AS 4139—2003
Reconfirmed 2018

Australian Standard™

Fibre-reinforced concrete pipes and fittings

Standards Australia

This Australian Standard was prepared by Committee WS-008, Fibre Reinforced Concrete Pipes and Fittings. It was approved on behalf of the Council of Standards Australia on 3 June 2003 and published on 5 August 2003.

The following are represented on Committee WS-008:

Australian Chamber of Commerce and Industry
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STANDARDS AUSTRALIA

RECONFIRMATION

OF
AS 4139–2003
Fibre-reinforced concrete pipes and fittings

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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.

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NOTES

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Fibre-reinforced concrete pipes and fittings

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PREFACE

This Standard was prepared by the Standards Australia Committee WS–008, Fibre-Reinforced Concrete Pipes and Fittings, to supersede AS 4139—1993, *Fibre-reinforced concrete pipes and fittings*, which is withdrawn.

The objective of this Standard is to provide manufacturers and purchasers with uniform requirements for fibre-reinforced concrete pipes and fittings.

The Standard has been written as a performance specification avoiding as far as possible any requirements that may restrict innovation in design. Pipe Classes 2, 3 and 4, specified in this Standard, correspond to the equivalent classes for steel-reinforced concrete pipe given in AS 4058, *Precast concrete pipes (pressure and non-pressure)*.

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.

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FOREWORD

Fibre-reinforced concrete pipe may be either rigid pipe or semi-rigid pipe.

Rigid pipe is assumed to be incapable of having sufficient deflection to gain support from the surrounding soil and must have sufficient ring bending strength to support the full soil prism load to maintain its integrity for its design life.

Semi-rigid pipe must have sufficient ring bending strength to initially support the full soil prism load, and sufficient deflection capability to deflect as its stiffness reduces with age, to obtain support from the surrounding soil to maintain its integrity for its design life.

A flexible pipe has insufficient ring bending strength to support the full soil prism load and relies on support from the surrounding soil to maintain its integrity for its full design life.

In common with other materials, fibre-reinforced concrete pipe may exhibit creep under sustained loading conditions. In order that this may be accommodated into the design of the product, the change is quantified by type-testing, either through the application of regression analysis or a stress relaxation methodology.

The minimum allowable test load for a pipe is determined by predicting the design life load that the pipe will be capable of withstanding in a saturated condition. A safety factor of 1.5 has been assumed for the purposes of design calculation. In addition, pipes satisfying the definition of being semi-rigid in this Standard have a further safety factor of 2 on long-term deflection.

The required design life and class of the pipe should be determined using informed engineering judgment of the conditions of installation and operation of the pipe.

This Standard has been developed with a focus on cellulose-reinforcing fibres. The Standard, however, covers a number of fibre types and does not restrict the method of pipe manufacture.

STANDARDS AUSTRALIA

Australian Standard
Fibre-reinforced concrete pipes and fittings

1 SCOPE

This Standard specifies minimum requirements for pipes and fittings manufactured from fibre-reinforced concrete using standard curing, including autoclaving, for the conveyance of gravity water supply, and stormwater, waste water and sewage drainage.

Four classes of pipes are covered by this Standard, distinguished on the basis of long-term design load: Class 1, Class 2, Class 3, and Class 4. Other classes of pipe may be designed using the principles described in this Standard.

This Standard addresses the effect of creep under load by either, regression analysis of pipe materials (see Appendix H), or long-term stiffness prediction.

NOTES:

1 Fibre-reinforced concrete pipe is herein referred to as 'pipe'.

2 The load classes correspond with those of AS 4058.

3 This Standard does not cover the assessment of external service loads to which a pipe will be subjected to in a particular installation. Purchasers should, therefore, satisfy themselves that the class of pipe specified or selected on the basis of this Standard is suitable for its intended application. For buried pipes, reference to AS 3725 is required.

4 Guidance on the information to be supplied by the purchaser at the time of enquiry or order is given in Appendix A.

5 Appendix B provides concentration limits for commonly occurring soil/terrain constituents of the buried environment, but does not provide special requirements for pipes intended for use in environments aggressive to concrete. Where such applications are envisaged, the advice of the manufacturer should be sought.

2 REFERENCED DOCUMENTS

The following documents are referred to in this Standard:

AS	
1199	Sampling procedures and tables for inspection by attributes
1379	Specification and supply of concrete
1399	Guide to AS 1199—Sampling procedures and tables for inspection by attributes
1478	Chemical admixtures for concrete, mortar and grout
1478.1	Part 1: Admixtures for concrete
1646	Elastomeric seals for waterworks purposes (all parts)
2193	Calibration and classification of force-measuring systems
2490	Sampling procedures and charts for inspection by variables for percent nonconforming (ISO 3951:1989)
2758	Aggregates and rock for engineering purposes
2758.1	Part 1: Concrete aggregates
3582	Supplementary cementitious materials for use with portland cement (all parts)
3725	Loads on buried concrete pipes