Designation: D4723 – 07ε2

Standard Classification Index of and Descriptions of Textile Flammability Test Methods[1]

This standard is issued under the fixed designation D4723; 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.

ε[1] NOTE—Editorial changes were made in 6.2.2.1 in March 2007.
ε[2] NOTE—Reference to ASTM F6545 in 6.1.1.2 was corrected to D6545 editorially in January 2011.

1. Scope

1.1 This index provides lists of test methods used in the United States of America and Canada for measuring and describing the properties of textiles and textile products or assemblies in response to heat and flame under controlled laboratory conditions. Military specifications are not included in the listing. Related but separately published sampling plans are not included.

1.2 *Indices:*

1.2.1 An index of test methods per end use application is found in 6.1.

1.2.2 An index of test methods by publishing agency or the authority having jurisdiction is found in 6.2. The World Wide Web address of the publisher is listed so that the reader can gather specific information on the standard or regulation.

1.2.3 Although some research test methods are not included, the listing is reasonably complete for textile items of commerce.

1.3 All published ASTM textile methods are included as well as methods useful for, but not necessarily intended exclusively for, textiles.

1.4 Some documents are included solely because they may be useful for reference or research purposes.

1.5 ASTM assumes no responsibility for the suitability of the listed test methods and performance specifications to describe or appraise the fire hazard of materials, products, or assemblies under actual fire conditions. Inclusion in this listing does not constitute endorsement by ASTM.

1.6 This standard can not be used to provide quantitative measure.

2. Referenced Documents

2.1 *ASTM Standards:*[2]

D123 Terminology Relating to Textiles
D883 Terminology Relating to Plastics
D4391 Terminology Relating to The Burning Behavior of Textiles
E176 Terminology of Fire Standards
F1494 Terminology Relating to Protective Clothing

3. Terminology

3.1 *Definitions*—For definitions of terms relating to burning behavior, refer to Terminology D4391. For definitions of other textile terms, refer to Terminology D123. For definitions of terms related to plastics refer to Terminology D883. For definitions related to fire science refer to Terminology E176. For definitions of terms relating to protective clothing refer to Terminology F1494.

4. Significance and Use

4.1 The information indexed provides the user with the identification of test methods, performance specifications, and related documents pertaining to the flammability or response to heat of textiles and materials.

5. Basis of Classification

5.1 The classification indices provides information about the end use of the test method, its identification number with no edition date, the publishing agency, and its World Wide Web (www) address so that detailed information can be obtained from the publisher.

6. Test Methods by End Use Application and by Publishing Agency

6.1 *Index of Test Methods by End Use Application:*

6.1.1 *Clothing and Textiles:*

[1] This classification is under the jurisdiction of ASTM Committee D13 on Textiles and is the direct responsibility of Subcommittee D13.52 on Flammability.

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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.

6.1.1.1 *Consumer Wearing Apparel:*

ASTM F1230
16 CFR 1610
16 CFR 1611
NFPA 705
CAN/CGSB 4.2 No. 27.3 /ISO 6941
CAN/CGSB 4.2 No. 27.4 /ISO 6940
CAN/CGSB 4.162

6.1.1.2 *Children's Sleepwear:*

ASTM D6545
16 CFR 1615
16 CFR 1616

6.1.1.3 *Protective Clothing:*

ASTM F1506
ASTM F4108
ASTM F1891
NFPA 1971
NFPA 1975
NFPA 1976
NFPA 1977
NFPA 1991
NFPA 1992
NFPA 1994
NFPA 1999
NFPA 2122
CAN/CGSB 4.2 No. 781.1
CAN/CGSB 155.1
CAN/CGSB 155.2

6.1.1.4 *Textile Flammability and Heat Transfer Methods:*

ASTM F1518
ASTM F3411
ASTM F3659
ASTM F6413
ASTM F7024
ASTM F1291
ASTM F1868
CAN/CGSB 4.2 No. 27.1
CAN/CGSB 4.2 No. 27.2
CAN/CGSB 4.2 No. 27.5
CAN 4 S109
CAN/CGSB 4.2 No. 27.10
CAN/CGSB 4.2 No. 27.11
ULC S109

6.1.2 *Home and Commercial Furnishings:*

6.1.2.1 *Blankets and Bed Clothing:*

ASTM F4151
UL 964
SAE ARP 5627

6.1.2.2 *Curtains and Drapes:*

BFD 1X-1 Boston Fire Department
Fire Department Advisory Safety Provisions of New York Board of Standards and Appeals Bulletin 44
Port Authority of New York and New Jersey
CA Title 19
NFPA 701
NFPA 705
UL 214
CAN/CGSB 4.2 No. 27.3 /ISO 6941
CAN/CGSB 4.2 No. 27.4 /ISO 6940
CAN/CGSB 4.162

6.1.2.3 *Wall Coverings:*

ASTM F84
ASTM F1354
ASTM F1740
ASTM F2257
BFD 1X-1 Boston Fire Department
NFPA 265
NFPA 286
NFPA 271
UL 1040
UL 1715
UL 1975
NFPA 271
CAN/CGSB S102
CAN 4–S124
ULC S102

6.1.2.4 *Office Panel Systems:*

ASTM F84
NFPA 255
UL 723

6.1.2.5 *Carpet, Rugs, and Flooring:*

ASTM F2859
ASTM F648
16 CFR 1630
16 CFR 1631
NFPA 253
CAN/CGSB 4.2 No. 27.6
CAN/CGSB 4.155
CAN/CGSB 4.162
CAN 4–S1022
CAN 4–S 117.1
CAN 4–S117
ULC S–102.2

6.1.2.6 *Upholstered Furniture:*

ASTM F5238
ASTM F1352
ASTM F1353
ASTM F1537
ASTM F1822
ASTM F1354
ASTM F1474
ASTM F1550
ASTM F1870
BFD 1X-1 Boston Fire Department
Fire Department Advisory Safety Provisions of New York Board of Standards and Appeals
Port Authority of New York and New Jersey
CA TB 116
CA TB 117
CA TB 133
UFAC
NFPA 260
NFPA 261
NFPA 271
NFPA 272
UL 962
UL 1286

6.1.2.7 *Mattresses and Mattress Pads:*

ASTM F5238
ASTM F7016
ASTM F7140
ASTM F1590
ASTM F1354
ASTM F1474
ASTM F1550
ASTM F1870
16 CFR 1632
16 CFR 1633
CA TB 106
CA TB 121
CA TB 129
CA TB 603
NFPA 271
NFPA 272
CAN/CGSB 4.2 No. 27.7
CAN/CGSB 4.162

6.1.3 *Outdoor and Sporting Equipment:*

6.1.3.1 *Tents:*

ASTM F437
ASTM F1955
CPAI–84
NFPA 701
UL 214

6.1.3.2 *Sleeping Bags:*

CPAI–75

6.1.4 *Materials (General and Other Uses):*

6.1.4.1 *Materials (General):*

ASTM F162
ASTM F662
ASTM F906
ASTM F1354
ASTM F1623
ASTM F2102
ASTM F2257
16 CFR 1500.44
NFPA 270
NFPA 271
ULC S135

6.1.4.2 *Building Materials:*

ASTM F84
ASTM F970
ASTM F1354
NFPA 255
NFPA 285
CAN/CGSB 4.2 No. 27

6.1.4.3 *Plastics:*

ASTM F635
ASTM F1929
ASTM F2843
ASTM F2863
ASTM F3104
ASTM F3675
ASTM F3801
ASTM F4723
ASTM F4804
ASTM F4986
ASTM F5048
ASTM F5207
UL 1975

6.1.4.4 *Aerospace Materials:*

ASTM F501
FAA Materials Fire Test Handbook
SAE ARP 5627

6.1.4.5 *Motor Vehicles:*

ASTM F4723
MVSS 302

6.1.5 *Toxicity:*

ASTM F1678
NFPA 269

6.1.6 *Terminology Documents and Guides for Various Flammability Methods:*

ASTM F4391
ASTM F883
ASTM F176
ASTM F1494
CAN/CGSB 4.2 No. 27
CAN/CGSB 4.175 /ISO 4880

6.2 *Index of Test Methods by Publishing Agency/Authority Having Jurisdiction and Their World Wide Web (www) Address:*

6.2.1 *USA Documents:*

6.2.1.1 *ASTM Standards:* (www.astm.org)

F635 Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position
D123 Standard Test Method for Flammability of Apparel Textiles
D1518 Standard Test Method for Thermal Transmittance of Textile Materials
D1929 Standard Test Method for Determining Ignition Temperature of Plastics
D2843 Standard Test Method for Density of Smoke from the Burning or Decomposition of Plastics
D2859 Standard Test Method for Ignition Characteristics of Finished Textile Floor Covering Materials
D2863 Standard Test Method for Measuring the Minimum OXYGEN Concentration to Support Candle-Like Combustion of Plastics (Oxygen INDEX)
D3014 Standard Test Method for Flame Height, Time of Burning, and Loss of Mass of Rigid Thermoset Cellular Plastics in a Vertical Position
D3411 Standard Method of Test for Flammability of Textile Materials (Withdrawn 1982)
D3659 Standard Test Method for Flammability of Apparel Fabrics by Semi-Restraint Method (Withdrawn 2001)
D3675 Standard Test Method for Surface Flammability of Flexible Cellular Materials Using a Radiant Heat Energy Source
D3801 Standard Test Method for Measuring the Comparative Burning Characteristics of Solid Plastics in a Vertical Position
D4151 Standard Test Method for Flammability of Blankets
D4372 Standard Specification for Flame-Resistant Materials Used in Camping Tentage (Withdrawn 2002)
D4391 Standard Terminology Relating to The Burning Behavior of Textiles
D4804 Standard Test Method for Determining the Flammability Characteristics of Nonrigid Solid Plastics
D4986 Standard Test Method for Horizontal Burning Characteristics of Cellular Polymeric Materials
D5048 Standard Test Method for Measuring the Comparative Burning Characteristics and Resistance to Burn-Through of Solid Plastics Using 125-mm Flame
D5132 Standard Test Method for Horizontal Burning Rate of Polymeric Materials Used in Occupant Compartments of Motor Vehicles
D5207 Standard Practice for Confirmation of 20-mm (50-W) and 125-mm (500-W) Test Flames for Small-Scale Burning Tests on Plastic Materials
D5238 Standard Test Method for Smoldering Combustion Potential of Cotton-Based Batting
D6413 Standard Test Method for Flame Resistance of Textiles
D6545 Standard Test Method for Flammability of Textiles Used in Children's Sleepwear
D7016 Standard Test Method for Evaluate Edge Binding Components Used in Mattresses After Exposure to an Open Flame
D7024 Standard Test Method for Steady State and Dynamic Thermal Performance of Textile Materials
D7140 Standard Test Method to Measure Heat Transfer Through Textile Thermal Barrier Materials
E84 Standard Test Method for Surface Burning Characteristics of Building Materials
E648 Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source
E162 Standard Test Method for Surface Flammability of Materials Using a Radiant Heat Energy Source
E662 Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials
E906 Standard Test Method for Heat and Visible Smoke Release Rates for Materials and Products
E970 Standard Test Method for Critical Radiant Flux of Exposed Attic Floor Insulation Using a Radiant Heat Energy Source
E1537 Standard Test Method for Fire Testing of Upholstered Furniture
E1352 Standard Test Method for Cigarette Ignition Resistance of Mock-Up Upholstered Furniture Assemblies
E1353 Standard Test Methods for Cigarette Ignition Resistance of Components of Upholstered Furniture
E1354 Standard Test Method for Heat and Visible Smoke Release Rates for Materials and Products Using an Oxygen Consumption Calorimeter
E1474 Standard Test Method for Determining the Heat Release Rate of Upholstered Furniture and Mattress Components or Composites Using a Bench Scale Oxygen Consumption Calorimeter

E1590 Standard Test Method for Fire Testing of Mattresses
E1623 Standard Test Method for Determination of Fire and Thermal Parameters of Materials, Products, and Systems Using an Intermediate Scale Calorimeter (ICAL)
E1678 Standard Test Method for Measuring Smoke Toxicity for Use in Fire Hazard Analysis
E1740 Standard Test Method for Determining the Heat Release Rate and Other Fire-Test-Response Characteristics of Wallcovering Composites Using a Cone Calorimeter
E1822 Standard Test Method for Fire Testing of Stacked Chairs
E2102 Standard Test Method for Measurement of Mass Loss and Ignitability for Screening Purposes Using a Conical Radiant Heater
E2257 Standard Test Method for Room Fire Test of Wall and Ceiling Materials and Assemblies
F501 Standard Test Method for Aerospace Materials Response to Flame, with Vertical Test Specimen (For Aerospace Vehicles Standard Conditions) (Withdrawn 1998)
F1291 Standard Test Method for Measuring the Thermal Insulation of Clothing Using a Heated Manikin
F1506 Standard Performance Specification for Flame Resistant Textile Materials for Wearing Apparel for Use by Electrical Workers Exposed to Momentary Electric Arc and Related Thermal Hazards
F1550 Standard Test Method for Determination of Fire-Test-Response Characteristics of Components or Composites of Mattresses or Furniture for Use in Correctional Facilities after Exposure to Vandalism, by Employing a Bench Scale Oxygen Consumption Calorimeter
F1868 Standard Test Method for Thermal and Evaporative Resistance of Clothing Materials Using a Sweating Hot Plate
F1870 Standard Guide for Selection of Fire Test Methods for the Assessment of Upholstered Furnishings in Detention and Correctional Facilities
F1891 Standard Specification for Arc and Flame Resistant Rainwear
F1995 Standard Test Method for the Flammability of Sleeping Bags
D4108 Standard Test Method for Thermal Protective Performance of Materials for Clothing by Open-Flame Method

6.2.2 *U.S. Federal, State, and City Regulations:*

6.2.2.1 *Consumer Product Safety Commission (CPSC):* (www.cpsc.gov)

16 CFR 1500.44 Standard Method for Determining Extremely Flammable and Flammable Solids
16 CFR 1610 Standard for the Flammability of Clothing Textiles
16 CFR 1611 Standard for the Flammability of Vinyl Plastic Film
16 CFR 1615 Standard for the Flammability of Children's Sleepwear: Sizes 0 Through 6X (FF 3-71)
16 CFR 1616 Standard for the Flammability of Children's Sleepwear: Sizes 7 Through 14 (FF 5-74)
16 CFR 1630 Standard For the Surface Flammability of Carpets and Rugs (FF 1-70)
16 CFR 1631 Standard for the Surface Flammability of Small Carpets and Rugs (FF 2-70)
16 CFR 1632 Standard for the Flammability of Mattresses and Mattress Pads (FF 4-72, AMENDED)
16 CFR 1633 Standard for the Flammability (Open Flame) of Mattress Sets

6.2.2.2 *State of California Fire Marshal Office:* (http://osfm.fire.ca.gov/regtitle19.html)

California Title 19

6.2.2.3 *State of California Bureau of Consumer Affairs and Thermal Insulation:* (http://www.bhfti.ca.gov/)

CA TB 106 Requirements, Test Procedure and Apparatus for Testing the Resistance of a Mattress or Mattress Pad to Combustion Which May Result from a Smoldering Cigarette
CA TB 116 Requirements, Testing Procedure and Apparatus for Testing the Flame Resistance of Resilient Filling Materials Used in Upholstered Furniture
CA TB 117 Requirements, Testing Procedure and Apparatus for Testing the Flame Resistance of Upholstered Furniture
CA TB 121 Flammability Test Procedure for Mattresses for Use in High risk Occupancies
CA TB 129 Flammability Test Procedure for Mattresses Used in Public Buildings
CA TB 133 Flammability Test Procedure for Seating Furniture for Use in Public Occupancies
CA TB 603 Requirements and Test Procedure for Resistance of a Mattress/Box Spring Set to a Large Open-Flame

6.2.2.4 *City of Boston:* (http://www.cityofboston.gov/bfd/download/BFD%20IX-10%20Upholstered%20Furniture%20Regulation.pdf)

BFD 1X-10

6.2.2.5 *New York Board of Standards and Appeals:* (www.nyc.gov/html/bsa/html/home/home.shtml)

Bulletin #44 of the New York City Board of Standards and Appeals

6.2.2.6 *Port Authority of New York and New Jersey:* (www.panynj.gov/)

6.2.2.7 *Department of Transportation (DOT, FAA, and MVSS):*

MVSS 302 Flammability of Interior Materials—Passenger Cars, Multipurpose Passenger Vehicles, Trucks, and Buses (www.nhtsa.dot.gov/)
FAA Fire Material Handbook (www.faa.gov)
SAE ARP 5627 Flammability Test Method for Aircraft Comfort Blankets (www.sae.org)

6.2.3 *Industry Standards:*

6.2.3.1 *Upholstered Furniture Action Council (UFAC):* (www.ufac.org)

Fabric Classification
Interior Fabrics
Barrie Test
Decking Materials
Filling/Pad Component: Part A
Filling/Pad Component: Part B
Decorative Trims
Welt Cord
Standard Method of Laundering
Materials Specifications
Standard Methods of Test

6.2.3.2 *Industrial Fabrics Association International (IFAI):* (www.ifai.org)

CPAI–75 Specification for Flame-Resistance Materials Used in Sleeping Bags
CPAI–84 Specification for Flame-Resistance Materials Used in Camping Tentage

6.2.3.3 *National Fire Protection Association (NFPA):* (www.nfpa.org)

NFPA 253 Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source
NFPA 255 Standard Method of Test of Surface Burning Characteristics of Building Materials
NFPA 260 Standard Methods of Tests and Classification System for Cigarette Ignition Resistance of Components of Upholstered Furniture
NFPA 261 Standard Method of Test for Determining Resistance of Mock-Up Upholstered Furniture Material Assemblies to Ignition by Smoldering Cigarettes
NFPA 265 Standard Methods of Fire Tests for Evaluating Room Fire Growth Contribution of Textile Coverings on Full Height Panels and Walls
NFPA 269 Standard Test Method for Developing Toxic Potency Data for Use in Fire Hazard Modeling
NFPA 270 Standard Test Method for Measurement of Smoke Obscuration Using a Conical Radiant Source in a Single Closed Chamber
NFPA 271 Standard Method of Test for Heat and Visible Smoke Release Rates for Materials and Products Using an Oxygen Consumption Calorimeter
NFPA 272 Standard Method of Test for Heat and Visible Smoke Release Rates for Upholstered Furniture Components or Composites and Mattresses Using an Oxygen Consumption Calorimeter
NFPA 285 Standard Method of Test for the Evaluation of Fire Propagation Characteristics of Exterior Non-Load Bearing Wall Assemblies Containing Combustible Components
NFPA 286 Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth
NFPA 701 Standard Methods of Fire Tests for Flame Propagation of Textiles and Films
NFPA 705 Recommended Practice for a Field Flame Test for Textiles and Films
NFPA 1971 Standard on Protective Ensemble For Structural Fire Fighting
NFPA 1975 Standard on Station/Work Uniforms for Fire and Emergency Services
NFPA 1976 Standard on Protective Ensemble for Proximity Fire Fighting
NFPA 1977 Standard on Protective Clothing and Equipment for Wildland Fire Fighting
NFPA 1991 Standard on Vapor-Protective Ensembles for Hazardous Materials Emergencies
NFPA 1992 Standard on Liquid Splash-Protective Ensembles and Clothing for Hazardous Materials Emergencies
NFPA 1994 Standard on Protective Ensembles for Chemical/Biological Terrorism Incidents
NFPA 1999 Standard on Protective Clothing for Emergency Medical Operations
NFPA 2112 Standard on Flame-Resistant Garments for Protection of Industrial Personnel Against Flash Fire

6.2.3.4 *Underwriter's Laboratory (UL):* (www.ul.com)

UL 214 Standard Tests for Flame-Propagation of Fabrics and Films
UL 723 Standard for Test for Surface Burning Characteristics of Building Materials
UL 962 Standard for Household and Commercial Furnishings
UL 964 Standard for Electrically Heated Bedding
UL 1040 Standard for Fire Test of Insulated Wall Construction
UL 1286 Standard for Office Furnishings
UL 1715 Standard for Fire Test of Interior Finish Material
UL 1975 Standard for Fire Tests for Foamed Plastics Used for Decorative Purposes

6.2.3.5 *Society of Automotive Engineers International (SAE):*

SAE ARP 5627 Flammability Test Method for Aircraft Comfort Blankets

6.2.4 *Canadian Documents:*

6.2.4.1 *Canadian General Standards Board (CGSB):* (http://www.pwgsc.gc.ca/cgsb/home/index-e.html)

CAN/CGSB 4.2 NO. 27 Textile Test Methods—Burning Behaviour—Selection of Methods
CAN/CGSB 4.2 NO. 27.1 Textile Test Methods—Flame Resistance—Vertical Burning Test
CAN/CGSB 4.2 NO. 27.2 Textile Test Methods—Flame Resistance—Surface Burning Test
CAN/CGSB 4.2 NO. 27.3 /ISO 6941 Textile Test Methods—Textile Fabrics—Burning Behaviour—Measurement of Flame Spread Properties of Vertically Oriented Specimens
CAN/CGSB 4.2 NO. 27.4/ISO 6940 Textile Test Methods—Textile Fabrics—Burning Behaviour—Determination of Ease of Ignition of Vertically Oriented Specimens
CAN/CGSB 4.2 NO. 27.5 Textile Test Methods—Flame Resistance—45° Angle Test—One Second Flame Impingement
CAN/CGSB 4.2 NO. 27.6 Textile Test Methods—Flame Resistance—Methenamine Tablet Test for Textile Floor Coverings
CAN/CGSB 4.2 NO. 27.7 Textile Test Methods—Combustion Resistance of Mattresses—Cigarette Test
CAN/CGSB 4.2 NO. 27.10 Textile Test Methods—Flame Resistance—Vertically Oriented Textile Fabric or Fabric Assembly Test
CAN/CGSB 4.2 NO. 27.11/ISO 10047 Textile Test Methods—Textiles—Determination of Surface Burning Time of Fabrics
CAN/CGSB 4.2 NO. 781.1 Textile Test Methods—Thermal Protective Performance of Materials for Clothing
CAN/CGSB 4.155 Flammability of Soft Floor Coverings—Sampling Plans
CAN/CGSB 4.162 Hospital Textiles—Flammability Performance Requirements
CAN/CGSB 4.175 PART 1/ISO 4880 Burning Behaviour of Textiles and Textile Products—Vocabulary
CAN/CGSB 155.1 Firefighters' Protective Clothing for Protection Against Heat and Flame
CAN/CGSB 155.20 Workwear for Protection Against Hydrocarbon Flash Fire
CAN 4 S102 Method of Test for Surface Burning Characteristics of Building Materials and Assemblies
CAN 4 S102.2 Method of Test for Surface Burning Characteristics of Flooring, Floor Coverings, and Miscellaneous Materials and Assemblies
CAN 4 S109 Flame Tests of Flame Resistant Fabrics and Films
CAN 4 S117.1 Standard Method of Test for Flame Resistance—Methenamine Tablet Test For Textile Floor Coverings

6.2.4.2 *Underwriter's Laboratory of Canada (ULC):* (www.ulc.ca)

ULC S102 Method of Test for Surface Burning Characteristics of Building Materials and Assemblies
ULC S102.2 Method of Test for Surface Burning Characteristics of Flooring, Floor Coverings, and Miscellaneous Materials and Assemblies
ULC S109 Flame Tests of Flame Resistant Fabrics and Films
CAN4 S117.1 Standard Method of Test for Flame Resistance—Methenamine Tablet Test For Textile Floor Coverings
CAN4 S124 Standard Method of Test for the Evaluation of Protective Coverings for Foamed Plastic
ULC S135 Standard Test Method for the Determination of Combustibility Parameters of Building Materials Using and Oxygen Consumption Calorimeter (Cone Calorimeter)

7. Keywords

7.1 aerospace materials; apparel; blankets and bed clothing; building materials; burning behavior; burning rate; carpet, rugs and floorcoverings; children's sleepwear; combustion; fire; fire resistant curtains and drapes; fire tests; flame resistant; flammability; heat release; heat transfer; ignition; materials; mattresses and mattress pads; motor vehicles; oxygen index; plastics; protective clothing; radiant panel; sleeping bags; smoke; tents; textiles; thermal protective; toxicity; upholstered furniture; wallcoverings