Organic Application Note ®

Moisture and Ash in Paper Products

Sample Preparation

Paper samples may be analyzed as received. Small strips may be sliced from each sheet of paper, and carefully folded into smaller pieces for analysis.

Analysis Time

~5.5 hours for moisture and ash

Steps Information

	Moisture	Ash
Covers:	OFF	OFF
Ramp Rate:	6	15
Ramp Time:	00:13	00:28
Start:	25	105
End:	105	525
Atmosphere:	Air	Air
Flow Rate:	High	Medium
Hold Time:	0:00	04:00
Const. Wt. %:	0.05%	100.0%
Const. Wt. Time:	0:09	0:09
Final Step Weight:	At end of step	At end of step

Equations

Initial Weight:	$W_{[Initial]}$
Moisture:	$((W_{[Initial]}-W_{[Moisture]})/W_{[Initial]})*100$
Ash:	$(W_{[Ash]}/W_{[Initial]})*100$
Ash Dry Basis:	$E_{[Ash]}*(100/(100-E_{[Moisture]}))$

Procedure

1. Enter method as described above through the PC or keypad.
2. Enter ID codes if a PC is used; if not, they will be entered through the keypad.
3. Choose "Collect" on the PC to begin a taring step or "Start" on the keypad.
4. Load empty crucibles into the furnace carousel making sure a crucible is in the reference position.
5. Press "Start" on the keypad to advance the taring process.
6. The furnace cover opens and each crucible is presented to the operator for sample loading.
7. Load 0.9 to 1.1 g of sample into the crucible. Make sure all paper is contained below the lid of the crucible.
8. Place crucible back in the unit and press "Next" on the keypad to continue.
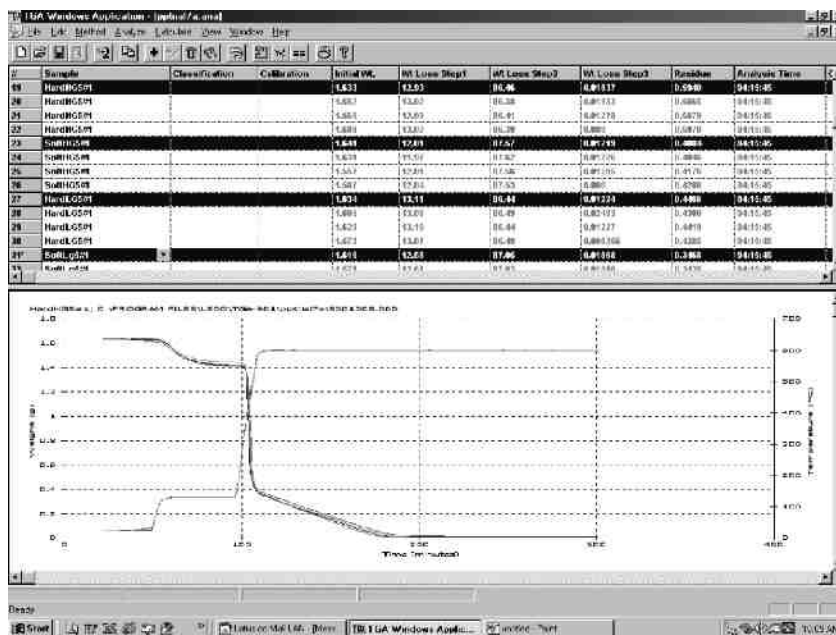9. When all crucibles are loaded, analysis begins.

TGA-601

Typical Results

Sample	Weight (g)	Moisture	Ash (dry basis)
Paper 1	0.9222	4.48	34.20
	0.9221	4.64	34.04
	Average	*4.56*	*34.12*
	Std. Dev.	*0.11*	*0.12*
Paper 2	0.9346	4.76	33.91
	0.9116	4.82	34.15
	Average	*4.79*	*34.03*
	Std. Dev.	*0.05*	*0.17*

TGA-601 PC Windows® Software Features

The optional TGA-601 Windows® software provides convenient spreadsheet-based sample login/data management and PC-based instrument operation. Furthermore, the Windows® software provides plots of sample weight and/or oven temperature vs. time—very powerful tools for both types of method development.

For example, minimum time for an ashing step can be determined by plotting sample weight and evaluating the minimum time required to reach the desired degree of weight stability. Other method variations that may be evaluated using the plots are temperature, atmosphere, and flow. Both raw data and reports data are recorded on the hard drive of the PC, and may be recalled at any later date for review.