

**Drive** Pre-Expanded Anchor

**PRODUCT DESCRIPTION**

The Drive is a one-piece, tamperproof, pre-expanded anchor available in carbon steel for use in concrete and stone. Tie-Wire Drive anchors are used for suspended ceiling applications. The flat head (counter-sunk) style is particularly suited for wood-to-concrete anchoring. The round head style can be used for all other applications requiring fast, permanent installations.

**GENERAL APPLICATIONS AND USES**

- Tamper Proof Applications
- Suspended Ceilings
- Cable Trays and Strut
- Fire Sprinkler and Pipe Supports

**FEATURES AND BENEFITS**

- Pre-expanded anchor design allows for easy installation.
- Round and flat head Drive anchors are tamper proof.

**APPROVALS AND LISTINGS**

Underwriters Laboratory (UL Listed) – File No. EX1289  
 Factory Mutual Research Corporation (FM Approvals) – J.I. OK4A9.AH  
 Federal GSA Specification – Meets the descriptive requirements of FF-S-325C, Group VI (superseded)

**GUIDE SPECIFICATIONS**

**CSI Divisions:** 03151-Concrete Anchoring and 05090-Metal Fastenings.  
 Pre-expanded Anchors shall be Drive anchors as supplied by Powers Fasteners, Inc., Brewster, NY.

**MATERIAL SPECIFICATIONS**

Anchor Component	Component Material
Anchor Body	Heat Treated AISI 1038
Zinc Plating	ASTM B633, SC1, Type III (Fe/Zn 5)

**INSTALLATION SPECIFICATIONS**

**Round Head Drive**

Dimension	Anchor Size, <i>d</i>			
	3/16"	1/4"	3/8"	1/2"
ANSI Drill Bit Size, <i>d<sub>bit</sub></i> (in.)	3/16	1/4	3/8	1/2
Fixture Clearance Hole, <i>d<sub>h</sub></i> (in.)	1/4	5/16	7/16	9/16
Head Height (in.)	3/32	1/8	3/16	1/4
Head Width (in.)	3/8	1/2	3/4	1

**Flat Head Drive**

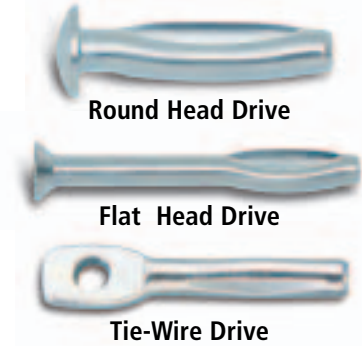
Dimension	Anchor Size, <i>d</i>	
	3/16"	1/4"
ANSI Drill Bit Size, <i>d<sub>bit</sub></i> (in.)	3/16	1/4
Fixture Clearance Hole, <i>d<sub>h</sub></i> (in.)	1/4	5/16
Head Height (in.)	7/64	9/64
Head Width (in.)	3/8	1/2

**Tie-Wire Drive**

Dimension	Anchor Size, <i>d</i>
	1/4"
ANSI Drill Bit Size, <i>d<sub>bit</sub></i> (in.)	1/4
Head Height (in.)	5/8
Tie-Wire Hole (in.)	13/64

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**HEAD STYLES**

- Round Head
- Flat Head
- Tie-Wire

**ANCHOR MATERIALS**

Zinc Plated Carbon Steel

**ANCHOR SIZE RANGE (TYP.)**

3/16" diameter x 1" length to  
 1/2" diameter x 3" length

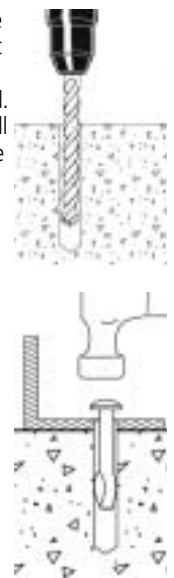
**SUITABLE BASE MATERIALS**

Normal-Weight Concrete

**Installation Guidelines**

Drill a hole into the base material to a depth of at least 1/2" deeper than the embedment required. The tolerances of the drill bit used should meet the requirements of ANSI Standard B212.15. Blow the hole clean of dust and other material.

Drive the anchor into the hole until the head is firmly seated against the fixture. Be sure the anchor is driven to the required embedment depth. The tie-wire Drive should be driven in until the head is flush against the surface of the base material.



**PERFORMANCE DATA**

**Ultimate Load Capacities for Drive in Normal-Weight Concrete<sup>1,2</sup>**

Anchor Diameter <i>d</i> in. (mm)	Minimum Embedment Depth <i>h<sub>v</sub></i> in. (mm)	Minimum Concrete Compressive Strength ( <i>f'<sub>c</sub></i> )					
		2,000 psi (13.8 MPa)		4,000 psi (27.6 MPa)		6,000 psi (41.4 MPa)	
		Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)
3/16 (4.8)	7/8 (22.2)	700 (3.2)	1,100 (5.0)	1,080 (4.9)	1,365 (6.1)	1,080 (4.9)	1,370 (6.2)
1/4 (6.4)	1 1/8 (28.6)	1,320 (5.9)	1,665 (7.5)	1,760 (7.9)	2,090 (9.4)	1,760 (7.9)	2,090 (9.4)
3/8 (9.5)	1 7/8 (47.6)	2,275 (10.2)	5,580 (25.1)	4,240 (19.1)	7,030 (31.6)	4,240 (19.1)	7,030 (31.6)
1/2 (12.7)	2 5/8 (66.7)	2,560 (11.5)	7,945 (35.8)	4,960 (22.3)	10,205 (45.9)	4,960 (22.3)	10,205 (45.9)

1. Ultimate load capacities should be reduced by a minimum safety factor of 4.0 or greater to determine the allowable working load.  
 2. Linear interpolation may be used to determine ultimate loads for intermediate compressive strengths.

**Allowable Load Capacities for Drive in Normal-Weight Concrete<sup>1,2</sup>**

Anchor Diameter <i>d</i> in. (mm)	Minimum Embedment Depth <i>h<sub>v</sub></i> in. (mm)	Minimum Concrete Compressive Strength ( <i>f'<sub>c</sub></i> )					
		2,000 psi (13.8 MPa)		4,000 psi (27.6 MPa)		6,000 psi (41.4 MPa)	
		Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)
3/16 (4.8)	7/8 (22.2)	175 (0.8)	275 (1.2)	270 (1.2)	340 (1.5)	270 (1.2)	345 (1.6)
1/4 (6.4)	1 1/8 (28.6)	330 (1.5)	415 (1.9)	440 (2.0)	525 (2.4)	440 (2.0)	525 (2.4)
3/8 (9.5)	1 7/8 (47.6)	570 (2.6)	1,395 (6.3)	1,060 (4.8)	1,760 (7.9)	1,060 (4.8)	1,760 (7.9)
1/2 (12.7)	2 5/8 (66.7)	640 (2.9)	1,985 (8.9)	1,240 (5.6)	2,550 (11.5)	1,240 (5.6)	2,550 (11.5)

1. Allowable load capacities are calculated using an applied safety factor of 4.0.  
 2. Linear interpolation may be used to determine allowable loads for intermediate compressive strengths.

**DESIGN CRITERIA**

**Combined Loading**

For anchors loaded in both shear and tension, the combination of loads should be proportioned as follows:

$$\left(\frac{N_u}{N_n}\right) + \left(\frac{V_u}{V_n}\right) \leq 1$$

Where: *N<sub>u</sub>* = Applied Service Tension Load  
*N<sub>n</sub>* = Allowable Tension Load  
*V<sub>u</sub>* = Applied Service Shear Load  
*V<sub>n</sub>* = Allowable Shear Load

**Load Adjustment Factors for Spacing and Edge Distances**

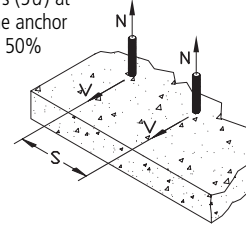
Anchor Installed in Normal-Weight Concrete					
Anchor Dimension	Load Type	Critical Distance (Full Anchor Capacity)	Critical Load Factor	Minimum Distance (Reduced Capacity)	Minimum Load Factor
Spacing ( <i>s</i> )	Tension and Shear	<i>s<sub>cr</sub></i> = 10 <i>d</i>	<i>F<sub>N</sub></i> = <i>F<sub>V</sub></i> = 1.0	<i>s<sub>min</sub></i> = 5 <i>d</i>	<i>F<sub>N</sub></i> = <i>F<sub>V</sub></i> = 0.50
Edge Distance ( <i>c</i> )	Tension	<i>c<sub>cr</sub></i> = 12 <i>d</i>	<i>F<sub>N</sub></i> = 1.0	<i>c<sub>min</sub></i> = 5 <i>d</i>	<i>F<sub>N</sub></i> = 0.80
	Shear	<i>c<sub>cr</sub></i> = 12 <i>d</i>	<i>F<sub>V</sub></i> = 1.0	<i>c<sub>min</sub></i> = 5 <i>d</i>	<i>F<sub>V</sub></i> = 0.50

**DESIGN CRITERIA**

**Load Adjustment Factors for Normal-Weight Concrete**

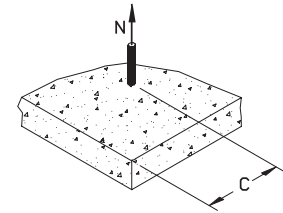
Spacing, Tension ( $F_N$ ) & Shear ( $F_V$ )					
Dia. (in.)	3/16	1/4	3/8	1/2	
$s_{cr}$ (in.)	1 7/8	2 1/2	3 3/4	5	
$s_{min}$ (in.)	1	1 1/4	1 7/8	2 1/2	
Spacing, $s$ (inches)	1	0.50			
	1 1/4	0.67	0.50		
	1 7/8	1.00	0.75	0.50	
	2		0.80	0.53	
	2 1/2		1.00	0.67	0.50
	3			0.80	0.60
	3 3/4			1.00	0.75
	4				0.80
	5				1.00

Notes: For anchors loaded in tension and shear, the critical spacing ( $s_{cr}$ ) is equal to 10 anchor diameters ( $10d$ ) at which the anchor achieves 100% of load. Minimum spacing ( $s_{min}$ ) is equal to 5 anchor diameters ( $5d$ ) at which the anchor achieves 50% of load.



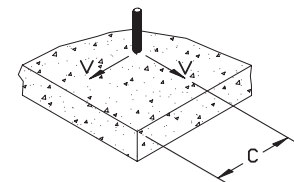
Edge Distance, Tension ( $F_N$ )					
Dia. (in.)	3/16	1/4	3/8	1/2	
$c_{cr}$ (in.)	2 1/4	3	4 1/2	6	
$c_{min}$ (in.)	1	1 1/4	1 7/8	2 1/2	
Edge Distance, $c$ (inches)	1	0.80			
	1 1/4	0.85	0.80		
	1 7/8	0.94	0.87	0.80	
	2	0.96	0.89	0.81	
	2 1/4	1.00	0.91	0.83	
	2 1/2		0.94	0.85	0.80
	2 3/4		0.97	0.87	0.81
	3		1.00	0.89	0.83
	3 1/2			0.92	0.86
	4			0.96	0.89
	4 1/2			1.00	0.91
	5				0.94
	6				1.00

Notes: For anchors loaded in tension, the critical edge distance ( $c_{cr}$ ) is equal to 12 anchor diameters ( $12d$ ) at which the anchor achieves 100% of load. Minimum edge distance ( $c_{min}$ ) is equal to 5 anchor diameters ( $5d$ ) at which the anchor achieves 80% of load.



Edge Distance, Shear ( $F_V$ )					
Dia. (in.)	3/16	1/4	3/8	1/2	
$c_{cr}$ (in.)	2 1/4	3	4 1/2	6	
$c_{min}$ (in.)	1	1 1/4	1 7/8	2 1/2	
Edge Distance, $c$ (inches)	1	0.50			
	1 1/4	0.62	0.50		
	1 7/8	0.86	0.68	0.50	
	2	0.90	0.71	0.52	
	2 1/4	1.00	0.79	0.57	
	2 1/2		0.86	0.62	0.50
	2 3/4		0.93	0.67	0.54
	3		1.00	0.71	0.57
	3 1/2			0.81	0.64
	4			0.90	0.71
	4 1/2			1.00	0.79
	5				0.86
	6				1.00

Notes: For anchors loaded in shear, the critical edge distance ( $c_{cr}$ ) is equal to 12 anchor diameters ( $12d$ ) at which the anchor achieves 100% of load. Minimum edge distance ( $c_{min}$ ) is equal to 5 anchor diameters ( $5d$ ) at which the anchor achieves 50% of load.



**ORDERING INFORMATION**

**Round Head Drive**

Cat. No.	Size	Drill Dia.	Min. Embed.	Std. Box	Std. Carton	Wt./100
3031	3/16" x 1"	3/16"	7/8"	100	1,000	1
3091	3/16" x 1 1/2"	3/16"	7/8"	100	1,000	1 1/4
3211	1/4" x 1 1/4"	1/4"	1 1/8"	100	1,000	1 3/4
3241	1/4" x 1 1/2"	1/4"	1 1/8"	100	1,000	2 1/2
3271	1/4" x 2"	1/4"	1 1/8"	100	1,000	3
3301	1/4" x 2 1/2"	1/4"	1 1/8"	100	1,000	3 3/4
3601	3/8" x 2"	3/8"	1 7/8"	25	250	7 1/2
3631	3/8" x 2 1/2"	3/8"	1 7/8"	25	250	8 1/2
3691	3/8" x 3 1/2"	3/8"	1 7/8"	25	250	11 3/4
3781	1/2" x 3"	1/2"	2 5/8"	25	125	25



**Flat Head Drive**

Cat. No.	Size	Drill Dia.	Min. Embed.	Std. Box	Std. Carton	Wt./100
3092	3/16" x 1 1/2"	3/16"	7/8"	100	1,000	1 1/4
3122	3/16" x 2"	3/16"	7/8"	100	1,000	1 3/4
3152	3/16" x 2 1/2"	3/16"	7/8"	100	1,000	2
3162	3/16" x 3"	3/16"	7/8"	100	1,000	2 1/2
3242	1/4" x 1 1/2"	1/4"	1 1/8"	100	1,000	2 1/2
3272	1/4" x 2"	1/4"	1 1/8"	100	1,000	3
3302	1/4" x 2 1/2"	1/4"	1 1/8"	100	1,000	3 3/4
3332	1/4" x 3"	1/4"	1 1/8"	100	1,000	4 1/2
3362	1/4" x 3 1/2"	1/4"	1 1/8"	100	1,000	5
3392	1/4" x 4"	1/4"	1 1/8"	100	500	5 3/4



**Tie-Wire Drive (13/64" Tie-Wire Hole)**

Cat. No.	Size	Drill Dia.	Min. Embed.	Std. Box	Std. Carton	Wt./100
3244	1/4" x 1 3/4" Master Pack	1/4"	1 1/8"	500	500	2 1/2
3245	1/4" x 1 3/4"	1/4"	1 1/8"	100	500	2 1/2
3250	Tie-Wire Setting Tool	-	-	1	1	1/4

