# *Etching Rate Prediction for Reactive Ion Etching*

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The manufacturing processes in slider fabrication can be divided to several catalogues; the one used in this case study is Reactive Ion Etching (RIE). Etching is the process of removing the top layer(s) from the wafer / slider surface through the openings in the resist pattern. RIE is one of the most accurate dry etch technique in which gases are the primary etch medium. It combines both plasma and ion beam etching principles in result with a high selectivity ratio than others. The etched surface in slider is used as the air grove for the magnetic head to fly on the disk media in HDD

Because of the complexity of the customer requirements, the process procedures and related process settings are strongly related to the process performance and the finish product quality. In fact, the whole jig of sliders will be wasted or required to rework if there is just a single failure, such as under-etch that the opening depth is not enough and over-etch causes the damage of slider. However, the causes of failure take time to be identified. Enhancing the method, tuning the machine, changing the material, rearranging the human resource and improving the environment can do improve the quality (4M1E). The result cannot be seen immediately when the RIE is still work-in-process. A well design model, which can help the engineers to find out the optimum factors in a shorter time period and predict the corresponding ideal etching rate / time, is needed.