



Test for Stress Mark Susceptibility of Plastic Materials

1 Introduction

Note: Nothing in this standard supercedes applicable laws and regulations.

Note: In the event of conflict between the English and domestic language, the English language shall take precedence.

1.1 Purpose. This procedure attempts to quantify the blush resistance of plastic materials (primarily used with polypropylene and related color concentrates). It establishes a Stress Evaluation Test (SET) number which can be used to predict blushing due to changes in pigment concentration.

1.2 Applicability. This test is intended for polyolefinic materials only.

2 References

Note: Only the latest approved standards are applicable unless otherwise specified.

2.1 External Standards/Specifications.

None

2.2 GM Standards/Specifications.

None

3 Resources

3.1 Facilities. Temperature and humidity-controlled materials test laboratory.

3.1.1 Calibration. The test facilities and equipment shall be in good working order and shall have a valid calibration label.

3.1.2 Alternatives. Alternative test facilities and equipment may also be used. However, all measuring variables as specified in this standard shall be determined correctly with respect to their physical definition.

3.2 Equipment.

3.2.1 Paul N. Gardner Heavy Duty Impact Tester Impact Tester or equivalent IM-IG-1121 (https://www.gardco.com/pages/impact_flex/im/bykimimpact.cfm)

3.2.2 xrite Benchtop Spectrophotometer Ci7600 or equivalent (<https://www.xrite.com/categories/benchtop-spectrophotometers/ci7600>)

3.2.3 Felt marking pen.

3.3 Test Vehicle/Test Piece. Polyolefinic grained color plaques 175 mm × 125 mm to 280 mm × 200 mm for each lot of material to be evaluated. Thickness of plaques are to be 3.2 mm ± 0.3 mm.

3.4 Test Time.

Calendar time: 1 d

Test time: 1 h per sample

Coordination time: 7 h

3.5 Test Required Information. Not applicable.

3.6 Personnel/Skills. Trained personnel with familiarity with materials testing and the equipment used in this procedure.

4 Procedure

4.1 Preparation.

4.1.1 Obtain grained plaques for each lot of material to be evaluated of size per 3.3.

4.1.2 Position the grained plaque with the ungrained side up and the smooth title block, if present, at the bottom.

4.1.3 Mark the ungrained side of the plaque with a grid seven squares by five squares. The squares will be between 25 mm and 40 mm on each side depending upon the size of the plaque.

4.1.4 Considering the first square to be in the upper left-hand corner, define squares 3, 9, 12, 14, 16, 27 and 31. See Figure 1.

Note: The plaque will be marked on the ungrained side to allow the colorimeter readings to be taken on the grained side.

		3				
	9			12		14
	16					
					27	
		31				

Note: Not to scale. The squares will be between 25 mm and 40 mm on each side depending upon the size of the plaque. See 3.3

Figure 1: Grid Template

4.2 Conditions.

4.2.1 Environmental Conditions. Test at laboratory ambient $23\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$ and $50\% \pm 5\%$ Relative Humidity (RH).

4.2.2 Test Conditions. Deviations from the requirements of this standard shall have been agreed upon. Such requirements shall be specified on component drawings, test certificates, reports, etc.

4.2.3 Deviations from the requirements of this standard must be agreed upon by GM Materials Engineering and GM Validation Engineering.

4.3 Instructions.

4.3.1 Calibrate the L scale on the colorimeter.

4.3.2 Take L scale readings on the seven predefined squares on the plaque.