



Austral Deck Fire and Thermal Resistance

Fire Resistance Period - Austral Deck profile

Any concrete slab must be designed to achieve a fire resistance period⁽¹⁾ (FRP) for structural adequacy, integrity and insulation of not less than the required fire resistance level⁽²⁾ (FRL) as specified in The National Construction Code – Building Code of Australia (NCC-BCA).

Chart (1) shows FRP for insulation of various slab thicknesses constructed using Austral Deck. The FRP has been calculated in accordance with Australian Standards: Concrete Structures, AS3600-2009, Clause 5.2.1 – Insulation for slabs, and modified taking into account Austral Deck profile - Image (1).

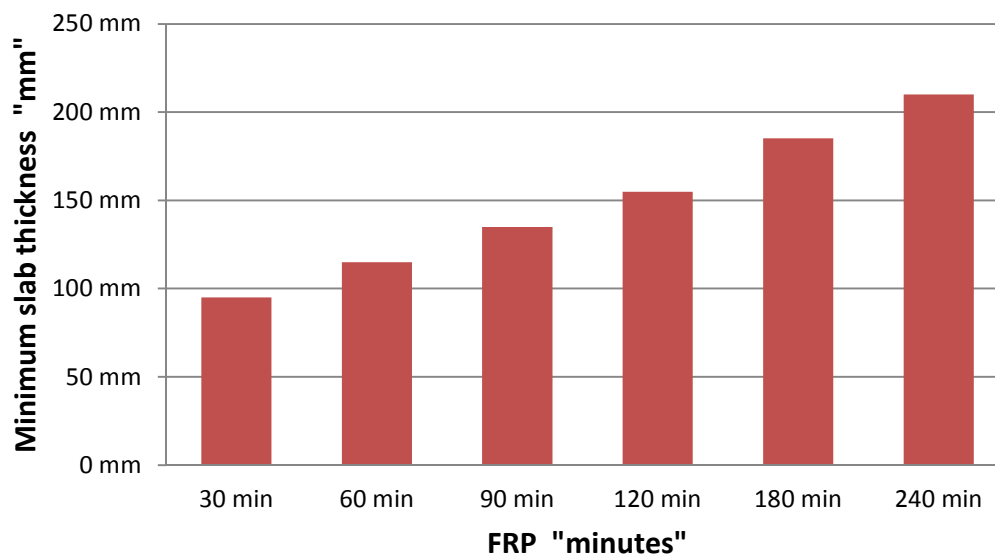


Chart (1) Fire Resistance Period⁽³⁾ for insulation for solid slabs constructed using Austral Deck profile

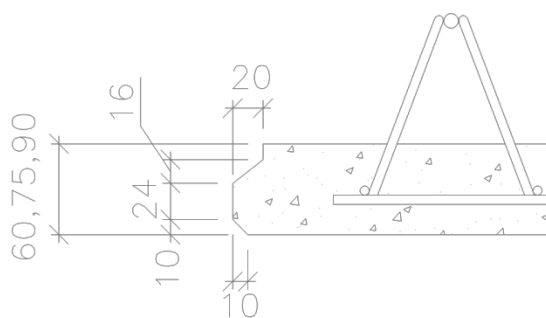


Image (1) Austral Deck side profile

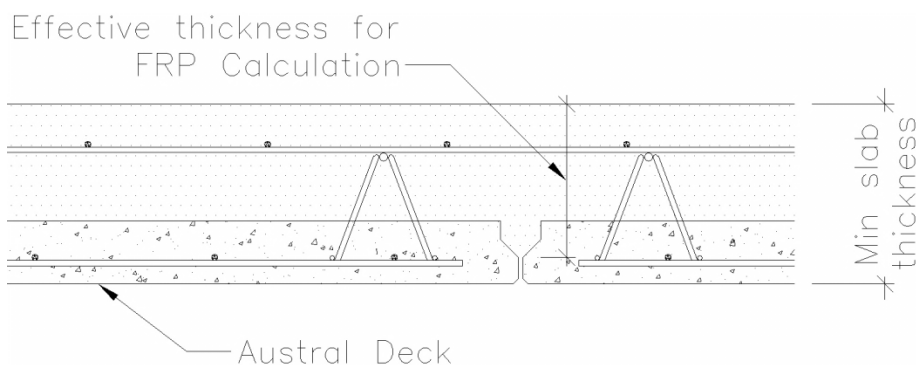


Image (2) effective thickness for FRP calculation
Austral Deck profile

Fire Resistance Period - Austral Deck Flat profile

Using an approved fire rated sealant can increase FRP of concrete slabs constructed using Austral Deck. The effective slab thickness is measured from the soffit of the Austral Deck to the top surface of the slab.

Chart (2) shows the FRP for insulation of various slab thicknesses constructed using 60mm thick Austral Deck with flat profile.

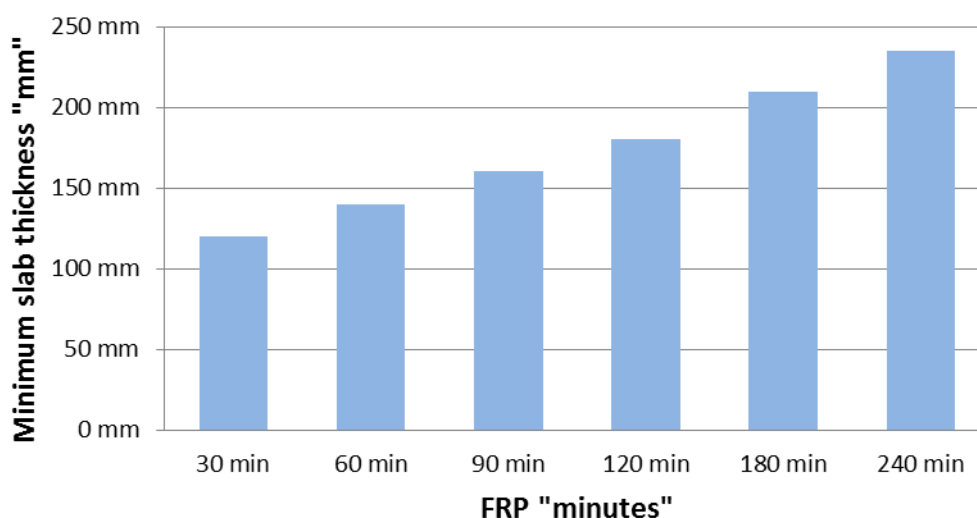


Chart (2) Fire Resistance Period for insulation for solid slabs constructed using 60mm thick Austral Deck with flat profile

Effective thickness for
FRP Calculation
(without joint sealant)

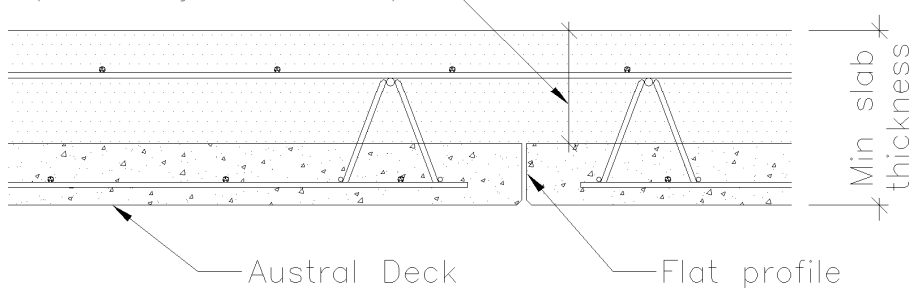


Image (3) effective thickness for FRP calculation
Austral Deck flat profile

Thermal resistance

Austral Deck, as part of the concrete slab can be designed to achieve energy efficiency provisions as specified in The National Construction Code Volume Two – Building Code of Australia (BCA).

The Thermal resistance coefficient “The R- Value” ⁽⁴⁾ of the Austral Deck slab is affected by the precast panel thickness, overall slab thickness, the use of slab voids, the use of other insulation materials, flooring and ceiling material.

The National Precast Concrete Association of Australia⁽⁵⁾ “NPCAA” has developed a software to calculate the R Value of Austral Deck considering all the above factors. Copy of the software can be downloaded via the NPCAA website.

http://www.nationalprecast.com.au/services/r_value_calculator/index.php

Definitions and references

(1) Fire resistance period (FRP)

Time, in minutes, for a member to reach the appropriate failure criterion (i.e., structural adequacy, integrity and/or insulation) if tested for fire in accordance with the appropriate Standard. Source Australian Standards, Concrete Structures, AS3600-2009, Clause 5.2.5

(2) Fire resistance level (FRL)

Fire resistance periods for structural adequacy, integrity and insulation, expressed in that order.

NOTE: Fire resistance levels for structures, parts and elements of construction are specified by the relevant authority, e.g., in the Building Code of Australia (BCA). Source Australian Standards, Concrete Structures, AS3600-2009, Clause 5.2.4

(3) Section 5 of AS3600-2009 outlines the requirements for the fire resistance of slabs. It is assumed that the criteria for integrity is considered to be satisfied if the design meets the criteria for both insulation and structural adequacy for that fire resistance period as per clause 5.3.1 of AS3600-2009

(4) The R-value of a substance is its direct measure of its resistance to transferring energy or heat; R Values are expressed using the metric units (m².K/W). The amount of degrees kelvin temperature difference required to transfer one watt of energy per one square meter of a substance.

(5) Published with an approval from NPCAA.

The information contained in this document is provided as a general guide only and does not replace the need for the specification to be reviewed and check by qualified in the field of concrete, energy, building construction, design, services and/or fire.

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