



# National Institute of Standards & Technology

## Certificate of Analysis

### Standard Reference Material® 1196a

#### Standard Cigarette for Ignition Resistance Testing

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

**Certified Ignition Strength 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 certified value for the NIST ignition strength is given in Table 1.

A Bayesian statistical analysis [5] 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 given in Table 1 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 [6], 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.

Table 1. Certified Values

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 <sup>(a)</sup> [7,8]	95.6 % $\pm$ 2.0 %

<sup>(a)</sup> 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. Metrological traceability of this result is to the method used (ASTM E2187).

**Expiration of Certification:** The certification of **SRM 1196a** is valid, within the measurement uncertainty specified, until **01 February 2025**, provided the SRM is handled and stored in accordance with the instructions given in this certificate (see “Warning and Instructions for Storage and Use”). The certification is nullified if the SRM is damaged, contaminated, or otherwise modified.

**Maintenance of SRM Certification:** NIST assesses that the fitness for purpose interval for the ignition strength of SRM 1196a is 85 % to 100 % and will conduct stability testing every 5 years to ensure the ignition strength of SRM 1196a has remained within this interval. In the event that the results of the NIST stability tests indicate ignition strength may be outside the fitness for purpose interval before the expiration of this certificate, NIST will notify the purchaser. Registration (see attached sheet or register online) will facilitate notification.

Coordination of the technical measurements leading to certification was performed by R.D. Davis of the NIST Fire Research Division.

Nelson P. Bryner, Chief  
Fire Research Division

Gaithersburg, MD 20899  
Certificate Issue Date: 18 February 2020

Steven J. Choquette, Director  
Office of Reference Materials

Ignition strength measurements at NIST were made by I. Kim of the NIST Fire Research Division.

Statistical consultation on experiment design and analysis of the certification data were performed by S.P. Lund of the NIST Statistical Engineering Division.

Support aspects involved in the issuance of this SRM were coordinated through the NIST Office of Reference Materials.

## **NOTICE AND WARNINGS TO USERS**

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.

## **INSTRUCTIONS FOR HANDLING, STORAGE, AND USE**

**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.

**Material Selection and Packaging<sup>(1)</sup>:** 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.

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<sup>(1)</sup> Certain commercial equipment, instruments or materials are 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.

## 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](https://www.cpsc.gov/s3fs-public/pdfs/blk_media_testmatt.pdf) (accessed Feb 2020).
- [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://www.bearhfti.ca.gov/laws/tb117\\_2013.pdf](https://www.bearhfti.ca.gov/laws/tb117_2013.pdf) (accessed Feb 2020).
- [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 Feb 2020).
- [4] May, W.; Parris, R.; Beck II, C.; Fassett, J.; Greenberg, R.; Guenther, F.; Kramer, G.; Wise, S.; Gills, T.; Colbert, J.; Gettings, R.; MacDonald, B.; *Definition of Terms and Modes Used at NIST for Value-Assignment of Reference Materials for Chemical Measurements*; NIST Special Publication 260-136 (2000); available at <https://www.nist.gov/system/files/documents/srm/SP260-136.PDF> (accessed Feb 2020). 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] Gelman, A.; Carlin, J.B.; Stern, H.S.; Rubin, D.B.; *Bayesian Data Analysis*; Chapman and Hall, London, (1995).
- [6] 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/utls/common/documents/jcgm/JCGM\\_100\\_2008\\_E.pdf](https://www.bipm.org/utls/common/documents/jcgm/JCGM_100_2008_E.pdf) (accessed Feb 2020); 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 Feb 2020).
- [7] ASTM E2187-2016; *Standard Test Method for Measuring the Ignition Strength of Cigarettes*; Annual Book of ASTM Standards, Vol. 04.07.
- [8] 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](https://tsapps.nist.gov/publication/get_pdf.cfm?pub_id=902075) (accessed Feb 2020).
- [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).

*Users of this SRM should ensure that the Certificate of Analysis in their possession is current. This can be accomplished by contacting the SRM Program: telephone (301) 975-2200; fax (301) 948-3730; e-mail [srminfo@nist.gov](mailto:srminfo@nist.gov); or via the Internet at <https://www.nist.gov/srm>.*