

GENERAL INFORMATION

MINI DROPIN™

Internally Threaded Expansion Anchor

PRODUCT DESCRIPTION

The Mini Dropin is a carbon steel machine bolt anchor for use in shallow embedment applications. In addition to solid concrete and precast hollow core plank, it can be considered for use in post-tensioned concrete slabs and concrete-filled steel deck.

GENERAL APPLICATIONS AND USES

- Suspending Conduit
- Fire Sprinkler
- Cable Trays and Strut
- Distributed Utilities
- Pipe Supports
- Suspended Lighting

FEATURES AND BENEFITS

- + Internally threaded anchor for easy bolt removability and service work
- + Ideal for precast hollow core plank and post-tensioned concrete slabs
- + Lip provides flush installation and consistent embedment
- + Manual setting tool scores flange when set to verify proper expansion depth

APPROVALS AND LISTINGS

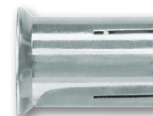
- Tested in accordance with ASTM E488
- FM Global (Factory Mutual) – 3/8" diameter, see FM Approval Guide
- Pipe hanger components for automatic sprinkler systems

GUIDE SPECIFICATIONS

CSI Divisions: 03 16 00 - Concrete Anchors and 05 05 19 - Post-Installed Concrete Anchors.
 Anchors shall be Mini Dropin anchors as supplied by DEWALT, Towson, MD.

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MINI DROPIN

THREAD VERSION

- UNC Thread

ANCHOR MATERIALS

- Zinc Plated Carbon Steel

ROD/ANCHOR SIZE RANGE (TYP.)

- 1/4" to 1/2" diameters

SUITABLE BASE MATERIALS

- Normal-weight Concrete
- Sand-lightweight Concrete
- Precast Hollow Core Concrete Plank
- Concrete-filled Steel Deck

MATERIAL AND INSTALLATION SPECIFICATIONS

Material Specifications

Anchor Component	Carbon Steel
Anchor Body	AISI 1008 or equivalent
Plug	AISI 1018 or equivalent
Zinc Plating	ASTM B633, SC1, Type III (Fe/Zn 5)

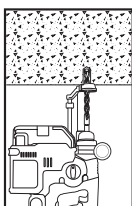
Installation Specifications

Dimension	Rod/Anchor Diameter, d		
	1/4"	3/8"	1/2"
ANSI Drill Bit Size, d_{bit} (in.)	3/8	1/2	5/8
Nominal Outside Anchor Dia., (in.)	3/8	1/2	5/8
Maximum Tightening Torque, T_{max} (ft-lbs)	3	5	10
Internal Thread Size (UNC)	1/4"-20	3/8"-16	1/2"-13
Thread Depth (in.)	3/8	13/32	5/8
Flange Size (in.)	15/32	5/8	25/32
Min. concrete thickness, h (in.)	3	3-1/2	4
Overall Anchor Length, l (in.)	5/8	3/4	1
Embedment, h_v (in.)			
Hole Depth, h_o (in.)			

Installation Procedure

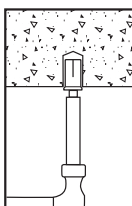


Read and follow all tool instructions. Always wear eye protection, gloves and other appropriate safety items for protection (PPE).



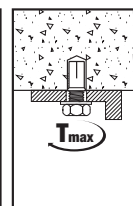
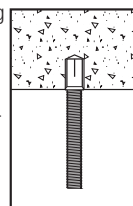
Drill a hole into the base material to the depth of embedment required. The tolerances of the drill bit used must meet the requirements of ANSI 1 B212.15 standard. Avoid drilling into the post-tensioned reinforcement and/or cables.

Remove dust and debris from the hole during drilling (e.g. dust extractor, hollow bit) or following drilling (e.g. suction, forced air) to extract loose particles created by drilling. Insert the anchor into the hole and tap flush with surface.



Using a DEWALT setting tool specifically, set the anchor by driving the tool with a sufficient number of hammer blows until the shoulder of the tool is seated against the anchor.

Note: anchor will not hold published capacities if shoulder of DEWALT setting tool does not seat against anchor.



Threaded rod is commonly used in overhead applications. If using a fixture, position it, insert bolt and tighten. Minimum thread engagement should be at least one anchor diameter. Do not exceed the maximum tightening torque, T_{max} for the selected anchor.

PERFORMANCE DATA

Ultimate and Allowable Load Capacities for Mini Dropin in Normal-Weight Concrete^{1,2,3,4}

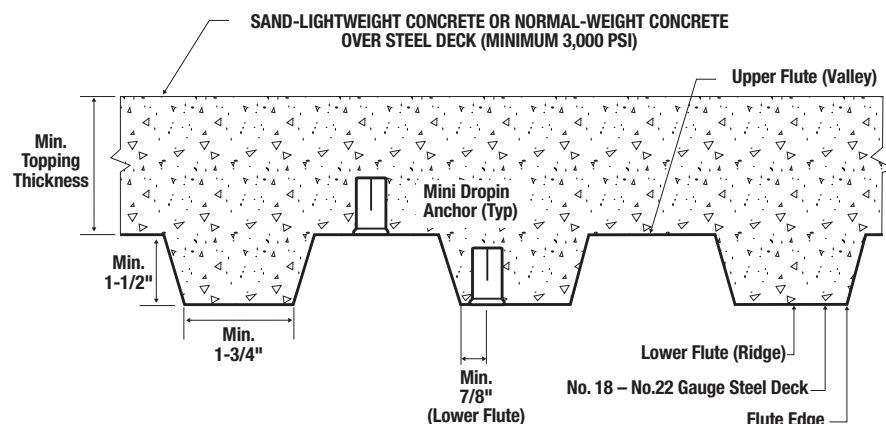

Rod/Anchor Size d in.	Minimum Embedment Depth h _v in. (mm)	Minimum Concrete Compressive Strength (f' _c)											
		3,000 psi (20.7 MPa)				4,000 psi (27.6 MPa)				6,000 psi (41.4 MPa)			
		Ultimate Load		Allowable Load		Ultimate Load		Allowable Load		Ultimate Load		Allowable Load	
		Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)
1/4	5/8 (16)	1,100 (6.3)	1,260 (5.7)	275 (1.2)	315 (1.4)	1,150 (5.1)	1,650 (7.4)	285 (1.3)	415 (1.9)	1,200 (5.3)	1,650 (7.4)	300 (1.3)	415 (1.9)
3/8	3/4 (19)	1,980 (8.9)	2,700 (12.2)	495 (2.2)	675 (3.0)	2,120 (9.5)	3,420 (15.2)	530 (2.4)	855 (3.8)	2,270 (10.2)	4,220 (19.0)	570 (2.6)	1,055 (4.7)
1/2	1 (25)	2,520 (11.2)	4,400 (19.8)	630 (2.8)	1,100 (5.0)	2,855 (12.7)	4,875 (21.9)	715 (3.2)	1,220 (5.5)	3,185 (14.2)	4,875 (21.9)	795 (3.5)	1,220 (5.5)

1. Tabulated load values are for anchors installed in uncracked 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 listed are calculated using and applied safety factor of 4.0.
3. Linear interpolation may be used to determine allowable loads for intermediate compressive strengths.
4. The tabulated capacities are for the anchors which must be checked against the steel strength of the corresponding threaded rod or bolt size and type; the lowest load level controls.

Ultimate and Allowable Load Capacities for Mini Dropin Installed Through Steel Deck into Sand-Lightweight or Normal-Weight Concrete^{1,2,3,4,5}


Rod/Anchor Size d in.	Minimum Embedment Depth h _v in. (mm)	Concrete-Filled Steel Deck f' _c ≥ 3,000 psi (20.7 MPa)			
		Minimum 1-3/4" Wide Deck			
		Ultimate Load		Allowable Load	
		Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)
1/4	5/8 (16)	740 (3.3)	1,880 (8.5)	185 (0.8)	470 (2.1)
3/8	3/4 (19)	880 (4.0)	2,040 (9.2)	220 (1.0)	510 (2.3)
1/2	1 (25)	1,380 (6.2)	2,120 (9.5)	345 (1.6)	530 (2.4)

1. The steel deck shall be No. 22 gauge to No. 18 gauge thick steel [0.030-inch to 0.047-inch base metal thickness (0.75 mm to 1.20 mm)].
2. Allowable load capacities listed are calculated using and applied safety factor of 4.0.
3. Tabulated load values are for anchors installed in uncracked concrete with a minimum edge distance of 7/8" when installed through the lower flute. Anchors installed through the upper flute may be in any location, provided the minimum edge distance is maintained for deck openings. Anchors can be considered for use in the lower or upper flute of the steel deck provided the installation specifications and procedures are maintained.
4. For installations into the lower flute the minimum topping thickness is 2 inches. For installations into the upper flute, the minimum topping thickness is 2-1/2" for 1/4-inch diameter anchors, 3-1/4" for 3/8" diameter anchors and 4" for 1/2" diameter anchors. Allowable shear loads for anchors installed through steel deck into concrete may be applied in any direction.
5. The tabulated capacities are for the anchors which must be checked against the steel strength of the corresponding threaded rod or bolt size and type; the lowest load level controls.





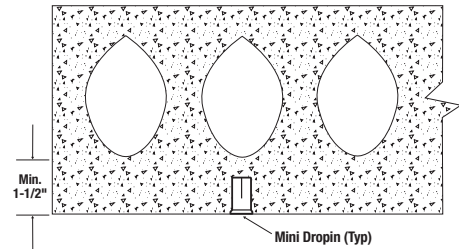
Ultimate and Allowable Load Capacities for Mini Dropin in Precast Hollow Core Concrete Plank^{1,2,3}

Rod/ Anchor Size d in.	Minimum Embed. Depth h, in. (mm)	Minimum Spacing in. (mm)	Minimum Edge Distance in. (mm)	Min. Concrete Compressive Strength f'c ≥ 5,000 psi (34.5 MPa)			
				Ultimate Load		Allowable Load	
				Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)
1/4	5/8 (16)	3 (76)	3 (76)	1,190 (5.3)	1,565 (7.0)	300 (1.3)	390 (1.7)
3/8	3/4 (19)	4-1/2 (114)	4-1/2 (114)	2,030 (9.0)	2,890 (12.9)	505 (2.3)	725 (3.2)
1/2	1 (25)	6 (152)	6 (152)	2,210 (9.8)	3,010 (13.4)	555 (2.5)	755 (3.3)

1. Tabulated load values are for anchors installed in uncracked concrete. 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. The tabulated capacities are for the anchors which must be checked against the steel strength of the corresponding threaded rod or bolt size and type; the lowest load level controls.



Avoid drilling into post-tensioned reinforcement and/or cables. Consider verifying the location and height of reinforcement/cable with the hollow core concrete plank supplier.

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 Distance Anchor Installed in Normal-weight Concrete^{1,2}

Anchor Dimension	Load Type	Critical Distance (Full Anchor Capacity)	Critical Load Factor	Minimum Distance (Reduced Capacity)	Minimum Load Factor
Spacing (s)	Tension	$S_{cr} = 12d$	$F_{NC} = 1.0$	$S_{min} = 8d$	$F_{NS} = 1.00$
	Shear	$S_{cr} = 12d$	$F_{VC} = 1.0$	$S_{min} = 8d$	$F_{VS} = 0.80$
Edge Distance (c)	Tension	$C_{cr} = 12d$	$F_{NC} = 1.0$	$C_{min} = 6d$	$F_{NC} = 0.90$
	Shear	$C_{cr} = 12d$	$F_{VC} = 1.0$	$C_{min} = 6d$	$F_{VC} = 0.75$

d = nominal anchor size

- Allowable loads for anchors loaded in shear parallel to the edge have no load reduction factor, $F_{VC} = 1.0$, when installed at minimum edge distances.
- 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.

Anchor Installed Through Steel Deck into Concrete^{1,2}

Anchor Dimension	Load Type	Critical Distance (Full Anchor Capacity)	Critical Load Factor	Minimum Distance (Reduced Capacity)	Minimum Load Factor
Spacing (s)	Tension	$S_{cr} = 12d$	$F_{NC} = 1.0$	$S_{min} = 8d$	$F_{NS} = 1.00$
	Shear	$S_{cr} = 12d$	$F_{VS} = 1.0$	$S_{min} = 8d$	$F_{VS} = 0.80$

d = nominal anchor size

- Allowable load values found in the performance data tables are multiplied by reduction factors when anchor spacing is less than critical distances. Linear interpolation is allowed for intermediate anchor spacing between critical and minimum distances. Multiple reduction factors for anchor spacing may be required depending on the anchor group configuration.
- See illustration of concrete over steel deck for edge distance requirements.

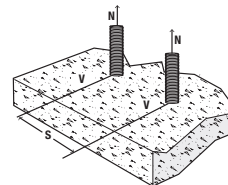
Load Adjustment Factors for Normal-weight and Sand-Lightweight Concrete

Spacing, Shear (F_{Vs})

Dia. (in.)	1/4	3/8	1/2
s_{cr} (in.)	3	4-1/2	6
s_{min} (in.)	2	3	4
Spacing, s (in.)	2	0.80	-
	2.5	0.90	-
	3	1.00	-
	3.75	1.00	-
	4	0.93	0.80
	4.5	1.00	0.85
	5	1.00	0.90
	6	1.00	1.00

Notes: For anchors loaded in shear, the critical spacing (s_{cr}) is equal to 12 anchor diameter (12d) at which the anchor achieves 100% of load.

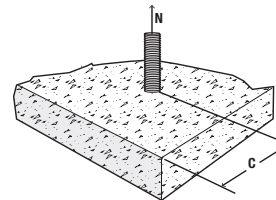
Minimum spacing (s_{min}) is equal to 8 anchor diameter (8d) at which the anchor achieves 80% of load.

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

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

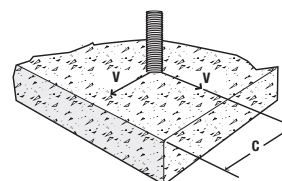
Minimum edge distance (c_{min}) is equal to 6 anchor diameters (6d) at which the anchor achieves 90% of load.

Edge Distance, Shear (F_{VC}) (Normal-weight concrete only)

Dia. (in.)	1/4	3/8	1/2
c_{cr} (in.)	3	4-1/2	6
c_{min} (in.)	1-1/2	2-1/4	3
Edge Distance, c (in.)	1-1/2	0.75	-
	2	0.83	-
	2-1/4	0.88	-
	2-1/2	0.92	-
	3	0.83	0.75
	4	0.94	0.83
	4-1/2	1.00	0.88
	5	1.00	0.92
	6	1.00	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 6 anchor diameters (6d) at which the anchor achieves 75% of load.



ORDERING INFORMATION

Carbon Steel Mini Dropin

Cat No.	Rod/Anchor Dia.	Outside Diameter	Overall Length	Pack Qty.	Carton Qty.
06335-PWR	1/4"	3/8"	5/8"	100	1,000
06322-PWR	3/8"	1/2"	3/4"	100	1,000
06337-PWR	1/2"	5/8"	1"	50	250



Setting Tools for Mini Dropin

Cat No.	Mini Dropin Size	Pin Length	Pack Qty.	Carton Qty.
06336-PWR	1/4"	27/64"	1	50
06323-PWR	3/8"	33/64"	1	50
06338-PWR	1/2"	49/64"	1	50



Accu-Bit™ Drill Stop for Mini Dropin

Cat No.	Rod/Anchor Size	Drill Depth	Pack Qty.
DWA5491	3/8" Accu-Bit for 1/4" Mini Dropin	7/8"	1
DWA5492	1/2" Accu-Bit for 3/8" Mini Dropin	15/16"	1
DWA5494	5/8" Accu-Bit for 1/2" Mini Dropin	1-13/32"	1

