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1477.1—1988

UNPLASTICIZED PVC (PIPES) AND FITTINGS FOR PRESSURE APPLICATIONS

Part 1—PIPES

[Title allocated by Defence Cataloguing Authority: PIPES AND FITTINGS, PLASTICS (Unplasticized PVC (UPVC) for Pressure Applications) NSC 4710, 4730]

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The following interests are represented on Committee PL/21:

CSIRO, Division of Building Research

Department of Local Government, Qld.

Engineering and Water Supply Department, S.A.

Federated Master Plumbers of Australia

Hunter District Water Board

Melbourne & Metropolitan Board of Works

Metropolitan Water Authority, W.A.

Public Works Department, N.S.W.

Rural Water Commission, Vic.

The Plastics Institute of Australia Inc.

Water Board, Sydney

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AS 1477.1/Amdt 1/1989-07-14

STANDARDS AUSTRALIA

Amendment No 1
to
AS 1477.1—1988
Unplasticized PVC (UPVC) pipes and fittings for pressure applications
Part 1: Pipes

REVISED TEXT

The 1988 edition of AS 1477.1 is amended as follows; the amendments should be inserted in the appropriate place.

SUMMARY: This Amendment applies to the Foreword, Table 2.1 and Clause 3.1.

Published on 14 July 1989.

AUSTRALIAN STANDARD

UNPLASTICIZED PVC (UPVC) PIPES AND FITTINGS FOR PRESSURE APPLICATIONS

Part 1
PIPES

AS 1477.1—1988

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Second edition 1967.
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Second edition 1988.

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PREFACE

This Standard was prepared by the Association's Committee on Unplasticized PVC Pipe under the direction of the Plastics Standards Board. It is the revision of AS 1477.1—1973 and supersedes it accordingly.

An attempt was made to quantify previously imprecise requirements. To this end a more reproducible test for light transmission was specified in place of the existing opacity test. The Freedom from Defects Clause was qualified by a note as it was not possible to specify the requirements properly and to provide a satisfactory method of test. Other changes include new limits on vinyl chloride monomer, a high temperature oven test, a multiple strike impact characteristics test at 20°C and the deletion of the anhydrous acetone test.

Test requirements previously specified and retained include flattening, longitudinal reversion, softening point, short and long-term hydrostatic pressure resistance as well as effect on water.

Requirements for sockets formed on pipe ends and for moulded socket fittings for solvent cement jointing are now incorporated in Part 1.

CONTENTS

FOREWORD

Pipe dimensions in this Standard were determined using maximum hoop stresses according to nominal size as follows: a hydrostatic design stress of 11.0 MPa under static hydrostatic conditions for calculating the minimum wall thickness of pipes of nominal sizes up to and including 150 mm and a hydrostatic design stress of 12.3 MPa under static hydrostatic conditions for pipes of nominal size greater than 150 mm. The higher hydrostatic design stress for larger diameter pipes is based on test results obtained by the manufacturers and is in accordance with international practice.

The ovality tolerance on outside diameters is applicable to Classes 9, 12, 15 and 18. No ovality tolerance is placed on sizes in Classes 4.5 and 6 because the thinner walled pipes may easily be rounded when inserted into sockets.

The formulas used are as follows:

(i) ~~$T_{min} = \frac{PD_{m\ max}}{2S + P}$ with a minimum of 1.4 mm~~ SEE AMENDMENT

(ii) $T_{max} = 1.10T_{min} + 0.20$

where

T_{min} = minimum wall thickness, in millimetres

T_{max} = maximum wall thickness, in millimetres

~~$D_{m\ max}$ = maximum mean outside diameter, in millimetres~~ SEE AMENDMENT

P = maximum allowable working pressure at 20°C, in megapascals

S = hydrostatic design stress, in megapascals, in the static condition at 20°C:
11.0 MPa for nominal sizes 8 to 150 mm.
12.3 MPa for nominal sizes 175 to 575 mm.

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Page 3. Foreword.

Delete $T_{min} = \frac{PD_{m\ max}}{2S + P}$ with a minimum of 1.4 mm

$D_{m\ max}$ = maximum mean outside diameter, in millimetres.

and *substitute*

$T_{min} = \frac{PD_{m\ min}}{2S + P}$ with a minimum of 1.4 mm

$D_{m\ min}$ = minimum mean outside diameter, in millimetres.

STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard

UNPLASTICIZED PVC (UPVC) PIPES AND FITTINGS FOR PRESSURE APPLICATIONS

Part 1—PIPES

SECTION 1. SCOPE AND GENERAL

1.1 SCOPE. This Standard specifies requirements for unplasticized PVC (UPVC) pipe for pressure applications for use below ground or above ground where not exposed to direct sunlight.

UPVC pipe manufactured to this Standard should be used and installed only in accordance with AS 2032, Installation of UPVC pipe systems and AS 2566, Plastics pipelaying design.

NOTE: Advisory information on alternative methods of determining compliance of a lot with this Standard is given in Appendix A.

1.2 REFERENCED DOCUMENTS. The following Standards are referred to in this Standard:

AS

1199 Sampling procedures and tables for inspection by attributes

1399 Guide to AS 1199

1462 Methods of test for unplasticized PVC (UPVC) pipes and fittings
- Part 1: Method for determining the dimensions of UPVC pipes and fittings (AS 1462.1)
- Part 2: Method for determining the flattening properties of UPVC pipes (AS 1462.2)
- Part 3: Method for determining the impact characteristics of UPVC pipes (AS 1462.3)
- Part 4: Method for determining reversion of UPVC pipes (AS 1462.4)
- Part 5: Method for determining the softening point of UPVC pipes and fittings (AS 1462.5)
- Part 6: Method for hydrostatic pressure testing of UPVC pressure pipes (AS 1462.4)
- Part 7: Method for determining extractability of lead and tin from UPVC pipes and fittings (AS 1462.7)
- Part 14: Method for determination of the light transmission of UPVC pipes (AS 1462.14)
- Part 15: Method for determination of vinyl chloride monomer content (AS 1462.15)
- Part 16: Method for high temperature testing of UPVC pipe (AS 1462.16)

1477 Unplasticized PVC (UPVC) pipes and fittings for pressure applications
- Part 6: Rubber ring joints (AS 1477.6)

1821-23 Suppliers quality systems

2000 Guide to AS 1821-23—Suppliers quality systems

2032 Code of practice for installation of UPVC pipe systems

2490 Sampling procedures and charts for inspection by variables for percent defective

2566 Plastics pipelaying design

3900/ISO 9000 Quality systems—Guide to selection and use

3901/ISO 9001 Quality systems for design/development, production, installation and servicing

3902/ISO 9002 Quality systems for production and installation

3903/ISO 9003 Quality systems for final inspection and test

3904/ISO 9004 Quality systems—Guide to quality management and quality system elements

1.3 DEFINITIONS. For the purpose of this Standard, the definitions below apply.

1.3.1 Hoop stress—the stress in a pipe or fitting under pressure acting tangentially to the perimeter of a transverse section.

1.3.2 Long-term hydrostatic stress—the continuously applied hoop stress which is estimated will cause failure at a specified time and temperature.

1.3.3 Hydrostatic design stress—the hoop stress due to internal hydrostatic pressure that can be applied continuously at a specified temperature. It is obtained by the application of a safety factor to the extrapolated 50-year long-term hydrostatic stress value.

1.3.4 Working pressure—the maximum pressure that can be sustained by the type and class of pipe or fitting for its estimated useful life under the expected working conditions.

1.3.5 Test pressure—the pressure applied internally to pipes or fittings when being tested for strength and water-tightness.

1.3.6 Pipe material temperature—the average temperature estimated as applying through the full wall thickness.

1.3.7 Type test—a test intended to prove the suitability and performance of a new composition, a new compounding or processing technique, or a new design or size of pipe, joint or fitting. Type tests are generally carried out when a change is made in compound composition or method of manufacture.

1.3.8 Quality control test—a test carried out during or after manufacture to prove the quality of a production run of pipe or fittings.