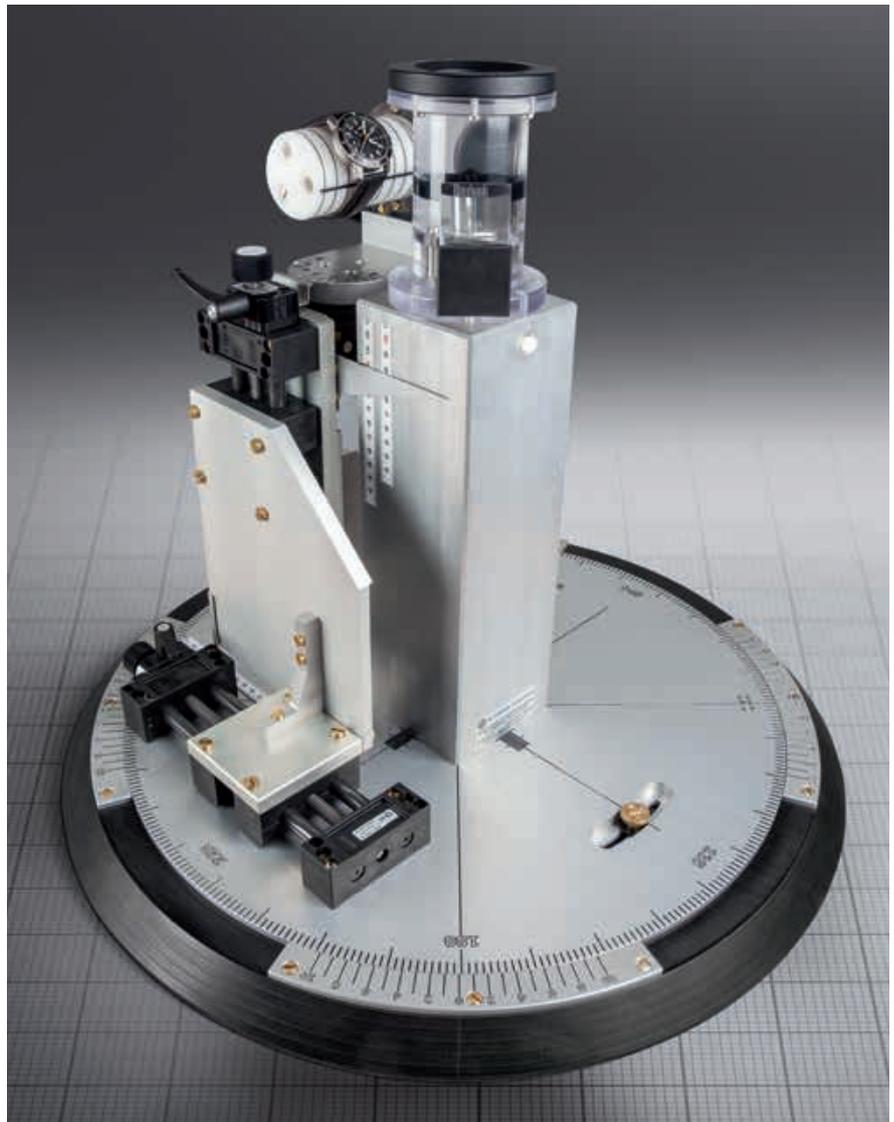
with night vision equipment. Light reflections that could distract or dazzle the pilot are minimised, and the possibility of any interference with the plane's avionics and emergency compass is eliminated as far as possible through tests at a specially developed test facility. All this means that watches certified in accordance with DIN 8330 not only ensure better safety in the air but also increased suitability for everyday use, going far beyond the shock-resistant and waterproof characteristics of standard watches.

Until now, there have not been any comparable regulations to define the requirements for wristwatches when it comes to meeting the relevant aeronautical specifications with a similar durability to comparable on-board instruments. The aim of DIN 8330 is for watches that conform to this standard to be recognised by regulatory authorities, manufacturers and aircraft operators as a replacement for malfunctioning on-board instruments. This would ensure objectively better safety in the air.

The TESTAF and DIN 8330 standards take the uncompromisingly high demands placed on aircraft and helicopter equipment and apply these to wristwatches.



Test facility for testing the safe fastening of the strap system.



The magnetic signature of a pilot watch certified according to DIN 8330 must not significantly divert the approved magnetic compasses in the aircraft through its physical proximity. The magnetic signature of a pilot watch is identified using a special test stand. First the test watch, in this case our **103 Ti IFR**, is demagnetised and then exposed to a homogeneous magnetic field of defined field strength. In the second stage of the test, the magnetic signature of the test watch is analysed using the test stand apparatus pictured.

Building on TESTAF, the DIN standard widens the pool of certifiable watches (mechanical watches are now eligible as well as quartz watches) and features more stringent test criteria for readability, vibration stresses and resistance to liquids commonly found in aircraft, among other things. The DIN standard also features a new requirement for pilot watches to be compatible with night vision equipment.

Thanks to the DIN 8330 standard, we hope that pilot watches will once again be defined as watches offering special functional and technical features. The special quality standards that apply to a DIN 8330-certified pilot watch can be seen at every stage of its manufacture, from the selection of high-quality materials to production processes where special care is always taken and ultra-narrow tolerances apply. The goal is achieved in an extensive, complex type-and-unit verification procedure and a certification process carried out by a neutral institution in accordance with DIN/ISO 17065 and 17067. Only then can the watch be furnished with the well-known DIN certification mark.

With its support for the TESTAF and DIN 8330 initiatives, Sinn Spezialuhren underlined its aspiration to create functional, high-quality and high-tech watches. For the technologically sophisticated German watchmaking industry, the new standard for pilot watches provides major impetus to maintain and expand its leading role in this segment among the international competition.

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Inductor apparatus for test with cockpit-specific magnetic fields. Magnetic fields must not significantly influence the accuracy of professional pilot watches.