TECHNICAL REPORT

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Plastics piping systems — Multilayer M (metal) pipes — Test method for strength of the weld line in the metal layer and bonding between layers by use of a cone

Systèmes de tuyauteries en plastiques — Tubes M (métal) multi-couches — Méthode d'essai de la résistance de la ligne de soudure et du collage entre les couches en utilisant un cone

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ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

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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.

In exceptional circumstances, when a technical committee has collected data of a different kind from that which is normally published as an International Standard ("state of the art", for example), it may decide by a simple majority vote of its participating members to publish a Technical Report. A Technical Report is entirely informative in nature and does not have to be reviewed until the data it provides are considered to be no longer valid or useful.

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/TR 18124 was prepared by Technical Committee ISO/TC 138, *Plastics pipes, fittings and valves for the transport of fluids*, Subcommittee SC 5, *General properties of pipes, fittings and valves of plastic materials and their accessories — Test methods and basic specifications*.

Introduction

This Technical Report is one of several documents developed by ISO/TC 138/SC 5, following the creation of the Subcommittee's Working Group WG 16 at Kyoto, Japan, in 1998, in response to worldwide demand for specifications, requirements and test methods for multilayer plastics pipes. The other documents include ISO 17454 [1], ISO 17455 [2] and ISO 17456 [3].

Initially, it was intended also to publish this Technical Report, together with ISO 17453, as International Standards. The Working Group then proposed the cancellation of both these projects, for the following reasons:

— because of the great variety of multilayer pipes, no identical forces for different types of multilayer M pipes can be created using the test principle;

— the realised force is very dependent on the tolerances of the pipe — because of the great variation of tolerances (even for the same product), it is extremely difficult to realise the same expansion for different types of multilayer M pipe;

— while the test method can very well be used as a product verification test during production, to give an indication of the quality of the multilayer M pipe product, International Standards are not intended for the setting up of such tests.

ISO/TC 138/SC 5 acknowledged the difficulty of standardization in this area owing to the different thicknesses of the inside layer of various types of multilayer pipes and the fact that the test force is strongly dependent on pipe dimensions and therefore on tolerances, which also vary strongly. Nevertheless, in order not to lose the acquired information, the Subcommittee decided at its 2004 plenary meeting to combine the two committee drafts, ISO/CD 18124 and ISO/CD 17453, into a single Technical Report, ISO/TR 18124.

Only multilayer pipes are dealt with in this Technical Report and for its purposes cross-linked polyethylene (PE-X) as well as adhesives are to be considered as a thermoplastics material.

Plastics piping systems — Multilayer M (metal) pipes — Test method for strength of the weld line in the metal layer and bonding between layers by use of a cone

1 Scope

This Technical Report specifies a method for testing the strength of the weld line in the metal layer and the adhesion between the different layers of multilayer M pipes by the use of a cone.

NOTE 1 Acceptance of any inner layer made from a specific grade of material is subject to the relevant product standard or system standard and the requirements detailed in that standard.

NOTE 2 The test can be used as a product verification test during production to give an indication of the quality of the multilayer M pipe product.

2 Principle

A test piece of specified length, cut from a multilayer M pipe, is subjected to a radial expansion by inserting a cone to verify the strength of the weld line of the metal layer and to assess the bond between the different layers. By visual inspection after withdrawal of the cone, the weld line is inspected for any damage and the test piece for any delamination.

NOTE 1 Acceptance of any inner layer (see definitions) made from a specific grade of material is subject to the relevant product standard or system standard and the requirements detailed in that standard.

NOTE 2 It is assumed that the following test parameters are set by the referring standard or the manufacturer's instructions:

a) for the preparation of the cone,

   1) the dimension d_i of the cone of the test piece, see Figure 1, and

   2) the dimension d_f of the cone, see Figure 1 and 5.1;

b) number of test pieces, see 6.2;

c) preconditioning requirements and test temperature, see Clause 7.