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DROP-IN ANCHORS – STEEL ZINC AND STAINLESS STEEL

The following Specification Sheet applies to all **Drop-In Anchors – Steel Zinc and Stainless Steel** including those in our **DIA and JDIA** series.

Smooth/Lipless



Flanged/Lipped



Ultimate and Allowable Load Capacities for Steel Dropin in Normal-Weight Concrete^{1,2,3}

Rod/Anchor Diameter d in. (mm)	Minimum Embedment Depth in. (mm)	Tension						Shear	
		2,000 psi (13.8 MPa)		4,000 psi (27.6 MPa)		6,000 psi (41.4 MPa)		f'c ≥ 2000 psi (20.7 MPa)	
		Ultimate lbs. (kN)	Allowable lbs. (kN)	Ultimate lbs. (kN)	Allowable lbs. (kN)	Ultimate lbs. (kN)	Allowable lbs. (kN)	Ultimate lbs. (kN)	Allowable lbs. (kN)
1/4 (6.4)	1 (25.4)	1,140 (5.1)	285 (1.3)	1,985 (8.9)	495 (2.2)	2,080 (9.4)	520 (2.3)	2,120 (9.5)	530 (2.4)
3/8 (9.5)	1-9/16 (39.7)	2,180 (9.8)	545 (2.5)	4,180 (18.8)	1,045 (4.7)	4,950 (22.3)	1,240 (5.6)	4,585 (20.6)	1,145 (5.2)
1/2 (12.7)	2 (50.8)	4,105 (18.5)	1,025 (4.6)	5,760 (25.9)	1,440 (6.5)	6,585 (29.6)	1,645 (7.4)	6,400 (28.8)	1,600 (7.2)
5/8 (15.9)	2-1/2 (63.5)	4,665 (21.0)	1,165 (5.2)	7,440 (33.5)	1,860 (8.4)	10,920 (49.1)	2,730 (12.3)	12,380 (55.7)	3,095 (13.9)
3/4 (19.1)	3-3/16 (81.0)	8,580 (38.6)	2,145 (9.7)	9,405 (41.8)	2,350 (10.5)	11,300 (50.3)	2,825 (12.6)	15,680 (70.6)	3,920 (17.6)

1. Tabulated load values are applicable to carbon and stainless steel anchors.
2. Tabulated load values are for anchors installed in concrete. Concrete compressive strength must be at the specified minimum at the time of installation.
3. Ultimate load capacities must be reduced by a minimum safety factor of 4.0 or greater to determine allowable working load.

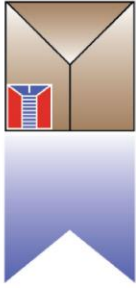
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Ultimate and Allowable Load Capacities for Steel Dropin in Lightweight Concrete^{1,2,3,4}

Rod/Anchor Diameter d in. (mm)	Minimum Embedment Depth in. (mm)	Tension						Shear	
		2,000 psi (13.8 MPa)		4,000 psi (27.6 MPa)		6,000 psi (41.4 MPa)		f'c ≥ 2000 psi (20.7 MPa)	
		Ultimate lbs. (kN)	Allowable lbs. (kN)	Ultimate lbs. (kN)	Allowable lbs. (kN)	Ultimate lbs. (kN)	Allowable lbs. (kN)	Ultimate lbs. (kN)	Allowable lbs. (kN)
1/4 (6.4)	1 (25.4)	1,060 (4.8)	265 (1.2)	1,360 (6.1)	340 (1.5)	1,660 (7.5)	415 (1.9)	1,920 (8.6)	480 (2.2)
3/8 (9.5)	1-9/16 (39.7)	3,040 (13.7)	760 (3.4)	3,780 (17.0)	945 (4.3)	4,520 (20.3)	1,130 (5.1)	4,120 (18.5)	1,030 (4.6)
1/2 (12.7)	2 (50.8)	4,240 (19.1)	1,060 (4.8)	4,840 (21.8)	1,210 (5.4)	5,460 (24.6)	1,365 (6.1)	5,680 (25.6)	1,420 (6.4)
5/8 (15.9)	2-1/2 (63.5)	6,860 (30.9)	1,715 (7.7)	7,840 (35.3)	1,960 (8.8)	8,840 (39.8)	2,210 (9.9)	9,640 (43.4)	2,410 (10.8)
3/4 (19.1)	3-3/16 (81.0)	10,280 (45.7)	2,570 (11.4)	11,700 (52.7)	2,925 (13.0)	13,120 (59.0)	3,280 (14.6)	15,680 (70.6)	3,920 (17.9)

1. Tabulated load values are applicable to carbon and stainless steel anchors.
2. Tabulated load values are for anchors installed in concrete. Concrete compressive strength must be at the specified minimum at the time of installation.
3. Ultimate load capacities must be reduced by a minimum safety factor of 4.0 or greater to determine allowable working load.
4. Allowable load capacities are multiplied by reduction factors found in the Design Criteria section when anchor spacing or edge distances are less than critical distances.

Allowable Load Capacities for Steel Dropin in Lightweight Concrete over Steel Deck^{1,2,3,4}

Rod/Anchor Diameter d in. (mm)	Minimum Embedment Depth h _v in. (mm)	Lightweight Concrete over Steel Deck, f'c ≥ 3,000 (20.7 MPa)							
		Minimum 1-1/2" Wide Deck				Minimum 4-1/2" Wide Deck			
		Ultimate Load		Allowable Load		Ultimate Load		Allowable Load	
		Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)
1/4 (6.4)	1 (25.4)	400 (1.8)	2,040 (9.2)	100 (0.4)	510 (2.3)	760 (3.4)	2,040 (9.2)	190 (0.8)	510 (2.3)
3/8 (9.5)	1-9/16 (39.7)	600 (2.7)	2,760 (12.3)	150 (0.7)	690 (3.1)	960 (4.3)	2,760 (12.3)	240 (1.1)	690 (3.1)
1/2 (12.7)	2 (50.8)	-	-	-	-	2,740 (12.3)	5,560 (25.0)	685 (3.1)	1,390 (6.3)

1. Tabulated load values are for carbon steel and stainless steel anchors installed in sand-lightweight concrete over steel deck. Concrete compressive strength must be at the specified minimum at the time of installation.
2. Allowable load capacities listed are calculated using and applied safety factor of 4.0.
3. Tabulated load values are for anchors installed in the center of the flute. Spacing distances shall be in accordance with the spacing table for lightweight concrete listed in the Design Criteria.
4. Flute edge distance equals one-half the minimum deck width.
5. Anchors are permitted to be installed in the lower or upper flute of the metal deck provided the proper installation procedures are maintained.

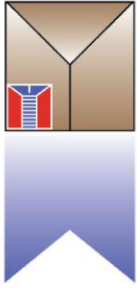
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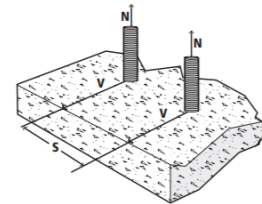
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Spacing, Tension (F_{NS}) & Shear (F_{VS})

Dia. (in.)	1/4	3/8	1/2	5/8	3/4	
h_v (in.)	1	1-1/2	2	2-1/2	3	
s_{cr} (in.)	3	4-1/2	6	7-1/2	9	
s_{min} (in.)	1-1/2	2-1/4	3	3-3/4	4-1/2	
Spacing Distance (inches)	1-1/2	0.50				
	2-1/4	0.75	0.50			
	3	1.00	0.67	0.50		
	3-3/4		0.83	0.63	0.50	
	4		0.89	0.67	0.53	
	4-1/2		1.000	0.75	0.60	0.50
	5			0.83	0.67	0.56
	6			1.00	0.80	0.67
	7-1/2				1.00	0.83
9					1.00	

Notes: For anchors loaded in tension and shear, the critical spacing (s_{cr}) is equal to 3 embedment depths ($3h_v$) at which the anchor achieves 100% of load.

Minimum spacing (s_{min}) is equal to 1.5 embedment depths ($1.5h_v$) at which the anchor achieves 50% of load.

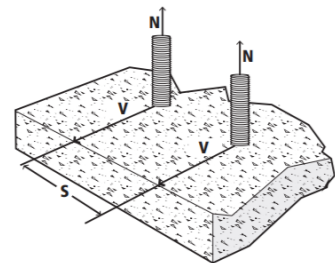


Edge Distance, Tension (F_{NC}) (Normal-Weight concrete only)

Dia. (in.)	1/4	3/8	1/2	5/8	3/4	
c_{cr} (in.)	3-1/2	5-1/4	7	8-3/4	10-1/2	
c_{min} (in.)	1-3/4	2-5/8	3-1/2	4-3/8	5-1/4	
Edge Distance, c (inches)	1-3/4	0.90				
	2	0.91				
	2-5/8	0.95	0.90			
	3	0.97	0.91			
	3-1/2	1.00	0.93	0.90		
	4-3/8		0.97	0.93	0.90	
	5-1/4		1.00	0.95	0.92	0.90
	6			0.97	0.94	0.91
	7			1.00	0.96	0.93
	8				0.98	0.95
8-3/4				1.00	0.97	
10-1/2					1.00	

Notes: For anchors loaded in tension, the critical edge (c_{cr}) is equal to 14 anchors diameters ($14d$) at which the anchor achieves 100% of load.

Minimum edge distance (c_{min}) is equal to 7 anchor diameters ($7d$) at which the anchor achieves 90% of load for normal-weight concrete and 80% of load for light-weight concrete.



Edge Distance, Tension (F_{NC}) (Lightweight concrete only)

Dia. (in.)	1/4	3/8	1/2	5/8	3/4	
c_{cr} (in.)	3-1/2	5-1/4	7	8-3/4	10-1/2	
c_{min} (in.)	1-3/4	2-5/8	3-1/2	4-3/8	5-1/4	
Edge Distance, c (inches)	1-3/4	0.80				
	2	0.83				
	2-5/8	0.90	0.80			
	3	0.94	0.83			
	3-1/2	1.00	0.87	0.80		
	4-3/8		0.93	0.85	0.80	
	5-1/4		1.00	0.90	0.84	0.80
	6			0.94	0.87	0.83
	7			1.00	0.92	0.87
	8				0.97	0.90
8-3/4				1.00	0.93	
10-1/2					1.00	

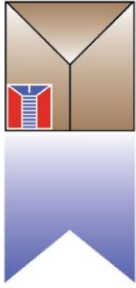
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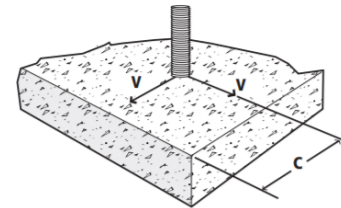
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Edge Distance, Shear (F_{vc})

Dia. (in.)		1/4	3/8	1/2	5/8	3/4
c _c (in.)		3-1/2	5-1/4	7	8-3/4	10-1/2
c _{min} (in.)		1-3/4	2-5/8	3-1/2	4-3/8	5-1/4
Edge Distance, c (inches)	1-3/4	0.50				
	2	0.57				
	2-5/8	0.75	0.50			
	3	0.86	0.57			
	3-1/2	1.00	0.67	0.50		
	4-3/8		0.83	0.63	0.50	
	5		0.95	0.71	0.57	
	5-1/4		1.00	0.75	0.60	0.50
	6			0.86	0.69	0.57
	7			1.00	0.80	0.67
	8				0.91	0.76
	8-3/4				1.00	0.83
10					0.95	
10-1/2					1.00	

Notes: For anchors loaded in shear, the critical edge distance (c_c) is equal to 14 anchor diameters (14d) at which the anchor achieves 100% of load.

Minimum edge distance (c_{min}) is equal to 7 anchor diameters (7d) at which the anchor achieves 50% of load.



MATERIAL SPECIFICATIONS

Anchor Component	Carbon Steel	Type 303 Stainless Steel	Type 316 Stainless Steel
Anchor Body	AISI 1008	Type 303 Stainless Steel	Type 316 Stainless Steel
Plug	AISI 1018	Type 303 Stainless Steel	Type 316 Stainless Steel
Zinc Plating	ASTM B633, SC1, Type III (Fe/Zn 5)	N/A	

Stainless steel anchor components are passivated.

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