



WATER SERVICES
ASSOCIATION OF AUSTRALIA

INDUSTRY STANDARD

FOR CALCIUM ALUMINATE CEMENT
MORTARS USED FOR THE RENOVATION OF
WASTEWATER STRUCTURES AND LARGE
DIAMETER PIPES

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About WSAA

The Water Services Association of Australia (WSAA) is the peak industry body representing the urban water industry. Our members provide water and sewerage services to over 24 million customers in Australia and New Zealand and many of Australia's largest industrial and commercial enterprises.

ACKNOWLEDGEMENT OF COUNTRY

The Water Services Association of Australia acknowledges and pays respect to the past, present and future Traditional Custodians and Elders of this nation. We recognise their continuing connection to land and waters and thank them for protecting our waterways and environment since time immemorial.

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PREFACE

This Standard was prepared by the Water Services Association of Australia (WSAA).

The objective of this Standard is to provide performance requirements for calcium aluminate cement mortars used for the renovation of non-pressure wastewater structures such as maintenance holes, wet-wells, tanks, pits, chambers, culverts, treatment plants and large diameter pipes (sized for personnel entry).

NOTE: Products complying with this Standard may also be suitable for the renovation of drainage pipes used for other applications such as stormwater. Design and installation requirements are covered by *WSA 201 Manual for Selection and Application of Protective Coatings*.

An excel-based tool has been developed in order to assist the water industry in establishing in what sewer conditions a liner can be applied effectively and how long it can be expected to last. This tool, the Sewer Rehabilitation & Prioritisation Decision Platform, is available via [email request](#). A fact sheet with additional details is available [here](#).

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FOREWORD

This Standard identifies the material and performance requirements of calcium aluminate cement mortar (CAC), or concrete, to meet the corrosion resistance requirements of cement-based liners in the renovation of large diameter wastewater pipelines (sized for personnel entry), or structures, subjected to deterioration under various corrosion classification or service conditions. It is intended to provide manufacturers and specifiers with a means of demonstrating fitness for purpose.

This Standard differs from those applicable to conventionally installed piping systems in that it is required to verify certain characteristics of the components as manufactured as well as in the installed condition. In accordance with ISO terminology these have been identified as the “M” stage for the collective materials used to fabricate the liner and the “I” stage for the liner as installed.

The service life of products conforming to this Standard will be dependent upon the condition of the host pipe, or structure, the quality of the liner material and its application and the service conditions. The material and process selection shall therefore be in accordance with the requirements of the asset owner with respect to extending the service life of the host pipeline, or structure. Liners shall meet the compositional and material property requirements including elemental and mineralogical analysis of both the binder and aggregates. Use of supplementary and admixture materials needs to be declared. All materials are required to meet the performance requirements of this Standard.

As part of its product appraisal process, WSAA may request details of previous successful installations or require contractors to undertake trial installations. Such trial details may include:

- the type and size of structure renovated;
- service conditions, e.g. temperature, relative humidity, CO₂ and H₂S;
- the lining material and applied thickness;
- application method(s) and equipment used, e.g. trowel applied, spray;
- the cure time between the application of the liner and the restoration of the service;
- methods and equipment used to verify the quality of application;
- contractor details and date of installation; and
- where relevant, details of any subsequent rectification work applied to the renovation.

SECTION 1 SCOPE AND GENERAL

1.1 SCOPE

This Standard specifies the material and performance requirements, and test methods for in-situ CAC linings for use in the renovation of non-pressure wastewater structures such as maintenance holes, wet-wells, tanks, pits, chambers, culverts, treatment plants and large diameter pipes (sized for personnel entry).

The standard is applicable to the CAC applied as a spray lining or hand-trowelled to concrete and masonry structures in accordance with the code of practice *WSA 201 Manual for Selection and Application of Protective Coatings*. The principal intent of applying such a liner is to extend the service life of the structure by providing corrosion protection in sewer conditions.

An excel-based tool has been developed in order to assist the water industry in establishing in what sewer conditions a liner can be applied effectively and how long it can be expected to last. This tool, the Sewer Rehabilitation & Prioritisation Decision Platform, is available via [email request](#). A fact sheet with additional details is available [here](#).

1.2 CONFORMITY REQUIREMENTS

Methods for demonstrating conformity with this Standard shall be in accordance with Appendix A.

Product certification, when required, shall be undertaken in accordance with WSA TN-08.

Note: The word 'shall' is used in this Standard to designate a mandatory requirement. 'Should' indicates a recommendation.

1.3 LIMITATIONS

This standard considers CAC mortar products in relation to their corrosion resistance properties. Structural repair of wastewater assets using CAC mortar is beyond the scope of this standard.

1.4 NORMATIVE REFERENCES

The following are the normative documents referenced in this Standard:

AS

1012.3.1 Methods of testing concrete Determination of properties related to the consistency of concrete - Slump test.

1012.9 Determination of the compressive strength of concrete