

**DRAFT STANDARDS FOR STAKEHOLDER ONLY**

**Draft**

**Tanzania Standard**

**Textiles – Twines – Specifications: Part 1 – Twines made from natural fibres.**

**(Second edition)**



**TANZANIA BUREAU OF STANDARDS**

## 0. FOREWORD

**0.1** The development of this Draft Tanzania Standard 2<sup>nd</sup> edition is based on the current practices and requirements of the industries and relevant authorities dealing with twines – natural fibres. This Draft Tanzania Standard is the second edition which has been technically revised, where; its foreword, standard title and other portions have been slightly improved. In the cover page, the title of the standard has been changed from “sisal and cotton twines” to read as “Textiles – Twines – Specifications: Part 1. Twines made from natural fibres”, also the Scope (Clause 1) has to read “This Draft Tanzania Standard specifies requirements for the manufacture and performance of twines made from Sisal and Cotton fibres”.

**0.2** In the preparation of this Draft Tanzania Standard assistance was derived from

BS EN ISO 5080:1999 Sisal agricultural twines.

This second edition cancels and replaces the first edition which was developed in year – 1992

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# Tanzania Bureau of Standards

## Draft Tanzania Standard

TDC8 (5625)P<sub>3</sub>

### Textiles – Twines – Specifications: Part 1. Twines made from natural fibres

#### 1. SCOPE

This Draft Tanzania Standard describes 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:

- a) TZS 3: Atmospheric conditions for testing;
- b) TZS 4: Rounding off numerical values.

#### 3. TERMS AND DEFINITIONS

For the purpose of this Draft Tanzania Standard 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 products such as ropes, lines, cords and 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. GENERAL REQUIREMENTS

**4.1** 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.

**4.2** 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.

**4.3 Twist** – Unless stated or unless otherwise ordered, twines shall be left-hand or S twist.

**4.4 Treatment** – Unless otherwise stated from this Draft Tanzania Standard 2<sup>nd</sup> edition or in the contract or order, twines shall be supplied in an untreated condition.

**4.5 Mass of package** – A tolerance of + 10%, -5% shall be allowed on the specific mass of any one package provided that the variation from the gross specified mass of any delivery of one size and description does not exceed 5%.

**4.6 Linear density and runnage** – The linear density and runnage shall be as specified as in the 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 described in annex A.

**4.7 Breaking force**– Breaking force shall be as specified in the 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 twine 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 twine 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
SPT6	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 twine (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**

Packing shall be in accordance with the instructions issued with the contract.

**6. MARKING**

**6.1** Each package of twines shall have a label securely attached which shall be clearly and legibly marked with the following:

- a) Manufacturer's name and/or trade mark;
- b) The reference number
- c) The material
- d) The length of twine
- e) The linear density and runnage and
- f) Any other marking required by the buyer.

The marking shall be protected against obliterations.

**6.2** The packages or bundles may also be marked with the tbs Certification Mark.

NOTE – The tbs Certification Mark may be used by manufacturers only under license from TBS. Particular of conditions under which the licenses are granted may be obtained from TBS.

**7. SAMPLING**

Sampling shall be as representative as possible of the batch that is to be subjected to the measurements and tests, and samples shall be selected away from the ends of the packages at points where they are in true lay.

**7.1 Lot** – A quantity of packages of the same linear density, same type, and same dimensions, manufactured under similar conditions and delivered to a buyer against a dispatch note shall constitute a lot.

**7.2** The conformity of the lot shall be determined on the basis of test carried out on the same sample selected from it.

**7.3** The number of package to be selected at random from a lot shall be as given in Table 3:

**Table 3 – Sampling plan**

Lot size	Sample size
0 to 10 packages	1
11 to 100 packages	10
101 and above	100

**7.4** For evaluating the length, linear density, breaking load and the number of packages selected according to 7.3 shall constitute the test sample.

For evaluating the gross mass of the lot all the package in the lot shall constitute the test sample.

**7.5 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.

**7.6 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 1.

### **7.7 Breaking Load**

**7.7.1** 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.

**7.7.2** 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 Draft Tanzania Standard.

**7.8 Criteria for conformity** – The lot shall be declared as conforming to this Draft Tanzania Standard if the conditions below are satisfied:

- a. The length of each package is not less than the specified length and
- b. The average values of the test results in respect of other requirements conform to the requirements specified in the standard.

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**ANNEX A**  
**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 0.5g

**A-2 .2** Wrap – reel of known perimeter

**A – 3 Specimens**

**Selection**

Select 10m (heavier twine) or 20m (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 10m of twine and discard them. Then draw 10m of twine (for twine 1000m/kg and heavier) or 20m of twine (for twine lighter than 1000m/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 10m or 20m 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

### 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 500mm.

#### 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**

**C.1 EQUIVALENT BREAKING FORCE IN DECANEWTONS**

**Table 4 – daN equivalent for 1kg and 1b values given in Tables 1, 2 and 3.**

kg	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 5 – 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