

LABORATORY REPORT

Date: December 22, 2003 (updated May 1, 2007)

Purpose:

To test the water tightness of foamed urethane seals in duct.

Procedure:

In this test, American Polywater's Foam Sealant (FST) is injected into a duct according to manufacturer's instructions. A small amount (approximately 8 ounces) of colored water is loaded above foam and air pressure is placed on the system to create a water-head. 7.25 psi air pressure is approximately to 50 kPa or 5-meters (16.4 feet) water-head pressure. The system is placed in a bucket of clear water. (See Figure 1.) Seal failure can be immediately detected by the appearance of colored water. Because Polywater's Foam Sealant is a light yellow color, the method of failure can also be determined by following the color.

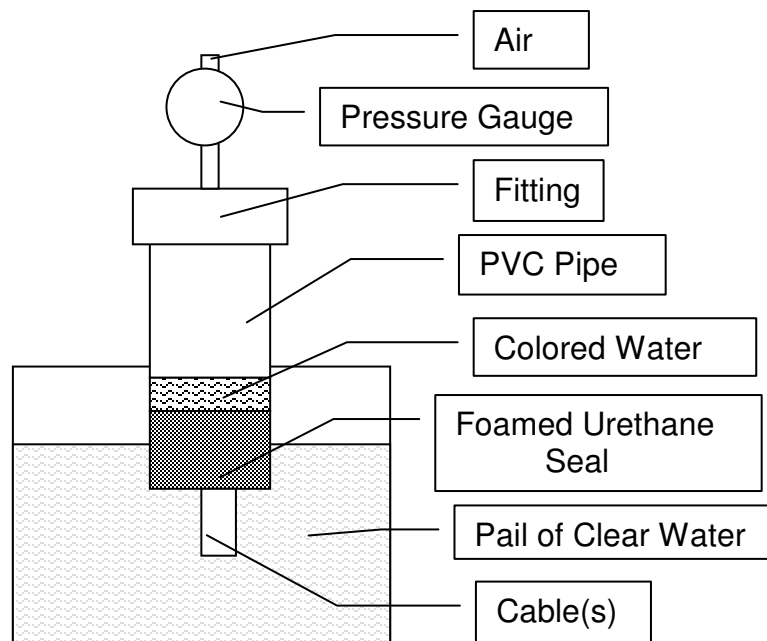


Figure 1

Conditions & Results:

In Tests 1, 2 and 3, 2-inch gray, schedule 40 PVC duct and MDPE-jacketed fiber cables (0.5-inch diameter) were used. The duct was swabbed with Polywater's solvent primer and 1.25 ounces of Polywater's Foam Sealant was injected according to basic instructions, using foam strips spaced 3-inches apart. The duct was in a horizontal position during the foaming process.

Test 1 (One Cable):

| Condition | Result |
|---|----------------------------------|
| One cable in system (basic) | Holds up to 15 minutes at 40 psi |
| Same cable is bent at a 45° angle and held for 5 minutes in two directions | Holds up to 15 minutes at 40 psi |
| Same cable is pulled with 15 lbs. axial force for 4 hours* | Holds up to 15 minutes at 40 psi |

*Note: at 50 psi, small leak was detected at interface between foam and duct.

Test 2 (Three Cables):

| Condition | Result |
|---|-----------------------------------|
| Three cables in system (basic) | Holds up to 15 minutes at 40 psi |
| Same cables are bent at a 45° angle and held for 5 minutes in two directions | Holds up to 15 minutes at 40 psi |
| Same cables are pulled with 15 lbs. axial force for 4 hours | Holds up to 15 minutes at 40 psi* |

* Note: no failure up to 100 psi—could not keep cable ends capped

Test 3 (Long Term Aging):

| Condition | Result |
|---|-------------------------------|
| Conduit is filled with Foam Sealant to a depth of 3 inches | Holds for 28 days at 7.25 psi |

Test 4 (FST using HDPE Duct):

In Test 4, 2-inch HDPE SDR 13.5 duct was used. The duct was cleaned with Polywater's Type CD™ Cleaning Wipe and 1.2 ounces of Polywater's Foam Sealant was injected according to basic instructions, using foam strips spaced 3-inches apart. The duct was held in a vertical position during the foaming process.

The duct was pressurized to 4 PSI and held for 7 days. Pressure is then increased in increments, holding at each pressure for 7 days.

| Pressure | Result |
|-----------------|---------------|
| 4 psi | Passed |
| 6 psi | Passed |
| 8 psi | Passed |
| 10 psi | Passed |
| 15 psi | Passed |
| 20 psi | Passed |
| 30 psi | Passed |
| 40 psi | Failed |

Summary:

When used properly Polywater's FST Foam Sealant can hold a water-head pressure up to 30 psi or 60 feet of water head. The foam sealant will seal between multiple cables and tolerates cable movement as noted. It can hold a water-head pressure of 7.25 psi or 5 meters (16.4 feet) over an extended period of time. The foam, applied in sufficient thickness, is impervious to water, as is the adhesive bond to both the PVC or HDPE conduit and PE cable jacket.

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