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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/Z 42964-2023

**Effectiveness of deacidification processes for paper-based
literature in libraries**

图书馆纸质文献脱酸工艺有效性评价方法

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Foreword

This document was issued on 6 August 2023 by the State Administration for Market Regulation; Standardization Administration of the PRC and takes effect on 6 August 2023.

It is a GB/Z guiding technical document: it does not oblige, it guides.

It is classified under ICS 01.140.20, Chinese classification A14.

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part 1. Structure and Drafting Rules of Standardization Documents"

Drafting.

This document is modified using ISO /T S18344.2016 "Effectiveness Evaluation of Deacidification Treatment of Paper Documents". The document type is determined by ISO 's technical specifications.

The standard was adjusted as my country's national standardization guiding technical document.

The technical differences between this document and ISO /T S18344.2016 and their reasons are as follows.

---The scope has been changed to conform to my country's national conditions;

---The term definition and English equivalent of alkali reserves have been changed (see

3.2), and the result units of alkali reserves have been changed (see Table 1, 5.3.3.3, 5.3.3.4, 5.3.3.5, 5.4.2.1), changed the terminology of degree of aggregation (see 3.3) to conform to my country's national conditions;

---The standard basis for test paper filler types, test paper quantification, and acidity has been changed (see Table 1) to conform to my country's national conditions;

---Replaced ISO 9184-1 and ISO 9184-4 (see Table 1) with the normatively quoted GB/T 4688 to adapt to my country's technology

condition;

---Replaced ISO 776 (see Table 1) with the normatively quoted GB/T 7978 to adapt to my country's technical conditions;

---Replaced ISO 536 (see Table 1) with the normatively cited GB/T 451.2 to adapt to my country's technical conditions;

---Replaced ISO 535 (see Table 1) with the normatively cited GB/T 1540 to adapt to my country's technical conditions;

---Replaced ISO 6588 (see Table 1) with the normatively quoted GB/T 1545 to adapt to my country's technical conditions;

---Replaced ISO 5630-5:2008 with normatively cited GB/T 40167-2021. The degree of consistency between the two documents is

Modify (see 5.3.3.1) to adapt to my country's technical conditions;

---Replaced ISO 10716 (see 5.3.3.3, 5.3.3.4 and 5.4.2.1) with normatively cited GB/T 24998 to adapt to my country's

Technical conditions;

---Replaced ISO 5351:2010 with normatively cited GB/T 1548-2016, and the degree of consistency between the two documents is revised

Modifications (see 5.3.3.5) to adapt to my country's technical conditions;

---Replaced ISO 5626 (see 5.3.3.6) with the normatively cited GB/T 457 to adapt to my country's technical conditions;

---The number of papers used for deacidification uniformity testing has been changed (see Table 2) to meet the testing quality requirements.

The following editorial changes have been made to this document.

---In order to coordinate with the existing standards, the name of the standard was changed to "Evaluation Method for Effectiveness of Deacidification Process of Library Paper Documents";

---Deleted the "Note" in Table 1 (see Table 1);

---Change the intrinsic viscosity value in Table B.8 to the degree of polymerization (see Table B.8);

---Change the MIT folding endurance standard tensile force to 9.81N (see the note in 5.3.3.6).

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Introduction

In accordance with the requirements of relevant laws, a large number of paper documents (manuscripts, printed copies, etc.) collected by libraries and other institutions need to be permanently preserved for the benefit of future generations.

Class civilization. Acidification and hydrolysis of paper caused by acidic substances has become a difficult problem faced by libraries and other paper document collection units.
paper acid

One of the factors that change is that the early industrial papermaking process used acidic substances such as aluminum sulfate as additives for in-slurry sizing. These acidic substances encounter

The water eventually forms free acid. Acid acts as a catalyst for fiber hydrolysis, causing the paper to become brittle. In addition, air pollution and cellulose degradation are also factors that paper

The source of neutral acidic substances also aggravates the acidification of paper.

Another factor in paper acidification is the stability of the raw material itself. Before industrial papermaking, flax, hemp or cotton were used to make paper.

Textile fibers as raw materials. The cellulose molecular chains in these fibers are longer and relatively stable. In the process of looking for more types of raw materials,

The process of making paper from groundwood pulp was invented. In addition to cellulose, groundwood pulp also retains most of the hemicellulose and lignin. Pulp purity

Decrease and fiber cutting caused by mechanical processing lead to poor paper quality.

Long-term stability of groundwood pulp paper compared to textile fiber pulp paper

It is also poorer and more susceptible to acidification.

Deacidification is to slow down the acidic degradation rate of paper by adding alkaline substances to neutralize acidic substances in the paper. Although it cannot

Improve the original physical properties of paper, but under appropriate storage conditions, it can reduce the speed of aging in the future. People have been using single-page strips in the early days

Acid process. Over the past few decades, new deacidification processes have emerged, and it is now possible to deacidify single pages or entire books in batches.

This document presents suitable methods for evaluating the effectiveness of deacidification processes.

This document does not specify which types of paper can be treated by batch deacidification.

In order to avoid physical damage or other unnecessary side effects to paper and binding, no matter what deacidification method is currently used, there are always some

The literature does not apply to deacidification processes. Deacidification techniques should be used to inform the library of the limitations of the chosen method.

The potential side effects of the deacidification process on the literature are beyond the scope of this document. Only routine measures to deal with these side effects are given in Appendix A.

suggestion.

Unvalidated analytical methods cannot evaluate whether paper has been deacidified and how effectively it has been deacidified.

Method for evaluating the effectiveness of library paper document deacidification process

1 Scope

GB/Z 42964-2023 covers how to judge whether a deacidification treatment applied to library paper has actually worked, and how uniformly. It gives the principle, then requirements arranged as an overview, sampling, process verification and routine monitoring, then the report, with an informative appendix on the side effects and drawbacks of deacidification and a second appendix holding a paper sample inspection record form. Paper made from the early industrial period onward carries its own destruction in it: acidic additives such as