실리콘 웨이퍼 양면 연마 공정의 기구학적 모델링과 해석에 관한 연구

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A Study on Kinematical Modeling and Analysis of Double Side Wafer Polishing Process

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Abstract : Double side polishing process has been used for various industrial applications, such as polishing of semiconductor substrates and flat panel display glasses. In wafer manufacturing, double side polishing process is applied to improve wafer flatness and to minimize particle generation from wafers in device manufacturing processes, which is recognized as one of the most important processes. Whereas the kinematical modeling and analysis results of single side polishing, extensively used for chemical-mechanical polishing (CMP) in device manufacturing, are well investigated, the studies in conjunction with double side polishing are barely carried out, due to the complication of polishing system and the uncertainty of wafer motion in the carrier.

This paper suggests the derivation of kinematical model with consideration of carrier and wafer motion in double side polishing, and then presents the effect of kinematical parameters on material removal amount and its non-uniformity. The kinematical analysis results help to understand the double side polishing process and to control the polishing results.

Key Words : Double side polishing, Kinematical modeling, Material removal amount, Non-uniformity