
Thermoplastics piping systems for non-pressure underground drainage and sewerage — Thermoplastics spirally-formed structured-wall pipes — Determination of the tensile strength of a seam

Systèmes de canalisations thermoplastiques pour branchements et collecteurs d'assainissement enterrés sans pression — Tubes thermoplastiques à paroi structurée enroulés en hélice — Détermination de la résistance en traction de la ligne de soudure



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Published in Switzerland

Foreword

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ISO 13262 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)*.

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1 Scope

This International Standard specifies a method for determining the tensile strength of a seam in a spirally-formed thermoplastics pipe. It is applicable to all such thermoplastics pipes, regardless of their intended use.

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.

ISO 5893, *Rubber and plastics test equipment — Tensile, flexural and compression types (constant rate of traverse) — Specification*

3 Principle

Test pieces of specified shape and dimensions are taken from a thermoplastics pipe with a spirally-formed seam in the direction perpendicular to the seam, by cutting or machining.

The tensile forces necessary to rupture test pieces, including the seam, are determined using a tensile testing machine under specified conditions.

It is assumed that the following test parameter is set by the referring standard: rate of movement of the driven grip (see 4.1 and 8.2).

4 Apparatus

4.1 Tensile testing machine, conforming to ISO 5893 for the specified rate of movement of the driven grip. It shall be capable of applying the necessary force and travel (see 4.3 and 8.3).

4.2 Grips, for holding the test piece, conforming to ISO 5893, which shall be fixed to the machine in such a way that they move freely into alignment as soon as any force is applied, such that the longitudinal axis of the test piece coincides with the direction of the force along the centreline of the grip assembly.

4.3 Force indicator, capable of showing or recording, with an accuracy conforming to grade A of ISO 5893, the total tensile force to which the test piece held in the grips is subjected when tested at the speed specified.

4.4 Micrometer or equivalent, capable of determining the width of the test piece with an accuracy of 0,05 mm or smaller.

5 Test pieces

5.1 Shape of the test piece

The alignment and dimensions of the test piece shall be as shown in Figure 1. The test piece shall consist of the overall wall thickness (construction height) of the pipe from which it is taken.

5.2 Test piece preparation

5.2.1 General

At least 15 h after production of the pipe, divide the circumference of the pipe into five equal sectors.

Without heating or flattening the sectors, cut one rectangular test piece, perpendicular to the seam, from each sector of the pipe (see Figure 1).

5.2.2 Adjustment of test piece dimensions

If the test pieces, after having been cut from the pipe, do not conform to 5.1, their size may be reduced by milling, provided the milling conditions are chosen so as to avoid:

- a) any tangible heating of the test piece;
- b) damage to its surface, such as cracks, scratches or other visible flaws

to an extent that would affect the tensile properties to be measured.

If the width of the wound profile is such that more than one seam is included in the length of the test piece, the test piece shall be cut in such a way that the seams are symmetrically located over the test piece.

If it is not possible to cut the test piece without getting a rib in the grip area, the test piece may be cut slightly longer or shorter to avoid this situation. Individual ribs in the grip area may be removed, if necessary, for a proper attachment of the grips.

6 Conditioning

The test pieces shall be conditioned at (23 ± 2) °C for not less than 1 h in water or 2 h in air, except in cases of dispute when the minimum period shall be 2 h in water or 4 h in air.

7 Test temperature

The test temperature shall be (23 ± 2) °C.

8 Procedure

8.1 Place the test piece in the tensile testing machine such that there is axial alignment with the direction of pull. Clamp the grips uniformly and sufficiently tightly to prevent any slipping of the test piece.

8.2 Set the rate of movement of the grips to the value specified in the referring standard and start the machine.

8.3 Record the maximum force necessary during testing to rupture the test piece.

8.4 Repeat the test until five results have been obtained, after discarding any test pieces which have slipped in the grips.