

# DIAPHRAGM N-DECK

## SCREW ATTACHMENT - BUTTON PUNCH 50KSI



### N-Deck 32/3 Screw Pattern - Button Punch 50KSI

Support fastening	AISI #12 screws or equivalent
Side-lap fastening	Non-piercing Button Punch

$F_u$	60 ksi
$F_y$	50 ksi
$F_{xx}$	60 ksi

Loading	$\phi df$	$\Omega df$
Seismic	0.70	2.30
Wind	0.80	2.00
Other	0.70	2.30

Fastener Layout	Side-lap Conn/Span	Nominal Shear Strength, $S_{nr}$ , plf <sup>1,2</sup>									$K_1$ 1/ft
		Span, ft.									
		8	8.5	9	9.5	10	10.5	11	11.5	12	
<b>3DR22</b> <b>0.0295"</b> <b>32/3</b>	2	165	155	145							1.093
	3	180	165	160	150	140	135	130	125	120	1.033
	4	190	180	170	160	150	145	140	130	125	0.980
	5	205	190	180	170	160	155	145	140	135	0.932
	6	215	205	190	180	170	165	155	150	145	0.889
	7	230	215	200	190	180	175	165	160	150	0.849
	8	240	225	215	200	190	185	175	165	160	0.813
	9	255	240	225	215	200	190	185	175	170	0.779
	10	265	250	235	225	210	200	190	185	175	0.749
	11	280	260	245	235	220	210	200	195	185	0.720
	12	290	275	260	245	230	220	210	200	195	0.694
	<b>l, in4/ft</b>		<b>Nominal Shear Strength due to Panel Buckling, <math>S_{nb}</math>, plf</b>								
0.808		6643	5884	5249	4711	4252	3856	3514	3215	2952	

Fastener Layout	Side-lap Conn/Span	Nominal Shear Strength, $S_{nr}$ , plf <sup>1,2</sup>									$K_1$ 1/ft
		Span, ft.									
		9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0	
<b>3DR20</b> <b>0.0358</b> <b>32/3</b>	2	175									1.204
	3	185	175	165	160	150	145	140			1.139
	4	195	185	175	170	160	155	145	140	135	1.080
	5	205	195	185	175	170	160	155	150	145	1.027
	6	220	205	195	185	180	170	165	155	150	0.979
	7	230	215	205	195	185	180	170	165	160	0.935
	8	240	230	215	205	195	190	180	175	165	0.895
	9	250	240	225	215	205	195	190	180	175	0.858
	10	265	250	235	225	215	205	195	190	180	0.825
	11	275	260	245	235	225	215	205	195	190	0.793
	12	285	270	255	245	235	225	215	205	195	0.764
	<b>l, in4/ft</b>		<b>Nominal Shear Strength due to Panel Buckling, <math>S_{nb}</math>, plf</b>								
0.989		7060	6337	5719	5187	4726	4324	3971	3660	3384	

Fastener Layout	Side-lap Conn/Span	Nominal Shear Strength, $S_{nr}$ plf <sup>1,2</sup>									$K_1$
		Span, ft.									
		10.0	10.5	11.0	11.5	12.0	12.5	13.0	13.5	14.0	1/ft
<b>3DR18</b> <b>0.0474</b> <b>32/3</b>	3	210	200	190	185	175					1.310
	4	220	210	200	190	185	175	170	165	155	1.242
	5	230	220	210	200	190	185	175	170	165	1.182
	6	240	230	220	210	200	190	185	180	170	1.126
	7	250	240	230	220	210	200	195	185	180	1.076
	8	260	250	235	225	215	210	200	195	185	1.030
	9	270	260	245	235	225	215	210	200	195	0.988
	10	280	270	255	245	235	225	215	210	200	0.949
	11	290	275	265	255	240	230	225	215	205	0.913
	12	300	285	275	260	250	240	230	220	215	0.879
	13	310	295	285	270	260	250	240	230	220	0.849
	<b>l, in4/ft</b>		<b>Nominal Shear Strength due to Panel Buckling, <math>S_{nb}</math> plf</b>								
	1.323		8782	7966	7258	6640	6099	5620	5196	4819	4481

Fastener Layout	Side-lap Conn/Span	Nominal Shear Strength, $S_{nr}$ plf <sup>1,2</sup>									$K_1$
		Span, ft.									
		11.0	11.5	12.0	12.5	13.0	13.5	14.0	14.5	15.0	1/ft
<b>3DR16</b> <b>0.0598</b> <b>32/3</b>	3	235	225	215							1.471
	4	245	235	225	215	205	200	190	185	180	1.396
	5	255	245	230	225	215	205	200	190	185	1.327
	6	265	250	240	230	220	215	205	200	190	1.265
	7	270	260	250	240	230	220	215	205	200	1.209
	8	280	270	255	245	235	230	220	215	205	1.157
	9	290	275	265	255	245	235	225	220	210	1.109
	10	300	285	275	265	255	245	235	225	220	1.066
	11	310	295	280	270	260	250	240	235	225	1.025
	12	315	305	290	280	270	260	250	240	230	0.988
	13	325	310	300	285	275	265	255	245	240	0.953
	<b>l, in4/ft</b>		<b>Nominal Shear Strength due to Panel Buckling, <math>S_{nb}</math> plf</b>								
	1.672		10299	9423	8654	7975	7374	6838	6358	5927	5538

	$\phi_{df}$	$\Omega_{df}$
Buckling	0.80	2.00

<sup>1</sup> Nominal shear strength of bare deck shown above may be limited by shear buckling.

<sup>2</sup> Design Strengths: ASD Required strength (Service Applied Load)  $\leq \text{Min} \{S_{nf} / \Omega_{df}, S_{nb} / \Omega_{db}\}$  • LRFD Required strength (Factored Applied Load)  $\leq \text{Min} \{\phi_{df} S_{nf}, \phi_{db} S_{nb}\}$

**N-Deck 32/5 Screw Pattern - Button Punch 50KSI**

Support fastening	AISI #12 screws or equivalent
Side-lap fastening	Non-piercing Button Punch

F <sub>u</sub>	60 ksi
F <sub>y</sub>	50 ksi
F <sub>xx</sub>	60 ksi

Loading	φ <sub>df</sub>	Ω <sub>df</sub>
Seismic	0.70	2.30
Wind	0.80	2.00
Other	0.70	2.30

Fastener Layout	Side-lap Conn/Span	Nominal Shear Strength, S <sub>nr</sub> , plf <sup>1,2</sup>									K <sub>1</sub> 1/ft
		Span, ft.									
		8	8.5	9	9.5	10	10.5	11	11.5	12	
<b>3DR22 0.0295" 32/5</b>	2	205	195	185							0.758
	3	220	205	195	185	175	165	160	150	145	0.729
	4	230	220	205	195	185	175	170	160	155	0.702
	5	245	230	215	205	195	185	175	170	160	0.677
	6	255	240	230	215	205	195	185	180	170	0.653
	7	270	255	240	225	215	205	195	185	180	0.632
	8	280	265	250	235	225	215	205	195	185	0.611
	9	295	275	260	250	235	225	215	205	195	0.592
	10	305	290	275	260	245	235	225	215	205	0.574
	11	320	300	285	270	255	245	230	220	210	0.558
	12	330	315	295	280	265	255	240	230	220	0.542
		<b>I, in4/ft</b>	<b>Nominal Shear Strength due to Panel Buckling, S<sub>nb</sub>, plf</b>								
	0.808	6643	5884	5249	4711	4252	3856	3514	3215	2952	

Fastener Layout	Side-lap Conn/Span	Nominal Shear Strength, S <sub>nr</sub> , plf <sup>1,2</sup>									K <sub>1</sub> 1/ft
		Span, ft.									
		9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0	
<b>3DR20 0.0358 32/5</b>	2	220									0.835
	3	230	220	205	195	190	180	170			0.803
	4	240	230	215	205	195	190	180	175	165	0.773
	5	255	240	225	215	205	195	190	180	175	0.745
	6	265	250	235	225	215	205	195	190	180	0.720
	7	275	260	245	235	225	215	205	195	190	0.696
	8	285	270	255	245	235	225	215	205	195	0.674
	9	295	280	265	255	245	230	220	215	205	0.653
	10	310	290	275	265	250	240	230	220	215	0.633
	11	320	300	285	275	260	250	240	230	220	0.614
	12	330	315	295	285	270	260	245	235	230	0.597
		<b>I, in4/ft</b>	<b>Nominal Shear Strength due to Panel Buckling, S<sub>nb</sub>, plf</b>								
	0.989	7060	6337	5719	5187	4726	4324	3971	3660	3384	

Fastener Layout	Side-lap Conn/Span	Nominal Shear Strength, $S_{nr}$ plf <sup>1,2</sup>									$K_1$	
		Span, ft.										
		10.0	10.5	11.0	11.5	12.0	12.5	13.0	13.5	14.0	1/ft	
<b>3DR18</b> <b>0.0474</b> <b>32/5</b>	3	265	250	240	230	220					0.924	
	4	275	260	250	240	230	220	210	205	195	0.889	
	5	285	270	260	250	235	230	220	210	205	0.858	
	6	295	280	270	255	245	235	225	220	210	0.828	
	7	305	290	275	265	255	245	235	225	215	0.801	
	8	315	300	285	275	260	250	240	235	225	0.775	
	9	325	310	295	280	270	260	250	240	230	0.751	
	10	335	320	305	290	280	270	255	250	240	0.728	
	11	345	330	315	300	285	275	265	255	245	0.707	
	12	355	340	325	310	295	285	275	260	255	0.687	
	13	365	350	330	315	305	290	280	270	260	0.668	
	<b>l, in4/ft</b>		<b>Nominal Shear Strength due to Panel Buckling, <math>S_{nb}</math> plf</b>									
	1.323		8782	7966	7258	6640	6099	5620	5196	4819	4481	

Fastener Layout	Side-lap Conn/Span	Nominal Shear Strength, $S_{nr}$ plf <sup>1,2</sup>									$K_1$	
		Span, ft.										
		11.0	11.5	12.0	12.5	13.0	13.5	14.0	14.5	15.0	1/ft	
<b>3DR16</b> <b>0.0598</b> <b>32/5</b>	3	295	285	270							1.037	
	4	305	295	280	270	260	250	240	230	225	0.999	
	5	315	300	290	275	265	255	245	240	230	0.964	
	6	325	310	295	285	275	265	255	245	235	0.930	
	7	335	320	305	295	280	270	260	255	245	0.899	
	8	345	330	315	300	290	280	270	260	250	0.870	
	9	350	335	320	310	295	285	275	265	255	0.843	
	10	360	345	330	315	305	295	285	275	265	0.818	
	11	370	355	340	325	315	300	290	280	270	0.794	
	12	380	365	345	335	320	310	295	285	275	0.771	
	13	390	370	355	340	330	315	305	295	285	0.750	
	<b>l, in4/ft</b>		<b>Nominal Shear Strength due to Panel Buckling, <math>S_{nb}</math> plf</b>									
	1.672		10299	9423	8654	7975	7374	6838	6358	5927	5538	

	$\phi_{df}$	$\Omega_{df}$
Buckling	0.80	2.00

<sup>1</sup>Nominal shear strength of bare deck shown above may be limited by shear buckling.

<sup>2</sup>Design Strengths: ASD Required strength (Service Applied Load)  $\leq \text{Min} \{S_{nf} / \Omega_{df}, S_{nb} / \Omega_{db}\}$  • LRFD Required strength (Factored Applied Load)  $\leq \text{Min} \{\phi_{df}S_{nf}, \phi_{db}S_{nb}\}$