

**STANDARD SPECIFICATION
FOR
MATTRESSES, URETHANE FOAM**

(This specification is released for procurement purposes until revised or rescinded.)

SCOPE

This specification covers flexible uncored urethane mattresses to be used by the State institutions and agencies.

I. CLASSIFICATION

Foam mattresses shall be classified in the following classes and sizes.

Class 1 - Regular ticking

Class 2 - Anti-bacterial, moisture resistant ticking. Intended for use where bacterial and/or moisture resistance is required.

TABLE I PHYSICAL SIZES

	WIDTH	LENGTH	THICKNESS
Size I	36"	75"	5"
Size II	36"	80"	5"
Size III	39"	75"	5"
Size IV	54"	75"	5"

II. APPLICABLE STANDARDS

The following documents of issue in effect on the date of the Invitation for Bids shall form a part of this specification to the extent described in III. REQUIREMENTS.

Federal Standard No. 191, Textile Test Methods
Superintendent of Documents
U.S. Government Printing Office
Washington, DC 20402

ASTM Test 1564-71
American Society for Testing Materials
1916 Race Street
Philadelphia, PA 19103

AATCC-147-76 Evaluation of Anti-Bacterial Finishes on Fabrics
American Association of Textile Chemists and Colorists
P. O. Box 12215
Research Triangle Park, NC 27709

16CFR1632 Part 1632 – Standard for the Flammability of Mattresses and Mattress Pads
Superintendent of Documents
U.S. Government Printing Office
Washington, DC 20402

16CFR1633 Part 1633 – Standard for the Flammability (Open Flame) of Mattresses Sets
Superintendent of Documents
U.S. Government Printing Office
Washington, DC 20402

III. REQUIREMENTS

A. CORE OF MATTRESS

The mattress core shall consist of not more than one piece with no breaks or cracks along the edges. The core shall be so fabricated that both sides are similar in appearance and either may be used with equal comfort. The corners shall be square or shall be rounded with a radius not exceeding 2"(50mm).

The core shall be made from 100% pure polyether type flexible uncured, cut-slab urethane foam, suitable for use as a mattress. Additives not exceeding 5% by weight may be used to increase use life or performance of the mattress. The foam shall be manufactured in accordance with good commercial practice, shall be free of all skin, and of uniform quality and texture. The foam shall be free from surface voids ½" (13mm) or larger in width or depth, free from hard spots and internal voids perceptible from the exterior of the mattress by sight or touch and free from any other defects that might affect serviceability. No coloring materials shall be used. The core material shall be free of objectionable odors. The material shall not deteriorate by contact with perspiration or other body fluids and shall not deteriorate excessively by exposure necessary to its intended use. The urethane foam shall be such that soil and odors from perspiration or other body fluids shall be readily removed by washing with mild soap or mild synthetic detergents, without harm to the mattress core.

The following physical requirements for urethane foam shall be tested according to ASTM Standard D-1564-71, by the sections specified and shall conform to the following:

1. Compression Set (Method B Constant Deflection)

The procedure as outlined in Sections 12 through 18 shall be used. The specimen shall be deflected to $90 \pm 1\%$ of its original cut thickness. When expressed as a percentage of the original height the compression set shall not be more than 15%.

2. Indentation Load Deflection (Method A-Indentation to Specific Deflections)

The procedure outlined in Sections 19 through 24 shall be used to test a specimen of the urethane foam 15 x 15 x 5" (381 x 381 x 127mm) for 25% and 65% ILD. The 25% ILD value shall be 37 ± 4 pounds per 50 sq. in. (16.8 ± 1.8 Kg/322 sq. cm). The 65% ILD value shall be at least 1.9 times greater than the 25% ILD value.

3. Fatigue Test (Suffix H, Procedure A)

The procedure as outlined in sections 53 through 60 shall be used. After testing the specimen shall show no breakdown of the physical structure. Permanent set, (loss in height) shall not be more than 5% and the ILD shall not be more than 30%.

4. Density Test (Suffix W)

The density of the polyurethane foam shall be determined according to Sections 69 through 74. The minimum density shall be 1.7 pounds per cubic foot (27.2 Kg/sq. m).

5. Tension Test (Suffix T)

The tensile strength and ultimate elongation shall be determined according to Sections 82 through 88. The tensile strength shall not be less than 14 lbs. per square inch (96 kPa) and elongation at rupture shall not be less than 200%.

6. Resilience (Ball Rebound) Test (Suffix R)

The resilience test shall be according to Sections 89 through 95. The Ball Rebound Resilience Value shall not be less than 45%.

B. TICKING

Regular ticking shall be minimum 6.2 oz./sq. yd. (0.21 kg/sq. m) woven with gray or blue stripes. No water repellent treatment is required. Flame retardance shall be as required to meet requirements under Section III.E. FLAMMABILITY. Thread count shall be 70/in. (2.75/mm) warp and 44/in. (1.75/mm) filling. Minimum breaking strength (grab method) shall be 110 lbs. (50kg) warp and 60 lbs. (27 kg) filling. Stripes shall run lengthwise of the mattress.

Sleep surfaces shall be one piece.

Anti-bacterial moisture resistant ticking shall be minimum 10 oz./sq. yd. (339 g/sq. m) with tolerance of minus ½ oz. (17g) and plus 1 oz. (34g). Breaking strength (grab method) minimum 110 lbs. (50 kg) both warp and filling. Coating adhesion 12 lbs/2" (15.4kg/50.8mm) width Federal Standard 191, Test 5970. Hydrostatic water resistance 175 lbs./sq./in. (1206 kPa) Federal Standard 191, Test 5512. Flame resistance, as specified in Section III.E. FLAMMABILITY. When tested by AATCC Test 147-1976 parallel streak method, the reduction of Staphylococcus aureus shall be not less than 98% and Klebsiella pneumonia bacteria shall be not less than 85%.

C. CONSTRUCTION

The mattress shall be so constructed that both sides are similar in appearance and either side may be used with equal comfort. The mattress shall be well finished, clean and free

from defects that materially affect its appearance or that might affect its serviceability. All workmanship shall be first class in every respect.

All materials shall be of first quality, 100% new, and unused, and shall be capable of withstanding one of the authorized sanitizing processes for mattresses as outlined in the of North Carolina statutes as applicable.

The cover shall be made oversize to allow for shrinkage. The top and bottom panels of the cover shall be hemmed with approximately a 3/8" (9.5mm) hem. The border shall be fully hemmed and sewn into the hem panels with a 5/8" (16mm) cotton tape. Thread shall be 3-ply cotton cord or acceptable substitute and shall have a breaking strength (single strand) of not less than 3 lbs.(1.4Kg). All machine stitching shall run not less than 10 stitches to the inch (0.4/mm). The ticking of each face shall be made up of not more than one piece. The stripes of the ticking on the upper and lower faces shall run lengthwise. The cover shall be anchored to the foam core by a proper and suitable method that will permanently hold the edges of the cover in alignment with the corresponding edges of the core. Handles are not required. Ventilators are required on Class 2 mattresses only.

D. LABELING

A sewed label shall be attached to each mattress as required by Public Health Law of North Carolina, Section 130A-265, and in compliance with the latest format approved by the Association of Bedding & Furniture Law Officials.

Included on the above label, or on a separate adjacent label as appropriate, shall be the identification of each of the CFR flammability requirements cited elsewhere herein with which the mattress complies for flammability resistance.

Manufacturer of mattresses shall hold a North Carolina registration number issued by the Dept of Health and Human Services. This registration number shall be included on the sewed label, in the proper format.

E. FLAMMABILITY

All mattresses shall comply with Code of Federal Regulations 16CFR1632, "Standard for the Flammability of Mattresses and Mattress Pads."

All mattresses shall comply with Code of Federal Regulations 16CFR1633, "Standard for the Flammability (Open Flame) of Mattress Sets."

IV. WARRANTY

The manufacturer warrants to the owner that all mattresses furnished under this specification will be of good material and workmanship and agrees to replace promptly any units which by reason of defective material or workmanship shall fail under normal use, free of negligence or accident, for a minimum period of two years from date of acceptance. Such replacement shall be free of any charge to the owner or his representative.

V. SERVICE, PARTS AND MANUALS

This specification does not require any service, parts or manuals to be supplied.

VI. ACCEPTANCE INSPECTION AND TESTING

The following provisions apply to all mattress manufacturers who are supplying mattresses under this specification.

MATTRESS TRACEABILITY SYSTEM: The contractor must have in place a detailed internal tracking system, such that if a user's mattress is determined to be defective in flammability resistance, all identical mattresses can be located and removed. Such tracking system must include as a minimum the mattress manufacturer's lot number. For contractor's benefit, it is recommended that the tracking system also include the mattress serial number, or the mattress sequence number within the lot. This additional tracking data may allow identification of a reduced number of identical defective mattresses. All appropriate tracking data shall be provided on a permanent fireproof label affixed to each mattress, which may be the same label required above under Section III.T, if such is fireproof.

The contractor is to submit to the Purchaser within ten (10) calendar days of notification of contract award written documentation which confirms the existence of the mattress producer's viable tracking program as set forth above, and which completely describes the elements and process of such tracking program. Failure to provide this documentation in a timely manner and in acceptable form may be considered grounds for removal of the contractor. The Purchaser will forward the documentation to the Chief Standards Engineer, Division of Purchase & Contract, Raleigh, NC, immediately upon receipt for his review, after which he will advise the Purchaser as to the acceptability of the documentation and the tracking program. The State reserves the right to have its authorized representative visit the mattress producer's plant unannounced, during normal working hours, and at any time during the contract period, to inspect and confirm the tracking program. A finding that the mattress producer has failed to maintain the tracking program as approved by the Chief Standards Engineer may result in removal of the contractor and in other measures as may be authorized by the contract.

It is required that the contractor submit to the Division of Purchase & Contract on a quarterly basis the information specified below, for each mattress sold by the contractor. The quarterly reports are to be in written or electronic form and are to be received by the Division within ten (10) working days after the end of the quarter. Quarters end on the last day of the respective months of March, June, September, and December. The information required is:

- (a) Line item under which mattress was produced
- (b) Name of using agency, college, university, or institution purchasing the mattress
- (c) The mattress manufacturer's lot number (and if available the serial or sequence number) of the mattress
- (d) The identification of the flammability test (by date, test report number, name of test facility, lot number, and if available the serial or sequence number, of test mattress) which applies to the line item under which the mattress was produced.
- (e) The date and location of the physical inspection of the first sample, and lot number (and if available the serial or sequence number) of test mattress, which represents the line item under which the mattress was produced.

The State may require, at its option, the data to be submitted in only electronic form, and in a specific format which would be provided to the contractor in a timely manner.

ACCEPTANCE INSPECTION FOR PHYSICAL CONSTRUCTION: Before initiating production of mattresses for any given line item, the supplier is responsible for shipping to a North Carolina site to be specified after award of contract, one mattress from that line item for inspection. Each line item must be represented by its own dedicated sample mattress. **Immediately upon shipment of this mattress, the contractor is to contact the Sleep Products Branch (within**

the NC Dept of Environment and Natural Resources), 919-733-6407, to request the inspection. This inspection will confirm that the physical construction of the mattress is in accordance with the contract requirements, and that the materials used and the affixed exterior label are in accordance with NC statutes and the contract requirements. A form approved by the Division of Purchase & Contract, and which may be obtained at http://www.doa.state.nc.us/PandC/mattress_form.pdf, will be used by the Sleep Products Branch to report the results of the physical inspection. If the sample is rejected, the reasons therefor shall be fully disclosed on the form, so that all appropriate parties can be apprised of such reasons. The original of the completed and signed form shall be forwarded by the Sleep Products Branch inspector to the Chief Standards Engineer, Division of Purchase & Contract, Raleigh, NC. A copy of the completed and signed form shall be forwarded by the Sleep Products Branch inspector to the purchasing officer (or appropriate purchaser) of the using agency. The using agency is cautioned that a copy of the above-linked mattress physical inspection form, properly completed and signed, and confirming acceptability of the sample mattress, should be in the agency's possession before payment is released to the contractor.

If the sample is determined to be acceptable, it will be retained for comparison, as necessary, against the remainder of the delivered units from that line item. The State may select one unit for each 50 delivered on the order to compare against the initial sample. Such comparison may involve invasive inspections which could render the mattresses unsuitable for use. The supplier is responsible for restoring the inspected units to new condition, or otherwise for providing replacement mattresses for the sacrificed units, also including the initial sample. The Sleep Products Branch may require that inspection of several selected samples be delayed until an authorized inspector can be present at the site. However, if necessary, mattresses may be installed before the corresponding sample(s) has/have been inspected.

FLAMMABILITY TESTING: In addition, before initiating production of mattresses for any given line item, the contractor is responsible, including all costs therefor, for having mattresses from that line item tested for compliance with 16CFR1632 Part 1632 and with 16CFR1633 Part 1633, at an independent testing lab of the State's choice, such as The Govmark Organization, Inc., Farmingdale, NY, or Stork Twin City Testing, St. Paul, MN. (The number of mattresses tested shall be as called for in the above regulations, except as may be modified by Interim Enforcement Policies issued by the U.S. Consumer Product Safety Commission and effective at time of mattress production.) An original certified copy of the test report results is to be mailed directly by the testing lab to the Chief Standards Engineer, Division of Purchase & Contract. **The State has the option to select and test additional units anywhere within the production run, at its own expense.** If ANY tested mattress fails to comply with either of the above tests, the circumstances will be investigated, and if warranted, the contractor may be required to retrieve at his own expense all suspect mattresses delivered under the affected line item, and to fully refund any payment already received therefor. A separate set of flammability tests is required for EACH line item, except that a mattress from a single line item may represent other line items which differ from the former only with respect to mattress size. Note that it is NOT required that a mattress from each delivery be tested per the above.

For traceability purposes, the contractor is responsible for providing to the independent testing lab, at the time the mattress is submitted, the following information on the order, **and requesting that this information be stated in the laboratory's test report:**

- (a) Contract number
- (b) Line item number
- (c) Mattress description
- (d) Manufacturer's lot number
- (e) Sequence or serial number of the tested mattress, if available
- (f) Date of production of the tested mattress

RANDOM SCREENING FOR FLAMMABILITY RESISTANCE: To maximize mattress fire safety while minimizing fire testing costs, the State may at its discretion conduct at any time and location flammability screening tests of a nature it deems appropriate, including testing of individual mattress components, on any mattress to be delivered, or which have been delivered, /under the contract. These screening tests shall exclude individual mattresses that are, per the contract, specifically intended for fire testing under promulgated standards, and furthermore these screening tests may not be substituted for, nor take precedence over, such promulgated standards. If a mattress subjected to the screening test indicates possible insufficient fire resistance, then the circumstances may be further investigated, and appropriate action taken as necessary to rectify the matter.

VII. DELIVERY AND PAYMENT

Delivery and payment for mattresses under this specification shall be in accordance with the terms and conditions of the Invitation for Bids. The Contractor shall be responsible for any packing, packaging, or protection required to insure delivery in an undamaged condition.

VIII. ORDERING DATA

Purchasers should exercise any desired option offered herein and should specify the following in the Requisition and Invitation for Bids:

1. Title, number, and date of this specification
2. Class and size of mattress required

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