# 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



Reference number ISO/TR 18124:2006(E)

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### Foreword

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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is entirely informative in nature and does not have to be reviewed until the data it provides are considered to be no longer valid or useful.

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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.

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### 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 <sup>[1]</sup>, ISO 17455<sup>[2]</sup> and ISO 17456 <sup>[3]</sup>.

Initially, it was intended as to publish this Technical Report, together with ISO 17453, as International Standards. The Working Goup 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 prod ), 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.

while ... indication or ... setting up of such test. SO/TC 138/SC 5 acknowledged the dime. f the inside layer of various types of multilayer process of the understand of the subcommittee decided at its 200 cm. acquired information, the Subcommittee decided at its 200 cm. drafts, ISO/CD 18124 and ISO/CD 17453, into a single Technic Report, Only multilayer pipes are dealt with in this Technical Report and or its purposes cm. (PE-X) as well as adhesives are to be considered as a thermoplastic material. 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 very strongly. Nevertheless, in order not to lose the acquired information, the Subcommittee decided at its 200 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 another its purposes cross-linked polyethylene

## 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



#### Scope 1

This Technical Report 3 perifies 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.

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

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

#### 2 Principle

A test piece of specified length, cut from a multilever 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.

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

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

- for the preparation of the cone, a)
  - the dimension  $d_i$  of the cone of the test piece, see Figure 1, and 1)
  - 2) the dimension  $d_f$  of the cone, see Figure 1 and 5.1;
- b) number of test pieces, see 6.2;
- preconditioning requirements and test temperature, see Clause 7. C)