



TECHNOLOGY

High-Throughput Thin Film Fabrication Vacuum Flange

OVERVIEW

In high-throughput thin film experimentation, otherwise known as the combinatorial approach to thin film materials, a large number of samples with different compositions are fabricated together on an individual chip. Such chips/wafers/substrates are called combinatorial libraries. Alternatively, one may choose to make a sample where the composition of the deposited thin film is continuously varying across the chip. Such chips are called composition spreads. Combinatorial libraries and composition spreads are fabricated in order to rapidly and systematically search for new materials with enhanced physical properties. The physical properties of interest could be of a variety of nature. For example, one might perform this type of study to look for a new magnetic material, an improved composition with a high dielectric constant, or a superconductor with a higher transition temperature than those of known compounds.

Vacuum flanges are basic elements of thin film fabrication equipment. However, there is no present technology where all the required components are contained entirely in one vacuum flange. In fact, conventional technology consists typically of large equipment where different components, such as shutters and substrate heaters, are located on different flanges with designs that are often equipment specific.

Researchers at the University of Maryland have developed a high-throughput thin film fabrication vacuum flange that greatly facilitates high-throughput thin film investigation by integrating all the necessary components in a single vacuum flange to perform different types of spatially selective thin film fabrication on a given chip or wafer at variable temperatures. In the present invention, the single flange, which has a diameter as small as 6" in its outer diameter, contains all the crucial components necessary for performing high-throughput thin film experiments, making the invention extremely compact and portable. The flange can be mounted on any type of thin film fabrication vacuum equipment to convert it into high-throughput thin film fabrication equipment.

For additional information, please contact the Office of Technology Commercialization, University of Maryland, College Park. TEL: (301)405-3947. E-MAIL: otc@umd.edu.

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Additional Information

INSTITUTION

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CATEGORIES

- Industrial Processing

EXTERNAL RESOURCES

- [US Patent 7,084,445](#)

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