

Semiconductor Review

**GERMAN
SEMICONDUCTOR
SPECIAL
EDITION**



**Semiconductor
Review**
TOP 10
**GERMAN
SEMICONDUCTOR TECH
COMPANIES - 2023**

Plasmetrex

Revolutionizing Advanced Plasma Metrology

As a specialized, small-scale enterprise, Plasmetrex develops, manufactures, and sells control and diagnostic systems, encompassing hardware and software. The company's business segments cover plasma metrology equipment designed for etch and deposition in high-end semiconductor manufacturing, large chamber plasma control for photovoltaic and display manufacturing, and cost-effective plasma control for surface treatment.

Plasmetrex's Hercules® SmartM is a production-proven and robust plasma metrology system for all main plasma processes and related services that optimize measurement applications in the semiconductor manufacturing process. Unlike classical metrology systems that measure outside the process, Hercules® directly measures within the process chamber, hence giving much more meaningful results. Plasma chambers generally run through a complex machine certification process prohibiting future chamber modifications. The resulting conflict of measuring what is inside the chamber while not being inside this chamber is resolved by simply being part of the existing wall. Hercules® can do that because walls are important in plasma physics.

Hercules excels in process analysis, offering tailored solutions through a profound understanding of intricate manufacturing processes and providing insights for optimizing performance. With Hercules sensor systems, even older equipment can be made more effective by providing superior process control and overview.

It also takes center stage in predictive maintenance. Temporal and sensitive data from Hercules are used to provide critical information via SECS/GEM, enabling clients to address potential issues before they escalate into costly accidents. This

includes addressing chamber mismatch, heavy process drift, and sudden yield loss. It also saves costs through higher mean time between cleans (MTBC), reducing scrap, and enhancing chamber matching.

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With Hercules® we go beyond traditional offerings by providing process control hardware and comprehensive support for specialized processes and preventive maintenance. With our Plasma-School we ensure clients have on-site specialists for a holistic understanding of their plasma processes

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Addressing global warming concerns, Hercules incorporates model-based process analysis, reducing fluorine-containing process gases. This aligns with environmental sustainability goals, showcasing dedication to responsible manufacturing practices.

In the service and consulting domain, Plasmetrex extends its 25 years' worth of expertise by providing qualifications for process and maintenance engineers in IC manufacturing, along with tailored consulting services for process, equipment, and metrology. These programs cover a spectrum from basic to specialized courses, including Deep Reactive Ion Etching (DRIE). Primarily catering to European clientele, including prominent German fabs, the company has also made significant inroads with global players such as Micron.

Though 40 percent of the processes in a typical fabrication facility involve plasma processing, and the majority of them use RF technology, most people involved in these processes do not have a full understanding of it.


Plasmetrex seeks to dispel the perception of radio frequency (RF) plasma as an enigma in the semiconductor industry by leveraging its deep understanding of



RF plasma processes and its RF-based plasma monitoring system to simplify the complexities associated with high-frequency technology. It has a team of specialists in plasma physics who are experts in RF processes, directly delivering tailored solutions to the fab floor and ensuring the company's commitment to maintaining a high level of specialization.

The Plasmetrex team substantiates their prowess with tangible success stories. Case studies, such as Samsung's groundbreaking feat in predicting critical dimensions (CD) values using Hercules plasma data, highlight the pivotal role of accurate and insightful data in advancing virtual metrology systems.

Another case study revolves around model-based FDC and chamber matching, demonstrating Plasmetrex's ability to assist clients in identifying the root causes of process issues. This involved leveraging measurement data for virtual metrology, predicting both X-ray and CD values for the plasma process.

Plasmetrex actively collaborates with research institutes and companies. Its commitment to driving scientific collaboration and knowledge transfer from the universities to the fab floor is evident through its connections with esteemed institutions like Ruhr-University Bochum and various Fraunhofer Institutes. 

Plasmetrex



The annual listing of 10 companies in Germany that are at the forefront of providing Semiconductor Tech solutions and impacting the marketplace