BD Loops
8161 Monroe Ave
Stanton, CA 90680
P: 714-723-0946
F: 714-890-1603

BD Loops

Polyethylene Pipe Insulation Shovel Guillotine Test

Can installers use semi-slit polyethylene pipe insulation to help protect loops from damage in a concrete pour?

Polyethylene Pipe Shovel Test

Purpose:

- Observe and record if 3/8” semi-slit polyethylene pipe insulation adds protection against shovel strikes.

Hypothesis:

The polyethylene pipe Insulation will add a small amount of protection against shovel strikes.

Materials:

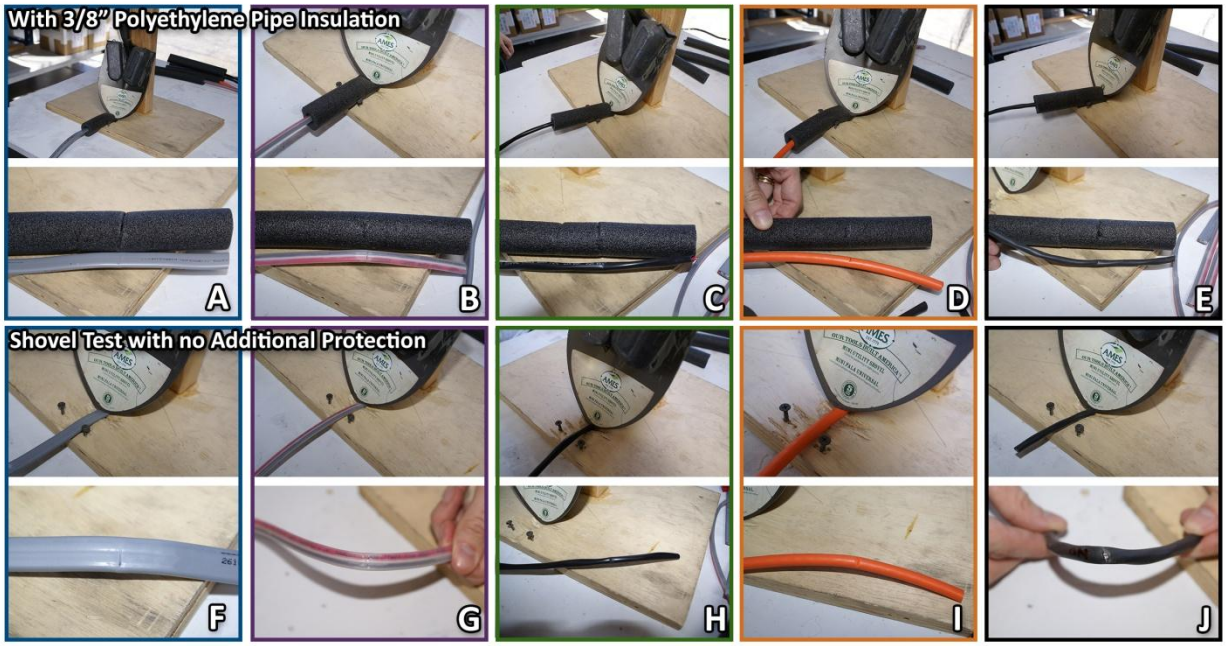
- Shovel Guillotine with the following measurements:
  - Shovel with 6lbs attached to blade and 6 ½” of drop height.
  - Pin release to ensure drop height is consistent.
  - Guide to center objects under the blade.
- BD Loops Direct Burial Loop Wire
- BD Loops Saw-Cut Loop Wire
- BD Loops Direct Burial Lead-in Wire
- Brand X Loop Wire
- Brand Y Loop Wire
- 3/8” Semi-slit polyethylene pipe insulation
- Camera for documentation purposes

Procedure:

The shovel guillotine has a pin release to ensure that the blade is dropped from the same height for each test. Each wire type is encased in the semi-slit polyethylene pipe insulation and placed in a guide at the bottom of the guillotine. The pin is pulled and the shovel falls down on the encased wire. This test is done twice for each wire type and the results are recorded.

Then each wire type is tested without the pipe insulation. The wires are placed in the guide at the bottom of the guillotine. The pin is pulled and the shovel falls down on the unprotected wire. This test is done twice for each wire type and the results are recorded.

Results:



Wire Type	BD Loops Direct Burial Loop Wire	BD Loops Saw-Cut Loop Wire	BD Loops Direct Burial Lead-In Wire	Brand X Loop Wire	Brand Y Loop Wire
W/ Insulation Test 1	Jacket Scratched No Short *(Img A)*	Jacket Pierced Insulation Intact No Short *(Img B)*	Jacket Dented No Short *(Img C)*	Jacket Dented No Short *(Img D)*	Jacket Dented No Short *(Img E)*
W/ Insulation Test 2	Jacket Dented No Short	Jacket Pierced Insulation Intact No Short	Jacket Dented No Short	Jacket Dented No Short	Jacket Scratched No Short
W/O Insulation Test 1	Jacket Dented No Short *(Img F)*	Jacket Pierced Insulation Pierced Short *(Img G)*	Jacket Pierced Insulation Intact No Short *(Img H)*	Jacket Dented No Short *(Img I)*	Jacket Pierced Installation Pierced Short *(Img J)*
W/O Insulation Test 2	Jacket Pierced Insulation Intact No Short	Jacket Pierced Insulation Intact No Short	Jacket Pierced Insulation Intact No Short	Jacket Dented No Short	Jacket Pierced Installation Pierced Short

Conclusion:

The 3/8” polyethylene pipe insulation absorbed some of the impact of the shovel strike. When the wires were covered with insulation the shovel strikes never resulted in exposed copper (short to ground). When the wires were run through the test without the additional insulation 50% of the shovel strikes resulted in pierced jackets, and 30% of the strikes resulted in exposed copper (shorts to ground).

What this means, BD Loops comments:

We know how nerve-wracking it can be to install loops in a concrete pour, you have little to no control of the contractors pouring the concrete and one careless dig with a shovel can damage the loop and cause it to short to ground.

In our testing we found that when the wires were covered with the semi-slit polyethylene pipe insulation enough of the impact was absorbed that the outer jacket was rarely broken and the copper was never exposed. The polyethylene pipe insulation will not protect the wire by itself, but it will add a layer of protection against a concrete crew that is working carefully around the loop.

To best protect a loop in a concrete pour a variety of tactics should be used, including warning signs, test result signoff sheets, communication with the concrete company, and more. To learn more about how you can protect your loops in a concrete pour visit the Education and More section of our website: www.bdloops.com.

Semi-slit polyethylene pipe Insulation is available through big box stores like Home Depot and Lowes in 6ft lengths, and can be special ordered in boxes of 90pcs (540ft).