

The effect of “elapsed time since cleaning” on the properties of anodically bonded wafers

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Anodic bonding is playing a vital part in the fabrication of Microelectromechanical Systems (MEMS) devices. The quality of the bonded wafer is the most crucial feature and it depends on many factors such as bonding parameters, flatness and unsurprisingly cleanliness of the wafers. This work is to study the effect of elapsed time since cleaning on the properties of anodically bonded micro-machined silicon and glass wafers. Silicon and glass wafers were inspected and the bow measurement on wafers surface was carried out in both directions, parallel and perpendicular to the flat of the wafers. Both wafers were cleaned using standard piranha cleaning ($\text{H}_2\text{SO}_4:\text{H}_2\text{O}_2$) prior to bonding. All wafers were cleaned at the same time but were bonded at different dates after cleaning. In total, twenty pairs of wafers were bonded. After bonding, optical microscopy was used to inspect any voids or defects at the bonded interface and bow measurement on bonded wafers was carried out again. Results showed that “time since cleaning” had no effect on the visual quality of the bonded wafers. However, the bow of the bonded wafers decreased with longer storage time.