



Nothing is unattainable.



# Precision & Purity

UHV ■ XHV ■ UCV

## Publisher

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*“We can only master  
what we understand.”*

Dr. Ute Bergner



A handwritten signature in black ink, appearing to read 'Ute Bergner'.

**Dr. Ute Bergner**  
President  
Company founder

A handwritten signature in black ink, appearing to read 'Jens Bergner'.

**Jens Bergner**  
President  
Operational business

- Ideas
- Innovations
- Added value



## ■ Family Company with Guidelines

Around 200 enthusiastic employees – many in house trained – are the driving force behind our successful development from a small trading business to one of the leading specialists in vacuum technology.

VACOM is an owner-run family company. The entity of ownership and responsibility forming VACOM since its foundation generates special freedom of action and promotes a trust-based company culture. We are convinced that sustainable success is based on honest partnership and appreciative communication on an equal footing, both internally and externally.

As a cross-industry enabling technology, vacuum technology is the partner of high-tech applications such as analytics, optics, semiconductors or accelerators.

All our production areas from machining and welding to cleaning and assembly in the cleanroom are optimally combined under one roof.

We foster new ideas and problem solving approaches in our own research and development center and do everything we can to create beneficial innovations. We think of the challenges of industry 4.0 with its connection of individuality, flexibility and the mastering of complexity as a chance that we will develop in an active way with our own IT department.

For us sustainability means more than the resource-efficient use of materials and energy. Our corporate philosophy includes viewing life as a whole, covering both profession and work – the basis of added value – as well as free self-development with family and all other areas of life.

Our corporate philosophy, based on innovation and sustainability, corresponds to our way of viewing life. The optimal combination of work and family is an important success criterion, especially for an organization with so many young and active colleagues, like VACOM.

*Dr. Ute Bergner and Jens Bergner*



*"If there's a way to  
do it better... Find it."  
Thomas Alva Edison*

## ■ Milestones on the Way to the Innovative Developer and Manufacturer

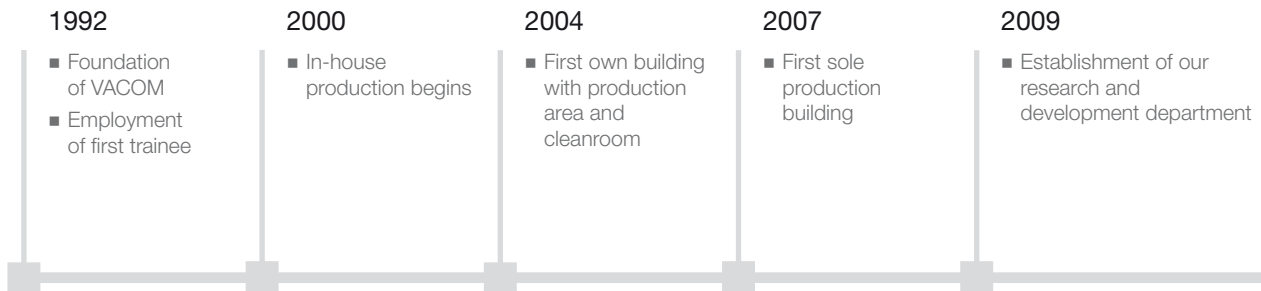
The Jena physicist, Dr. Ute Bergner, founded the company VACOM, with its 2 employees, in 1992.

Increasing customer demands for flexible and innovative solutions lead to the establishment of in-house manufacturing and subsequently, research and development capacities.

The first company headquarters, used today by the sales and marketing departments, were built in Jena

in 2004. The integrated manufacturing and laboratory area soon proved to be too small.

In 2007, with the construction of our first dedicated production building in Großlöbichau, only a few kilometers away from Jena, the manufacturing of complex vacuum components was able to commence. A turning, milling and welding shop as well as an ultrasonic cleaning and electro polishing line were part of the production center. Clean room facilities were equipped



with measurement instrumentation for vacuum and cleanliness testing.

The prominent architectural design of the main building is inspired by a CF cube, a vacuum component from our product range.

In 2011, the nearby spacious production and technology center was put into operation. The 5000 m<sup>2</sup> building houses turning and milling centers for precision machining, areas for welding technologies, surface finishing, quality assurance and offices.

The 800 m<sup>2</sup> clean room facilities of the ISO classes 7 to 5 and work stations to ISO class 1 comprise

the latest machinery for high demand cleaning and bakeout procedures as well as measuring equipment for the verification of the achieved cleanliness. A fully automated small-parts warehouse enables quick access to thousands of different components and ensures their prompt dispatch.

The original production building was then modified into our research and development center for our 20 or more scientists and technicians.

The latest erected building on the VACOM estate is our integrated daycare facility, for the children of our employees, the building of which is surrounded by a spacious playing and garden area.

#### 2011

- Construction of our production and technology center

#### 2012

- Set-up of our research and development center
- VACOTEC becomes VACOM

#### 2013

- ZIM Award
- Grand Prix of the Mittelstand (small and medium business)
- Rudolf Jaeckel Prize

#### 2014

- VACOM named in the TOP 30 of Germany's most innovative medium-sized enterprises
- Opening of VACOM's daycare facility for children

#### 2015

- Fraunhofer Cleanliness Technology Award "CLEAN! 2015"
- Ernst Abbe Prize for Innovative Entrepreneurship



## ■ Precision & Purity – Our Core Expertise

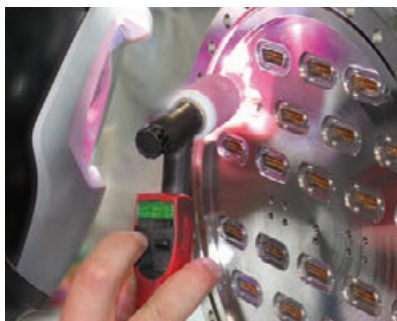


Vacuum  
hardware

Vacuum hardware encompasses vacuum chambers and components such as flanges, sealings, fittings, valves and translators.

We offer a wide range of vacuum components made of stainless steel and aluminum and produce vacuum chambers according to your specification. Uniquely offering these with guaranteed outgassing rates.

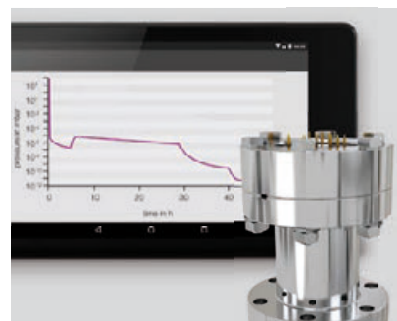
Newly developed technologies such as the UHV/XHV compatible **AluVaC®** components and **VaCFix®** clamp chains provide significant time and energy savings.



Electrical  
feedthroughs

Electrical feedthroughs enable the vacuum-tight transfer of electric energy or signals into or out of a vacuum chamber.

In addition to one of the most comprehensive ranges of standard feedthroughs and accessories worldwide, we offer special solutions including minor modifications of standard products, flanges with combinations of feedthroughs and the design and production of complex customized components.



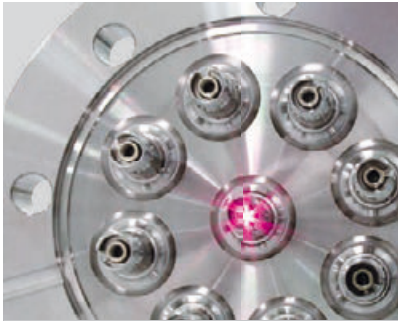
Vacuum  
measurement

A continuous pressure measurement is necessary in order to ensure that vacuum processes run smoothly under defined conditions.

Our portfolio comprises vacuum gauges based on different measuring principles and for pressure ranges up to the extreme high vacuum (XHV).

Our innovative **BARION® smart** wide range gauges measure from atmosphere to XHV and are in-situ bakeable up to 200 °C.

Our **VACOM** app enables the process monitoring of up to 45 sensors per mobile display, such as a smart phone or tablet.

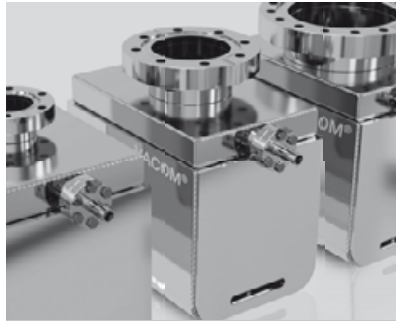


Vacuum  
optics

For many vacuum applications it is necessary to transfer electromagnetic waves e.g. in form of light or laser radiation into a vacuum or out of a vacuum.

We offer a wide range of viewports and optical fiber feedthroughs including a huge number of immediately available standard products.

Specialized colleagues give advice for the product choice and customization.



Ion getter  
pumps

With ion getter pumps it is possible to reach pressures  $< 10^{-11}$  mbar. They offer the most clean and inexpensive method to preserve an ultrahigh vacuum. Since they function without moving parts they are free of vibrations and almost maintenance-free.

Our in-house developed and produced ion pumps, carrying the brand name **REVION®**, stand out due to their high pumping speed and notable space-saving construction.



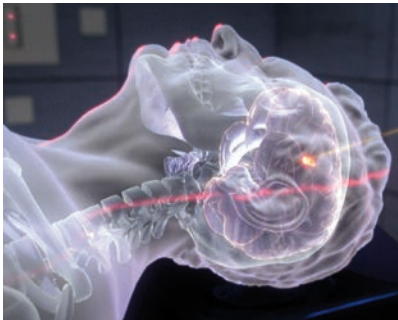
Measurement of  
cleanliness

The cleanliness of the assembled components is of vital importance for many innovative industries. Hence, we developed processes for defined purity classes and appropriate measuring methods. With our cleanliness measuring device **VIDAM®** it is possible to quantitatively and non-destructively determine filmic impurities on the entire surface of a component. The measurement allows to adjust the steps of the cleaning process precisely and subsequently to guarantee the process reliability of the parts. We were awarded the Fraunhofer Cleanliness Technology Award "CLEAN! 2015" for **VIDAM®**.

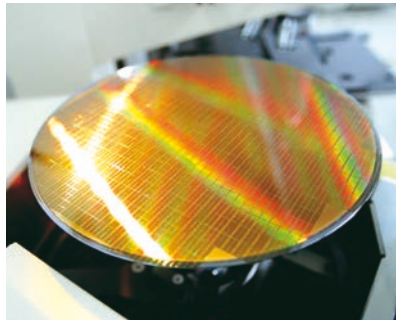
# ■ Nothing is Unattainable

This is valid at least for vacuum, which in its ultimate form is unrealizable, even if there only a few particles or molecules are measurable. However, this imperfect vacuum makes many things possible:

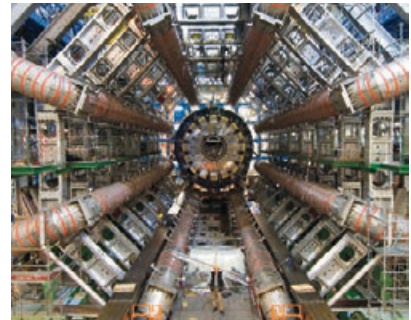
Many products of modern life such as computers, mobile phones, digital-cameras, energy saving LEDs or simply anti-glare glasses would be inconceivable. Even Thermos jugs and refrigerators would not work.



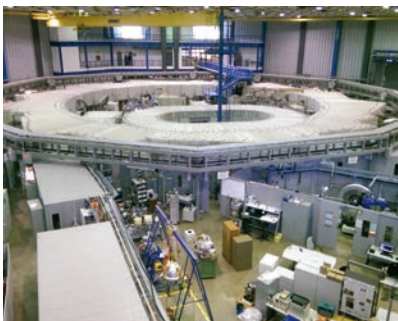
Particle accelerators  
in cancer therapy



Semiconductors



Particle accelerators



Research and development



Thin-film coating for optics



Surface analysis

Sources, courtesy of:  
Helmholtz-Zentrum Dresden-Rossendorf, X-FAB Semiconductor Foundries AG, CERN,  
Laboratório Nacional de Luz Sincrotron, Fraunhofer Institute for Applied Optics and Precision Engineering IOF, ION-TOF GmbH

## High-tech needs vacuum

The industrial use of vacuum started at the end of the 19<sup>th</sup> century. The invention of the lightbulb by Thomas Edison in 1879 gave the decisive impulse. The application of the significantly longer lasting carbon filament required the evacuation of the bulb.

At the beginning of the 20<sup>th</sup> century, further applications emerged from the development of radio and X-ray technology based on the availability of efficiently and reliably evacuated vessels and systems.

The coating of optics – co-founded in Jena – is an important application to this day. Many new fields of application were added and extended: e. g. semi-conductors, light and solar technologies. Computers, displays and smart phones would not be possible without vacuum. The electron microscopy with its manifold applications from materials engineering and geology to biology and medicine would not work without vacuum. Particle accelerators make it possible to investigate the smallest building blocks of matter, to study extremely fast processes and provide access to

new methods in cancer treatment. Coatings applied under vacuum conditions enable the thermal insulation of glass, protect tools from wear or give jewelry iridescent brilliance.

Our comprehensive range of vacuum components, measurement and quality determining technologies makes us a supplier and developing partner of high-tech industries e.g. in the field of analytics, optics, EUV lithography, electronics, thin-film and accelerator technologies.

For many years, we have been cooperating with prominent research associations such as Max Planck, Fraunhofer, Helmholtz and Leibniz, scientific institutions and particle accelerators worldwide.

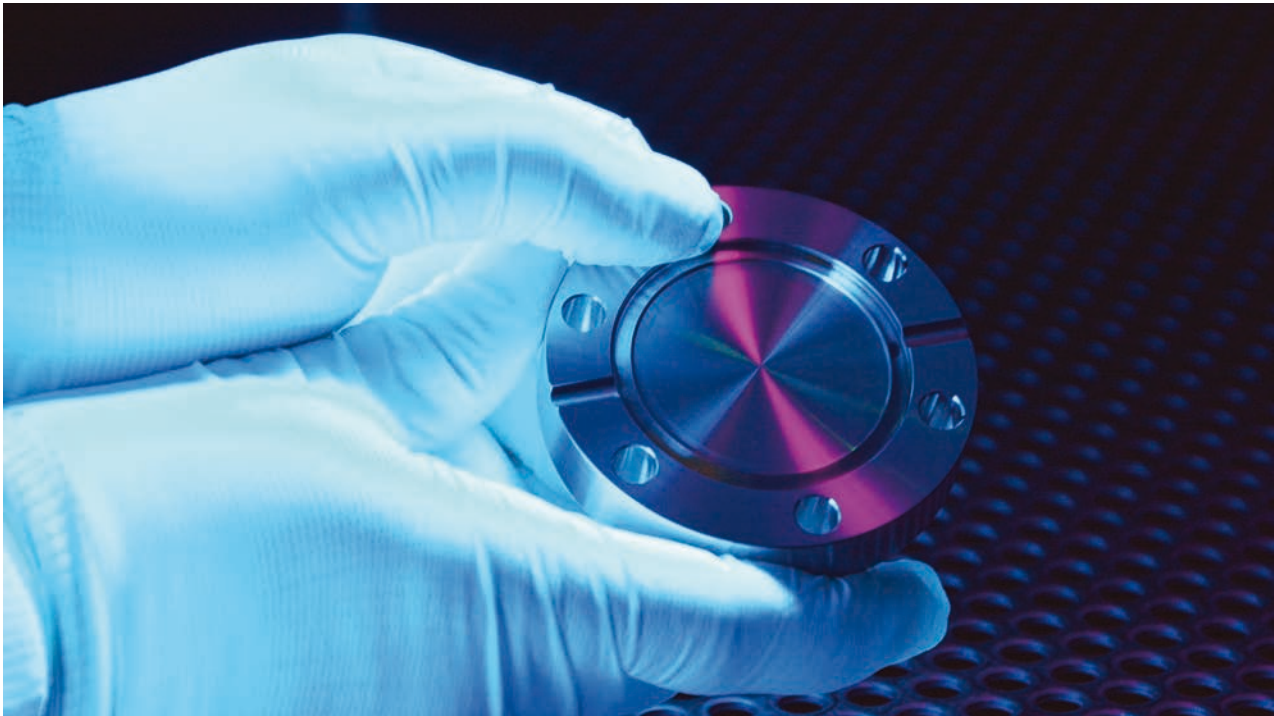
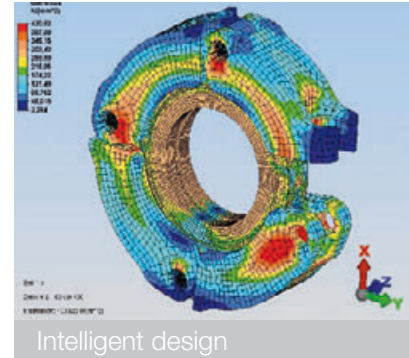
The continuously increasing demands and innovations in vacuum technology are reflected in our product development such as our UHV/XHV compatible AluVaC<sup>®</sup> CF aluminum components, the VACOM Purity Classes or our cleanliness measurement device VIDAM<sup>®</sup>.



Source, courtesy of:  
Deutsches  
Elektronen-Synchrotron DESY

*"It is necessary to know  
which means the  
technique offers, to achieve  
what the theory proves  
to be possible..."*  
Ernst Abbe

## ■ VACOM® Quality



## Quality is a basis on which we build our future

Quality means that the description of products, processes and services coincides with the reality.

This sounds logical, but includes many aspects that determine the perception of a quality product in their interaction. At the same time, it is necessary to make aware that quality does not mean to produce something with great effort to the ultimate precision.

Quality is inseparably linked to the specific requirements of the respective product or service.

We do not understand quality assurance as a task of one department, the production shop or the quality manager, but regard quality as a basic criterion of all corporate processes. At the same time, we consider the pursuit of quality as a continuously revolving and enhancing process that includes an open error culture.

We gladly seize new ideas in collaboration with you and accompany you on the way to innovation. The mutual respect of the intellectual property can be ensured by nondisclosure agreements (NDA).



## A set of certificates of independent institutions proves our expertise and performance:

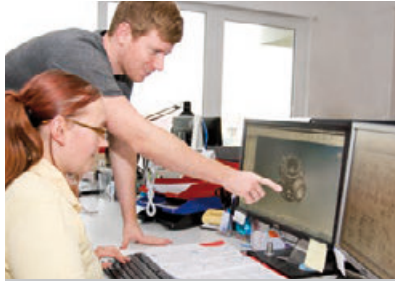
- Certificate of the quality management system acc. to DIN EN ISO 9001:2008
- Certificate of the quality requirements for fusion welding of metallic materials acc. to DIN EN ISO 3834-2:2006
- QuB certificate – Quality Association of Environmentally Conscious Companies
- NAT – Thuringian Sustainability Agreement

DIN EN ISO 9000ff.:  
"Quality is the degree  
to which a set of  
inherent characteristics  
fulfills a set  
of requirements."

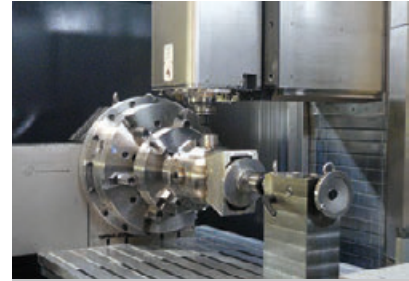
## ■ From the Idea to the Product Ready for Use



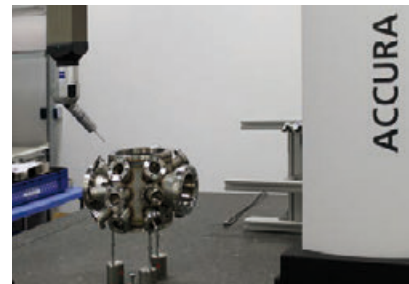
Consulting and planning



Construction and design



Mechanical production



Quality control



Surface finishing and cleaning

### Vacuum technology makes high demands

These clearly exceed the requirements of general engineering. A welding seam has not only to be stable, but also leak-tight. The materials have to display low outgassing and gas permeation rates. It is not sufficient to have a blank surface after electro-polishing treatment.

### The course is set with the design

Many aspects have to be considered during the design: ports have to be aligned to a focus point, manufacturing induced abbreviations of semifinished products have to be compensated and the heat input from welding has to be considered. On the basis of our manufacturing specifications summarized in our Generic Standards, we develop the design in close consultation with you. Your 3D data can directly be imported and optimized for production.

### Turning, milling, welding with highest precision

The manufacture of vacuum chambers and components is executed on precision laths and multi-axis milling machines. We adjust different welding technologies to the material and the component geometry.

### Surface finishing and cleaning

The determining factor for surface treatments such as glass bead blasting or electro-polishing is not only to fulfill the aesthetic demand, but to achieve pure passivated surfaces with low surface desorption.

The cleaning process is executed in the cleanroom area according to our defined purity classes accompanied by optional bakeout processes and outgassing measurement. The cleaned components – cleanroom compatible packed on request – are directly placed into our automated small parts storage.

### Quality assurance and digitalization

All technologies are accompanied by an effective quality assurance system, working with defined processes and modern testing methods. Sophisticated data acquisition and management systems support the traceability of processes.

We are looking forward, together with you, to realizing the specific requirements on your vacuum chamber or component.



*"Curiosity is always  
the top priority of a  
problem to be solved."*  
Galileo Galilei

## ■ Innovation Secures Future



2015: Dr. Ute Bergner honored with the Ernst Abbe Prize for Innovative Entrepreneurship.



2010: "Bambus-Champion"  
Award



2013: Rudolf Jaekel Prize of  
the German Vacuum  
Society



2013: ZIM-Prize of the Federal  
Ministry for Economy  
and Technology

We are explicitly committed to the encouragement of innovation, flexibility and positive change processes. It is our aspiration to question standards developed from experiences and to get to the bottom of things. We are convinced that we can only master what we really understand.

On these grounds we started to establish our own research and development department in 2005. More than 20 scientists such as physicists, material scientists, electronics engineers and laboratory technicians are working together.

In addition to the development of own products, we often work together with partners from industry and science in finding solutions for new products and technologies.

It is our aim that good ideas become real innovations, bringing practical benefit and leading to economic success.

We are pleased that the success of our methods is reflected by the appreciation of different scientific and corporative bodies:

- **Ernst Abbe Prize** for Innovative Entrepreneurship 2015
- **Cleanliness Technology Award “CLEAN! 2015”** of the Fraunhofer-Gesellschaft for the development of our innovative cleanliness measuring device VIDAM®
- **“Grand Prix of the Mittelstand”** Premier Finalist and **Rudolf Jaeckel Prize** of the German Vacuum Society for Dr. Ute Bergner 2013
- **ZIM-Prize** of the Federal Ministry for Economy and Technology 2013
- **“Bambus-Champion”** Award 2010
- **“Grand Prix of the Mittelstand”** of the Oscar Patzelt Foundation 2003



*“Almost anyone can think up an idea. The thing that counts is developing it into a practical product.”*  
Henry Ford

## ■ Our Philosophy

The viewing of life as a whole stands at the center of our corporate philosophy. Both profession and work as the basis of value generation and the free self-development with family and all other areas of life as a whole form a successful way of life.

### The creation of value and family shape life

Profession and work mean more than securing one's livelihood. Family and friends give energy and support. All aspects of life are intimately bound together, challenge and encourage us equally.

### Life means development

Long-term success requires the willingness to

break new grounds. We develop and impart knowledge to master future challenges.

### Active life needs personal-responsibility

The acceptance of responsibility for the own way of life and also for the solution of work tasks is an essential point of our philosophy. Respect and appreciation are inseparably linked.

### Communication and social contacts shape life

We understand that honest partnership and communication on an equal footing, both internally and externally, are the basis for sustainable success.



Professional education  
from the beginning



We are a team



Healthy eating in the  
staff canteen

## ■ Contact

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Online Shop: [www.vacom-shop.com](http://www.vacom-shop.com)

Contact for France, Belgium, the Netherlands  
and Luxembourg

We look forward to working with you!



Every new way  
starts with  
the first step.



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