## Introduction:

In Application Note No. 47 Flour Analysis 8 Parameters, data was presented showing the ability to develop calibrations for rheological parameters in flour samples. These included Starch Damage, Water Absorption, Dough Development Time and Dough Stability Time. This study reinforces the results obtained in the previous study.

## Description:

29 samples of Australia flour were collected and analysed using the Brabender Farinograph to determine the Starch Damage and Water Absorption. The samples were then scanned using a Cropscan 2000F Flour Analyser across the spectral range, 720-1100nm. A 5mm pathlength Powder Cell was used to present the flour samples to the Cropscan 2000F which uses a Moving Sample Transport to scan up to 10 portions of each sample. Each sample was scanned in duplicate and the 20 scans were saved in the Cropscan 2000F's memory chip and later uploaded to a PC using NTAS(NIR Technology Analysis Software). Figure 1. shows the NIT spectra for the 29 samples of flour.

The NIT spectra were imported into Microsoft Excel where the reference values for Starch Damage and Water Absorption were added to the spectral file. The edited file was imported back into NTAS and a Partial Least Squares regression analysis was performed against each constituent.

## Results

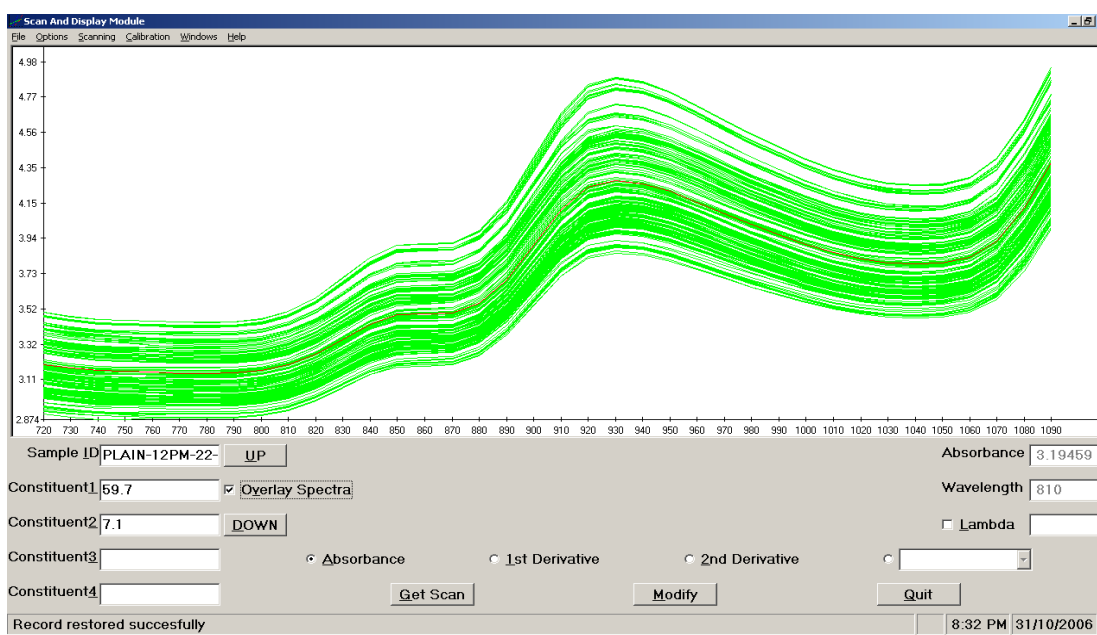Figures 2 and 3. show the plot of the NIT calibration data vs the Farinograph data.
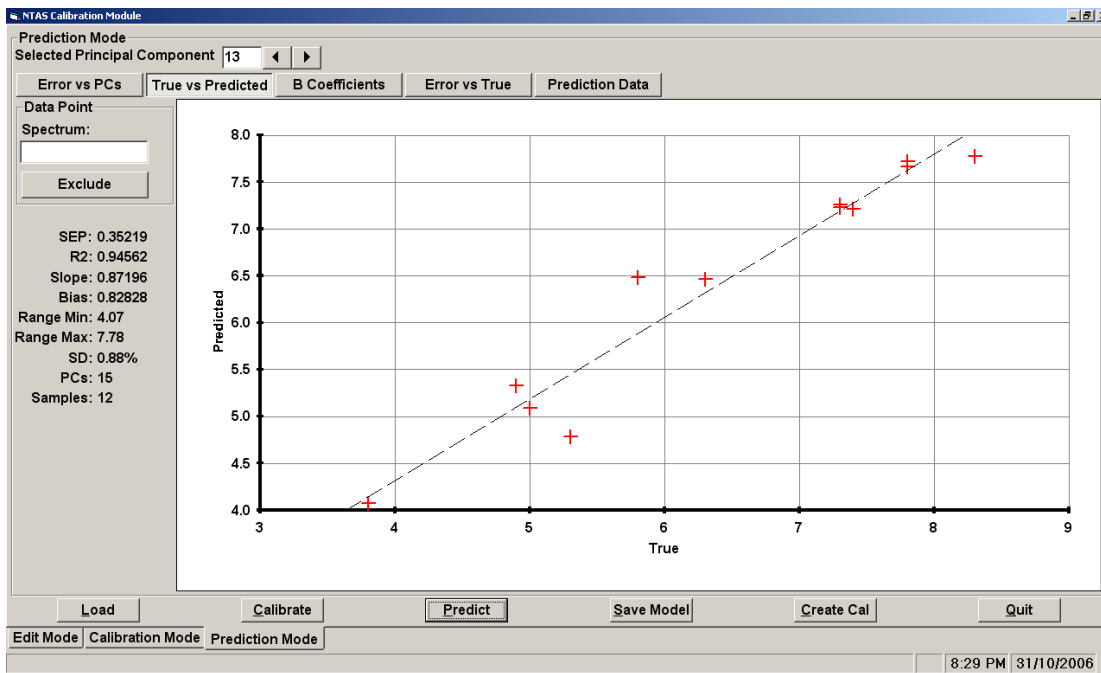


Figure 1. NIT Spectra of Flour

Figure 2. Calibration Plot for NIR Starch Damage vs Farinograph Starch Damage
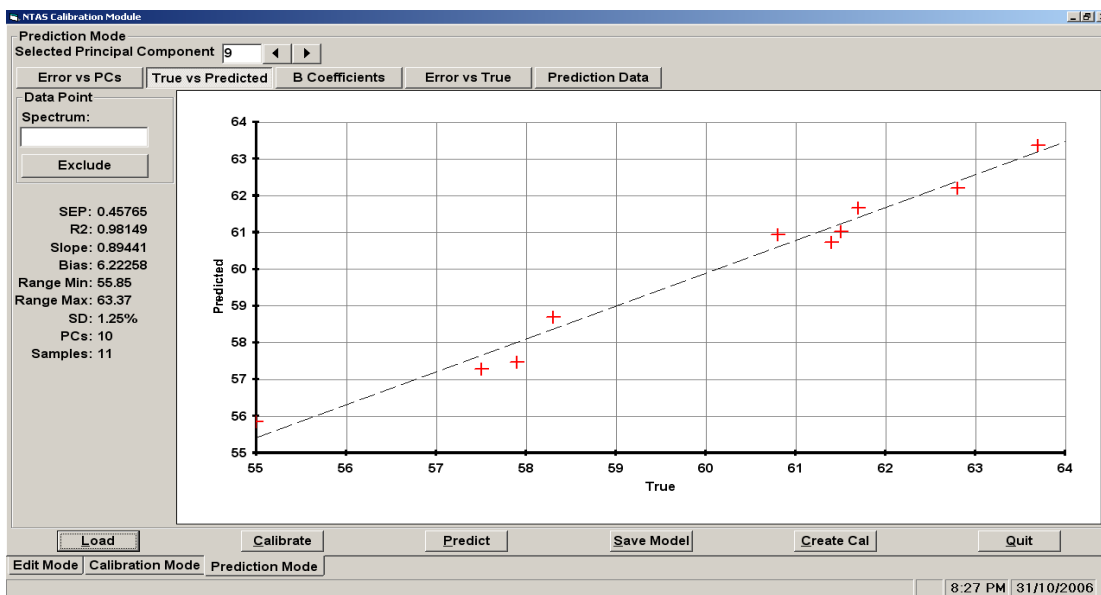


Figure 3. Calibration Plot for NIR Water Absorption vs Farinograph Water Absorption

## Discussion

In Application Note 47, showed the Standard Error of Calibration(SEC) to be 0.06 for Starch Damage and 0.55 for Water Absorption. In this study the SEC were determined to be 0.36 for Starch Damage and 0.46 for Water Absorption.

In the previous study, the range for Starch Damage was 9.0 to 13.0, where as the range for this study was 3.8 to 8.2. The ranges for Water Absorption were approximately the same, ie, 54 to 65. The much higher SEC for Starch Damage for this study cannot be explained.

The issue is whether the errors of the NIT measurements for SD and WA are low enough to be useful in the flour milling industry. It is considered that the NIT method can be

useful as a rapid means of screening and thereby allowing the millers to more quickly make decisions on refining the process. However it is not felt that the NIT method is to be considered as a replacement for the Farionograph.