



RESISTANCE TO SCRATCH AND MARR

Application

This procedure is used to determine the resistance to scratching, whitening and marring on surfaces of plastic or other materials under standard conditions.

For the scratch, whitening and marring evaluation the acceptance criteria and ratings can be independently selected based on the application.

Apparatus Required

Mechanically Driven Scratch Apparatus

Apparatus is a movable sledge with five metal fingers - 250 mm long, one end fixed, the other end of fingers are supplied with interchangeable scratch pins (steel balls, highly polished, 1.0 +/- 0.1 mm diameter). The pins are loaded with different weights exerting the following standard forces on the surface of test material:

Scratch finger No.	1	15.0 N
	2	10.0 N
	3	7.0 N
	4	3.0 N
	5	2.0 N

Note: If necessary it is possible to move/change the weight(s) on the scratch finger(s) so that force(s) can be differentiated.

The complete apparatus should be purchased from the following or equivalent approved by Materials Engineering:

Rockwood Systems and Equipment, INC
34303 Industrial Road
Livonia, MI 48150
Phone: (734) 525-9140

Date	Action	Revisions	Rev 0
2009 01 22	Activated	New method replacing BN 108-13	

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**Spring Balance**

15 N maximum or functionally equivalent electronic force transducer

Viewing Cabinet

As described in FLTM BI 109-01

Stop Watch**Samples for Visual Evaluation (Method A)**

Flat, recommended size 200 x 150 mm; smaller samples are acceptable if extracted from finished parts.

Conditioning and Test Conditions

All test values indicated herein are based on material conditioned in a controlled atmosphere of 23 +/- 2 °C and 50 +/- 5 % relative humidity for not less than 24 h prior to testing and tested under the same conditions unless otherwise specified.

Procedure

1. Install the 2N, 3N, 7N, 10N, and 15N scratch pins and 1.0 mm diameter balls or as specified by the relevant engineering document, under the fingers.
2. Check the loading forces, measured directly at the scratch pin by using spring balance.

If necessary change the weight(s) to meet the required scratch force(s) on the surface of sample.

3. Place the sample - grain on the top - with the short side of sample under the five scratch fingers and push them one time from right to left across the sample at the rate of approximately 100 mm per second, length of scratch lines 200 mm recommended length. Control the scratch speed by using a stop watch.
4. Mark the direction of outlined movement by labeling the load at the beginning of the test line.
5. Document the evaluation technique on the test report as either visual evaluation or Instrumental evaluation.

Method A (Visual Evaluation)

1. Use north sky day light according to FLTM BI 109-01.
2. Place the sample under the light so that the scratch lines are in a horizontal position to the observer. The scratch line caused by the highest weight should be at the upper position.
3. Disregard the start and end 10% of the scratch line.
4. Evaluate only the center 80% of the scratch line according to the rating scale below. The evaluation should take place rotating the sample in all angles at a distance of approximately 300 mm.