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1. Fastener Selection

1.1 Fastener Selection According to Base Material and Approval Requirements

The thickness and grade of structural base steel are the primary factors influencing the choice of fastener. Hilti siding and decking fasteners are designed for reliable, consistent fastenings. This has resulted in fasteners that are base material specific, especially with regard to base material thickness. There are essentially two steel base material thickness groups, thin base and thick base, with ¼□being the thickness that roughly defines the border between the two.

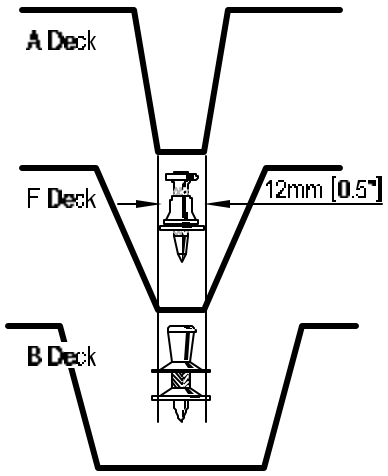
Applications and products may need specific approvals. For roof decking, either an FM or a UL approval is usually required. In certain areas of the country, an ICBO approval is required. The fastenings of form deck are usually considered to be temporary and not requiring an approval. Fastenings of composite floor decking to hold the decking in place (tacking) until shear connector studs are welded are also usually considered to be temporary and not requiring an approval.

If the decking is used as a diaphragm, diaphragm design tables are needed. Diaphragm design tables are available for all Hilti fasteners to be used in fastening of diaphragms.

The chart on page 4 can be used to assist in the selection of the fastener(s) by base material and approval requirements.

3.1.2 Fastener Selection According to Decking Type

Hilti power driven siding and decking fasteners are available with 12 mm (0.472□) and 15 mm (0.590□) washers. The washers have to fit in the valleys of the decking profile without damaging the web of the profile. Because all of the known composite and non-composite floor deck profiles have valley widths of 0.8□and greater, this fitting issue is actually confined to the roof deck application. The valleys of wide ribbed roof decking (B Deck) are wide enough for both of these washer diameters, however, the ½□wide valleys of intermediate ribbed roof deck (F Deck) are too narrow for 0.590□washers. Obviously, 5/8□diameter puddle welds do not fit in the ½□valleys either, however, the fit is made by making an oval puddle that is longer than 5/8□

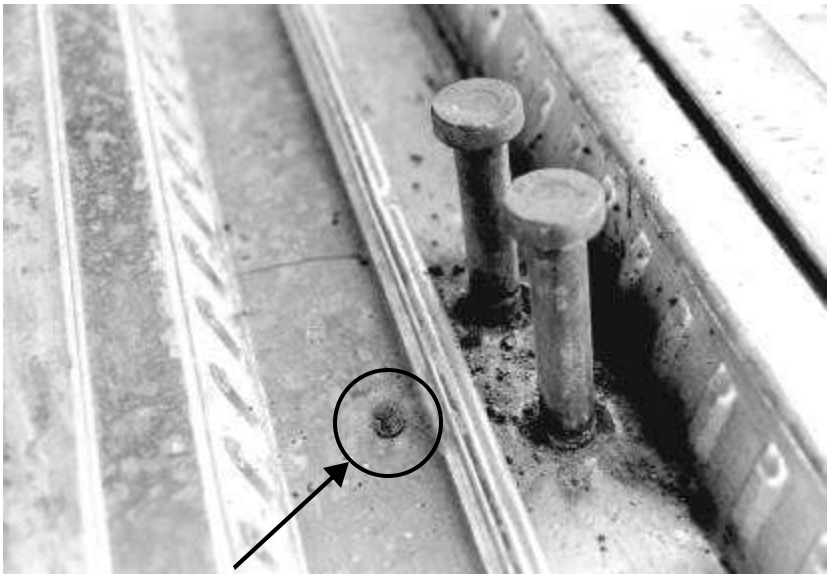


Very thin (28 and 26 gauge) form deck with a high tensile strength is easily damaged while fastening. If the form deck is welded, section 4.4a Welding of the SDI SPECIFICATIONS FOR NON-COMPOSITE STEEL FLOOR DECK requires the use of welding washers for all deck units with less than 0.028□(0.7 mm) thickness. With power driven fasteners, the washer design is important and led to the development of the **X-ZF22 THS12**, a fastener especially designed for fastening 28 and 26 gauge, 80 ksi form deck to bar joist.

1. Fastener Selection

If beam spacing is great enough that the use of composite floor deck is economical, then composite beam design with shear connectors is usually economical as well. According to section 4.4a Welding of the SDI SPECIFICATIONS FOR COMPOSITE STEEL FLOOR DECK, the stud welds of headed studs applied through the deck onto the structural steel can be used to replace the fastenings as required under section 4.4 Anchorage.

However, before the studs are welded, the deck has to be attached to the structure to act as a working platform and to prevent blow-off. Decking installers often prefer powder-actuated fastening for this application because of its speed and portability. In fact, this desire for portability has led to the use of small, lightweight general-purpose powder-actuated tools and fasteners for tacking of composite floor deck. The Hilti **DAK16 P8TH** is a general-purpose fastener used for tacking floor deck.



The chart on page 5 gives an overview of the Hilti siding and decking fasteners typically recommended for various deck profiles.

3.1.3 Fastener - Tool Compatibility

Each fastener is designed and tested for placement with one or more specific tools. This means that when the fastener is selected, the placing tool (or tools) is also selected. Information on fastener tool compatibility is provided in the product data sheets in chapter 4.

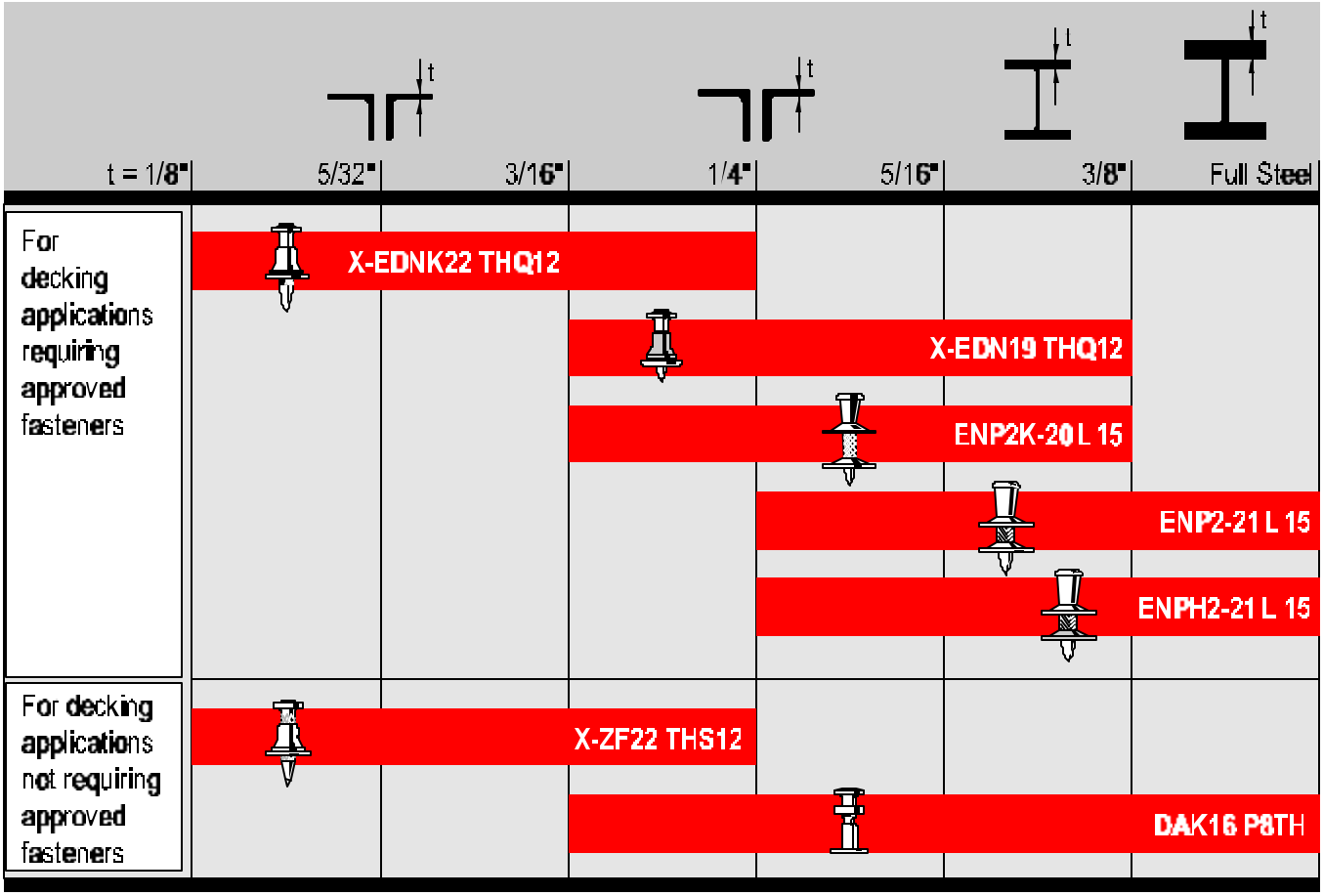
2. Fastener Selection Charts

2.1 Fastener Selection Chart – Base Material

The chart below is a convenient tool for assisting in the selection of the proper fastener according to the base material. For projects where the structural steel is predominantly bar joists, the **X-EDNK22 THQ12** and the **X-EDN19 THQ12** are the fasteners typically chosen. They are placed with the same tool and the operator can change from one fastener type to another as dictated by the actual thickness of the steel angles. Both of these fasteners have the same FM and UL approvals and the SDI diaphragm strengths are the same as those of the 5/8" puddle weld.

If hot-rolled beams are predominant, then the **ENP2-21 L15** & **ENPH2-21 L15** should be considered. If there are some bar joists in the project, these are typically fastened with the **ENP2K-20 L15** , which is also placed with the DX 750 tool. If there is 50 ksi steel thicker than about ½" then only the **ENPH2-21 L15** should be considered. All three of these fasteners have FM and UL approvals. The SDI diaphragm strength of the **ENP2K-20 L15** is also the same as that of a 5/8" puddle weld but slightly lower than that of the **ENP2-21 L15** & **ENPH2-21 L15**.

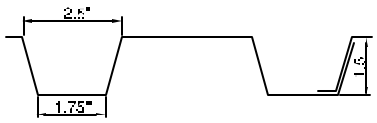
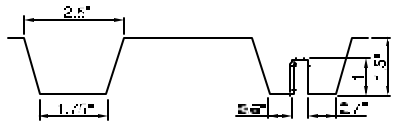
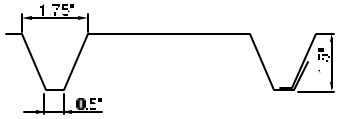
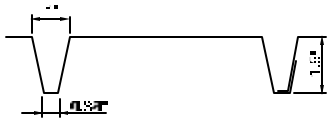
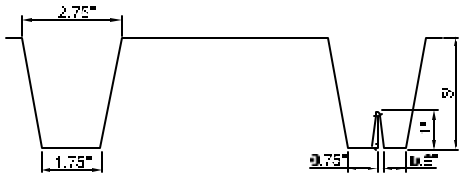
For projects with the steel thicknesses so mixed that diaphragm areas cannot easily be segregated by fastener, the fastening pattern can be specified based on the **X-EDNK22 THQ12** & **X-EDN19 THQ12** diaphragm tables. On the plans and/or specifications, the possible fasteners can be listed with a requirement that they be selected according to this table (manufacturer's recommendations).



2. Fastener Selection Charts

2.2 Fastener Selection Chart – Deck Type

The chart below gives a quick overview of the fasteners suitable for various common deck types.

Deck Type	EDNK22 THQ12 EDN19 THQ12	ENP2-21 L15 ENPH2-21 L15	ENP2K-20 L15	X-ZF22 THS12	DAK16 P8TH
B Deck 	+	+	+	!	!
BI Deck 	+	+	+	!	!
F Deck 	+	-	-	!	!
A Deck 	-	-	-	-	!
3N Deck 	+	+	+	!	!
3NI Deck 	+	-	-	!	!
2 and 3 composite floor deck	+	+	+	+	+
28 and 26 gauge, 80 ksi form deck	!	!	!	+	!

+ Fastener fits in deck valley

- Fastener does not fit in the deck valley

! Fastener fits in the deck valley but may not be suitable for other reason (approval, deck material, etc.)

NOTE : Deck profile dimensions and fastener fits are based on deck dimensions as experienced by Hilti. Dimensions may vary by manufacturer. When in doubt, inquire with deck manufacturer.