



Standard Practice for Resistance of Plastics to Sulfide Staining¹

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1. Scope*

1.1 This practice covers the determination of the resistance of plastics to staining in the presence of sulfides.

1.2 The values stated in SI units are to be regarded as the standard.

1.3 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.* For specific precaution statements, see Section 6.

NOTE 1—There is no equivalent ISO standard.

2. Referenced Documents

2.1 *ASTM Standards:*

D 618 Practice for Conditioning Plastics for Testing²

D 883 Terminology Relating to Plastics²

3. Terminology

3.1 *Definitions:* For definitions of terms used in this practice, refer to Terminology D 883.

4. Significance and Use

4.1 Plastic compositions containing salts of lead, cadmium, copper, antimony, and certain other metals (as stabilizers, pigments, driers, or fillers) may stain due to the formation of a metallic sulfide when in contact with external materials that contain sulfide. The external sulfide source may be liquid, solid, or gas. Examples of materials that may cause sulfide stains are rubber, industrial fumes, foods, kraft paper, etc. This practice provides a means of estimating the relative susceptibility of plastic composition to sulfide staining.

5. Reagent

5.1 *Hydrogen Sulfide Solution*—A freshly prepared saturated solution of hydrogen sulfide (**Caution**, see Section 6). Prepare the solution by rapidly bubbling hydrogen sulfide gas

(Note 2) through water. Five minutes of bubbling is sufficient for 100 to 150 mL of water at room temperature (approximately 23°C).

NOTE 2—Hydrogen sulfide gas may be obtained commercially as compressed gas in cylinders.

6. Precautions

6.1 Hydrogen sulfide is a highly toxic gas and must be handled only in a suitably ventilated area such as a hood. Avoid breathing of vapors.

7. Sampling

7.1 Sampling shall be in accordance with the pertinent material specification or as agreed to by customer and client.

8. Test Specimens

8.1 Test specimens shall be representative of the particular plastic composition being tested. Size and shape of test specimens are relatively unimportant. Specimens 100 ± 25 mm [4 ± 1 in.] in length by 13 ± 6 mm [0.5 ± 0.25 in.] in width by the thickness of the composition being tested, have been found suitable for this test.

9. Conditioning

9.1 *Conditioning*—Condition the test specimens at $23 \pm 2^\circ\text{C}$ [$73.4 \pm 3.6^\circ\text{F}$] and 50 ± 5 % relative humidity for not less than 40 h prior to test in accordance with Procedure A of Practice D 618 for those tests where conditioning is required. In cases of disagreement, the tolerances shall be $\pm 1^\circ\text{C}$ [$\pm 1.8^\circ\text{F}$] and ± 2 % relative humidity.

9.2 *Test Conditions*—Conduct tests in the standard laboratory atmosphere of $23 \pm 2^\circ\text{C}$ [$73.4 \pm 3.6^\circ\text{F}$] and 50 ± 5 % relative humidity, unless otherwise specified in the test methods or in this specification. In cases of disagreements, the tolerances shall be $\pm 1^\circ\text{C}$ [$\pm 1.8^\circ\text{F}$] and ± 2 % relative humidity.

10. Procedure

10.1 Using a 250-mL beaker or equivalent, immerse approximately half of each specimen (Note 3) in the saturated hydrogen sulfide solution for 15 min (Note 4). Cover the test container with a watch glass or aluminum foil during the test.

¹ This practice is under the jurisdiction of ASTM Committee D20 on Plastics and is the direct responsibility of Subcommittee D20.50 on Durability of Plastics.

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² *Annual Book of ASTM Standards*, Vol 08.01.

*A Summary of Changes section appears at the end of this standard.