HIGH-SPEED SPRECTROSCOPIC ELIIPSOMETRY AND ITS APPLICATIONS

Lars Jansen[a], **Gai Chin**[b]

[a]SCHAEFER TECHNOLOGIE GmbH, Robert-Bosch-Strasse 31, 63225 Langen, Germany

[b]ULVAC Inc., Mechatronics Engineering Department, 2500 Hagisono, Chigasaki, Kanagawa, 253-8543, Japan

As a comprehensive manufacturer of metrology tools and deposition tools, ULVAC developed an innovative high-speed spectroscopic ellipsometer for many deposition applications, such as PVD, CVD, ALD and others.

This novel spectroscopic ellipsometry can measure the thickness and optical constants of thin films at a dramatically fast speed. Its data acquisition time is as short as 10ms. It does not require any active components for polarization-control, such as a rotating compensator or an electro-optical modulator.

It created great opportunities for new applications of the spectroscopic ellipsometry in which the compactness, the simplicity and the rapid response are extremely important. It can be integrated into the deposition tool and successfully measure thin films in-situ and ex-situ. Obviously, those from PVD, CVD and ALD are some promising applications for this novel spectroscopic ellipsometry.

This presentation describes the principle, system configuration and creative efforts on developing a series of high-speed spectroscopic ellipsometers. Some of the novel applications will be also introduced, such as the PVD, CVD, ALD, EUV, OLED, MEMS and some measurement data of thin films from the semiconductor, flat panel display, and other industries.

Keywords: Spectroscopic Ellipsometry; High-order Retarder; High-Speed