

## **Accelerated Aging of Leather.**

The authors of this paper, K. Donmez and H. V. Piltingsrud, prepared it for its eventual inclusion in an ASTM International Practice. ASTM International is one of the largest standards-producing organizations in the world.

The paper shows in detail all of the steps required to carry out a longevity analysis of leather samples using the sulfur dioxide and air method, similar to that described in "Aging of Organ Leather." The samples are exposed to an atmosphere of sulfur dioxide and air at an elevated pressure and temperature for a known period of time. All of the details of the equipment and chemicals used, the procedures of using those, the measurements of the effects of the treatment and the analysis of the results are given. In section 12 an example is given of the deterioration of three leathers, having both normal aging as well as subsequent artificial accelerated aging. It then shows a projection of likely remaining lifetime for those leathers. The two samples demonstrating the longest projected lifetimes were chrome-tanned hair sheep. The other sample had an unknown vegetable tannage.

The measurement of aging is related to the measurement of the tensile strength, the force required to break or pull apart a sample of the leather, in pounds per square inch cross-section of the leather sample. The leather sample has its tensile strength measured before its accelerated aging exposure and after the exposure. The loss of tensile strength is then used to indicate the projected longevity of the leather. When leather is being analyzed for potential use in a pipe organ, it is considered too weak for continued use if its tensile strength is under 500 lb/in<sup>2</sup>.

This paper was subsequently used as the basis for ASTM D8137-18, "Practice for Accelerated Aging of Leather."