

Study on force analysis for elastomer pad by single diamond tool

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Abstract

The chemical mechanical polishing/planarization (CMP) is a primary technology for fabricating semiconductor wafers and thin films. As part of CMP process, diamond dressing process plays vital role for regenerating a uniform pad surface topography both before and after CMP. In this study, the normal reaction forces have been measured during dressing action of soft elastomer pad on single-diamond pyramids at slow dressing speed. Furthermore, single diamond grit with the grit angle of 90° is determined to be most suitable for dressing process through 3-dimensional scanning the depths of scratching on the pad surface and force analysis. Results of this study not only estimate the effect of diamond shape with various orientations and dressing parameters during diamond dressing process, but it also can be applied to optimize the pad surface topography uniformity and calculate pad cutting rate.

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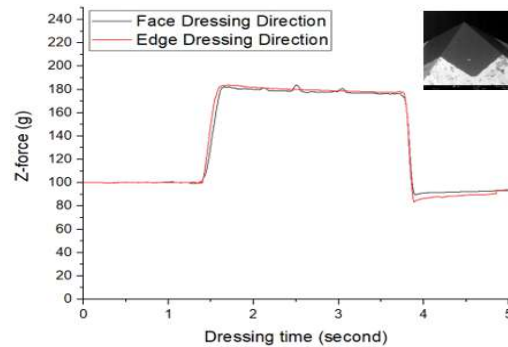


Fig.2 The profile of normal reaction force by single diamond grit of 90° .

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Topic Area: Consumables, equipment, and metrology



Fig.1 Experiment set up for single-diamond point dressing on PM5 machine.