

Got Acid-Free Liner?

by Gary Cothran & Cecil Longwisch

Have you ever received a call asking for a bid on a product your plant routinely makes and then, right before you hang up, the customer says: "Oh, by the way, the liners have to be acid-free!" Acid-free?! In this edition of *Paperwise*, we will explain acid-free terminology and why certain product applications demand acid-free liners or anti-tarnishing liners.

Acid-Free Terminology

The *Dictionary Of Paper* defines *acid-free paper* as "...paper for applications where paper acidity would be harmful to the materials in contact with the paper." In the papermaking process, pH is important for managing the effectiveness of certain chemical additives. This is

most virgin unbleached kraft linerboards, the optimum sizing chemistry takes place at a pH between 4.5 and 6.5. Therefore, most virgin unbleached linerboards are not acid-free.

By contrast, white top linerboard producers typically use calcium carbonate fillers to enhance the appearance and brightness of their product. Calcium carbonate will decompose under acidic conditions. Consequently, white top producers will operate their process at a pH of 7.5 to 7.8 and use an alkaline sizing chemistry. As the pH scale in Figure 1 shows, these conditions are considered acid-free. Calcium carbonate naturally buffers or stabilizes the pH in this range like a common stomach antacid.

Some recycled linerboard manufacturers are tapping into acid-free chemistry since some recycled paperstocks can contain calcium carbonate fillers. It is important to note that a liner may be acid-free, but it may not be an "anti-tarnishing" substrate. The term *anti-tarnishing* requires that the paper does not contain or emit chemical compounds that can discolor or stain packaged goods. We will discuss anti-tarnishing further in the next section.

Why End Users Care

We have to look at what our customers are packaging to understand why acid-free or anti-tarnishing are important qualities to them. Here are some common items packaged using acid-free or anti-tarnishing liner.

Archival documents, photographic film, electronic components, coins, silverware, lead crystal or glass, automotive parts, needles, razor blades, aluminum goods, metal plating, hardware, or wedding gowns.

Storage of archived documents is a popular application for acid-free packaging because of a paper quality called *permanence*. Paper fibers exposed to acidic papermaking conditions are prone to degradation (yellowing and brittleness) over time. End users are concerned that documents in contact with acidic packaging will be contaminated and lose permanence. Additionally, some

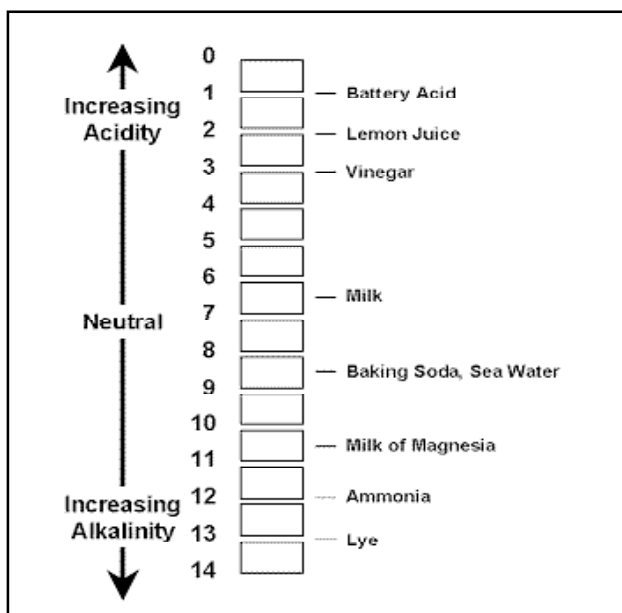


Figure 1. The pH of some common materials. Papermaking processes operating at a pH between 4.5 and 6.5 are acidic while papermaking at a pH of 7.5–10.0 is considered alkaline or acid-free.

particularly true for a chemical additive called sizing, which imparts water resistance to linerboard. Without proper sizing, the liner would be absorbent like a paper towel. For

textiles can be sensitive to the liner’s pH over time. Alkaline or acid-free papermaking promotes permanence and keeps the paper from becoming yellow and brittle. The calcium carbonate fillers used in white top production, can aid neutralization of acidic materials with which they come in contact.

Other materials such as photographic film (contains silver), silverware, electronic components (silver solder), metals, metal plating, or leaded glassware are sensitive to tarnishing or staining due to reactions with reduced sulfur (sulfides). The paper’s pH will typically impact the speed at which tarnishing occurs while the presence of certain chemicals such as reducible sulfur or chlorides create tarnishing in the first place.

Other metal products such as steel or copper may be sensitive to chlorides present in the paper. Papermakers do not intentionally add these to products; they are naturally present in the raw materials used to process and make the paper. Finally, chemicals in the paper are not the only reason goods can tarnish. Sensitive goods can tarnish if stored in an environment where the offending chemical (such as sulfur) is present.

How Much is Too Much?

Reducible sulfur levels of 8 ppm or less are considered anti-tarnishing according to TAPPI T406 and ASTM D984. On the other hand, chloride levels that are detrimental to metals depend on the metal’s quality or grade.

Regardless of the material, the original product manufacturer is the most qualified consultant on what chemicals and chemical concentrations can damage their goods. Ask them to specify their requirements. Manufacturers should also specify a recognized TAPPI (Technical Association of the Pulp and Paper Industry), ASTM (American Society for Testing and Materials) or ANSI (American National Standards Institute) test method for measuring the amount of chemical in the paper. Your

paper supplier can use the test method to report their results in a language familiar to your customer.

Smurfit-Stone offers linerboards in a variety of basis weights that can be used in acid-free and anti-tarnishing applications (see table below).

If your customer requires an acid-free or anti-tarnishing linerboard be used and you are unsure of their requirements, please contact us for us help at 888-284-4470.

If you would like more information on acid-free, anti-tarnishing liner or other technical topics, contact your Smurfit-Stone Sales Manager or call us toll free at 1-877-785-7835 or e-mail us at paperwise@smurfit.com

Product	Basis Weight	Acid Free	Non-tarnishing Silver
Unbleached Liner	33#, 35#, 42#	X	
White Top	31# - 69#	X	X
Premium White Top	31#, 36#, 42#	X	X
Coated White Top	29#-41#	X	X