Measurement of PET Flake or Pellet Discoloration

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Introduction – Scope, Significance and Use

It is common in the PET industry to measure the discoloration of washed flake or pelletized product as an indicator of the presence or absence of contamination in a PET sample. Discoloration measurements can be useful in laboratory work to document the impact of package design features on PET recycling. The degree of discoloration from pure clear PET may also be a specification value used in a purchase specification.

This document presents a standard method to evaluate discoloration in flake and pellets using a color spectrophotometer in reflectance mode.

Test Method Summary

The color of PET flake or pellets is evaluated in reflected light using a color spectrophotometer. One can report the absolute values employed in the CIE L*a*b* Scale. One can also measure the differences between test samples and control samples. The average of five separate measurements is reported.

Equipment Required

- Color spectrophotometer capable of testing CIE L*a*b* Scale in reflectance mode with d65 light source.
- A transparent cell designed for use with the spectrophotometer that holds samples for reflectance color readings.

Materials Required

- Samples of PET flake or pellets for evaluation.

Test Method Steps

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1. Calibrate the spectrophotometer to the manufacturer's recommendations for reflectance mode.
2. Control Flake or Pellet Color Measurement steps:
   a. Fill in the transparent reflectance cell with the sample to required level.
   b. Place the sample cell in the spectrophotometer.
   c. Measure the d65 CIE L*, a*, b* reflected color values.
   d. Record color data for d65 L*, a* and b*.
   e. Pour the sample contained in the cell in with the rest of the initial sample and mix it.
3. Repeat Step 2 four more times for reaching a total of 5 measurements for the control sample.
4. In the same manner, collect five color measurements for each test sample.
5. A report as shown on the next page can be used to present data.

It is common to report the difference or "delta" values between the average of the five readings between the test and control samples. There may be situations where it is valuable to report the individual measurements to assess variability within a sample. Or, to report the absolute values of a color value to make comparisons between samples.

When there are large color variations, it may be valuable to photograph samples to record and illustrate differences.

Control Flake or Pellet Color Testing Data

Sample	Result	L*	a*	b*
Control Flake or Pellet	Run 1			
	Run 2			
	Run 3			
	Run 4			
	Run 5			
	Average			

Test Flake or Pellet Color Testing Data

Sample	Result	L*	a*	B*
Testing Flake or Pellet	Run 1			
	Run 2			
	Run 3			
	Run 4			
	Run 5			
	Average			

DOCUMENT VERSION HISTORY

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