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EAST AFRICAN STANDARD

Thermoplastics piping systems for non-pressure underground drainage and sewerage — Thermoplastics fittings — Test method for mechanical strength or flexibility of fabricated fittings

EAST AFRICAN COMMUNITY

First Edition 2010

Foreword

Development of the East African Standards has been necessitated by the need for harmonizing requirements governing quality of products and services in East Africa. It is envisaged that through harmonized standardization, trade barriers which are encountered when goods and services are exchanged within the Community will be removed.

In order to meet the above objectives, the EAC Partner States have enacted an East African Standardization, Quality Assurance, Metrology and Test Act, 2006 (EAC SQMT Act, 2006) to make provisions for ensuring standardization, quality assurance, metrology and testing of products produced or originating in a third country and traded in the Community in order to facilitate industrial development and trade as well as helping to protect the health and safety of society and the environment in the Community.

East African Standards are formulated in accordance with the procedures established by the East African Standards Committee. The East African Standards Committee is established under the provisions of Article 4 of the EAC SQMT Act, 2006. The Committee is composed of representatives of the National Standards Bodies in Partner States, together with the representatives from the private sectors and consumer organizations. Draft East African Standards are circulated to stakeholders through the National Standards Bodies in the Partner States. The comments received are discussed and incorporated before finalization of standards, in accordance with the procedures of the Community.

Article 15(1) of the EAC SQMT Act, 2006 provides that "Within six months of the declaration of an East African Standard, the Partner States shall adopt, without deviation from the approved text of the standard, the East African Standard as a national standard and withdraw any existing national standard with similar scope and purpose".

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

East African Community

P O Box 1096

Arusha

Tanzania

Tel: 255 27 2504253/8

Fax: 255-27-2504481/2504255

E-Mail: eac@eachq.org

Web: www.each.int

Introduction

In the preparation of this East African Standard, the following source was consulted extensively:

ISO 13264:2010, *Thermoplastics piping systems for non-pressure underground drainage and sewerage — Thermoplastics fittings — Test method for mechanical strength or flexibility of fabricated fittings*

Assistance derived from this source and others inadvertently not mentioned is hereby acknowledged.

INTERNATIONAL STANDARD

ISO 13264

First edition
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Thermoplastics piping systems for non-pressure underground drainage and sewerage — Thermoplastics fittings — Test method for mechanical strength or flexibility of fabricated fittings

Systèmes de canalisations thermoplastiques pour branchements et collecteurs d'assainissement enterrés sans pression — Raccords thermoplastiques — Méthode d'essai de la résistance mécanique ou de la flexibilité des raccords façonnés

Reference number
ISO 13264:2010(E)

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Foreword

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The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 13264 was prepared by Technical Committee ISO/TC 138, *Plastics pipes, fittings and valves for the transport of fluids*, Subcommittee SC 1, *Plastics pipes and fittings for soil, waste and drainage (including land drainage)*.

Thermoplastics piping systems for non-pressure underground drainage and sewerage — Thermoplastics fittings — Test method for mechanical strength or flexibility of fabricated fittings

1 Scope

This International Standard specifies a method for testing the mechanical strength or flexibility of a fabricated thermoplastic fitting intended to be used in non-pressure underground applications.

2 Principle

An assembly of a fabricated fitting and the relevant number of adjacent pipes and anchorages (see Figures 1 and 2) is subjected to a moment at the critical point. The critical point is where structural damage is most likely to start when increasing the moment.

Either a specified moment, M, or a specified displacement, A, becomes the determining factor, whichever is reached first.

It is assumed that the following test parameters are set by the referring standard:

a) the sampling procedure and the number of test pieces (see 4.2);

b) the conditioning temperature, if other than (23 ± 5) °C (see Clause 5);

c) the conditioning time, if other than 21 days (see Clause 5);

d) if appropriate, the moment ($M = F \times L$) or displacement to be applied (see Clause 6).

3 Apparatus

3.1 Anchorage(s), capable of maintaining the body of the fabricated fitting rigid during the test. The anchorages shall not deform the fitting.

3.2 Equipment for applying a force, that results in a moment in the critical point (see Clause 6).

The direction of the force can be clockwise or anticlockwise provided tensile stresses are applied to the critical point.

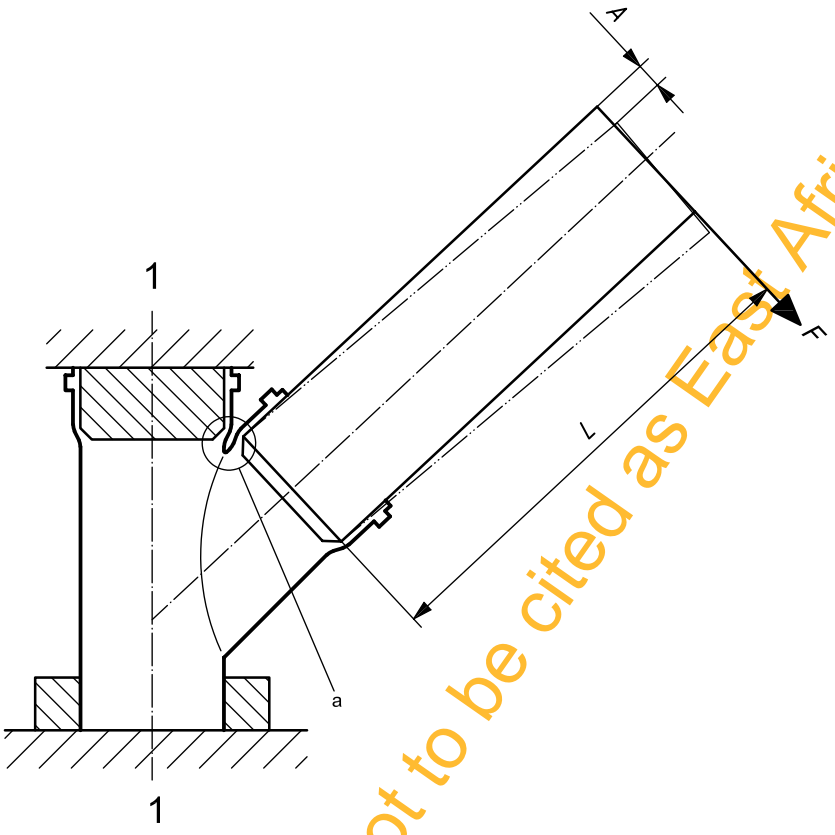
3.3 Equipment for determining the length, L, of the arm to the critical point (see Figures 1 and 2).

When the displacement, A, is the determining factor, the arm, L, as shown in Figures 1 and 2, shall be (1 200 ± 10) mm.

3.4 Force and displacement measurement instruments, capable of determining the force applied and the displacement of the end of the arm to which the force is applied, as applicable (see Clause 4 and Table 1).

If a socket is designed to take up an angular deflection, β, the total displacement shall be the sum of the displacement given by the design angle, β, as declared by the manufacturer, plus the specified displacement. In this case, however, a mechanical arrangement, where the arm is fixed to the socket, is preferred.

3.5 Additional means, to ensure the tightness of the joint (see Clause 4), if necessary.



Key

1 fixing

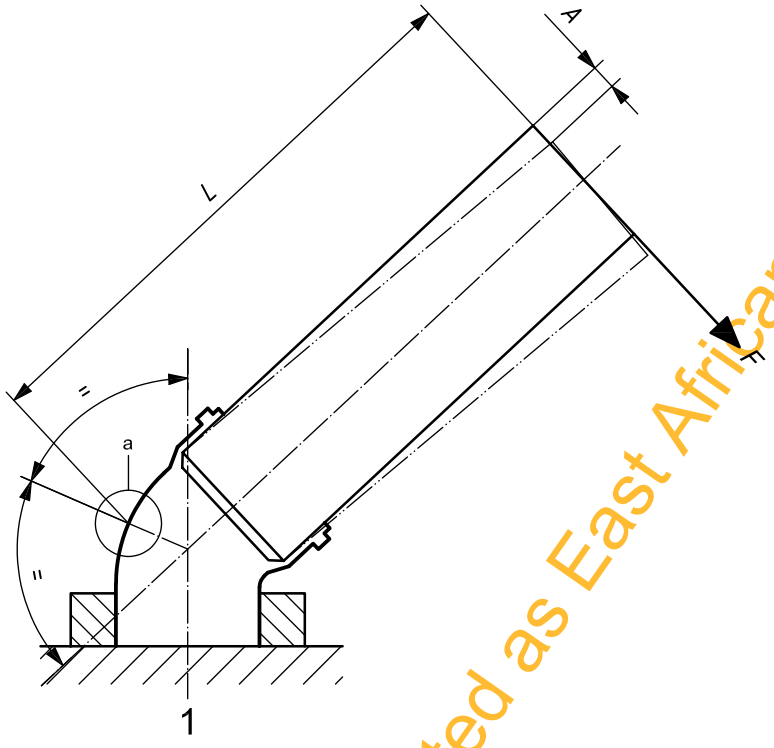
A displacement

F force applied

L arm

a Example of critical point (see Clause 2).

Figure 1 — Typical test assembly for a branch with a socket



Key

1 fixing

A displacement

F force applied

L arm

[a] Example of critical point (see Clause 2).

Figure 2 — Typical test assembly for a bend with a socket

4 Test pieces

4.1 Preparation

The test piece shall comprise an assembly of the fabricated fitting with a pipe of the ring stiffness class for which the fitting is designed and fixings, as appropriate.

In cases where a fitting is designed for both solid-wall and structured-wall pipes, a solid-wall pipe shall be used.

If the limiting factor is the moment, M, the pipe may be replaced by a mechanical arrangement that ensures that the required moment is applied.

If the limiting factor is the displacement, A, the pipe may be replaced by a mechanical arrangement of longitudinal rigidity not less than that of the specified pipe. In case of dispute, the specified pipe shall be used.

Where a joint between a pipe and a fabricated fitting is made, the manufacturer's instructions shall be followed although additional means may be used to ensure the tightness of the joint during the test.

4.2 Sampling procedure and number of test pieces

The sampling procedure and number of test pieces shall be as specified in the referring standard.

5 Conditioning

Samples shall be stored at a room temperature of (23 ± 5) °C for at least 21 days before testing, unless otherwise specified in the referring standard.

6 Procedure

6.1 Non-mechanical jointed fabricated fittings — Cemented or fused

Carry out the following procedure at (23 ± 5) °C.

Assemble the fitting with the pipe or mechanical arrangement (see 4.1) and fix it as shown in Figure 1 or 2.

If possible, fill the assembly with water or air pressure.

Apply the necessary force in 1 s to 20 s to obtain the specified moment at the critical point or the specified displacement as given in Table 1, unless otherwise specified in the referring standard.

Maintain the force or the displacement applied for 15 min while monitoring for and recording any signs of splitting, cracking, separation and leakage. The inspection may be performed after relaxing the force or displacement and, if necessary, after removing the anchorage, by applying water or air pressure or vacuum.

NOTE The level of air pressure or vacuum is not specified because it is only used to detect leakage.

Record any leakage at the fabricated joint as a failure.

6.2 Mechanical jointed fabricated fittings

Carry out the following procedure at (23 ± 5) °C.

Assemble the fitting with the pipe or mechanical arrangement (see 4.1) and fix it as shown in Figure 1 or 2.

Fill the assembly with water until the level is between 200 mm and 300 mm above the critical point.

Apply the necessary force in 1 s to 20 s to obtain the specified moment at the critical point or the specified displacement as given in Table 1, unless otherwise specified in the referring standard.

Maintain the force or the displacement applied for 15 min while monitoring for and recording any signs of splitting, cracking, separation and leakage.

Record any leakage at the fabricated joint as a failure.

Table 1 — Moment/displacement to be applied

Nominal size DN/OD[a] mm	Minimum moment M kN·m	Minimum displacement L mm
110	0,20	170
125	0,29	170
160	0,61	170
200	1,20	170
250	2,30	170
315	3,10	170
355	3,50	170
400	4,00	170
450	4,50	170
500	5,00	170
630	6,30	170
710	7,10	170
800	8,00	170
900	9,00	170
1 000	10,00	170

[a] For fittings of a DN/ID series, conduct the test using the parameters specified for the next larger DN/OD pipe rather than the actual outside diameter of the corresponding pipe.

For DN/ODs up to and including 250 mm, the figures of the minimum moment approximate to Equation (1):

$$M = 0{,}15 \times [\mathrm{DN}]^3 \times 10^{-6}\ \mathrm{kN{\cdot}m} \quad (1)$$

For DN/ODs greater than 250 mm, Equation (2) is used:

$$M = 0{,}010 \times [\mathrm{DN}]\ \mathrm{kN{\cdot}m} \quad (2)$$

7 Test report

The test report shall include the following information:

a) a reference to this International Standard, i.e. ISO 13264:2010, and the referring standard;

b) the identity of the product(s) tested, including the stiffness of the pipe used, if applicable;

c) the method of jointing, e.g. mechanical, cemented, fused;

d) the method used for determining splitting, cracking, separation and leakage;

e) the determining factor applicable, i.e. moment or displacement;

f) a brief description of the test apparatus;

g) the permitted angular deflection, if any (see 3.4);

h) the moment or the displacement applied;

i) details of any signs of splitting, cracking, separation and leakage;

j) any factor that could have affected the results, such as any incident or any operating detail not specified in this International Standard;

k) the date of test.

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