



TANZANIA STANDARD

Draft Tanzania Standard
Performance specification for mattress made from man-made fibres

Draft for Public Comments Only

TANZANIA BUREAU OF STANDARDS

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Foreword

This Tanzania Standard was published under the authority of the Board of Director of Tanzania Bureau of Standards.

Tanzania Bureau of Standards (TBS) is the statutory national standards body for Tanzania established by the Standards Act Cap. 130.

Tanzania Standards are developed through Technical Committees that are representatives of key stakeholders including government, academia, consumer groups, private sector and other interested parties. The Technical Committees work under the supervision of Divisional (sectoral) Committees. The Standards are developed in accordance with the Guide and Procedure for Development of Tanzania Standards and TZS 0: *Guide for presentation of Tanzania Standards*.

Tanzania Standards are subject to review to keep pace with science and technological advances. Users of the Tanzania Standards are therefore expected to ensure that they always have the latest versions of the standards they are implementing.

This Tanzania Standard was developed under the supervision of the Textile and Leather Division standards Committee (TLDC). The technical committee responsible for this standard is TDC7-Textile fibres

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1. Scope

This Draft Tanzania Standard specifies the performance requirements, construction, labeling, and packaging of mattresses made exclusively from synthetic fibres. It does not apply to mattresses made from natural fibres, foam, or hybrid materials.

2. Normative References

The following standards are referred to in the text in such a way that some or all of their content constitutes requirements of this Draft Tanzania Standard. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

TZS 4, *Rounding off numerical values*

TZS 24, Textiles -- Tests for colour fastness -- Part C10: Colour fastness to washing with soap or soap and soda

TZS 21, Textiles – Determination of mass per unit length and per unit area of knitted or woven fabric

TZS 4894, Textile-Tensile properties of fabrics - Part 1 Determination of maximum force and elongation at maximum force using the strip method

TZS 3671-1, Textiles - Seam tensile properties of fabrics and made-up textile articles - Part 1: Determination of maximum force to seam rupture using the strip method

TZS 26, Textiles – Determination of conductivity, pH, water soluble matter, chloride and sulphate in aqueous extracts

TZS 1420 Textiles – Stitch types – Specification

3. Terms and definitions

For the purposes of this Draft Tanzania Standard, the following terms and definitions shall apply.

3.1 Block

a piece of mattress manufactured using a hollow conjugate fibre or silicon fibre compressed under high temperature with hot melt glue.

3.2 Hollow conjugate fibre

a synthetic polyester fibre with a spiral or crimped structure, giving it bounce and softness. The hollow channel reduces weight and improves airflow.

3.3 Silicon fibre

polyester fibre treated with silicone oil, making it smoother, more resilient, and less prone to clumping.

3.4 Hot melt adhesive/glue

a thermoplastic adhesive used to bond fibres together when compressed under high temperature, ensuring the mattress retains its shape and firmness.

3.5 Tick

Suitable outer cover that provides a comforting top layer of the mattress

4. Requirements

4.1 General requirements

4.1.1 The grades of fibre mattresses are permitted due to their proven comfort and resilience and shall be in four grades:

- i) Light duty grade
- ii) Medium duty grade
- iii) Heavy duty grade
- iv) Superior heavy-duty grade

4.1.2 Fibre mattress shall be manufactured using hollow conjugate fibre or silicon fibre uniformly distributed and thermally bonded with hot melt adhesive/glue to form a resilient and stable box structure. The adhesive shall have a pH value not lower than 3.5 and must withstand heat and moisture treatments with performance equivalent to that of the fibre mattress itself. The pH value of the outer cover shall meet the requirement given in Table 1

4.1.3 The fibre material shall be non-toxic and free from harmful residues such as volatile amine or formaldehyde, resistant to microbial growth, mold and mildew and sustainability issue related to recyclability or environmentally neutral in disposal shall be taken in the consideration.

4.1.4 Outer cover fabric of fibre mattresses shall be of a woven or knitted ticking fabric conforming to the requirement given in Table 2. Under mutually agreed upon between the buyer and seller, the outer cover may also be made from heavy-duty material such as cotton, polyester, viscose or blends thereof. The cover shall be free from visible defects (tears, stains, holes or weaving irregularities)

4.1.5 Unless otherwise agreed to between buyer and seller, the Stitch density shall be 8-12 stitches per inch subject to lockstitch or double chainstitch according to TZS 1420. This type of seams is recommended for side part to prevent fibre leakage and maintain mattress integrity.

4.1.6 Seams strength and resistance to slippage for outer cover shall withstand under the force given in Table 1. The mattress edges shall be constructed to resist collapse under normal use without rupture or yarn displacement.

4.2 Specific requirement

4.2.1 Fibre mattress shall conform to the specific requirements given in Table 1 when tested in accordance with the test method specified therein.

Table 1 —Dimensions and Physical requirement of fibre mattress

SN	Properties	Requirements	Test methods
1	Length, mm	As agreed between buyer and seller, with tolerance ± 10	TZS 359
2	Width, mm	As agreed, tolerance ± 10	
3	Thickness, mm, Min.	150	
4	Density, Min, kg/m ³ i) Superior heavy duty grade ii) Heavy duty grade iii) Medium duty grade iv) Light grade	30 28 20 15	
5	Tensile strength, N/mm ² , Min i) Superior heavy duty grade ii) Heavy duty grade iii) Medium duty grade iv) Light grade	0.109 0.089 0.068 0.059	TZS 4894
6	Flammability	a) No specimen shall burn in 3 min or more b) No specimen shall burn beyond the gauge line	Annex A
7	Durability (hardness loss), % Min	20% after 30,000 cycles of compression	Annex B
8	Weight of the outer fabric, g/m ² , Min	40	TZS 21
	Seam strength, N	≥ 200 before rupture	TZS 3671-1
9	Colour fastness to washing i) Change in colour ii) Staining on adjacent fabrics	4 3	TZS 24
10	pH	6.5-7.5	TZS 26

6. Packaging and Labelling

6.1 packaging

Unless otherwise agreed between buyer and seller, the mattress shall be wrapped with PVC or any water-proofed material. The Packaging must protect against moisture, dust, and mechanical damage during transport and storage.

6.2 Labelling

6.2.1 Each mattress shall be labeled with:

- a) Manufacturer's name and address
- b) Mattress type (synthetic fibre mattress) and grade
- c) Dimensions (length × width × thickness)
- d) Fibre type (e.g., hollow conjugate fibre, polyester fibre or silicon fibre)
- e) Date of manufacture
- f) Care instructions

6.2.2 The Mattress may also be marked with the 'tbs' Standards Mark. The standards mark is granted to manufacturer only under license from TBS. Particulars of conditions under which the license is granted is available through online application at TBS website or any near TBS office.

Annex A (Normative)

Determination of flammability

A.1 Apparatus

An apparatus as shown schematically in Figure A.1 and consisting of a heat-resistant glass tube (chimney) in which a test specimen can be mounted, the base of the tube being connected to metered supplies of oxygen and nitrogen. The glass tube shall have a diameter of at least 75 mm and a height of at least 450 mm, and shall have at its base a bed of glass beads (or other inert particles) that will mix and distribute the incoming gases. The tube shall also contain a clamp that is capable of holding a test specimen (vertically) that the top of the specimen is at least 100 mm below the top of the tube.

The oxygen and nitrogen used shall be of commercial grade (or better) and shall be supplied to the base of the glass tube through individual metering devices that enable the volumetric flow of each gas to be measured with an accuracy of 1 per cent or better.

A.2 Test specimens

From the appropriate slab (pieces of total volume at least 0.01 m^3), cut five specimens each of size $12.5 \pm 0.5 \text{ mm} \times 12.5 \pm 0.5 \text{ mm} \times 130 \text{ mm}$ and draw a gauge line across each specimen 75 mm from the end that is to be positioned uppermost in the apparatus.

A.3 Procedure

Clamp a test specimen in the holder of the apparatus so that it is held vertically in the center of the glass chimney. Open the valves of the gas cylinders and adjust the flow so that the oxygen content of the gas mixture is 20 ± 0.2 percent and that the flow rate up the glass chimney (as calculated from the volumetric flow rate divided by the cross-sectional area of the chimney) is $40 \pm 10 \text{ \% mm/s}$. Allow the gas to flow for at least 30 s and then, using a small gas flame at the end of a tube, ignite the test specimen so that the whole of the upper surface is burning. Note whether the specimen burns for 3 min or longer and if not, whether or not the specimen has burned to below the 75 mm gauge line. Repeat the test with the remaining four specimens.

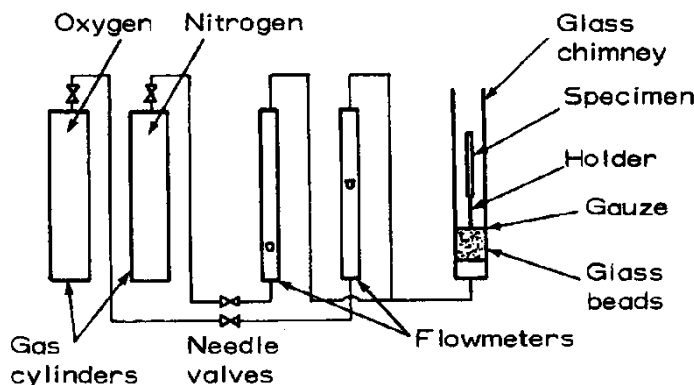


Figure A.1 — General arrangement of flammability test apparatus

Annex B
(Normative)

Determination of hardness factor

B-1 Apparatus

A machine consisting of a flat circular indenter foot of thickness 10 mm, having the bottom edge rounded to a radius of 1 mm and a contact area of 322.5 cm, and that can be raised or lowered at a speed of 100" 20 m/m min and a base-plate that has 6.0 mm diameter perforations at 20 mm centres. The indenter foot is connected through a swivel joint to two gauges, one of which is capable of recording the force exerted by the foot upon the specimen and the other the distance travelled, relative to the base-plate.

B-2 Test specimen

From the appropriate slab (pieces of total volume at least 0.01 m³), cut one rectangular specimen of size 380 mm x 380 mm x 50 mm. For a sample of thickness less than 50 mm, specimens of thickness at least 15 mm may be plied together (without the use of an adhesive) to give a total thickness of 50 mm.

B-3 Procedure

Place the specimen centrally under the indicator foot and lower the foot into contact with the specimen and record the distance between the foot and the base-plate. Flex the specimen twice by lowering the foot 35 mm then allow the specimen to recover for 10 min under no load.

Lower the foot until a force of 5 N is recorded on the gauge, record the distance travelled, and calculate, as follows, the thickness of the specimen under this load:

Thickness of specimen, mm = $A - B$
where,

A = the distance of the foot from the base-plate before flexing, in mm;

B = the distance travelled by the foot, in mm.

Then lower the foot until the specimen is compressed to 60 percent of its calculated thickness and note the force recorded on the gauge after 60 s.

B- 4 Calculation

Calculate, as follows, the hardness factor of the specimen, and record this value as the hardness factor of the sample:

Hardness factor = 0.102 x force, in newton's required to produce 40 percent compression.