

POWERS PE1000+ Instruction Card

DESCRIPTION:

PE1000+ is an easy dispensing, high strength, 100% solids epoxy anchoring adhesive which is formulated for use in anchoring applications by trained professionals. Please refer to Powers Fasteners installation instructions and MSDS for additional detailed information.

PREC AUTION:

Safety glasses and dust masks should be used when drilling holes into concrete, stone and masonry. Wear gloves and safety glasses when handling and dispensing adhesive. Do not sand the adhesive and create silica dust which could be inhaled. Avoid skin and eye contact. Use a NIOSH-approved chemical mask to avoid respiratory discomfort if working indoors or in a confined area, or if sensitive to adhesive odors. Wash hands or other affected body parts with soap and water if skin contact occurs. Flush eyes with plenty of water and seek immediate medical attention if eye contact occurs. Move to fresh air if adhesive odor begins to cause discomfort.

IMPORTANT!

Before using, read and review Material Safety Data Sheet (MSDS).

This product contains crystalline silica and as supplied does not pose a dust hazard. IARC classifies crystalline silica (quartz sand) as a Group I carcinogen based upon evidence among workers in industries where there has been long-term and chronic exposure (via inhalation) to silica dust; e.g. mining, quarry, stone crushing, refractory brick and pottery workers. This product does not pose a dust hazard; therefore, this classification is not relevant. However, if reacted (fully cured) product is further processed (e.g. sanded, drilled) be sure to wear proper respiratory and eye protection to avoid health risk.

HANDLING AND STORAGE:

Store in a cool, dry, well ventilated area at temperatures between 32°F (0°C) and 95°F (35°C). Keep away from excessive heat and flame. Keep partially used containers closed when not in use. Protect from damage. Store away from heat and light.

Note expiration date on product label before use. Do not use expired product. Cartridge temperature must be between 41°F - 104°F (5°C - 40°C) when in use. Partially used cartridges may be stored with hardened adhesive in the attached mixing nozzle. If the cartridge is reused, attach a new mixing nozzle and discard the initial quantity of the anchor adhesive as described in the setting instructions (steps #3 and #5).

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[V.] Adhesive piston plugs

Threaded rod diameter (inch)	Rebar size (no.)	ANSI drill bit diameter (inch)	Plug Size (inch)	Plastic Plug (Cat. #)	Horizontal and overhead installations
3/4	#6	7/8	7/8	08300	
7/8	#7	1	1	08301	
1	#8	1-1/8	1-1/8	08303	
1-1/4	#9	1-3/8	1-3/8	08305	
-	#10	1-1/2	1-1/2	08309	

A plastic extension tube (3/8" dia., Cat# 08281) must be used with piston plugs.

[I.] Hole cleaning tools - wire brushes and air blowers

Threaded rod diameter (inch)	Rebar size (no.)	Hammer-drill bit / core bit diameter (inch)	Min. brush dia., D _{min} (inches)	Brush length, L (inches)	Steel wire brush (Cat. #)	Air blowers
3/8	#3	7/16	0.475	6-3/4	08284	Hand pump (volume 25 fl. oz.), Cat #8280 or compressed air nozzle (min. 90 psi)
1/2	#4	9/16	0.600	6-3/4	08285	
5/8	#5	11/16 (hammer-drill only) ¹	0.735	7-7/8	08286	
3/4	#6	3/4	0.790	7-7/8	08278	Compressed air nozzle only, Cat #8292 (min. 90 psi)
7/8	#6	7/8	0.920	7-7/8	08287	
7/8	#7	1	1.045	11-7/8	08288	
1	#8	1-1/8	1.175	11-7/8	08289	
1-1/4	#9	1-3/8	1.425	11-7/8	08290	
-	#10	1-1/2	1.550	11-7/8	08291	
A brush extension (Cat. #08282) must be used with a steel wire brush for holes drilled deeper than the listed brush length.						

¹For installations with 5/8-inch threaded rod and #5 rebar size, the preferred ANSI drill bit diameter is 3/4-inch. If an 11/16-inch ANSI drill bit is used the user must check before injecting the adhesive to verify that the steel anchor element can be inserted into the cleaned borehole without resistance.

[II.] Gel (working) times and curing times

Temperature of base material		Gel (working) time	Full curing time
41°F	5°C	180 minutes	50 hours
50°F	10°C	120 minutes	30 hours
68°F	20°C	30 minutes	10 hours
86°F	30°C	20 minutes	6 hours
104°F	40°C	12 minutes	4 hours

[III.] Installation parameters - Specifications for installation of threaded rods and reinforcing bars

Anchor property / Setting information	Threaded rod (inch) / reinforcing bar size (rebar)									
	3/8 or #3	1/2 or #4	5/8 or #5	3/4 or #6	7/8 or #7	1 or #8	#9	1-1/4	#10	
d = Threaded rod outside diameter (in.)	0.375	0.500	0.625	0.750	0.875	1.000	-	1.250	-	
d = Nominal rebar diameter (in.)	0.375	0.500	0.625	0.750	0.875	1.000	1.125	-	1.250	
d_o (d_{bit}) = Nominal ANSI drill bit size (in.)	¹ / ₁₆	⁹ / ₁₆	¹¹ / ₁₆ or ³ / ₄	¹ / ₈	1	¹ / ₈	¹ / ₈	¹ / ₈	¹ / ₂	
d_o (d_{bit}) = Nominal diamond core bit size (in.)	¹ / ₁₆	⁹ / ₁₆	³ / ₄	¹ / ₈	1	¹ / ₈	¹ / ₈	¹ / ₈	¹ / ₂	
$h_{ef, min}$ = Minimum embedment (inches)	2 ³ / ₈	2 ³ / ₄	3 ¹ / ₈	3 ¹ / ₂	3 ¹ / ₂	4	4 ¹ / ₂	5	5	
$h_{ef, max}$ = Maximum embedment (inches)	4 ¹ / ₂	6	7 ¹ / ₂	9	10 ¹ / ₂	12	13 ¹ / ₂	15	15	
s_{min} = Minimum spacing (inches)	1 ¹ / ₈	2 ¹ / ₂	3 ¹ / ₈	3 ³ / ₄	4 ³ / ₈	5	5 ⁵ / ₈	6 ¹ / ₄	6 ¹ / ₄	
c_{min} = Minimum edge distance (inches)	1 ³ / ₄	1 ³ / ₄	1 ³ / ₄	1 ³ / ₄	1 ³ / ₄	1 ³ / ₄	2 ³ / ₄	2 ³ / ₄	2 ³ / ₄	
h_{min} = Minimum member thickness (inches)	$h_{ef} + 1-1/4$			$h_{ef} + 2d_o$						
T_{max} = Maximum torque (ft.-lb.)	15	33	60	105	125	165	165	280	280	
T_{max} = Maximum torque (ft.-lb.) for low strength steel only	10	25	50	90	125	165	165	280	280	

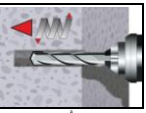

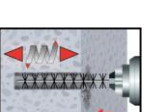
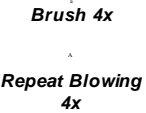
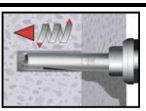

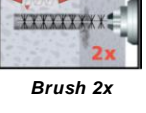

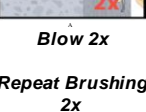
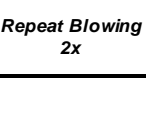
For installations between the minimum edge distance and 5 anchor diameters, the tabulated maximum torque must be reduced (multiplied) by a factor of 0.45.


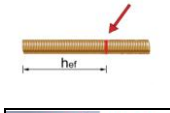
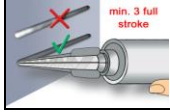
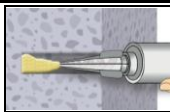

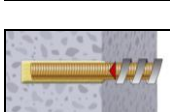
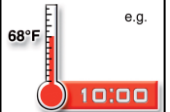
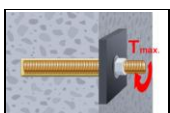
[IV.] PE1000+ epoxy adhesive anchor system selection table

Injection tool	Plastic cartridge system	Extra mixing nozzle
13 fl. oz. manual dispenser Cat. #08295	PE1000+ 13 fl. oz. dual cartridge w/mixing nozzle and extension tube - Cat. #0500SD	Mixing nozzle and extension tube Cat. #08293 or 08294
20 fl. oz. manual dispenser Cat. #08298	PE1000+ 20 fl. oz. dual cartridge w/mixing nozzle and extension tube - Cat. #0502SD	Mixing nozzle and extension tube Cat. #08293 or 08294
13 & 20 fl. oz. pneumatic dispenser Cat. #8497SD	PE1000+ 13 fl. oz. dual cartridge w/mixing nozzle and extension tube - Cat. #0500SD or PE1000+ 20 fl. oz. dual cartridge w/mixing nozzle and extension tube - Cat. #0502SD	Mixing nozzle and extension tube Cat. #08293 or 08294
13 & 20 fl. oz. battery dispenser Cat. #08279	PE1000+ 20 fl. oz. dual cartridge w/mixing nozzle and extension tube - Cat. #0502SD	Mixing nozzle and extension tube Cat. #08293 or 08294
47 fl. oz. pneumatic dispenser Cat. #08276	PE1000+ 47 fl. oz. dual cartridge w/mixing nozzle and extension tube - Cat. #0503SD	Mixing nozzle and extension tube Cat. #08293 or 08294

A plastic extension tube (3/8" dia., Cat# 08281) must be used for embedment depths greater than 7-1/2 inches.

SELECT HAMMER DRILLING OR CORE DRILLING AS SUITABLE FOR APPLICATION

HAMMER DRILLING		<p>1 Drill a hole into the base material with rotary hammer drill to the size and embedment required by the selected steel hardware element (see Table III). Tolerances of carbide drill bits must meet ANSI Standard B212.15. Precaution: Wear suitable eye and skin protection. Avoid inhalation of dusts during drilling and/or removal.</p> <p>Note: In case of standing water in the drilled bore hole (flooded hole), all the water has to be removed from the hole (e.g. vacuum, compressed air, etc.) prior to cleaning.</p>
		<p>2a. Starting from the bottom or back of the drilled anchor hole, blow the hole clean (free of noticeable dust) a minimum of four times (4x).</p> <p>Use a compressed air nozzle (min. 90 psi) or a hand pump (min. volume 25 fl. oz. supplied by Powers Fasteners) for anchor rod 3/8" to 3/4" diameter or reinforcing bar (rebar) sizes #3 to #6. Use a compressed air nozzle only (min. 90 psi) for anchor rod 7/8" to 1-1/4" diameter and rebar sizes #7 to #10 (a hand pump must not be used with these large anchor sizes).</p>
HOLE CLEANING HAMMER DRILLED HOLES		<p>2b. Determine brush diameter (see Table I) for the drilled hole and attach the brush with adaptor to a rotary drill tool or battery screw gun. Brush the hole with the selected wire brush a minimum of four times (4x).</p> <p>A brush extension (supplied by Powers Fasteners) must be used for holes drilled deeper than the listed brush length. The wire brush diameter must be checked periodically during use ($\varnothing_{brush} > D_{min}$, see Table I). The brush should resist insertion into the drilled hole, if not the brush is too small and must be replaced with the proper brush diameter.</p>
		<p>2c. Repeat Step 2a again by blowing the hole clean a minimum of four times (4x).</p> <p>When finished the hole should be clean and free of dust, debris, ice, grease, oil or other foreign material. → Next go to Step 3.</p>
		<p>1 Drill a hole into the base material with core drill to the size and embedment required by the selected steel hardware element (see Table III). Precaution: Wear suitable eye and skin protection. Avoid inhalation of dusts during drilling and/or removal.</p>
HOLE CLEANING CORE DRILLED HOLES		<p>2a. Starting from the bottom or back of the drilled anchor hole, rinse/flush the hole clean with water (water line pressure) until clear water comes out.</p>
		<p>2b. Determine brush diameter (see Table I) for the drilled hole and attach the brush with adaptor to a rotary drill tool or battery screw gun. Brush the hole with the selected wire brush a minimum of two times (2x).</p> <p>A brush extension (supplied by Powers Fasteners) must be used for holes drilled deeper than the listed brush length. The wire brush diameter must also be checked periodically during use ($\varnothing_{brush} > D_{min}$, see Table I). The brush should resist insertion into the drilled hole, if not the brush is too small and must be replaced with the proper brush diameter.</p>
		<p>2c. Repeat Step 2a again by rinse/flushing the hole clean with water.</p> <p>Following this remove all standing water completely (e.g. vacuum, compressed air, etc.) prior to further cleaning. To attain a dried borehole a Powers compressed air nozzle is recommended.</p>
		<p>2d. Starting from the bottom or back of the drilled anchor hole, blow the hole clean (free of noticeable dust) a minimum of two times (2x).</p> <p>Use a compressed air nozzle (min. 90 psi) for all sizes of anchor rod and reinforcing bar (rebar).</p>
		<p>2e. Repeat Step 2b again by brushing the hole with a wire brush a minimum of two times (2x).</p> <p>2f. Repeat Step 2d again by blowing the hole clean a minimum of two times (2x).</p> <p>When finished the hole should be clean and free of dust, debris, ice, grease, oil or other foreign material. → Next go to Step 3.</p>

PREPARING		<p>3. Check adhesive expiration date on cartridge label. Do not use expired product. Review Material Safety Data Sheet (MSDS) before use. Cartridge temperature must be between 41°F - 104°F (5°C - 40°C) when in use. Review published working and cure times. Consideration should be given to the reduced gel (working) time of the adhesive in warm temperatures. For the permitted range of the base material temperature see Table II.</p> <p>Attach a supplied mixing nozzle to the cartridge. Do not modify the mixer in any way and make sure the mixing element is inside the nozzle. Load the cartridge into the correct dispensing tool.</p> <p>Note: Always use a new mixing nozzle with new cartridges of adhesive and also for all work interruptions exceeding the published gel (working) time of the adhesive.</p>
		<p>4. Prior to inserting the anchor rod or rebar into the filled bore hole, the position of the embedment depth has to be marked on the anchor. Verify anchor element is straight and free of surface damage.</p>
INSTALLATION		<p>5. Adhesive must be properly mixed to achieve published properties. Prior to dispensing adhesive into the drilled hole, separately dispense at least three full strokes of adhesive through the mixing nozzle until the adhesive is a consistent red color.</p> <p>Review and note the published working and cure times (see Table II) prior to injection of the mixed adhesive into the cleaned anchor hole.</p>
		<p>6. Fill the cleaned hole approximately two-thirds full with mixed adhesive starting from the bottom or back of the anchor hole. Slowly withdraw the mixing nozzle as the hole fills to avoid creating air pockets or voids. For embedment depths greater than 7-1/2" a plastic extension tube supplied by Powers Fasteners must be used with the mixing nozzle (see Table IV).</p> <p>Piston plugs (see Table V) must be used with and attached to mixing nozzle and extension tube for horizontal and overhead installations with anchor rod from 3/4" to 1-1/4" diameter and rebar sizes #6 to #10. Insert piston plug to the back of the drilled hole and inject as described in the method above. During installation the piston plug will be naturally extruded from the drilled hole by the adhesive pressure.</p> <p>Attention! Do not install anchors overhead without proper training and installation hardware provided by Powers Fasteners. Contact Powers for details prior to use.</p>
		<p>7. The anchor should be free of dirt, grease, oil or other foreign material. Push clean threaded rod or reinforcing bar into the anchor hole while turning slightly to ensure positive distribution of the adhesive until the embedment depth is reached. Observe the gel (working) time.</p>
		<p>8. Be sure that the anchor is fully seated at the bottom of the hole and that some adhesive has flowed from the hole and all around the top of the anchor. If there is not enough adhesive in the hole, the installation must be repeated. For overhead applications the anchor must be secured from moving/falling during the cure time (e.g. wedges). Minor adjustments to the anchor may be performed during the gel time but the anchor shall not be moved after placement and during cure.</p>
CURING AND FIXTURE		<p>9. Allow the adhesive anchor to cure to the specified full curing time prior to applying any load (see Table II).</p> <p>Do not disturb, torque or load the anchor until it is fully cured.</p>
		<p>10. After full curing of the adhesive anchor, a fixture can be installed to the anchor and tightened up to the maximum torque (shown in Table III) by using a calibrated torque wrench.</p> <p>Note: Take care not to exceed the maximum torque for the selected anchor.</p>