

VACUUM SOLUTIONS FROM A SINGLE SOURCE

Pfeiffer Vacuum stands for innovative and custom vacuum solutions worldwide, technological perfection, competent advice and reliable service.

COMPLETE RANGE OF PRODUCTS

From a single component to complex systems: We are the only supplier of vacuum technology that provides a complete product portfolio.

COMPETENCE IN THEORY AND PRACTICE

Benefit from our know-how and our portfolio of training opportunities! We support you with your plant layout and provide first-class on-site service worldwide.

Are you looking for a perfect vacuum solution? Please contact us:

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www.pfeiffer-vacuum.com

NON-EVAPORABLE GETTER COATING

Special surface coatings for ultra-high vacuum applications



With our new sputter coating technology, we are now able to supply a wide range of NEG-coated vacuum vessels and components of different shapes and materials:

- Circular or elliptical tubes, straight or with bends
- Maximum length up to 10 m
- Typical diameters 16–100 mm
- Elbows, crosses, t-pieces and even bellows
- Vacuum chambers
- Stainless steel, aluminum and other substrate materials on request



Setup for non-evaporable getter coating of tubes, with planar magnetron sputter source

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NON-EVAPORABLE GETTER COATING

Sputtering is an established deposition technique to coat the inner surfaces of vacuum chambers and components with a thin film of non-evaporable getter (NEG) materials to equip them with autonomous pumping capacity.

Compared with conventional sputter coating processes, Pfeiffer Vacuum offers an alternative production technology. Our new planar magnetron sputter source simultaneously achieves a strong adhesion of thin-films on the substrate and a faster deposition.

In addition to a long-time experience in manufacturing vacuum vessels and components for ultra-high vacuum applications, Pfeiffer Vacuum now also provides complete NEG-coated solutions for highest demands.

Pfeiffer Vacuum's getter technology is based on well-known NEG materials consisting of Titanium (Ti), Vanadium (V), Zirconium (Zr). With our new coating technique, we achieve a homogeneous surface coverage with a strong adhesion, even in long bent tubes. The pumping effect starts already at low activation temperatures of 180 °C.

To meet our customers' requirements, we offer a complete production and quality control chain consisting of:

- Vacuum calculations and design, including finite element method (FEM)
- High precision chamber manufacturing
- Advanced welding technologies, for example laser welding or tungsten inert gas welding
- Cleanliness for ultra-high vacuum applications
- Visual surface inspection
- Helium leak detection
- Residual gas analysis (RGA)
- X-ray photoelectron spectroscopy (XPS)

Main applications

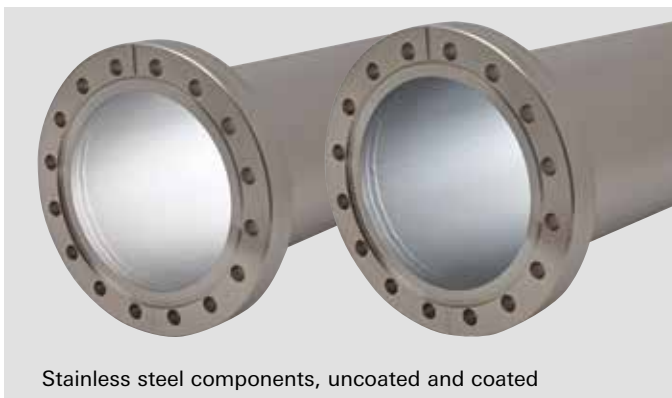
Thin-film coatings of non-evaporable getter materials are providing chemical pumping capabilities to the inner surfaces of vacuum chambers and components. This well-established technique provides many advantages to solve tasks, where stand-alone pumps cannot be used due to geometrical or process-related restrictions.

Main applications of NEG coatings are found in the fields of:

- Beam lines for accelerators
- Analytical instrumentation
- Mobile transport chambers
- Vibration sensitive experiments
- Thermal insulation

Customer benefits

- Complete customized solutions, including chamber production, non-evaporable getter coating and quality control
- Non-evaporable getter coatings with low activation temperature
- Wide range of part geometries possible with planar magnetron sputter source
- Strong adhesion of the coating to the substrate



Experimental results¹⁾

	Value	Unit
Activation temperature	200	°C
Activation duration	24	h
Pumping speed for H ₂	40	l/s
Pumping speed for CO	390	l/s
Adsorption capacity for CO	9 · 10 ¹⁴	molecules/cm ²
Specific pumping speed for H ₂	0.5	l/s per cm ²
Specific pumping speed for CO	5.0	l/s per cm ²

¹⁾ Measurements have been performed with a coating tube DN 100 CF, 500 mm length, material stainless steel, 1 µm thickness of non-evaporable getter film