# **Mechanical Anchors in Early** Strength Concrete (12 MPa)

## **Description**

Both the Australian Standard AS/NZS 1576.1:2019 Scaffolding Part 1: General requirements and the Queensland Scaffolding Code of Practice 2021 state that an important part of the design of post-installed anchors used in the tying of scaffold is to consider the concrete strength at the time of installation. The working load limit specified by the anchor supplier should be greater than or equal to 6 kN for horizontal tie anchors.

### Points to consider for Australian scaffold

- Suppliers often aim to install the scaffold the day after the concrete has been poured when it is has not reached it's final cured strength
- Published technical data from anchor manufacturers' on post-installed anchors provide . capacities based on a minimum concrete compressive strength of 20 MPa
  - This is governed by the parameters on testing requirements imposed by the European Assessment Documents
- Concrete typically reaches compressive strengths of 12 to 15 MPa the day after pouring Special testing on post-installed anchors is needed to understand their performance in early age concrete with a minimum compressive strength of 12 MPa
  - This needs to align with testing requirements stipulated in national or international standards

Ramset<sup>™</sup> in collaboration with the Scaffolding Association Queensland, have conducted testing of anchors commonly used in tying scaffold into 12 MPa early age strength concrete; BoaCoilTM BAC08100, BoaCoil™ BAC10090, and AnkaScrew™ Xtrem™ AS12110X.

The testing was carried out in Ramset's testing laboratory in Chimside Park, Melbourne, using Australian concrete with an early age strength of 12 MPa.

instructions and the tightening torque used was as tabled. The concrete mix was in 32 MPa,

The anchors were installed centrally in 200 mm wide slabs representing the worst case encountered on site and the results are detailed below. They were installed to manufacturer's

20mm aggregate, 80mm slump concrete and unreinforced.

# Installation and Performance Details

Working load Drilled hole Max. Fixture Depth of drill Fixture hole Effective Tightening Concrete Global safety Anchor type Anchor size limit diameter diameter thickness depth hole torque strength factor (FoS) (Tension, N<sub>a</sub>)\* BoaCoil™ 13 mm x 100 mm 13 mm 14 mm 8 mm 76 mm 115 mm 50 Nm 12 MPa 3 6.3 kN BAC08100 BoaCoil™ 3 16 mm x 90 mm 16 mm 19 mm 10 mm 61 mm 109 mm 110 Nm 12 MPa 60 kN BAC10090 **AnkaScrew™** 12 mm x 110 mm 60 Nm 3 86 kN 12 mm 16 mm 10 mm 85 mm 115 mm 12 MPa AS12110X

\* Working Load Limit (Tension, N.) = N./FoS where N. = Characteristic Ultimate Concrete Tensile Capacity derived from Test Results.

Note: This data is based on fixing to uncracked concrete, i.e. compressive or neutral zone. In addition the concrete strength and condition at the time of fixing should be assessed to ensure that it has completed its initial curing process and has reached a suitable strength.

### **Testing Apparatus**







#### For further information, please contact Ramset<sup>™</sup> AU - PHONE: 1300 780 063 www.ramset.com.au

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