

T 431 cm-10

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TENTATIVE STANDARD – 1965
SUGGESTED METHOD – 1972
OFFICIAL TEST METHOD – 1982
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CAUTION:

This method may require the use, disposal, or both, of chemicals which may present serious health hazards to humans. Procedures for the handling of such substances are set forth on Material Safety Data Sheets which must be developed by all manufacturers and importers of potentially hazardous chemicals and maintained by all distributors of potentially hazardous chemicals. Prior to the use of this test method, the user should determine whether any of the chemicals to be used or disposed of are potentially hazardous and, if so, must follow strictly the procedures specified by both the manufacturer, as well as local, state, and federal authorities for safe use and disposal of these chemicals.

Ink absorbency of blotting paper

1. Scope and significance

1.1 This method is used to determine the rate at which blotting papers absorb writing ink. It yields results that have been found useful in predicting and specifying the absorptive quality of blotting papers.

1.2 The method is based on the determination of the length of time required to absorb completely 1 mL of a standard writing ink at 23°C (73.4°F).

2. Apparatus

2.1 *Dispensing device*, a pipet calibrated to deliver 1.00 mL $\pm$ 0.01 mL, or other dispensing device having equal accuracy.

2.2 *Support*, a 75-mm (3-in.) inside diameter metal ring, a 400-mL glass beaker, or equivalent support.

2.3 *Timer*, stopwatch or electric timer reading in seconds.

3. Material

3.1 *Standard ink*, made in accordance with the following formula and method of preparation:

Approved by the Standard-Specific Interest Group for this Standard

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3.1.1 Formula

	grams
Gallic acid, National Formulary, VII Edition	5.0
Ferrous sulfate, $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$, USP	7.5
Tartaric acid, USP	1.0
Sodium benzoate, USP	1.0
Soluble blue dye ¹ , Color Index 42755, Acid Blue 22	3.5
Distilled water to make a volume of 1000 mL at 20°C (68°F)	

3.1.2 Preparing the ink

3.1.2.1 *Iron content of ink.* When exposed to the air, ferrous sulfate heptahydrate loses some water of crystallization and no longer contains seven parts of water. The loss in weight may be as much as 20% of the original weight of the crystals. In 7.5 g of $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$ there are 1.5068 g of Fe. If the salt has lost 20% of its weight as water, the 7.5 g called for in the formula will contain 1.9 g of Fe, or 25% more than it should, and an ink made with 7.5 g of the weathered salt may be expected to deposit a sediment in a short time. Because the quantity of water of crystallization lost depends upon the conditions under which the material is kept, the ferrous sulfate should be analyzed before weighing, and the weight required to provide 1.507 g of Fe should be calculated. If facilities for analysis are not available, the ferrous sulfate, enclosed so as to prevent access of air, may be heated to 100°C (212°F) (at which temperature it loses $6\text{H}_2\text{O}$) and weighed as $\text{FeSO}_4 \cdot \text{H}_2\text{O}$. The last molecule of H_2O will remain until 300°C (570°F) is reached.

3.1.2.2 *Procedure for preparation.* Place 5 g of gallic acid, 1 g of tartaric acid, and 1 g of sodium benzoate in a 1000-mL flask, and add 750 mL of distilled water. Set the flask in a vessel of water, resting on a piece of wire netting or other support so that the bottom of the flask is not in direct contact with the outer vessel. Gradually heat the water in the outer vessel to about 60°C (about 140°F) and swirl the flask frequently until all the gallic and tartaric acids are dissolved. Add 7.5 g of $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$ and again swirl the flask to dissolve the iron salt. Then filter into the flask a solution of 3.5 g of the blue dye in 175 mL of distilled water. Wash the beaker in which the dye was dissolved with two or three 10-mL portions of distilled water and pour them into the funnel to rinse the filter paper. Finally, let the flask and contents cool to 20°C (68°F), fill to the mark with distilled water, and mix thoroughly.

3.1.2.3 *Age of ink.* The ink used for the test must be less than 1 year old.

4. Sampling and test specimens

4.1 Divide each test unit obtained in accordance with TAPPI T 400 "Sampling and Accepting a Single Lot of Paper, Paperboard, Fiberboard, or Related Product," into ten specimens, each a single sheet of paper approximately 100 by 100 mm (4 by 4 in.).

4.2 Divide the specimens into two sets of 5 sheets each, identifying them as wire side up and felt side up.

5. Conditioning

Condition the specimens and make the tests in an atmosphere in accordance with TAPPI T 402 "Standard Conditioning and Testing Atmospheres for Paper, Board, Pulp Handsheets, and Related Products."

6. Procedures

6.1 Place the test specimen on the support and use an object that will not contaminate the sample to depress the center slightly so that the ink, when applied, will remain in a pool in the center.

6.2 Fill the pipet with the test ink at a temperature of $23 \pm 2^\circ\text{C}$ ($73.4 \pm 3.6^\circ\text{F}$).

6.3 Hold the tip about 13 mm (about 0.5 in.) above the center of the specimen and deliver 1.00 mL of ink in 5 ± 1 s.

¹ Names of suppliers of testing equipment and materials for this method may be found on the Test Equipment Suppliers list, available as part of the CD or printed set of Standards, or on the TAPPI website general Standards page.