



LINK-PIPE®
INC.

No-Dig Rehabilitation For Underground Pipes

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HydroSeal™ Sleeve

Installation Instruction

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INDEX

CONTENT	PAGE
1. Intent	3
2. General Information	3
3. Product Handling, Equipment and Site Work	4
3.1 Product Handling	4
3.2 Required Equipment	5
3.3 Site Preparation	7
3.3.1 Verification of Location of the Damage	6
3.3.2 Cleaning of the line	6
3.3.3 Preparation of the Work Area	7
4. Plug Calibration	8
5. Sleeve & Plug Preparation for Installation	9
5.1 Preparation of the Plug Assembly	9
5.2 Preparing and Pouring of the Grout	9
6. Sleeve Installation	12
7. Post-Installation Quality Control	13
8. Disposal of waste	14
9. Safety	14



NOTE

Before commencing with the installation of a sleeve, review these instructions carefully and be sure you understand them.

There are time critical steps in these instructions that must be carefully followed for a successful installation.

If you have any questions regarding these instructions, Link-Pipe technical personnel is on standby at 1-800-265-5696 during normal working hours (9am to 5pm EST.)

1.INTENT

The function of the HydroSeal™ Sleeve is to permanently seal the joints and puncture sealing in host pipe with ultimate internal pressure up to 300 psi. (20 bars) and diameters from 4" to 54" made from:

- **Reinforced concrete pipe**
- **Cast iron pipe**
- **Steel pipe**

NOTE:

The HydroSeal™ Sleeves dia. 4"-24" are equipped with Ratchet Lock mechanism. The Ratchet Lock mechanism was designed for the purpose of creating dimensional compatibility in host pipe.

The HydroSeal™ Sleeves dia. 25"-54" are equipped with single row of locking mechanism.

All sealants and other sleeve components meet generally accepted health standards applicable for potable water contact. (Local standards must be verified before the use of these sleeves is specified.)

2.General Information

The Link-Pipe **HydroSeal™** is manufactured by Link-Pipe under strict quality control conditions.





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All sleeves fit and can be locked in a pipe having the diameter given on the product label found on the shipping box of a sleeve.

The product is shipped prepackaged with all the necessary components needed for a particular joint repair.

The sleeve consists of a stainless steel core surrounded by a polyethylene foam gasket and O-Rings.

In the shipping box is also found a sheet of felt gasket and a two bottles of epoxy resin A and B.

3. Product Handling, Equipment and Site Work

3.1 Product Handling

Recommended procedure

- Check that products are received as ordered (e.g. verify part numbers and quantities.)
- Check that the products fit the project, e.g. host pipe diameter, host pipe material.
- Verify that the shipment is received in good condition. (I.e. boxes are undamaged and unopened)
- All products are shipped from the factory in good condition. If they arrive in damaged condition, the shipment has been damaged in transit and the shipping company must be notified. Insurance claims may apply.
- Store all materials in a cool place - preferably between 50°F (10°C) and 75°F (24°C)

A sleeve comes in a package containing complete supplies including the right amount of epoxy sealant ready for installation.

- HydroSeal™** sleeve
- Epoxy Grout in 2 plastic containers: **Component-A Resin** and **Component-B Hardener**
- Paint roller
- Gloves
- Felt Sheet





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- Plastic Ground Sheet
- Rubber, or wire Bands

3.2 Required Equipment

Please see Fig. 1

Before going to the Installation site, ensure that all your equipment is available and in good working order. From the start to the completion of the project following equipment must be always present on the job site

- 2 HP air compressor
- ¼" to ½" dia. air hose with quick couplers
- Pressure controller (see Fig. 2)
- Link-Pipe Flow Through Plug
- CCTV Equipment, preferably on a crawler.

NOTE: Most difficulties occur because of incompatible connectors and leaking hoses. Check those in your shop before going to the job site.



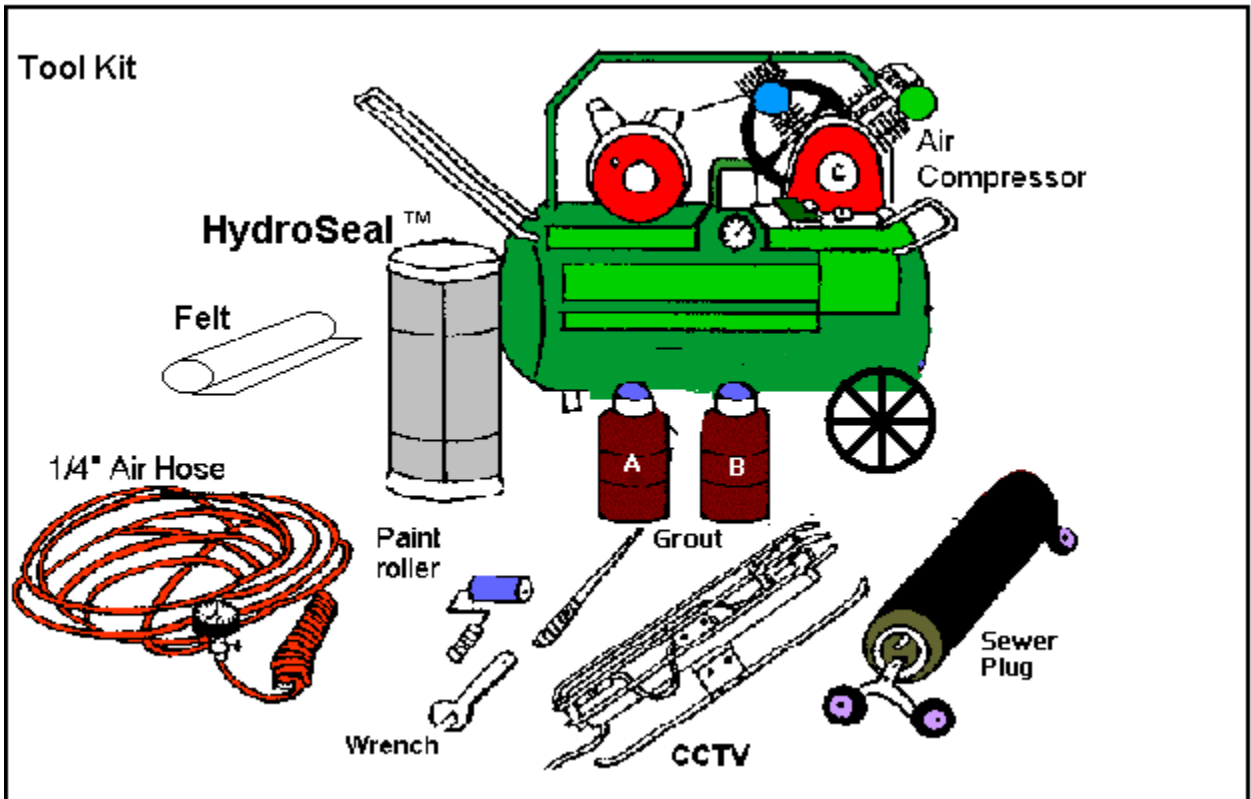


Fig. 1 Installation Equipment

Installation Pressure Reading (1)

Control Valve (3)

Inlet Pressure Reading (4)

Air outlet to the plug hose

Air Inlet

Air Regulator (2)



Fig. 2



3.3 Site Preparation

3.3.1 Verification of Location of the Damage

Often video records are old and conditions have changed.

Therefore:

- We recommend that the damage be re-inspected prior to starting the repair work.
- We also recommend that the diameter of the line be checked to ensure that the correct sleeve will be installed. Check the shipping box label to compare the sleeve diameter to the host pipe diameter.

3.3.2 Cleaning of the line

Immediately prior to installation:

- The line should be cleaned to remove any debris (grease, deposits, etc.) that may interfere with the installation.
- Open water left in the main during the cleaning should be removed by vacuum process using standard of-the- shelf equipment
- A video record of the pipe should be made at that time to record the conditions before installation.
- A copy of the report together with the video should be provided to the City Engineer or Inspector on completion of the repair.

3.3.3 Preparation of the Work Area

Fig. 3 shows the layout of the work area that needs to be set up to prepare the HydroSeal [™] at the installation manhole.



Fig. 3 - Work Area

- Place Plastic Ground Sheet on a flat area near the manhole
- Place the Felt Sheet with the PVC side down on the Plastic Sheet

NOTE: The Gloves are provided to protect your hands from coming into contact with the epoxy resin

The Paint Roller is provided to ensure uniform spreading of the epoxy resin onto the felt.

4. Plug Calibration

In preparation for the HydroSeal™ sleeve installation the plug **must** be calibrated. “**Calibration pressure**” is the pressure required to inflate the plug rubber to make contact with inside wall of the host pipe. For calibration of the plug you will need the following from the tools in Fig. 1:

- Air Compressor
- Air Hose
- Sewer Plug
- Pressure Controller (Fig. 2)

Calibration Procedure



- Ensure that the Air Compressor output is OFF
- Connect the Air Hose to the Sewer Plug
- Referring to Fig. 2, connect the Pressure Controller's Air Outlet to the Air Hose leading to the Plug
- Connect the Pressure Controller Air Inlet to the hose leading to the Air Compressor (NOTE: and additional hose may be needed)
- Ensure that the Control Valve (3) is OFF
- Turn on the Air Compressor output
- Adjust the Air Regulator (2) to 0 psi.
- Open the Control Valve (3)
- Adjust the Air Regulator (2) to allow enough air pressure to be applied to the plug to inflate the plug to the desired pipe diameter (e.g. if the pipe to be repaired is 8" dia. then inflate the plug to 8") **BE SURE NOT TO OVER INFLATE**
- Shut the Control Valve (3)
- Read and record the pressure on the Installation Pressure gauge (1)

The calibration is complete

5. Sleeve and Plug Preparation for Installation

5.1 Preparation of the Plug Assembly

- Ensure that the Air Compressor output is OFF
- Referring to Fig. 2, connect the Pressure Controller's Air Outlet to the Air Hose leading to the Plug.
- Connect the Pressure Controller Air Inlet to the Air Compressor (use an additional hose if needed)
- Ensure that the Control Valve (3) is OFF
- Remove the wheels from the end of the plug that is without the air hose (to allow easy placement of the sleeve when ready)

5.2 Preparing and Pouring of the Grout

The following steps are time constrained. As soon as the Epoxy components are combined, you will have



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approximately 20 minutes to complete the installation. Use the entire Epoxy resin components in the package.

- Pour Component- B (Hardner) into the bottle containing Component- A (Resin). See Fig. 4.
- Immediately mix the Epoxy resin. Use the mechanical mixer rotating at low speed.



Fig. 4 - Mixing the Grout

- Immediately pour all except about 6 oz. of the Epoxy resin onto the felt and use the paint rollers to spread the Epoxy resin evenly throughout the felt. See (Fig. 5)



Fig. 5 - Spreading the Epoxy Grout

- Flip the felt over so the Epoxy Grout side is down against the Plastic Sheet
- Paint a thin layer of the remaining grout onto the PVC side now facing up (Fig 6)



Fig. 6 - Rolling the Felt Sheet onto the Sleeve

- Paint a thin layer of the Epoxy Grout onto the Overlap End of the Polyethylene foam gasket (Fig 6)
- Place the sleeve onto the felt (as shown in Fig. 6.)
- Wrap the Felt Sheet onto the Sleeve and place rubber, or wire bands (supplied) around the sleeve to hold the sheet in place

The Sleeve is ready to be installed.

6. Sleeve Installation

NOTE:
KEEP AN EYE ON THE AIR PRESSURE
-If the plug deflates, the sleeve will slip off.

- Put the sleeve onto the plug and reattach the wheels.
- Connect the Air Hose to the Sewer Plug
- Connect the video equipment to the Sewer Plug
- Turn on the Air Compressor output
- Referring to Fig. 2, adjust the Air Regulator (2) to 0 psi.
- Open the Control Valve (3)
- Carefully adjust the Air Regulator (2) to allow enough air pressure to be applied to the plug to inflate the plug to grab onto the sleeve and prevent it from sliding off the plug - **BE SURE NOT TO OVER INFLATE** because this may uncoil the sleeve before it arrives at the repair location
- Shut the Control Valve (3) when the plug is snug inside the sleeve
- Make a note of the pressure - it must be kept constant
- Connect the cable previously strung through the line to the Plug to pull the assembly to the repair location (the cable of the video equipment may be sufficient to pull the assembly in the opposite direction)
- Lower the assembly into the manhole and into the sewer line while ensuring that:
 - The plug remains inflated to hold onto the sleeve
 - The assembly is right side up in the line
 - The cables are not tangled or twisted



- Pull the assembly into position at the repair location
- Begin recording to make a video record of the installation.
- The “**Installation Pressure**” is then applied, forcing the sleeve to expand (The air pressure depends on the diameter of the host pipe. See Table 1)

Table 1 - Installation Surcharge

Host Pipe Diameter	6”-8”	10”-12”	15”-18”	21”-24”	27”-36”	39”-48”	54”
Installation Surcharge (psi)	30 to 35 psi	27 to 32 psi	27 to 30 psi	22 to 27 psi	20 to 25 psi	15 to 20 psi	17 to 22 psi

NOTE: Add “Calibration Pressure” to the “Installation Surcharge” to get the recommended “Installation Pressure”

- Hold this pressure for 1 minute to ensure that the pressure at the plug is the same as at the gauge
- Deflate quickly
- Record the operation onto the sample Installation Record Form #3 (found in Appendix A)

7. Post-Installation Quality Control

When all specified sleeves have been installed in the pipe, the entire line shall be inspected from manhole to manhole.

- Once the plug is deflated, pull the plug out of the sleeve (away from the camera)
- Move the camera towards the sleeve and observe that all locking teeth are engaged
- If the teeth are not engaged, pull the plug back into the sleeve and re-inflate to the recommended installation pressure plus 5 psi and hold for another 1 minute
- Deflate again and re-inspect

Record the operation onto the Post-Installation Record Form





The inspection is recorded on a videotape. This tape and “Post Installation Record” shall be turned over to the Owner forming the “as built record” of the completed work.

The project is considered completed when:

- All pipe damage is fully covered by the repair sleeve
- Every installed sleeve has at least two locks at the extremities of the sleeve engaged (for Ratchet Sleeve”.
- All locks are engaged (for constant diameter sleeve)

NOTE:

If it is found on final inspection that;

- The sleeve is not locked,
- Any part of damaged pipe area is not properly covered

The work must be remedied according to Chapter 4, “Installation Procedure”.

8. Disposal Of Waste

Pack all waste into shipping box and dispose it in accordance to local safety and health regulations for waste management.

9. Safety

The Contractor shall carry out his operations in strict accordance with all local safety and health requirements.

NO PERSON IS PERMITTED IN THE HOST PIPE DURING THE APPLICATION OF THE COMPRESSED AIR.

