

PAT and Gas-Actuated Fasteners — Allowable Tension Loads in Normal-Weight Concrete

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Direct Shank Minimum Minimum Minimum								llowable Tensio	n Load — lb. (k	N)	
Fastening Type	Model No.		Penetration In. (mm)	Edge Distance In. (mm)		f' _c ≥ 2,000 psi (13.8 MPa) Concrete	$\begin{array}{l} {\rm f'_c \geq 2,\!500~psi} \\ {\rm (17.2~MPa)} \\ {\rm Concrete} \end{array}$	$\begin{array}{c} {f'}_c \geq 3{,}000 \text{ psi} \\ (20.7 \text{ MPa}) \\ \text{Concrete} \end{array}$	$\begin{array}{l} \text{f'}_\text{c} \geq 4,\!000 \text{ psi} \\ \text{(27.6 MPa)} \\ \text{Concrete} \end{array}$	$\begin{array}{l} \text{f'}_\text{c} \geq 5{,}000 \text{ psi} \\ \text{(34.5 MPa)} \\ \text{Concrete} \end{array}$	$\begin{array}{c} {f'}_c \geq 6,\!000 \; psi \\ (41.3 \; MPa) \\ Concrete \end{array}$
			3/4 (19)	3.5 (89)	5 (127)	_	110 (0.49)	110 (0.49)	110 (0.49)	_	110 (0.49)
	PDPA PDPAT	0.157	1 (25)	3.5 (89)	5 (127)	_	210 (0.93)	240 (1.07)	310 (1.38)	_	160 (0.71)
	PDPAW PDPAWL	(4.0)	1 1/4 (32)	3.5 (89)	5 (127)	_	320 (1.42)	340 (1.51)	380 (1.69)	_	365 (1.62)
			1½ (38)	3.5 (89)	5 (127)	_	375 (1.67)	400 (1.78)	450 (2.00)	_	465 (2.07)
Powder Actuated	PDPWL-SS	0.145 (3.7)	1 (25)	3 (76)	4 (102)	60 (0.27)	_	_	_	_	_
	PHN	PHN 0.145 (3.7)	3/4 (19)	3 (76)	4 (102)	_	_		60 (0.27)	_	_
			1 (25)	3 (76)	4 (102)	45 (0.20)	70 (0.31)	100 (0.44)	150 (0.67)	_	150 (0.67)
			1 1/4 (32)	3 (76)	4 (102)	140 (0.62)	195 (0.87)	255 (1.13)	370 (1.65)	_	370 (1.65)
	PSLV3	0.205 (5.2)	1 1/4 (32)	4 (102)	6 (152)	_	260 (1.16)	_	_	_	_
	GDP	0.106	5% (16)	3 (76)	4 (102)	25 (0.11)	25 (0.11)	30 (0.13)	45 (0.20)	45 (0.20)	_
Gas	GDP	(2.7)	3/4 (19)	3 (76)	4 (102)	30 (0.13)	30 (0.13)	30 (0.13)	30 (0.13)	30 (0.13)	_
Actuated	GW-75	0.125	5% (16)	3 (76)	4 (102)	60 (0.27)	65 (0.29)	70 (0.31)	95 (0.42)	_	_
	C_{1} C_{1} C_{1} C_{1} C_{1} C_{2} C_{3} C_{1} C_{3} C_{3	(3.2)	3/4 (19)	3 (76)	4 (102)	85 (0.38)	95 (0.42)	105 (0.47)	190 (0.85)	_	_

- 1. The fasteners must not be driven until the concrete has reached the designated minimum compressive strength.
- 2. Minimum concrete thickness must be three times the fastener embedment into the concrete.
- 3. The allowable tension and shear values are only for the fastener in the concrete. Members connected to the concrete must be investigated in accordance with accepted design criteria.

PAT and Gas-Actuated Fasteners — Allowable Shear Loads in Normal-Weight Concrete



Direct	Shank		Minimum	Minimum	Minimum		F	Allowable Shear	Load — lb. (kN)	
	Model No.		Penetration In. (mm)	Edge Distance In. (mm)	Spacing In. (mm)	f' _c ≥ 2,000 psi (13.8 MPa) Concrete	f' _c ≥ 2,500 psi (17.2 MPa) Concrete	$\begin{array}{c} \text{f'}_\text{c} \geq 3,\!000 \text{ psi} \\ \text{(20.7 MPa)} \\ \text{Concrete} \end{array}$	$\begin{array}{c} f'_c \geq 4{,}000 \; psi \\ (27.6 \; MPa) \\ Concrete \end{array}$	$\begin{array}{c} {\rm f^i}_c \geq 5{,}000 \; psi \\ {\rm (34.5 \; MPa)} \\ {\rm Concrete} \end{array}$	$\begin{array}{c} f'_c \geq 6,000 \; psi \\ (41.3 \; MPa) \\ Concrete \end{array}$
			3/4 (19)	3.5 (89)	5 (127)	_	120 (0.53)	125 (0.56)	135 (0.60)	_	130 (0.58)
	PDPA PDPAT	0.157	1 (25)	3.5 (89)	5 (127)	_	285 (1.27)	290 (1.29)	310 (1.38)	_	350 (1.56)
	PDPAWL PDPAWL	(4.0)	1 1/4 (32)	3.5 (89)	5 (127)	_	360 (1.60)	380 (1.69)	420 (1.87)	_	390 (1.73)
Powder			1 ½ (38)	3.5 (89)	5 (127)	_	405 (1.80)	430 (1.91)	485 (2.16)	_	495 (2.20)
Actuated	PDPWL-SS	0.145 (3.7)	1 (25)	3 (76)	4 (102)	195 (0.87)	_	_	_	_	_
	PHN		3/4 (19)	3 (76)	4 (102)		_	_	95 (0.42)	_	_
		0.145 (3.7)	1 (25)	3 (76)	4 (102)	120 (0.53)	140 (0.62)	165 (0.73)	205 (0.91)	_	205 (0.91)
			1 ½ (32)	3 (76)	4 (102)	265 (1.18)	265 (1.18)	265 (1.18)	265 (1.18)	_	265 (1.18)
	GDP	0.106	5/8 (16)	3 (76)	4 (102)	25 (0.11)	25 (0.11)	25 (0.11)	25 (0.11)	25 (0.11)	_
Gas	GDI	(2.7)	3/4 (19)	3 (76)	4 (102)	45 (0.20)	50 (0.22)	55 (0.24)	75 (0.33)	75 (0.33)	_
Actuated	GW-75	0.125	5/8 (16)	3 (76)	4 (102)	55 (0.24)	60 (0.27)	65 (0.29)	95 (0.42)	_	_
	GW-100 GTH	(3.2)	3/4 (19)	3 (76)	4 (102)	120 (0.53)	135 (0.60)	145 (0.64)	215 (0.96)	_	_

- 1. The fasteners must not be driven until the concrete has reached the designated minimum compressive strength.
- 2. Minimum concrete thickness must be three times the fastener embedment into the concrete.
- 3. The allowable tension and shear values are only for the fastener in the concrete. Members connected to the concrete must be investigated in accordance with accepted design criteria.

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^{*} See page 12 for an explanation of the load table icons.



PAT and Gas-Actuated Assemblies — Allowable Tension Loads in Normal-Weight Concrete





Direct		Shank	Minimum	Minimum	Minimum		A	llowable Tension	n Load — lb. (kl	V)	
Fastening Type	Model No.		Penetration In. (mm)	Penetration Edge		$\begin{array}{c} f'_c \geq 2,\!000 \; psi \\ (13.8 \; MPa) \\ Concrete \end{array}$	$\begin{array}{c} f'_c \geq 2{,}500 \; psi \\ (17.2 \; MPa) \\ Concrete \end{array}$	$\begin{array}{c} f'_c \geq 3{,}000 \; psi \\ (20.7 \; MPa) \\ Concrete \end{array}$	$\begin{array}{c} \text{f'}_c \geq 4,\!000 \text{ psi} \\ \text{(27.6 MPa)} \\ \text{Concrete} \end{array}$	$\begin{array}{c} \text{f'}_\text{c} \geq 5{,}000 \text{ psi} \\ \text{(34.5 MPa)} \\ \text{Concrete} \end{array}$	$\begin{array}{c} f'_c \geq 6,\!000 \; psi \\ (41.3 \; MPa) \\ Concrete \end{array}$
	PCLDPA	0.157	1 (25)	3.5 (89)	5 (102)	175 (0.78)	_	_	180 (0.80)	_	190 (0.85)
	PULDPA	(4.0)	1 1/4 (32)	3.5 (89)	5 (102)	210 (0.93)	_	_	210 (0.93)	_	190 (0.85)
Powder Actuated	PECLDPA	0.157 (4.0)	1 (25)	3.5 (89)	5 (102)	180 (0.80)	_	_	155 (0.69)	_	180 (0.80)
	PTRHA3	0.157	1 (25)	3.5 (89)	5 (102)	180 (0.80)	_	_	190 (0.85)	_	180 (0.80)
	PTRHA4	(4.0)	1 1/4 (32)	3.5 (89)	5 (102)	185 (0.82)		_	220 (0.98)	_	190 (0.85)
Gas	GRH25 GRH37	0.125 (3.2)	3/4 (19)	3 (76)	4 (102)		85 (0.38)	115 (0.51)	160 (0.71)	165 (0.73)	165 (0.73)
Actuated	CAC	0.125	3/4	3	4		105	120	150	170	195

- 1. The fasteners must not be driven until the concrete has reached the designated minimum compressive strength.
- 2. Minimum concrete thickness must be three times the fastener embedment into the concrete.

(3.2)

3. The allowable tension values are only for the fastener in the concrete. Members connected to the concrete must be investigated in accordance with accepted design criteria.

PAT and Gas-Actuated Assemblies — Allowable Oblique Loads in Normal-Weight Concrete





(0.87)



		Shank	Minimum	Minimum	Minimum	Allowable Oblique Load — lb. (kN)						
Direct Fastening Type	Model No.			Edge Distance In. (mm)	Spacing 1 In. (mm)		f' _c ≥ 2,500 psi (17.2 MPa) Concrete	f¹ _c ≥ 3,000 psi (20.7 MPa) Concrete	f' _c ≥ 4,000 psi (27.6 MPa) Concrete	f' _c ≥ 5,000 psi (34.5 MPa) Concrete	f' _c ≥ 6,000 psi (41.3 MPa) Concrete	
DOLL	PCLDPA	0.157	1 (25)	3.5 (89)	5 (102)	255 (1.13)	_	_	240 (1.07)	_	245 (1.09)	
Powder Actuated	PULDPA	(4.0)	1 1/4 (32)	3.5 (89)	5 (102)	250 (1.11)	_	_	265 (1.18)	_	265 (1.18)	
	PECLDPA	0.157 (4.0)	1 (25)	3.5 (89)	5 (102)	225 (1.00)	_	_	230 (1.02)	_	255 (1.13)	
Gas Actuated	GAC	0.125 (3.2)	3/4 (19)	3 (76)	4 (102)	_	130 (0.58)	135 (0.60)	145 (0.64)	155 (0.69)	175 (0.78)	

- 1. The fasteners must not be driven until the concrete has reached the designated minimum compressive strength.
- 2. Minimum concrete thickness must be three times the fastener embedment into the concrete.
- 3. The allowable oblique values are only for the fastener in the concrete. Members connected to the concrete must be investigated in accordance with accepted design criteria.
- 4. Oblique load direction is 45° from the concrete member surface.

Direct Fastening

Gas- and Powder-Actuated Pins Design Information - Concrete



PAT Fasteners — Allowable Tension and Shear Loads for Attachment of Wood Sill Plates to Normal-Weight Concrete







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		Overall	Nominal Head	I Shank	Washer	Washer	f' _c ≥ 2,000 ps	si (13.8 MPa)	f' _c ≥ 2,500 psi (17.2 MPa)	
Direct Fastening Type	Model No.	Length In. (mm)	Diameter In. (mm)	Diameter In. (mm)	Thickness In. (mm)	Bearing Area In ² (mm ²)	Allow. Tension Load lb. (kN)	Allow. Shear Load lb. (kN)	Allow. Tension Load Ib. (kN)	Allow. Shear Load lb. (kN)
	PDPAW-287	2 % (73)	0.300 (7.6)	0.157 (4.0)	0.070 (1.8)	0.424 (274)	_	_	200 (0.89)	205 (0.91)
Powder Actuated	PDPAWL-287 PDPAWL-287MG	2 % (73)	0.300 (7.6)	0.157 (4.0)	0.070 (1.8)	0.767 (495)	_	_	200 (0.89)	205 (0.91)
	PHNW-72	2 % (73)	0.315 (8.0)	0.145 (3.7)	0.070 (1.8)	0.770 (497)	125 (0.56)	150 (0.67)		_

- 1. The fasteners must not be driven until the concrete has reached the designated minimum compressive strength.
- 2. Minimum concrete thickness must be three times the fastener embedment into the concrete.
- 3. The allowable tension and shear values are only for the fastener in the concrete. Members connected to the concrete must be investigated in accordance with accepted design criteria.
- 4. Minimum concrete edge distance is 1¾ inches.
- 5. Only mechanically galvanized fasteners may be used to attach preservative-treated wood to concrete.
- 6. Minimum spacing shall be 4" on center.

Spacing of PAT Fasteners for Attachment of Wood Sill Plates to Normal-Weight Concrete



	Direct Fastening Type	Model No.	Overall Length In. (mm)	Nominal Head Diameter In. (mm)	Shank Diameter In. (mm)	Maximum Spacing In. (mm) Interior Nonstructural Walls ²
						Trano
	Powder Actuated	PHNW-72 ³	27/8 (73)	0.315 (8.0)	0.145 (3.7)	36 (914)
		PDPAW-287 ⁴ PDPAWL-287 ⁴ PDPAWL-287MG ⁴	2 % (73)	0.300 (7.6)	0.157 (4.0)	48 (1219)

- 1. Spacings are based upon the attachment of 2-inch (nominal thickness) wood sill plates, with specific gravity of 0.50 or greater, to concrete floor slabs or footings.
- 2. All walls shall have fasteners placed at 6 inches from ends of sill plates, with maximum spacing as shown in the table.
- 3. Fasteners shall not be driven until the concrete has reached a compressive strength of 2,000 psi. Minimum edge distance is 1% inches.
- 4. Fasteners shall not be driven until the concrete has reached a compressive strength of 2,500 psi. Minimum edge distance is 1¾ inches.
- 5. The maximum horizontal transverse load on the wall shall be 5 psf.
- 6. The maximum wall height shall be 14 feet.
- 7. For exterior walls and interior structural walls, this table is not applicable and allowable loads must be used .
- 8. Walls shall be laterally supported at the top and the bottom.
- 9. Minimum spacing shall be 4" on center.
- 10. Only mechanically galvanized fasteners may be used to attach preservative-treated wood to concrete.

^{*} See page 12 for an explanation of the load table icons.



PAT and Gas-Actuated Fasteners — Allowable Tension Loads in Sand-Lightweight Concrete over Metal Deck

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					Allowat	ole Tension Loa	d — lb. (kN)	
Direct Fastening Type	Model No.	Shank Diameter In. (mm)	Minimum Penetration In. (mm)	Installed in Concrete ⁴	Installed Thru. 3" "W" Deck with 31/4" Concrete Fill ⁵		Installed Thru. 1.5" "B" Deck with 21/4" Concrete Fill ⁷	Installed Thru. 1.5" "B" Deck with 2" Concrete Fill ⁸
					f' _c ≥ 3,0	00 psi (20.7 MI	Pa) Concrete	
			3/4 (19)	85 (0.38)	105 (0.47)	_	_	160 (0.71)
	PDPA PDPAT	0.157	1 (25)	150 (0.67)	145 (0.64)	_	_	210 (0.93)
	PDPAW PDPAWL	(4.0)	1 1/4 (32)	320 (1.42)	170 (0.76)	_	_	265 (1.18)
Powder Actuated			1 ½ (38)	385 (1.71)	325 (1.45)	_	_	_
	PHNT	0.145 (3.7)	7/8 (22)	185 (0.82)	165 (0.73)	_	_	_
	PSLV3	0.205 (5.2)	1 1/4 (32)	_	225 (1.00)	_	_	_
	PSLV4	0.150 (3.8)	1 (25)	<u>—</u>	80 (0.36)	<u>—</u>	_	_
	GDP	0.106	5% (16)	75 (0.33)	_	60 (0.27)	65 (0.29)	_
Gas Actuated	GDP	(2.7)	3/4 (19)	105 (0.47)	_	60 (0.27)	130 (0.58)	_
	GW-75 GW-100	0.125	5/8 (16)	60 (0.27)		35 (0.16)		_
	GW-100 GTH	(3.2)	3/4 (19)	115 (0.51)	_	55 (0.24)	_	_

- 1. The fastener shall not be driven until the concrete has reached the designated compressive strength.
- 2. The allowable tension values are for the fastener only. Members connected to the steel must be invesigated separately in accordance with accepted design criteria.
- 3. Metal deck must be minimum 20 gauge and have a minimum yield strength of 38,000 psi.
- 4. The minimum fastener spacing is 4". The minimum edge distances are 31/2" and 3" for powder-actuated fasteners and gas-actuated fasteners, respectively.
- 5. The fastener shall be installed minimum 11/2" from the edge of flute and 4" from the end of the deck. The minimum fastener spacing is 4".
- 6. The fastener shall be installed minimum 1" from the edge of flute and 3" from the end of the deck. The minimum fastener spacing is 4". For GW and GTH fasteners, the fastener must be a minimum of 11/6" from the edge of flute.
- 7. The fastener shall be installed minimum 7/8" from the edge of flute. For inverted 1.5" "B" deck configuration, the fastener must be a minimum of 1" from the edge of flute. Fastener must be installed mininim 3" from the end of the deck. The minimum fastener spacing is 4".
- 8. The fastener shall be installed minimum 1/8" from the edge of flute and 4" from the end of the deck. The minimum fastener spacing is 4".

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PAT and Gas-Actuated Fasteners — Allowable Shear Loads in Sand-Lightweight Concrete over Metal Deck



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					Allowabl	e Shear Load —	– Ib. (kN)	
Direct Fastening Type	Model No.	Shank Diameter In. (mm)	Minimum Penetration In. (mm)	Installed in Concrete ⁹	Installed Thru. 3" "W" Deck with 31/4" Concrete Fill ⁵	3" "W" Deck with 21/4"	Installed Thru. 1.5" "B" Deck with 21/4" Concrete Fill ⁷	
					f¹ _c ≥ 3,000	0 psi (20.7 MPa)) Concrete	
			3/4 (19)	105 (0.47)	280 (1.25)	_	_	275 (1.22)
	PDPA PDPAT PDPAW PDPAWL	0.157	1 (25)	225 (1.00)	280 (1.25)	_	_	370 (1.65)
Powder Actuated		(4.0)	1 1/4 (32)	420 (1.87)	320 (1.42)	_	_	460 (2.05)
			1½ (38)	455 (2.02)	520 (2.31)	_	_	_
	PHNT	0.145 (3.7)	7/8 (22)	275 (1.22)	400 (1.78)	_	_	_
	GDP	0.106	5% (16)	35 (0.16)	_	180 (0.80)	195 (0.87)	_
Gas Actuated	QDI	(2.7)	3/4 (19)	140 (0.62)	_	180 (0.80)	270 (1.20)	_
	GW-75 GW-100	0.125	5% (16)	110 (0.49)	_	215 (0.96)	_	_
	GTH	(3.2)	3/4 (19)	130 (0.58)	_	235 (1.05)	_	_

- 1. The fastener shall not be driven until the concrete has reached the designated compressive strength.
- The allowable shear values are for the fastener only. Members connected to the steel must be investigated separately in accordance with accepted design criteria.
- 3. Metal deck must be minimum 20 gauge and have a minimum yield strength of 38,000 psi.
- 4. Shear values are for loads applied toward edge of flute.
- 5. The fastener shall be installed minimum 11/2" from the edge of flute and 4" from the end of the deck. The minimum fastener spacing is 4".
- 6. The fastener shall be installed minimum 1" from the edge of flute and 3" from the end of the deck. The minimum fastener spacing is 4". For GW and GTH fasteners, the fastener must be a minimum of 11%" from the edge of flute.
- 7. The fastener shall be installed minimum ½" from the edge of flute. For inverted 1.5" "B" deck configuration, the fastener must be a minimum of 1" from the edge of flute. Fastener must be installed minimim 3" from the end of the deck. The minimum fastener spacing is 4".
- 8. The fastener shall be installed minimum 1/8" from the edge of flute and 4" from the end of the deck. The minimum fastener spacing is 4".
- 9. The minimum fastener spacing is 4". The minimum edge distances are 3½" and 3" for powder-actuated fasteners and gas-actuated fasteners, respectively.

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Gas- and Powder-Actuated Pins Design Information - Concrete



PAT and Gas-Actuated Assemblies – Allowable Tension Loads in Sand-Lightweight Concrete over Metal Deck





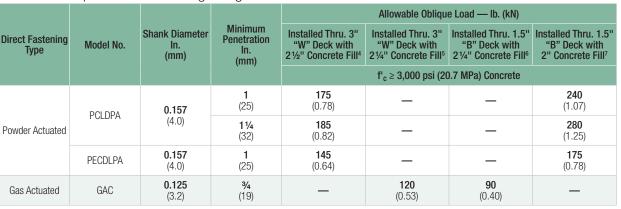


					Allowable Tension	ı Load — Ib. (kN)		
Direct Fastening Type	Model No.	Shank Diameter In. (mm)	Minimum Penetration In. (mm)	Installed Thru. 3" "W" Deck with 2½" Concrete Fill ⁴	Installed Thru. 3" "W" Deck with 2¼" Concrete Fill ⁵	Installed Thru. 1.5" "B" Deck with 21/4" Concrete Fill ⁶	Installed Thru. 1.5" "B" Deck with 2" Concrete Fill ⁷	
			, ,		f' _c ≥ 3,000 psi (20	0.7 MPa) Concrete		
	PTRHA3	0.157	1 (25)	160 (0.71)	_	_	175 (0.78)	
	PTRHA4	(4.0)	1 1/4 (32)	160 (0.71)	_	_	175 (0.78)	
Powder Actuated		PCLDPA	0.157	1 (25)	140 (0.62)	_	_	160 (0.71)
	FOLDFA	(4.0)	1 1/4 (32)	160 (0.71)	_	_	180 (0.80)	
	PECDLPA	0.157 (4.0)	1 (25)	120 (0.53)	_	_	135 (0.60)	
Con Antivoted	GRH25 GRH37	0.125 (3.2)	3/4 (19)	_	95 (0.42)	95 (0.42)	_	
Gas Actuated	GAC	0.125 (3.2)	3/4 (19)	_	105 (0.47)	90 (0.40)	_	

- 1. The fastener shall not be driven until the concrete has reached the designated compressive strength.
- The allowable tension values are for the fastener only. Members connected to the steel must be investigated separately in accordance with accepted design criteria.
- 3. Metal deck must be minimum 20 gauge and have a minimum yield strength of 38,000 psi.
- 4. The fastener shall be installed minimum 11/2" from the edge of flute and 4" from the end of the deck. The minimum fastener spacing is 4".
- 5. The fastener shall be installed minimum 1" from the edge of flute and 3" from the end of the deck. The minimum fastener spacing is 4".
- 6. The fastener shall be installed minimum 7/8" from the edge of flute and 3" from the end of the deck. The minimum fastener spacing is 4".
- 7. The fastener shall be installed minimum 7/8" from the edge of flute and 4" from the end of the deck. The minimum fastener spacing is 4".

PAT and Gas-Actuated Assemblies – Allowable Oblique Loads in Sand-Lightweight Concrete over Metal Deck





- 1. The fastener shall not be driven until the concrete has reached the designated compressive strength.
- 2. The allowable oblique values are for the fastener only. Members connected to the steel must be investigated separately in accordance with accepted design criteria.
- 3. Metal deck must be minimum 20 gauge and have a minimum yield strength of 38,000 psi.
- 4. The fastener shall be installed minimum 11/2" from the edge of flute and 4" from the end of the deck. The minimum fastener spacing is 4".
- 5. The fastener shall be installed minimum 1" from the edge of flute and 3" from the end of the deck. The minimum fastener spacing is 4".
- 6. The fastener shall be installed minimum 1/8" from the edge of flute and 3" from the end of the deck. The minimum fastener spacing is 4".
- 7. The fastener shall be installed minimum %" from the edge of flute and 4" from the end of the deck. The minimum fastener spacing is 4".
- 8. Oblique load direction is 45° from the concrete member surface.



PAT and Gas-Actuated Fasteners — Allowable Tension and Shear Loads in Hollow CMU



		Shank Diameter	Minimum	Minimum Edge	Minimum	8-inch Hollow CMU Loads Based on CMU Strength		
Direct Fastening Type	Model No.	ln.	Penetration In.	Distance In.	Spacing In.	Tension Load	Shear Load	
.,,,,,		(mm)	(mm)	(mm)	(mm)	Allowable lb. (kN)	Allowable lb. (kN)	
Powder Actuated	PDPA PDPAT PDPAW PDPAWL	0.157 (4.0)	13/4 (44)	4 (102)	8 (203)	125 ¹ (0.56)	210 ¹ (0.93)	
Gas Actuated	GDP	0.106 (2.7)	⁵ / ₈ (16)	3 (76)	8 (203)	35 ¹ (0.16)	50 ¹ (0.22)	
	GW-75 GW-100 GTH	0.125 3.2)	5/8 (16)	3 (76)	8 (203)	55 ² (0.24)	65 ² (0.29)	

^{1.} Values for 8-inch-thick lightweight concrete masonry units conforming to ASTM C90. Values for 8-inch-thick medium-weight concrete masonry units conforming to ASTM C90.

PAT and Gas-Actuated Fasteners — Allowable Tension Loads in Steel¹



Direct		Shank	Minimum	Minimum		Allowabic iclision Load ib. (Kiv)						
Fastening Type	Model No.	Diameter ¹⁰ In. (mm)	Edge Distance In. (mm)	Spacing In. (mm)	Minimum Steel Strength ³	1/8" Thick Steel	3/16" Thick Steel	1/4" Thick Steel	%" Thick Steel	½" Thick Steel	¾" Thick Steel	
	PDPA PDPAT PDPAW PDPAWL		0.5 (13)	1 (25)	ASTM A36	_	260 (1.16)	370 (1.65)	380 ⁷ (1.69)	530 ⁷ (2.36)	195 ⁴ (0.87)	
Powder Actuated		(4.0)	0.5 (13)	1 (25)	ASTM A572 Gr. 50 or ASTM A992	_	305 (1.36)	335 (1.49)	355 ⁷ (1.58)	485 ⁵ (2.16)	170 ⁶ (0.76)	
	PHN	0.145 (3.7)	0.5 (13)	1 (25)	ASTM A36	_	155 (0.69)	_	_	_	_	
	PHN Knurled ¹¹	0.145 (3.7)	0.5 (13)	1 (25)	ASTM A36	_	155 (0.69)	440 (1.96)	_	_	_	
	PHNT	0.145 (3.7)	0.5 (13)	1 (25)	ASTM A36	40 (0.18)	50 (0.22)	250 (1.11)	_	_	_	
	PSLV3	0.205 (5.2)	1 (25)	1 ½ (38)	ASTM A36	_	270 (1.20)	680 (3.02)	_	_	_	
	PSLV3- 12575K	0.205 (5.2)	1 (25)	1 ½ (38)	ASTM A36	_	270 (1.20)	870 (3.87)	_	_	_	
	PSLV4	0.150 (3.8)	0.5 (13)	1 (25)	ASTM A36		200 (0.89)	420 (1.87)	_	_	_	
Gas Actuated	GDP 0.106 (2.7)	CDD	0.106	0.5 (13)	1 (25)	ASTM A36	125 (0.56)	210 (0.93)	220 (0.98)	_	_	_
		(2.7)	0.5 (13)	1 (25)	ASTM A572 Gr. 50 or ASTM A992		225 (1.00)	185 (0.82)	_	_	_	
	GDPS	GDPS 0.118/0.102 (3.0/2.6)	0.5 (13)	1 (25)	ASTM A36	_	95 (0.42)	170 (0.76)	165 ⁸ (0.73)	145 ⁸ (0.64)	_	
			0.5 (13)	1 (25)	ASTM A572 Gr. 50 or ASTM A992	_	110 (0.49)	170 (0.76)	155 ⁸ (0.69)	_	_	
	CW EO	0.128/0.110	0.5 (13)	1 (25)	ASTM A36	_	225 (1.00)	275 (1.22)	245 ⁹ (1.09)	_	_	
	GW-50	(3.3/2.8)	0.5 (13)	1 (25)	ASTM A572 Gr. 50 or ASTM A992	_	240 (1.07)	215 ⁹ (0.96)	280 ⁹ (1.25)	_	_	

- 1. The entire pointed portion of the fastener must penetrate through the steel to obtain the tabulated values, unless otherwise indicated.
- 2. The allowable tension values are for the fastener only. Members connected to the steel must be investigated separately in accordance with accepted design criteria.
- Steel strength must comply with the minimum requirements of ASTM A 36 ($F_V =$ 36 ksi, $F_u = 58$ ksi), ASTM A 572, Grade 50 ($F_y = 50$ ksi, $F_u = 65$ ksi), or ASTM A992 ($F_y = 50 \text{ ksi}, F_u = 65 \text{ ksi}$).
- 4. Based upon minimum penetration depth of 0.46" (11.7 mm).

- 5. Based upon minimum penetration depth of 0.58" (14.7 mm).
- 6. Based upon minimum penetration depth of 0.36" (9.1 mm).
- 7. The fastener must be driven to where the point of the fastener penetrates through the steel.
- 8. Based upon minimum penetration depth of 0.35" (8.9 mm).
- 9. Based upon minimum penetration depth of 0.25" (6.4 mm).
- 10. For stepped shank fasteners: (Diameter of shank above the step)/(Diameter of shank below the step.)
- 11. PHN-16K or longer.

Direct Fastening

^{2.} Minimum penetration is measured from the outside face of the concrete masonry unit. No more than one fastener may be installed in an individual hollow CMU cell.

^{*} See page 12 for an explanation of the load table icons.









PAT and GAS Fasteners — Allowable Shear Loads in Steel¹

Direct	Model No.	Shank Diameter ¹⁰ In. (mm)	Minimum Edge Distance						able Shear Load — lb. (kN)				
Fastening Type			In. (mm)	In. (mm)	Strength ³	1/8" Thick Steel	3/16" Thick Steel	1/4" Thick Steel	%" Thick Steel	½" Thick Steel	¾" Thick Steel		
	PDPA, PDPAT, PDPAW, PDPAWL	0.157	0.5	1	ASTM A36	_	410 (1.82)	365 (1.62)	385 ⁷ (1.71)	385 ⁷ (1.71)	325 ⁴ (1.45)		
		(4.0)	(13)	(25)	ASTM A572 Gr. 50 or ASTM A992	_	420 (1.87)	365 (1.62)	290 ⁷ (1.29)	275 ⁷ (1.22)	275 ⁷ (1.22)		
	PHN	0.145 (3.7)	0.5 (13)	1 (25)	ASTM A36	_	395 (1.76)	_	_	_	_		
Powder	PHN Knurled ¹¹	0.145 (3.7)	0.5 (13)	1 (25)	ASTM A36	_	395 (1.76)		_	_	_		
Actuated	PHNT	0.145 (3.7)	0.5 (13)	1 (25)	ASTM A36	440 (1.96)	620 (2.76)	620 (2.76)	_	_	_		
	PSLV3	0.205 (5.2)	1 (25)	1½ (38)	ASTM A36	_	770 (3.43)	1,120 (4.98)	_	_	_		
	PSLV3-12575K	0.205 (5.2)	1 (25)	1½ (38)	ASTM A36	_	930 (4.14)	1,130 (5.03)	_	_	_		
	PSLV4	0.150 (3.8)	0.5 (13)	1 (25)	ASTM A36	_	630 (2.80)	690 (3.07)	_	_	_		
	GDP	0.106	0.5 (13)	1 (25)	ASTM A36	285 (1.27)	225 (1.00)	205 (0.91)	_	_	_		
		(2.7)	0.5 (13)	1 (25)	ASTM A572 Gr. 50 or ASTM A992	_	250 (1.11)	145 (0.64)	_	_	_		
Gas	GDPS	0.118/0.102 (3.0/2.6)	0.5 (13)	1 (25)	ASTM A36	_	180 (0.80)	265 (1.18)	225 ⁸ (1.00)	225 ⁸ (1.00)	_		
Actuated			0.5 (13)	1 (25)	ASTM A572 Gr. 50 or ASTM A992	_	205 (0.91)	305 (1.36)	205 ⁸ (0.91)	_	_		
	GW-50	0.128/0.110 (3.3/2.8)	0.5 (13)	1 (25)	ASTM A36	_	400 (1.78)	345 (1.53)	310 ⁹ (1.38)	_	_		
			0.5 (13)	1 (25)	ASTM A572 Gr. 50 or ASTM A992	_	380 (1.69)	325 ⁹ (1.45)	350 ⁹ (1.56)	_	_		

- 1. The entire pointed portion of the fastener must penetrate through the steel to obtain the tabulated values, unless otherwise indicated.
- 2. The allowable shear values are for the fastener only. Members connected to the steel must be investigated separately in accordance with accepted design criteria.
- 3. Steel strength must comply with the minimum requirements of ASTM A 36 (F_y = 36 ksi, F_u = 58 ksi), ASTM A 572, Grade 50 (F_y = 50 ksi, F_u = 65 ksi), or ASTM A992 (F_y = 50 ksi, F_u = 65 ksi).
- 4. Based upon minimum penetration depth of 0.46" (11.7 mm).
- 5. Based upon minimum penetration depth of 0.58" (14.7 mm).
- 6. Based upon minimum penetration depth of 0.36" (9.1 mm).
- 7. The fastener must be driven to where the point of the fastener penetrates through the steel.
- 8. Based upon minimum penetration depth of 0.35" (8.9 mm).
- 9. Based upon minimum penetration depth of 0.25" (6.4 mm).
- 10. For stepped shank fasteners: (Diameter of shank above the step)/(Diameter of shank below the step).
- 11. PHN-16K or longer.



Spiral Knurl Pin Allowable Tension and Shear Loads in Cold-Formed Steel Studs, 33 ksi Minimum Yield Strength

	Shank	Minimum	Minimum	Designation	Allowable Loads		
Model No.	Diameter in. (mm)	Edge Dist. in. (mm)	Spacing in. (mm)	Thickness mils (gauge)	Tension lb. (kN)	Shear lb. (kN)	
CDDCV 100	0.109	¹³ / ₁₆	4 (102)	33 (20)	30 (0.13)	70 (0.31)	
GDPSK-138	(2.8)	(2.1)		43 (18)	48 (0.21)	89 (0.40)	

- 1. Entire pointed portion of the fastener must penetrate through the steel to obtain tabulated values.
- 2. The allowable tension and shear values are for the fastener only. Members connected to the steel must be investigated separately in accordance with accepted design criteria.
- 3. Fastener is to be installed in the center of the stud flange.

Spiral Knurl Pin Allowable Tension and Shear Loads in Cold-Formed Steel Studs. 50 ksi Minimum Yield Strength

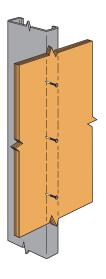
Steel Studs, 50 ks Millimitati field Strength								
	Shank	Minimum	Minimum	Designation	Allowable Loads			
Model No.	Diameter in. (mm)	Edge Dist. in. (mm)	Spacing in. (mm)	Thickness mils (gauge)	Tension lb. (kN)	Shear lb. (kN)		
GDPSK-138		¹³ / ₁₆	4	54 (16)	92 (0.41)	150 (0.67)		
		(2.1)	(102)	68 (14)	73 (0.32)	218 (0.97)		

- 1. Entire pointed portion of the fastener must penetrate through the steel to obtain tabulated values.
- 2. The allowable tension and shear values are for the fastener only. Members connected to the steel must be investigated separately in accordance with accepted design criteria.
- 3. Fastener is to be installed in the center of the stud flange.

PHN Fasteners Attaching Light-Gauge Steel Channels — Allowable Shear Loads in Normal-Weight Concrete

Model	Shank Diameter	Minimum Penetration	Light Gauge Steel Channel	Allowable Shear Load lb. (kN)	
No.	in. (mm)	in. (mm)	Thickness gauge	f' _c ≥ 2,000 psi (13.8 MPa) Concrete	
DUM	0.145 (3.7)	7/8 (22)	20	160 (0.71)	
PHN			18	135 (0.60)	

^{1.} The fasteners shall not be driven until the concrete has reached the designated compressive strength. Minimum concrete thickness is three times the faster embedment into the concrete.



Typical GDPSK Installation

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