Tutorial PVD

Vacuum and its application for thin film processing

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Most of thin film processing techniques and treatments rely on stringent vacuum conditions. The increasing demand on new, improved and higher productive technologies in thin film processing for photovoltaics, microelectronics, energy storage and other come along with complex requirements for the vacuum conditions and techniques. In general, these conditions are defined while the technology is developed in research laboratories or departments. In large scale applications for productive use, the requirements are extended by topics like production reliability and efficiency, energy consumption, maintenance and other. Eventually, the successful realization of these requirements is a major challenge for machine manufacturers and operators.

This presentation provides an overview about many of these vacuum-related topics. Starting with the physical foundation of vacuum, the generation of vacuum will be discussed. Furthermore, different measurement techniques and their specific application are explained. During the commissioning or production, the operator must identify vacuum leaks, which is another topic in this presentation. Finally, different methods for the vacuum dimensioning as used by VON ARDENNE GmbH will be explained. This includes basic calculations, advanced simulation based on system dynamics and Monte-Carlo-methods.