MiTek® PRO SERIES™

WEDGE ANCHOR
(WAC) MECHANICAL ANCHORS

Wedge Anchor for temporary or permanent material attachment to cracked and uncracked concrete

SIZES: 3/8" - 3/4"

CODES: IBC, FL, LA, UL

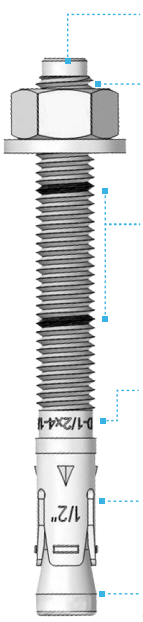
DRILL CONDITIONS: Dry

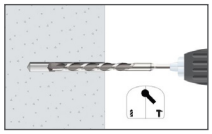
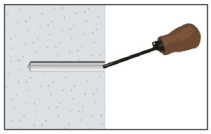
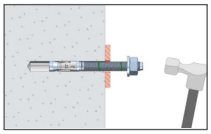
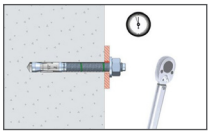
BENEFITS:

- Embedment marks to ensure accurate installation depth. Most anchors have 2 embedment depth options
- Length ID code stamped on head of each anchor
- Unique anchor design allows for expansion clip re-engagement under tensile loading
- Code evaluated to IBC/IRC in accordance with ICC-ES AC193 and ACI 355.2 for cracked and uncracked concrete
- Approved for use in wind and seismic applications

APPLICATIONS

- Structural connections, i.e., beam and column anchorage
- Interior applications / low level corrosion environment
- Overhead applications, i.e., cable trays and strut, pipe supports, fire sprinklers
- Safety barriers
- Fixing billboards, boilers, signals, advertising hoardings,etc.
- Installation of sprinkler systems



1. DRILL	2. BLOW & CLEAR	3. INSTALL	4. APPLY TORQUE
			
Drill a hole into the base material of the correct diameter and depth using a drill bit that meets the requirements of ANSI B212.15	Remove dust and debris from hole using a blow bulb, compressed air or vacuum to remove the loose particles left from drilling.	Position the washer on the anchor and thread on the nut. If installing through a fixture drive the anchor through the fixture into the hole. Be sure the anchor is driven until the corresponding green mark depth is leveled with the base material surface.	Tighten the anchor with a torque wrench by applying the required installation torque, $T_{ins.}$ Note: the threaded stud will draw up during the tightening of the nut; the expansion wedge (clip) remains in the original position.

ESR-4298 provides design information for load factor and characteristic resistance (LRFD), however allowable stress design (ASD) is still in use by some users. Translation of LRFD to ASD values is possible, however it is dependent on the levels of dead load and live load. Dead load is defined in the ACI 318 Building Code Requirements for Structural Concrete as "the weights of members, supported structure and permanent attachments that are likely to be present on a structure in service". Live load is defined in ACI 318-14 as "load that is not permanently applied to a structure, but is likely to occur during the service life of the structure (excluding environmental loads)". Examples of live loads are traffic on a walkway and non permanent loads associated with usage of a structure. Live load values are stipulated in the building code for various loading conditions and parts of structures.

To facilitate the translation of LRFD characteristic values to ASD values, a scenario of dead load and live load level is used to conservatively address the most common application as follows: 30% dead load; 70% live load. ACI 318-14 Equation (5.3.1b) provides a conversion factor of 1.48 which is divided into the LRFD characteristic resistances and multiplied by a Φ factor (according to the failure type) to determine an equivalent ASD load.

It is the responsibility of the user to select the appropriate ASD values based on the example loadings shown in this document or alternative dead versus live loading that may be applicable to the specific design.

The ASD values are provided in the following tables for tension and shear for different concrete strengths. Other installation and design provisions in ESR-4298 must be followed.

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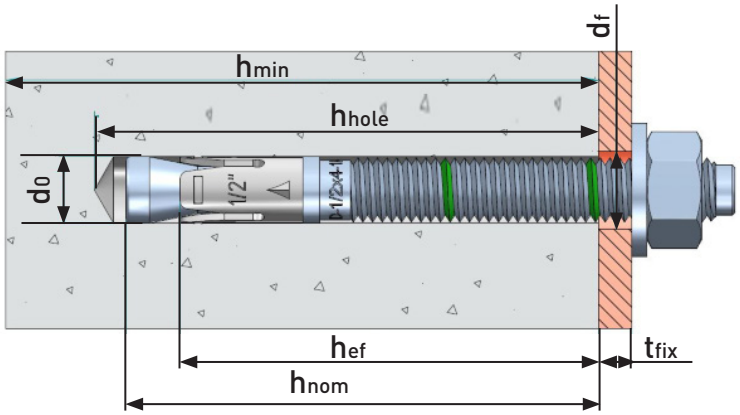

Parameter	Symbol	Unit	Nominal Anchor Diameter						
			3/8"	1/2"		5/8"		3/4"	
ICC approved			✓	✓	✓	✓	✓	✓	✓
UL certified			✓	✓	✓		✓	✓	✓
Outside diameter	d_0	in (mm)	3/8 (9.5)	1/2 (12.7)	1/2 (12.7)	5/8 (15.9)	5/8 (15.9)	3/4 (19.1)	3/4 (19.1)
Nominal embedment depth	h_{nom}	in (mm)	2.33 (59)	2.33 (59)	3.59 (91)	3.23 (82)	4.49 (114)	3.74 (95)	5.26 (134)
Effective embedment depth	h_{ef}	in (mm)	2 (51)	2 (51)	3-1/4 (83)	2-3/4 (70)	4 (102)	3-1/4 (83)	4-3/4 (121)
Minimum hole depth	h_{hole}	in (mm)	2-5/8 (67)	2-5/8 (67)	4 (102)	3-1/2 (89)	4-3/4 (121)	4 (102)	5-3/4 (146)
Maximum fixture clearance hole dia.	d_f	in (mm)	7/16 (11.1)	9/16 (14.3)		11/16 (17.5)		7/8 (22.2)	
Installation torque	T_{inst}	ft lbf (Nm)	30 (41)	45 (61)	45 (61)	75 (102)	75 (102)	150 (203)	150 (203)
Minimum concrete thickness	h_{min}	in (mm)	4 (102)	4 (102)	6 (152)	5 -1/2 (140)	6-1/2 (165)	6 (152)	8 (203)
Critical edge distance	c_{ac}	in (mm)	6 (152)	6 (152)	7-1/2 (191)	7 (178)	8-1/2 (216)	9 (229)	12 (305)
Minimum edge distance (c_{min}) for spacing ($s \geq$)	c_{min}	in (mm)	2-1/2 (64)	3 (76)	2-1/2 (64)	3-1/2 (89)	3-1/2 (89)	5 (127)	4-1/2 (114)
	$s \geq$	in (mm)	6-1/2 (165)	6 (152)	6 (152)	8 (203)	6 (152)	10-1/2 (267)	9-1/2 (241)
Minimum spacing (s_{min}) for edge distance ($c \geq$)	s_{min}	in (mm)	2-1/2 (64)	2-3/4 (70)	2-1/2 (64)	4-1/2 (114)	4 (102)	5 (127)	4 (102)
	$c \geq$	in (mm)	4 (102)	6 (152)	4 (102)	6 (152)	5 (127)	10-1/2 (267)	8-1/2 (216)
Minimum overall anchor length	l_{anch}	in (mm)	3 (76)	3-1/2 (89)	4-1/2 (114)	4-1/4 (108)	5-1/2 (140)	5 (127)	6-1/2 (165)
Torque wrench size	S_w	in	9/16	3/4		15/16		1-1/8	

1) The embedment depth, h_{nom}, is measured from the outside surface of the concrete member to the embedded end of the anchor prior to tightening.
2) The listed minimum overall anchor length is based on anchor sizes commercially available at the time of publication compared with the requirements to achieve the minimum nominal embedment depth and possible fixture attachment.
3) Holes in metal fixtures to be mounted should match the diameter specified in the table.
4) Caution: do not use impact wrench to set or tighten anchors.
5) Caution: oversized holes in base material will make it difficult to set the anchor and will reduce the anchors' load capacity.

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CRACKED CONCRETE

Nominal anchor diameter (in)	Nominal embed. h_{nom} (in)	Minimum Concrete Compressive Strength									
		f'_c = 2,500 psi		f'_c = 3,000 psi		f'_c = 4,000 psi		f'_c = 6,000 psi		f'_c = 8,000 psi	
		$T_{allowable\ ASD}$ Tension (lb)	$V_{allowable\ ASD}$ Shear (lb)	$T_{allowable\ ASD}$ Tension (lb)	$V_{allowable\ ASD}$ Shear (lb)	$T_{allowable\ ASD}$ Tension (lb)	$V_{allowable\ ASD}$ Shear (lb)	$T_{allowable\ ASD}$ Tension (lb)	$V_{allowable\ ASD}$ Shear (lb)	$T_{allowable\ ASD}$ Tension (lb)	$V_{allowable\ ASD}$ Shear (lb)
3/8	2-3/8	950	1,137	1,041	1,246	1,336	1,256	1,472	1,256	1,699	1,256
1/2	2-3/8	1,056	1,137	1,157	1,246	1,336	1,438	1,636	1,762	1,889	2,034
	3-5/8	1,867	2,118	2,031	2,118	2,318	2,118	2,793	2,118	3,189	2,118
5/8	3-1/4	2,103	3,971	2,304	3,971	2,660	3,971	3,258	3,971	3,762	3,971
	4-1/2	2,986	3,971	3,272	3,971	3,778	3,971	4,627	3,971	5,342	3,971
3/4	3-3/4	2,702	5,402	2,960	5,402	3,418	5,402	4,186	5,402	4,883	5,402
	5-1/4	4,774	6,270	5,230	6,270	6,039	6,270	7,396	6,270	8,540	6,270

1) Allowable load values are calculated using a conversion factor, α, from factored design strengths.
2) Tabulated allowable load values assume 30% dead load and 70% live load, with controlling load combination 1.2D + 1.6L. Calculated weighted average for the conversion factor, α = 1.2*(0.3) + 1.6*(0.7) = 1.48.

UN-CRACKED CONCRETE

Nominal anchor diameter (in)	Nominal embed. h_{nom} (in)	Minimum Concrete Compressive Strength									
		f'_c = 2,500 psi		f'_c = 3,000 psi		f'_c = 4,000 psi		f'_c = 6,000 psi		f'_c = 8,000 psi	
		$T_{allowable\ ASD}$ Tension (lb)	$V_{allowable\ ASD}$ Shear (lb)	$T_{allowable\ ASD}$ Tension (lb)	$V_{allowable\ ASD}$ Shear (lb)	$T_{allowable\ ASD}$ Tension (lb)	$V_{allowable\ ASD}$ Shear (lb)	$T_{allowable\ ASD}$ Tension (lb)	$V_{allowable\ ASD}$ Shear (lb)	$T_{allowable\ ASD}$ Tension (lb)	$V_{allowable\ ASD}$ Shear (lb)
3/8	2-3/8	1,460	1,256	1,565	1,256	1,746	1,256	2,037	1,256	2,272	1,256
1/2	2-3/8	1,491	1,605	1,600	1,759	1,790	2,031	2,097	2,117	2,346	2,117
	3-5/8	2,513	2,117	2,753	2,117	3,179	2,117	3,894	2,117	4,496	2,117
5/8	3-1/4	2,403	3,970	2,633	3,970	3,040	3,970	3,723	3,970	4,299	3,970
	4-1/2	4,216	3,970	4,619	3,970	5,333	3,970	6,532	3,970	7,542	3,970
3/4	3-3/4	3,474	5,402	3,805	5,402	4,394	5,402	5,382	5,402	6,214	5,402
	5-1/4	5,456	6,272	5,977	6,272	6,901	6,272	8,452	6,272	9,760	6,272

1) Allowable load values are calculated using a conversion factor, α, from factored design strengths.
2) Tabulated allowable load values assume 30% dead load and 70% live load, with controlling load combination 1.2D + 1.6L. Calculated weighted average for the conversion factor, α = 1.2*(0.3) + 1.6*(0.7) = 1.48.

LENGTH ID

Length ID marking on threaded stud head		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
Overall anchor length (in)	From	1-1/2	2	2-1/2	3	3-1/2	4	4-1/2	5	5-1/2	6	6-1/2	7	7-1/2	8	8-1/2	9	9-1/2
	Up to, but not including	2	2-1/2	3	3-1/2	4	4-1/2	5	5-1/2	6	6-1/2	7	7-1/2	8	8-1/2	9	9-1/2	10

Customer Service & Technical Assistance

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MiTek-US.com