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U. S. DEPARTMENT OF COMMERCE
NATIONAL BUREAU OF STANDARDS
Washington

Letter
Circular
LC-667
(Supersedes
LC-577)

September 30, 1941

LEATHER:
Publications by Members of the Staff of
the National Bureau of Standards.

GENERAL INFORMATION

Some of these publications were printed in the regular series of publications of the Bureau and others in the various scientific and technical journals. Copies can usually be consulted at the leading libraries of the larger cities.

For ready reference and convenience in ordering the separate papers of the Bureau, these have been listed with the serial letter and number in one column and the price in the last column. Those marked "OP" are out of print, but may be consulted in libraries as stated in the first paragraph. A complete list of our publications (Circular No. 24 and Supplements) is also generally available at such libraries.

Where the price is stated, the publication can be purchased from the Superintendent of Documents, Government Printing Office, Washington, D. C. The prices quoted are for delivery to addresses in the United States and its territories and possessions and in certain foreign countries which extend the franking privilege. In the case of all other countries, one-third the cost of the publication should be added to cover postage. Remittances should be made either by coupons (obtainable from the Superintendent of Documents in sets of 20 for $1.00 and good until used), or by check or money order payable to the "Superintendent of Documents, Government Printing Office" and sent to him with order.

Serial letters are used to designate Bureau publications:

RP = "Research Paper". These are reprints of articles appearing in the "Bureau of Standards Journal of Research" (BS J. Research) and the "Journal of Research of the National Bureau of Standards" (J. Research NBS), the latter being the title of this periodical since July 1934 (volume 13, number 1).

C = "Circular" of the National Bureau of Standards.

T = "Technologic Paper" of the National Bureau of Standards. Nos. T1 to T370. This series was superseded by the "Bureau of Standards Journal of Research" in 1928.

For papers in other scientific or technical journals, the name of the journal or of the organization publishing the article is given in abbreviated form, with address in parenthesis, together with the volume number (underscored), page, and year of publication, in the order named. The Bureau cannot supply copies of these journals, or reprints from them, and it is unable to furnish information as to their availability or price.

RESEARCH PAPERS

Title	Series	Price
A comparison of the quinhydrone and hydrogen electrodes in solutions containing tannin. E. L. Wallace and John Beek, Jr. BS J. Research 4, 737 (1930)	RP176	OP
A study of the adsorption of sulphuric acid by leather. John Beek, Jr. BS J. Research 5, 1109 (1930)	RP249	OP
The hydrolysis of chestnut and quebracho tanned leathers by sulphuric acid. E. L. Wallace. BS J. Research 7, 621 (1931)	RP362	5c
A contribution relative to the structure of collagen. John Beek, Jr. BS J. Research 8, 549 (1932)	RP434	5c
The influence of pH on the deterioration of vegetable-tanned leather by sulphuric acid. R. C. Bowker and E. L. Wallace. BS J. Research 10, 559 (1933)	RP548	5c
The effects of atmospheric moisture on the physical properties of vegetable and chrome tanned calf leathers. W. D. Evans and C. L. Critchfield. BS J. Research 11, 147 (1933)	RP583	5c
Influence of magnesium-sulphate on the deterioration of vegetable-tanned leather by sulphuric acid. R. C. Bowker and E. L. Wallace. J. Research NBS 14, 121 (1935)	RP761	5c
Combining weight of collagen. John Beek, Jr. J. Research NBS 14, 217 (1935)	RP765	5c
Amino-nitrogen contents of wool and collagen. Joseph R. Kanagy and Milton Harris. J. Research NBS 14, 563 (1935)	RP787	5c

RESEARCH PAPERS (Cont'd)

Title	Series	Price
Effect of sulphuric acid on chrome-tanned leather. Everett L. Wallace, John Beek, Jr., and Charles L. Critchfield. J. Research NBS 14, 771 (1935)	RP802	5c
Method for measuring the pH of leather using a simple glass-electrode assembly. Everett L. Wallace. J. Research NBS 15, 5 (1935)	RP805	5c
Influence of sulphonated cod-liver oil on the deterioration of vegetable-tanned leathers by sulphuric acid. Everett L. Wallace, Charles L. Critchfield and John Beek, Jr. J. Research NBS 15, 73 (1935)	RP811	5c
Comparative wear of chrome-tanned, vegetable-tanned, and retanned sole leather. Roy C. Bowker and Warren E. Emley. J. Research NBS 15, 363 (1935)	RP834	5c
Influence of some sulphur containing tanning materials on the deterioration of vegetable-tanned leathers by sulphuric acid. Everett L. Wallace, Joseph R. Kanagy and Charles L. Critchfield. J. Research NBS 15, 369 (1935)	RP835	5c
Deterioration of vegetable-tanned leathers containing sulphuric acid and glucose. Everett L. Wallace and Joseph R. Kanagy. J. Research NBS 15, 523 (1935)	RP846	5c
The soluble decomposition products in aged vegetable-tanned leathers. Joseph R. Kanagy. J. Research NBS 17, 247 (1936)	RP909	5c
Behavior of leather in the oxygen bomb. Joseph R. Kanagy. J. Research NBS 18, 713 (1937)	RP1004	5c
Influence of copper and iron salts on the behavior of leather in the oxygen bomb. Joseph R. Kanagy. J. Research NBS 20, 840 (1938)	RP1109	5c
Combination of hydrochloric acid and sodium hydroxide with hide, tendon, and bone collagen. John Beek, Jr. J. Research NBS 21, 117 (1939)	RP1119	5c

RESEARCH PAPERS (Cont'd)

Title	Series	Price
Accelerated aging of leather in the oxygen bomb at 100° C. Joseph R. Kanagy. J. Research NBS 21, 241 (1939)	RP1128	5c
Electrophoresis of collagen. John Beek, Jr., and Arnold M. Sookne. J. Research NBS 23, 271 (1939)	RP1230	5c
Effect of oxygen and moisture on the stability of leather at elevated temperatures. Joseph R. Kanagy. J. Research NBS 25, 149 (1940)	RP1319	5c
Effect of speed of pulling jaws on the tensile strength and stretch of leather. Robert B. Hobbs. J. Research NBS 25, 207 (1940)-	RP1321	5c
Evolution of carbon dioxide and water from vegetable-tanned leathers at elevated temperatures. Joseph R. Kanagy. J. Research NBS 27, 257 (1941)	RP1418	5c
The carbohydrate content of collagen. John Beek Jr. J. Research NBS (1941) -----		

CIRCULAR

Shoe Constructions. R. C. Bowker. (1938) ---	C419	10c

TECHNOLOGIC PAPERS

Effects of glucose and salts on the wearing quality of sole leather. P. L. Wormeley, R. C. Bowker, R. W. Hart and L. M. Whitmore. Tech. Pap. BS 12 (1919) ------	T138	OP
An apparatus for measuring the relative wear of sole leathers, with results obtained with leather from different parts of a hide. R. W. Hart and R. C. Bowker. Tech. Pap. BS 13 (1919-20)	T147	5c
Area measurement of leather. F. J. Schlink. Tech. Pap. BS 13 (1919-20)	T153	OP

Technologic Papers (Cont'd)

Title	Series	Price
Effects of oils, greases, and degree of tannage on the physical properties of russet harness leather. R. C. Bowker and J. B. Churchill. Tech. Pap. BS 13 (1919-20)	T160	5c
Laboratory wearing test to determine the relative wear resistance of sole leather at different depths throughout the thickness of a hide. R. W. Hart. Tech. Pap. BS 13 (1919-20)	T166	OP
Durability of sole leather filled with sulphite cellulose extract. R. C. Bowker. Tech. Pap. BS 16, 495 (1921-22)	T215	5c
Comparative durability of chrome and vegetable-tanned sole leathers. R. C. Bowker and M. N. V. Geib. Tech. Pap. BS 19, 267 (1924-25)	T286	10c
Investigation of synthetic tanning materials. E. Wolesensky. Tech. Pap. BS 20, 1 (1925-26)	T302	15c
Behavior of synthetic tanning materials toward hide substance. E. Wolesensky. Tech. Pap. BS 20, 275 (1925-26)	T309	5c
Analysis of synthetic tanning materials. E. Wolesensky. Tech. Pap. BS 20, 519 (1925-26)	T316	5c
Action of sodium sulphate in synthetic tanning materials. E. Wolesensky. Tech. Pap. BS 20, 529 (1925-26)	T317	10c
Use of sulphite cellulose extract as a tanning material. E. L. Wallace and R. C. Bowker. Tech. Pap. BS 21, 309 (1926-27)	T339	30c
Cleaning of fur and leather garments. M. H. Goldman and C. C. Hubbard. Tech. Pap. BS 22, 183 (1927-28)	T360	OP

OUTSIDE PUBLICATIONS

The following publications were printed in the Journal of the American Leather Chemists Association, 143 West 20th

OUTSIDE PUBLICATIONS (Cont'd)

Street, New York, N. Y. Reprints of those marked with an asterisk may be secured without charge (until the supply is exhausted) by addressing the Leather Section, National Bureau of Standards, Washington, D. C.

The work of the Bureau of Standards in leather. P. L. Wormeley. 13, 367 (1918).

The effect of grease on the tensile strength of strap and harness leather. L. M. Whitmore, R. W. Hart and A. J. Beck. 14, 128 (1919).

The leather work at the Bureau of Standards. L. M. Whitmore. 14, 401 (1919)

Analyses of different tannages of strap, harness and side leathers. L. M. Whitmore. 14, 567 (1919).

Sampling of leather for chemical analysis. R. C. Bowker and E. L. Wallace. 17, 217 (1922).

Progress report on the effects of acids on leather. R. C. Bowker. 23, 82 (1928)*

The influence of splitting on the strength and stretch of commercial leathers. R. C. Bowker and E. S. Olson. 25, 275 (1930)*.

Analysis of salt used for curing skins. R. C. Bowker and John Beek, Jr. 26, 312 (1931)*.

The deterioration of chestnut and quebracho tanned leathers by sulphuric acid. R. C. Bowker. 26, 444 (1931)*.

The hydrolysis of chestnut and quebracho tanned leathers by sulphuric acid. E. L. Wallace. 26, 545 (1931)*.

The influence of grease on the deterioration of chestnut and quebracho leathers by sulphuric acid. R. C. Bowker. 26, 667 (1931)*.

The effect of atmospheric moisture on the deterioration of commercial and quebracho tanned leathers containing sulphuric acid. R. C. Bowker and W. D. Evans. 27, 81 (1932)*.

The addition of a definite quantity of sulphuric acid to leather. John Beek, Jr. 27, 79 (1932)*.

OUTSIDE PUBLICATIONS (Cont'd)

The deterioration of leather by sulphuric acid as influenced by tanning with blends of chestnut and quebracho extracts. R. C. Bowker and C. L. Critchfield. 27, 158 (1932)*.

The influence of pH on the deterioration of vegetable-tanned leather by sulphuric acid. R. C. Bowker and E. L. Wallace. 28, 125 (1933)*.

The influence of sodium chloride and magnesium sulphate on the hydrolysis of leather by sulphuric acid. E. L. Wallace and J. R. Kanagy. 28, 186 (1933)*.

Report of the Committee on the determination of acid in leather, 1934. R. C. Bowker, Chairman. 29, 403 (1934).

Comments on the Procter and Searle method for determining the acidity of vegetable-tanned leather. R. C. Bowker and E. L. Wallace. 29, 421 (1934)*.

Effect of temperature on the deterioration of leather containing sulphuric acid. R. C. Bowker and E. L. Wallace. 29, 523 (1934)*.

The deterioration of vegetable-tanned leather by oxalic acid. R. C. Bowker and J. R. Kanagy. 30, 26 (1935)*.

Influence of magnesium sulphate on the deterioration of vegetable-tanned leather by sulphuric acid. R. C. Bowker, E. L. Wallace and J. R. Kanagy. 30, 93 (1935)*.

The effect of sulphuric acid on chrome-tanned leather. Everett L. Wallace, John Beek, Jr., and Charles L. Critchfield. 30, 311 (1935)*.

Method of measuring the pH of leather using a simple glass electrode assembly. Everett L. Wallace. 30, 370 (1935)*.

Influence of sulphonated cod-liver oil on the deterioration of vegetable-tanned leathers by sulphuric acid. Everett L. Wallace. 30, 438 (1935)*.

Comparative wear of chrome-tanned, vegetable-tanned, and retanned sole leather. Roy C. Bowker and Warren E. Emley. 30, 572 (1935)*.

Influence of some sulphur-containing tanning materials on the deterioration of vegetable-tanned leathers by sulphuric acid. E. L. Wallace, Joseph R. Kanagy and Charles L. Critchfield. 30, 510 (1935)*.

OUTSIDE PUBLICATIONS (Cont'd)

Deterioration of vegetable-tanned leather containing sulphuric acid and glucose. Everett L. Wallace and Joseph R. Kanagy. 30, 614 (1935)*.

Effect of acid on leather - a summary. Warren E. Emley. 30, 621 (1935)*.

First Annual Report of Committee on Standardization of Physical Tests of Leather. Warren E. Emley, Chairman. 31, 210 (1936)*.

Report of the Committee on a Method for the Determination of Moisture in Leather. E. L. Wallace, Chairman. 31, 213 (1936)*.

The probable error in the measurement of the tensile strength of heavy leather. John Beek, Jr. 32, 4 (1937)*.

The soluble decomposition products in aged vegetable-tanned leather. J. R. Kanagy. 32, 12 (1937)*.

Behavior of leather in the oxygen bomb. J. R. Kanagy. 32, 314 (1937)*.

Laboratory apparatus and method for determining the resistance of sole leather to abrasion. E. L. Wallace. 32, 325 (1937).

Methods for measuring physical properties of leather and method of preparing samples of leather for analysis. W. E. Emley. 32, 418 (1937).

Annual Report of Committee on Standardization of Physical Tests of Leather. Warren E. Emley. 33, 297 (1938)*.

Influence of copper and iron salts on the behavior of leather in the oxygen bomb. Joseph R. Kanagy. 33, 352 (1938)*.

Accelerated aging of leather in the oxygen bomb at 100° C. Joseph R. Kanagy. 33, 565 (1938)*.

Note on the evaluation of leather by means of the X-ray diffraction patterns. Roy C. Bowker and Harry J. McNicholas. 34, 101 (1939)*.

Report of the A. L. C. A. committee on the determination of pH in tannery practice. Roy C. Bowker. 34, 280 (1939)*.

OUTSIDE PUBLICATIONS (Cont'd)

Stability of leather as indicated by different Procter and Searle values and by pH values. Roy C. Bowker and Everett L. Wallace. 34, 551 (1939)*.

Influence of natural non-tannins on the deterioration of chestnut and quebracho leathers by sulfuric acid. Roy C. Bowker and Robert B. Hobbs. 35, 5 (1940)*.

Shrinkage temperature of leather. Robert B. Hobbs. 35, 272 (1940)*.

Effect of oxygen and moisture on the stability of leather at elevated temperatures. Joseph R. Kanagy. 35, 632 (1940)*.

Effect of speed of pulling jaws on the tensile strength and stretch of leather. Robert B. Hobbs. 35, 715 (1940)*.

Some applications of statistical methods to sampling of leather. John Beek, Jr. and Robert B. Hobbs. 36, 190 (1941)*.

Note on the measurement of the permeability of leather to water vapor. Robert B. Hobbs. 36, 346 (1941)*.

OTHER OUTSIDE PUBLICATIONS

Organ and piano leathers. R. C. Bowker. The Leather Manufacturer (683 Atlantic Ave., Boston, Mass.) 31, 259 (1920).

Polishing leather for cutlery. R. C. Bowker. The American Cutler. (Feb. 1925).

Increasing the wear of sole leather. R. C. Bowker. Hide and Leather (300 W. Adams St., Chicago, Ill.) (Oct. 1925).

Leather work of the Bureau of Standards. R. C. Bowker. The Leather Manufacturer (683 Atlantic Ave., Boston, Mass.) 39, 11 (1928).

Leather standardization activities at the Bureau of Standards. R. C. Bowker. U. S. Daily (now U. S. News) (2201 M. St., N. W., Washington, D. C.) (March 30 and 31, 1928).

Analyze polishing wheel leather. R. C. Bowker. Abrasive Industry. (Jan. 1926).

OTHER OUTSIDE PUBLICATIONS

Leather work at the Bureau of Standards. R. C. Bowker. American Shoemaking (Aug. 26, 1925).

Outline of the United States specifications for leather belting. R. C. Bowker. Belting, Transmission, Tools and Supplies (Feb. 1922).

Leather and its manufacture, Industry. R. C. Bowker. U. S. Daily (now U. S. News) (2201 M. St., N. W., Washington, D. C.) (Dec. 20, 1929).

The adsorption of sulphuric acid by leather. John Beek, Jr. Ind. Eng. Chem. (Mills Bldg., Washington, D. C.) 22, 1373 (1930).

The supply of chestnut wood extract for tanning purposes. R. C. Bowker. Hide and Leather (300 W. Adams St., Chicago, Ill.) (Dec. 20, 1930).

Some physical properties of fur-seal skins. R. C. Bowker. Tech. Assn. Fur Ind. (71 Clymer St., Brooklyn, N. Y.) 2, 34 (1931).

Technical studies to aid leather manufacturers. R. C. Bowker. U. S. Daily (now U. S. News) (2201 M. St., N. W., Washington, D. C.) (Nov. 23, 1931).

Quality standardization of leather products. R. C. Bowker. U. S. Daily (now U. S. News) (2201 M. St., N. W., Washington, D. C.) (Nov. 24, 1931).

Studies to prolong the life of leather. R. C. Bowker. U. S. Daily (now U. S. News) (2201 M. St., N. W., Washington, D. C. (Nov. 25, 1931).

Simplifying practices in the leather trade. R. C. Bowker. U. S. Daily (now U. S. News) (2201 M. St., N. W., Washington, D. C.) (Nov. 27, 1931).

The amino-nitrogen contents of wool and collagen. Milton Harris and Joseph R. Kanagy. Am. Dyestuff Reporter 24, 182 (1935).

Machine tests will help women select best wearing shoes. R. C. Bowker. Industrial Standardization and Commercial Standards Monthly 7, 104 (May 1936).

Apparatus for testing coated fabrics. R. C. Bowker. Rayon Textile Monthly 28, 57 (25) (Jan. 1937).

OTHER OUTSIDE PUBLICATIONS (Cont'd)

The deterioration of leather by acid. R. C. Bowker. Stiasny-Festschrift-1937. Eduard Roether-Verlag-Darmstadt.

National Bureau of Standards experimental tannery. Roy C. Bowker. Hide and Leather and Shoes 97, No. 23 (June 1939).

The physical properties of sole leather. Dorothy Jordan Lloyd, R. C. Bowker, F. O'Flaherty, E. Norlin, J. Gordon Parker and E. L. Wallace. J. Int. Soc. Leather Trades' Chemists 23, 461-480 (Aug. 1939).

Performance tests for leather. Everett L. Wallace. Hide and Leather and Shoes. Vol. 102, No. 3 (July 19, 1941).

The carbohydrate in collagen. John Beek, Jr. J. Am. Chem. Soc. 63, 1483 (1941).

COMMERCIAL STANDARDS

Title	CS No.	Price
Bag, case, and strap leather. (Thickness).	CS34-31	5c

SIMPLIFIED PRACTICE RECOMMENDATION

Title	SPR No.	Price
Braided shoe laces. (Lengths).	R168-37	5c

FEDERAL SPECIFICATIONS

Prepared by the Technical Committee on Leather Products of the Federal Specifications Executive Committee.

Title	Designation	Price
Leather; bag.	KK-L-151	5c
Leather; hydraulic-packing (vegetable tanned).	KK-L-181	5c
Leather; lace	KK-L-201	5c
Leather; rigging	KK-L-241	5c
Leather; sole, vegetable-tanned.	KK-L-261a	5c
Leather; upholstery.	KK-L-291	5c
Cases; brief, leather.	KK-L-121	5c

OTHER OUTSIDE PUBLICATIONS (Cont'd)

	Designation	Price
Leather; case	KK-L-166	5c
Leather; strap, black and russet.	KK-L-271	5c
Envelopes; leather	KK-E-561	5c
Aprons; leather, blacksmiths'.	KK-A-606	5c
Skins; chamois	KK-S-416	5c
Holsters; pistol, leather.	KK-H-566	5c
Leather; harness, black and russet.	KK-L-171	5c
Bags; hand, leather.	KK-B-50	5c
Belts; linemen's, safety, leather.	KK-B-151	10c
Belting; flat, leather, vegetable-tanned. (Superseding KK-L-161)	KK-B-201	5c
Welting; leather, shoe.	KK-W-231	5c
Belting; round, leather, vegetable-tanned.	KK-B-211	5c