

## **R&D cluster tool SAF: Simple, Adjustable, Flexible**

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### **ABSTRACT**

Research and development work, feasibility study and general academic work in the field of thin film technologies have a strong need for a simple, adjustable and flexible deposition tool that can dependably grow with a task or a project. Such a deposition tool must allow sample manufacturing from pure research to product prototyping for market evaluation of out-of-box technologies.

The SAF system, designed, offered and backed by Sidrabe is such a tool. The tool contains all the gathered experience and innovations in vacuum technology from an experienced and knowledgeable partner that seamlessly provides all the way from idea to production equipment.

The cluster tool is modular, expandable and flexible. Each chamber can be added and operated independently due to individual pumping, control and utility flange. Deposition chambers and sources are interchangeable due to identical design of the chambers and utility flanges. All chambers can operate simultaneously. The central chamber is equipped with 8 flanges for chambers of choice. The user is offered a system that is a easy and Simple tool in control and maintenance, is Adjustable to customized configuration and setup, and Flexible with a wide spectrum of possible technological processes. Options are to start with any solo process chamber, to cluster with necessary additional process chambers, to obtain customized arrangements and instrumentation, and to easily add additional chambers when needed.

Features include: substrate loading and unloading, storage and pre-treatment; deposition by Electron Beam evaporation, thermal evaporation, thermal sublimation, magnetron sputtering and other deposition processes; residual gas analysis and Mass Spectrometry; plasma emission monitoring; glove box; blanked-off flanges allowing customized instrumentation; handling of various substrates (metal, glass, plastic, ceramic) with standard size 50x50x5 mm; ion pretreatment; contact and contactless heating and cooling; creation of multi-layer stacks without venting; uniform coatings due to substrate rotation; debris-free coatings due to upward deposition; Base pressure  $10^{-7}$  mbar; process control.

A typical system with a central and 4 processing chambers has dimensions (LxWxH) of 3x3x2 m, a weight 2.8 t, installed power of 50 kW and a cooling water need of 2.7 m<sup>3</sup>/h.

The cluster tool was designed in collaboration with the University of Latvia, Institute of Solid State Physics ([www.cfi.lv](http://www.cfi.lv)), where one of fully equipped cluster tools is operating in the clean rooms of ISSP. Several single-chamber SAF systems are also used for R&D works by different European companies.