

**Library of Congress Preservation Directorate  
Specification Number 300-301 – 16  
Specifications for Board Stock, Un-Buffered  
For the Storage of Artifacts**

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## **1. Composition and Chemical Requirements**

### **1.1 Fiber**

The stock must be made from rag or other high alpha-cellulose content pulp, minimum of 87%. It must not contain any post consumer waste recycled pulp.

### **1.2 Lignin**

The stock must give a negative reading for lignin as determined by the phloroglucinol test when tested according to TAPPI T 401, Appendix F, and shall have a Kappa number of 5 or less when tested according to TAPPI T 236.

### **1.3 Impurities**

The stock must be free of metal particles, waxes, plasticizers, residual bleach, peroxide, sulfur (which will be less than 0.0008% reducible sulfur as determined by TAPPI T 406), and other components that could lead to the degradation of the board stock itself, or the artifacts stored therein.

### **1.4 Metallic Impurities**

Iron must not exceed 150 ppm and copper shall not exceed 6 ppm when tested according to TAPPI T 266.

### **1.5 Optical Brighteners**

The stock must be free of optical brightening agents.

### **1.6 pH**

The stock must have a pH value of approximately 7.0 as determined by TAPPI T 509, cold extraction (modified by slurring sample pulp before measurement).

### **1.7 Alkaline Reserve**

There must be no alkaline reserve added to the stock. This requirement will be verified by testing the stock according to TAPPI T 553 (modified by slurring sample pulp before measurement).

## **1.8 Sizing**

Only neutral or alkaline sizing shall be used. No alum rosin or rosin sizing should be used, as determined by TAPPI T 408.

## **2. Physical and Performance Requirements**

### **2.1 Thickness and Basis Weight**

The stock must meet the following minimum requirements for basis weight as determined by TAPPI T 410.

#### **2.1.1 40 pt. Board**

The minimum basis weight should be 550 lbs/ 3,000 ft<sup>2</sup>

#### **2.1.2 60 pt. Board**

The minimum basis weight should be 800 lbs/ 3,000 ft<sup>2</sup>

### **2.2 Color**

The color of the stock should be tan, unless otherwise specified on the purchase order. The color must not be so dark that it obscures color-dependent test evaluations, e.g., spot stain tests.

### **2.3 Color Bleeding**

The color must show no bleeding when soaked in distilled water for 48 hours while held under suitable weight in contact with white bond paper. The color must not rub off.

### **2.4 Color Retention**

The color of the stock must not change more than 5 points of brightness as measured by directional reflectance at 457 nm (TAPPI T 452), when exposed 24 hours to a Xenon arc lamp in an Atlas Weatherometer under the following conditions: Irradiance Level: 1.0 watts/m<sup>2</sup> at 420 nm. Inner filter: Borosilicate glass. Outer filter: clear soda lime glass. Black panel temperature: 50°C. Wet bulb depression: 8.5°C.

### **2.5 Surfaces**

The surfaces of the stock must be free of fingerprints, dirt, bubbles, knots, shives and other imperfections.

### **2.6 Creases and Folds**

The stock must not fray, crack or split when folded and/or creased.

### **2.7 Stiffness**

The stock must meet the following minimum requirements for stiffness. Test will be conducted according to TAPPI T 489, after conditioning by TAPPI method T 402.

#### 2.8.1 40 pt. Board

The minimum internal stiffness must be not less than 2,800 Taber units in the machine direction and 800 in the cross direction.

#### 2.8.2 60 pt. Board

The minimum internal stiffness must be not less than 5,600 Taber units in the machine direction and 2,500 in the cross direction.

### **2.8 Adhesive**

If an adhesive is required, it must not soften or run. The adhesive must not cause the stock to become transparent or alter the color of the stock. The adhesive must not yellow, discolor, or fail (causing delamination) over time. The adhesive should not contain sulfur, iron, copper or other ingredients that may be detrimental to photographic materials. The adhesive should not contain or generate oxidants. Pressure-sensitive or rubber-based adhesives are not acceptable. When used, the adhesive must not extend beyond the joined area.

## **3. Product Requirements**

### **3.1 Construction**

Construction parameters will be specified on the purchase order.

### **3.2 Workmanship**

Edges must be cut square and clean. Sizes must be accurate. There must be minimal planar distortion upon visual inspection.

### **3.3 Dimensions**

Dimensions will be specified on the purchase order. The allowable tolerance for each dimension is  $\pm 1/16$  inch.

### **3.4 Thickness**

The thickness of the board will be specified on the purchase order.

### **3.5 Marking**

There must be no identification marks on the board stock unless otherwise specified.

## **4. Packaging and Identification**

### **4.1 Inner Packages**

Each package must plainly identify the type, size and number of items within, the name of the supplier or manufacturer, year of manufacture, and manufacturing run or batch number.

## **4.2 Outer Package**

The items must be packed in standard commercial containers that are constructed to ensure that they arrive at the Library of Congress in dry, undamaged condition. The outside of each container must be identified by type, size and number of items within; manufacturing run or batch number; LC Purchase Order / Contract number and line number.

## **5. Compliance with Specification**

### **5.1 Quality Assurance Testing**

The Library of Congress has the right to perform any of the tests set forth in the specification where such tests are deemed necessary to ensure that supplies conform to prescribed requirements.

### **5.2 Sampling**

To sample for testing, shipments will be sampled according to ANSI/ASQ Z1.4, inspection level S-2, AQL 2.5%.

### **5.3 Methods**

Tests will be conducted in accordance with specified test methods of the American National Standards Institute (ANSI), the American Society for Testing and Materials (ASTM), the Technical Association of the Pulp and Paper Industry (TAPPI), and the International Organization for Standardization (ISO). Publications describing these tests may be ordered directly from the technical associations, their websites, or other on-line standards vendors.

### **5.4 Acceptance**

Materials will be accepted when the Library of Congress has ascertained that the products comply with all parts of the specification. A quick reference table of the physical and chemical requirements and test methods used to ascertain compliance is provided in section 5.5.

**FAILURE TO MEET ANY PART OF THE SPECIFICATION WILL BE CAUSE FOR REJECTION**

## 5.5 Table of Physical and Chemical Requirements and Test Methods

Property	Requirement	Test Method
Lignin	Negative / Kappa 5	TAPPI T 401, Appendix F or TAPPI T 236
Reducible Sulfur	< 0.0008%	TAPPI T 406
Iron	≤ 150 ppm	TAPPI T 266
Copper	≤ 6 ppm	TAPPI T 266
pH	7.0	TAPPI T 509, cold extraction, slurried pulp
Alkaline Reserve	0%	TAPPI T 553, slurried pulp
Alum Rosin Sizing	Negative	TAPPI T 408
Basis Weight	40 pt: 550 lbs./3,000 ft <sup>2</sup> 60 pt: 800 lbs./3,000 ft <sup>2</sup>	TAPPI T 410
Color Bleeding	No bleed in 48 hours	See section 2.3
Color Retention	≤ 5 pts	TAPPI T 452
Stiffness	40 pt: 2800 MD, 800 CD 60 pt: 5600 MD, 2500 CD	TAPPI T 489

## Configuration Management

Date	Revision History
19-Jun-2002	Initial release of document on website, html format.
14-Dec-2009	Revised and reformatted for release as PDF document.
30-Sept-2016	Initial release of document, PDF format.