Draft
Tanzania Standard
Textiles – Polypropylene Baler Twine – Specifications

(First edition)

TANZANIA BUREAU OF STANDARDS

0. FOREWORD

0.1 This Draft Tanzania Standard has been prepared with a view of assisting manufacturers of Polypropylene (PP) baler twines to come up with a product of defined quality suitable for intended applications.

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

Local company specifications

ISO 9554: 2010(E) – *Fiber Ropes – General specifications*

ISO 1346: 2012 – *Fibre Ropes – Polypropylene split film, monofilament and multifilament (PP2) ropes*

Tanzania Bureau of Standards
Draft Tanzania Standard TDC8 (5627)P_3
Textiles – Polypropylene Baler Twine – Specifications

1. SCOPE

This Draft Tanzania Standard describes requirements for Polypropylene (PP) baler twine used for packaging applications.

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 Twine – textile product normally less than 5mm in diameter generally assembled into a structure that compacts the fiber into a useable structure in various construction forms

3.2 Linear density – mass per unit length of a fiber, twines, yarn or rope. In the universal count system, it is expressed in Tex or kilotex

3.3 Bale – large bundle, or package

3.4 Baler – twine used to tight or bind large packages into bales.

3.5 Spool – cross – wound cylindrical unit twine

3.6 Runnage – normal measure of the size of twine, expressed in meters per kilogram

3.7 package – container, as a box or case, in which something is or may be packed in.

4. GENERAL REQUIREMENTS

4.1 PP baler twines shall be manufactured using the finest PP material.

4.2 PP baler twines shall be of a highly abrasion resistant and which does not unravel when cut and unspooled.

4.3 PP baler twines shall be substantially circular in cross section.

4.4 Each package of PP baler twine shall be of continuous length and knotless.

4.5 The package shall be designed for the PP baler twines to be drawn from the center.

4.6 Each package shall be capable of working with continuity throughout its length.

5. SPECIFIC REQUIREMENTS

The specific requirements shall include the following:

5.1 Linear density and runnage – They are subject to a tolerance of ± 5% and shall be as described in annex A.

5.2 Minimum breaking force – Shall be as specified in Table 1. Any tolerance to be allowed shall be agreed between the purchaser and the supplier. Breaking force shall be determined as described in annex B.

5.3 Mass of package – A tolerance of ±5% shall be allowed on the specific mass of any package provided that the variation from the gross specified mass of any delivery of one size and description does not exceed 5%.

5.4 Twist – Unless stated or unless otherwise ordered, PP baler twines shall be S-twist direction.

5.5 Treatment – PP baler twines shall be protected against deterioration due to exposure to sunlight (UV).

Table 1 – Requirements of PP baler twine

Reference number	Description	Linear density *Min,* (tex)	Runnage ±5% (m/kg)	Breaking force *min,* (tex)
1	Fine	2400	417	525
2	Medium	2800	357	725
3	Extra medium	4500	222	925
4	Course	5400	185	1020

6. FINISH

6.1 The finished PP baler twine shall be of any colour unless otherwise specified by the purchaser.

6.2 The PP baler twine shall contain no cuts or damaged sections and all ends shall be secured.

7. PACKING AND LABELLING

7.1 Packing

The identity of the material, quality and origin of PP twine conforming to this Draft Tanzania Standard shall be marked alongside the package so as to remain visible during usage. For covered twine, the marking tape shall be incorporated between the cover and the core or within the core.

7.2 Labeling

Each cone shall have a label, which is firmly fixed in place, giving the following information:

a) constituent material;
b) identification of manufacturer and country of origin;
c) reference number and
d) delivered length.

8. PACKAGING AND DELIVERED LENGTH

8.1 Packaging.

8.1.1 The packaging unit may be a reel, a coil, a box or a bag or as specified by the purchaser.

8.1.2 The finished twine shall be supplied in a package, so that it can be distributed freely without entanglement of any kind.

8.1.3 Either the unit mass or the length may be used to invoice the twine. When the gross mass is used for invoicing, the mass of the packaging shall not exceed 1.5% of the gross mass of the twine.

8.2 Delivered length

8.2.1 Standard delivered length

The length of the package shall be determined by dividing the mass of the package by the mass per meter of the twine. The limit deviation on delivered length shall not be -3% twines.

On condition that the gross mass corresponding to the delivered length is not less than the product of the minimum linear density and the theoretical delivered length.

Standard delivered lengths are as follows:

100m; 183m; 200m; 220m; 366m;

Other lengths may be supplied for special orders.

8.2.2 Shorter delivered length due to sampling

To carry out testing at the request of the purchaser, test pieces may be taken from the order length of twine. The length of the twine delivered shall be less than the ordered length because of these test pieces (which are considered to be part of the delivery).

In the event that a specific length is required and testing is required, the purchaser may be invoiced the additional length or mass of the rope required to perform such testing.

9. TESTING

9.1 The testing of the finished twine shall be conducted as specified in this Draft Tanzania Standard and in the purchase order or contract.

9.2 The required length and number of test samples shall be removed from the selected test reels as outlined in 8.2.2, if required.

9.3 Test reports shall be prepared in accordance with contract or the purchaser order.

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 Specimen

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 1000m/kg and heavier) or 20m of twine (for 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 of 10m or 20m thus obtained constitutes a test piece.

A-4 Procedure

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

A-5 Expression of results

A-5.1 Calculation of linear density

For each specimen; calculate the linear density *T,* in Tex, using the following 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:

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

Where *T,* is the linear density

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

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 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 specimen, a means of elongating the specimen at a suitable rate and a 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, that is; 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 employed.

B-2 Specimens

Take 10 or more than 10 specimens per sample length. The free length of the test specimen between the holding devices at the start of the test shall be 500mm.

A-3 Speed

The rate of traverse of the straining head of Constant rate of extension *(CRE)* and Constant rate of traverse (*CRT)* machines shall be 500mm ± 50mm per minute.

If a *CRL* machine is used, the rate of loading shall be that the time to break is 60 ± 10 seconds.

B-4 Procedure

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 break in 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 the breaking load of each specimen in N or kg or decanewton (daN) to the nearest 1%

*The SI unit for force is the newton (N). A load of 1kg = 0.981 decanewton (daN)

ANNEX C
INFORMATION ON DEFECTS AND VARIANCES

B-1 Major defects

Major defects include the following:

a) any cuts, snags, pulled strands;
b) any damaged sections;
c) any twine/rope ends knotted or spliced to make a continuous standard length;
d) colour not as specified;

B-2 Minor defects

a) clearly visible and excessive stains
b) broken, lose or projecting ends in the twine
c) ends not cut off squarely, or not securely whipped, taped or heat-sealed;
d) any chaffed sections