



DRAFT TANZANIA STANDARD

**Textiles — Twines — Specifications — Part 1 — Twines made from
sisal and cotton (Revision of TZS 490-1:2018)**

Draft Stakeholder For Public Comments

TANZANIA BUREAU OF STANDARDS

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National 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 representative 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 Divisional Standards Committee (TDC). The Technical Committee responsible for the standard is (TDC 8- Yarns and Twines)

This third edition cancels and replaces the second edition (TZS 490-1 2018), which has been technically revised

The reporting of the results of a test or analysis made in accordance with this Tanzania Standard, if the final value, observed or calculated is to be rounded off, shall be done in accordance with TZS 4.

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1. Scope

This Draft Tanzania Standard specifies requirements for the manufacture and performance of twines made from sisal and cotton fibres.

2. Normative references

The following referenced documents are indispensable for the application of this document. 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*

3. Terms and definitions

For the purpose of this document, the following terms and definitions shall apply;

3.1

hairiness

ends of fibres, standing out from twine.

3.2

spool

cross – wound cylindrical unit of twine

3.3

pack

parcel of two or more spools

3.4

sample length

length of twine taken from any one spool sufficient to obtain the required number of specimens for strength, linear density and runnage determinations.

3.5

specimen

length taken from any test sample for testing purposes

3.6

runnage

normal measure of the size of twine, expressed in meters per kilogram (see annex A)

3.7

linear density

mass per unit length of textile Twines. In the universal count system, it is expressed in Tex or kilotex (see annex A)

3.8

manufacturer's batch

quantity from which a specified number of packs will be drawn for testing

3.9

package

container, as a box or case, in which something is or may be packed in

4 Requirements

4.1 General requirements

- 4.1.1** The fibres used for the manufacture of the twines shall be of such quality and fineness as is necessary to produce twines having the characteristics required in the Tables 1, 2 and 3. With the exception of the fibres for cotton twines, the sisal fibres shall be well hacked and free from defects.
- 4.1.2** The twines shall be evenly and well spun and shall be substantially circular in cross section. Throughout its length, each package of twine shall be continuous and knotless. The package shall be designed for the twine to be drawn from the center. Each package shall be capable of working with continuity throughout its length.
- 4.1.3** Twist – Unless stated or otherwise ordered, twines shall be left-hand or S twist.
- 4.1.4** Treatment – Unless otherwise stated from this Draft Tanzania Standard or in the contract or order, twines shall be supplied in an untreated condition.
- 4.1.5** Weight of package – A tolerance of +10 %, -5 % shall be allowed on the specific weight of any one package provided that the variation from the gross specified weight of any delivery of one size and description does not exceed 5 %.

4.2 Specific requirements

- 4.2.1 Linear density and runnage** – The linear density and runnage shall be as specified in Tables 1, 2 and 3. They are subject to a tolerance of $\pm 5\%$. For twines that are rot-proofed, the tolerance on length shall be agreed between purchaser and supplier. Linear density and runnage shall be determined as specified in Annex A.
- 4.2.2 Breaking force** – Breaking force shall be as specified in Tables 1, 2 and 3. Any tolerance to be allowed on rot-proofed twines shall be agreed between the purchaser and the supplier. Breaking force shall be determined as described in Annex B.

Table 1 — Sisal packing twines for services use

Reference number	Description	Linear density (Tex)	Runnage $\pm 5\%$ (m/kg)	Minimum Breaking forces (daN)	Minimum ply (No. of threads)
SPT 1	Heavy	18182	55	177	3
SPT 2	Course	6667	150	108	3
SPT 3	Extra medium	5000	200	79	3
SPT 4	Medium	3333	300	54	2
SPT 5	Fine	2500	400	38	2
SPT6	Extra fine	1980	505	31	2

NOTE — The SI unit of force is the newton (N). A load of 1kg = 0.981 decanewton (daN), further details are given in annex C

Table 2 — Sisal packing twines for ordinary commercial use

Reference number	Linear density (Tex)	Runnage $\pm 5\%$ (m/kg)	Minimum Breaking forces (daN)	Minimum ply (No. of threads)
SPT 1	20000	50	299	4
SPT 2	15385	65	201	3
SPT 3	10000	100	142	3
SPT 4	8333	120	123	3
SPT 5	6667	150	108	3
SPT 6	6667	150	108	4
SPT 7	5000	200	79	3
SPT 8	3333	300	54	2
SPT 9	1653	605	26	1

Table 3 — Cotton parceling twines (polished)

References number	Linear density (Tex)	Runnage $\pm 5\%$ (m/kg)	Minimum breaking force (daN)	Minimum ply (No. of threads)
CPT 00	7692	130	60	3
CPT 0	6667	150	50	3
CPT 1	5882	170	40	3
CPT 2	4545	220	34	3
CPT 3	3846	260	29	3
CPT 4	2778	360	20	3
CPT 5	1905	525	15	3
CPT 6	1307	765	10	3
CPT 104	825	1212	7	1
CPT 103	621	1610	5	1

5 Packing and marking

5.1 Packing

Each Spool shall be securely packed in a suitable material to prevent damage during transportation and storage.

5.2 Marking

5.2.1 Each individual Spool shall be marked with following information:

- a) name of the material and construction,
- b) the reference Number
- c) net weight,
- d) colour
- e) country of origin
- f) name and/ or address of the manufacturer
- g) month and year of manufacture.

5.2.2 Each package containing Spool shall be marked with following information:

- a) name of the material and construction,
- b) Net weight,
- c) gross weight,
- d) country of origin
- e) Name and/ or address of the manufacturer
- f) name and/ or address of the manufacturer
- g) month and year of manufacture.

6 Sampling

The sampling criteria shall be in accordance with ISO 2859-1.

a. Length per package

The length of twine per package of each package tested shall be determined in accordance with the method given in annex A and shall be not less than the length declared.

b. Linear density and runnage

The linear density and runnage of sample lengths shall be determined in accordance with the method given in annex B and shall be in accordance with the appropriate figures given in Table

c. Breaking Load

- i. The breaking load of each sample shall be determined in accordance with the method given in annex C and shall be not less than that given in Table 1.
- ii. For the breaking load test, take into consideration only the results obtained when the break occurs between the grips of the testing machines. If one of the ten specimens from a sample spool fails to reach the minimum breaking load specified in Table 1 for which the twine being tested, the results shall be rejected and another package of twine sampled in its place.

This retest procedure is applicable to all sample packages representing a batch.

Should any test result from the reset sample package or packages fail to reach the minimum breaking load requirement, the batch represented by the sample packages shall be deemed to comply with the requirements of this Tanzania Standard.

Annex A
(Normative)

Determination of linear density and runnage

A.1 Principle

Weigh, under specified conditions, specimens of specified length, then followed by calculation of the linear density and the runnage (or length in meters per kilogram).

A.2 Apparatus

A.2.1 Balance, accurate to 0.5 g

A.2.2 Wrap – reel of known perimeter

A.3 Specimens selection

Select 10 m (heavier twine) or 20 m (lighter twine) from each package, proceeding in the following manner:

Directly from the center of each package, in an anti-clockwise direction, draw the first 10 m of twine and discard them. Then draw 10 m of twine (for twine 1000 m/kg and heavier) or 20 m of twine (for twine lighter than 1000 m/kg) and wind them as adjacent turns (without overlapping) on the wrap – reel, exercising just sufficient tension on the twine to maintain straightness.

Each specimen of 10 m or 20 m thus obtained constitutes a test piece.

A.4 Procedures

Weigh each specimen to the nearest 0.5g (let m , be the mass obtained in grams).

A.5 Expression of result

A.5.1 Calculation of linear density

For each specimen, calculate the linear density T , in Tex using the formula:

$$T = \frac{1000m}{l}$$

Where,

m , is the mass, in grams, of the specimen and

l , is the length, in meters of the specimen.

A.5.2 Calculation of runnage

Calculate the runnage L, in meters per kilogram of twine, using the following formula:

$$L = \frac{10^6}{T}$$

Where,

T, is the linear density

A.5.3 If a specimen is outside the tolerance, a check test shall be carried out on another spool.

A.5.4 If the result of the check test is found to be within the limits of the permitted tolerances, it is the result of the check test which is adopted for the value of the linear density.

Annex B (normative)

Method for determination of breaking load

B.1 Apparatus

Use a power driven constant rate of extension or constant rate of traverse testing machine, which includes a pair of suitable devices to hold the specimens, a means of elongating the specimen at suitable rate and load – indicating mechanism to indicate or record continuously the load applied to the specimen.

The machine shall comply with the specified requirements for grade A machine. i.e. the maximum permissible error shall not exceed 1 % of the applied load or 0.2 % of the maximum of the scale, whichever is the greater. Subject to agreement between the purchaser and the supplier a power – driven machine of the constant rate of loading type may be applied.

B.2 Specimens

Take five test specimens per sample length. The free length of the test specimen between holding devices at the start of the test shall be 500 mm.

B.3 Speed

The rate of transverse of the straining head of Constant rate of extension (*CRE*) and Constant rate of traverse (*CRT*) machine shall be 500mm $\pm$ 50mm per minute.

If a Constant rate of loading (*CRL*) machine is used, the rate of loading shall be such that the time to break is 60 $\pm$ 10 seconds.

B.4 Procedures

Insert the specimen carefully between the holding devices, set the machine in operation and increase the load continuously until the specimen breaks. Record the maximum load attained. Should any specimen slip in either of the holding devices or at either of the holding devices at a load less than the appropriate minimum breaking load specified in the schedule, disregard the result and test a fresh specimen.

B.5 Results

Express the result for breaking load of each specimen in kg or decanewton to the nearest 1 %. The SI unit for force is the newton (N). A load of 1kg =0.981 decanewton (daN)

Annex C
(normative)

Unit conversion

C.1 Equivalent breaking force in decanewtons

Table C.1 — daN equivalent for 1kg and 1b values given in Tables 1, 2 and 3

	lb	daN	kg	lb	daN
5	11	5	51	112	50
7	15	7	55	120	54
10	22	10	61	135	60
15	34	15	80	180	79
20	45	20	110	240	108
27	60	26	125	280	123
30	67	29	145	320	142
32	70	31	180	400	177
35	78	34	205	450	201
39	85	38	305	670	299
41	90	40	-	-	-

C.2 Equivalent measure of size IN m/kg

Table C.2 — m/kg equivalent for yd/lb values given in Tables 1, 2 and 3

yd/lb	m/kg	yd/lb	m/kg
25	50	130	260
28	55	150	300
33	65	180	360
50	100	200	400
60	120	250	505
65	130	260	525
75	150	300	605
85	170	380	765
100	200	600	1212
110	220	800	1610