

LABORATORY REPORT

Date November 24, 2004

Purpose

Time study on adhesion rates and the effect of cold temperature.

Test Method:

Pipe Adhesion Test

This test mimics the “real world” tensile strength of the connector and conduit and measures the cure rate at cold temperature.

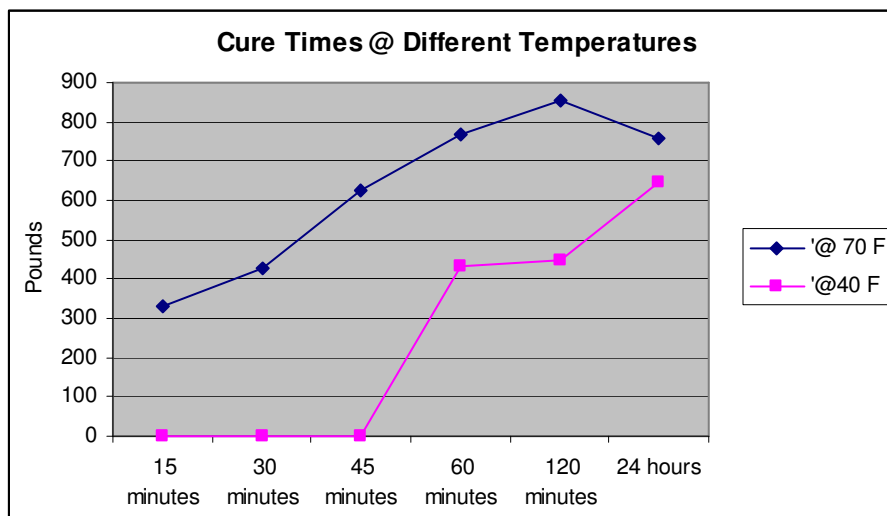
A 1 ¼-inch PVC connector (with 1.1 inches of insert) was bonded to a 1 ¼-inch HDPE conduit. The interior bonding surface of the PVC connector and the exterior of the HDPE conduit were sanded with 80-grit abrasive cloth and then cleaned with the TR™ Cleaning Wipe before bonding.

After the surfaces were prepared, the BonDuit™ Conduit Adhesive was applied as a ¼ inch bead line along the outside edge of the HDPE conduit. The connectors were twisted on, spreading a thin layer of adhesive throughout the connection. The BonDuit™ Conduit Adhesive is cured and aged according to the listed condition. The conduit was attached to a stationary fitting and the connector was attached to a load cell with winch attachment. The maximum pulling force was recorded. The results below are an average of three trials.

For the cold temperature testing, the connector and conduit were placed outside for 2 hours to chill. The temperature ranged from 40° F to 45° F with overcast conditions. The BonDuit™ Conduit Adhesive was kept at 70° F until application. Once the adhesive was applied, the connector and conduit were kept in the cold temperatures, 40° F to 45° F, until testing. Testing was completed within 5 minutes.

Results:

Time	70° F		40° to 45° F	
	Total Lbs	Lbs per Inch ²	Total Lbs	Lbs per Inch ²
15 minutes	332	105	n/a	n/a
30 minutes	429	136	n/a	n/a
45 minutes	623	198	n/a	n/a
60 minutes	770	245	434	138
120 minutes	856	272	450	143
4 hours	n/a	n/a	430	137
24 hours	760	242	646	206



Results show that the adhesion of BonDuit™ Conduit Adhesive reaches a significant strength fairly rapidly at both 70° F as well at 40° F. Pull-out testing on the connectors was not done for cure times under 60 minutes at 40° F temperatures. Although it takes longer to reach full strength at 40° F to 45° F, the BonDuit™ Conduit Adhesive has reached over 50% strength in one hour.

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