

Picture of an electron beam with a power of 200 kW taken through the view port of an electron beam gun EH300V.



VON ARDENNE 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, absorbers and absorber tubes for solar-thermal power plants, reflectors for lighting systems, 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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ADVANCED MELTING & COATING EQUIPMENT

HIGH-POWER ELECTRON BEAM GUNS

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HIGH-POWER ELECTRON BEAM GUNS

EH150V/EH300V/EH800V

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

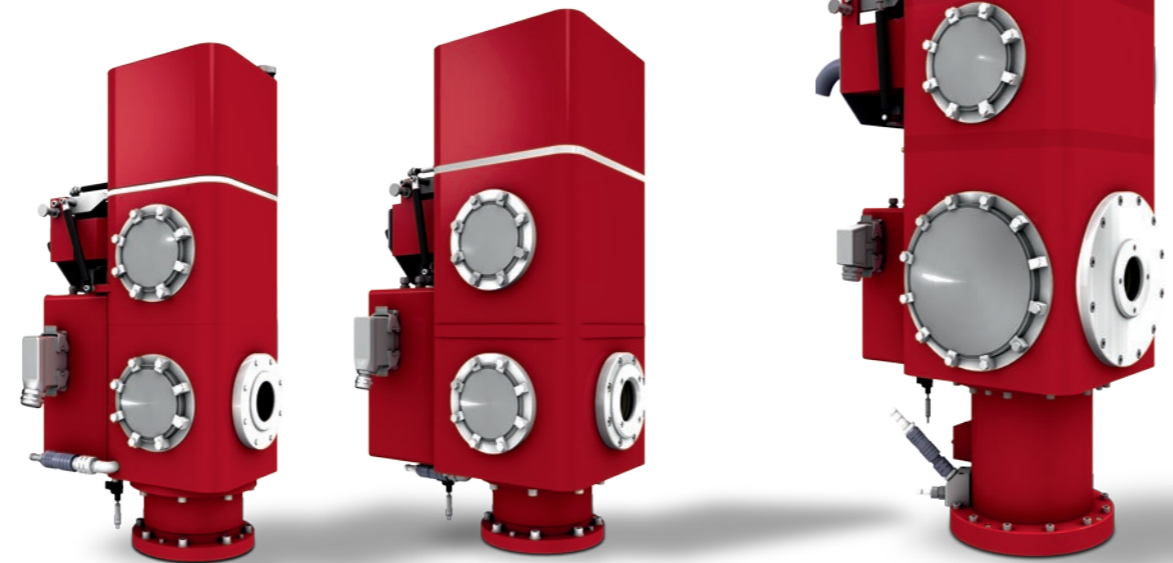
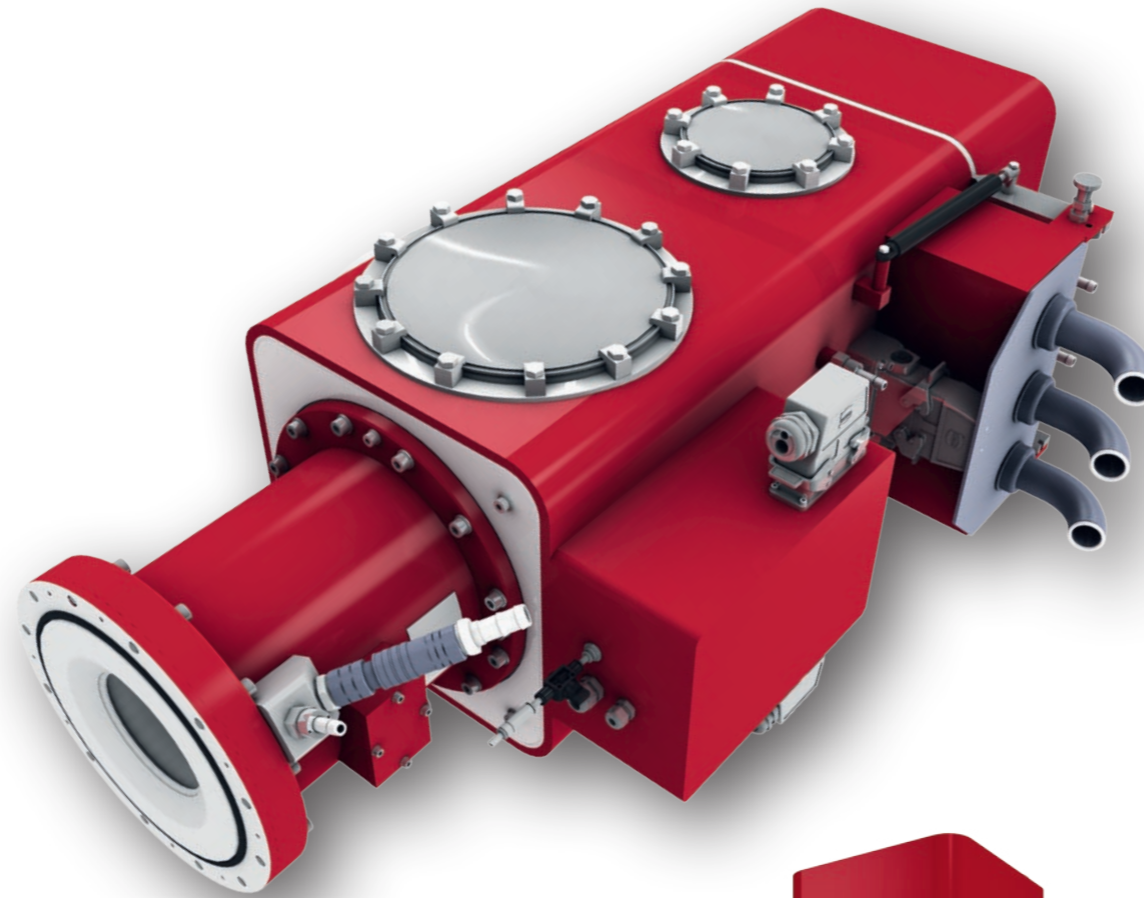
We work on the continuous improvement of our key components at our development center for electron beam technologies. This is where we produce and test our high-quality electron beam guns.

APPLICATIONS

- 1 High-rate **evaporation** of metals, alloys and compounds
- 2 **Melting** of metals, alloys and compounds
- 3 **Heat treatment** of different materials, especially metal strip (preheating in evaporation plants, annealing)

FEATURES AND BENEFITS

- 1 Power control by means of a patented VARIOCATHODE
- 2 High degree of pressure decoupling
- 3 Internal valve to separate EB gun from process chamber
- 4 Quick and simple changing of cathode plug
- 5 Ease of handling and maintenance
- 6 High reliability
- 7 High acceleration voltage up to 60 kV
- 8 Magnetically self-focusing beam



Electron beam gun **EH150V**

Electron beam gun **EH300V**

Electron beam gun **EH800V**

TECHNICAL DATA

Subject to change without notice due to technical improvement.

	EH150V	EH300V	EH800V
Maximum beam power	150 kW	300 kW	800 kW
Beam power control range			
— Power control by VARIOCATHODE (space charge limited mode)	≈ 20 % to 100 %	≈ 20 % to 100 %	≈ 20 % to 100 %
— Power control by bombardment power (temperature limited mode)	0 % to ≈ 20 %	0 % to ≈ 20 %	0 % to ≈ 20 %
Maximum acceleration voltage	35 kV	45 kV	60 kV
Average life time of cathodes at maximum beam power	100 h to 200 h	100 h to 200 h	200 h to 300 h
Magnetic lenses	2	2	2
Number of X/Y coils	1	1	1
Maximum deflection angle			
1 kHz system (coil/amplifier)	± 40°	± 40°	± 45°
10 kHz system	± 25°	± 25°	± 25°
20 kHz system	-	-	± 40°
Minimum spot diameter (at distance of 1 m, maximum beam power and maximum acceleration voltage)			
— At process pressure of 5*10 ⁻² Pa	≈ 10 mm	≈ 15 mm	≈ 30 mm
— At process pressure of 5*10 ⁻³ Pa	≈ 15 mm	≈ 20 mm	≈ 50 mm
Maximum process pressure	≈ 5 Pa	≈ 5 Pa	≈ 2 Pa
Recommended size of vacuum pumps			
— Turbomolecular pump at cathode chamber	300 l/s	300 l/s	500 l/s
— Turbomolecular pump at intermediate chamber	300 l/s	300 l/s	1 600 l/s
— Roughing pump for both turbomolecular pumps	20 m ³ /h	20 m ³ /h	35 m ³ /h
Pump down time	< 10 min	< 10 min	< 15 min
X-ray leakage	< 1 μSv/h	< 1 μSv/h	< 1 μSv/h
Total cooling water consumption	0.5 m ³ /h	0.5 m ³ /h	2.2 m ³ /h
Compressed air supply (dry)	0.5 MPa	0.5 MPa	0.5 MPa
Height (with closed lid)	900 mm	1 010 mm	1 400 mm
Maximum radius (without vacuum pumps)	350 mm	350 mm	400 mm
Weight	150 kg	190 kg	550 kg
Connection flange of the gun	DN 160 ISO-F	DN 160 ISO-F	DN 250 ISO-F
Connection flanges for vacuum pumps:			
— Cathode chamber	DN 100 ISO-F	DN 100 ISO-F	DN 160 ISO-F
— Intermediate chamber	DN 100 ISO-F	DN 100 ISO-F	DN 250 ISO-F