

Standard Reference Material® 1196a

Standard Cigarette for Ignition Resistance Testing

CERTIFICATE

Purpose: The certified value delivered by this Standard Reference Material (SRM) is intended for use by laboratories to test the cigarette ignition resistance of soft furnishings and their components, and thermal insulation for resistance to cigarette ignition in accordance with 16 CFR 1632 [1], California Technical Bulletin 117-2013 [2], and 16 CFR 1209 [3].

Description: A unit of SRM 1196a consists of two cartons of cigarettes containing 10 packs of 20 cigarettes each.

Certified Value: A NIST certified value is a value for which NIST has the highest confidence in its accuracy and that all known or suspected sources of bias have been investigated or taken into account [4]. The ignition strength certified value is provided below. Metrological traceability is to the method used (ASTM E2187).

Measurand	Test Method	Certified Value and Expanded Uncertainty
NIST Ignition strength (on 6.35 mm brass plate plus 2 layers of filter paper)	ASTM E2187 modified per NIST TN 1627 ^(a) [5,6]	95.6 % ± 2.0 %

^(a) Standard Test Method for Measuring the Ignition Strength of Cigarettes, as modified in NIST Technical Note 1627, Modification of ASTM E 2187 for Measuring the Ignition Propensity of Conventional Cigarettes, June 2009.

A Bayesian statistical analysis [7] was used to establish the ignition strength value and its expanded uncertainty, U , from full-length burn tests of cigarettes from 20 cartons conducted by seven operators at NIST. The expanded uncertainty listed above is reported at the 95 % probability level. Although the expanded uncertainty of the certified value was not computed using the methods outlined in the ISO/JCGM Guide [8], the results of the Bayesian analysis can be interpreted in essentially the same way as results from the ISO approach. The expanded uncertainty can be expressed as $U = ku_c$, where $u_c = 1$ % is the combined standard uncertainty, and the coverage factor, $k = 2$, is based on a normal distribution.

Values of Potential Interest to Users: Values of potential interest to users are provided in Appendix A.

Period of Validity: The certified value delivered by **SRM 1196a** is valid within the measurement uncertainty specified until **18 February 2030**. The certified value is nullified if the material is stored or used improperly, damaged, contaminated, or otherwise modified.

Maintenance of Certified Value: NIST will monitor this SRM over the period of its validity. If substantive technical changes occur that affect the certification, NIST will issue an amended certificate through the NIST SRM website (<https://www.nist.gov/srm>). Before making use of any of the values delivered by this material, users should verify they have the most recent version of this documentation, available through the NIST SRM website (<https://www.nist.gov/srm>).

Safety: THESE CIGARETTES ARE FOR RESEARCH USE ONLY. THERE ARE SUBSTANTIAL HEALTH HAZARDS ASSOCIATED WITH EXPOSURE TO BOTH PRIMARY AND SECOND-HAND SMOKE FROM CIGARETTES. THESE CIGARETTES ARE NOT FOR HUMAN CONSUMPTION AND ARE NOT TO BE OFFERED FOR SALE, SOLD, OR DISTRIBUTED TO CONSUMERS.

Handling: In general, cigarette test specimens are to be protected from physical or environmental damage while in handling and storage. It is important that the specimens not be crushed or deformed in any manner. Careful handling is needed to ensure that the specimens are not contaminated while in storage and that they are protected from degradation by insects.

Storage: This SRM should be stored in a freezer at approximately $-20\text{ }^{\circ}\text{C}$ ($-4\text{ }^{\circ}\text{F}$).

Use: The cigarettes are intended for use in testing prescribed in Federal regulations (16 CFR 1632 [1], 16 CFR 1209 [2]) and in California Technical Bulletin 117-2013 [3]. Additional Standards for which the cigarettes are intended, but are not limited to, are NFPA 260 [9] and NFPA 261 [10], and ASTM E1352 [11] and ASTM E1353 [12]. These methods describe the procedures for proper handling of the cigarettes and conduct of the testing.

Additional Information: This material was made for the use of the U.S. government and acquired under Federal and State tax-exempt status. Any manufacturing number on the SRM unit are related to the manufacturing run of this product and do not affect in any way the values determined for SRM 1196a. Regulations, 16 CFR 1632 [1], 16 CFR 1209 [3] and Technical Bulletin 117-2013 [2], standard test methods, NFPA 260 [9] and NFPA 261 [10], and ASTM 1352 [11] and ASTM 1353 [12], specify using NIST's SRM 1196 as the standard cigarette ignition source. The ignition strength of the replacement for SRM 1196, SRM 1196a, is believed to be within 5 % of that from SRM 1196 with 95 % probability, and therefore it is expected these regulations and test methods will adopt SRM 1196a as the specified standard ignition source.

REFERENCES

- [1] CPSC 16 CFR 1632; *Standard for the Flammability of Mattresses and Mattress Pads*, Consumer Product Safety Commission Part 1632; Office of the Federal Register (2014), available at https://www.cpsc.gov/s3fs-public/pdfs/blk_media_testmatt.pdf (accessed Aug 2025).
- [2] Technical Bulletin 117-2013; *Requirements, Test Procedure and Apparatus for Testing the Smolder Resistance of Materials Used in Upholstered Furniture*, State of California, Department of Consumer Affairs (2013), available at https://bhgs.dca.ca.gov/laws/ndis_updated.pdf (accessed Aug 2025).
- [3] CPSC 16 CFR 1209: *Interim Safety Standard for Cellulose Insulation*, Consumer Product Safety Commission Part 1209, Office of the Federal Register (2019), available at <https://www.govinfo.gov/content/pkg/CFR-2019-title16-vol2/xml/CFR-2019-title16-vol2-part1209.xml> (accessed Aug 2025).
- [4] Beauchamp, C.R.; Camara, J.E.; Carney, J.; Choquette, S.J.; Cole, K.D.; DeRose, P.C.; Duewer, D.L.; Epstein, M.S.; Kline, M.C.; Lippa, K.A.; Lucon, E.; Molloy, J.; Nelson, M.A.; Phinney, K.W.; Polakoski, M.; Possolo, A.; Sander, L.C.; Schiel, J.E.; Sharpless, K.E.; Toman, B.; Winchester, M.R.; Windover, D.; *Metrological Tools for the Reference Materials and Reference Instruments of the NIST Material Measurement Laboratory*; NIST Special Publication 260-136, 2021 edition; National Institute of Standards and Technology, Gaithersburg, MD (2021); available at <https://nvlpubs.nist.gov/nistpubs/SpecialPublications/NIST.SP.260-136-2021.pdf> (accessed Aug 2025). Note: For purposes of consistency with the previous product, SRM 1196, this product is identified as a Standard Reference Material. NIST recognizes that given the new definitions of a certified reference material to include a statement of metrological traceability to a higher order reference system (e.g. SI). This material meets the NIST definition of a reference material which states that a reference material is sufficiently homogeneous and stable with respect to one or more specified properties, which has been established to be fit for its intended use in a measurement process. The significant difference between a certified and a reference value is that NIST does not believe that all or suspected sources of bias have been investigated or taken into account and this is correct for this product, SRM 1196a. As SRM 1196 is cited in all applicable codes, NIST will identify this product as an SRM though this product is designated solely as a reference material.
- [5] ASTM E2187-2016; *Standard Test Method for Measuring the Ignition Strength of Cigarettes*; Annual Book of ASTM Standards, Vol. 04.07.
- [6] Gann, R.G.; Hnetkovsky, E.; *Modification of ASTM E2187 for Measuring the Ignition Propensity of Conventional Cigarettes*; NIST Technical Note 1627; U.S. Government Printing Office: Washington, DC (2009); available at https://tsapps.nist.gov/publication/get_pdf.cfm?pub_id=902075 (accessed Aug 2025).
- [7] Gelman, A.; Carlin, J.B.; Stern, H.S.; Rubin, D.B.; *Bayesian Data Analysis*; Chapman and Hall, London, (1995).

- [8] JCGM 100:2008; *Evaluation of Measurement Data — Guide to the Expression of Uncertainty in Measurement (GUM 1995 with Minor Corrections)*; Joint Committee for Guides in Metrology (2008); available at <https://www.bipm.org/en/committees/jc/jcgm/publications> (accessed Aug 2025); see also Taylor, B.N.; Kuyatt, C.E.; *Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results*; NIST Technical Note 1297; U.S. Government Printing Office: Washington, DC (1994); available at <https://www.nist.gov/pml/nist-technical-note-1297> (accessed Aug 2025).
- [9] NFPA 260: *Standard Methods of Tests and Classification System for Cigarette Ignition Resistance of Components of Upholstered Furniture*; National Fire Protection Association (2019).
- [10] NFPA 261: *Standard Method of Test for Determining Resistance of Mock-Up Upholstered Furniture Material Assemblies to Ignition by Smoldering Cigarettes*, National Fire Protection Association (2018).
- [11] ASTM E1352-16: *Standard Test Method for Cigarette Ignition Resistance of Mock-Up Upholstered Furniture Assemblies*, Annual Book of ASTM Standards, Vol. 04.07 (2016).
- [12] ASTM E1353-16: *Standard Test Methods for Cigarette Ignition Resistance of Components of Upholstered Furniture*, Annual Book of ASTM Standards, Vol. 04.07 (2016).

Certificate Revision History: 01 August 2025 (Editorial changes); 22 July 2025 (Addition of value of potential interest; editorial changes); 05 December 2024 (Change of period of validity; updated format); 18 February 2020 (Original certificate date).
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Certain commercial equipment, instruments, or materials may be identified in this Certificate to adequately specify the experimental procedure. Such identification does not imply recommendation or endorsement by the National Institute of Standards and Technology, nor does it imply that the materials or equipment identified are necessarily the best available for the purpose.

Users of this SRM should ensure that the Certificate in their possession is current. This can be accomplished by contacting the Office of Reference Materials 100 Bureau Drive, Stop 2300, Gaithersburg, MD 20899-2300; telephone (301) 975-2200; e-mail srminfo@nist.gov; or the Internet at <https://www.nist.gov/srm>.

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APPENDIX A

Values of Potential Interest: Values of potential interest have insufficient information available to assess the uncertainty associated with them, or only a limited number of analyses were performed. These values may not be used to assess metrological traceability.

Following the testing methods specified in DIN EN 1021-1:2014-10, Section 6.4 Ignition Source: Smouldering Cigarette, NIST measured smoldering rates for 120 cigarettes, ranging from 6.23 minutes to 7.93 minutes.

***** End of Appendix A *****