ABSTRACT

This project report optimizes the wire bonding factor in Magnetic Resistive Recording Head Stack Assembly Process through Analysis of Variance (ANOVA) method. In the process, most of the defects that we found are poor bonding. Poor bonding has been important and affected product quality and the company credits. So the factors which are concerned with in the wire bonding process are the power of wire bonder machine, the bonding tip force, the bonding time, type of bonding tip length, and type of wires. The experiment treats the factors with an experimental design with Full Factorial method to find the optimize value. We use statistics to generate the treatment combination and analyse the result.

The result of the measurable data analysis reveals that the type of bonding tip length has a significant effect on the wire bonding performance. Therefore we separated the results of optimized analysis referring to the bonding tip length. The result shows that for a 10 Mil. tip length the bonding performance is higher than that of 7 Mil. tip length in terms of wire pull strength. The factors that significantly affect the bonding performance of both the bonding tip length are the bonding tip force, the power of wire bonder machine, the color of wires, and the interaction of the force and power. The optimized value of 10 Mil. tip length is the force at 170 grams, the power at 280 mW. and the Gold color of the wire. And the optimize value of 7 Mil. tip length is the force at 170 grams, the power at 270 mW. and the Green color of the wire. After we implement the optimize value of 7 Mil. tip length wire, the pull strength average increases from 17 grams to 20 grams and the Cpk increases from 0.7 to 1.0. For 10 Mil. tip, we can get the wire pull strength to 22 grams and Cpk 1.2. The 10 Mil. tip length is a good choice to improve the wire bonding performance.