

**REPORT OF THE  
STATE LIBRARIAN ON**

**The Feasibility  
of Printing State  
Publications and  
Public Records on  
Alkaline Paper**

**TO THE GOVERNOR AND  
THE GENERAL ASSEMBLY OF VIRGINIA**



**HOUSE DOCUMENT NO. 22**

**COMMONWEALTH OF VIRGINIA  
RICHMOND  
1991**

## PREFACE

House Joint Resolution No.36 requested the State Librarian to conduct a feasibility study of the use of alkaline paper for all state publications and public records. The resolution also directed that the study include the consideration of costs associated with the use of alkaline paper.

The scientific analysis of types of papers is complex and cost is relative to the type and quantity of paper. However, evidence shows that there is no significant cost difference between alkaline paper and acidic paper. In addition, the use of permanent alkaline paper for records of enduring value will significantly reduce the cost of conservation in the future.

The Commonwealth would be taking a significant step forward in the preservation of public records and state publications of enduring value by adopting a policy of using alkaline permanent paper. We would encourage the adoption of such a policy, and would further call for support for a state-wide preservation plan which is currently being developed by the Virginia State Library and Archives, in cooperation with libraries and repositories across the commonwealth, to address the identification and conservation of archival and library materials of enduring value.

This report was prepared by staff of Virginia State Library and Archives; Pearl Holford, Conservation Officer, Dr. Louis Manarin, State Archivist and Dennis Hallerman, Assistant State Archivist for Records, with the able assistance of Ellen McCrady, Editor of the Alkaline Paper Advocate, Robert W. Frase, Consulting Economist, Warren Mitchell, Purchase Officer, Division of Purchase and Supply, Marla Ichnoski, Wilcox-Walter-Furlong Paper Company, and Terry Martin, Dillard Paper Company.

Dr. John C. Tyson  
State Librarian

TABLE OF CONTENTS

PREFACE . . . . . 1

EXECUTIVE SUMMARY . . . . . 1

INTRODUCTION . . . . . 2

DEFINITIONS . . . . . 3

    ACID PAPER

    ALKALINE PAPER

    PERMANENT PAPER

RECYCLED PAPER AND PERMANENCE . . . . . 4

TECHNIQUES AND COSTS OF CONSERVATION . . . . . 4

PRICING AND AVAILABILITY OF ALKALINE PAPER . . . . . 5

CONCLUSION . . . . . 6

    I. SUMMARY

    II. RECOMMENDATION

APPENDIX A

HOUSE JOINT RESOLUTION NO. 36, 1990 SESSION

*Requesting the State Librarian to study the feasibility of the printing of all state publications and public records on alkaline paper.* . . . . . 7

APPENDIX B

PROPOSED RESOLUTION TO ESTABLISH A STATE POLICY ON PERMANENT PAPER. . . . . 9

## EXECUTIVE SUMMARY

\* Many paper-based historical documents are in danger because of rapid deterioration. The chemical instability of acidic paper has resulted in the brittleness and browning of an estimated 25% of the collections in major university and research libraries in the United States and Canada. Acidic paper becomes so brittle that pages break as they are handled.

\* Alkaline paper making is an established industrial process utilized for the manufacture of a variety of paper types, including products for commercial and industrial consumption. The alkaline paper making process is being increasingly adopted by the paper industry because of technological and economic incentives. Production of alkaline paper for writing and printing appears sufficient to accommodate increases in demand and the outlook for meeting future demand is favorable as more paper mills convert to alkaline paper production.

\* There are alkaline equivalents for all of the paper types and grades currently used for state publications and public records. Studies show that the cost of alkaline paper does not significantly exceed the cost of non-alkaline paper. While the Commonwealth of Virginia studies the feasibility of its use, alkaline paper is already being used under state contract, attesting to its price competitiveness. The use of alkaline paper will significantly reduce the problem of deterioration of documents and the threat of their being lost to the record of civilization forever. The use of alkaline paper will increase the longevity of important documents and records.

\* Since all public records and state publications do not have to be retained permanently, it is not necessary to produce all of them on alkaline permanent paper. Only those public records defined as archival under section 42.1-77 of the Code of Virginia and those state publications of enduring value need to be produced on alkaline permanent paper.

## INTRODUCTION

Deterioration of paper caused by residual acids, a result of the paper-making processes adopted in the mid-nineteenth century, is the major threat to the survival of paper produced since that time and to the survival of the records in the nation's archives and libraries accumulated since then. Without expensive efforts at preservation, the majority of the paper used for printing and writing now on shelves and in files across the nation is destined to become brittle and to crumble over the period of a lifetime.

The expense and effort of preservation of existing documents cannot be avoided, but it is possible to lessen the need for preservation treatment in the future. Paper-making processes that employ alkaline chemistry have now begun to come into use. Alkaline permanent paper will last for centuries rather than decades in ordinary use. It is now available in commercial quantities and at competitive prices in most paper grades.

The printed word is expected to remain the premier means of communicating knowledge. It is not responsible to continue to use acidic paper when it is known that the paper will self destruct. It is inefficient and illogical to continue to apply costly, labor intensive remedial preservation measures to perishable volumes and records when much of the preservation problem can be prevented at its source by using the permanent, archival medium of alkaline paper that is not predisposed to rapid deterioration.

## **DEFINITIONS**

While there are many types of paper, there are chemical characteristics which determine the stability of the paper itself. Common definitions universally recognized in the preservation field are:

### **ACID PAPER**

Acidity or alkalinity of paper is most often expressed by specifying the concentration of positive hydrogen ions or pH in the paper on a scale of 1 to 14. A pH of 7.0 is neutral. Paper with a pH of less than 7.0 is acidic and paper with a pH of more than 7.0 is alkaline. An acid affects paper by weakening its fibers. This deteriorative process can be further aggravated by improper storage conditions, air pollution, and heavy use.

### **ALKALINE PAPER**

During the paper making process alkaline sizing agents are combined with calcium carbonate filler to provide a useful pH control by producing a buffering action during the aging of paper. The terms acid-free and alkaline are used interchangeably to refer to the pH and alkaline reserve of the paper.

### **PERMANENT PAPER**

The American National Standard for Information Sciences (ANSI) Z39.48-1984 specifies the characteristics of permanent uncoated paper as "paper that should last at least several hundred years without significant deterioration under normal library use and storage conditions." The minimum requirements of paper for printed library materials set by ANSI Z39.48-1984 are:

1. Minimum pH of 7.5
2. Minimum alkaline reserve of 2%
3. Pulp free of groundwood and unbleached pulp

In addition to alkalinity the standard for permanent paper includes requirements for durability. Durable (permanent) alkaline paper has greater folding endurance, tear resistance, and color retention over prolonged periods.

Archival records as defined in the Code of Virginia, 42.1-77

will require the use of permanent alkaline paper.<sup>1</sup> While alkaline permanent paper does not last forever, under proper storage conditions it will retain its strength and pliability for several hundred years, compared to several decades for acidic paper.

## RECYCLED PAPER AND PERMANENCE

Physical and chemical properties of recycled fibers are degraded in the processing of the pulp. As a result, the properties of papers so produced are generally lower in strength and brightness than those produced with comparable virgin pulp. The use of recycled fibers in permanent papers *per se* is not precluded, assuming that the paper meets the chemical composition and strength requirements specified for a given grade of permanent paper.

## TECHNIQUES AND COSTS OF CONSERVATION

Paper conservation techniques include deacidification, repairing, restoring, rebinding and/or boxing or reformatting. Reformatting techniques include microfilming, copying text onto optical disks or photocopying of text onto permanent paper and then binding the text.

It is estimated that 25% of the holdings in American research libraries, 75-77 million volumes, are on acidic paper. The expense to the federal government, for restoration and reformatting of documents on acidic paper is stated in Senate Joint Resolution 57 and House Joint Resolution 226 of the 101st Congress: "...the Congress has already appropriated \$50 million to the National Archives and Records Administration, \$32 million to the Library of Congress and \$2.4 million to the National Library of Medicine for deacidifying or microfilming books too brittle for ordinary use and \$25 million to the National Endowment for the Humanities for grants to libraries and archives for such [conservation] purposes."<sup>2</sup> These resolutions go on to say that "there is an urgent need to prevent the continuance of the acid paper problem into the indefinite future..." There is also an urgent need to address the acid paper problem which now exists in the Commonwealth's archives and libraries.

---

<sup>1</sup>"*Archival records*" means all noncurrent records of continuing and enduring value useful to the citizens of the Commonwealth and necessary to the administrative functions of public agencies in the conduct of services and activities mandated by law.

<sup>2</sup>House Joint Resolution 226, To establish a national policy on permanent papers. 101st congress, 1st session, March 23, 1989, pp.1A,2.

Senate Joint Resolution 57, To establish a national policy on permanent papers, 101st congress, 1st session, August 2, 1989, p. 2.

## PRICING AND AVAILABILITY OF ALKALINE PAPER

Various reports and studies have determined that: "In general, the cost of alkaline paper is not significantly different from acid paper"<sup>3</sup> A report of the Association of Research Libraries concluded: "Cost studies of major paper manufacturers' prices for selected paper grades reveal that when comparable papers are considered, the cost of alkaline paper is comparable to that of acidic paper."<sup>4</sup> The United States Government Printing Office reported in April 1990 that "The preponderance of alkaline paper among the 1989 contract purchases of paper by the pound indicates that it was available on the market in sufficient quantities to ensure its procurement at prices that were competitive with acid papers."<sup>5</sup> Examination of paper brands presently purchased under state contract in Virginia shows eight alkaline paper brands are now being used. Of the paper manufacturers whose brands are used under state contract at least three manufacture only alkaline papers.

Because of variables which will determine the price on any given day, price comparisons on a dollar by dollar basis will fluctuate. The demand for paper at present exceeds the supply nationwide. Thus, prices quoted now will tend to be higher, due to a tight market. Prices paid under state contract are for large quantities which will also result in overall lower prices per unit. Current paper prices quoted below are based upon quantities of 10,000 sheets of the same grade and weight.

Specifications for fine paper products procured by the Commonwealth of Virginia as determined in the Notice of Contract Award, Commonwealth of Virginia Department of General Services, Division of Purchases and Supply, September 22, 1989, were used for identification of specific paper types and brands used by the state government. Brand names and manufacturers of equivalent alkaline papers were determined through use of The Paper Buyers' Encyclopedia, Fine Paper Directory and Sample Book, 14th ed., 1990/1991.

---

<sup>3</sup>Hearings before a subcommittee of the Committee on Appropriations, House of Representatives, 101st Congress, First Session (statement by Joseph Jennifer, Acting Public Printer), Washington, D.C.: U.S. Government Printing Office, 1989.

<sup>4</sup>Preserving knowledge: the case for alkaline paper. Washington, D.C.: Association of Research Libraries, 1990, p.I-A-3.

<sup>5</sup>Use of Alkaline Paper in Government Printing; report and plan prepared at the direction of the Committee on Appropriations, House of Representatives. Washington, D.C.: United State Government Printing Office, April 1990, p.8.



## PRICE COMPARISONS OF NON-ALKALINE AND ALKALINE PAPERS

<u>Non-Alkaline Paper</u>	<u>Price/wt.</u>	<u>Alkaline Paper</u>	<u>Price/wt</u>
October, 1990			
Capitol Bond	\$16.25/20	Certificate Bond II	\$14.36/20
Williamsburg Offset	5.32/50	Springhill Offset	7.73/50
or Spectrum (11x17)	12.86/60		9.01/60
Circa Select Bond	20.11/24	Curtis Brightwater	19.50/24

### CONCLUSION

#### I. SUMMARY

The use of alkaline and permanent papers by the state government of Virginia for publications and permanent records will ensure the longevity of the documents produced. Proper environmental control and storage of these documents will further enhance the resistance of alkaline paper to decay. Through use of alkaline paper the cost of reformatting and deacidifying fragile records recorded on acid paper will be reduced and eventually eliminated. Use of alkaline permanent paper will minimize the threat of losing historically significant works. By specifying the purchase and use of alkaline permanent papers by state government for archival records and state publications of enduring value, Virginia will take action to safeguard its important documents on paper, and ensure that they will be available for future use.

#### II. RECOMMENDATION

It is recommended that the Commonwealth adopt a policy to use alkaline permanent paper for archival public records and for state publications of enduring value. A proposed resolution is attached in Appendix B.

APPENDIX A

HOUSE JOINT RESOLUTION NO. 36, 1990 SESSION

*Requesting the State Librarian to study the feasibility of the printing of all state publications and public records on alkaline paper.*

# 1990 SESSION

LD4052584

## HOUSE JOINT RESOLUTION NO. 36

Offered January 16, 1990

*Requesting the State Librarian to study the feasibility of the printing of all state publications and public records on alkaline paper.*

Patrons—Van Landingham, Plum, Almand, Marshall, Cohen and Forehand

Referred to the Committee on Rules

WHEREAS, extensive research has proven that the acid present in most writing and printing paper produced since the mid-nineteenth century has drastically reduced the life of books, documents, and other publications; and

WHEREAS, there has been a serious deterioration of the holdings of the libraries and archives on the state and national levels; and

WHEREAS, large expenditures of funds will be required during the next several decades to prevent the further deterioration of holdings printed on acidic papers by deacidifying the paper; and

WHEREAS, the potential loss of a high percentage of the publications and unique records produced over the course of more than a century poses a threat to the continuity of the documentary heritage of the Commonwealth; and

WHEREAS, this problem can be alleviated by printing on alkaline paper, which is readily available and which has a prospective life of several hundred years; and

WHEREAS, the National Information Standards Organization has urged American publishers to use paper meeting ANSI Standard Z39.48-1984 for the printing of publications of enduring value; and

WHEREAS, the Depository Library Council to the Public Printer of the United States adopted a recommendation on October 16, 1987, that permanent paper be used for federal government publications of enduring value; and

WHEREAS, the American Library Association adopted a resolution on January 13, 1988, urging (i) publishers to use paper meeting ANSI Standard Z39.48-1984, (ii) the United States Congressional Joint Committee on Printing to adopt standards for permanent papers and to encourage agencies of the federal government to use such paper for publications of enduring value, and (iii) appropriate agencies of state and local governments to adopt similar policies; and

WHEREAS, one of the duties of the State Librarian as provided in § 42.1-15 is the proper preservation and care of the State Library and Archives; and

WHEREAS, the Virginia Public Records Act, § 42.1-77 et seq., establishes a State Public Records Advisory Council which is responsible for proposing to the State Library Board regulations and standards for the establishment of uniform guidelines for the management and preservation of public records throughout the Commonwealth; now, therefore, be it

RESOLVED by the House of Delegates, the Senate concurring, That the State Librarian conduct a study on the feasibility of the use of alkaline paper for all state publications and official records. Included in the study shall be the consideration of the costs associated with the use of alkaline paper.

The State Librarian shall complete the study in time to submit the findings and any recommendations to the Governor and the 1991 Session of the General Assembly as provided in the procedures of the Division of Legislative Automated Systems for processing legislative documents.

**APPENDIX B**

PROPOSED RESOLUTION TO ESTABLISH A STATE POLICY ON PERMANENT PAPER.

HOUSE JOINT RESOLUTION NO.....

Establishing a state policy for the use of alkaline permanent papers for the preservation of important public records and publications.

WHEREAS, it has been scientifically demonstrated that the acidic papers commonly used in documents, books, and other publications for more than a century are self-destructing and will continue to self-destruct; however, these facts are not widely recognized; and

WHEREAS, Virginians are facing the prospect of continuing to lose the Commonwealth's historical, scientific and scholarly publications and records, including government publications and public records, faster than salvage efforts can be mounted despite the dedicated efforts of many libraries, archives, and agencies, such as the Virginia State Library and Archives; and

WHEREAS, alkaline permanent papers with a life of several hundred years already are being produced at prices competitive with acidic papers; and

WHEREAS, there is an urgent need to prevent the continuance of the acidic paper problem into the indefinite future; now, therefore, be it

RESOLVED by the House of Delegates, the Senate concurring, That it is the policy of the Commonwealth of Virginia that public records of the Commonwealth defined as archival under § 42.1-77 and all state publications of enduring value be produced on alkaline permanent

papers and that the Virginia State Library and Archives provide guidance to state and local agencies in implementing this policy.

#