

**MonM06**

## **Ion beam sources for surface modification**

André Rosenkranz, Jens Landrock, Alfonz Luca, Margit Sarstedt

*Roth & Rau AG Business Unit MicroSystems*

*Corresponding author: André Rosenkranz, [andre.rosenkranz@roth-rau.com](mailto:andre.rosenkranz@roth-rau.com)*

The focus of the presentation is the optimization and development of ion beam sources for processing equipment in the area of micro and nanometer surface treatment. Therefore RF or ECR coupled ion beam sources with a multiaperture grid system are used. The development focus is on the beam intensity, the beam shape, the stability and reliability of the parameters. A distinction is made between focused grid systems for localized scanning etching technologies and homogenous broad beam sources. Referring to the presented sources the presentation includes one or two applications with their respective requirements for ion beam sources in such an industrial field. One industrial application is the IonScan series as a production ready tool for ion beam trimming with a collimated beam. The main application is tuning of the resonant frequency of SAW and BAW filters, where inhomogeneities over the wafer during the whole production line would lead to high spread of frequencies and sequentially to a high failure rate. The issue during the development is the stability of the parameters during a twentyfour-seven process in an industrial field and the reproducibility of the parameters of wearing parts e.g. grid systems. Another application is the IonSys series, based on broad beam sources, for sensitive and well controllable deposition and etching processes. These etching processes are used for e.g. magnetoresistance nanopillars, facets etching and ion beam smoothing. The deposition processes are used for multilayer coatings, X-ray filters, optical elements, anti-reflective coating, highly reflective mirrors, sensors or gradient layers. Especially characteristic with the IonSys is the good etch rate and deposition uniformity that meets the standards of reproducibility and stability.