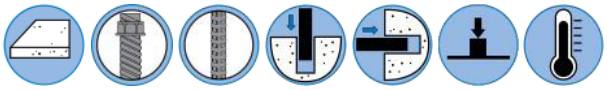
ULTRABOND® 1300



Product Description

ULTRABOND® 1300 is a 2-component structural epoxy system that offers exceptional strength in anchoring and doweling applications and can be used in temperatures from 40 °F to 110 °F (4 °C to 43 °C). It is a specially formulated non-abrasive epoxy that works extremely well in bulk dispensing pumps and meets the requirements of ASTM C881.

General Uses & Applications

- Adhering dowel bars and tie bars for full depth concrete pavement repairs
- Short term tensile anchoring and shear loading conditions in accordance with allowable stress design (ASD)
- Bonding raised pavement markers to concrete or asphalt
- Bulk dispensing flowability for efficient application
- Bonding agent for fresh to hardened concrete and hardened to hardened concrete

Advantages & Features

- Little or no odor
- Non-sag
- High modulus
- Non-abrasive formulation
- Convenient bulk mix ratio of 1:1 by volume
- Bulk components clearly indicated by container color, resin (white) and hardener (black)

Availability: Adhesives Technology Corp. (ATC) ULTRABOND products are available through select distributors providing all your construction needs. Please contact ATC for a distributor near you or visit our website to search by zip code.

STANDARDS & APPROVALS

ASTM C881-14 Type I, II, IV & V Grade 3 Class B & C

AASHTO M235

Multiple DOT Listings

(See ATC website for current list of Department of Transportation Approvals throughout the United States and Canada)

Color & Ratio: Part A (Resin): White, Part B (Hardener): Black, Mixed: Concrete Gray, Mix Ratio: 1:1 by volume

Storage & Shelf Life: 24 months when stored in unopened containers in dry conditions. Store between 40 °F (4 °C) and 95 °F (35 °C).

Installation & Coverage: Manufacturer's Printed Installation Instructions (MPII) are available within this Technical Data Sheet (TDS). Due to occasional updates and revisions, always verify that you are using the most current version of the MPII. In order to achieve maximum results, proper installation is imperative.

Clean Up: Always wear appropriate protective equipment such as safety glasses and gloves. Clean uncured materials from tools and equipment using mild solvent. Cured material can only be removed mechanically.

Limitations & Warnings:

- Do not thin with solvents, as this will prevent cure
- Not recommended for any application where there may be a sustained tensile load, including overhead applications
- For anchoring applications, concrete should be a minimum of 21 days old prior to anchor installation

Safety: Please refer to the Safety Data Sheet (SDS) for ULTRABOND 1300 published on our website or call ATC for more information at 1-800-892-1880.

Specification: Anchoring adhesive shall be a two component, 1:1 ratio by volume, high viscosity, non-sag, 100% solids, epoxy system. Epoxy must meet the requirements of ASTM C881 specification for Type I, II, IV, and V, Grade 3 Class B & C. Epoxy must have a minimum compressive yield strength of 10,520 psi (73 MPa) at 75 °F (24 °C) after a 7 day cure per ASTM D695. Shelf life must be a minimum of 24 months. The Adhesive shall be ULTRABOND 1300 manufactured by Adhesives Technology Corp., Pompano Beach, Florida.

ORDERING INFORMATION

TABLE 1: ULTRABOND 1300 Adhesive, Dispensing Tools and Mixing Nozzles[1,2]

Package Size	8.6 oz. (254 ml) Cartridge	21.2 oz. (627 ml) Cartridge	53 oz. (1.6 L) Cartridge	102 oz. (3.0 L) Kit	2 Gallon (7.6 L) Kit	10 Gallon (38 L) Kit	100 Gallon (379 L) Kit
Part #	A9-1300HN	A22-1300N	A53-1300N	BUG-1300	B2G-1300	B10G-1300S	B100G-1300S
Manual Dispensing Tool	TM9HD	TM22HD	N/A	N/A	N/A	N/A	N/A
Pneumatic Dispensing Tool	N/A	TA22HD-A	TA53HD-A	N/A	N/A	Pump[3]	Pump[3]
Case Qty.	12	12	6	1	1	1	1
Pallet Qty.	1,116	576	252	75 kits	75 kits	12 kits	2 kits
Pallet Weight (lbs.)	1,725	1,578	1,368	965	2,230	1,650	2,758
Recommended Mixing Nozzle	T12	T3438C[4]	T3412CT[4]	N/A	N/A	T3412CT	T3412CT

1. Call for bulk packaging availability and lead times.
2. Part #'s ending in "N" come packaged with mixing nozzle, one per cartridge.
3. For bulk dispensing pumps, contact ATC for recommended manufacturers.
4 For projects with hole diameters greater than 3/4 inch, the T3412CT can be used on A22-1300N cartridge. For large projects with anchor hole diameters greater than 1-inch, the T1C Hi-Flow mixing nozzle can be used on the A53-1300N cartridge (highly trained professional use only).

TABLE 2: Wire Brushes, Handles and Adapters

Part #	Threaded Rod Diameter in.	Rebar Diameter	Nominal Brush Diameter in.	Minimum Brush Diameter in.	Qty.
HB038	3/8	#3	5/8	0.563	1
HB012	1/2	#4	3/4	0.675	1
HB058	5/8	#5	1	0.900	1
HB034	3/4	#6	1 1/4	1.125	1
HB078	7/8	----	1 1/2	1.350	1
HB100	1	----	1 5/8	1.463	1
HBHT	Steel brush 12" usable extension with T-Handle (manual)				1
HBEXT	Steel brush 12" usable extension with SDS + drill adaptor				1

MATERIAL SPECIFICATIONS

TABLE 3:ULTRABOND 1300 performance to **ASTM C881-14**[1,2,3]

Property	Cure Time	ASTM Standard	Units	Sample Conditioning Temperature	
				Class B	Class C
				40 °F (4) °C	75 °F (24) °C
Gel Time - 60 Gram Mass[4]	----	C881	min	30	23
Compressive Yield Strength	7 day	D695	psi (MPa)	10,490 (72.3)	10,520 (72.5)
Compressive Modulus	7 day	D695	psi (MPa)	575,000 (3,964.5)	591,500 (4,078.2)
Bond Strength Hardened to Hardened	2 day	C882	psi (MPa)	2,520 (17.4)	2,850 (19.7)
Bond Strength Hardened to Hardened	14 day	C882	psi (MPa)	3,070 (21.2)	3,220 (22.2)
Bond Strength Fresh to Hardened	14 day	C882	psi (MPa)	1,720 (11.9)	
Consistency or Viscosity	----	C881	----	Non-sag	
Heat Deflection Temperature	7 day	D648	°F (°C)	143 (61.7)	
Water Absorption	14 day	D570	%	0.10	
Linear Coefficient of Shrinkage	----	D2566	%	0.0006	

1. Results based on testing conducted on a representative lot(s) of product. Average results will vary according to the tolerances of the given property.
2. Full cure is listed above to obtain the given properties for each product characteristic.
3. Results may vary due to environmental factors such as temperature, moisture and type of substrate.
4. Gel time may be lower than the minimum required for ASTM C881.

TABLE 4: ULTRABOND 1300 **CURE SCHEDULE**[1,2,3]

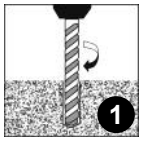
Base Material Temperature °F (°C)	Working Time	Full Cure Time
40 (4)	28 min	72 hr
75 (24)	20 min	24 hr
110 (43)	12 min	18 hr

1. Working and full cure times are approximate, may be linearly interpolated between listed temperatures and are based on cartridge/nozzle system performance.
2. Application Temperature: Substrate and ambient air temperature should be from 40 - 110 °F (4 - 43 °C).
3. When ambient or base material temperature falls below 70 °F (21 °C), condition the adhesive to 70 - 75 °F (21 - 24 °C) prior to use.

Revision 8.0

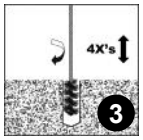
INSTALLATION INSTRUCTIONS (MPII)

Drilling and Cleaning



Using a rotary hammer drill, and a bit which conforms to ANSI B212.15 and is the appropriate size for the anchor diameter to be installed, drill the hole to the specified embedment depth. **CAUTION:** Always wear appropriate personal protection equipment (PPE) for eyes, ears & skin and avoid inhalation of dust during the drilling and cleaning process. Refer to the Safety Data Sheet (SDS) for details prior to proceeding.

NOTE: Remove any standing water from hole prior to beginning the cleaning process. If removal of standing water is not possible, please contact ATC for application specific installation instructions. Using oil free compressed air with a minimum pressure of 80 psi (5.5 bar), insert the air wand to the bottom of the drilled hole and blow out the debris with an up/down motion for a minimum of 4 seconds/cycles (4X).



Select the correct wire brush size for the drilled hole diameter (See Table 2), making sure that the brush is long enough to reach the bottom of the drilled hole. Reaching the bottom of the hole, brush in an up/down and twisting motion for 4 cycles (4X). **CAUTION:** The brush should contact the walls of the hole. If it does not, the brush is either too worn or small and should be replaced with a new brush of the correct diameter.

Blow the hole out once more to remove brush debris using oil free compressed air with a minimum pressure of 80 psi (5.5 bar). Insert the air wand to the bottom of the drilled hole and blow out the debris with an up/down motion for a minimum of 4 seconds/cycles (4X). Visually inspect the hole to confirm it is clean. **NOTE:** If installation will be delayed for any reason, cover cleaned holes to prevent contamination.
Proceed to Cartridge Preparation section if using a cartridge system or Bulk Preparation section for bulk products.

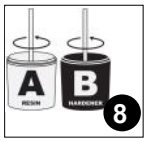
Cartridge Preparation

CAUTION: Check the expiration date on the cartridge to ensure it is not expired. **Do not use expired product!** Remove the protective cap from the adhesive cartridge and insert the cartridge into the recommended dispensing tool. Before attaching mixing nozzle, balance the cartridge by dispensing a small amount of material until both components are flowing evenly. For a cleaner environment, hand mix the two components and let cure prior to disposal in accordance with federal, state and local regulations.

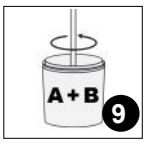
Only after the cartridge has been balanced, screw on the proper Adhesives Technology mixing nozzle to the cartridge (See Table 1). Do not modify mixing nozzle and confirm that internal mixing element is in place prior to dispensing adhesive. Take note of the air and base material temperatures and review the working/full cure time chart (See Table 4) prior to starting the injection process.

Dispense the initial amount of material from the mixing nozzle onto a disposable surface until the product is a uniform gray color with no streaks, as adhesive must be properly mixed in order to perform as published. Dispose of the initial amount of adhesive according to federal, state and local regulations prior to injection into the drill hole. **CAUTION:** When changing cartridges, never re-use nozzles. A new nozzle should be used with each new cartridge and steps 5-7 should be repeated accordingly. **Skip to step 10 for installation and curing instructions.**

Bulk Preparation



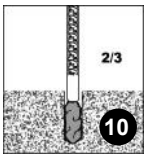
CAUTION: Check the expiration date on the container to ensure it is not expired. **Do not use expired product!** Epoxy materials may separate. This is normal and can be expected when stored over a period of time. Thoroughly stir the contents of each container (Part A then Part B) before pouring and mixing the two components together. **BUG Packaging (102 fluid oz. kit):** Pour contents of "B" component pail (hardener) into "A" component pail (resin). Make certain to scrape the sides of the pail so that you completely empty the contents of component "B". **GALLON Packaging (B2G, B10G, B100G):** Mix only the amount of material that can be used before the pot life expires. Pour resin (Part A) and hardener (Part B) equally (1:1 ratio) into a third container, adding Part A first then Part B. Mix thoroughly.



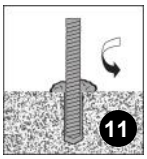
Mix thoroughly with a low speed drill (400 – 600 rpm) with a mix paddle attachment (i.e. jiffy mixer). **CAUTION:** mixing the epoxy on high speed may cause air bubbles which may cause application problems. Keep the paddle speed on low and the mix paddle below the surface of the material to avoid entrapping air. Carefully scrape the sides and the bottom of the container while mixing. Proper mixing will take 2 – 3 minutes and when well mixed the material will be uniform in color and free of streaks or lumps. **NOTE:** Due to the high viscosity/non-sag consistency of this product, a bulk dispensing pump should be used to ensure mixed epoxy is placed to the deepest end of anchor hole and that threaded rod / rebar is fully encapsulated.

INSTALLATION INSTRUCTIONS (MPII)

Installation and Curing (Vertical Down and Horizontal)



NOTE: The engineering drawings must be followed. For any applications not covered by this document, or if there are any installation questions, please contact Adhesives Technology Corp. Insert the mixing nozzle to the bottom of the hole and fill from the bottom to the top approximately two-thirds full, being careful not to withdraw the nozzle too quickly as this may trap air in the adhesive. **NOTE:** When using a pneumatic dispensing tool, ensure that pressure is set at 90 psi (6.2 bar) maximum.



Prior to inserting the threaded rod or rebar into the hole, make sure it is clean and free of oil and dirt and that the necessary embedment depth is marked on the anchor element. Insert the anchor element into the hole while turning 1-2 rotations prior to the anchor reaching the bottom of the hole. Excess adhesive should be visible on all sides of the fully installed anchor. **CAUTION:** Use extra care with deep embedment or high temperature installations to ensure that the working time has not elapsed prior to the anchor being fully installed. For horizontal installations, wedges should be used to center and support the anchor while the adhesive is curing.

Do not disturb, torque or apply any load to the installed anchor until the specified full cure time has passed. The amount of time needed to reach full cure is base material temperature dependent - refer to Table 4 for appropriate full cure time.

Bonding and Coating Use

I. **Surface Preparation:** Surfaces may be prepared by acid etching, shot blasting or other equivalent mechanical means to ensure that bonding surfaces are clean and free of foreign materials and loose particles. It is the user's responsibility to choose the appropriate method of creating the best profile for their specific application (see NACE NO. 6 - SSPC SP13 for reference).

II. **Mixing & Proportioning Instructions:** See steps 8 & 9 on previous page for bulk preparation, or steps 5-7 for cartridge preparation.

III. **Bonding fresh concrete to hardened concrete:** After preparing concrete surfaces described above, use a brush, roller or airless sprayer and apply an even coat of mixed epoxy to the clean and prepared concrete surface. Placement of fresh concrete must be done while epoxy is still tacky. If epoxy hardens prior to concrete placement, epoxy surface will need to be roughened and new epoxy must be mixed and placed.

Bonding hardened concrete to hardened concrete: Using a brush, roller or airless sprayer, apply and even coat of mixed epoxy to both concrete surfaces being sure to fill all gaps between the mating concrete surfaces.

TECHNICAL DATA

ASD Allowable Stress Design

TABLE 5: ULTRABOND 1300 ultimate and allowable **TENSION** loads for **THREADED ROD** in normal-weight concrete[1,2]

Threaded Rod Diameter in.	Nominal Drill Bit Diameter in.	Embedment Depth in. (mm)	Tension Load Based on Bond Strength/Concrete Capacity						Allowable Tension Load Based on Steel Strength[3]		
			f'c ≥ 3,000 psi (20.7 MPa)4		f'c ≥ 5,000 psi (34.5 MPa)4		f'c ≥ 7,000 psi (48.3 MPa)4				
			Ultimate lbs. (kN)	Allowable lbs. (kN)	Ultimate lbs. (kN)	Allowable lbs. (kN)	Ultimate lbs. (kN)	Allowable lbs. (kN)	ASTM F1554 lbs. (kN) Grade 36	ASTM A193 Grade B7 lbs. (kN)	ASTM F593 304/316 SS lbs. (kN)
3/8	7/16	3 1/2 (89)	9,334 (41.5)	2,334 (10.4)	10,122 (45.0)	2,531 (11.3)	10,937 (48.7)	2,734 (12.2)	2,114 (9.4)	4,556 (20.3)	3,645 (16.2)
1/2	9/16	4 1/2 (114)	14,146 (62.9)	3,537 (15.7)	14,513 (64.6)	3,628 (16.1)	18,400 (81.8)	4,600 (20.5)	3,758 (16.7)	8,099 (36.0)	6,480 (28.8)
5/8	3/4	5 5/8 (143)	19,600 (87.2)	4,900 (21.8)	20,688 (92.0)	5,172 (23.0)	29,286 (130.3)	7,322 (32.6)	5,872 (26.1)	12,655 (56.3)	10,124 (45.0)
3/4	7/8	6 3/4 (171)	25,053 (111.4)	6,263 (27.9)	26,864 (119.5)	6,716 (29.9)	34,762 (154.6)	8,691 (38.7)	8,456 (37.6)	18,224 (81.1)	12,392 (55.1)
7/8	1	7 7/8 (200)	33,374 (148.5)	8,344 (37.1)	34,328 (152.7)	8,582 (38.2)	39,524 (175.8)	9,881 (44.0)	11,509 (51.2)	24,804 (110.3)	16,867 (75.0)
1	1 1/8	9 (229)	41,696 (185.5)	10,424 (46.4)	41,792 (185.9)	10,448 (46.5)	52,143 (231.9)	13,036 (58.0)	15,033 (66.9)	32,398 (144.1)	22,030 (98.0)

1. Allowable bond strength/concrete capacity was calculated using a safety factor of 4.0.
2. The lower value of either the allowable bond strength/concrete capacity or steel strength should be used as the allowable tension value for design.
3. Allowable steel strengths calculated in accordance with AISC Manual of Steel Construction: Tensile = $0.33*F_u*A_{nom}$.
4. Linear interpolation may be used for intermediate concrete compressive strengths.

TECHNICAL DATA

ASD Allowable Stress Design

TABLE 6: ULTRABOND 1300 ultimate and allowable **SHEAR** loads for **THREADED ROD** in normal-weight concrete[1,2]

Threaded Rod Diameter in.	Nominal Drill Bit Diameter in.	Embedment Depth in. (mm)	Shear Load Based on Bond Strength/Concrete Capacity						Allowable Shear Load Based on Steel Strength[3]		
			f'c ≥ 3,000 psi (20.7 MPa)[4]		f'c ≥ 5,000 psi (34.5 MPa)[4]		f'c ≥ 7,000 psi (48.3 MPa)[4]				
			Ultimate lbs. (kN)	Allowable lbs. (kN)	Ultimate lbs. (kN)	Allowable lbs. (kN)	Ultimate lbs. (kN)	Allowable lbs. (kN)	ASTM F1554 Grade 36 lbs. (kN)	ASTM A193 Grade B7 lbs. (kN)	ASTM F593 304/316 SS lbs. (kN)
3/8	7/16	3 1/2 (89)	6,941 (30.9)	1,735 (7.7)	7,034 (31.3)	1,759 (7.8)	7,143 (31.8)	1,786 (7.9)	1,089 (4.8)	2,347 (10.4)	1,878 (8.4)
1/2	9/16	4 1/2 (114)	8,316 (37.0)	2,079 (9.2)	10,379 (46.2)	2,595 (11.5)	13,097 (58.3)	3,274 (14.6)	1,936 (8.6)	4,172 (18.6)	3,338 (14.8)
5/8	3/4	5 5/8 (143)	15,326 (68.2)	3,832 (17.0)	18,056 (80.3)	4,514 (20.1)	19,052 (84.7)	4,763 (21.2)	3,025 (13.5)	6,519 (29.0)	5,216 (23.2)
3/4	7/8	6 3/4 (171)	22,336 (99.4)	5,584 (24.8)	25,733 (114.5)	6,433 (28.6)	26,073 (116.0)	6,518 (29.0)	4,356 (19.4)	9,388 (41.8)	6,384 (28.4)
7/8	1	7 7/8 (200)	29,365 (130.6)	7,341 (32.7)	31,409 (139.7)	7,852 (34.9)	33,093 (147.2)	8,273 (36.8)	5,929 (26.4)	12,778 (56.8)	8,689 (38.7)
1	1 1/8	9 (229)	36,395 (161.9)	9,099 (40.5)	37,085 (165.0)	9,271 (41.2)	40,950 (182.2)	10,238 (45.5)	7,744 (34.4)	16,690 (74.2)	11,349 (50.5)

1. Allowable bond strength/concrete capacity was calculated using a safety factor of 4.0.
2. The lower value of either the allowable bond strength/concrete capacity or steel strength should be used as the allowable shear value for design.
3. Allowable steel strengths calculated in accordance with AISC Manual of Steel Construction: Shear = $0.17*F_u*A_{nom}$.
4. Linear interpolation may be used for intermediate concrete compressive strengths.

TABLE 7: ULTRABOND 1300 ultimate and allowable **TENSION & SHEAR** loads for **REBAR** in normal-weight concrete[1,2]

Rebar Size	Nominal Drill Bit Diameter in.	Embedment Depth in. (mm)	Tension Load Based on Bond Strength/Concrete Capacity		Allowable Load Based on Steel Strength[3]			
			f'c ≥ 3,000 psi (20.7 MPa)		Tension		Shear	
			Ultimate lbs. (kN)	Allowable lbs. (kN)	ASTM A615 Grade 60 lbs. (kN)	ASTM A615 Grade 75 lbs. (kN)	ASTM A615 Grade 60 lbs. (kN)	ASTM A615 Grade 75 lbs. (kN)
#3	1/2	3 3/8 (86)	10,025 (44.6)	2,506 (11.1)	2,640 (11.7)	3,300 (14.7)	1,683 (7.5)	1,870 (8.3)
#4	5/8	4 1/2 (114)	15,236 (67.8)	3,809 (16.9)	4,800 (21.4)	6,000 (26.7)	3,060 (13.6)	3,400 (15.1)
#5	3/4	5 5/8 (143)	22,285 (99.1)	5,571 (24.8)	7,440 (33.1)	9,300 (41.4)	4,743 (21.1)	5,270 (23.4)
#6	7/8	6 3/4 (171)	32,993 (146.8)	8,248 (36.7)	10,560 (47.0)	13,200 (58.7)	6,732 (29.9)	7,480 (33.3)

1. Allowable bond strength/concrete capacity was calculated using a safety factor of 4.0.
2. The lower value of either the allowable bond strength/concrete capacity or steel strength should be used as the allowable tension or shear value for design.
3. Allowable steel strengths calculated in accordance with AISC Manual of Steel Construction: Tensile = $(F_y*A_{nom})/2.5$, Shear = $0.17*F_u*A_{nom}$.