AS 5216:2018

Design of post-installed and cast-in fastenings in concrete

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- Association of Wall and Ceiling Industries of Australia
- Australian Building Codes Board
- Australian Chamber of Commerce and Industry
- Australian Engineered Fasteners and Anchors Council
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- New Zealand Heavy Engineering Research Association
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Australian Standard®

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PREFACE

This Australian Standard was prepared by the Standards Australia Committee ME-029, Fasteners, to supersede SA TS 101:2015, *Design of post-installed and cast-in fastenings for use in concrete*.

The objective of this Australian Standard is to provide minimum design requirements for fastenings used to transmit loads to concrete for safety-critical applications.

Standards Australia acknowledges and thanks the European Committee for Standardization—CEN, Rue de la Science 23, B-1040 Brussels, Belgium for permission to reproduce its content in the development of this Standard.

The terms ‘normative’ and ‘informative’ are used in Standards to define the application of the appendices or annexes to which they apply. A ‘normative’ appendix or annex is an integral part of a Standard, whereas an ‘informative’ appendix or annex is only for information and guidance.

This Standard includes a commentary on some of the clauses. The commentary directly follows the relevant clause, is designated by ‘C’ preceding the clause number and is printed in italics in a box. The commentary is for information and guidance and does not form part of the Standard.

CONTENTS

Page

Page

STANDARDS AUSTRALIA

Australian Standard
Design of post-installed and cast-in fastenings in concrete

S E C T I O N 1 S C O P E A N D G E N E R A L

1.1 SCOPE AND APPLICATION

1.1.1 Scope

This Standard specifies minimum requirements for the design of fastenings used to transmit loads to concrete for safety-critical applications.

The fasteners covered in this Standard are as follows:

(a) Post-installed fasteners:

  (i) Mechanical fasteners (e.g. expansion fasteners, undercut fasteners and concrete screws).

  (ii) Chemical fasteners (e.g. chemical fasteners, chemical expansion fasteners).

(b) Cast-in anchor channel with rigid connection (e.g. forged or welded) between the channel profile and anchor.

This Standard also includes requirements for the testing and assessment of post-installed and cast-in fasteners to establish the necessary design parameters for use with this Standard.

The design provisions in this Standard are relevant to static and quasi-static loading that may include tension, shear, bending or torsion moments, or a combination thereof.

The design provisions in this Standard do not apply to the following:

(a) Design of anchor channel for shear in the longitudinal direction of anchor channel.

(b) Design of fixtures.

(c) Design of fastenings for exposure to fire, durability and seismic actions.

(d) Fasteners for lifting, transport and erection (e.g. brace inserts, lifting inserts, etc.), headed fasteners, ferrules, reinforcement for development length considerations, headed reinforcement and anchorage for prestressing strands.

NOTES:

1 For design actions, fastener products, substrates and applications not covered by the scope of this Standard, the design engineer should seek technical advice from the fastener supplier in relation to the suitability of the selected fastener for the intended application.

2 This Standard does not include design provisions to address stress development in reinforcement. For design provisions for stress development refer to AS 3600. For post installed rebar connections, qualifications to be done to TR 023, refer to AEFAC *Technical Note: Post-installed rebar connection*.

C1.1.1 *The design theory for fastenings embodied in this Standard utilizes the tensile strength of concrete and is closely based on the design procedure published in EN 1992-4.*

The design and installation provisions of this Standard have been developed on the assumption that materials used and their maintenance ensure that the installed fasteners will fulfil their intended function for the intended life of the structure.