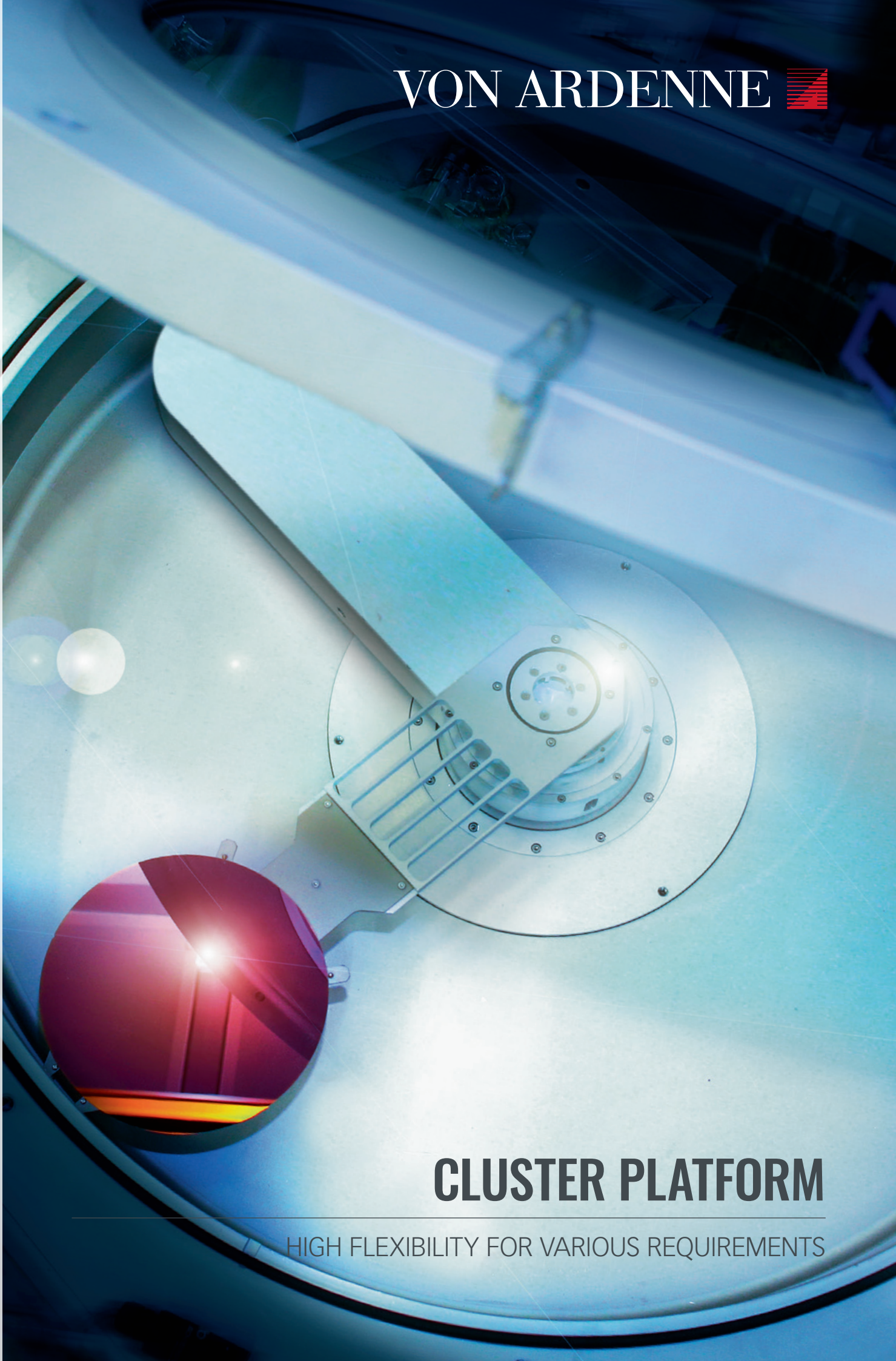
VON ARDENNE

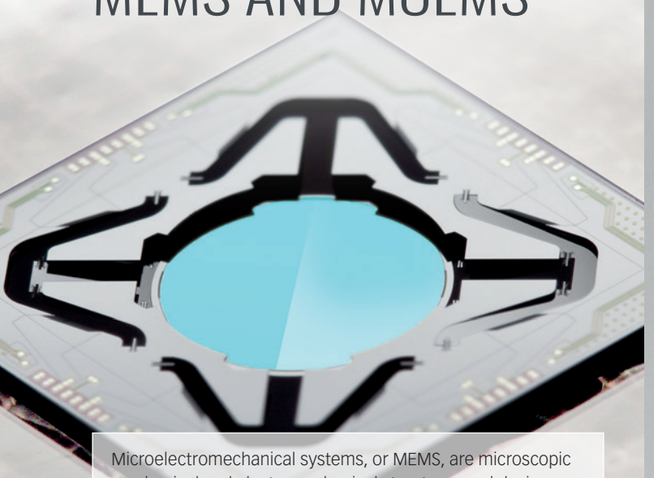


CLUSTER PLATFORM

HIGH FLEXIBILITY FOR VARIOUS REQUIREMENTS

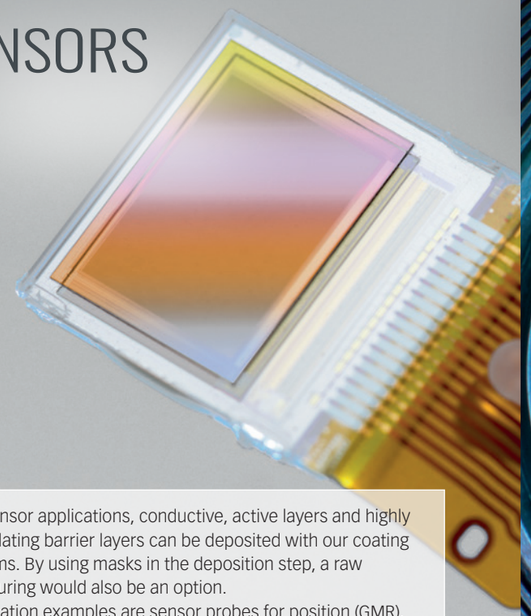
Applications

MEMS AND MOEMS



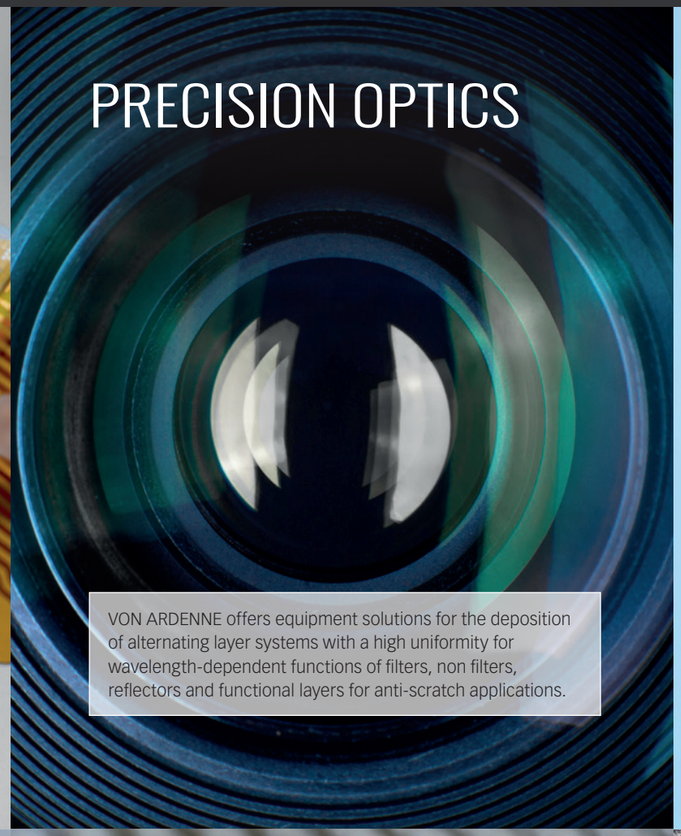
Microelectromechanical systems, or MEMS, are microscopic mechanical and electromechanical structures and devices. For customers who are active in this technology field, we offer equipment for the manufacturing of micromirror arrays for industrial applications. We also offer equipment solutions for creating microoptoelectromechanical systems - MOEMS.

SENSORS



For sensor applications, conductive, active layers and highly capsulating barrier layers can be deposited with our coating systems. By using masks in the deposition step, a raw structuring would also be an option.
Application examples are sensor probes for position (GMR), distance, pressure, temperature, resistance etc.

PRECISION OPTICS



VON ARDENNE offers equipment solutions for the deposition of alternating layer systems with a high uniformity for wavelength-dependent functions of filters, non filters, reflectors and functional layers for anti-scratch applications.

MEDICAL APPLICATIONS

We provide coating systems that are able to coat three-dimensional objects with metallization layers or barrier systems. These machines benefit from a special substrate holder, and are suited for medical applications such as electrical contacts of heart catheters or the encapsulation of circuits.

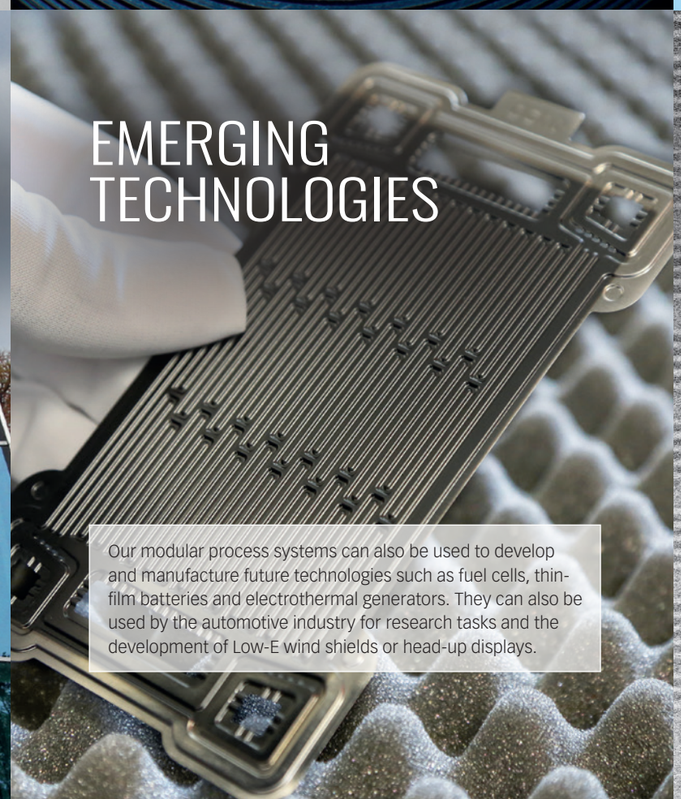
OLED

VON ARDENNE provides different systems for small-scale and mass production focusing on the deposition of the active layer with proprietary organic evaporation sources. Furthermore, we can provide systems for metallization in combination with a mask structuring process. Beyond that, our systems can be used to create barrier systems.
The major applications for OLEDs are smaller displays, digital signage and lighting.

PHOTOVOLTAICS / ARCHITECTURAL GLASS

For the photovoltaics and architectural glass industry, we offer equipment for R&D purposes and for the optimization of existing layer stacks on mass production tools. Using our modular process systems at the R&D stage facilitates the transfer to bigger VON ARDENNE production equipment for high-volume production.

EMERGING TECHNOLOGIES



Our modular process systems can also be used to develop and manufacture future technologies such as fuel cells, thin-film batteries and electrothermal generators. They can also be used by the automotive industry for research tasks and the development of Low-E wind shields or head-up displays.

RESEARCH & DEVELOPMENT

We also provide systems for all basic research tasks that require sophisticated vacuum coating equipment. Our ability to provide the most suitable setup is based on our long-term experience as a supplier for research facilities in Germany and abroad.

Key Features

Based on the experience of more than 45 years in magnetron sputtering and over 60 years in evaporation, we have incorporated a broad scope of features into VON ARDENNE modular process systems. Our modular process systems use all the important vacuum thin-film technologies.

Beyond that, they can also apply various pre- and post-treatment methods. On top of that, there are many options for monitoring, handling and control. You can see all the key features of our systems in more detail in this brochure.

PRE-/POST-TREATMENT

- Heating
- Cooling
- Degassing
- Etching (ion beam, RF-/-DC-bias, sputter etcher)
- Surface activation (glow discharge)

SUBSTRATE HANDLING

- Single substrate
- Magazine
- Substrate flip station
- Mask
- Automatic substrate transfer by vacuum robots
- Cleanroom compatible
- Aligner

COATING PROCESSES

- Sputtering, planar
- Sputtering, confocal
- Sputtering with rotating magnet field
- Evaporation (thermal, e-beam)
- Plasma-enhanced chemical vapor deposition (PECVD)
- Spurring double ring cathode
- Hot wire
- Other process technologies on request

PROCESS CONTROL AND MONITORING

- VA PROCOS 2 for reactive magnetron sputtering
- Plasma emission monitor (PEM)
- Temperature logger (e.g. with pyrometer)
- Deposition rate monitoring & control
- Measurement of optical layer properties (transmisson, reflectivity)
- Comprehensive process data logging

CONTROL

- Manual, semiautomatic or fully automatic
- SECS / GEM interface
- User management
- Trend view

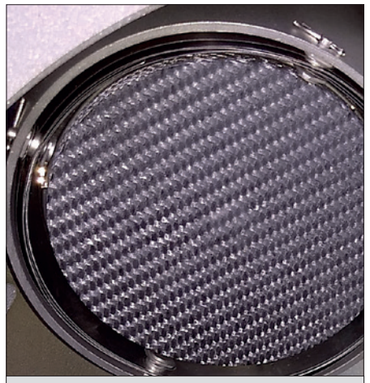
Key Components

The success of our modular process systems is based on their highly flexible and broad configuration range, our technological experience and know-how. Another basis for the success of these systems are our proprietary key components that we manufacture in-house.

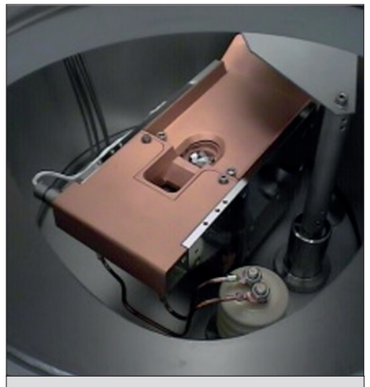
Depending on the required tool configuration, a VON ARDENNE system may include one or more of the listed components. Due to their modular design, the systems can also be upgraded or retrofitted with these components after the initial system installation.

Glow Discharge Device

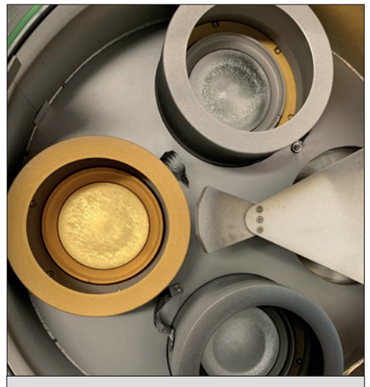
High-Performance Magnetron



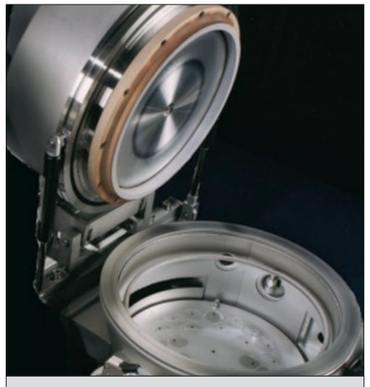
Heater



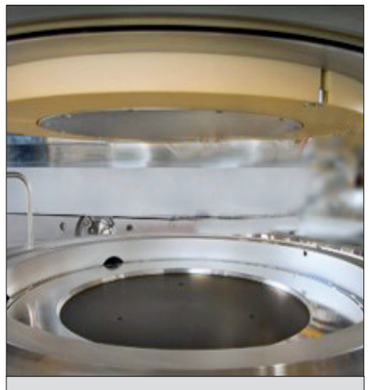
Electron Beam Evaporator



Circular Magnetron

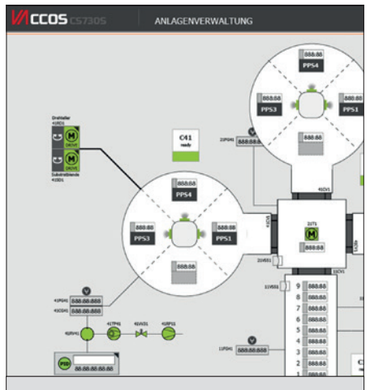


Circular Magnetron



Circular PECVD Source

VA PROCOS 2 Process Control System

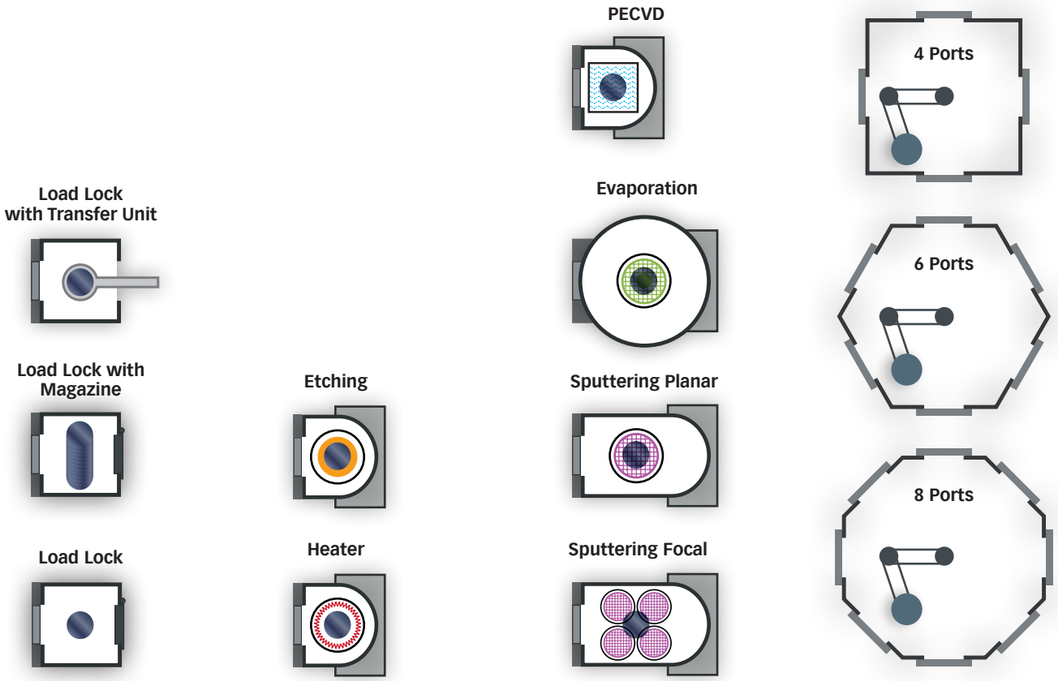


VA CCOS Coating Control System

Cluster Systems

Modular, flexible & cost-effective

Our cluster systems are based on a platform with many modular units. Therefore, every tool can be configured according to your specific applications. On top of that, special features can be integrated to meet your demands. Thanks to this flexibility, VON ARDENNE cluster systems will help you reduce your cost of ownership.



Loading/Unloading Station

The entry load lock chamber enables substrate loading without venting the process chambers of the system.

Different versions are available featuring single substrate storage or a substrate magazine.

A load lock with a transfer unit can optionally be equipped with a heating or/and a glow discharge module.

Pre-/Post-Treatment Chambers

The pre-treatment chambers can be fitted with components for preparing the substrate for the coating process such as: glow discharge device, inverse sputter etcher, Ion source or heater.

The heater can be combined with all the other components mentioned here.

Coating Chambers

The coating chambers can contain different process modules.
The available coating processes are sputtering (planar or focal), thermal and e-beam evaporation and PECVD.

For sputtering, the process chambers can be used with standard VON ARDENNE planar magnetrons, magnetrons with a rotating magnetic field or third-party magnetrons, e.g. double ring magnetrons (Fraunhofer FEP).

Additional components such as heaters and measuring instruments for monitoring or controlling the process can also be integrated.

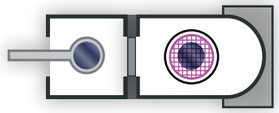
Transfer Chambers

The transfer chambers are equipped with an automatic handling system, which enables a safe transport of the substrates and carriers through the individual chambers of the system.

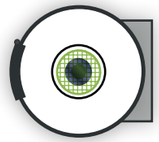
For a higher throughput, 6- and 8- port chambers can be equipped with double-arm robots.

CONFIGURATION EXAMPLES

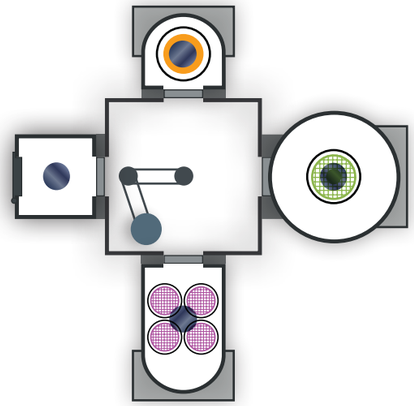
R&D TOOL
Sputter chamber with load chamber for one substrate



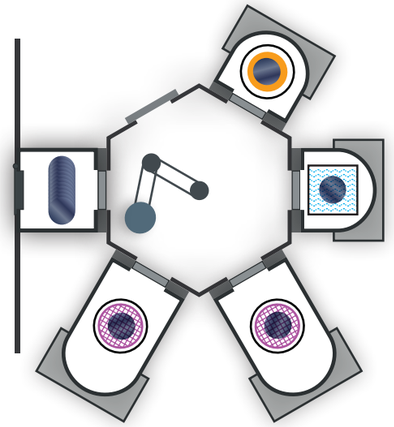
BATCH SYSTEM
Evaporation batch system for R&D and small-volume production



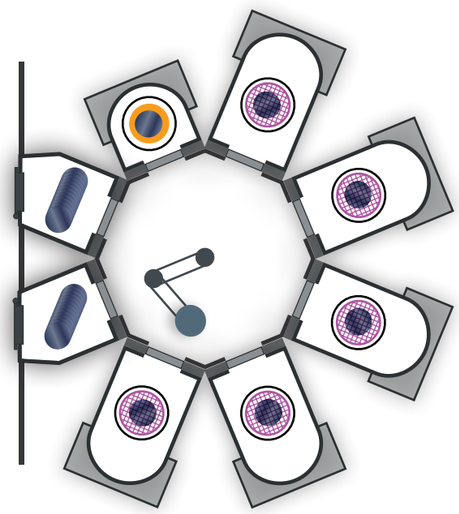
CLUSTER SYSTEM CS400ES
Cluster system for R&D and small-volume production



CLUSTER SYSTEM CS400S
Cluster system for R&D and medium-volume production

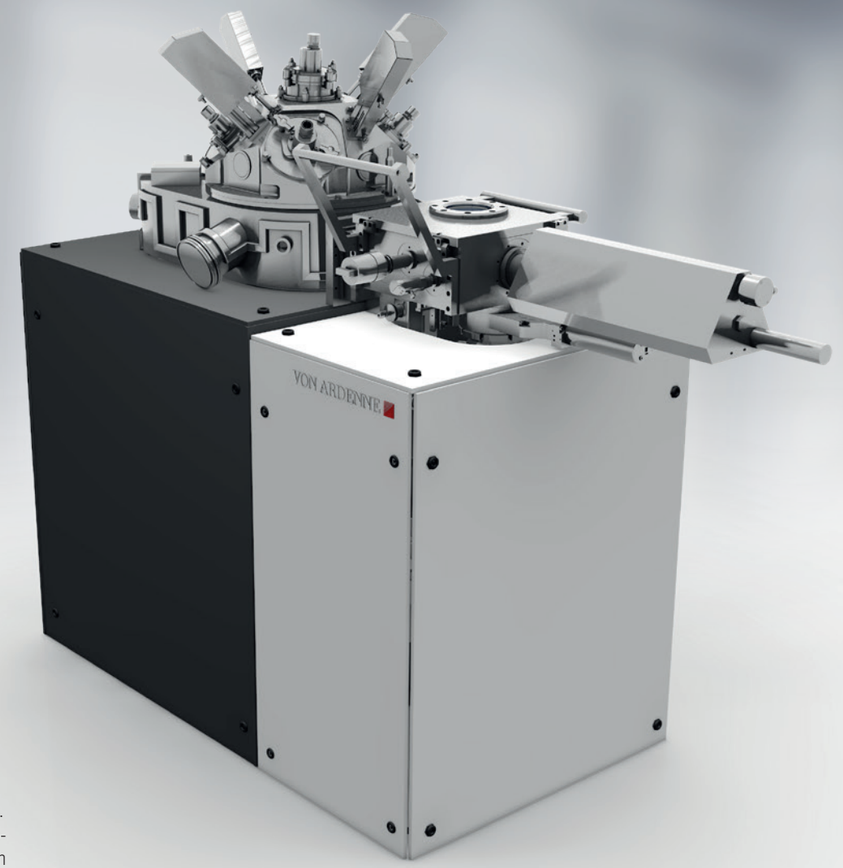


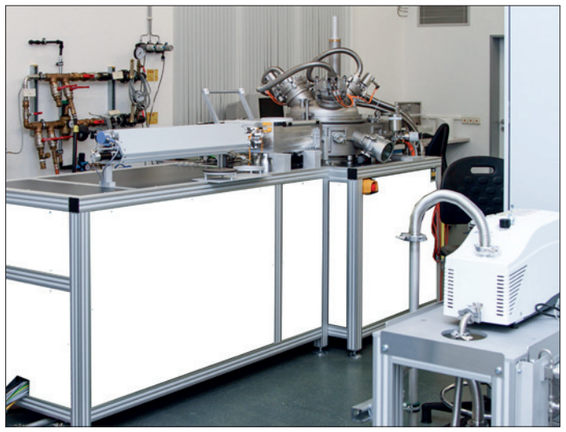
CLUSTER SYSTEM CS400PS
Cluster system for high-volume production

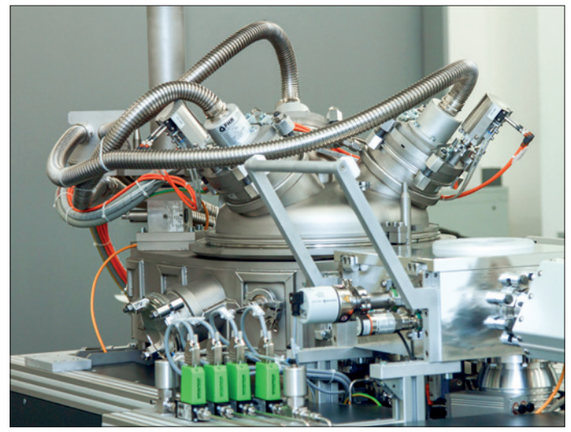


LS400 THE COMPACT ALL-ROUNDER

Ideal for smaller budgets in R&D and production







This very compact system can be applied for the deposition of layer systems in research and development and in small-scale production.

The up to four magnetrons of the system enable a highly flexible operation with various layer systems. Furthermore, the LS400 is suited for separate or co-sputtering. As these features can be combined with further options such as BIAS and monitoring systems, the LS400 is a true all-rounder.

The substrate handling is wafer- or carrier-based.

TECHNICAL DATA

Subject to change without notice due to technical improvement.

SUBSTRATE

Material	wafers (Si, GaAs,..), glass, polymers, metals
Coating diameter	up to 220 mm
Size (L x W)	up to 156 mm x 156 mm
Thickness	up to 50 mm

DEPOSITION SYSTEM

Deposition type	DC, pulsed DC, AC, RF
Magnetron type	confocal, planar, rotatable
Plasma source	glow discharge device, inverse sputter etcher (ISE) or ion source
Sputter arrangement	up, down
Substrate temperature range	RT/ 600 °C
Substrate potential	grounded / floating
Number of independent process gases	4 (e.g. Ar, Ar/O_2, N_2, O_2, H_2)

TRANSPORT

Type of transport	electric linear transfer unit

SYSTEM CONTROL & SOFTWARE

Hardware	industry PC
User interface	Windows 10 with WICON control software
MES link	SECS/ GEM

DIMENSIONS AND WEIGHT

Depending on version (200/600) and configuration

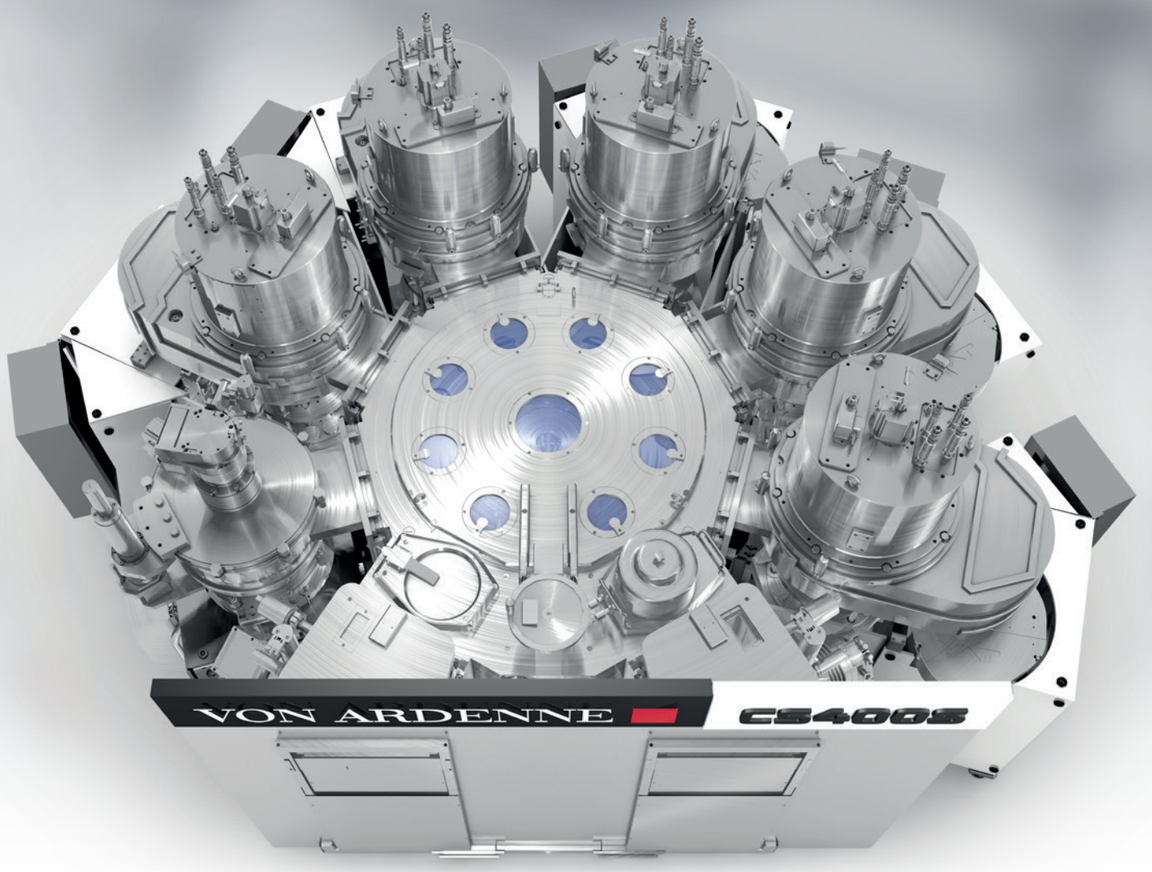
Total system size (L × W × H)	2700 mm x 900 mm x 2100 mm
weight	600 kg

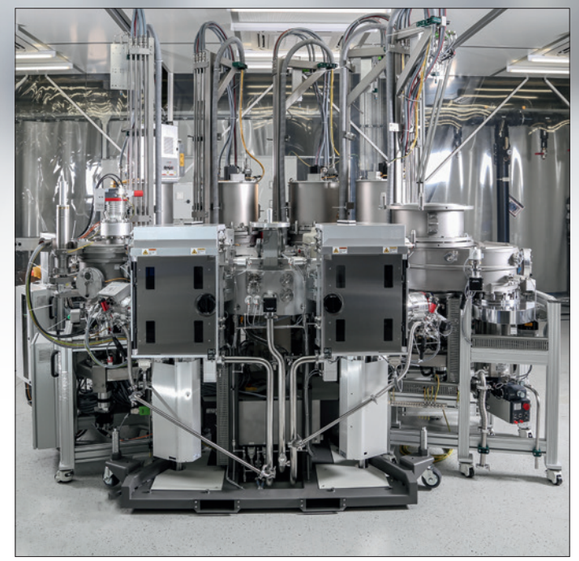
OPTIONAL

Plasma pre-treatment, process technology, VA PROCOS process control system, more on request

CS400 MEMS CLUSTER SYSTEM

Volume production system





The CS400 is especially suited for the deposition of highly reflective layer systems for MEMS and MOEMS (micro(opto)electromechanical systems). These layer systems are, for instance, micromirror arrays tailored for industrial applications. Thanks to the cluster design of the CS400, several consecutive layers can be deposited in-situ, without removing the substrate from the vacuum.

The system enables coatings with exceptionally high precision with regards to layer quality. It also enables a long-term stable process and a quick sputter pressure control system.

TECHNICAL DATA

Subject to change without notice due to technical improvement.

SUBSTRATE	
Material	wafers (Si, GaAs,..), glass, polymers, metals
Coating diameter	up to 220 mm
Size (L x W)	up to 156 mm x 156 mm
Thickness	up to 50 mm

DEPOSITION SYSTEM	
Deposition type	HIPIMS, DC, pulsed DC, AC, RF
Magnetron type	confocal, planar, rotatable
Plasma source	inverse sputter etcher (ISE) or ion source
Sputter arrangement	up, down
Substrate temperature range	RT/ 800 °C
Substrate potential	grounded / floating
Number of independent process gases	4 (e.g. Ar, Ar/O_2, N_2, O_2, H_2)

TRANSPORT	
Type of transport	automatic by robot

SYSTEM CONTROL & SOFTWARE	
Hardware	industry PC/ SPS module
User interface	Windows 10 with WICON control software
MES link	SECS/ GEM

DIMENSIONS AND WEIGHT	
Depending on version and configuration	
Total system size ca. (L × W × H)	2600 mm x 3200 mm x 2100 mm
Weight	2500 kg

OPTIONAL

Process technology, VA PROCOS process control system, more on request

OUR STRENGTHS

IN-HOUSE TECHNOLOGY & APPLICATION CENTER

- Sample coatings of customer applications
- Development of customized layer stacks
- Product & process verification and optimization
- Testing of new technologies and components

PROFESSIONAL SIMULATION SUPPORT

We offer professional simulation technology to ensure best process quality with regards to plasma, heat and cooling. Furthermore, our simulation tools help demonstrate, develop and improve layer properties and define or optimize processes, details and the performance of our systems.

GLOBAL PROJECT EXPERIENCE

VON ARDENNE equipment is used in over 50 countries.

We have established an installed base of hundreds of coating systems worldwide, ranging from small tools to equipment for large-area coating applications for several markets.

COMPREHENSIVE SERVICE PORTFOLIO

- VON ARDENNE services hubs around the world
- On-site service (on request)
- Remote access from our technology department (if required)
- Regular technical and technological trainings offered
- Spare & wear part warehouse close to customers
- Lifecycle extension of wear parts

CLOSE PARTNERSHIP

VON ARDENNE entertains a close network of partners for even more profound R&D work and to identify future technologies. It consists of:

- Fraunhofer Institutes such as IPMS, FEP, IST and ISE
- Institutes of the Helmholtz Association (Jülich, Berlin)
- Universities (Kiel, Dresden, Sheffield)
- Companies such as FAP GmbH, scia Systems GmbH

UPGRADES & RETROFITS

As soon as your business is growing, your VON ARDENNE equipment will grow accordingly - thanks to its modular design and the upgrades we provide. We will also supply you with the necessary technology upgrades if you decide to change your applications.

Furthermore, when your equipment is ageing, we will retrofit your systems with new components, no matter if they are VON ARDENNE or third-party machines.

PRODUCT TOPICS | PRODUCT INDEX | COMPO-NENTS

www.vonardenne.biz

WHO WE ARE & WHAT WE DO

VON ARDENNE develops and manufactures industrial equipment for vacuum 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, displays for smartphones and touchscreens, solar modules and heat protection window film 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 made by 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.

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ENGLISH 05/2022