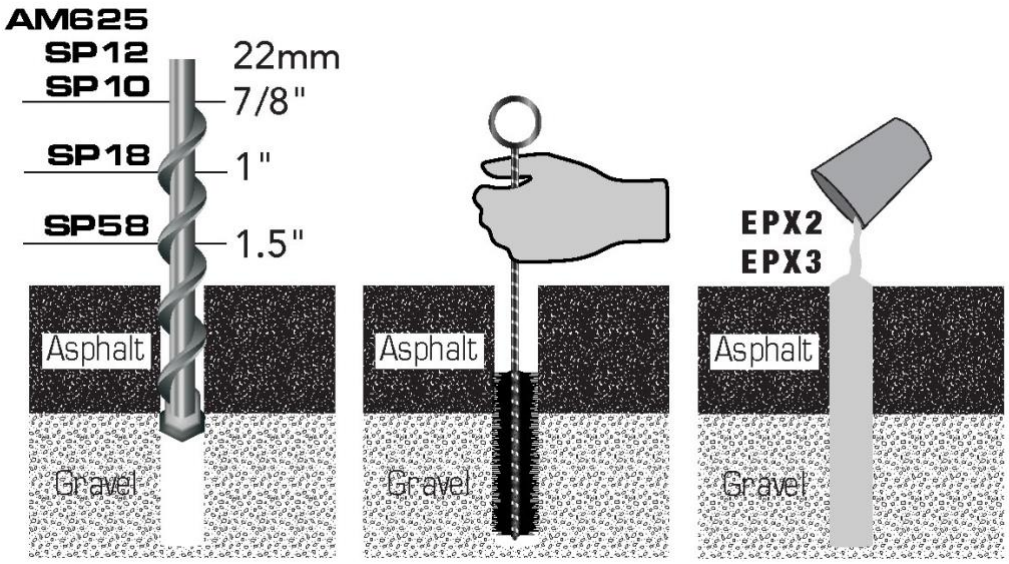
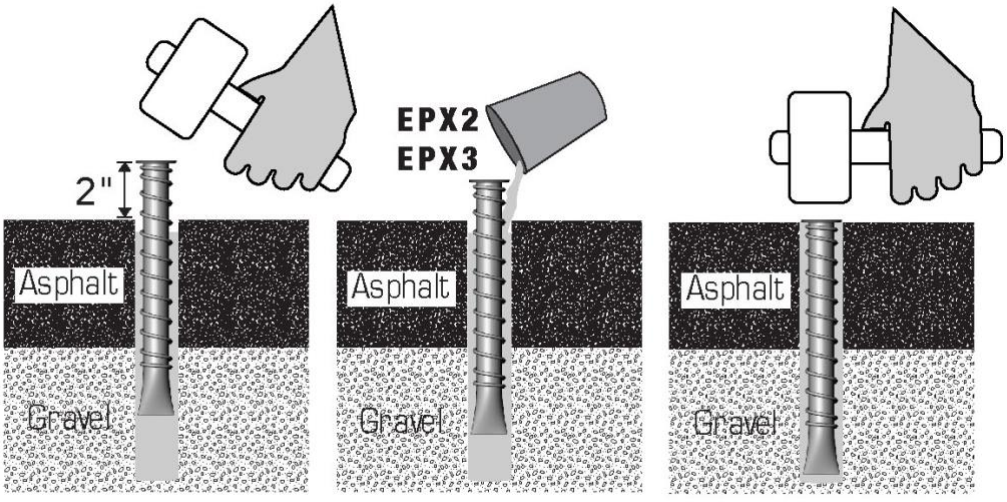
Anchor Installation Manual V8.6

5/11/2025

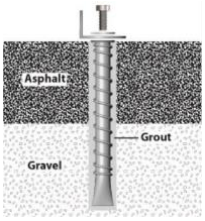


1.Drill 2.Brush 3.Pour



4. Hammer 5. Top Up 6. Flush

***BoltHold**tm* is a family of anchors specifically designed for anchoring to asphalt. The anchors are suitable for attaching objects and structures to asphalt. This document provides instructions and a guide for the installation of our line of anchors. Updated information on anchor installation, as well as application-specific calculators, can be found on our web site asphaltanchors.com



Please review AN62 for recommendations for site preparation, view AN36 for cold weather handling and AN65 for hot weather handling. AN44 lists installation errors. AN48 shows non-standard installations. AN55 provides details about fence installation.

STATIC VS. DYNAMIC STRESS

Asphalt "flows" under *continuous* pull stress. Asphalt is, however, very resilient when subjected to short duration forces. Expansion anchors, which depend on pressure against the walls and work well in concrete, will loosen quickly when used in asphalt. BoltHold anchors, however, use an **adhesive** (also referred to as "**grout**") to bind with the asphalt in a stress-free bond and will therefore hold fast for many years. *Please note that this adhesive grout has nothing in common with tile grout.*

When considering securing a structure using the BoltHold anchors, review how stable the object is without the effects of wind, ice or snow. If the structure stands solidly on its own, you may load the anchors at 80% of their pull rating. If the object will apply a static pull force on the anchors just as it stands, limit the load on the anchors to 20% of the pull rating.

PULL RATING

See online calculator https://aac.fyi/GroupCalc

Ratings are based on a minimum distance of 12" between anchors. If the distance is less than 12", de-rate the pull force of all but the first anchor by 6% for every inch less than 12"[2]. Ratings are based on asphalt thickness of 2½". For heavier asphalt, increase the allowed forces proportionately[3].

	SP10 / AM625	**SP12**	**SP18**	**SP58**
Rated Pull, lbs.	1,500	2,000	2,500	[1]5,000
Bolt Torque lb-in	200	200	280	720
Drill Depth	6"	12"	12"	10"
Drill diameter	7/8"	7/8"	1"	1.5"
Drill Part Number	83-1002	83-1002	83-1003	83-1004
Anchors per EPX2 bag	3-4	2	1.5	0.8
Anchors per EPX2 tub	60	30	15	10
Anchors per EPX3 cartridge	4.5	2.7	1.4	0.8
Adhesive required, mL (cc)	60	120	150	290

Table 1

[1] This anchor is specified at 3" asphalt thickness.

[2] An example for derating due to proximity of anchors: 4 anchors are installed 5" apart. The force capacity for the 2nd 3rd and 4th anchors is derated by (12-5) x 0.06 = 42%. See de-rating calculator asphaltanchors.com/calculators.

[3] An example for calculating the effect of asphalt thickness: 3" asphalt will increase the anchor's force capacity to 3/2.5 = 1.20. Thus, SP10 rated at 1,500lbs. will handle 1,800 lbs. See Group calculator asphaltanchors.com/calculators.

BOLT LENGTH

For metal anchors, the minimum required thread *inside* the anchors is 5 turns of the bolt or 0.75", whatever is more. The maximum is the length of the anchor less 2". There is no strength benefit in having more than 0.75" of thread inside the anchor.

ADHESIVE SELECTION

The adhesive binds the anchors on the one hand and bonds with the asphalt on the other hand. Suitable materials are expanding cement or low shrink resins ("epoxy"). The adhesive must be self-leveling (meaning that it can flow to fill in crevices and voids). It must cure to a hard material. The cured adhesive must be immune to extended exposure to water. The amount of adhesive required depends on the model of the anchor you selected and the dimensions of the hole you drilled. See Table 1.

EPX2 BAG

EPX2 TUB

The most cost-effective anchoring results are achieved using our EPX2, an expanding anchoring cement. The EPX2 is packaged either in bags or in a large tub. The bags hold 12oz (P/N 82-5002.K for a six-pack). The re-sealable bags allow adding water, kneading the mixture, then pouring it. The EPX2 is also available in 10 lbs. tubs at a lower cost (P/N 82- 5002.010). Note that *the EPX2 cannot be applied at temperatures below 50°F.*

EPX3 Cartridge

Our EPX3 epoxy (a 2-part acrylic resin) is packaged in a single cartridge compatible with many caulk guns[4]. We recommend high-thrust (40:1) guns such as our CG40. The EPX3 can be applied at temperatures as low as 14°F (see footnote[5]) and offers the convenience of cartridge application requiring no manual mixing.

OTHER

Our ratings of the anchors are based on tests that we have run with the EPX2 and EPX3. Your results and the reliability of the installation using other grouts may vary**.** Do not use Rocktite or Kwixset as the cured product is water soluble.

REQUIRED SUPPLIES

Before starting the installation, make sure that you have the following items:

1. Adhesive in quantity per table 1
2. If the object that you are attaching is thicker than 3/8", procure the required bolts[6]. Otherwise, the bolts provided with the anchors will do.

[4] Due to the force required to squeeze the epoxy we recommend using a hi-thrust caulk gun. See the EPX3 datasheet. The EPX3 does not fir in the Milwaukee P18 battery powerfed gun. It does fit in many others, including Dewalt DCE560.

[5] Extra caution is advised when working at temperatures below freezing as the normally porous asphalt may be frozen and the grout will not be able to grab its crevices. The result will be a much weaker installation. The EPX3 cartridge needs to be at 50F or higher for a fast installation.

[6] Length of bolt equals thickness of object plus thickness of washer plus 0.75", rounded up.

3. If you provide your own bolts, you will need Permatex anti-seize paste to facilitate removal of the bolts in the future. #80078 for steel anchors, #77124 for stainless steel anchors. (More in the next pages)
4. Masonry drill bit per Table 1
5. Tools — hammer-drill, mallet, wrench for bolts, vacuum cleaner or blower or broom, nylon tube brush.
6. 3 plastic containers and mixing sticks (EPX2 only)
7. Caulk gun if using the EPX3.

FOR REALLY FLUSH INSTALLATION

The head of the anchor is about 0.080" (2mm) high. That only presents a problem if the attached object is removed for the winter for snow plowing, as some snowplows may snag the head of the anchor. The asphalt may be compacted to accommodate the entire head of the anchor using our Flattener tool (P/N 01-6390). The tool is placed in the hole *before* any adhesive is applied and hammered in to compact the area below the head. The tool is not suitable for the SP58 anchors. **Do not use the tool on an installed anchor**.

DIRECTIONS

The directions that follow apply to the use of the EPX2 in bag or tub, and for the use of the EPX3. Sections specifically for the EPX3 are shaded to separate them from the EPX2.

EPX2 USE

The original mixing instructions for the EPX2 were based on adding water to a measured volume of EPX2 powder. The shortcoming of that method is that the mixture switches abruptly from powder to liquid.

We found that adding powder to water allows for a controlled increase in the mixture's density. The instructions below have been rewritten to follow this method.

Old labels on EPX2 bags may show the add-water-to-powder.

1. Prior to the activation of the adhesive, make sure that you have the anchors on hand. Do not separate the bolts from the anchors. Tighten the bolt to the anchor to protect the thread from hammering the anchor.
2. Note that the EPX2 and EPX3 are fast curing; you have less than 10 minutes handling time for the EPX2 and 5 minutes for the EPX3 (at 75°F).
    a. At elevated temperatures (above 85F), the pot life becomes very short (single minutes). See AN65 for solutions before proceeding with the installation.
    b. At low temperatures (below 45°F) the EPX2 may not cure. See AN36 for solutions. (Best is not to use the EPX2 at low temperatures.)

DRILLING TIPS

3. We recommend that you drill and clean all the holes first, then proceed with applying the adhesive.
4. Drilling in asphalt requires masonry drill bits and a hammer drill. **Use only SDS+** or **SDS MAX** type drills – do not attempt to use standard chucks to hold the drill bit.
5. Do not apply excessive force when drilling. This avoids tearing small chunks of asphalt which can jam the drill.
6. Clean the flutes of the drill bit after each hole. This is particularly critical when drilling the larger holes.
7. Drill the holes in the diameter and length per table 1. If you use a larger drill diameter or drill deeper than specified, you will need more adhesive. A larger diameter hole adds to the strength of the installation.
8. Do not proceed with the use of the EPX2 if the holes fill up with water due to high ground-water level! Use the EPX3 instead.
9. Use compressed air or a blower to clean the drilled dust from around the hole, then thoroughly clean the hole of any internal dust. Wear goggles for safety.
10. Using a nylon tube brush (such as our part number 46-3001), clean the hole's first 4-6 inches with an up/down motion while pressing against the walls. Tap the brush after every few strokes to clear it from dust. It is essential that all the dust be removed and that the walls of the hole have been slightly roughed up. It may require 5 separate passes to get all the dust out.

11. Blow the area clean again.
12. Pour a pre-measured volume of water into the mixing container. We recommend mixing enough material for 4 holes; if less, the quantities of the grout and water become small and harder to measure.

ESTIMATING REQUIRED GROUT VOLUME

The volume required depends on the depth of the asphalt layer, the density and depth of the soil under the asphalt, the consistency of the mixture as it is being poured, on topping off to fill the hole to the top, and on the curing time. The values in the table represent an average requirement. We recommend that you have **20% overage** available at the job site.

Use the table below to estimate the water and adhesive volumes. Note that numbers are rounded and approximate:

Anchor	Water Volume, for 4 anchors		EPX2 Volume, for 4 anchors		EPX2 bags for 4 anchors
	CUPS	Fl. Oz.	CUPS	Fl. Oz.	# Bags
AM625	0.4	2.9	1.6	12.4	1.1
SP10	0.4	2.9	1.6	12.4	1.1
SP12	0.5	3.7	2.0	16.3	1.4
SP18	0.6	4.9	2.6	21.2	1.8
SP58	1.4	11.0	6.0	47.6	5

13. Slowly add the EPX2 powder and stir continuously. There is variability in the required amount, depending on the water content of the adhesive. The end consistency of the mixture should be syrup-like. Note that the transition from liquid to solid is quite abrupt, so add the powder slowly. Aim at a consistency as shown in the picture on the right.

14. If the consistency is too thin, the adhesive will require much longer to cure and may not reach full strength. If too much adhesive was applied, there will be lumps in the mixture and it will clog the top of the hole and the adhesive will not flow to the full length of the hole. The pull resistance will be severely reduced.
15. If more water is required, add one tablespoon at a time.
16. Slowly pour the mixture into the hole.
17. Make sure that the adhesive fills the hole to the very top of the hole, even a little above it. Failure to fill to the top will greatly weaken the bond between the anchor and the asphalt. To eliminate air pockets, prod the adhesive with a thin tool such as a chopstick or pull the anchor out a couple of inches and push it back in.

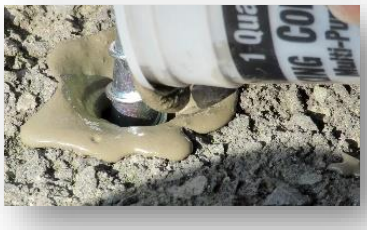
EPX3 DIRECTIONS

See EPX3 datasheet

1. **EPX3 USER:** Place the EPX3 cartridge in a single cartridge caulk gun. Remove the protective nut at the top of the cartridge. There is no need to puncture the opening as in many other cartridges.
2. Attach the supplied mixing nozzle to the threaded front of the cartridge.
3. Pump a full length of the nozzle so that the mix coming out of the nozzle in uniformly gray. You can use this mix if you are starting to fill a new hole. If you are just topping off a hole, discard the first 2 inches coming out of the nozzle..
4. Proceed to fill the hole with the mixture, starting with the nozzle deep in the hole and slowly retracting the nozzle as the hole fills. This assures that the epoxy will reach the full length of the anchor. Prodding the adhesive with the tip of the nozzle will collapse air pockets.
5. Make sure that the adhesive reaches the very top of the hole, even a little above it. Failure to fill to the top will greatly weaken the bond between the anchor and the asphalt.

INSERT ANCHOR

1. Push the anchor into the hole with a slow, down-up motion so that the entire length of the anchor will be wetted by the mixture. When the anchor head is about 2" from the asphalt, inspect the level of the adhesive in the hole. If the level is below the surface, top-up the adhesive without pulling out the anchor.



2. Push the anchor in until its head is flush with the surface. You may need to use a mallet to force the anchor to seat all the way, because the gravel/soil at the bottom tends to close on itself.
3. An indication that the adhesive has reached the all-important top of the anchor is squeezed-out adhesive visible around the head of the anchor.
4. Immediately wet-clean the area around the anchor to remove unsightly adhesive before it cures. Alternately, scrape the excess using a trowel or a piece of cardboard.
5. The time for EPX2 to cure is about 15 minutes at 75°F. The time for full cure is 1 hour. Wait 2 hours before exerting a pull load or a heavy torque on the anchors. For pull tests (to failure) wait 24 hours.
6. If the EPX2 adhesive fails to start curing due to low temperatures (50°F and below), use a blow torch to gently heat the inserted anchor. That will usually start the curing process.
7. The worktime and curing times for the EPX3 are shown in the table below.

Temp	Work Time	Cure Time
14°F	90	24 hours
41°F	25	2 hours
68°F	6	45 min
86°F	4	25 min

ATTACH OBJECT

1. Remove the bolt and washer from the anchor after the recommended cure time.

2. If you use your own bolt, apply a small amount of Permatex paste along the thread (one side is enough). Use Permatex 80078 for steel anchors; use Permatex 77124 for Stainless Steel anchors.
3. Making sure that the plate to be attached is flat[7] and in contact with the head of the anchor, align the holes in the plate with the anchors.
4. Insert the washer and the bolt and tighten. Do not exceed the torque allowed in Table 1. **Do not use an impact wrench**.

[7] A convex plate will allow the anchor to be pulled as the bolt is tightened, breaking the bond between the asphalt and the anchor.

EPX2 WARNINGS

- Mixed with water but not yet cured, the adhesive is caustic and can cause burns to eye and skin.
- Prevent aluminum from coming in contact for a lengthy period with the installed EPX2 adhesive. No such precaution is necessary for the EPX3.
- Do not use the EPX2 with Dacromet or similar coating that contains aluminum.
- Use of the EPX2 at temperatures lower the 50F is not recommended due to the slowed curing process.

CALCULATORS

Our website offers 6 useful calculators that will save you time and will recommend the least-cost anchors for your application. You can find the calculators at asphaltanchors.com/Calculators.

- The **Grout** calculator computes the required amount of adhesive for the selected number of anchors of any one anchor model.
- The **Group** calculator provides the rated pull resistance of a group of anchors installed close to each other, in asphalt of specified thickness.
- The **Fence** calculator suggests the number and model of anchors to secure surface-mounted fence posts to asphalt.
- The **Sign** calculator suggests the number and model of anchors to secure a surface-mounted signpost to asphalt.
- The **Carport** calculator suggests the number and model of anchors to secure surface-mounted carport posts to asphalt
- The **Shed** calculator is like the carport calculator except that is supports walls on all sides

ANCHOR REMOVAL

Sometimes an installed anchor needs to be removed. The best time to do so is immediately after installation, before the adhesive is fully cured. That is usually within 15-60 minutes of pouring the adhesive.

The recommended method is to use a socket or wrench and over-tighten the bolt to the point where the entire anchor will rotate and break away from the adhesive that surrounds it. Once the anchor rotates in the asphalt, try and rotate it counterclockwise and it may thread itself out. If that does not work, use two large flat screwdrivers or a nail puller under the anchor's head to extract it.

Removing the anchor this way allows you to reinstall an anchor in the same hole. If the adhesive is already fully cured, the over-tightening method may result in the head of the anchor breaking off the body of the anchor. In that case, you can use a suitable metal drill and drill out the body of the anchor.

SHADE

For applications at tropical ambient temperatures (>90°F), where the sun directly hits the anchor or its immediate area (6" radius) we recommend placing a white light-blocking 8x8 acrylic cast plate over the anchor. If the installed object covers the immediate area, such as in the case of speed bumps, no shade is needed. See AN65.

Applications for securing containers against hurricane winds may not require plates because the attendant rain cools the surfaces.