

Standard Method of Test for

PENTOSANS IN PAPER¹



A.S.T.M. Designation: D 688 - 44

ADOPTED, 1944.²

This Standard of the American Society for Testing Materials is issued under the fixed designation D 688; the final number indicates the year of original adoption as standard or, in the case of revision, the year of last revision.

Scope

1. This method of test covers the procedure for determining pentosans in paper.

Apparatus

2. The apparatus shall consist of the following:

(a) *Grinder*.—A Koerner³ or equivalent type grinder that will completely disintegrate the paper without heating or contaminating it.

(b) *Distillation Apparatus*.—A suitable distillation apparatus may be set up as follows: A 300-ml. separatory or dropping funnel is mounted in the neck of a 500-ml. distilling flask, which in turn is connected to a long water-cooled condenser. The condenser delivers through an adapter into a 1-liter reagent bottle, which is used as a receiver and subsequently as a reaction vessel. Rubber stoppers may be used to make the connections. If, during the distillation

(Section 5 (a)), the temperature of the condensate in the receiver is 30 C. or over, owing to inefficient cooling or high laboratory temperature, a small U-trap containing glass beads and 5 ml. of water should be used to close off the system.

Reagents

3. (a) *Hydrochloric Acid* (12 per cent, 3.5 N).—Dilute 307 ml. of c.p. HCl (sp. gr. 1.19) to 1 liter.

(b) *Ice*.—The ice used preferably shall be frozen from distilled water. Ordinary commercial ice is satisfactory if uniform values for the blank determinations (Section 5 (c)) are obtained.

(c) *Potassium Iodide Solution* (10 per cent).—Dissolve 10 g. of c.p. KI in 90 g. of water.

(d) *Standard Sodium Thiosulfate Solution* (0.1 N).—Dissolve 25.3 g. of c.p. $\text{Na}_2\text{S}_2\text{O}_3 \cdot 5\text{H}_2\text{O}$ in water containing 1 ml. of 1 N NaOH and dilute to 1 liter. This gives a solution slightly stronger than 0.1 N, but subsequent calculations are thus made easier. After allowing the solution to stand 1 week, standardize it against 0.1 N KMnO_4 as follows:

¹ Under the standardization procedure of the Society, this method is under the jurisdiction of the A.S.T.M. Committee D-6 on Paper and Paper Products.

² Prior to adoption as standard, this method was published as tentative from 1942 to 1944.

³ The Koerner type of grinder is described in a paper by J. O. Burton and R. H. Rasch on "The Determination of the Alpha-Cellulose Content and Copper Number of Paper," *Journal of Research*, Nat. Bureau Standards, Vol. 6, No. 4, p. 603 (1931) (*Research Paper 295*).