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I. Introduction

The transition from 200-mm to 300-mm wafers has seen the introduction of numerous controls at different stages of manufacturing in the semiconductor industry. This is because increasing the size of the wafer combined with a reduction in the size of the transistor has made more expensive the price of a wafer [1].

In this study, we investigated the case of controls in the defectivity area for the CMP (Chemical Metal Polishing) workshop and proposed a solution and a prototype which helps to highlight when too many measurements are done for "nothing" and when there is a lack of measurement. The solution proposed here is based on real time data analysis and risk computation in terms of number of wafers processed on a production tool since the last control. This notion is called Wafer At Risk [2][3]. It helps to reduce the work in the defectivity area and reorganize some activities in the fabrication line of ST Microelectronics Crolles.

II. Description of the study

The goal of this study is to master the risk of processing a lot on a tool using real time data analysis and to minimize the number of controls. It consists in sampling lots in order to minimize risks. To each lot is associated a risk array. This array contains the new value of each risk (or of the risk reduction) if the lot is measured. And when a lot is measured in the defectivity area, the risks of various tools are reduced [2] [3].

The evolution of the risks might be controlled by warning and inhibit limits. The question asked here was: how to be sure that the Inhibit limit would not be exceeded to avoid the case of lack of control and how to know and determine the right time for a measurement to avoid "unnecessary" control?

III. First results and conclusion

The algorithm, based on the idea described in the paper, has been implemented and tested on real instances of the industry. The algorithm has been embedded in a prototype. After two weeks of utilization of the prototype, a first analysis helped to highlight the major case of over-control and lack of control.

IV. References

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