ERICA
VACUUM CLUSTER TOOL
FOR COMPLEX COATING AND STRUCTURING PROCESSES
Complex vacuum process chains can be simulated within the closed ERICA system. This makes it possible to carry out cost-effective technological development and feasibility studies of coating and structuring steps in any desired sequence. The five interlinked chambers in ERICA are equipped for pre-treating substrates, for vacuum-coating, as well as for modifying and etching these surfaces. The ERICA internal conveyor system is designed for flat substrates (silicon wafers, sheet glass, film, etc.) up to a diameter of eight inches and maximum thickness of 3.5 mm. The versatility of this prototyping system makes it ideal for technological development of complex process chains such as solar cell manufacturing, abrasion-resistant and optical coatings, as well as for etching features and modifying surfaces, for example.

**Technological capabilities of the ERICA cluster system**

- **Pre-/Post-treatment**
  - Sputter etcher
  - Solid ceramic heater (up to 500°C)
  - Hollow cathode (200 A/20 kW)

- **Sputter etching**
  - such as for cleaning wafers, removing oxide layers, and etching dopant layers

- **Heating/Annealing/Curing**
  - such as pre-warming substrates, drying liquid films, annealing TCOs, and layer activation

- **Coating**
  - pulsed electron beam deposition (PED)
  - plasma-enhanced chemical vapour deposition (PECVD)
  - (reactive) high-rate electron-beam vapor deposition (EB-PVD) up to 45 kW with supplemental plasma activation (up to 20 kW)
  - (reactive) magnetron sputtering

- **Interface Layers**
  - such as dielectric layers, diffusion barriers, adhesion promoters, conversion layers

- **Functional Layers**
  - such as solar absorbers, metallization, hard material layers, optical layer systems, layers as source of dopants

- **Protective Layers**
  - such as anti-contamination and anti-corrosion coatings, passivation layers, ARC/TCO layers

- **Texturing/Etching**
  - electron-beam lithography, masked coating, electron beam-induced deposition (EBID), electron beam-induced etching (EBIE)
  - such as area and selective doping of solar cells, recrystallization of amorphous silicon, layer activation, sintering particles

- **Layer and Surface Modification, Structuring**
  - Precision electron beam (focus diameter < 100 µm) with x-y positioning table and wide beam deflection (± 20°)

- **Perforating/Cutting**
  - such as monolithic interconnection of thin-film solar cells, trimming precision electrical components, perforating polymer and metallic foils

- **Engraving**
  - such as ID marks, engraving tools, electron beam-fired contacts (EBFC), texturing of metallic layers

- **Modifying**
  - such as area and selective doping of solar cells, recrystallization of amorphous silicon, layer activation, sintering particles
Applications

- Coating, etching and structuring steps in manufacturing solar cells and sensors, such as producing contact, barrier, and passivation layers, anti-reflection and transparent conductive oxide layers (TCOs), as well as monolithic electrical connections
- Coating and engraving of tools and small parts (such as sacrificial or enhancement layers)
- Metallization of plastics for decorative and electromagnetic-compliance (EMC) applications
- Multilayer polymer cross-linking for printed conductors

Our offer

- Development of technology and feasibility studies for complex vacuum process chains at low entry-level pricing
- Diverse pre-treatment and post-treatment processes as well as various coating and layering technologies together in a single, synergistic facility
- Broad technological range and adaptability to meet your process requirements
- Physical and chemical pre-cleaning with ultrasound cleaning installation
- Analytical monitoring capability
- Pilot runs

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Facility partner

CREAVAC-Creative Vakuumbeschichtung GmbH
We focus on quality and the ISO 9001.