DRAFT TANZANIA STANDARD

Timber – Determination of average moisture content of a lot

TANZANIA BUREAU OF STANDARDS

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0 National Foreword

The Tanzania Bureau of Standards is the statutory national standards body for Tanzania, established under standards Act No. 3 of 1975, amended by Act No. 1 of 1977 and then Act No. 3 was replaced by the Act No. 2 of 2009.

This draft Tanzania Standard was prepared by BCDC 6 Sawn timber, Sawn logs and Wood based Components Technical Committee, under the supervision of the Building and Construction Divisional Committee (BCDC).

During the preparation of this draft Tanzania Standard assistance was dirived from ***ISO 4470: 1981, (E) Sawn timber – Determination of the average moisture content of a lot,*** published by the International Organization for Standardization.

1 Scope

This Tanzania Standard specifies two methods for the determination of the average moisture content of a homogenous lot of sawn timber of the same cross-section.

2 Field of application

The method using an electrical moisture meter is applicable to timber having moisture contents from 7 to 28 %, and does not require cutting of the test pieces. When measuring the moisture content of sawn timber having a wet surface, due to water or to a surface protection treatment, the electrical moisture meter should be used with electrode needles that are covered, except for their tips, with an insulated coating.

The method by drying requires cutting of the test pieces. It is applicable irrespective of the moisture content, and is the only method applicable in cases of dispute.

3 References

For the purpose of this Tanzania Standard, the following references shall apply:

TZS 258 *Timber – Sampling methods and general requirements for physical and mechanical tests*

TZS 4 *Rounding off numerical values*

4 Principle

4.1 Method using an electrical moisture meter

Measurement of the electrical resistance or conductance of the test pieces, using an electrical moisture meter to relate the resistance or conductance measured to the moisture content.

4.2 Method by drying

Determination of the loss in mass after drying test pieces to constant mass.

5 Electrical moisture meter method

5.1 Apparatus

Moisture meter, of any design, calibrated for the species of wood concerned, and capable of making an individual measurement with an error of not more than ± 2 % at moisture contents from 7 to 28 %.

5.2 Sampling

Take samples at random in accordance with TZS 258 (see clause 3).

5.3 Procedure

5.3.1 Measure the moisture content of the test pieces in the middle of the width of each face, at a distance not less than 0.5 m from either end.

Select the measuring areas at random, the number being not less than two for test pieces more than 1.5 m and up to 2.5 m long, not less than three for test pieces more than 2.5 m and up to 4 m long and not less than four for test pieces more than 4 m long.

The measuring areas shall not contain any dirt or visible wood defects. Drive the electrodes into the wood so that the line between the tips of the needles lies in the direction of, or perpendicular to, the grain, according to the design of the electrical moisture meter.

5.3.2 Make at least three measurements in each measuring area, 10 mm to 15 mm apart, to avoid any accidental error due to the electrodes piercing an inner invisible defect of the wood. Take as the result the arithmetic mean of three readings closest in their values.

5.4 Calculation and expression of results

Calculate the mean of the individual measurements, and express the average moisture content, W of the lot or of one board, as a percentage by mass, to the nearest 1 %.

6 Drying method

6.1 Apparatus

6.1.1 Balance, accurate to 0.1 g.

6.1.2 Equipment for drying wood, ensuring free internal circulation of air and capable of maintaining a temperature of 103 °C ± 2 °C.

6.1.3 Desiccators, containing a hygroscopic substance.

6.1.4 Moisture-proof film or glass vessels, preferably of capacity 2 to 3 dm^3, capable of being hermetically sealed.

6.2 Sampling

Take samples at random in accordance with TZS 258 (see clause 3).

6.3 Preparation of test pieces

6.3.1 Each test piece shall be of 20 mm length taken in the direction of the grain, and of full cross section.

6.3.2 The test pieces shall be sawn from any portion of sample, at a distance not less than 0.5 m from either end.

6.3.3 The test pieces shall be free from bark and defects in the wood.

6.4 Procedure

6.4.1 For determination of the average moisture content of the lot, weigh all the test pieces free from saw dust and burrs, at one time, to an accuracy of at least 1%. If it is desired to determine the variability or the moisture content, weigh each test piece separately.

6.4.2 In exceptional cases, when it is not possible to weigh the test pieces immediately after cutting, place them in previously tared packets of moisture proof film (6.1.4) or in previously tared glass vessels (6.1.4). The packets and vessels shall be filled as far as possible and shall be hermetically sealed. Determine the masses of the test pieces by difference.

6.4.3 Dry the weighed test pieces at a temperature of 103 ± 2°c, checking repeated weighings of two or three control pieces. The test pieces are considered to be dried to constant mass when, for each control piece, the difference in mass between two successive weighings separated by an interval of 6 h is less than 1 %.

6.4.4 Cool the dried test pieces to room temperature in the desiccators (6.1.3) and weigh as described in 6.4.1.

> **NOTE** – It is also possible to weigh the test pieces immediately after removal from the oven, without cooling in the desiccators.

6.5 Calculation and expression of results

Calculate the moisture content, W, as a percentage by mass, using the formula

$$W = \frac{m_1 - m_2}{m_2}$$

Where;

m_1 is the mass, in grams, of sample taken (i.e. one test piece, all the test pieces, or part of the test pieces) before drying.

m_2 is the mass, in grams, of the same sample after drying.

Express the result to the nearest 1 %.

7 Test report

The report shall include the following:

a) Reference to this Tanzania Standard;

b) The method used;

c) The characteristics of the electrical moisture meter, if used;

d) Information on the selection of test pieces;

e) The results obtained in accordance with 5.4 or 6.5 including the individual values;

f) The date of the test;

g) The name of the organization responsible for the test.