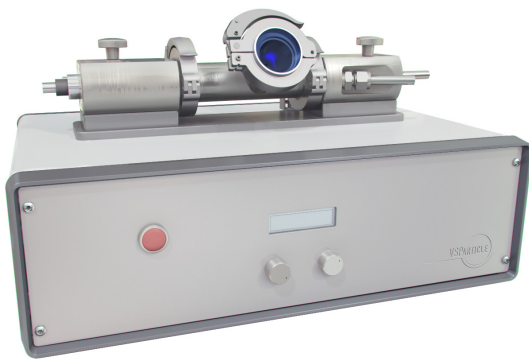


VSParticle strives to help those who think beyond the limit and look for new material solutions by making particle generation as easy as the push of a button

Introduction

VSParticle manufactures desktop nanoparticle generators for research applications using spark ablation technology. Developed within the TU Delft in the Netherlands, we apply over 20 years of research experience to make nanoparticle generators that produce inorganic particles with a focus on the 0-20 nm size range.

Our generators enable a high degree of control over **particle size** (monodisperse), **purity** (no contamination of reaction materials), and particle **composition**. It is a cost effective and easy (plug and play) way of producing nanoparticles for research applications.



Safety of the particle generator

We make it safer for you to work with nanoparticles by using a closed reactor system that can quickly and easily be dismantled for cleaning and maintenance. The use of inert gases reduces risk of pyrophoricity and can be filtered out of the system (and reused) when production is complete.

The closed system is also designed for high purity with an inner chamber containing no polymers near the ablation zone. The gas-based process eliminates the need for chemicals/surfactants or precursors, thus there are no polluting by-products formed during production. The particles are produced as an aerosol, allowing you to choose the most suitable deposition method.

Target markets

Validated applications (see below)

- Catalysis, synthesis of active materials
- Microelectronics, conductive wires

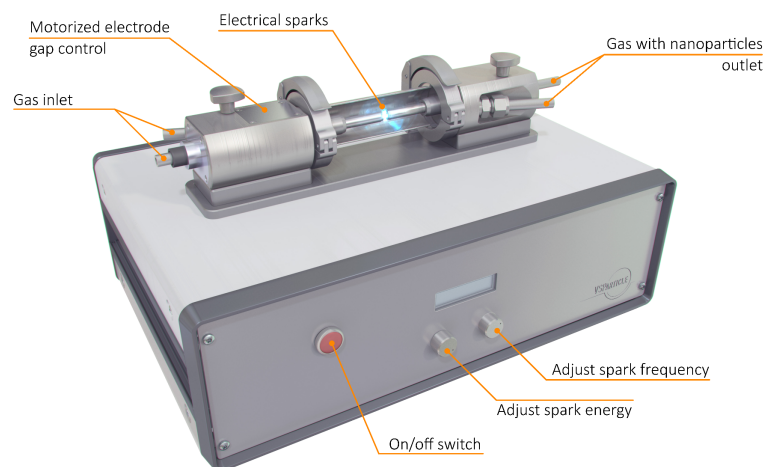
Possible applications:

- Healthcare, new treatments, imaging
- Toxicology, hazards of nanoparticles
- Material science & new materials
- Filter validation for (semiconductor) industry
- Lubrication, decrease friction
- Coatings, for wear and corrosion resistance
- Batteries, higher energy capacity
- Fuel cells, higher efficiency
- Photovoltaics (PV) panels, higher efficiency

Our solution

Instead of offering particles in stabilized liquid or powder, we enable you to make particles 24/7 on location, at the push of a button, with the VSP Generator One (VSP-G1).

The VSP-G1 is designed for the easy production of inorganic nanoparticles ranging in 1 atom to 20nm in size from conductive materials. By adjusting gas flowrate, spark energy and spark frequency, you are able to control the size and production rate.

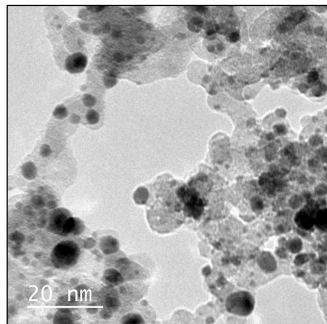
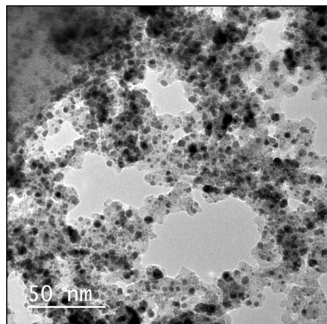


VSPARTICLE

Validated applications

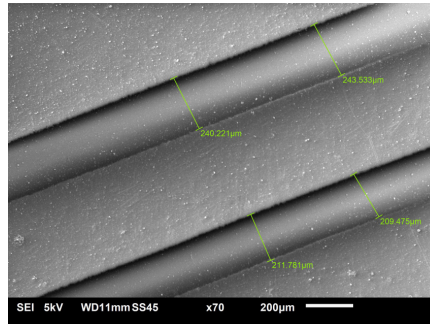
Catalysis:

The VSP-G1 enables the production of pure particles without contamination of any liquid/surfactant. With the same system you can make the porous oxide support as the highly monodisperse catalyst material at the push of a button.



Microelectronics:

Using the VSP-G1 and copper electrodes it is possible to print conductive wires/tracks of nanoparticles. Applications for this technology are high quality sensors, printed electronic circuits on a micron scale and flexible electronics.



Supported electrode materials

- Noble metals: Pt, Au, Ag, Ru, Rh, Rd, Ir, W
- Other: Cu, Al, Fe, Mg, Ti, V, Nb, Cr, Mo, Mn, Co, Ni, Zn, Ga, Ge, Si, C, Pb, Ag, Cd, In, Sn, Sb
- Alloys: Inox, Cu-Ni, Cr-Co, Au-Pd, Ag-Pd
- Various oxides and doped materials: upon request.

Operational specifications

- | | |
|-------------------------|---|
| • Operating pressure | Atmospheric pressure |
| • Operating temperature | Room temperature |
| • Flow rate | 1-30 L/min |
| • Gas | Supported: Ar or N ₂ (recommended purity 5.0) Contact us for more info |
| • Electrode Material | Comes with Cu electrodes. See above for more recommended materials. |
| • Primary particle size | 1 atom to 20 nm |
| • Ablation rate | ~0.01-100 mg/h (material dependent) |
| • Concentration | 10 ⁸ -10 ¹¹ cm ⁻³ |

The VSP-G1 is designed for a broad operating window, making it suitable for applications ranging from cluster research to materials science. For information on industry or bulk applications, please get in contact with us.

More information? VSP-G1 Quotation?

Get in contact!

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VSParticle

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