

April 24, 2008

Diversified Products & Research I, Inc.  
13591 Cable Road  
Pataskala, Ohio 43062

Attention: Mr. Ron Green

Reference: Aerosol Applied Plastic Pipe Cement  
Formulation: ASWC-07  
Pipe Materials Tests: ABS, PVC  
CTL Project No. 08030160COL

Dear Mr. Green:

The following report is in response to your request, describing the CTL Engineering, Inc. test of an aerosol plastic pipe solvent identified as ASWC-07. The testing is now complete and the test samples have been returned to you.

I. BACKGROUND

It was made known to CTL Engineering that Diversified Products & Research I, Inc. required hydrostatic and lap shear testing of a plastic pipe aerosol solvent cement used on a variety of plastic materials. The aerosol adhesive contains both primer and adhesive; no separate priming is required. CTL Engineering was requested to apply the cement, assemble test samples and perform hydrostatic and lap shear testing.

II. TEST STANDARDS

A. PVC pipe

ASTM D 2564-96, "Solvent Cements for Poly (Vinyl Chloride) (PVC) Plastic Piping Systems", sections 5.5 & 6.3.3, Hydrostatic burst test for solvent cements and sections 5.4 & 6.3.2 lap shear strength.

B. ABS and PVC Transition Joints

ASTM D 3138-95, "Solvent Cements for Transition Joints Between Acrylonitrile-Butadiene-Styrene (ABS) & Poly (Vinyl chloride) (PVC) Non-Pressure Piping Components", sections 5.5 & 6.3.3, Hydrostatic burst test for solvent cements and section 5.4 & 6.3.2 lap shear strength

III. TEST EQUIPMENT

1. Pressure transducer: Sensotec, Model LM/2345-11, range 0 to 2,000 psig, accuracy  $\pm 0.5\%$  of full scale, calibration date February 12, 2008
2. Transducer indicator conditioner: Vishay Micro-Measurements, Model P3
3. Baldwin Universal Testing Machine, calibration date March 5, 2008.

IV. TEST PROCEDURE

1. Hydrostatic pressure tests were conducted using a hand pump to pressurize the water filled test assemblies. Pressure was applied at approximately 200 psi/min.
2. Lap shear tests were conducted using the test fixture shown in Fig. 2 of the standard. The fixture was placed in a calibrated testing machine which applied a compression load at approximately 0.05 in/min. shear rate.

V. RESULTS

The test results are shown in the attached tables. All of the test results exceeded the minimum requirements specified by the ASTM standards referenced above.

Thank you for using the services of CTL Engineering, Inc. Should you have any questions, or if we may be of further assistance, please do not hesitate to contact us.

Respectfully submitted,

CTL ENGINEERING, INC.



Hal I. Dunham, P.E.  
Mechanical Engineer

HID/gm  
Attachments



TABLE I  
TEST RESULTS

PVC				
Hydrostatic burst test				
Sample Number	Joint Cure Time (Hr:min)	Joint Cure Temperature (°F)	Pressure at Failure (PSIG)	Failure Description
1	2:00	73	1,078	Pipe & coupling separated
2	2:00	73	1,252	Coupling broke
3	2:00	73	1,092	Coupling broke
4	2:00	73	1,026	Pipe & coupling separated
5	2:00	73	968	Pipe & coupling separated
Avg			1,083	
Requirement			400 average minimum	

TABLE II  
TEST RESULTS

PVC/ABS				
Hydrostatic burst test				
Sample Number	Joint Cure Time (Hr:min)	Joint Cure Temperature (°F)	Pressure at Failure (PSIG)	Failure Description
1	72:00	72	1,127	End threads leaked
2	71:59	72	1,297	Pipe/coupling shattered
3	72:00	72	1,327	Pipe/coupling shattered
4	72:00	73	1,276	Pipe/coupling shattered
5	72:00	73	1,394	Pipe/coupling shattered
Avg			1,284	
Requirement			200 average minimum	

TABLE III  
TEST RESULTS

PVC			
Lap shear test at 73°F			
Sample Number	Joint Cure Time (Hr:min)	Joint Cure Temperature (°F)	Shear Strength (PSI)
1	2:00	73	375
2	1:59	73	257
3	1:58	74	235
4	2:00	73	340
5	2:10	73	340
Avg			290
Required			250 average minimum

TABLE IV  
TEST RESULTS

PVC/ABS			
Lap shear test at 73°			
Sample Number	Joint Cure Time (Hr:min)	Joint Cure Temperature (°F)	Shear Strength (PSI)
1	71:55	73	755
2	71:55	73	902
3	71:56	73	718
4	71:55	73	1,018
5	71:57	73	761
Avg			831
Required			600 average minimum