PRIMELINE PRODUCTS, INC.

"Your Prime Source for Solutions, Products, and Training"

INSTRUCTIONS FOR SECTIONAL POINT REPAIR

USING PRIMELINER EPOXY RESIN or SILICATE RESIN AND FIBERGLASS

NOTE: These instructions assume that procedures such as defect measurement, line cleaning, pre-CCTV inspection, etc. have been completed.

Materials List:

PrimeLiner Epoxy Resin Components A and B; Mixed 4:1 (Base : Hardener) **or**

PrimeLiner Silicate Resin Component A and B; Mixed 2:1 (B:A, by volume)

Trevara® coated fiberglass mat; sold in 5'0" wide rolls or Polyester cord reinforced polyethylene tube

Bondbreaker materials - Polyethylene sheeting or Shrink Wrap material

Calibrated measuring buckets (preferably plastic for easier cleanup) or digital scale

Mixing buckets (preferably plastic for easier cleanup)

Variable speed drill (capable of at least 900 rpm)

Typical paint mixing tool for drill

Plastic trowels (available at paint stores)

Protective gloves

Protective eyewear

Acetone (small amount for cleanup and/or removal of liquid resin from skin)

Duct tape

Fastening devices such as plastic tape, tube netting, breakaway wire ties, etc.

Cleanup materials

311 Altamonte Commerce Blvd #1608 Altamonte Springs, FL 32714
Office: 407-772-8131 Fax: 407-786-8131
Web: www.PrimeLineProducts.com

Easy to Follow Steps:

1. Choose the site for wet out. Mixing and impregnation should be accomplished in the shade, and materials - especially resin - should be protected from direct sunlight at all times to avoid overheating. Also, try to avoid impregnation operations on asphalt or other dark surfaces which may retain excessive heat.

2. Measure the amount of resin parts A and B required. Remember that the mix ratio for Quik-Pox Epoxy is 4:1 (Base:Hardener) PrimeLiner 3P Silicate Resin Component A and B; Mixed 2:1 (B:A, by volume). See Addendum for measuring Resin.

3. Measure and cut the amount of fiberglass required using the following procedure. Multiply the diameter of the pipe by pi (3.14) and add about four inches to determine the width of the fiberglass. Multiply the length of the repair by either two or three (depending upon repair thickness required) to determine the length of the fiberglass. For instance, for a 5-foot repair in an 8-inch diameter pipe with double thickness, the width of the mat to be impregnated would be about 29 inches (8 x 3.14 = 25.12 plus 4 inches) and the length would be 10 feet (5-foot repair length times 2).

4. Determine the amount of pressure required in the packer for the repair. This is accomplished by placing the packer inside a pipe of the same diameter as is being repaired. Make certain the packer is fully inserted into the pipe. Then inflate the packer just enough for the rubber to make contact with the pipe and note that pressure reading on the pressure gauge. Add five pound to that pressure. For instance, if the rubber makes full contact with the host pipe at 8 psi, then add five pounds for a total of 13 psi pressure for the actual repair. **REMEMBER THAT YOU WILL BE WORKING IN A DAMAGED PIPE AND IT IS VERY IMPORTANT THAT THE PACKER NOT BE PRESSURIZED TO THE POINT THAT IT WILL FURTHER DAMAGE THE PIPE.**

5. Prepare the packer. For protection of the carrier and to act as a bond breaker, the carrier should be wrapped with a polyethylene tube or flat material or a heavy duty shrink wrap. If polyester cord reinforced polyethylene tube is used, cut a length of the tube to completely cover the packer from end to end. Duct tape one end of the tube so that it is securely attached to the end of the packer that will be inserted first into the line from the manhole. This is necessary so that when the packer is deflated and removed from the repair, the tube will invert and easily pull away from the repair surface and then come out of the line trailing the packer. Do not tape or secure the other end of the tube. If PE sheeting is used, loosely wrap the sheeting around the packer enough so that when the packer is fully deflated, the sheeting will expand with the packer and still be overlapped when fully inflated. Again, completely cover the

packer and secure it on one end only as stated above. Note that PE sheeting can rupture if it is not properly wrapped so that it will expand with the packer. Secure cables and air fittings.

6. Place a protective layer of PE sheeting on the surface for impregnation, making sure it is larger than the fiberglass matting so that resin will not spill or run onto the ground or into the environment.

7. Impregnation: Place the fiberglass matting on the PE sheeting with the Trevara side facing up. Combine the two parts of the resin and mix thoroughly, about 45 seconds. Do not mix more than 60 seconds or use excessive speed. Spread approximately 2/3's of the resin on the Trevara surface and work it in with the trowel or plastic spatula, paying special attention to thoroughly saturate all surfaces, including edges. Turn the matting over. Take a moment or two to use the trowel/spatula to work the resin up through the matting, and then spread the remaining resin over that surface. Again, thoroughly work the resin into all surfaces, including edges.

8. Fold the matting. After impregnation, fold the matting as follows. If a double thickness is desired, fold the two ends of the matting into the middle, overlapping an inch or so in the middle. If a triple thickness is desired, fold one end to a point about two-thirds of the way to the opposite end, then fold the opposite end over that fold, stopping short of the opposing edge about one inch (for aesthetics).

9. Carefully turn the resin/matting composite over and lay the packer over the middle of the length of the composite. Wrap the composite over the packer as tightly as possible and then secure the composite with some medium such as plastic tape (which will stretch and break under pressure from the packer), tube netting, rubber bands or breakaway wire ties or zip ties.

10. Place the packer into the line. Winch the packer into the line to a point just outside the manhole and STOP. Note that care should be taken while placing the packer with the composite into the manhole and line so that the composite does not slide or slip forward or backward on the packer. After the packer and composite are fully in the line, put just enough air pressure into the packer to make it firm, but not to expand it. By so doing, the packer will "snug" against the composite, helping to hold it in place as it travels through the line to the site of the repair.

11. Winch the packer into the line to the point of the repair and inflate it to the required pressure (see item number 4 above). At that point, the composite should be firmly pressed against the inside of the host pipe. Monitor the packer to make certain that the packer maintains the required pressure for the entire curing time.

12. Determine curing time. The cure time of the resin is typically about 120 to 150 minutes after mixing. This time, however, can vary somewhat due to factors such as ambient temperature when mixed and impregnated, resin storage temperature and

other factors which typically affect virtually any resin. To determine when cure has been completed, take a small amount of the mixed resin and place it between two pieces of polyethylene sheeting and press it so that the resin is only about one-eighth of an inch thick. Place this in a small container and place that container into the manhole so that the resin sample is at about the same temperature as the repair composite. Periodically withdraw the sample and try to slightly pull the PE off the resin sample. When you can separate the PE from the resin sample without leaving any residue on the PE, then you can be reasonably certain that the repair has cured.

13. Deflate and remove the packer. After curing has finished, deflate the packer and remove it from the line. Remember that when the packer is first being removed from the repair site in the pipe, it is inverting the PE protective tube or sheeting from inside the repair so be careful not to remove it too quickly at that point so that the PE won't tear and remain in the line. Also note that when the packer is removed from the line, the PE tube or sheeting should be trailing the packer.

14. At this point the repair should be completed, ready/for CCTV inspection.

Further notes: Read and follow all MSDS. The individual components (A and B) can be removed from skin with soap and water. Note that if the mixed resin is allowed to harden on skin, it will be worn until natural oils and "wear and tear" remove it. Cleanup any tools as desired using a small amount of acetone. Typically, the resin will easily pop off plastic buckets, spatulas, etc., after it has hardened so those generally don't need to be cleaned. Also, by spinning the mixer at high speed just over the surface of the resin, but still contained in the mixing bucket, most of the resin can be removed from the mixer. Typically, since plastic is used so much for mixing and impregnation, there is very little (if any) cleanup required with acetone.

PrimeLiner Epoxy and Silicate resin is available in various formulations for various setting times and weather conditions. If you experience working and setting times that are too short (perhaps in very hot weather) or too long (very cold weather), let us know at PrimeLine Products and we will help you obtain the working/setting times you require. There is a separate paper available which details resin storage, handling, mixing and how to increase or decrease working/setting times.

A typical sectional lining application typically takes only a couple of hours by an experienced crew. Note that fiberglass and PE can be cut to the desired size before leaving the shop and the two resin components can be measured in the same way. There are ways to maximize efficiency to make many repairs by one crew in one day.

Never inflate a carrier packer outside a pipe. Also, never exceed maximum pressure recommended by the packer manufacturer.

24/7 Phone Support – Call us anytime. All calls go to our cell phones if out of office.

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Addendum Resin Calculator

Silicate Resin Sectional Point Repairs

Silicate Resins are mixed 2:1 (B:A) by volume.

Since the resins are mixed 2:1 by volume; one kit of resin is two (2) five-gallon pails of B resin and one (1) five-gallon pail of A resin.

The B (Brown) side is sold in five (5) gallon pails. Each pail weighs 50 pounds. Therefore, one gallon of B resin will weigh 10 pounds.

The A (Clear) side is sold in five (5) gallon pails. Each pail weighs 64 pounds. Therefore, one gallon of A resin will weigh 12.8 pounds.

Use the following table for computing the total pounds of mixed resin required per linear foot of repair.

Pipe Diameter	Material Thickness	A Comp. (Pounds)	B Comp. (Pounds)
4”	Two Layers	0.36	0.57
6”	Two Layers	0.55	0.85
8”	Two Layers	0.73	1.14
10”	Two Layers	0.91	1.42
12”	Two Layers	1.09	1.71
15”	Two Layers	1.37	2.14
18”	Two Layers	1.64	2.56
21”	Two Layers	1.91	2.99
24”	Two Layers	2.19	3.42

Example: 15” Diameter Sectional Repair; 5 LF long requires:

A Resin: 5 x 1.37 (Pounds) B Resin: 5 x 2.14 (Pounds

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