

DuPont™ Appearance Analyzer™

Video Image Analysis Instrument

The DuPont™ Appearance Analyzer™ video image analysis instrument measures the appearance uniformity of paper and paperboard products. It offers the papermaker a distinct way to reliably quantify final sheet appearance.

How Does It Work?

The DuPont™ Appearance Analyzer™ instrument assigns a DuPont™ Appearance Value™ test result that quantifies uniformity of appearance, or mottle, of a paper or paperboard sample. A sample is inserted into the custom optical section (see **Figure 1**) and illuminated; a video image is recorded. The image is digitized and a patented pixel comparison algorithm is performed that generates the DuPont™ Appearance Value™ test result. Lower test results indicate greater uniformity.

DuPont Science Responds to a Paper Quality Need

Finished sheet “appearance” is a high priority quality issue for papermakers. Inherent variations in paper and board manufacturing can lead to an objectionable, mottled appearance that negatively affects coated and uncoated paper and board quality. Dinginess,

coating coverage, calender blackening, and coating/base contrast are some of the papermaker’s terms for appearance issues that can be quantified with the DuPont™ Appearance Analyzer™.

The DuPont Titanium Technologies technical service team recognized the need for a test method that would reproducibly quantify the overall sheet appearance via an objective measurement technique. Tracking reliable appearance values during production could lead to a more consistent level of quality for the finished product. As a result, the DuPont™ Appearance Analyzer™ instrument was developed to respond to this unique need of the paper industry.



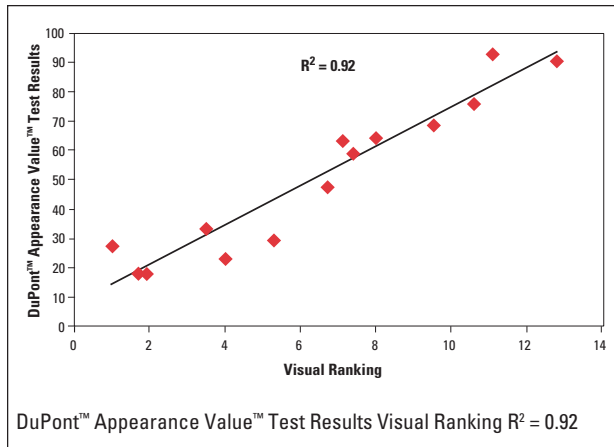
Figure 1. Computer Cabinet and Custom Optical Section

Correlation of DuPont™ Appearance Analyzer™ Instrument with Visual Techniques

Multiple studies have been completed in which results generated by the Appearance Analyzer™ instrument were compared to visual rankings. In all cases, there has been excellent correlation between readings from the DuPont™ Appearance Analyzer™ instrument and visual assessment of appearance uniformity.

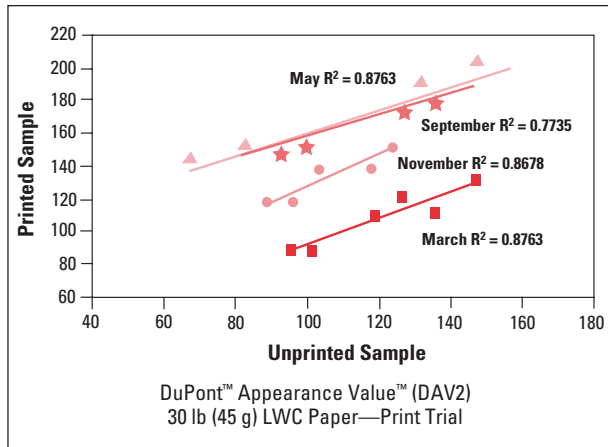
Figure 2 details a board study in which 12 observers ranked the visual appearance of board samples. Comparison of visual rankings with appearance values generated by the Appearance Analyzer™ instrument resulted in a correlation of $R^2 = 0.92$.

Figure 2. Correlation of Visual Rankings for Coated Board with DuPont™ Appearance Value™ Test Results



In addition, unprinted DuPont™ Appearance Value™ is an excellent predictor of printed DuPont™ Appearance Value™ results, as can be seen in **Figure 3**.

Figure 3. Printed versus Unprinted DAV2™



Equipment Information

The DuPont™ Appearance Analyzer™ is designed to be portable and can be transported by air as checked luggage.

It measures approximately 31 in x 21 in x 17 in (L x D x H) after unpacking and setup. The approximate weight of the entire unit is 45 lb. The power requirement for the computer cabinet and optical cabinet is 120 V.

Additional Information

Inquiries about the DuPont™ Appearance Analyzer™ instrument may be directed to the DuPont Titanium Technologies Technical Service Center at (302) 999-5253.

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