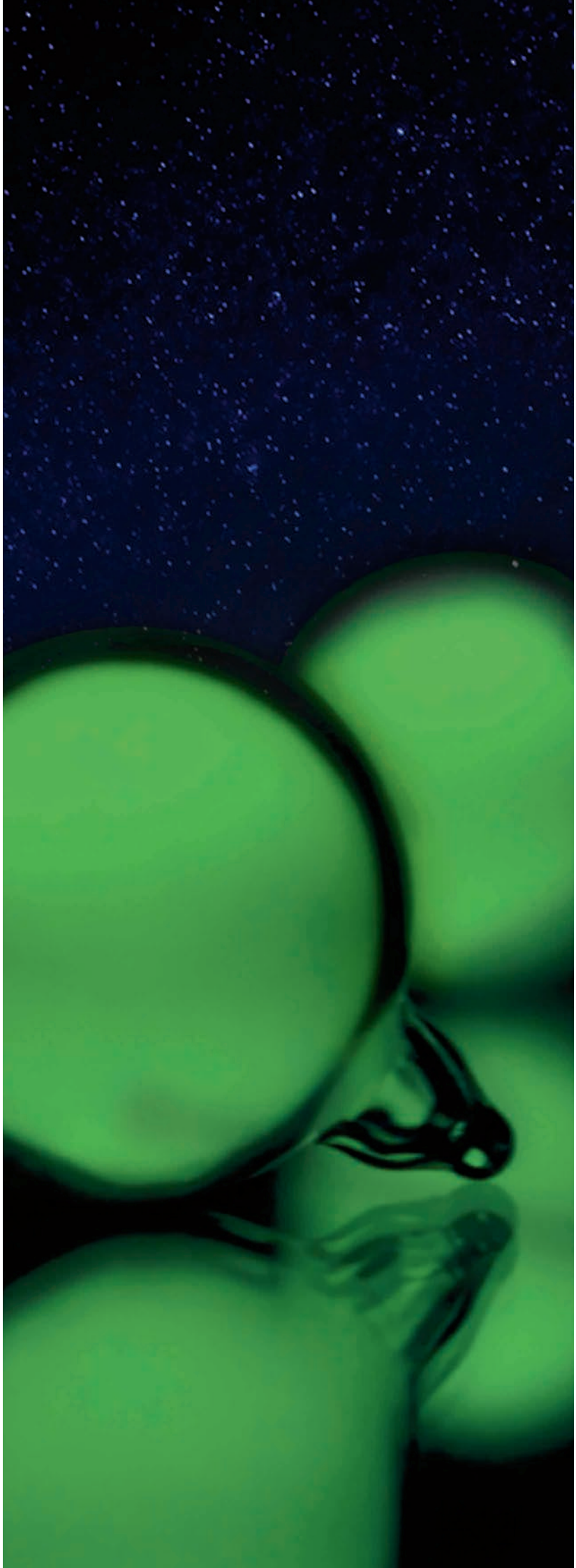
trigalight®
self-powered illumination

TRADE CATALOGUE



trigalight®
self-powered illumination

THE PROFESSIONALS' **FIRST CHOICE**

"Since the beginning of time, light has fascinated mankind. Humans have always endeavoured to create light themselves. Passion and curiosity are also the driving forces of mb-microtec with its trigalight brand. The curiosity to discover further applications and new markets. The curiosity to find solutions for customers' needs. The passion to bring light into our customers' products. The beauty of microsystems and the enthusiasm to effect a clever interaction of elements, mechanics, chemistry and physics to develop and build unique products – this is what drives us forward. We are looking forward to a bright future and many more successful years in an exciting partnership."

Roger Siegenthaler, CEO

THE BRAND – **THE ORIGINAL**

The success story began in 1969 with the production of a self-powered illumination light source called trigalight. This led to the foundation of mb-microtec ag. With successful marketing of the product, the company made a breakthrough into a new era of microtechnology.

trigalight is a brand owned by the Swiss microtechnology company mb-microtec ag, based in Niederwangen near Bern. mb-microtec ag is the inventor and global market leader in the development, manufacture and production of this unique self-powered illumination technology. The technology is primarily used in the tactical, watch, security, automotive, aerospace and aeronautical industries.

Around one hundred qualified employees work for the parent company and the trigalight brand. The company has extensive know-how and a state-of-the-art infrastructure, where the entire development and production takes place. The products meet the highest quality standards. Up to 90% of the goods produced are exported.


mb-microtec
traser
trigalight

WHAT IS **trigalight?**

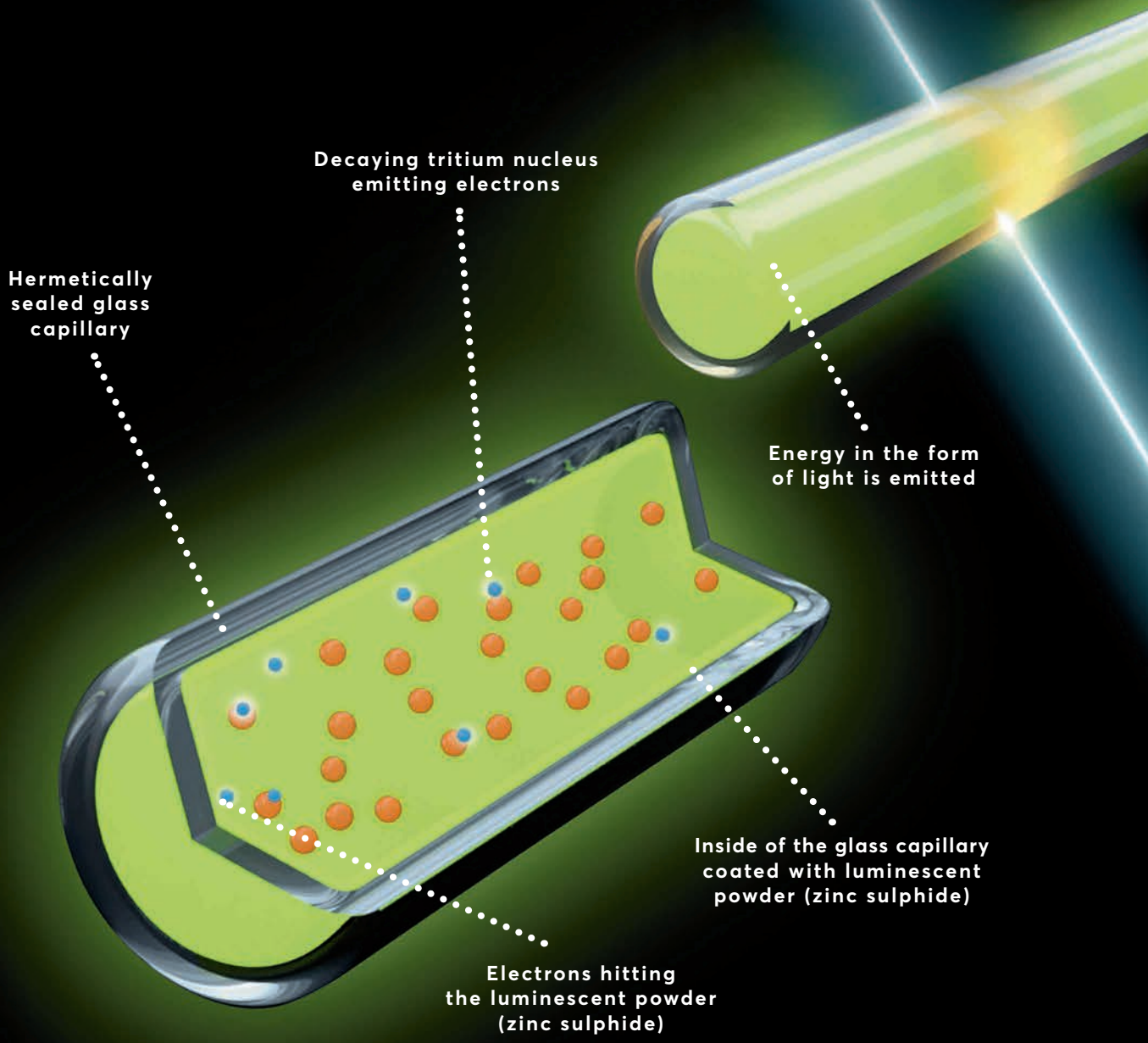
trigalight is a unique self-powered illumination technology with the world's smallest gaseous tritium light sources (GTLS) that delivers constant luminescence for decades without any external energy source.

A trigalight consists of a glass capillary, the inside of which is coated with a luminescent powder (zinc sulphide) and filled with tritium gas. The glass capillaries are available in different colours, shapes and sizes. Their smallest possible outer diameter is currently 0.30 mm, so-called hairlights.

With trigalight mb-microtec ag offers a maintenance-free, very compact system with a minimal installation size, which stands for safety and efficiency.

trigalight works similar to a cathode ray tube, which was once used in television screens. The luminescent coating (zinc sulphide) on the inside of the glass capillaries has the ability to transform the kinetic energy of the electrons into light. The energy is generated by the added tritium gas. The tritium nucleus slowly decays, emitting electrons in the process. When the electrons hit the coating, energy in the form of light is emitted. The colour variations of trigalight depend on the diversity of coatings. The luminescence of the light sources is proportional to the filling pressure (quantity of gas).

- SWISS MADE
- REQUIRES NO EXTERNAL ENERGY SOURCE
- DELIVERS CONSTANT LUMINESCENCE FOR DECADES
- MAINTENANCE-FREE
- 10 YEARS' LIGHT GUARANTEE



PRODUCTION **PROCESS**

Various machines required for the production process are developed in-house by mb-microtec ag.

STEP 1
PRODUCTION OF GLASS CAPILLARIES

Large glass tubes are heated and dawn into thin glass capillaries of the desired dimension. The smallest possible outer diameter is 0.30 mm and is equivalent to approximately five times the thickness of a human hair.

STEP 2
COATING PROCESS

The inside of the glass capillary is coated with a luminescent powder (zinc sulphide). Any colour is possible. The colour green is most often used, as it is the brightest colour perceived by the human eye.

STEP 3
TRITIUM FILLING

The glass capillaries are filled with tritium gas in a process developed by mb-microtec.

STEP 4
LASER CUTTING PROCESS

The glass capillaries filled with tritium gas are cut to the desired length and at the same time hermetically sealed by a highly automated laser melting machine.

STEP 5
QUALITY CONTROL

Each individual light source is subjected to a strict quality and leak test.

STEP 6
APPLICATIONS

Depending on the application, the light sources are installed in aluminium or polymer sleeves with sapphire glass or fitted directly onto dials. Our trigalight products are mainly used in the tactical, watch, security, automotive, aerospace and aeronautical industries.


T1000

PRODUCTS

trigalight

TURNS YOUR WATCH INTO A 24 HOUR TIMEPIECE!

Looking for a reliable companion that guarantees perfect and constant readability of the time even in complete darkness or poor visibility? The hands, indices and bezel of your watch glow thanks to the in-house–developed trigalight self-powered illumination technology, which provides constant luminescence for decades without an external energy source.

We use some of our smallest types of trigalight, so-called watch lights, for watches. They are available in various colours, shapes and sizes for hands, hour indices and bezels.

Our hairlights with an outer diameter of only 0.30 mm, which is approximately five times the thickness of a human hair, are the world's smallest gaseous tritium light sources (GTLS).

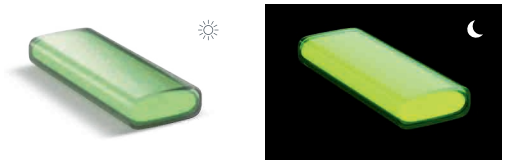
One of our core competences is the assembly of watch components such as hands, hour indices and bezels. Depending on the quantity and shape of the watch components, both manual and robot assembly are possible.

- IN-HOUSE–DEVELOPED SELF-POWERED ILLUMINATION TECHNOLOGY
- SMALLEST TRITIUM GASEOUS LIGHT SOURCE
- DELIVERS CONSTANT LUMINESCENCE FOR DECADES
- TEMPERATURE-RESISTANT
- MAINTENANCE-FREE
- SELECTION OF DIFFERENT COLOURS, SHAPES AND SIZES

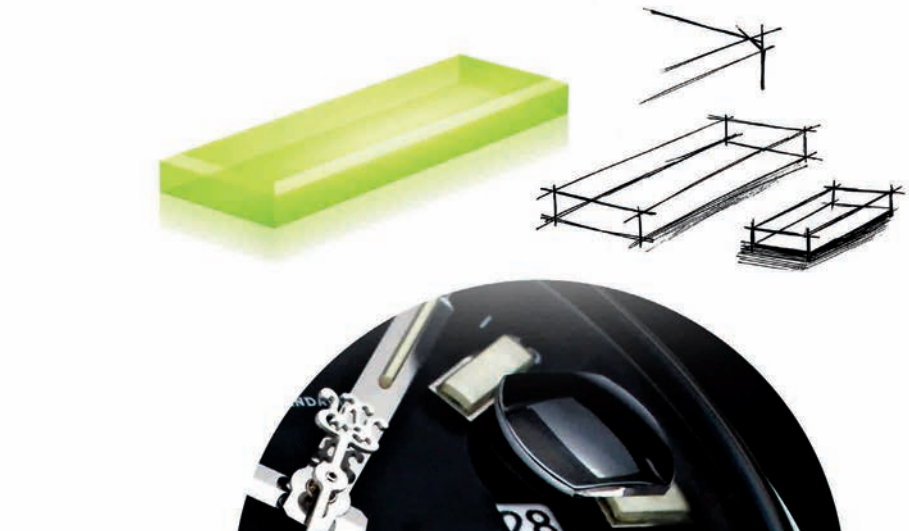
We produce customer- and application-specific watch components. Below you will find a selection of our most common colours, shapes and sizes. If this selection does not cover your application needs, we will be pleased to develop an individual solution for you.

TYPE	SHAPE	COLOURS	Ø MM	LENGTH MM
HAIRLIGHTS	ROUND	GREEN, YELLOW, ICE BLUE	0.30	2.50 3.00 4.00 5.00 6.00

SHAPE	COLOURS	Ø MM	LENGTH MM
ROUND	GREEN, YELLOW, ORANGE, RED, PINK, BLUE, ICE BLUE, WHITE	0.50 0.65 0.90	1.30, 1.60, 1.95, 4.45 4.10, 6.60 2.20, 2.50, 3.30, 5.00



SHAPE	COLOURS	CROSS-SECTION MM	LENGTH MM
RECT-ANGULAR	GREEN, YELLOW, ORANGE, RED, PINK, BLUE, ICE BLUE, WHITE	1.00 X 1.00 1.50 X 0.75 2.80 X 0.83 3.00 X 1.50 4.00 X 1.30	3.00, 13.00 3.50, 5.00 5.60 25.00 8.00



STANDARD
COLOURS

Green is the brightest colour perceived by the human eye.
The brightness of the other colours is noticed as follows:

COLOUR	BRIGHTNESS IN %
GREEN	100%
YELLOW	80%
WHITE	60%
ICE BLUE	60%
PINK	45%
ORANGE	40%
RED	20%
BLUE	15%

ABOUT **trigalight**

QUALITY & PRECISION

trigalight technology involves the specialised, highly automated production and mainly manual assembly of tritium-containing micro-components. From the first idea to the final customer-specific product, everything is produced from one source. All the manufacturing processes take place within the large 1,200 m^2 climate-controlled production area, which is equipped with the world's most modern tritium monitoring system. The pick-and-place technology allows for the high-speed positioning of large quantities of the smallest trigalight using automated, high-precision assembly machines.

RESEARCH & DEVELOPMENT

We have many years of experience and comprehensive knowledge in the fields of microtechnology, chemistry and physics. In addition, trigalight has the necessary resources and a state-of-the-art infrastructure. This enables us to refine our own product range, optimise our self-built systems and develop new customer-specific solutions.

trigalight invests in:

- Customer-specific solutions
- Internal development of the systems
- Development of the manufacturing processes
- Further development of key technologies

SERVICE

trigalight provides its partners with a comprehensive service:

- We provide a wide product range. If this selection does not cover your application, we will be pleased to develop an individual solution
- We offer consulting and training for our customers in all regulatory matters (national and international)
- We check optical and mechanical criteria for all components
- We perform luminance and spectral measurements
- We check the aesthetics and functionality of all products
- No product leaves our premises without a meticulous final inspection
- We place high value on dependable shipping and on time delivery

SUSTAINABILITY & COMMITMENT

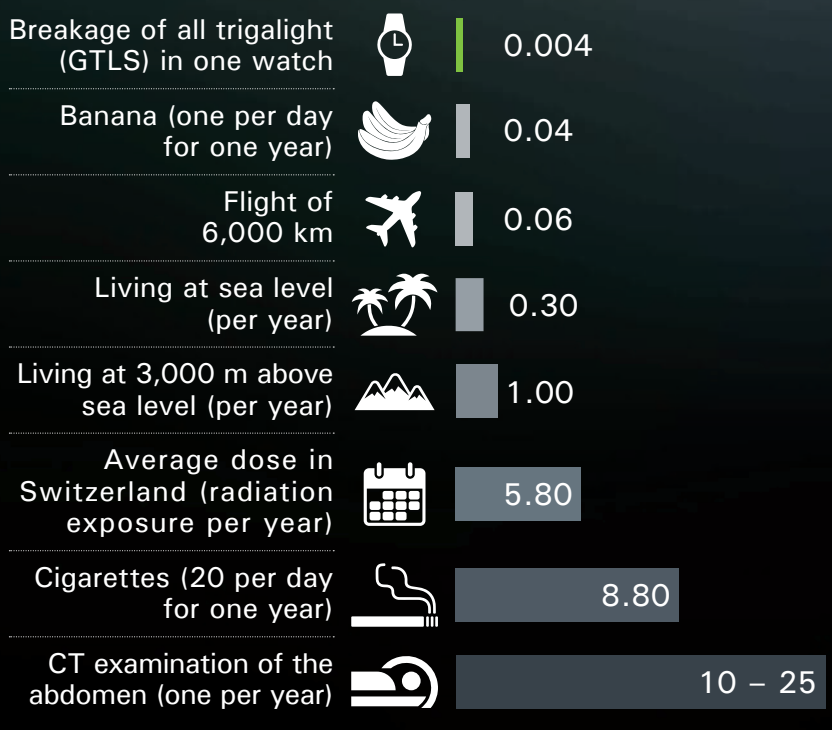
Long-term commitment is one of our strategic priorities, which is why we invest heavily in modern infrastructure, resources and skills. We support a variety of initiatives and non-profit projects. Our products are all developed and manufactured in Switzerland from a single source. trigalight has an ISO-certified management system and is currently building a globally unique Tritium Recycling Facility to recycle old tritium-containing products.

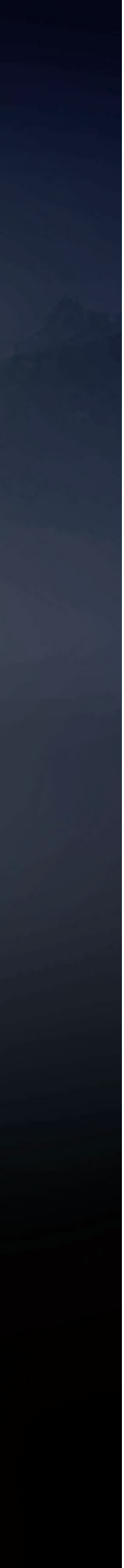
- ISO-certified: ISO 14001:2015 and ISO 9001:2015
- Tritium Recycling Facility
- Minergie-certified site

DID YOU KNOW **THAT...**

Tritium is a natural trace isotope of hydrogen. Its nucleus, also called a triton, consists of a proton and two neutrons. Tritium is a radioactive beta emitter and decays by sending out an electron with a half-life of 12.32 years. In its natural form, tritium is most commonly found in the stratosphere, but it is also created as a by-product in nuclear fission or in the cooling water of reactors. Tritium is a soft beta emitter, i.e. the energy of the electrons is very low. In water, it is stopped after a few micrometres, and it is also incapable of penetrating the outer skin layers. As a result, trigalight does not emit any harmful radiation because the electrons cannot pass through the hermetically sealed glass capillaries.

AVERAGE DOSE IN MILLISIEVERT (mSv)





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