

Abstract

Slider Head Alignment is one of the most important key performance indices to Head Gimbals Assemblies in Hard Disk Drive manufacturing process. Slider Head Alignment affects its reading or writing accuracy and its capability to keep the fly height space above disk media during its operations. Reduction of variation of Slider Head Alignment also brings Hard Disk Drive areal density at the higher levels.

An objective of this research is to study influential factors to dual response of Slider Head Alignment. Dual responses consist of location and dispersion of alignments. Aims are to improve an accuracy of the Head Gimbals attachment process for achieving its target and to reduce the process variation. Consolidation of all expected factors to both responses of location and dispersion of alignments are collected and analysed via an expert system. Screened and important factors from the previous process will be designed and analysed via Taguchi and fractional factorial designs. Desirability function will be finally used to determine the optimised levels on all affected factors.

Proper levels on all factors from both experimental designs and its desirability function are used on a confirmation experiment. Experimental results show that Slide head position seems very close to the target. Its standard deviation is reduced 30-40% on average when compared with the conventional results from the original levels of factors. This reveals that the objective of this research is met and the problem solving procedures can be used as guidance to the product development and Head Gimbals Assembly process for Hard Disk Drive industries.