

The background of the page is an abstract, colorful composition of overlapping, irregular shapes in shades of blue, purple, red, and yellow, creating a textured, artistic effect.

THE ART OF
**HERMETIC
PACKAGES**

AUTOMOTIVE | AEROSPACE | ENERGY | INDUSTRY | MEDICAL | PETROL | TELECOMMUNICATIONS

INNOVATIVE BY TRADITION - WORLDWIDE!

For over 70 years, we have been developing and manufacturing high-quality **glass-to-metal seals** for a wide variety of industries and applications.

With passion, commitment and a high degree of innovation, we work on solutions for our customers, which made us one of the world's leading manufacturers of hermetic packages.

In addition to the sealing technology, our core competencies include the production of stamped parts and glass preforms, surface finishing and the manufacture of pins, turned and milled parts.

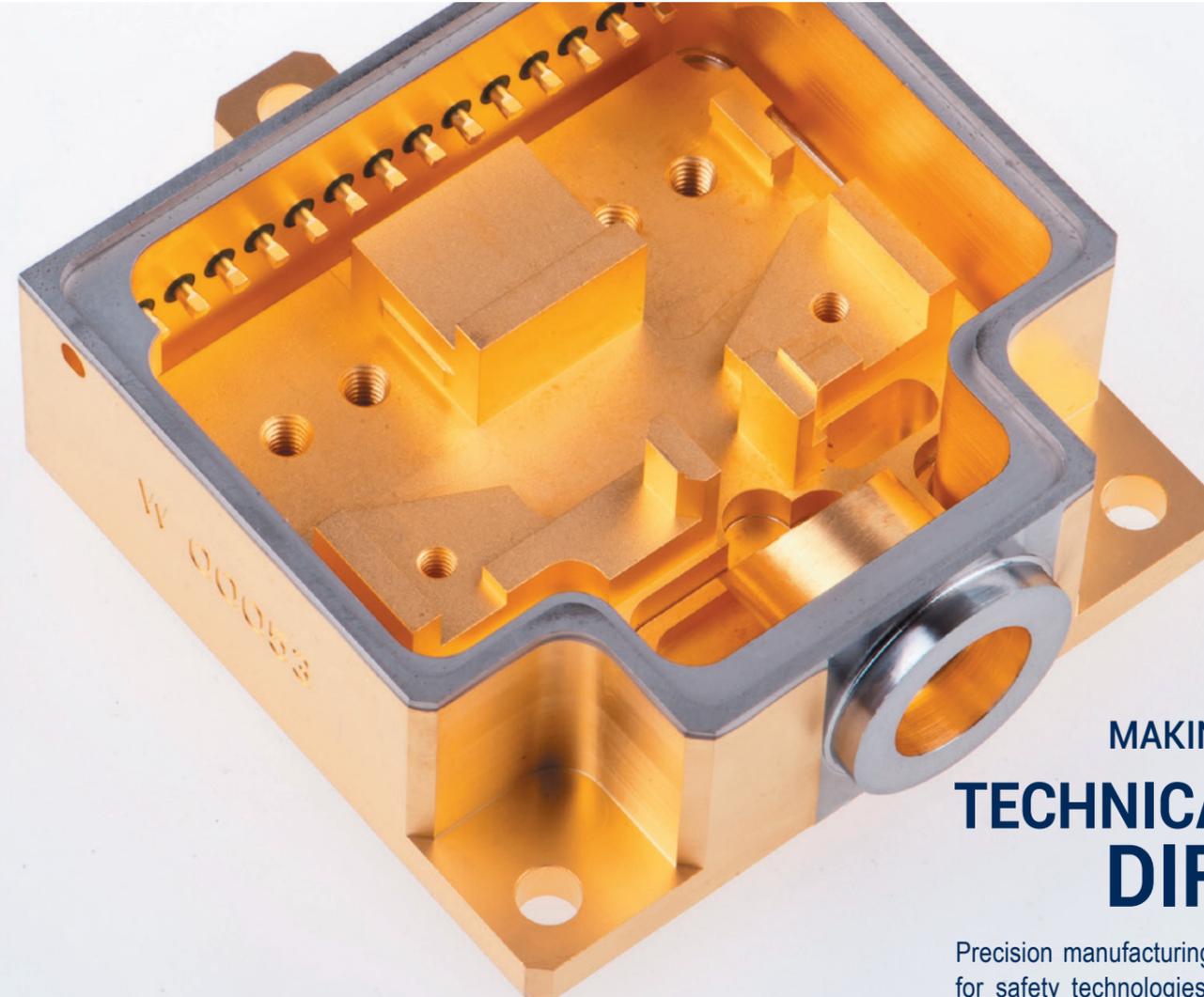
Customer satisfaction is our ultimate goal.

Our corporate culture is based on the zero-error strategy, which requires continuous optimization through innovative process development.

Electrovac - THE ART OF HERMETIC PACKAGES.
Where tradition meets progress.

Dieter Thumfart
CEO

Rainer Matzka
CFO



MAKING THE TECHNICAL DIFFERENCE

Precision manufacturing of hermetic protection solutions for safety technologies, sensors and control elements.

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FROM THE IDEA TO SERIES PRODUCTION

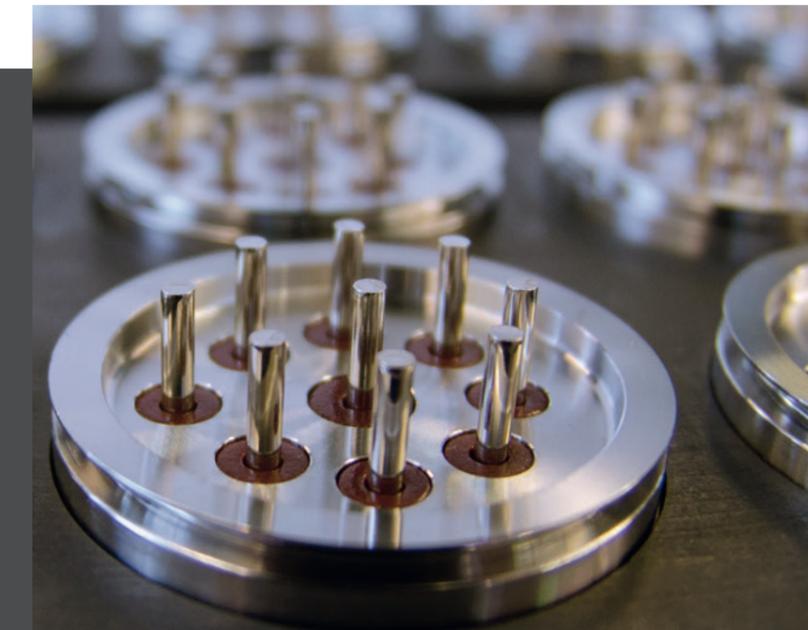
It all starts with a systematic analysis of the customer's requirements.

The earlier our customers involve us in new projects, the shorter the development phase will be. That enables us to immediately apply our expertise and our experience to the project. Having our own prototype, tool and die-making capability means we can get the developed products ready for series production extraordinarily quickly.

At our production sites in Germany, Austria and Thailand our engineers develop the productspecific manufacturing lines to meet the highest level of quality.



PRECISION



PRECISION DOWN TO THE SMALLEST DETAIL

Our quality products bear a heavy responsibility in the most diverse industries and fields of application. Human health and physical safety often depend on the reliability of our products.

To do justice to this responsibility, we work meticulously and uncompromisingly on a zero-error strategy that is inherent in our corporate culture. Along with the glass seal technology, our core competencies encompasses stamped part and glass pre-form production as well as plating technology.

E-MOTION



- Glass-to-metal seals for airbag igniters
- seatbelt pretensioners
- airbag sensors
- ESP sensors
- tyre pressure sensors
- injection pressure monitoring
- air-conditioning compressors
- humidity sensors
- acceleration sensors
- alternator regulators
- ethanol sensors
- transmission control modules
- pressure sensors for engine control units
- sensors for engine test benches



Along with our customers we develop customised hermetic packages that serve as the basis for encapsulating highly sensitive and longlasting electronic components. Our glass-to-metal seals help to protect life and limb and make driving much more fun.

Best quality – produced in Germany, Austria and Thailand.

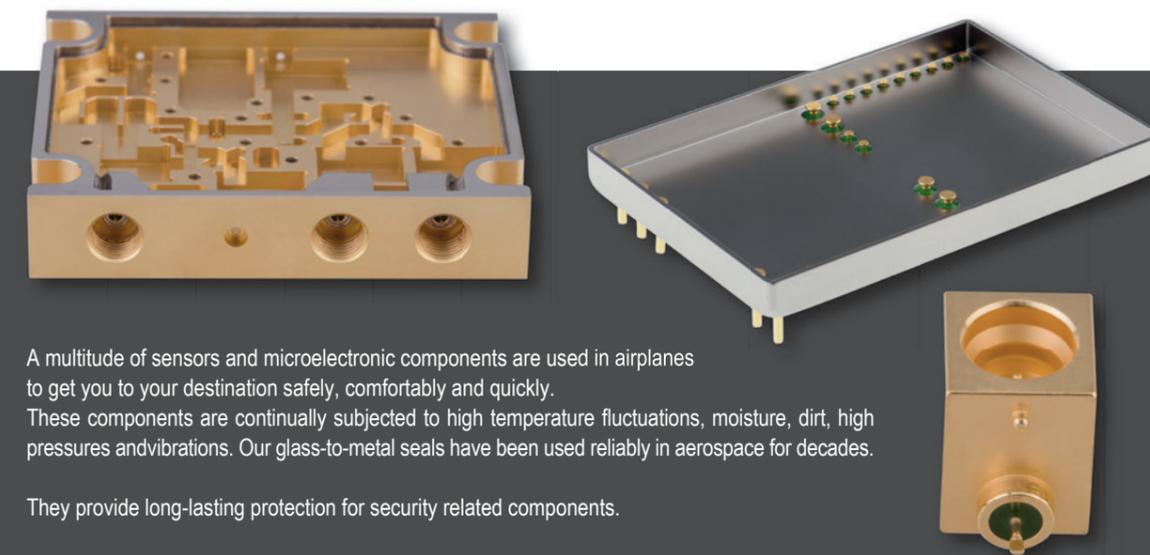


Hermetic packages such as microelectronic hybrid packages

- transistor headers
- relays
- special housings
- sensors for the aerospace industry
- primary and secondary power supply systems
- turbine control systems
- power distribution systems in aircraft
- lighting and ventilation management
- starters for main turbines
- emergency turbines
- fuel control systems
- de-icing systems
- attitude and heading reference systems
- speed, altitude and acceleration measurement systems
- high-quality special housings for a variety of European and American satellite programs



DYNAMIC ENERGY



A multitude of sensors and microelectronic components are used in airplanes to get you to your destination safely, comfortably and quickly. These components are continually subjected to high temperature fluctuations, moisture, dirt, high pressures and vibrations. Our glass-to-metal seals have been used reliably in aerospace for decades.

They provide long-lasting protection for security related components.

PROGRESS



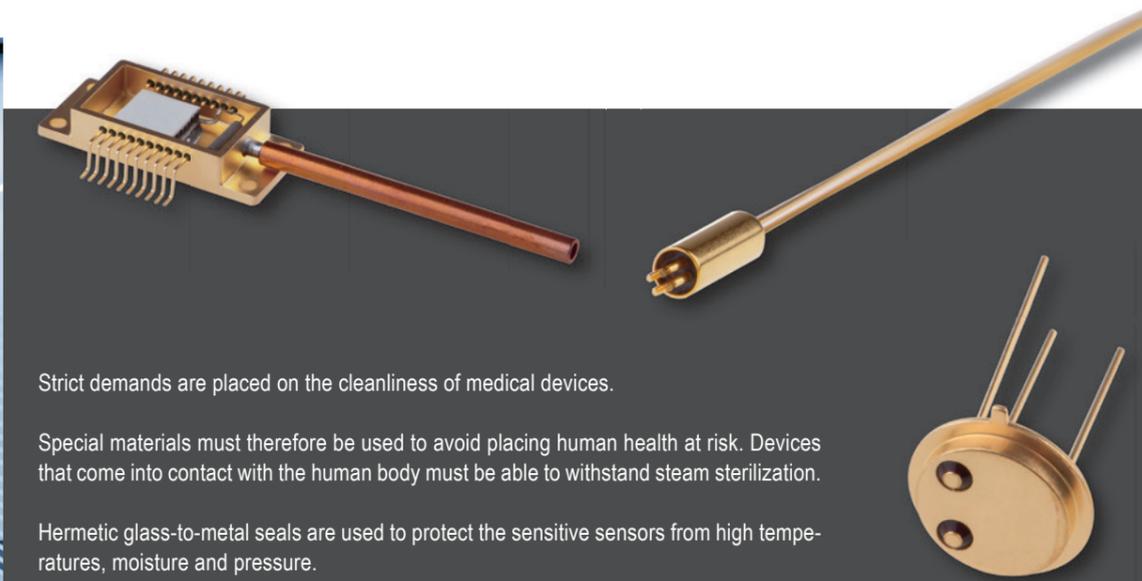
- Hermetic special housings for petroleum exploration and production
- pressure, temperature, flow, humidity and level sensors for refrigeration technology
- chemistry and petrochemical
- renewable energies such as wind power, water power, solar thermal and geothermal energy
- water and wastewater technology
- mechanical engineering
- shipbuilding, lithium thionyl chloride batteries for electricity, gas, and water meters
- buoys
- electronic toll collection truck and container tracking
- glass-to-metal seals for illumination industry
- refrigerators
- air-conditioning equipment and ventilation



Our glass-to-metal seals are used successfully in industrial technologies for a great variety of products manufactured in series as well as niche products – our customers value our multi-sector development knowhow and flexibility in fabrication.

SAFETY

- Glass feedthroughs for Joints and prosthetic limbs
- blood pressure measurement
- hermetic encapsulation of LEDs
- for oral medicine instruments
- oxygen tank pressure monitoring
- hermetic packages for laser treatments
- glass-to-metal seals for endoscopy



Strict demands are placed on the cleanliness of medical devices.

Special materials must therefore be used to avoid placing human health at risk. Devices that come into contact with the human body must be able to withstand steam sterilization.

Hermetic glass-to-metal seals are used to protect the sensitive sensors from high temperatures, moisture and pressure.

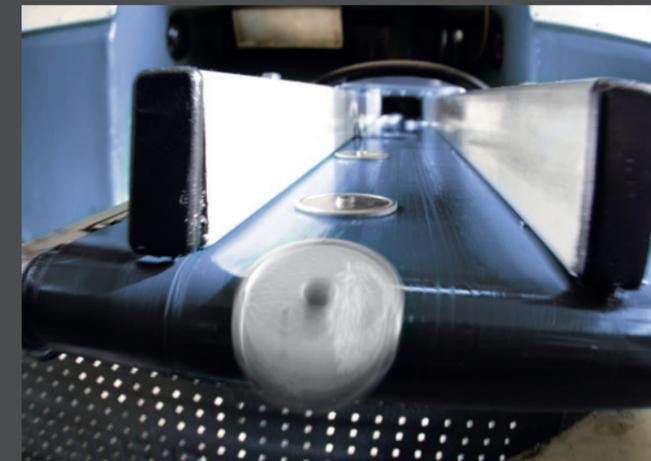
INTERACTIVE



In opto-electronics, transistor headers are used for many different applications in transmitters and receivers.

Electrovac hybrid packages, for example, are used in the encapsulation of fully electronic switches.

In addition, customers also trust in the expertise and the product quality of Electrovac for data communications and microwave technology.



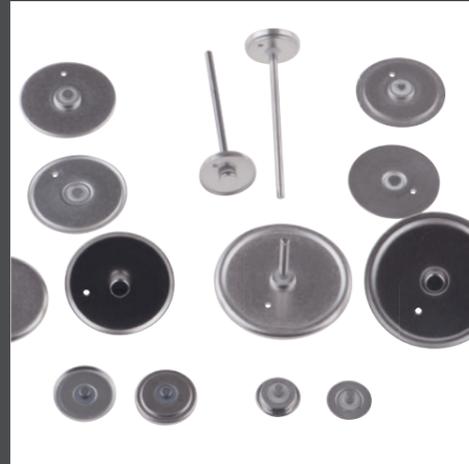
TRANSISTOR HEADERS



Depending on the glass seal technology, two different types of metal are used.

- as a compression glass-to-metal seal: cold-rolled steel with NiFe or kovar pins
- as a matched glass-to-metal seal: kovar or alloy 42 with kovar pins

BATTERY COVERS



To be able to counteract the aggressive materials in this area of application, Electrovac has developed special types of high-quality glass. They guarantee an extremely low discharge and are used for temperatures ranging from -65°C up to +150°C. These quality products have a lifetime up to 25 years.

AIRBAG IGNITERS SEATBELT PRETENSIONERS



Specifications of the hermetic packages:

- hermetically sealed 1E-8 mbar l/s He
- glass ejection force up to 5000 N
- tensile force of the conductors up to 250 N
- temperature resistance of -65°C up to +230°C

GENERAL APPLICATIONS



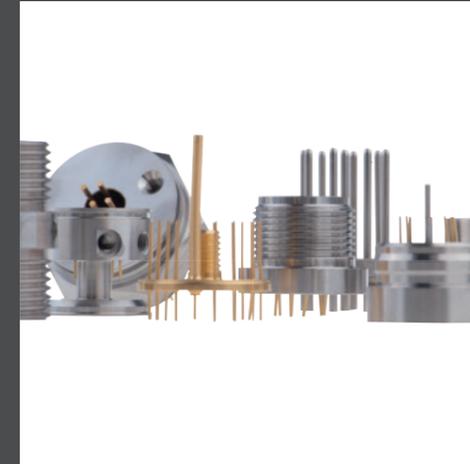
Along with the products already described, Electrovac develops and manufactures a multitude of additional glass-to-metal seal varieties, such as hermetically sealed sight glasses, 50 Ohm feedthroughs for high frequency applications, additional single and multi-pin feedthroughs, compressor feedthroughs and hermetic relay housings.

SPECIAL HOUSINGS HYBRID PACKAGES



These glass-to-metal seals, developed to meet specific customer requirements, are used in the aviation industry, satellites, opto-electronics, microwave technology, laser technology, in power electronics, telecommunications and in medical technology for long-lasting protection of sensitive electronic switches without any loss of performance.

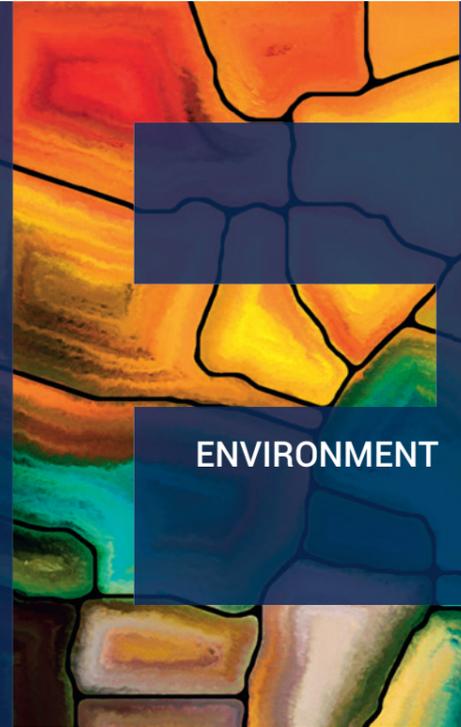
SENSOR PACKAGES



Our products provide long-lasting protection for high-precision sensors against aggressive substances, high pressure and major temperature fluctuations. The materials used, such as kovar, titanium or stainless steels, are hermetically sealed to our special glasses.



PRODUCT GROUPS



ENVIRONMENT

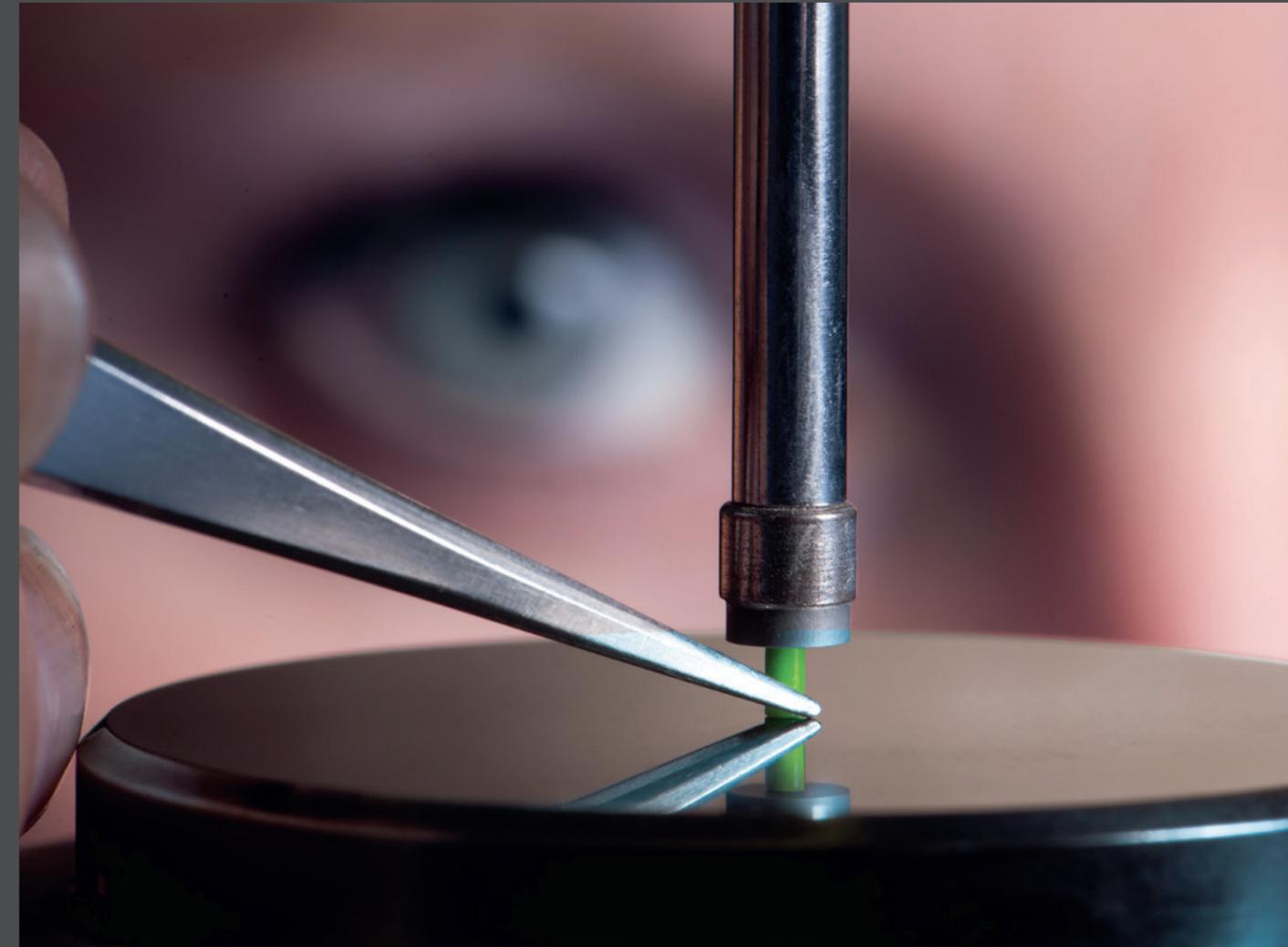
RESPONSIBILITY

We take responsibility for our environment and the quality of our products.

It is our duty to protect the sensitive ecosystem in which we live and work and to preserve this heritage for future generations.

Therefore, a vibrant environmental management system pursuant to the requirements of ISO 14001 has top priority for us.

Our products are manufactured in accordance with the strict requirements of ISO 9001 and IATF 16949, thus ensuring the highest level of safety and quality.



QUALITY

As a global leader in quality, customer satisfaction and product quality are our highest priority! Established quality assurance measures form the basis of the high quality of our products. Continuous work on CIP and Six-Sigma processes underscores our commitment to permanent improvement.

We take responsibility for our products and often for human life and limb. For this reason, we do everything it takes to contribute to the further development and consistent quality of our products and services.

Our certifications in this field are an expression of this quality offensive - our products are the proof.





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- 2 ELECTROVAC AUSTRIA
- 3 ELECTROVAC THAILAND
- 4 BEUTLHAUSER GERMANY



A glass-to-metal seal (GTMS)

is a vacuum-sealed connection (typically $< 1E-8$ mbar l/s He) between metal and glass. This connection is needed to feed the electrical conductors (pins) hermetically sealed and screened from the surrounding ambient environment into the package.

Hermetic packages

are always used when the electronics, the ignition powder or other components must be permanently isolated from the surrounding ambient environment without a loss of performance. The harsher the surrounding environment, the easier it is to see the advantages of glass-to-metal seals over plastic connections.

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