Designation: D 509 – 98

Standard Test Methods of Sampling and Grading Rosin[1]

This standard is issued under the fixed designation D 509; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 These test methods cover procedures for sampling and determining the grade of rosin delivered in commercial bags, barrels, drums or in molten form.

NOTE 1—All rosin sold in interstate commerce must be described by reference to the U. S. Standards for rosin, and is therefore subject to grading prior to such sale. The grading procedure described in these test methods is used for checking grades or regrading after the rosin has moved from the primary markets to distributing or consuming points.

1.2 The values stated in inch-pound units are to be regarded as the standard. The values given in parentheses are for information only.

1.3 *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 and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*

D 465 Test Methods for Acid Number of Naval Stores Products Including Tall Oil and Other Related Products[2]

D 5974 Test Method for Fatty and Rosin Acids in Tall Oil Fractionation Products by Capillary Gas Chromatography[2]

D 6090 Standard Test Method for Softening Point of Resins (Mettler Cup and Ball Method)[2]

E 28 Test Method for Softening Point by Ring-and-Ball Apparatus[2]

3. Significance and Use

3.1 Rosin is an important product of the centuries old Naval Stores industry and is produced and consumed in many countries throughout the world. Consequently, reliable methods of sampling and grading rosin are necessary. The test methods described herein were developed many years ago for the sampling and grading of rosin and are similar to those included in the Naval Stores Act.[3]

3.2 Although these test methods are still applicable, many modifications of these methods and many additional test methods are now used to grade rosin. For example, Test Methods E 28, D 465, and D 5974 are widely used to assess the quality of rosin in addition to the color grading described in those methods. Further, as rosin is often available in molten form, it is common practice to pour liquid rosin into molds in order to prepare specimens for color grading. The need for a test method describing such a technique is under discussion by Subcommittee D01.34. Thus, even though some parts of these test methods are somewhat outdated, these test methods are still important from both a practical and historical viewpoint.

4. Apparatus

4.1 *Official Rosin Standards*—The official standards for use in grading rosin (*G*, Fig. 1, plus three standards lighter than "*X*") consists of assemblies of colored glass plates, cemented together, as issued on loan by the U.S. Department of Agriculture.[4] The grades and standards are designated as follows: XC, XB, XA, X, WW, WG, N, M, K, I, H, G, F, E, and D. A special grade, FF, is used for dark wood rosins. Grades XA, XB, and XC are not available from the U.S. Department of Agriculture but may be purchased commercially.[5] The standards issued by the Department of Agriculture (except FF), consist of combinations of plates cut, ground, and polished to specified thicknesses from selected melts of Corning and Jena colored glass. The colorimetric specifications of the standards, based on the 1931 CIE Coordinate System, for a standard observer using standard Illuminant C, are given in Table 1. The colorimetric specifications for the U.S. Rosin Standards, Master Cubes XA, XB, and XC, are given in Table 2.

4.2 Secondary standards or "type samples" are sometimes used for approximate grading, in the absence of permanent official standards of glass.[5] Such samples may consist of cubes

[1] These test methods are under the jurisdiction of ASTM Committee D-1 on Paint and Related Coatings, Materials, and Applications and are the direct responsibility of Subcommittee D01.34 on Naval Stores.

Current edition approved June 10, 1998. Published August 1998. Originally issued as D 509 – 38. Last previous edition D 509 – 70 (1993).

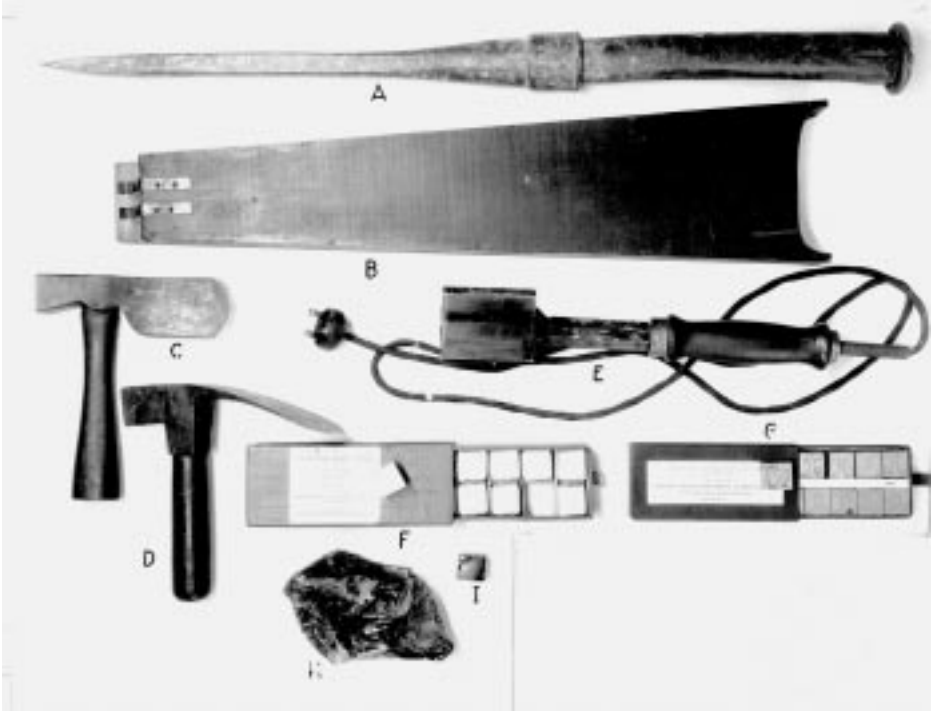
[2] *Annual Book of ASTM Standards*, Vol 06.03.

[3] Naval Stores Act of 1923 (42 Stat 1435.7 USC-91-99) as amended in 1951 and regulations promulgated thereunder by the United States Department of Agriculture.

[4] The U.S. Rosin Standards are issued only by the Agricultural Marketing Service, Tobacco Division, U.S. Department of Agriculture, P.O. Box 96456, Washington, DC 20090-6456. To obtain a set of standards, a Form N.S.A. 2" Request for Loan of Official United States Rosin Standards" and a security deposit of $100.00 should be sent to the above address.

If an applicant is unable to borrow a set of the U. S. Rosin Standards, because of the limited number of sets in existence, secondary sets are available. These standards are excellent duplicates of the U. S. Rosin Standards but could not be classified as identical and do not have official recognition of the U.S. Department of Agriculture.

[5] The Standards XA, XB, and XC and secondary standards may be purchased directly from Tintometer, Ltd., Salisbury, England, or from their United States representative HF Scientific Inc. 3170 Metro Parkway Fort Myers, FL 33916.



A—Rosin spike.
B—Comparison box.
C—Sampling hatchet.
D—Sampling adz.
E—Smoothing device.
F—Rosin type samples.
G—Official rosin standards.
H—Spiked lump sample.
I—Sample for grading.

FIG. 1 Apparatus for Sampling and Grading Rosin

TABLE 1 Colorimetric Specifications for U.S. Rosin Standards (Master Set No. 200)[A]

Grade	*x*	*y*	*T*	λ	*p*
X	0.4339	0.4663	0.609	575.0	0.755
WW	0.4579	0.4732	0.531	576.8	0.851
WG	0.4785	0.4741	0.466	578.5	0.905
N	0.5001	0.4704	0.396	580.5	0.944
M	0.5212	0.4619	0.322	582.8	0.969
K	0.5430	0.4483	0.245	585.5	0.985
I	0.5649	0.4310	0.178	588.7	0.993
H	0.5879	0.4102	0.1114	592.4	0.997
G	0.6116	0.3874	0.0723	596.8	0.999
F	0.6364	0.3632	0.0398	602.1	1.000
E	0.6640	0.3358	0.0131	609.4	1.000
D	0.6943	0.3057	0.0021	621.4	1.000

[A] *x* and *y* are CIE trilinear coordinates; *T* is the luminous transmission factor; λ is the dominant wavelength in nanometers; *p* is the colorimetric purity.

TABLE 2 Colorimetric Specifications for U. S. Rosin Standards (Master Cubes XA, XB, and XC)[A]

Grade	*x*	*y*	*T*
XA	0.4048	0.4443	0.708
XB	0.3724	0.4117	0.788
XC	0.3406	0.3696	0.848

[A] *x* and *y* are CIE trilinear coordinates; *T* is the luminous transmission factor.

of specially selected rosin or other colored transparent medium; solutions are also sometimes used (Note 2). Secondary standards or "types" are usually not permanent in color and must be protected from excessive exposure to sunlight or heat. Wrapping and storage in a cool dark place when not in use is recommended. To ensure correctness of grading therewith, they should be tested periodically by comparison with permanent glass standards.

NOTE 2—It is not possible to dissolve a specified quantity of rosin in a solvent and use such solution as a standard for grading the rosin because there is no constant relationship between the color of the original solid rosin and the color of the rosin after being put in solution. Consequently, the color of such solution is not a criterion of the color of the rosin itself.

4.3 *Rosin Color Molds*, ⅞ in. (22.225 mm), standard size or *Rosin Sample Trays*, ⅞ by ⅞ by 1 in. (22.225 by 22.225 by 22.225 mm), white cover without labels.

5. Sampling

5.1 *Number of Packages to Be Sampled*— A preliminary sampling of 20 % of the entire lot or shipment shall be made. If the grade of 85 % or more of the number of such preliminary samples agrees with the grade indicated on the package or invoice, with none of the samples disagreeing by more than one grade, the original grading shall be considered confirmed and the shipment accepted as a good delivery. If the grades of more than 15 % of the preliminary samples are in disagreement, or if any appreciable number are under grade by more than one grade, additional packages in the lot to make up a total equal to not less than 50 % of the entire shipment (preferably the entire shipment if accessible and not too great) shall be sampled. The findings on such larger quantity shall be accepted as the basis for settlement between the purchaser and the seller.

5.2 *Method of Sampling*—Take samples that are approximately cubical in shape and exactly ⅞-in. (22.225-mm) thick