
**Plastics piping systems — Multilayer
pipes — Determination of the oxygen
permeability of the barrier pipe**

*Systèmes de canalisations en plastiques — Tubes multicouches —
Détermination de la perméabilité à l'oxygène de la couche barrière d'un
tube*



PDF disclaimer

This PDF file may contain embedded typefaces. In accordance with Adobe's licensing policy, this file may be printed or viewed but shall not be edited unless the typefaces which are embedded are licensed to and installed on the computer performing the editing. In downloading this file, parties accept therein the responsibility of not infringing Adobe's licensing policy. The ISO Central Secretariat accepts no liability in this area.

Adobe is a trademark of Adobe Systems Incorporated.

Details of the software products used to create this PDF file can be found in the General Info relative to the file; the PDF-creation parameters were optimized for printing. Every care has been taken to ensure that the file is suitable for use by ISO member bodies. In the unlikely event that a problem relating to it is found, please inform the Central Secretariat at the address given below.

This document is a preview generated by EVS

© ISO 2005

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either ISO at the address below or ISO's member body in the country of the requester.

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

Published in Switzerland

Contents

Page

Foreword.....	iv
Introduction	v
1 Scope	1
2 Principle	1
3 Terms and definitions.....	1
4 Symbols and abbreviated terms	2
5 Apparatus	3
6 Test piece	4
7 Preconditioning.....	4
8 Calibration of the test assembly	4
9 Preparation for testing	4
10 Measuring procedure	5
11 Calculation of flux.....	7
12 Test report	8
Annex A (informative) Oxygen solubility as a function of temperature	9
Bibliography	10

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

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 17455 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

In response to the worldwide demand for specifications, requirements and test methods for multilayer pipes, WG 16 of ISO/TC 138/SC 5 was created at a meeting held in Kyoto, Japan, in 1998. The working group then started drafting three test standards (including ISO 17455) for multilayer pipes:

- ISO 17456, *Plastics piping systems — Multilayer pipes — Determination of long-term strength*;
- ISO 17454, *Plastics piping systems — Multilayer pipes — Test method for the adhesion of the different layers by using a pulling rig*.

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

This document is a preview generated by EVS

Plastics piping systems — Multilayer pipes — Determination of the oxygen permeability of the barrier pipe

1 Scope

This International Standard specifies two test methods for determining the oxygen permeability of barrier pipe: the dynamic (Method I) and the static (Method II). In principle, both methods give the same results. The method to be applied is not application-dependent, but can be specified in the referring standard.

2 Principle

The principle is measurement of the oxygen transfer through the wall of the test piece under specified conditions.

The oxygen increase is measured in a system of which the test piece forms part. Oxygen can only be transported through the wall of the test piece. Therefore, the increased amount of oxygen in the closed system is the result of the functioning of the barrier layer of the test piece.

NOTE A certain continuous oxygen permeation through the barrier layer is allowed.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1

multilayer pipe

pipe comprising layers of different materials

3.2

multilayer M pipe

multilayer pipe comprising layers of polymers and one or more metal layers

NOTE

The wall thickness of the pipe consists of at least 60 % polymer layers.

3.3

multilayer P pipe

multilayer pipe comprised of two or more polymer layers

3.4

inner layer

layer in contact with the liquid or gas

3.5

outer layer

layer exposed to the outer environment