

Australian Standard™

**Fusion-bonded medium-density
polyethylene coating and lining for
pipes and fittings**



This Australian Standard was prepared by Committee WS-009, Rolled and Welded Steel Pipes. It was approved on behalf of the Council of Standards Australia on 20 April 2001 and published on 5 May 2001.

The following interests are represented on Committee WS-009:

Australian Chamber of Commerce and Industry
Australian Industry Group
New Zealand Manufacturers Association
Water Services Association of Australia
Department of Land and Water Conservation

Keeping Standards up-to-date

Standards are living documents which reflect progress in science, technology and systems. To maintain their currency, all Standards are periodically reviewed, and new editions are published. Between editions, amendments may be issued. Standards may also be withdrawn. It is important that readers assure themselves they are using a current Standard, which should include any amendments which may have been published since the Standard was purchased.

Detailed information about Standards can be found by visiting the Standards Australia web site at www.standards.com.au and looking up the relevant Standard in the on-line catalogue.

Alternatively, the printed Catalogue provides information current at 1 January each year, and the monthly magazine, *The Australian Standard*, has a full listing of revisions and amendments published each month.

We also welcome suggestions for improvement in our Standards, and especially encourage readers to notify us immediately of any apparent inaccuracies or ambiguities. Contact us via email at mail@standards.com.au, or write to the Chief Executive, Standards Australia International Ltd, GPO Box 5420, Sydney, NSW 2001.

STANDARDS AUSTRALIA

RECONFIRMATION

OF

AS 4321—2001

**Fusion-bonded medium-density polyethylene coating and lining
for pipes and fittings**

RECONFIRMATION NOTICE

Major stakeholders of this publication have reviewed the content of this publication and in accordance with Standards Australia procedures for reconfirmation, it has been determined that the publication is still valid and does not require change.

Certain documents referenced in the publication may have been amended since the original date of publication. Users are advised to ensure that they are using the latest versions of such documents as appropriate, unless advised otherwise in this Reconfirmation Notice.

Approved for reconfirmation in accordance with Standards Australia procedures for reconfirmation on 27 December 2018.

NOTES

Australian Standard™

**Fusion-bonded medium-density
polyethylene coating and lining for
pipes and fittings**

Originated as AS 4321—1995.
Second edition 2001.

COPYRIGHT

© Standards Australia International

All rights are reserved. No part of this work may be reproduced or copied in any form or by any means, electronic or mechanical, including photocopying, without the written permission of the publisher.

Published by Standards Australia International Ltd
GPO Box 5420, Sydney, NSW 2001, Australia

ISBN 0 7337 3871 0

PREFACE

This Standard was prepared by the Standards Australia Committee WS-009, Rolled and Welded Steel Pipe, to supersede AS 4321—1995.

This edition differs from the 1995 edition as follows:

- (a) A new sampling and testing frequency plan has been included.
- (b) Allowable variations, which can be tolerated prior to retesting, have been specified.
- (c) The allowable number of pipes with six coating repairs has been reduced.
- (d) Changes have been made to the marking requirements.
- (e) References to nominal size have been deleted.
- (f) Minor changes have been made to improve the test methods.

The objective of this Standard is to provide a standard specification for fusion-bonded medium-density polyethylene coating and lining for pipes and fittings, for use by the manufacturers and purchasers of these products.

The terms 'normative' and 'informative' have been used in this Standard to define the application of the appendix to which they apply. A 'normative' appendix is an integral part of a Standard, whereas an 'informative' appendix is only for information and guidance.

CONTENTS

	<i>Page</i>
1 SCOPE.....	4
2 REFERENCED DOCUMENTS.....	4
3 DEFINITIONS.....	5
4 MATERIALS	6
5 COATING AND LINING APPLICATION	6
6 TEST REQUIREMENTS	7
7 REINSTATEMENT.....	9
8 REPAIRS.....	10
9 TEST FREQUENCY	11
10 EFFECT OF FBPE LINING ON WATER QUALITY.....	12
11 STORAGE, HANDLING, TRANSPORT AND MARKING.....	12
 APPENDICES	
A MEANS FOR DEMONSTRATING COMPLIANCE WITH THIS STANDARD	13
B PURCHASING GUIDELINES	18
C THERMAL STABILITY TEST.....	19
D WATER ABSORPTION TEST	20
E PENETRATION RESISTANCE TEST	21
F METHOD FOR THE DETERMINATION OF TENSILE STRESS AT YIELD	22
G METHOD FOR THE DETERMINATION OF ENVIRONMENTAL STRESS- CRACKING RESISTANCE	23
H PREPARATION OF COATING AND LINING TEST SPECIMENS	24
I IMPACT RESISTANCE TEST	26
J ADHESION OF POLYETHYLENE REINSTATEMENT COMPOUND TO STEEL.....	27
K ADHESION OF POLYETHYLENE REINSTATEMENT COMPOUND TO POLYETHYLENE COMPOUND	28
L CATHODIC DISBONDING RESISTANCE TEST	29
M CONTINUITY TEST	34
N BOND STRENGTH TEST	36

STANDARDS AUSTRALIA

Australian Standard

Fusion-bonded medium-density polyethylene coating and lining for pipes and fittings**1 SCOPE**

This Standard specifies requirements for factory-applied fusion-bonded medium-density polyethylene coating and lining of pipes and fittings, for protection against corrosion.

Polyethylene materials complying with this Standard are intended for application to pipes and fittings where the pipeline operating temperatures are not less than -40°C nor more than 70°C for the coating and 50°C for the lining.

The coating is intended for use on pipes and fittings for underground and underwater service, including steel piling. The lining is intended for use on pipes and fittings for pipelines conveying wastewater and water intended for human consumption.

Methods for determining compliance with this Standard are given in Appendix A.

NOTE: Guidelines on requirements that are to be specified by the purchaser at the time of enquiry or order are given in Appendix B.

2 REFERENCED DOCUMENTS

The following documents are referred to in this Standard:

AS

- | | |
|--------|--|
| 1145 | Determination of tensile properties of plastics materials |
| 1145.1 | Part 1: General principles |
| 1145.3 | Part 3: Test conditions for films and sheets |
| 1193 | Plastics—Methods for determining the density and relative density of non-cellular plastics |
| 1199 | Sampling procedures and tables for inspection by attributes |
| 1281 | Cement mortar lining of steel pipes and fittings |
| 1627 | Metal finishing—Preparation and pretreatment of surfaces |
| 1627.2 | Part 2: Power tool cleaning |
| 1627.4 | Part 4: Abrasive blast cleaning |
| 3855 | Suitability of plumbing and water distribution systems products for contact with potable water |
| 3894 | Site testing of protective coatings |
| 3894.3 | Method 3: Determination of dry film thickness |

AS/NZS

- | | |
|--------|---|
| 3500 | National Plumbing and Drainage Code |
| 3500.0 | Part 0: Glossary of terms |
| 4020 | Products for use in contact with drinking water |
| 4131 | Polyethylene (PE) compounds for pressure pipes and fittings |