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## ETCHING BEHAVIORS OF TUNNELING MAGNETO RESISTIVE (TMR) MATERIALS BY ION BEAM ETCHING SYSTEM

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In microelectronic industry, lithography and patterning by using ions bombard on the surface to remove atoms of material is a very important process. In data storage manufacturing, ion etching process is chosen to prepare a specific pattern under the read-write head of the hard disk drive (HDD) to form an “air bearing surface” or ABS. This makes the HDD head can float or slide over the surface of the hard disk platter. In this work, we use the Monte Carlo-based simulation package to calculate the etching yield of different materials in the head's structure. The plasma characteristic in the industrial-size ion beam etching (IBE) system has been studied by the special plasma diagnostic. Plasma parameters such as floating potential, plasma potential, electron temperature and ion current density are obtained from plasma I-V curve characterization. The sputtering yields of materials are maximum when an incident angle is about 70 degree to the normal surface. The floating potential of plasma in the system with the ion\electron compensation from plasma bridge neutralizer (PBN) is calculated. Other results will be more discussed further.

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