Drive® *Pin Anchor*

PRODUCT DESCRIPTION

The Drive is a one-piece, tamperproof, pre-formed 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 other applications requiring fast, permanent installations.

GENERAL APPLICATIONS AND USES

- Tamperproof Applications
- Suspended Ceilings

FEATURES

+ Pre-expanded anchor design allows for easy installation.
+ Round and flat head anchors are tamperproof

APPROVALS AND LISTINGS

Underwriters Laboratory (UL Listed) – VFXT. EX1289
FM Global (Factory Mutual) J.I. OK4A9.AH

GUIDE SPECIFICATIONS

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

MATERIAL SPECIFICATIONS

Anchor Component	Component Material
Anchor Body	Heat Treated AISI 1018
Zinc Plating	ASTM B633, SC1, Type III (Fe/Zn 5)

SECTION CONTENTS


Round Head Drive


Flat Head Drive


Tie-Wire Drive

HEAD STYLES

Round Head
Flat Head
Tie-Wire

ANCHOR MATERIALS

Zinc Plated Carbon Steel

ANCHOR SIZE RANGE (TYP.)

3/16" diameter to 1/2" diameter

SUITABLE BASE MATERIALS

Normal-Weight Concrete

INSTALLATION SPECIFICATIONS

Round Head Drive

Dimension	Anchor Size, *d*			
	3/16"	1/4"	3/8"	1/2"
ANSI Drill Bit Size, d_{bit} (in.)	3/16	1/4	3/8	1/2
Fixture Clearance Hole, d_h (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

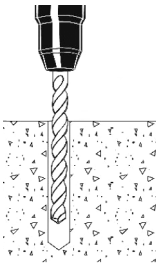
Dimension	Anchor Size, *d*	
	3/16"	1/4"
ANSI Drill Bit Size, d_{bit} (in.)	3/16	1/4
Fixture Clearance Hole, d_h (in.)	1/4	5/16
Head Height (in.)	7/64	9/64
Head Width (in.)	3/8	1/2

Tie-Wire Drive

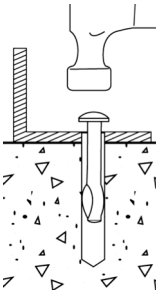
Dimension	Anchor Size, *d*
	1/4"
ANSI Drill Bit Size, d_{bit} (in.)	1/4
Head Height (in.)	5/8
Tie-Wire Hole Diameter (in.)	13/64

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 must 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.



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PERFORMANCE DATA

Ultimate Load Capacities for Mushroom and Flat Head Drive in Normal-Weight Concrete[1,2]

Anchor Diameter d in. (mm)	Minimum Embedment Depth h_v in. (mm)	Minimum Concrete Compressive Strength (f'_c)					
		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. Tabulated load values are for anchors installed in concrete. Concrete compressive strength must be at the specified minimum at the time of installation.
2. Ultimate load capacities must be reduced by a minimum safety factor of 4.0 or greater to determine allowable working load. Consideration of safety factors of 10 or higher may be necessary depending upon the application such as life safety or overhead.

Allowable Load Capacities for Mushroom and Flat Head Drive in Normal-Weight Concrete[1,2,3]

Anchor Diameter d in. (mm)	Minimum Embedment Depth h_v in. (mm)	Minimum Concrete Compressive Strength (f'_c)					
		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 listed are calculated using and applied safety factor of 4.0. Consideration of safety factors of 10 or higher may be necessary depending upon the application such as life safety or overhead.
2. Linear interpolation may be used to determine allowable loads for intermediate compressive strengths.
3. 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.

Ultimate Load Capacities for Tie-Wire Drive in Normal-Weight Concrete[1,2]

Anchor Diameter d in. (mm)	Minimum Embedment Depth h_v in. (mm)	Minimum Concrete Compressive Strength (f'_c)					
		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)
1/4 (6.4)	1 1/8 (28.6)	1,320 (5.9)	1,100 (4.9)	1,760 (7.9)	1,560 (6.9)	1,760 (7.9)	1,560 (6.9)

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

Allowable Load Capacities for Tie-Wire Drive in Normal-Weight Concrete[1,2,3]

Anchor Diameter d in. (mm)	Minimum Embedment Depth h_v in. (mm)	Minimum Concrete Compressive Strength (f'_c)					
		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)
1/4 (6.4)	1 1/8 (28.6)	330 (1.5)	275 (1.2)	440 (2.0)	390 (1.7)	440 (2.0)	390 (1.7)

1. Allowable load capacities listed are calculated using and applied safety factor of 4.0.
2. Linear interpolation may be used to determine allowable loads for intermediate compressive strengths.
3. 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.

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DESIGN CRITERIA (ALLOWABLE STRESS DESIGN)

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_u = Applied Service Tension Load
N_n = Allowable Tension Load
V_u = Applied Service Shear Load
V_n = Allowable Shear Load

Load Adjustment Factors for Spacing and Edge Distances[1]

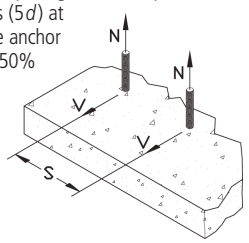
Anchor Installed in Normal-Weight Concrete					
Anchor Dimension	**Load Type**	**Critical Distance (Full Anchor Capacity)**	**Critical Load Factor**	**Minimum Distance (Reduced Capacity)**	**Minimum Load Factor**
Spacing (s)	Tension and Shear	$s_{cr} = 10d$	$F_{Ns} = F_{Vs} = 1.0$	$s_{min} = 5d$	$F_{Ns} = F_{Vc} = 0.50$
Edge Distance (c)	Tension	$c_{cr} = 12d$	$F_{Nc} = 1.0$	$c_{min} = 5d$	$F_{Nc} = 0.80$
	Shear	$c_{cr} = 12d$	$F_{Vc} = 1.0$	$c_{min} = 5d$	$F_{Vs} = 0.50$

1. Allowable load values found in the performance data tables are multiplied by reduction factors when anchor spacing or edge distances are less than critical distances. Linear interpolation is allowed for intermediate anchor spacing and edge distances between critical and minimum distances.When an anchor is affected by both reduced spacing and edge distance, the spacing and edge reduction factors must be combined (multiplied). Multiple reduction factors for anchor spacing and edge distance may be required depending on the anchor group configuration.

Load Adjustment Factors for Normal-Weight Concrete

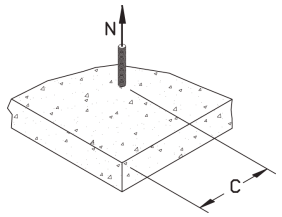
Spacing, Tension (F_{Ns}) & Shear (F_{Vs})					
Dia. (in.)		3/16	1/4	3/8	1/2
s_{cr} (in.)		1 7/8	2 1/2	3 3/4	5
s_{min} (in.)		1	1 1/4	1 7/8	2 1/2
Spacing, s (inches)	1	0.50			
	1 1/4	0.67	0.50		
	1 7/8	1.00	0.75	0.50	
	2		0.80	0.53	
	2 1/2		1.00	0.67	0.50
	3			0.80	0.60
	3 3/4			1.00	0.75
	4				0.80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



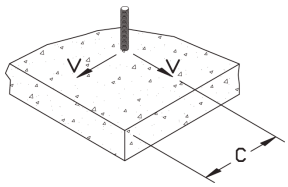
DESIGN CRITERIA (ALLOWABLE STRESS DESIGN)

Load Adjustment Factors for Normal-Weight Concrete

Edge Distance, Shear (F_{v_c})					
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
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

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