Test Method for Dusting Propensity of Powder Dyes

Developed in 1987 by Committee RA87; editorially revised and reaffirmed 1988, 1989 (title change), 1996; editorially revised 1992, 2004, 2008, 2019; reaffirmed 2001, 2006, 2011, 2016, 2017.

1. Purpose and Scope

1.1 This test method provides a standard method for the evaluation of dusting properties of powder dyes.

1.2 The method of assessment permits the assignment of a numerical rating describing the degree of dusting; or, conversely, the degree of non-dusting of powder dyes.

1.3 This test method is not intended for a quantitative determination of dusting. Water soluble dyes may give an inferior rating than an equal amount of dusting caused by disperse dyes. Further studies indicated that not all factors; i.e., humidity, are fully controlled. Also the method does not distinguish between slow and fast settling dust.

2. Principle

2.1 Three, approximately equal, weighed portions of a 10 g powder dye sample are dropped consecutively and rapidly into a funnel which has a wet filter paper collar on the stem and is fitted into a cylinder. Any dust which forms rises and settles on the pre-wet filter paper collar.

2.2 The resulting coloration on the filter paper is then compared to a series of five standards and a numerical rating is assigned.

3. Terminology

3.1 **dusting,** n.—the tendency of particles of sufficiently low mass to become airborne when a powder material is handled or agitated.

3.2 **dye,** n.—a colorant applied to or formed in a substrate, via the moleculary dispersed state, which exhibits some degree of permanence.

4. Safety Precautions

NOTE: These safety precautions are for information purposes only. The precautions are ancillary to the testing procedures and are not intended to be all inclusive. It is the user's responsibility to use safe and proper techniques in handling materials in this test method. Manufacturers MUST be consulted for specific details such as material safety data sheets and other manufacturer's recommendations. All OSHA standards and rules must also be consulted and followed.

4.1 Good laboratory practices should be followed. Wear safety glasses in all laboratory areas and a single-use dust respirator while handling powder dyes.

5. Apparatus and Materials

5.1 Funnel, 1.5 mm thick stainless steel, 110 mm diameter, 230 mm stem length with 15 mm stem diameter (see Fig. 1).

5.2 Cylinder, stainless steel, 50 mm diameter, 355 mm tall (approx. capacity 500 mL) with capability of grounding to prevent interference from static electricity (see 11.1).

5.3 Filter paper, Whatman No. 2, 39 mm diameter circle with 16 mm diameter center hole (see 11.1 and 11.2).

5.4 Pipettes, Pasteur.

5.5 Beakers, Griffin, 50 mL.

5.6 Photographic Scale for Rating (see 11.3, Fig. 2).

6. Preparation and Assembly

6.1 Slip a filter paper collar on the funnel stem and position it 100 mm from the bottom of the stem.

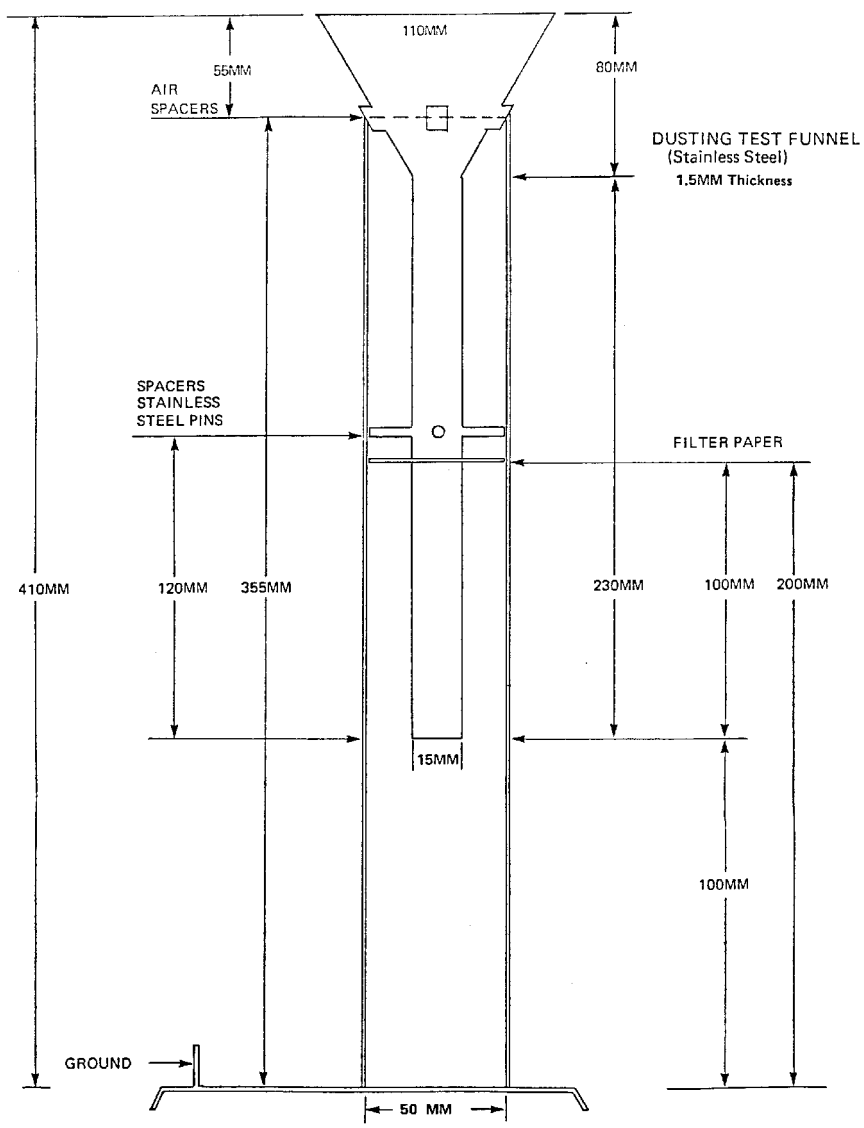

Fig. 1—Dusting test funnel.

Copyright © 2021 American Association of Textile Chemists and Colorists

Documents
Document Searching Hub
Full document details: AATCC TM170 2017

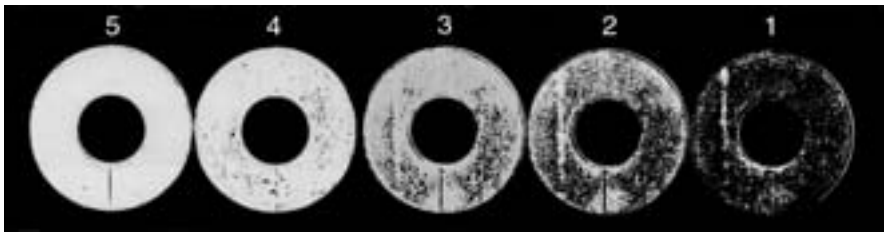

Fig. 2—Dusting test scale.

6.2 Moisten the paper collar with three drops of distilled water at points approximately equidistant from one another around the stem of the funnel. Use care to avoid water running down the funnel stem.

6.3 Place the funnel, with wet collar, in the steel cylinder. Ground the cylinder (see 11.4). The paper collar should be 200 mm from the bottom of the steel cylinder.

7. Procedure

7.1 Use a 10 g sample of powder dye, weighing it out as 3.3 g portions, into three 50 mL beakers.

7.2 Pour the three portions of dye onto the side of the funnel at intervals of approximately 2-3 s.

7.3 Allow the apparatus to remain undisturbed for 3 min to avoid erroneous results due to any external effects on the air in the cylinder.

7.4 Remove the funnel and, with scissors, snip off the filter paper collar from its periphery to the stem for easy removal (see 11.5). Air dry the collar by placing it on a sheet of filter paper away from possible sources of atmospheric "fly" or contaminants.

8. Evaluation

8.1 Compare the specimen with the scale (see 11.3) and assign the appropriate numerical rating. Intermediate ratings; e.g., 4-5 may be estimated.

8.2 The matching standard establishes a numerical rating for degree of dusting. A rating of 1 describes a very dusty material and a rating of 5 describes a non-dusting or minimally dusting dye.

8.3 Duplicate or triplicate tests may be conducted and the average noted.

9. Report

9.1 Report the numerical rating for degree of dusting.

10. Precision and Bias

10.1 *Precision*. Precision for this test method has not been established. Until a precision statement is generated for this method, use standard statistical techniques in making any comparisons of test results for either *within-laboratory* or *between-laboratory* averages.

10.2 *Bias*. Dusting propensity can only be defined in terms of a test method. There is no independent method for determining the true value. As a means of estimating this property, the method has no known bias.

11. Notes

11.1 Stainless steel funnels, cylinders, and filter paper collars are available from AATCC, P.O. Box 12215, Research Triangle Park NC 27709; tel: +1.919.549.8141; fax: +1.919.549.8933; e-mail: ordering@aatcc.org; web site: www.aatcc.org.

11.2 Filter paper collars required for this test may be prepared in a number of different ways.

11.2.1 Larger circles of paper may be die cut or hand cut to size with scissors and the center hole punched out with a light blow on a #6 cork borer.

11.3 The illustration of the dusting scale in the text of this method is inadequate for the evaluation. A standard scale (photographic replicas) must be used and is available from AATCC, P.O. Box 12215, Research Triangle Park NC 27709; tel: +1.919.549.8141; fax: +1.919.549.8933; e-mail: ordering@aatcc.org; web site: www.aatcc.org.

11.4 The steel cylinder is grounded by connecting one end of a copper conductor (No. 14 solid wire) to the grounding screw at the base of the cylinder and the other end clamped to a metallic (not plastic) water pipe or any metallic electrical conduit.

11.5 Pulling the paper collar off the stem of the funnel without using the scissors causes a "squeegee" effect which could lead to erroneous results.

Documents Document Sharing Hub
Copyright © 2021 American Association of Textile Chemists and Colorists
Full document details: AATCC TM170 2017