

VON ARDENNE 

WHO WE ARE
WHAT WE DO



WHO WE ARE

VON ARDENNE develops and manufactures equipment for industrial coatings on materials such as glass, wafers, metal strip and polymer films. These coatings give the surfaces new functional properties and can be between one nanometer and a few micrometers thin, depending on the application.

Our customers use these materials to make high-quality products such as architectural glass, absorbers and absorber tubes for solar-thermal power plants, reflectors for lighting systems, displays for smartphones and touchscreens, solar modules and heat protection foil for automotive glass.

We supply our customers with technologically sophisticated vacuum coating systems, extensive expertise and global service. The key components are developed and manufactured by VON ARDENNE itself.

Systems and components from VON ARDENNE make a valuable contribution to protecting the environment. They are vital for manufacturing products which help to use less energy or to generate energy from renewable resources.



GC330H glass coating system for architectural glass



VON ARDENNE was founded in 1991 as a spin-off of the Manfred von Ardenne Research Institute in Dresden. The technological principles and components which are vital to our current success had been developed and steadily improved by this institute since 1955.

Over 50 years of experience with electron beam processes and more than 40 years of competence in magnetron technology make VON ARDENNE the leading provider of glass coating systems and equipment for thin-film photovoltaics.

This expertise is used in all our products and guarantees that our customers receive reliable systems for their production.

At VON ARDENNE we adhere strictly to the values which provided the basis for Manfred von Ardenne's work - scientific meticulousness and curiosity, the constant search for innovative technical solutions, quality awareness, sustainable activity and reliability.



Manfred von Ardenne at the age of 16



WORKING AT VON ARDENNE

The fact that today we are a dynamic, expanding company is mainly thanks to our committed, highly skilled workforce. Personalities of different ages who are experts in different fields work together successfully in our teams.

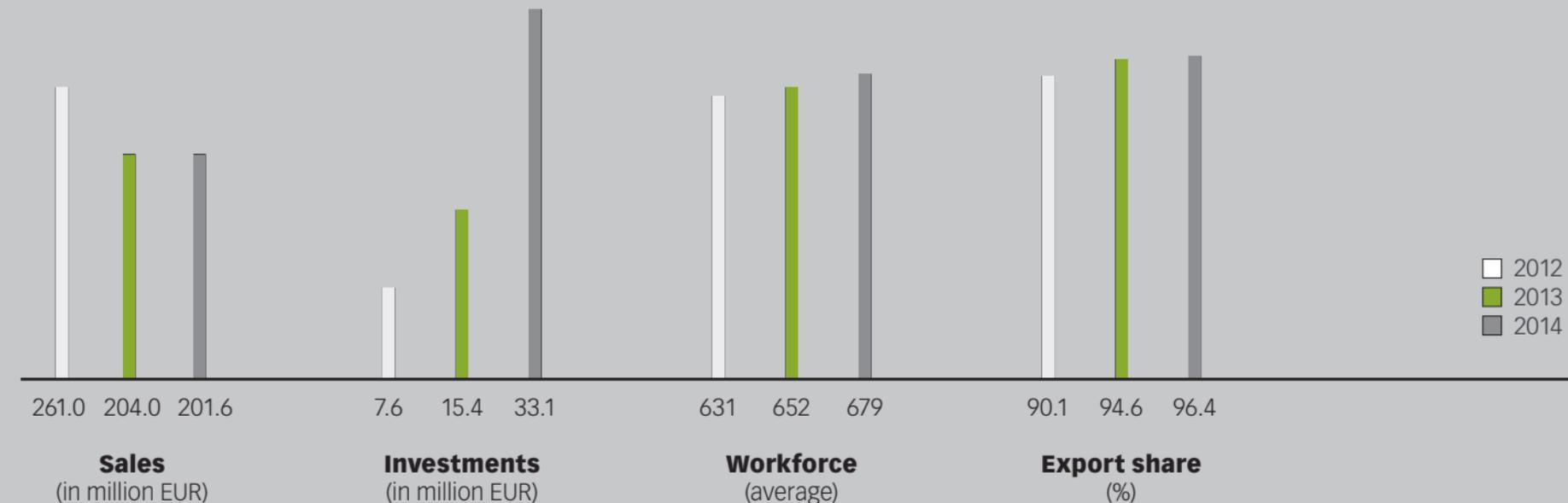
We are constantly looking for additional creative visionaries.

At VON ARDENNE, you can expect an exciting, wide-ranging working environment dominated by team spirit and mutual trust. We are a family-friendly company which will help you achieve a genuine work-life balance.

Employee development is one of our greatest concerns. We support the development of our employees' expertise and personality and provide them with internal qualifications for new tasks.

We also train our junior staff ourselves. When they complete their final examinations, we are always interested in taking on our former trainees in permanent jobs or working with them on international projects.

FACTS & FIGURES



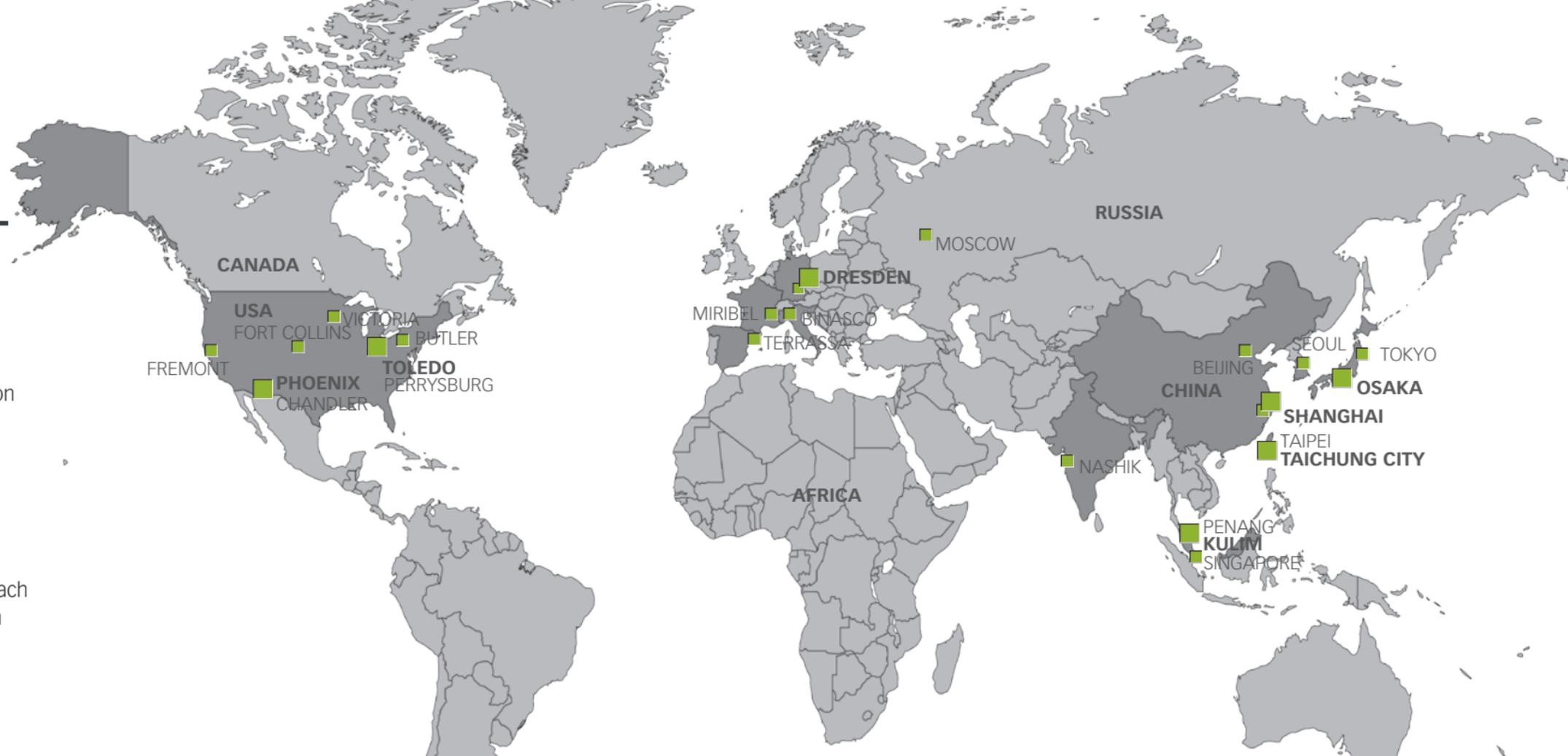
VON ARDENNE INTERNATIONAL

VON ARDENNE equipment is used in over 50 countries and we now make over 90 percent of our sales overseas.

We believe that being close to our customers is vital for the provision of fast, straightforward services and upgrades. That is why VON ARDENNE is growing globally.

Apart from our headquarters in Germany, we have five subsidiaries. In 2006, our first subsidiary was founded in Shanghai, China.

We have added four more since: one in Malaysia in 2008 and one each in Taiwan and the USA in 2011. Our latest subsidiary was founded in 2014: VON ARDENNE Japan.



SERVICE AND UPGRADES

Wherever VON ARDENNE equipment is installed, we have experts at our subsidiaries or skilled partners available. They ensure that the machines function perfectly and smoothly. Our idea of service is to ensure that the systems we supply work properly at all times. We also provide customer technology support, technical training and solutions for upgrades.

Our service portfolio consists of:

- Technology support
- On-site service
- Maintenance service
- Technical training
- After-sales service
- End block service
- Storage

ARCHITECTURAL GLASS

VON ARDENNE is a leading manufacturer of architectural glass coating systems. We supply these most advanced systems to leading glass manufacturers all over the world. They feature VON ARDENNE magnetrons - the key components of our equipment.

INVISIBLE COATINGS WITH A MASSIVE EFFECT

We fit our GC330H and GC254H modular glass coating systems with the configuration and layer system that suit the customer's individual requirements.

Coated architectural glass drastically reduces energy consumption and therefore helps to protect the environment. This means that sun protection coatings prevent the interior of buildings from heating up in the summer and reduce costs for air-conditioning.

In winter, on the other hand, low emissivity coatings (Low-E) almost completely eliminate heat loss through glass surfaces so that hardly any heat energy is lost. This means that up to 80 percent of energy for heating and air conditioning can be saved in buildings.

With 50 systems installed globally VON ARDENNE is the

TECHNOLOGY & MARKET LEADER

in the manufacture of architectural glass coating systems.

GC330H

glass coating system for large-scale architectural glass



THIN-FILM PHOTOVOLTAICS

VON ARDENNE coating systems continue to set standards in thin-film photovoltaics.

HIGHLY PRODUCTIVE AT LOW COSTS

PIA|nova®

modular glass coating platform for photovoltaic applications



The PIA|nova® is a modular, highly automated coating platform for depositing metallic contact coatings, transparent conductive oxides (TCO) and various absorber coatings such as for CIGS or CdTe technology.

The modular concept allows the combination of high reliability and efficiency with the unique flexibility of configuring the coater according to the requirements of the customer.

The GC60V is another of our successful coating platforms and allows the deposition of various layer systems in a vertical substrate layout. Depending on the technology use, the GC60V can coat up to one million glass substrates for solar modulators with a capacity of 80 megawatt every year.

This product portfolio enables our customers to produce thin-film modules for use on facades, roofs and in solar power plants which

**SUPPLY ENTIRE CITY
DISTRICTS WITH ELECTRICITY.**

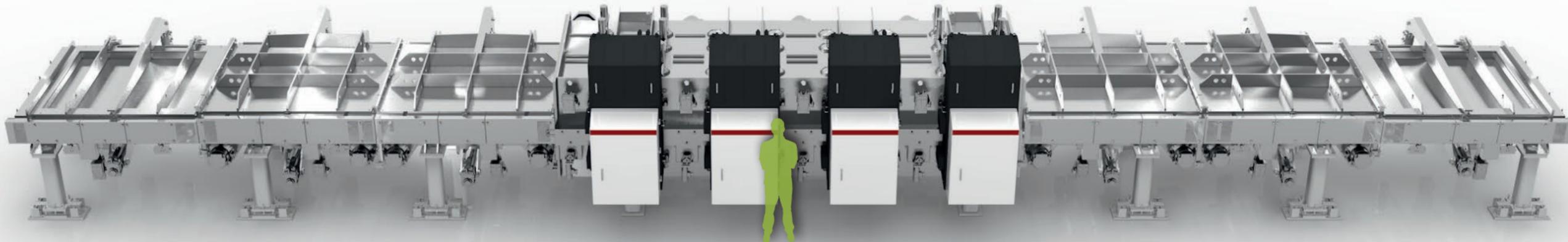
CRYSTALLINE PHOTOVOLTAICS

WAFER COATING FOR HIGHLY EFFICIENT SOLAR CELLS



XEA|nova

modular platform
for coating
silicon wafers
for photovoltaic
applications



The XEA|nova is a new type of modular, individually configurable platform for wafer coating for the production of silicon-based high-efficiency solar cells.

As a leading supplier of vacuum coating equipment, VON ARDENNE has benefited from its vast process expertise in the development of the XEA|nova. This expertise has been gained from more than 140 coating systems that were sold to the PV industry.

The fact that it enables double-sided wafer coating in one coating cycle is just one of the features that make the XEA|nova such an efficient, highly productive and flexible coating system for standard and special format wafers.

HIGH-EFFICIENCY SOLAR CELLS

made of ultra-thin silicon wafers
= **LOW MATERIAL COSTS**
+ **HIGH ENERGY YIELD**

WEB COATING

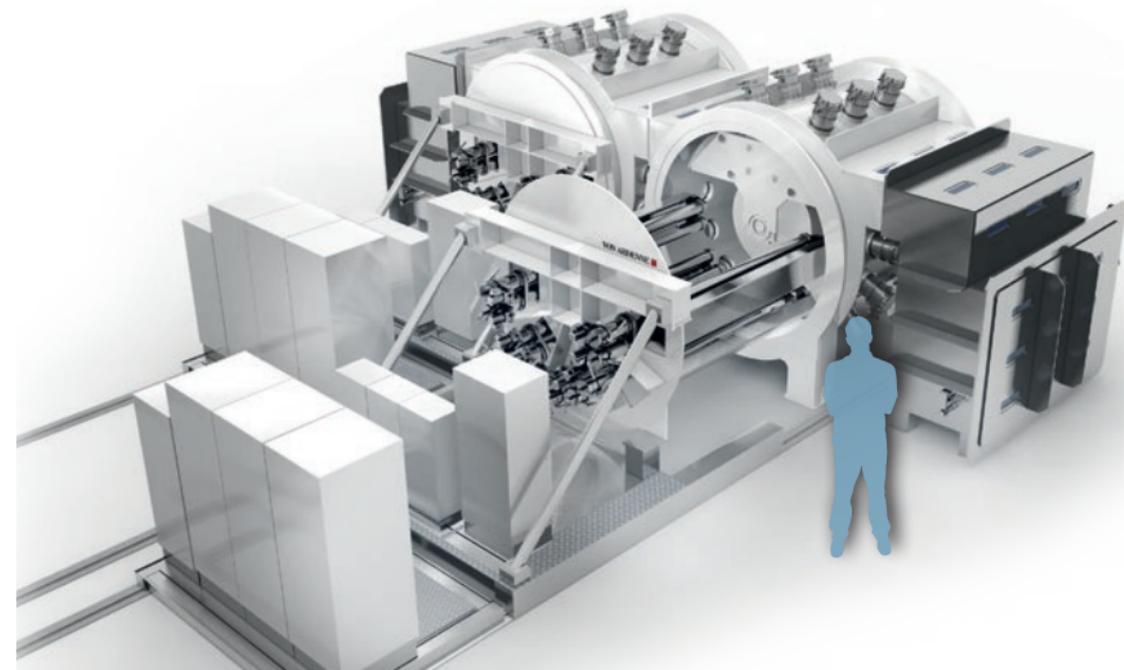
FUNCTIONAL COATINGS FOR FLEXIBLE MATERIALS

Coated polymer films are essential components for touchscreens, tablets and smartphones. Sun protection films in automotive glazing create a pleasant climate in the interior of cars and also reduce fuel consumption. The range of applications is massive.

Our FOSA web coating systems can also be individually configured for a wide range of other applications such as contact layers for displays, anti-static coatings, anti-reflection coatings and Low-E window films.

Windows in older buildings retrofitted with Low-E films drastically reduce heating and air conditioning costs.

VON ARDENNE supplies web coating systems for substrate widths between 100 millimeters to more than two meters.



Lightweight and flexible:

UNDREAMT-OF POSSIBILITIES

with coated polymer films

FOSA MX1600

web coating system for applications such as touchscreens and energy-saving window films for cars

CONCENTRATED SOLAR POWER

CONCENTRATED SOLAR POWER FOR SOLAR POWER PLANTS

VON ARDENNE systems create coatings which are components of highly reflective mirrors or highly absorbing receiver tubes in modern thermal solar power plants.

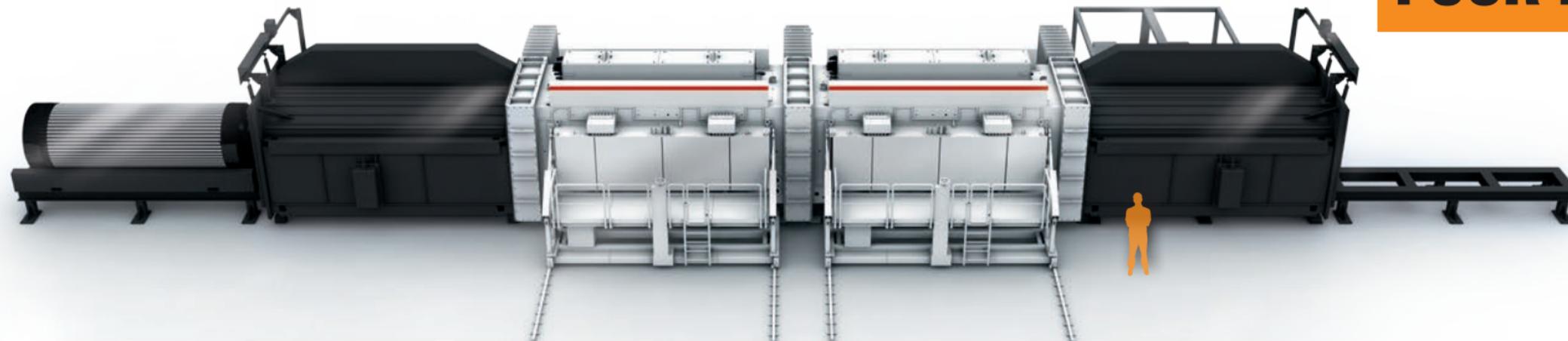
The highly productive TSS4000 tube sputter system coats stainless steel absorber tubes up to four meters in length with complex absorbing layer systems. These tubes are used in parabolic trough CSP technology.

Based on our system design for the architectural glass industry, the GC330H and GC254H glass coating systems are solutions for coating flat or curved glass substrates for the production of highly reflective mirrors.

These mirrors can also be produced by using a roll-to-roll coating process on metal strip. VON ARDENNE can supply the MSC1250 metal strip coating system for this purpose. This makes it possible to coat substrates that are up to 1.25 meters wide.

Layer systems for

ABSORBER TUBES UP TO FOUR METERS IN LENGTH



TSS4000

tube sputter system for coating steel tubes with absorber coatings for solar thermal applications

**JUST AS YOU WANT:
HIGHLY REFLECTIVE OR
HIGHLY ABSORBING**

METAL STRIP

Our MSC1250 metal strip coating system for high-volume production can create extremely thin functional coatings. It is based on the principle of physical vapor deposition (PVD). Electron beam guns evaporate metals or other substances which are then deposited on the strip.

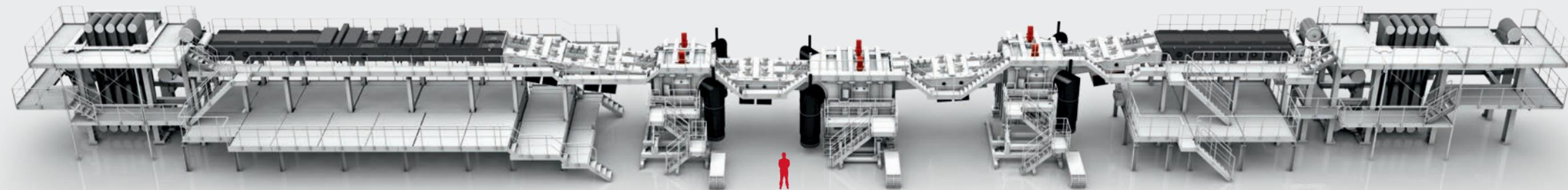
With this process in combination with magnetron sputtering, highly reflective, highly absorbing or decorative surfaces can be created for a whole range of applications.

Highly reflective coatings improve the yield of lighting systems and therefore their energy efficiency. Highly absorbing coatings, on the other hand, are vital for solar thermal power plants.

Versatile tools for efficient

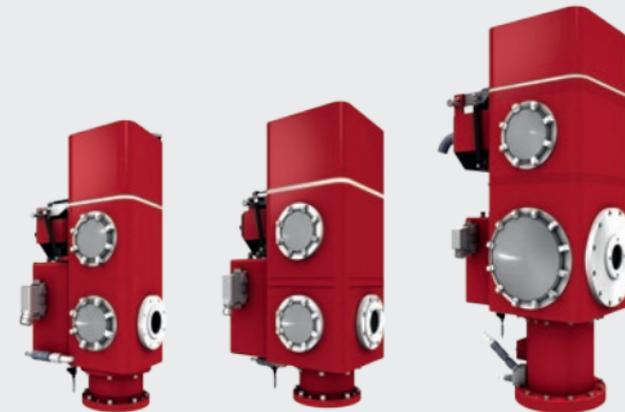
**HEAT PRODUCTION,
LIGHTING SYSTEMS and
DECORATIVE SURFACES**

MSC1250 metal strip coating system for reflective, absorbing or decorative coatings



ELECTRON BEAM APPLICATIONS

E-BEAM: NOT JUST FOR HIGH-PURITY MATERIALS



VON ARDENNE develops and manufactures electron beam systems which are used for melting, refining, evaporation or heat treatment.

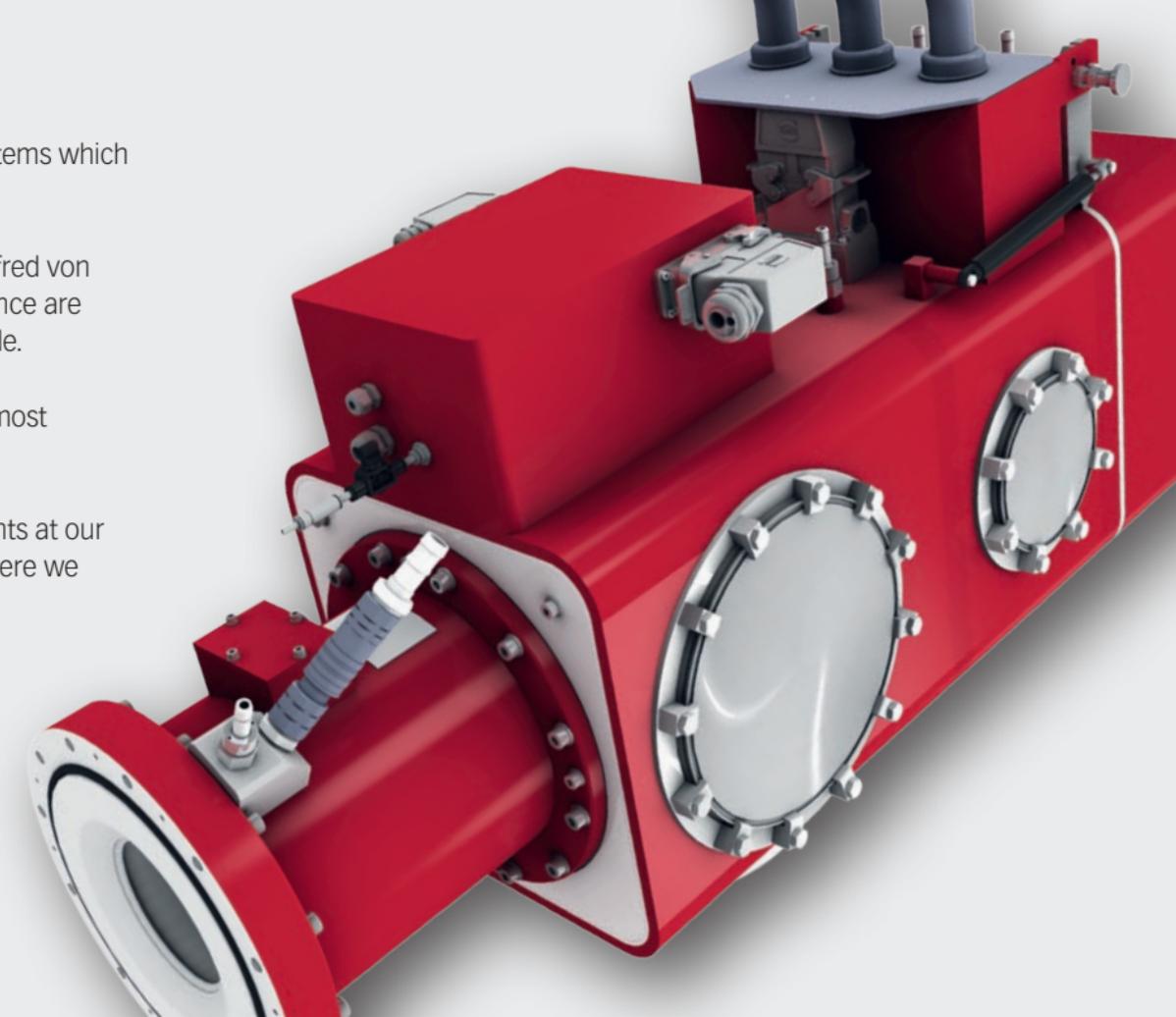
The first electron beam gun was developed in 1960 at the Manfred von Ardenne Research Institute. Our more than 50 years of experience are reflected in over 400 electron beam systems installed worldwide.

Our EH150V, EH300V and EH800V electron beam guns are the most powerful in the world.

We work on the continuous improvement of our key components at our development center for electron beam technologies. This is where we produce and test our high-quality electron beam guns.

EH150V EH300V EH800V

high-power electron beam guns for melting and evaporation



FLEXIBLE SYSTEMS FOR SMALL SUBSTRATES

IDEAL FOR RESEARCH AND PRODUCTION

We have over 40 years of experience in the manufacture of coating equipment, both for industrial production and for research and development. Thanks to this expertise, we have managed to supply over 140 vacuum coating systems for smaller substrates to our customers.

Based on various modular assembly systems, we offer flexible and customized systems in batch, load-lock, cluster or inline configuration. They are suited for silicon wafer-based products, three-dimensional objects and substrates with a coating width of up to one meter.

These systems can be applied in research and development and for production purposes in the semiconductor industry and sensor construction. They can also be used to manufacture products with optical precision coatings, micro-opto-electro-mechanical systems (MOEMS) or MEMS.

Our flexible systems for small substrates use all the important vacuum thin-film technologies such as PVD and PECVD. Beyond that, they can also apply thermal pre- and post-treatment solutions, etching methods with electron or ion beams and HIPIMPS and ALD technology.

The modular design of the systems ensures that they can be ideally tailored to technology and productivity requirements. VON ARDENNE offers suitable upgrades and supports customers with a broad service portfolio.

CLUSTER SYSTEM

coating system for small substrates



RESEARCH & DEVELOPMENT

VON ARDENNE permanently develops other innovative technologies and applications in which ultra-thin functional layers provide certain benefits.

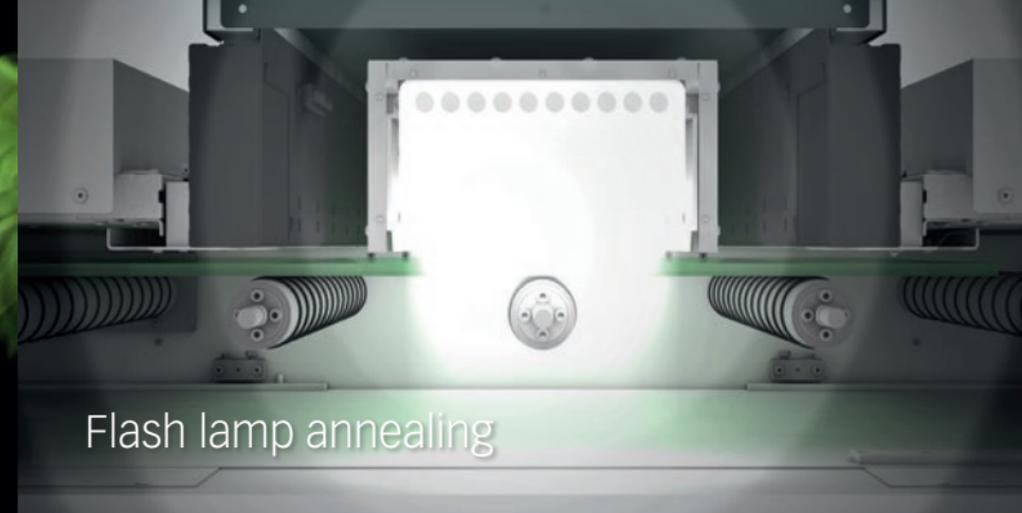
The responsible use of natural resources is one of the main driving forces behind our development of new systems and processes.

That is why our engineers are constantly seeking solutions that will enable our customers to manufacture the products of the future on an ecologically and economically sustainable basis.

We are currently looking into the development of technologies and improvements in coatings for:



OLED (organic light-emitting diodes)



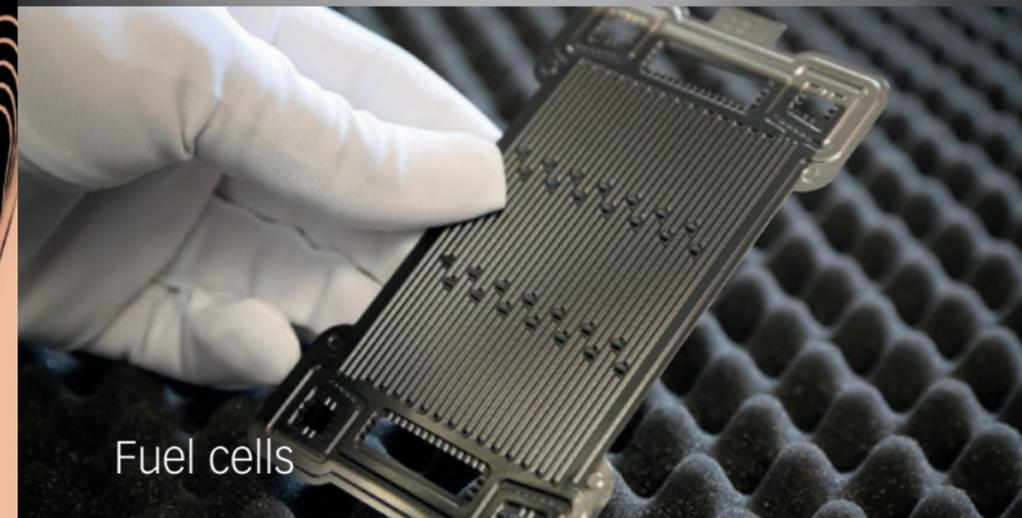
Flash lamp annealing



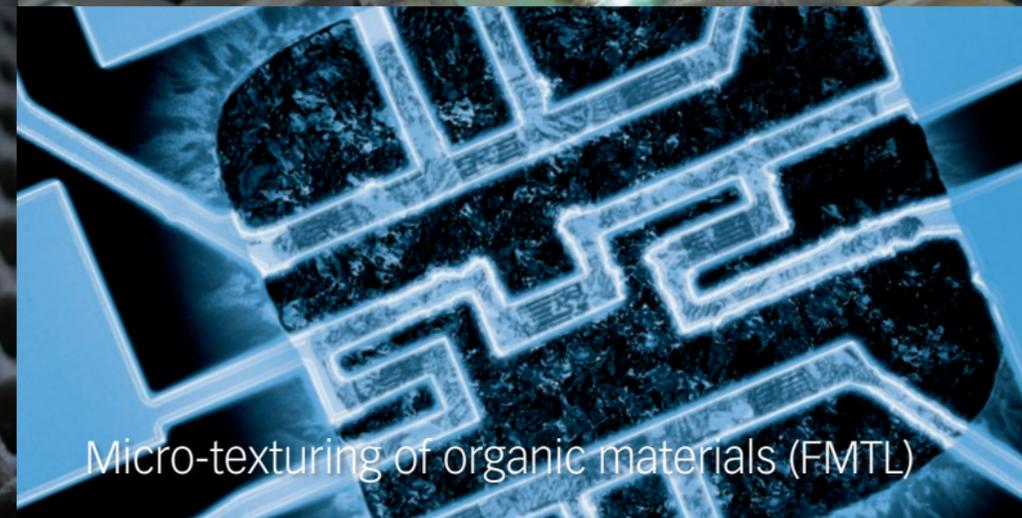
Flexible glass



Lithium ion batteries



Fuel cells



Micro-texturing of organic materials (FMTL)