Archival or Permanent Pressure Sensitive Paper Products

There is no current standard test method for determining the permanent quality of pressure sensitive coated paper products. Much prior investigation into the face paper raw materials that are used in pressure sensitive laminates are covered under ASTM Standard D-3290-94 entitled, "Standard Specification for Bond and Ledger Papers for Permanent Records".

We frequently receive the question on whether our products may be considered "acid free". The term "acid free" relates to the absence of components in the paper furnish, coatings used as print or back coatings, and adhesive that contain acidic raw materials, by-products, or potential by product development. It is, therefore, our conclusion that if the paper furnish, coatings, and pressure sensitive adhesive are all identified as being alkaline in nature (pH greater than 7.0), and then the finished product can be represented as "acid free".

The background and driving force behind the investigation of archival quality products resulted from the recognition that many important paper documents of historical significance, including book editions and permanent records, were truly disintegrating with age due to the degradation process created by rosin/alum acidic medium and other acidic pulp manufacturing methods. The papers that were produced by acid process were capable of absorbing acidic gases from the atmosphere and also proving non-resistant to acidic by-products produced in the natural aging of such papers.

For more than a decade, we have witnessed the transition to "alkaline process" paper production. Some of the leading paper manufacturers of fine printing papers estimate that in 1999 more than 80% of these fine printing paper grades are produced by alkaline process. In addition, over recent years some of the acid process mills have made additional changes to also extend product permanence.

We have taken some of the products that we believe are "acid free" and carried out cold water extraction tests using TAPPI T-509-OM-88 testing procedure to determine the degree of alkalinity represented by the component raw materials. We are not aware of any prior work being done on the actual adhesive-coated face materials, since both ASTM Standard D-3290-94 and the ANSI/NISO Z-39.48-1992 entitled, "Permanence of Paper for Publications and Documents in Libraries and Archives" deal exclusively with the face papers alone and not the pressure sensitive adhesive coated products.

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Those paper mills that still retain some form of acid process production tend to believe that specific physical strength qualities can only be achieved with acid process production.

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This is not to say that production exhibiting slight acidity may not have any archival quality. The ASTM D-3290-94 standard elaborates on permanent paper history indicating "Machine-made papers with alkaline filler have existed with little apparent change for almost 100 years. Similar handmade papers have survived for almost 400 years. Manifold papers stored in U.S. government files with PH as low as 4.2 have survived almost 60 years. A minimum pH of 5.5 should indicate longevity greater than 50 years".

In our investigation if the furnish or body stock is slightly acidic, and the coatings and adhesive are alkaline, we did not include such products in our archival product recommendations. Currently, an ASTM/ISR program is under way to further examine effects of aging on archival paper. It is likely that additional tests will evolve which may include temperature/relative humidity exposure of 90°C. /55-60% Rh, fadeometer exposure, and exposure to SO_2 and NO_X to cover additional testing. It is not likely, however, that these tests will be resolved and recommended to ASTM until late 2003.

ASTM D-3290-94 attempts to classify permanent papers as follows:

Type 1: Maximum permanence of several hundred years. pH is 7.5-9.5
Type 2: High permanence of 100 year minimum. pH of 6.5-8.5.
Type 3: Medium permanence of 50-100 years. pH of 5.5 minimum.

Again, in our study we limited our recommendations of archival or permanent quality to those products having all components of alkaline nature (greater than 7.0 pH) and included furnish, coatings, and pressure sensitive adhesive.