Minimum Technical Requirements for a UV/VIS/IR Variable Angle Spectroscopic Ellipsometer System

The following is a list of technical specifications required for minimum operation of the requested ultraviolet/visible/infrared (UV/VIS/IR) variable angle spectroscopic ellipsometer system:

1. Hardware
    a. Spectral Range: 240-3200 nanometers
    b. Monochromator type: double chamber
    c. Resolution: Variable between 0.05nm and 5nm
    d. Wavelength Accuracy: <0.1 (240-1700nm); <1nm (1700-3200)
    e. Goniometer Range: 15-90 degrees
    f. Beam Size: <5mm (without focusing optics)
    g. Focusing optics with spectral range from 240 to 2400 nm.
    h. Spot Size using removable focusing optics: 100 microns
    i. The system shall include a camera to view the spot location on the sample
    j. Sample Mount: Vertical
    k. Ellipsometry Configurations: Reflection, Transmission
    l. Intensity Configurations: Reflection, Transmission
    m. Measurements Capabilities: Ellipsometry, Generalized Ellipsometery, Percent Depolarization, and Muellar-Matrix, Reflected and Transmitted Scatterometry
    n. Typical Psi accuracy: +/-0.05 degrees (240-2500nm); +/-0.1 degrees (2500-3200nm)
    o. Typical Delta accuracy: +/-0.10 degrees (240-2500nm); +/-0.20 degrees (2500-3200nm)
    p. The system shall include a heat stage capable of handling samples up to 2.5 cm x 2.5 cm (1" x 1") in size
    q. The temperature range of the heat stage shall be from -50 °C to 500 °C
2. Software
    a. The operation of the system and data acquisition shall be computer controlled and system shall include software for data acquisition, data analysis, optical simulations and system calibrations.
    b. The system shall include at least 2 copies of data analysis software, so it can be installed in more than one computer to perform data analysis remotely.
    c. Data analysis software shall be capable of determination of: Optical Constants (n and k), film thickness, and doping concentration
    d. Data analysis software shall include the following dispersion Models: Cauchy, Selllmeier, Loretnz, Gaussian, Tauc-Lorentz, and Cody-Lorentz
    e. Data analysis software shall be capable of performing optical modeling and fitting of multilayer films
    f. Shall include an optical constant library of 300+ materials