GRÖNEFELD

EXCLUSIVE TIMEPIECES

Tim and Bart Grönefeld
present the “One Hertz Titanium” collection

The One Hertz Fire

The One Hertz Ice

The One Hertz Classic

The One Hertz Ruthenium

Four titanium cases, four stunning designs: The flame-orange dial of **One Hertz Fire;** dashing cool white of **One Hertz Ice**; and two stylishly traditional **One Hertz Classic** and **One Hertz Ruthenium.**

Watchmakers Tim and Bart Grönefeld are proud to present the “One Hertz Titanium” collection, comprising three remarkable models: One Hertz Fire, One Hertz Ice, One Hertz Classic and One Hertz Ruthenium.

Each one features Grönefeld’s own ground-breaking 285-component, independent-dead-seconds movement – where the second hand advances in full steps – housed inside a high-tech, polished, grade 5 titanium case.

Images of the One Hertz Titanium Collection are available to download at www.gronefeld.nl/gallery

One Hertz Fire

With the One Hertz Fire, the One Hertz dial has been radiantly reinterpreted in a more casual/muscular layout, with flame-coloured touches that contrast against the dark grey background and blackened hand.

The hour and minute subdial at 2 o'clock features an electrifying orange crosshair and number 12 and bright white chapter ring. The raised seconds sapphire subdial – transparent over the hour and minute subdial – features metallised indices on a resplendent orange background, with a striking inner ensemble of white circles and arcs.

In a scorching shade of orange, the power reserve indicator at 11 o'clock – now outside of the large seconds – and the setting-winding indicator at 3 o'clock look like two leaping sparks. The stark orange-on-black Grönefeld logo at 5 o'clock neatly complements
the orange stitching on the hand-sewn matte black strap.

The One Hertz Fire

One Hertz Ice

One Hertz Ice sees the One Hertz dial dazzlingly reinterpreted in more casual/muscular layout with ice white and smooth silvery touches that show up superbly against the dark grey background and gold-toned hands.

The hour and minute subdial at 2 o'clock now features a white crosshair and number 12 together with a silver-toned chapter ring. The raised seconds sapphire subdial features metallised indices here on a pearly white background, with a striking silver inner ensemble of circles and arcs.

The power reserve indicator at 11 o'clock – outside of the large seconds – and the setting-winding indicator at 3 o'clock are in fresh white. The dial is framed by a clean, white outer ring that merges into the grey-on-white Grönefeld logo at 5 o'clock. >>

The One Hertz Ice

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One Hertz Classic

The One Hertz Classic indicates hours and minutes on a sub-dial at 2 o'clock and has a large subdial for the dead seconds at 7 o'clock; the innovative setting-winding indicator at 3 o'clock is counter-balanced by the power reserve indicator, placed at 12 o'clock on the hour-minute sub-dial – the classic One Hertz position for this complication.

The ensemble of indicators is all the more striking thanks to the stylish, circular micro-guilloche beneath.

The One Hertz Classic

One Hertz Ruthenium

The One Hertz Ruthenium indicates hours and minutes on a sub-dial at 2 o'clock and has a large subdial for the dead seconds at 7 o'clock; the innovative setting-winding indicator at 3 o'clock is counter-balanced by the power reserve indicator, placed at 12 o'clock on the hour-minute sub-dial – the classic One Hertz position for this complication.
The ensemble of indicators on its almost black ruthenium dial is very stylish and sophisticated. The One Hertz Ruthenium in a polished and brushed titanium case is a perfect combination for a beautiful and comfortable to wear dress watch. >>

The One Hertz Ruthenium

The "One Hertz Titanium" collection comprising One Hertz Fire, One Hertz Ice, One Hertz Classic and Onze Hertz Ruthenium is available in four limited editions of 30 pieces each.

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The reinvention of mechanical dead seconds

The distinctive stepping movement of the large second hand of the One Hertz subtly signals its unique mechanism – invisible to most, but obvious to haute horlogerie connoisseurs, who will appreciate the sublime, flawless fine-finishing of the Grönefelds' in-house calibre G-02.

Now rare, the dead seconds complication – *secondes mortes* in French –traditionally denoted precision clocks, in a era where most clock were not accurate enough to measure seconds.

With the One Hertz Titanium collection and the unique secondary gear train that independently powers the One Hertz's dead seconds, Tim and Bart Grönefeld have resurrected this highly respected complication and returned it to where it once was: On the pedestal of high precision.

History of Dead Seconds

With the introduction of the pendulum in the 17th century, clocks finally became accurate enough to measure seconds. It was then not long before a hand indicating seconds on a long clock's dial signified a precision timepiece. A pendulum with a period – the time to swing forward and back – of two seconds (the most common) resulted in a single tick per second.

The invention of the balance spring, which replaced the pendulum, enabled miniaturization. As portable pocket watches became more accurate, watchmakers naturally thought to copy the one-second steps of the second hand which signified a precision timepiece; however, the rapidly oscillating balance meant that it could not be directly driven as with the pendulum, so it required either a new mechanism if independent, or be driven from another complication e.g. constant force device. While pocket watches have featured independent dead seconds in the past, the Grönefeld One Hertz was the first wristwatch featuring independent dead seconds.

The Grönefeld One Hertz is unique among wristwatches in that its dead seconds are powered by a secondary gear train independent of the gear train for the hour and minute indications.

One Hertz

The hertz (symbol: Hz) is the SI unit of frequency defined as the number of cycles per second of a periodic phenomenon. This SI unit is named after Heinrich Hertz. One Hertz simply means "one cycle per second".

The second (SI symbol: s), sometimes abbreviated sec., is the name of a unit of time, and is the international base unit of time. To highlight the SI seconds, the One Hertz displays dead seconds with a large seconds hand in its own dial. Hours and minutes are non-SI units of time because they do not use the decimal system so are displayed separately.

Mechanical wristwatch movements often have balance frequencies of 2.5 to 5 hertz, which results in the seconds hand making tiny steps of 5 to 10 steps each second and looking like a smooth movement. The second hand of the One Hertz is either stationary (dead) or jumping in a full one-second increment each second. >>

The “One Hertz” independent dead seconds complication

Displaying dead seconds in a wristwatch without a constant force device is no easy task. The friction of the mechanism has to be absolutely minimal so it does not interfere with the escapement.

Tim and Bart Grönefeld used an independent dead seconds mechanism that is driven from its own secondary gear train with its own power supply. The seconds are driven from one main-spring barrel and the hours and minutes from another. Friction is with this system guaranteed to an absolute minimum and the complication has no adverse influence on the escapement and free sprung balance.

The two mainspring barrels are wound simultaneously from the crown, which features an innovative “push to set”, “push to wind function”, with the mode selected indicated on the dial at 3 o’clock. A power reserve indicator at the top of the dead seconds dial keeps track of the 72 hours of autonomy. >>

Technical Specifications for the One Hertz Titanium collection

The “One Hertz Titanium” collection is available in four limited editions of 30 pieces each: The One Hertz Fire, the One Hertz Ice, One Hertz Classic and the One Hertz Ruthenium.

Features

One Hertz Fire and One Hertz Ice Indications:
Hours and minutes in subdial at 2 o’clock, large seconds at 7 o’clock, power reserve at 11 o’clock, setting-winding indicator at 3 o’clock.

One Hertz Classic Indications:
Hours and minutes in subdial at 2 o’clock, large seconds at 7 o’clock, power reserve within large seconds, setting-winding indicator at 3 o’clock.

Winding-Setting mechanism:
Push function crown for winding or setting.
Power reserve mechanism:
Classic Breguet style by means of a cone moving up and down on the threaded barrel arbour.

Case and dial

Case crafted in grade 5 polished titanium made of 68 components, security screws, polished bezel and centre band with hand-finished straight graining.

Case dimensions:	43mm x 12.5mm
Engraving:	“Titanium” and “Limited 30 pieces” and serial number
Sapphire crystals:	Top domed with antireflective treatment both sides, display back with antireflective treatment inside.
Water resistance:	3atm/30m/100 feet.
Crown:	Titanium with engraved “G” logo

One Hertz Fire Dial
Hour and minutes subdial with orange crosshair and number 12; raised seconds sapphire subdial (transparent over the hour and minute subdial) featuring metallised indexes with orange background; orange power reserve indicator; orange setting-winding indicator; Grönefeld logo and model name in orange on individual screwed down nameplates

One Hertz Ice Dial
Hour and minutes subdial with white crosshair and number 12; raised seconds sapphire subdial (transparent over the hour and minute subdial) featuring metallised indexes with white background; white power reserve indicator; white setting-winding indicator; Grönefeld logo and model name in white on individual screwed down nameplates

One Hertz Classic Dial
Silvered base dial. Classic One Hertz Hour and minutes subdial; Classic One Hertz raised seconds sapphire subdial (transparent over the hour and minute subdial), Classic One Hertz power reserve indicator; Classic One Hertz setting-winding indicator, Grönefeld logo and model name on individual screwed down nameplates. >>

One Hertz Ruthenium Dial
Dark ruthenium base dial. Classic One Hertz Hour and minutes subdial; Classic One Hertz raised seconds sapphire subdial (transparent over the hour and minute subdial), Classic One Hertz power reserve indicator; Classic One Hertz setting-winding indicator, Grönefeld logo and model name on individual screwed down nameplates.

Hands
Hours and minutes, long thin counter-poised seconds, power-reserve and setting-winding.

One Hertz Fire strap and buckle
Hand-sewn matte black, orange stitching, alligator leather with steel buckle engraved with Grönefeld logo

One Hertz Ice strap and buckle
Hand-sewn matte brown, alligator leather with steel buckle engraved with Grönefeld logo

One Hertz Classic strap and buckle
Hand-sewn matte black, alligator leather with steel buckle engraved with Grönefeld logo

One Hertz Ruthenium strap and buckle
Hand-sewn matte black, alligator leather with steel buckle engraved with Grönefeld logo

Calibre
G-02, mechanical hand winding, independent dead seconds, power reserve Indicator and setting indicator.

Movement dimensions:	15 1/4‘‘‘ 34mm x 9,5mm
No. of jewels:	39 jewels set in gold chatons
Power reserve:	72 hours
Barrels:	2 barrels, one for the going gear train and one for the independent dead seconds mechanism. Both barrels are wound at the same speed and in the same direction
Balance wheel:	9.12 mm free sprung variable inertia balance wheel, gold excenters
Balance frequency:	21’600 bph/ 3 Hz
Balance spring:	Phillips terminal overcoil curve, triangle-style stud
Main Plate:	Spotted rhodium plated nickel silver
Bridges:	Stainless steel hand bevelled, micro-blasted, circular grain on the top, relief engraved on micro blasted surface
Gearing:	2 independent gear trains each with their own energy source
Dead seconds mechanism:	Independent mechanism, cam with 30 teeth on the going gear train on the second’s wheel, escape wheel on the seconds wheel of the independent gear train, double lever with jewelled pallets.

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Biography: Tim and Bart Grönefeld

The name Grönefeld and the art of watchmaking have a family history spanning a hundred years, originating in the ancient town of Oldenzaal in the Netherlands. There, in a shop facing the ancient basilica church from 1240, Johan Grönefeld, Tim and Bart's grandfather, began his career as a watchmaker in 1912, marking the beginning of the highly talented dynasty of Grönefeld watchmakers that continues today.

Tim and Bart's workshop is located in Johan Grönefeld's original building as, representing a continuous, unbroken watchmaking family history that is exceptionally rare to find anywhere in the world today.

Tim and Bart underwent extensive training in Switzerland, and within a relatively short span of time proved themselves adept world specialists in the production of the most coveted and exquisite horological complications of all: the tourbillon and the minute repeater wristwatch. In 2008, after working anonymously behind the scenes for prestigious Swiss brands, they presented the first watch bearing their own name, the GTM-06 Tourbillon Minute Repeater.

In June 2010 Tim and Bart presented their second watch, the One Hertz, the world's first wristwatch with independent dead seconds and featuring a completely new movement. The One Hertz Platinum, with exclusive platinum case and sophisticated blue dial, was unveiled at Baselworld 2012. 2012 also saw the launch of the One Hertz Titanium collection comprising One Hertz Fire, One Hertz Ice, One Hertz Classic and One Hertz Ruthenium.

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