Schunk Carbon Technology

The carbon-based diamond electrode by Schunk

Modern wastewater treatment has never been this economical and efficient
A real jewel in industrial wastewater treatment

For the first time, Schunk’s innovation coating technology allows diamond electrodes to be produced on the basis of an especially economical carbon substrate. The result: highly efficient purification processes at remarkably lower acquisition costs and great freedom in the customer-specific layout of electrodes and cells.

Diamond electrodes set technological benchmarks in the treatment of wastewaters and many other contaminated fluids. Compared to conventional purification processes and electrodes, diamond electrodes offer a much broader range of applications, are very corrosion-resistant and additional oxidizing chemicals become superfluous.

The substrate makes the difference

The technology with diamond electrodes up to now relies on niobium as a substrate. The issue: besides high material-related manufacturing costs, the availability for a satisfactory supply to customers is very limited.

Schunk replaces the niobium through carbon-based substrates. Besides graphite and CFCs, ceramics such as SiC and SiSiC are also available. This results in lower material costs and guarantees the availability of materials, while also ensuring excellent purification performance.

Flexibility in design for a broad spectrum of applications

The mechanical processing options of our substrate as electrically conductive solids in combination with versatile coating variations open up maximum freedom in electrode design and in application-specific flexibility.

Besides industrial wastewater treatment, there are also potentials in the synthesis of oxidizing agents and analysis processes.

Technological competence for a clean result

Our core competences in carbon and ceramic materials, their application-specific flexibility as well as our existing and coating processes, are the basis for excellent results.

For this, know-how in multi-layer technology from electro-chemically stable intermediate layers and diamond coating plays a central role. In production, we combine all steps from engineering to substrate purification all the way to coating to create an efficient, high-quality process.

Schunk has the advantages of diamond electrodes...

- Largest known overvoltage for oxygen and hydrogen development.
- Close to 100% electrical efficiency for the production of OH radicals in water.
- High corrosion resistance in diamond coating.
- No chemicals need to be used or stored.
- Safe decomposition of hazardous materials at any time, even at varying waste water compositions.
- Simple and convenient technical handling.
- Use as a cathode and anode possible.
- Suitable for batch and continuous in-line processes.
- Reduced to one economical denominator.
- Lower costs: replaces usual niobium substrates on the market by using graphite, CFC or technical ceramics.
- High availability of materials: carbon-based substrates can be produced in large quantities.
- More flexible designs: customized electrode and cell designs through simpler mechanical substrate adaptations.
- Broad spectrum of applications: safety in possible coating combinations enable electrode executions for a wide variety of applications.
- Customized development: rapid prototyping for fast, economical adaptation to the type of application.
- Solid competence in production: covers the complete process chain from the design to material purification, coating and packaging.
- Highest level of purity: purification of substrate materials, for example for the semiconductor and pharmaceutical industries.

A new level of quality in wastewater treatment

This new technology is predestined for application areas in industrial wastewater treatment where, based on the level of pollution, conventional methods cannot be used or only at a very high cost. At the same time, the purification process should be as non-hazardous as possible for the people and the environment. This also holds true for the disinfection and hygienization of process waters—from cooling water circuits to ultra-pure water systems.

Set-up of a flow-through cell for electro-chemical wastewater treatment or synthesis
Schunk Carbon Technology
Schunk Carbon Technology: Always at your side.

Schunk Carbon Technology focuses on development, manufacture and application of carbon and ceramic solutions. It combines innovative spirit and technological expertise with exceptional customer service to provide a range of products and services unique to the market. In Schunk Carbon Technology, you have a partner who can offer all the technological possibilities of an international company and implement ideas custom-tailored to your needs, both for high-volume industrial markets and for highly specialized niche markets. After all, this is our commitment: Ahead in Carbon Technology. Closer to your Business.

A Schunk Group division.
Enabling, idea-driven, cooperative – if you hope to apply technology to develop better products and capture new markets, we can help. The Schunk Group has been supporting customers with innovative technologies since 1913. As an idea-driven technology company, innovation is fundamental to our culture. We forge long-lasting, cooperative working relationships with our clients.

You will find our custom-tailored high-tech products and systems in markets such as carbon technology and ceramics, environmental simulation and air conditioning, sintered metals and ultrasonic welding. The Schunk Group is active in a large number of key industries, from automotive, rail, aviation and marine technologies to solar and wind energy, medical and electrical technology as well as the semiconductor industry. Our more than 8,100 employees in 29 countries are ready to serve you.