



Designation: D8137 – 18 (Reapproved 2023)

Practice for Accelerated Aging of Leather¹

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1. Scope

1.1 This practice is based on studies relating the rate of deterioration of leathers having known durabilities from long-term storage of samples, to the deterioration experienced by laboratory exposure of specimens to known contents of acid gases in air or oxygen. This is accomplished by measuring the deterioration (reduction in tensile strength) of leather specimens when they are subjected to exposure to a mixture of air, moisture and sulfur dioxide at a given temperature and pressure and for a given exposure time. The loss of tensile strength of the specimens resulting from this exposure is compared to that experienced by a variety of leathers having various tannages and having historically long and short service lifetimes. The initial tensile strength and the degree of loss of tensile strength is related to what service life can be anticipated from a given leather.

1.2 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.3 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*²

[D1517 Terminology Relating to Leather](#)

[D1610 Practice for Conditioning Leather and Leather Products for Testing](#)

[D1813 Test Method for Measuring Thickness of Leather Test Specimens](#)

¹ This practice is under the jurisdiction of ASTM Committee [D31](#) on Leather and is the direct responsibility of Subcommittee [D31.05](#) on Upholstery.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

[D2209 Test Method for Tensile Strength of Leather](#)

3. Terminology

3.1 For definitions of leather terms used in this Practice refer to Terminology [D1517](#).

4. Reagents

4.1 *Sulfur Dioxide (SO₂)*, Anhydrous, 99.9 % pure.

4.2 *Air*, From compressor, filtered, stored at ~21°C (saturated water vapor conditions) 90 psi to 100 psi delivery pressure.

5. Summary of Practice

5.1 Specimens are prepared and placed in a pressure chamber containing known or constant quantities of air, moisture and SO₂. They are held in the chamber at a constant temperature for a given time period. After that processing, the tensile strengths of the specimens are measured along with the tensile strengths of unprocessed specimens of the same leather. The loss of tensile strength resulting from the processing relative to that of the unprocessed specimens (%) is determined and may be directly compared to that of other leathers considered for an application. Where applicable, the results may also be considered as the basis for projected service lifetimes as shown in Section [11](#).

6. Significance and Use

6.1 A substantial difficulty in using leather in applications requiring very long service lives is estimating how well a particular leather will actually hold up in service. Such applications may include use in musical instruments such as pipe organs, bookbinding leathers, etc. Use of leather in pipe organs in the past (prior to approximately 1930) demonstrated service lives frequently over 100 years, and the consequences of short service lives can result in extremely costly repairs. Many post-1930 leathers have had short service lives (as little as 15 years) due to the use of various more modern tannages and processing methods. Identifying exactly what tannage and processing was used in a particular leather and how successful this tanning and processing was can be very difficult. Failure of bookbinding and upholstery leathers formed the impetus for extensive work by leather chemists in the 1940s to identify tests that could be used to verify the durability of leather