

AS1720.1 Considerations When Using SPAX Design Guide & Software

Joint design using the SPAX Design Guide and software is based on the Eurocode (EC5) and SPAX European Technical Assessment (ETA). When designing joints with Australian timbers, the basis of the SPAX Design Guide and software may be used but the information below should be taken into consideration.

	<u>AS1720.1</u>	<u>Design Guide Strength Class and Software</u>
Equivalent Material ("members" tab on software)		
Timber	JD5 Joint group	C16
	JD4 Joint group	C35
	JD1 Joint group	D60
Glulam	GL12	GL24c
	GL13	GL24h/GL28c
	GL17	GL32h/GL36c
LVL	Hyne LVL	Use C35 timber
	Wesbeam e-beam+	Use C35 timber
	Hyspan (CHH)	Use C35 timber
	Hyspan+ F17	Use C35 timber
	Stora S	Kerto S
	Stora X	Kerto Q

Modification Factors

Modification factors for both AS1720.1 and SPAX ETA are the same or similar in most cases so the SPAX design guide and software can generally be used in conjunction with AS1720.1 design. In individual cases, the differences in factors in the examples shown below may need to be considered. Except for γ_m and k_{mod} , all other factors are calculated automatically in the SPAX software as a result of input variables.

Capacity Factor	$\phi = x \cdot 0.8$	$\gamma_m = \div 1.3 (= x \cdot 0.77)$
Load Duration	$k_1 = 0.77$ (N/A for withdrawal)	$k_{mod} = 0.8$
Capacity x Load Duration	$\phi \times k_1 = 0.8 \times 0.77$ $= 0.616$	$k_{mod} \div \gamma_m = 0.8 \div 1.3$ $= 0.615$
Grain Direction	Shear	
	$k_{13} = 1.0$ in side grain $= 0.6$ in end grain	$k_{ax} = 1.0$ in side grain $= 0.632$ in end grain
	Withdrawal	
	$k_{13} = 1.0$ in side grain $= 0.6$ in end grain	$k_{ax} = 1.0$ in side grain N/A in end grain (min angle 15°)

Edge/End Distances and Spacing

If requirements of AS1720.1 wish to be met, the distances below may need to be checked as they may vary to the SPAX design distances.

Spacing	Minimum distance
End distance	$10d_a$
Edge distance	$5d_a$
Between screws	
- along grain	$10d_a$
- across grain	$3d_a$

AS 1720 vs SPAX Eurocode Design Guide

AS1720.1

- Joint strength groups based on design densities
(radiata pine = 550 kg/m³)
- Considers shank diameter
- Shear – tables specify characteristic capacities
- Withdrawal – considers 2 failure modes. Head pull-through not considered.
- Simplified minimum edge, end and spacing distances
- All values applied to pre-drilled holes only
- No design criteria for inclined screws

EC 5

- Based on characteristic densities
(radiata pine = 400 kg/m³)
- Considers thread diameter
- Shear – based on Johansen's Yield Theory with 6 possible failure modes plus rope effect
- Withdrawal – considers 3 failure modes, including head pull-through.
- Complicated minimum distances but more logical
- Pre-drilling not necessary. Values calculated for both non pre-drilled and pre-drilled holes
- Design methods for larger no. of configurations