

REAL-TIME CONTROL OF CHEMICAL-MECHANICAL POLISHING PROCESSES USING A SHAFT DISTORTION MEASUREMENT

ABSTRACT

A method and apparatus are described for detecting an endpoint of a film removal process in which a film is removed using a polishing apparatus having a polishing surface (12) connected to a shaft (15). Deformation of the shaft, (15) resulting from torque caused by friction on the polishing surface (12), is detected. This detection is performed using either a sensor (201) mounted on the shaft (15), or by monitoring a phase difference between light signals reflected from two points on the shaft (15). A signal (203) is generated in accordance with the deformation of the shaft. A change in the signal (203) indicates a change in the torque, thereby indicating the endpoint of the film removal process. This arrangement permits real time and in-situ monitoring and control of the film removal process.

FIG.4