

Comparable Fastener Withdrawal of AdvanTech® Subflooring and Sheathing

The allowable design withdrawal value (W') for a common nail in pounds-force for AdvanTech and plywood are listed in Table 1 derived from Equation 1, and the allowable design withdrawal value (W') for a wood screw in pounds-force in AdvanTech and plywood are listed in Table 2 derived from Equation 2.

Equation 1: $W' = 1380 \times G^{5/2} \times D \times C_D \times C_M$

G, Specific Gravity = 0.44 for AdvanTech¹ and 0.40 APA plywood and OSB²

D, Diameter of Fastener = 0.131" for 8d common nail

C_D, Load Duration Factor = 1.0 for normal duration of loads.

C_M, Wet Service Factor = 1.0 for In-Service moisture content less than 19% for the wood structural panels.

Table 1 : Fastener Withdrawal Values of Nail Fastener for Plain-shank or Screw-shank Nail

Product	Thickness (in)	Specific Gravity (G)	With Drawal Strength (lbf)
Plywood	15/32	.40	8
Plywood	19/32	.40	10
AdvanTech	1/2	.44	11
AdvanTech	5/8	.44	14

Equation 2: $W' = 2850 \times G^2 \times D \times L \times C_D \times C_M$

G, Specific Gravity = 0.49 for SYP OSB and 0.55 for SYP plywood³

D, Diameter of Fastener = 0.1875" for #10 wood screw

L, length of thread penetration into the panel.

C_D, Load Duration Factor = 1.0 for normal duration of loads.

C_M, Wet Service Factor = 1.0 for In-Service moisture content less than 19% for the wood structural panels.

Table 2 : Fastener Withdrawal Values of Nail Fastener for Screws

Product	Thickness (in)	Specific Gravity (G)	With Drawal Strength (lbf)
Plywood	15/32	.55	56
Plywood	19/32	.55	71
AdvanTech	1/2	.49	44
AdvanTech	5/8	.49	56

Please take notice that these are allowable values and not **ultimate** design values. Ultimate values are values that are measured at the point of failure. In this case, ultimate value is the amount of pulling force being exerted on a fastener as it first begins to withdraw from the panel. It does not include any adjustment or safety factors. Ultimate values should not be used as design values. The equations can be found in the 2015 NDS in chapter 11.

¹ See ESR-1785 Table 4, ²See APA TT-039C Table 1, ³ See APA TT-051