



TER No. 1711-01

## DECK LEDGER FASTENING SOLUTION WITH SPAX® POWERLAGS®

SPAX® 5/16" PowerLag® fasteners have been tested for use in the attachment of deck ledger boards to the building structure to provide prescriptive solutions that are equivalent to the International Residential Code provisions for deck ledger attachment. When installed per this technical bulletin, SPAX® 5/16" PowerLag fasteners can be used in place of 1/2" lag screws as described in Table R507.9.1.3(1)<sup>+</sup> of the 2018 IRC.

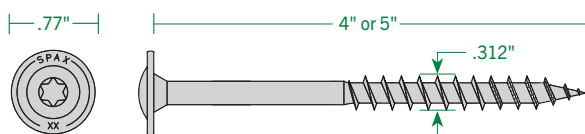
+ 2015 IRC Table R507.2, 2012 IRC Table R507.2

### PRODUCT FEATURES

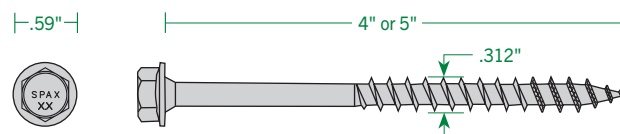
- Code compliant per DrJ TER No. 1711-01.
- Patented thread technology requires no pre-drilling, and drives faster and easier than conventional lag screws.
- Two head types to choose from:
  - Hex Washer Head
  - T-STAR Washer Head
- HCR® Coating has been tested to ICC-ES standards (AC257) and has proven to be equivalent to code approved hot-dip galvanized coatings. HCR is suitable for many preservative-treated woods and exterior applications.
- Fastener length on head provides easy identification.

### INSTALLATION INSTRUCTIONS

- 1) Select the preferred head style and appropriate length PowerLag fastener to ensure the threads fully engage the band joist and the fastener tip extends beyond the back face of the band joist.
- 2) Using a 1/2" low rpm/high torque electric drill and appropriate driver bit, install the PowerLag through the ledger and sheathing into the band joist until the built-in washer is drawn firm and flush to the ledger board. Do not overdrive.
- 3) Stagger the PowerLag fasteners from top to bottom along the length of the ledger while maintaining the required spacing, edge and end distances as found in Figure 2 and Table 1.



5/16" x 4" or 5" T-STAR Washer Head PowerLag® with HCR® Coating



5/16" x 4" or 5" Hex Washer Head PowerLag® with HCR® Coating

## Structural Applications

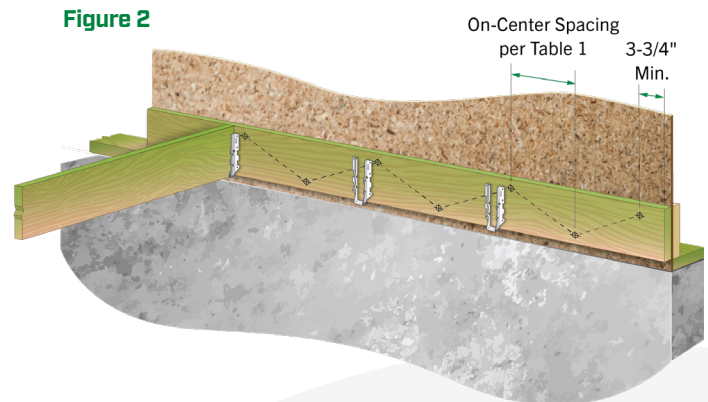
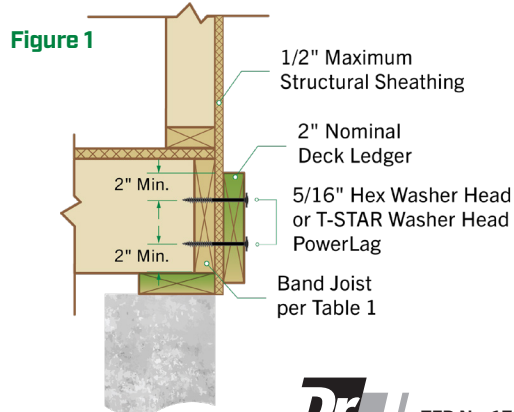


Table 1

Loading Condition	Head Type	Fastener Length	2x Nominal Ledger Species	Band Joist Material	Maximum Deck Joist Spans						
					Up to 6'	Up to 8'	Up to 10'	Up to 12'	Up to 14'	Up to 16'	Up to 18'
					Maximum On-Center Spacing of PowerLags* Fasteners						
40 psf Live	T-STAR Washer	4" or 5"	HF/SPF	Sawn Lumber	22	16	16	15	12	11	10
				1" min EWP*	23	17	16	15	13	11	10
			DF/SP	Sawn Lumber	34	25	20	17	13	12	10
				1" min EWP*	23	17	16	14	12	11	9
10 psf Dead	Hex Washer		HF/SPF	Sawn Lumber	28	21	17	12	11	9	8
				1" min EWP*	21	14	11	9	8	7	6
			DF/SP	Sawn Lumber	30	22	18	12	10	9	8
				1" min EWP*	26	19	16	13	11	10	8
60 psf Live	T-STAR Washer		HF/SPF	Sawn Lumber	16	16	12	10	9	8	7
				1" min EWP*	16	16	13	11	9	8	7
			DF/SP	Sawn Lumber	24	18	13	11	9	8	7
				1" min EWP*	16	15	12	10	9	7	7
10 psf Dead	Hex Washer	HF/SPF	Sawn Lumber	20	13	11	9	7	6	6	
			1" min EWP*	14	10	8	7	6	5	4	
		DF/SP	Sawn Lumber	21	13	10	8	7	6	5	
			1" min EWP*	18	14	11	9	8	7	6	

\*Engineered Wood Product (EWP)

- Based on load duration of 1.0. Spacing may be adjusted by the applicable load duration as specified in NDS 2018.
- Fasteners are required to have full thread penetration into the main member.
- Fasteners shall be staggered from the top to the bottom along the length of the ledger while maintaining the required edge and end distances as shown in Figures 1 and 2.
- A maximum 1/2" structural sheathing, fastened per code, may be installed between the ledger and the band joist.
- Multiple ledger plies shall be fastened together per code and independent of the 5/16" PowerLags\*.
- Minimum ledger board requirements: 1-1/2" thick by 7-1/2" depth. Must be greater than or equal to the depth of the deck joist and no greater than the depth of the band joist.
- Solid sawn ledger shall be HF/SPF or DF/SP species (specific gravity of 0.42 and 0.50 respectively), designed by others.
- Ledger materials assumed to be in wet service condition.
- Minimum band joist requirements: SPF (specific gravity of 0.42) solid-sawn lumber 1-1/2" thick and 7-1/2" depth; Engineered Wood Product (EWP) 1" thick by 7-1/4" depth.
- Fastener spacing for 4" fasteners is based on tested loads. The design values use the lesser of a 1/8" deflection or a factor of safety equivalent to or greater than that of the code compliant lag screw application.
- Fastener spacing for 5" fasteners is based on previously published reference lateral design values.
- Tabulated on-center spacing values are applicable where a third party tested plastic washer (e.g. Deck2Wall® Spacer) is installed between the ledger board and band joist at each fastener location. The plastic washer shall be installed per the washer manufacturer's instructions and this TER. The plastic washer shall be 2" in diameter, 1/2" thick (max), with an approximate 5/16" hole in the center for the PowerLag\* and three 3/16" (approx.) holes for the #8 screws. The plastic washer shall be independently fastened to the ledger with three SPAX® #8 x 1-5/8" or three SPAX® #8 x 2" screws.

- For guidance on designing a deck ledger to truss connection where a band joist is not used, see SBCA's Tech Note, "Attachment of Residential Deck Ledger to Metal Plate Connected Wood Truss Floor System" available at [www.sbcindustry.com](http://www.sbcindustry.com).
- Attachment of a deck ledger to concrete or CMU/masonry using PowerLags\* is outside the scope of this technical bulletin.
- This technical bulletin is subject to periodic review and updates. For the most current version, visit [www.spax.us](http://www.spax.us).
- For a comprehensive review of SPAX PowerLags for use in deck ledger attachment, please see "DrJ TER No. 1711-01" available at [www.drjengineering.com](http://www.drjengineering.com).