T 573 sp-09
PROVISIONAL METHOD – 2003
STANDARDS PRACTICE – 2009
©2009 TAPPI

The information and data contained in this document were prepared by a technical committee of the Association. The committee and the Association assume no liability or responsibility in connection with the use of such information or data, including but not limited to any liability under patent, copyright, or trade secret laws. The user is responsible for determining that this document is the most recent edition published.

CAUTION:
This Test Method may include safety precautions which are believed to be appropriate at the time of publication of the method. The intent of these is to alert the user of the method to safety issues related to such use. The user is responsible for determining that the safety precautions are complete and are appropriate to their use of the method, and for ensuring that suitable safety practices have not changed since publication of the method. 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 method, the user must 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.

Accelerated temperature aging of printing and writing paper by dry oven exposure apparatus

1. Scope

1.1 This standard practice describes a laboratory procedure for accelerating the aging of printing and writing paper within sealed glass tubes through exposure to elevated temperature within an oven.

1.2 The standard practice applies to all types of printing and writing paper whether it is plain base paper, has internal additives, is coated, is printed or contains any variants of printing and writing paper found in normal usage.

2. Summary

2.1 In this practice conditioned samples of printing and writing paper are placed inside airtight glass tubes to retain moisture and air. They are then aged at a constant elevated temperature in a well-controlled laboratory oven for a fixed test period. The aging of paper due to its interaction with moisture and air is accelerated at the elevated temperature.

2.2 Mechanical strength properties of the paper are measured before and after the aging process. The extent of retention of these properties provides a measure of the physical strength stability of the paper as it relates to its aging.

3. Significance

3.1 This standard practice will find use by parties concerned with the relative level of physical strength stability over time of various printing and writing papers.

3.2 The practice will provide manufacturers, paper users and other interested parties with a means of accelerated aging to identify papers that will be stable and those that will be unstable when aged under normal conditions of use and handling over time.

Approved by the Standard Specific Interest Group for this Test Method
TAPPI

Documents
Document Sharing Hub

Provided by IHS
No reproduction or networking permitted without license from IHS
Full document details: TAPPI T 573 SP 2009

Licensee=University of Alberta/5966844001, User=albert, sam
Not for Resale, 11/08/2014 22:45:24 MST

4. Apparatus

4.1 Use a laboratory forced-ventilation oven that maintains a uniform temperature of 100 ± 1.0°C.

4.2 Configure the oven so that conditioned paper, enclosed within airtight glass tubes, can be aged in its interior space.

4.3 Include multiple racks within the oven to allow horizontal orientation of glass tubes inside the oven.

4.4 Provide glass tubes of approximately 36.0-cm^3 internal volume per oven-dry gram of paper to be evaluated. Use screw-on caps that are fitted with O-rings or gaskets that ensure a hermetic seal of the interior contents during the elevated temperature aging. Use materials (glass, cap, O-ring or gasket) that are thermally stable at or preferably well above the aging temperature of 100°C, and also chemically resistant to acid corrosion. Two sources of tubes of approximately 145-cm^3 internal volume have been tested and found to be satisfactory. They are:

Kontes hybridization tubes, 35-mm I.D. x 150-mm long (Kontes No. K736500-3515). These glass tubes have polypropylene screw caps with silicone rubber O-rings.

Lab-Line hybridization tubes, 38-mm o.d. x 150-mm long (Lab-Line No. 308-9). These tubes have polypropylene screw caps with Teflon fluorocarbon resin gaskets.

Other tubes of similar high quality laboratory glass can be found from other manufacturers.

5. Calibration

5.1 Provide an oven in which the internal temperature uniformity can be maintained to within ± 1.0°C at 100°C.

5.2 Recalibrate the oven with sufficient frequency to ensure continual maintenance of the required temperature.

6. Conditioning

Condition the paper samples according to TAPPI T 402 for a minimum of 24 hours both immediately prior to and immediately following the accelerated aging period. Omit the preconditioning step of TAPPI T 402 "Standard conditioning and testing atmospheres for paper, board, pulp handsheets, and related products" following the aging period.

7. Procedure

7.1 At all times throughout this test procedure, handle paper samples only with clean cotton gloves. This means that clean cotton gloves are required for handling of the paper both before and following the aging procedure.

7.2 Select paper samples according to TAPPI T 400.

7.3 For the sample selected, randomize the sheets of paper.

7.4 From the randomized set of paper sheets, select eight individual sheets (equivalent to 8½ x 11-in sheets) at random for each test unit. Two test units are required for each sample; one for the testing of the unaged paper, and a second for the testing of the aged paper.

7.5 Thoroughly clean the aging tubes prior to insertion of paper. The required cleaning sequence follows:

7.5.1 Wash thoroughly with non-ionic detergent and tap water.

7.5.2 Rinse the tubes thoroughly with tap water to remove all residual soap.

7.5.3 Rinse three more times with distilled water and allow to drain sufficiently.

7.5.4 Dry the tubes in an oven at about 105°C.

7.5.5 Condition the complete tube assembly (opened) for a minimum of 24 hours in a room conditioned at the terms specified in TAPPI T 402.

7.6 If starting with new, previously unused aging tubes, caps, O-rings or gaskets, bake them at 100 to 105°C for at least 24 hours in preparation for their first use, following the completion of the above cleaning steps.

Documents
Document Sharing Hub

Provided by IHS
No reproduction or networking permitted without license from IHS
Full document details: TAPPI T 573 SP 2009

Licensee=University of Alberta/5966844001, User=albert, sam
Not for Resale, 11/08/2014 22:45:24 MST