Mechanical Fasteners to Supports

As an alternate to welds, FORMLOK deck may be attached to the supports with mechanical fasteners, specifically, Hilti Fasteners, Pneutek Fasteners, and SDI recognized #12 or #14 screws from Buildex, Elco, Hilti, and Simpson. Allowable shear strengths for FORMLOK decks attached with mechanical fasteners are determined by multiplying the allowable diaphragm shear strengths for deck attached with welds by the adjustment factors shown in the diaphragm table footnotes for each FORMLOK profile and attachment pattern.

Comply with minimum and maximum substrate thickness requirements for applicable mechanical fasteners. Consult fastener manufacturer for applicable fire-resistance assembly ratings.

Sidelap Connections

FORMLOK deck is to be fastened at the sidelap with the PunchLok II tool, button punches, screws, or 1½ in. long top seam welds at 36 in. on center maximum. VERCOR deck is to be fastened at the sidelaps with screws at the spacing shown in the tables.

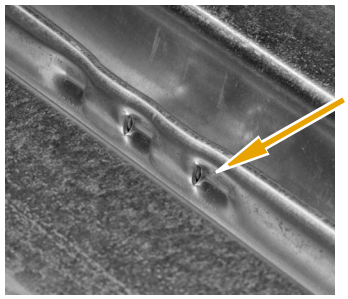
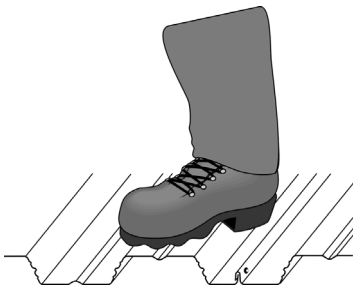


FIGURE 5

PunchLok® II System: Connect sidelaps of the PLB, PLW2, PLW3, PLN3, and PLN FORMLOK decks with the Verco PunchLok II tool. The PunchLok II tool creates a positive connection between the male and female lips of the FORMLOK decks. The connection made by the PunchLok II tool is referred to as a VSC2 (Verco Sidelap Connection 2). An acceptable VSC2 connection has been made when the sidelap material has been sheared and offset so the sheared surface of the male leg is visible (Figure 5). The VSC2 connection may be made in either direction.



Button Punches: When sidelaps of FORMLOK decks are connected with button punches (BP), as shown in Figure 6, an average-sized person should be able to stand (not jump) on the flute adjacent to the attachment without the joint coming apart.

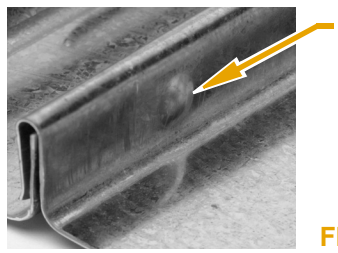


FIGURE 6

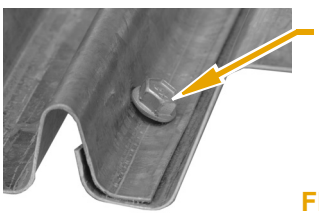


FIGURE 7

Screws: When self-drilling, self-tapping screws are used to connect the sidelaps of B-36-SS, W2-36-SS, W3-36-SS, N3-SS, N3-NS, or N-24-SS FORMLOK decks, they are to be minimum #10 x ¾ in. long. The "SS" designation indicates deck provided with modified female lip for screw fastening. See Figure 7. The "NS" designation for N3 FORMLOK deck indicates deck provided with nested sidelap. Deep and Shallow VERCOR decks have a nested sidelap.

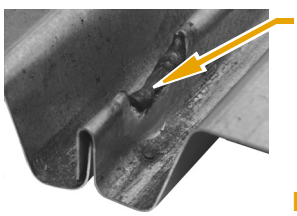


FIGURE 8

Top Seam Welds: When sidelaps of FORMLOK decks are connected with top seam welds (TSW) (Figure 8), the 1½ in. long weld must engage the top of the inner (male) leg. Clinch the joint before welding to create positive contact between the lips.

Consider the PunchLok II system as a cost-effective alternative to top seam welds.

Parallel Collectors

Spacing of the connections at diaphragm chords, struts, ties or other collector elements that are parallel to the deck flutes shall be based on the actual shear to be transferred and shear strength of the connections used. The maximum spacing of connections at parallel collectors is 3 ft.

Allowable shear strengths for Arc Spot Welds, Arc Seam Welds, Hilti Fasteners, Pneutek Fasteners, and SDI Recognized Screws are listed in Table 2.

Table 2: Allowable Shear Strength (lbs/connection) for Arc Spot Welds, Arc Seam Welds, Hilti Fasteners, Pneutek Fasteners, and SDI Recognized Screws for Verco Deck Support Connections[11,12]

Deck Gage	Profile[1]	BMT[2]	ARC SPOT WELD[3,4]	ARC SEAM WELD[3,4]	HILTI[5] X-EDNK22 or X-HSN 24	HILTI[5] X-ENP-19	PNEUTEK[6] SDK61	PNEUTEK[6] SDK63	PNEUTEK[6] K64	PNEUTEK[6] K66	SDI RECOGNIZED SCREWS[7,8,9,10]
		(in.)	(lbs)	(lbs)	(lbs)	(lbs)	(lbs)	(lbs)	(lbs)	(lbs)	(lbs)
22	B, N & W3	0.0299	783	1231	603	650	618	691	694	736	561
	W2	0.0300	788	1236	605	652	620	693	697	739	563
21	W2 & W3	0.0330	936	1365	664	715	678	744	797	822	619
20	B, N & W3	0.0359	1091	1491	720	775	733	791	886	903	673
	W2	0.0360	1096	1495	722	777	735	792	889	906	675
19	B, N, W2 & W3	0.0420	1455	1758	837	901	846	884	1057	1079	788
18	W2	0.0470	1793	1981	932	1003	937	956	1184	1228	881
	B, N & W3	0.0478	1850	2017	947	1020	951	967	1204	1253	896
16	W2	0.0590	2280	2527	1155	1244	1145	1115	1457	1604	1106
	B, N & W3	0.0598	2309	2564	1169	1259	1158	1125	1474	1630	1121

Deck Gage	Profile[1]	BMT[2]	SDI RECOGNIZED SCREWS[7,8,9,10]
		(in.)	(lbs)
26	9/16" SV	0.0179	376
	1-5/16" DV	0.0195	410
24	9/16" SV	0.0239	502
	1-5/16" DV	0.0254	533
22	9/16" SV	0.0299	628
	1-5/16" DV	0.0314	659
20	1-5/16" DV	0.0374	785

1. The profile designations used in this table apply to the profile families as summarized below:
   "B" – PLB & B FORMLOK deck
   "N" – PLN3, N3, N3-NS, PLN & N FORMLOK deck
   "W2" – PLW2 & W2 FORMLOK deck
   "W3" – PLW3 & W3 FORMLOK deck
   "9/16" SV" - 9/16 in. (Shallow) VERCOR deck
   "1-5/16" DV" - 1-5/16 in. (Deep) VERCOR deck
2. Base metal thickness (BMT) = specified minimum uncoated base metal thickness used in design. Deck subject to thickness tolerances as described in Section A2.4 of AISI S100.
3. The minimum arc spot weld effective fusion diameter, d_e, is 1/2 inch. The minimum arc seam weld effective fusion width, d_e, is 3/8 inch and the minimum arc seam weld length, L, is 1 inch excluding circular ends.
4. Details, workmanship, technique and qualification of welds must comply with AWS D1.3.