

# AS 5216:2021 COMPLIANCE

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

AS 5216:2021 was released in July 2021 and replaces AS 5216:2018.

### What is the difference between AS 5216:2018 and AS 5216:2021?

The 4 major changes in the 2021 update of AS 5216 are:

#### (a) Design of fasteners for seismic actions

AS 5216:2021 now covers the design of structural and non-structural connections under seismic actions such as those resulting from earthquakes in its Appendix F. The seismic performance categories are defined in table F.3.1 and should be taken into account with the minimum recommended seismic performance categories for fasteners found in table F.3.2 in the standard.

Table F.3.1 Minimum required seismic performance categories for fasteners

Crack width under design earthquake <sup>a</sup>	Fastener seismic performance category
$w \leq 0.3$ mm	Seismic pre-qualification is not required
$w \leq 0.5$ mm	C1
$w \leq 0.8$ mm	C2
$w > 0.3$ mm (plastic hinge region)	Not covered by AS 5216

a The crack widths are based on the pre-qualifications requirements in accordance with EOTA TR049. The expected crack widths outside the plastic hinge region under seismic actions may be calculated by using the equation for maximum crack width ( $w$ ) in accordance with AS 3600 for ULS assuming steel stress less than characteristic yield strength.

b Design of fastener for seismic action is required but the fastener does not require seismic pre-qualification.

For calculation of fastener seismic design resistance, please refer to AEFAC TN-10 ([www.aefac.org.au](http://www.aefac.org.au)).

Ramset™ anchors in the Xtrem™ range meet seismic category C1 and C2 where available.

#### (b) Design of anchor channels

Ramset™ does not currently have anchor channels in its range.

#### (c) Design of redundant non-structural systems

Appendix E outlines how to design post-installed fasteners connect statically indeterminate non-structural light weight systems into concrete. It is assumed that individual fastening points can have excessive slip or fail without affecting the function of the attached non-structural element. There should be at least three fixing points and the design load on a fixing point is limited to 2kN if there are 3 and 3kN if there are more than 3.

#### (d) Design of post-installed reinforcing bar connections

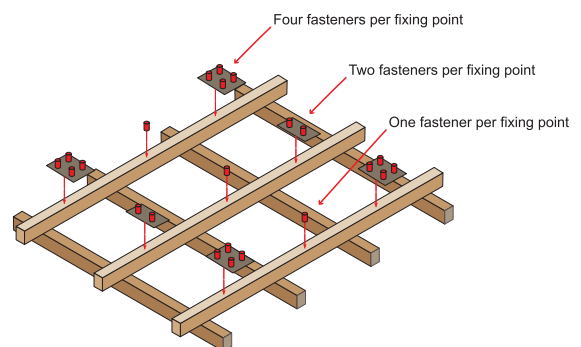
The 2021 update has introduced the design for development and lap length to achieve the characteristic yield strength of reinforcing bar in conjunction with AS 3600:2018 and is outlined in Appendix D. The design ultimate bond strengths to be used in the design are given in table D.4.

Table D.4 - Design ultimate bond strength without limitation

Compressive strength of concrete MPa	Design ultimate bond strength ( $f_{bd}$ ) <sup>a</sup> MPa
20	2.3
25	2.7
32	3.2
40	3.7
45	4.0
50	4.3

a The design ultimate bond strength ( $f_{bd}$ ) provided in this table is for reinforcing bar with a diameter less than or equal to 32 mm. If the diameter of the reinforcing bar is greater than 32 mm, the design ultimate bond strength provided in this table shall be reduced by a factor  $(132 - d_b) / 100$ .

**It should be noted that this is an overview of the changes and designers should refer to the detailed information in AS 5216:2021 when carrying out designs.**



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### What are the product qualification requirements for AS 5216?

Post-installed anchors must be tested in accordance with EAD 330232 and EAD 330499 (which is essentially the same as the formerly known ETAG001 Part 1 to Part 5 referenced in SA TS101:2015, which is now superseded).

Pre-qualification to AS 5216:2021 is demonstrated by an assessment report, which may be issued by the product supplier or via an independent third party such as a European Technical Assessment (ETA).

### When does AS 5216 take affect?

AS 5216:2021 was published on 23rd July 2021 and is referenced in the NCC (National Construction Code) 2022 which was released 23rd July 2021, and adopted by the States and Territories from 1st May 2023.

### Need Expert Advice?

As a founding member of AEFAC (Australian Engineered Fasteners and Anchoring Council), the initiator and author of SA TS 101/ AS 5216, Ramset™ are well placed to provide expert advice on post-installed anchor design.

### Contact Ramset™ Engineering on 1300 780 063 for Expert Advice.

### What Ramset™ products are qualified to AS 5216:2021?

Anchor Type	Product Name	Test Method	Test Report No
Mechanical	TruBolt™ Xtrem™	EAD 330232	ETA 21/0973
	SpaTec™ Xtrem™		ETA 10/0276
Chemical	Epcon™ C8 Xtrem™	EAD 330499	ETA 10/0309, ETA 07/0189
	ChemSet™ Reo 502™ PLUS		ETA 18/0675
	ChemSet™ 801 Xtrem™		ETA 18/0045
	ChemSet™ Maxima™		ETA 18/0197
	ChemSet™ 101 PLUS		ETA 13/0681
	UltraFix™ Plus		ETA 13/0681



For fast, easy design of Ramset™ post-installed anchoring products to AS 5216:2021, iExpert Design Software is recommended.

For further information, please contact Ramset™

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