

# Rework Reduction and Optimization of 150MM Wafer Mount Process

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## ABSTRACT

In September of 2010 a project was initiated with the goal of reducing the rework rate at the wafer mount operation for 150mm wafers at TriQuint Semiconductor and optimizing the overall process. The entire process and all possible variables to the process had to be evaluated to determine the root causes for the high rework rate and the possible solutions to rectify the problem. This paper will discuss the steps taken to significantly reduce the mount rework rate and maintain an acceptable process..

## INTRODUCTION

The 150mm wafers at TriQuint are mounted to 152mm Silicon carriers for back grind. The entire mount process includes several steps including coating the wafers and carriers with a bonding agent, pressing the wafers together, and measuring the thickness uniformity of the mounted wafers. Additional measurement steps are also added in between the steps. To achieve significant improvements in process robustness and consistency, all variables including the 4M and 1E (man, method, material, measurement and environment) had to be explored and evaluated.

### Scope:

The average monthly remount rate for mounted wafers from January 2010 to September 2010 did not meet TriQuint's internal expectations. The goal of the project was to improve all aspects of the mount process and reduce the rework rate down to meet internal goals. The process includes coating both the wafers and carriers with wax which serves as an adhesive for mounting the wafers together. Next, the wafers and carriers are individually pressed together by an inflated bladder while being held by vacuum to a hotplate. The mounted wafers are measured for thickness uniformity before they can be run through the grind process. When the wafer fails to meet the specified uniformity criteria, the wafer has to be reworked by demounting and cleaning the wafers and running through the entire mount process again. In addition to wasting time, this process costs a significant amount of money for the company. Analyzing and improving the process required studying the process, analyzing the operators, machines, measurement tools, materials and chemicals used. Engineers collaborated with engineering technicians, manufacturing, management, and a statistician to effectively evaluate all relevant variables. Extensive data was gathered and analyzed prior to implementing any significant changes to the process. The following figures depict the mount process flow (Figure 1) and the monthly mount rework trend from January 2010 to May 2011 (Figure 2).

Figure 1 – Mount Process Flow Chart

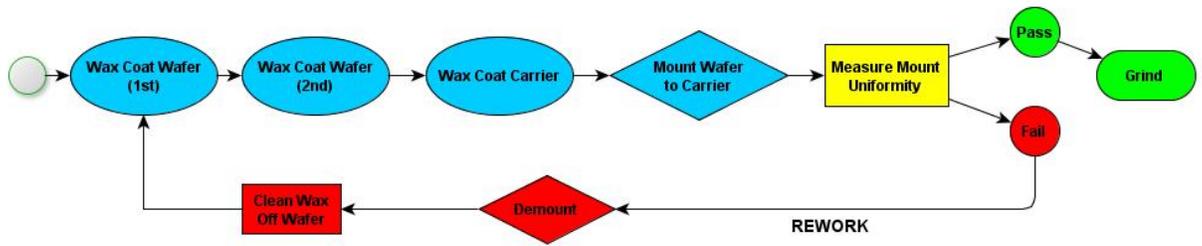


Figure 2 – Monthly Mount Reworks Trend

