
TECHNICAL BULLETIN

Fastening Tropical Forest Products Decking

Fastening

Not all fasteners are created equal. There are many fastening options and systems available on the market today. Fastener selection will significantly impact the outcome of any deck installation. It is critical to ensure that the fastener is appropriate for the deck material that is being installed. Whatever system you choose, it is essential to remember that once selected, liability for fastening performance shifts to the specifier, fastener company, or contractor and away from the decking manufacturer. So carefully consider your options and follow the manufacturer's and fastener company's instructions.

Selecting Screw Material

The use of high-quality T304 or T316 stainless steel fasteners is recommended to provide superior service life and avoid potential galvanic reaction issues related to the connection of naturally durable wood products with treated softwood substructures. High-quality T316 stainless steel will reduce staining, resulting from the interaction between the natural tannins in the wood and a lower grade of stainless steel. T316 stainless steel is the most resistant steel to corrosion caused by salt spray and should be used for construction in coastal environments. Strength is increased in T316 stainless by increasing the diameter of the screw shank, i.e., a #8 T316 screw is roughly equivalent in strength to a #7 T305 Stainless screw. Regardless of the fastening system selected, performance evaluation and selection are the responsibilities of the specifier or installer.

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Selecting Screw Diameter, Length, Head Type, and Drive Type

The general rule of thumb is that a screw should penetrate the substrate at a minimum depth equal to the thickness of the decking. The recommended minimum shank diameter and screw length by net deck thickness are as follows...

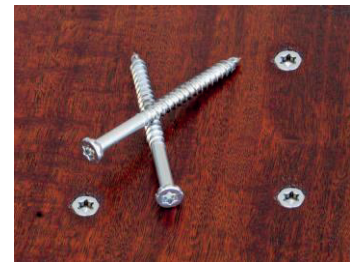
- Nominal 1X and 5/4X Grooved for Hidden Fastener: #7x1-5/8" – Trim Head, Black Head Coat
- Nominal 1X and 5/4X Drill, Screw and Plug: #8x2.5" Pro Plug Screw
- Nominal 1X (net.75"): #8 x 2"-2.5" – Trim Head Countersunk
- Nominal 5/4X (net 1"): #8 x 2.25"-2.5" – Trim Head Countersunk
- Nominal 2X (net 1-1/2"): #12 x 3-4" – Flat Head Countersunk
- Nominal 3X (Net 2.-1/2"): #14 x 5-6" – Flat Head Countersunk

Pre-Drill, Countersink, and Screw Method

Pre-drill and countersink two holes per deck stringer intersection. Install self-drilling trim heads or flat head screws. Drilling and screwing through the face of the deck boards provide the strongest mechanical connection. Drilling and screwing also allow the boards to expand and contract equally across the face, ensuring that the spaces between boards remain consistent in width. It is always recommended that you pre-drill and pre-countersink the boards, especially the ends of the boards, as the ends are the most susceptible to splitting.

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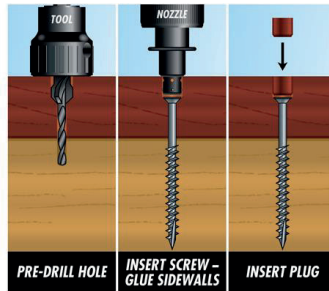
Tools like the TFP PRODECK Smart Bit™ drill and countersink tool, and bit system deliver the perfect depth countersink every time. Simply set the drill bit depth to the thickness of your decking as you do not want to pre-drill into a treated substructure. If you are using a hardwood substructure, drilling through the deck and into the stringer may be required. Be sure not to over torque the screws as the head may cause the board to split. Tools like the TFP PRODECK Depth Setter™ System prevent over-countersinking and over-torquing. Typically, commercial decks are constructed using the face screw method. Stainless steel fasteners are now available in both natural stainless (silver) if you intend to let the deck weather naturally, or with brown coated heads, which can be used to match the Tropical Forest Products Wood Decking lineup.



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Drill, Screw and Plug Method

The drill, screw, and plug method has all the mechanical benefits of the drill and face screw method. However, the countersinks are deeper to allow for the application of adhesive and wood plugs to cover the screw heads. Typically used in wood boat construction, this method offers a unique appearance. Drill Screw and Plug systems like the TFP PRODECK Pro Plug™ system provides the TFP PRODECK Smart Bits™, Glue Injector Cap (regulates glue volume) and Tapered Wood Plugs to facilitate quick installation by eliminating the need to trim and sand plugs after installation. Finished or left to weather, wood plugs maintain the same color appearance as the deck surface. Like face screwing, the drill, screw, and plug method allows the deck boards to expand and contract equally in width, so the spaces between boards remain consistent.



Hidden Deck Clips

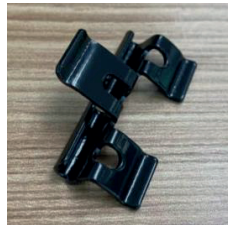
Typically referred to as “hidden fasteners,” this method requires either grooving or biscuit cutting the decking down the side of the board and connecting the decking to the stringers with clips. There are two types of clip systems available. Mechanically Connected and Non-Mechanically Connected systems.

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Mechanically Connected systems create a mechanical or structural connection between the board and the stringer by drilling a hole through one side of the board and setting a screw through the clip and board into the stringer. This allows the board to expand and contract towards and away from the mechanically connected edge, maintaining consistent spacing between boards. Boards should never share a clip that does not allow for screws to penetrate both boards at butt joints.

Tropical Forest Products Premium Deck Clip System

The art of simplicity. The TFP PRODECK Deck Clip's™ state-of-the-art design and materials deliver a hidden deck fastening system that outperforms the competition. One clip, one spacing. The TFP PRODECK Deck Clip creates a 3/16" gap. The clip's 1.5" length provides a longer holding surface than the competition. The unique three-hole design allows the clips to be applied with one screw for connection to center joists and two screws at butt joints by providing an aligned, solid fastening platform that ties abutting boards together. This unique design eliminates the potential for movement (snaking) at butt joints and down the length of the deck boards.



Pre-drilling of hardwood decking for the use of hidden fasteners is always recommended. The TFP PRODECK Deck Clip™ System comes with a Drilling Guide. This guide allows the installer to pre-drill holes through the decking at the proper angle for installation. It ensures fasteners are appropriately installed, unlike some clips that leave the drilling angle up to the installer. It is, however, essential to avoid drilling into the joist, so set your drill bit to generate the correct depth and avoid over-drilling.

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It is important to understand that hidden fasteners are not entirely hidden. You will see the fastener and screw head between the boards. We recommend the use of kiln-dried hardwood decking only when using hidden fasteners. We recommend the use of kiln-dried 5/4x4 decking for poorly ventilated decks or kiln-dried 5/4x6 decking for well-ventilated decks when using hidden fasteners. We do not recommend using air-dried hardwood decking when using hidden fasteners, as shrinkage may reduce the contact surface between the clip and the deck. Some markets are using 1x4 and 1x6 KD grooved decking. It should, however, be noted that clips are more visible vs. 5/4x6 grooved decking as the shadow line is decreased and there is less board for fasteners to penetrate in 1X nominal decking. We do not recommend using air-dried grooved decking with hidden fasteners under any conditions. This is because air-dried decking is more likely to cup and shrink, which makes it more challenging, if not impossible, for the clips to keep the deck boards in place.

Some clip systems do not create a mechanical or structural connection between the deck board and the stringer that prevents lateral movement. It is important to remember that it is natural for a board to bow or curve as the natural tension in the wood fiber is released. Non-mechanically connected systems allow the boards to move towards or away from the adjoining boards, which may result in inconsistent or irregular spacing between boards. This movement is exaggerated at butt joints and when air-dried decking is used. As such, we do not recommend clips that do not require that one side of the deck board be drilled and mechanically connected to the stringer.



Mechanical Connection



Non-Mechanical Connection

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Wood Deck to Metal Framing

Fastening wood decking to metal framing presents a unique set of challenges. Hidden fasteners that create a mechanical connection between the decking and the stringer are almost impossible to install. You will need to pre-drill the metal framing, and the drill bit will want to wander when trying to drill at a 45-degree angle.

You can use clips that don't create a mechanical connection, but you're faced with the snaking issue again.

When fastening wood decking to metal framing, face fastening is your best option. Drill and countersink the decking, and then use a self-tapping 410 stainless steel flat head screw. 410 stainless steel gives the screws the strength they need to self-drill. The use of stainless steel reduces the potential for a galvanic reaction between the fasteners and the steel stringers.

