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**STUDY OF MATERIAL WASTAGE
IN A WAFER MANUFACTURING PLANT**

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DECLARATION

I hereby declare that the work reported in this dissertation is my own unless specified and duly acknowledged by quotation.

A handwritten signature in black ink, consisting of stylized, flowing characters, positioned above a horizontal dotted line.

(KOK FATT CHIN)

PREFACE

The study of material wastage in a wafer manufacturing plant was done in MEMC Electronic Materials Sdn. Bhd. (MEMC KL), based on the 1995 fourth quarter production data. MEMC worldwide is one of the largest silicon wafer manufacturer and produces Czochralski-grown silicon wafers; sold as polished or with an epitaxial layer in diameter ranges from 100mm to 200mm. The applications use ranges from discrete diodes to complex microprocessors and DRAM memories.

At present MEMC KL produces 100mm and 125mm diameter silicon wafers for the semiconductor industry, utilizing the most advanced silicon wafer technology available. In line with the production of polished wafers, some of the material is wasted as silicon wastage which is basically contributed by the removal of materials and the defective wafers in various wafer manufacturing processes. As the silicon wastage contribute a large proportion of the manufacturing cost, they need to be reduced in order to improve yield performance and generate maximum profit.

In this project, the study of silicon wastage is divided into different sections, i.e. the amount of silicon wastage in each category, and the types of defects as well. Besides that, the experimental techniques used for measuring defects is also included. The reduction, recycling and utilization of the silicon wastage is also discussed in this project. However, specific details have not been given and care has been taken to preserve company specific problems and proprietary values. At the same time, most of the references quoted in this work pertain to laboratory manuals and documents produced by semiconductor companies. The author has taken care to compile all such reference materials and study them.

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