

Case Study: Test Wafer Management System

I. Description

A leading semiconductor manufacturing Fab had a very high usage of test wafers with a test wafer to production wafer ratio of 2.3 to 1. The Fab spent approximately \$1.1M per quarter on test wafers. The Fab did not have any system to manage and track test wafer usage.

II. Objectives

- Design and implement a test wafer management system that would:
- Lower test wafer costs by at least 30%.
- Reduce the test wafer to production wafer ratio to 1:1.
- Ensure tools are not idle due to an insufficient supply of test wafers.
- Forecast future test wafer purchases based upon existing test wafer inventory and consumption.
- Ensure test wafers are used and reused to their full potential.

III. Methodology

- The overall Project Methodology (Figure 1) involved five major phases: data collection, data analysis, model design, simulation and model results, and sensitivity analysis and recommendations.

Figure 2.
Tefen's TWMS

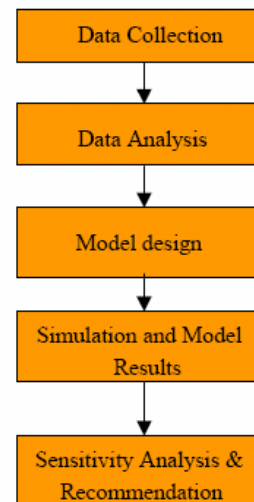
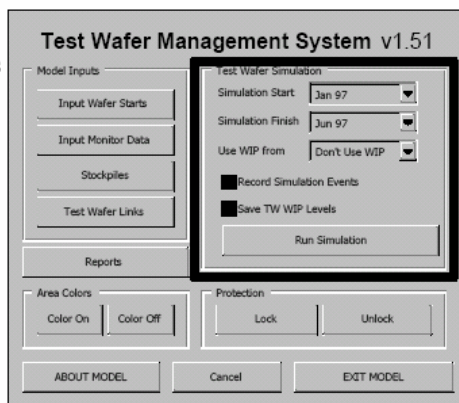
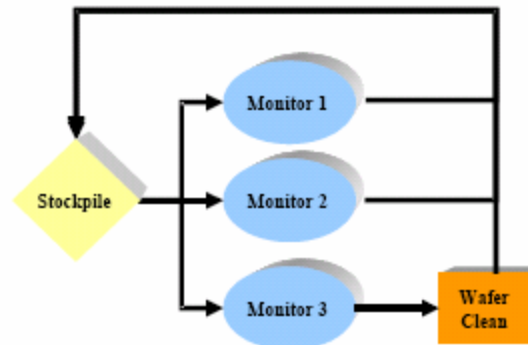


Figure 1. Project Methodology

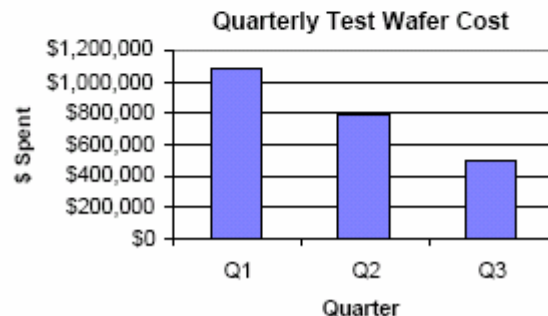
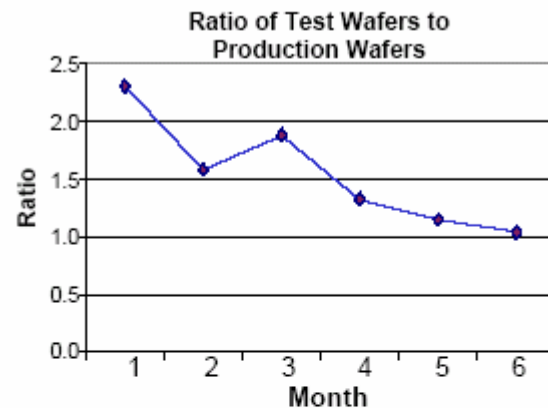
- Tefen's TWMS (Test Wafer Management System) software package was selected as the modeling tool due to its user-friendliness (Figure 2), its capability to capture a realistic test wafer flow (Figure 3), and its flexibility in performing various what-if scenarios.
- A simple system was set up in the Fab to identify test wafer types and to help operators internally recycle test wafers.
- A Test Wafer Controller position was added to manage test wafer inventories and ensure tools were never idle due to a lack of test wafers.

Figure 3: Flow of test wafers in TWMS™



VI. Results

- Test wafer costs decreased by 50% in just 6 months.
- The ratio of test wafers to production wafers was reduced to approximately 1:1.
- The Fab now has a software package that forecasts and manages their test wafer usage.
- Test wafer inventories were actively managed to continuously support production.
- Test Wafer Controllers took nonvalue-added activities away from the operators. Consequently, the operators could devote more time to value-added activities (such as moving WIP).



**For more information regarding this case study or to request an introductory meeting, email us at info@tefen.com.*