

TEST REPORT



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Report Number: 1131-08001

Report Issued: June 10, 2008

Client: Diversified Products and Research Inc. **Lab Project No.:** 14956
13591 Cable Rd
Pataskala Ohio 43062
Contact: Ron Green

Source of Samples: The samples were sent to IAPMO R&T Lab by Diversified Products and Research Inc. on March 18, 2008 and were received in good condition.

Date of Testing: May 19, 2008 to June 10, 2008.

Sample Description: Solvent Weld Cement.

Scope of Testing: The purpose of testing was to determine if the samples tested Solvent Weld Cement complied with the requirements of ANSI/NSF61-2007a, section 6.

Conclusion: The samples tested of the Diversified Products and Research Inc. Solvent Weld Cement **COMPLIED** with ANSI/NSF 61-2007a section 6 at room temperature condition. Refer to pages 2 through 10 for more detailed information and findings.

By our signatures below we certify that all the testing and sample preparation for this report was performed under continuous, direct supervision of IAPMO R&T Lab.

Tested by,

Reviewed by,

A handwritten signature in black ink, appearing to read "Lin Nguyen", written over a horizontal line.

Lin Nguyen, Chemist

A handwritten signature in black ink, appearing to read "Michael N. Briggs", written over a horizontal line.

Michael N. Briggs, Manager, Analytical Lab

Primary Standards: ANSI/NSF-61-2007a, section 6:

Preparation of Test Samples

Test samples were rinsed and conditioned as described in ANSI/NSF61-2007a, Sections B.3.1 and B.3.2.

Conditioning and Exposure

In-product conditioning and exposure were conducted as described in ANSI/NSF61 section B3.3. Two (2) samples were exposed to pH5 and pH10 extraction water for conditioning and exposure for metal contaminants evaluation. One (1) sample was exposed to pH8 none chlorine extraction water for conditioning and exposure for organic contaminants. A sample is 6 foot of ½" PVC tube with 3 solvent welded joints. The conditioning and exposure were performed at room temperature.

Exposure and Normalization

Following conditioning, the samples were exposed to extraction water according to the applicable scheme detailed in annex B, Sections B3.5.

The laboratory concentration was normalized for 43 joints in 140 ft as the following equation

$$\frac{\text{Laboratory Concentration} \times \text{Number of Joints in the Field} \times \text{Volume in the Lab}}{\text{Volume in the Field} \times \text{No of Joints in the Lab}}$$

Extraction Water

The extraction water was prepared as described in ANSI/NSF61-2007a, annex B section B9. pH5 and pH10 waters were prepared with chlorine using volumes shown in Table B15. pH 8 water for organic determinations was prepared without chlorine using volumes shown in Table B15.

Collection / Preservation of Extraction Water

Immediately following the exposure period, extraction waters collected for analysis were poured into previously prepared sample containers for storage until analysis, as specified in annex B, Section B.6 and Table B8.

Sample extracts for metal analysis were acidified with nitric acid as specified in EPA 200.8 protocols.

Samples for volatile organic contaminants were preserved with sodium thiosulfate and HCl as outlined in EPA 524.2 protocol.

Samples for semi-volatile organic contaminants were preserved with sulfuric acid as described in EPA 525.2 and SW-846 protocol

Evaluation of Contaminant Concentrations

Metal contaminants, were determined as single point determinations. The normalized results were compared to MCL, TAC, or action level as applicable.

Organic contaminants were determined as single point determinations. The normalized results were compared with the MCL, TAC and other criteria listed in Annex D and Annex E of the standard.

Analytical methodology

Metal determinations: EPA 200.8, Metal determinations by ICP/MS

Volatile organic contaminants: EPA 524.2, Volatile organic determinations by Purge and Trap, GCMS.

Residual Vinyl Chloride Monomer determination (RVCM): Direct solvent extraction followed by EPA 524.2, RVCM by Purge and Trap, GCMS.

Semi-volatile contaminants: EPA 525.2 SW-846 8270, Semi-volatile organic determinations by liquid/liquid extraction followed by GC/MS determinations.

Analytical Instrumentation

Metal determinations: Thermo Electron X7 ICP/MS with CCT

Volatile organic determinations: Thermo Electron DSQ GC/MS with Tekmar Velocity Purge and Trap system.

Residual Vinyl Chloride Monomer determination (RVCM): Thermo Electron DSQ GC/MS with Tekmar Velocity Purge and Trap system.

Semi-volatile organic determinations: Thermo Electron DSQ GC/MS with AS2000 auto sampler

Discussion:

This solvent cement is aerosol packaged the formulation is appended to the PMI. This solvent cement consists of acetone, 2-butanone, THF, Geon 124A and propane and isobutene as propellants.

Geon 124A is a Polyone PVC material which is not listed to the standard. The composition of this material is appended to the PMI. Section 3, Table 3.1 analytes for PVC (regulated metals, VOCs, phenolics, and RVCM. Tin was not run as the formulation does not contain tin.) were determined on the appropriate retained exposure water samples. Please see Attachment A for a confidential discussion of formulation specific analytes.

These samples were normalized to the following conditions. The standard states that a residence contains 280 feet of pipe, 140 feet for hot water, and 140 feet for cold water. This tubing is for cold water only, so the model consisted of 140 feet of nominal 1/2" tubing. The diameter of this tubing was measured as 0.60" and all calculations were based on this measured diameter. The model tested to contained 43 joint for various fitting. This calculates to 43 joints to 7.78 liters or 5.5 joints/liter. The test sample contained 3 joints to 343 mL, or 8.7 joints/liter.

1/2" Nominal tubing was selected as it would have the largest surface area to volume ratio as the surface area to volume ratio is proportional to 2/t.

Metals were measured on the retained pH5 and pH10 retained exposure waters. The observed normalized metal concentrations are all below the MCL, TAC, or AL as appropriate.

VOCs were determined by GC/MS. The pH 8 exposure water was run undiluted and was diluted and held in vials with no head space at the time of collection. The diluted samples were used to determine the analytes that exceeded the calibration curve. The only target analytes observed in the resulting volatile GC/MS analysis were 2-butanone and THF, at normalized concentrations less than the TAC level set in the standard.

Acetone was the only TIC compound observed in the resulting volatile GC/MS chromatogram at a normalized estimated concentration below the TAC set in the standard.

The propellants are gasses at room temperature. If either propellant were retained in the joints and migrated from the joint, they would have been observed in the VOC GC/MS analysis as TIC compounds.

Semi-volatile organic compounds were observed by GC/MS. No target analytes were observed in the resulting semi-volatile GC/MS analysis. No non-target analytes were observed in the resulting semi-volatile GC/MS chromatogram.

RVCM was monitored on the Polyone Geon 124A PVC resin. RVCM was not observed.

Metal evaluations at Room Temperature (23°C):

Metal	MCL (ug/L)	pH5 Analytical Data (ug/L)	Normalized (ug/L)	Analytical Data (ug/L)	Normalized Data pH 10	Test Methods
Antimony	6	0.064	0.040	0.08	0.0509	EPA 200.8
Arsenic	10	0.003	ND (< 0.0597)	0.05	ND (< 0.060)	EPA 200.8
Barium	2000	0.254	0.160	0.87	0.5458	EPA 200.8
Beryllium	4	0.069	ND (< 0.0582)	0.10	0.0616	EPA 200.8
Cadmium	5	0.040	ND (< 0.0681)	0.04	ND (< 0.068)	EPA 200.8
Chromium	100	0.154	ND (< 0.1093)	0.24	0.1515	EPA 200.8
Copper	1300 (AL)	0.326	ND (< 0.2782)	0.13	ND (< 0.278)	EPA 200.8
Mercury	2	0.046	0.029	0.02	0.0126	EPA 200.8
Nickel	100 (TAC)	0.194	0.122	0.25	0.1553	EPA 200.8
Selenium	50	0.056	ND (< 0.1831)	0.00	ND (< 0.183)	EPA 200.8
Thallium	2	0.009	ND (< 0.0290)	0.00	ND (< 0.029)	EPA 200.8
Zinc	3000 (TAC)	6.803	4.278	9.28	5.8349	EPA 200.8
Lead	15 (AL)	0.033	ND (< 0.0777)	0.02	ND (< 0.078)	EPA 200.8

- MCL: Maximum Contaminant Level
- TAC: Total Allowable Concentration
- AL: Action Level
- Note: Static Normalized Contaminant Concentration =

$$\frac{\text{Laboratory Concentration} \times \text{Number of Joints in the Field} \times \text{Volume in the Lab}}{\text{Volume in the Field} \times \text{No of Joints in the Lab}}$$

Number of joints in the lab 3
 Volume in the lab 343 ml
 Number of joints in the field 43
 Volume in the field 140ft or 7.78 Liter
 Measured tubing diameter 0.6"

Test Result of Organics:

Target Analyte	Test Method	Result	Normalized
Volatile Organic Compounds:	EPA 524.2	(ug/L)	Result (ug/L)
Difluorodichloromethane		ND < 0.3	ND < 0.190
Chloromethane		ND < 0.3	ND < 0.190
Vinylchloride		ND < 0.3	ND < 0.190
1,3-Butadiene		ND < 0.3	ND < 0.190
Bromomethane		ND < 5.0	ND < 3.161
Chloroethane		ND < 0.3	ND < 0.190
Trichlorofluoromethane		ND < 0.3	ND < 0.190
1,1-Dichloroethene		ND < 0.3	ND < 0.190
Carbon disulfide		ND < 0.3	ND < 0.190
Dichloromethane		ND < 0.3	ND < 0.190
t-Butanol		ND < 0.3	ND < 0.190
MtBE		ND < 0.3	ND < 0.190
trans-1,2-Dichloroethene		ND < 0.3	ND < 0.190
Acrylonitrile		ND < 0.5	ND < 0.316
Vinylacetate		ND < 0.3	ND < 0.190
1,1-Dichloroethane		ND < 0.3	ND < 0.190
2,2-Dichloropropane		ND < 0.3	ND < 0.190
cis-1,2-Dichloroethene		ND < 0.3	ND < 0.190
2-Butanone		1461.6	923.975
Tetrahydrofuran		1298.0	820.575
Bromochloromethane		ND < 0.3	ND < 0.190
Chloroform		ND < 0.3	ND < 0.190
1,1,1-Trichloroethane		ND < 0.3	ND < 0.190
Carbon tetrachloride		ND < 0.3	ND < 0.190
1,1-Dichloropropene		ND < 0.3	ND < 0.190
Isopropylacetate		ND < 0.3	ND < 0.190
Benzene		ND < 0.3	ND < 0.190
1,2-Dichloroethane		ND < 0.3	ND < 0.190
Trichloroethene		ND < 0.3	ND < 0.190
Methylmethacrylate		ND < 0.3	ND < 0.190
1,2-Dichloropropane		ND < 0.3	ND < 0.190
Dibromomethane		ND < 0.3	ND < 0.190
Bromodichloromethane		ND < 0.3	ND < 0.190
cis-1,3-Dichloropropene		ND < 0.3	ND < 0.190
Toluene		ND < 0.3	ND < 0.190
Ethylmethacrylate		ND < 0.3	ND < 0.190
trans-1,3-Dichloropropene		ND < 0.3	ND < 0.190

Target Analyte	Test Method	Result	Normalized
Volatile Organic Compounds:	EPA 524.2	(ug/L)	Result (ug/L)
1,1,2-Trichloroethane		ND < 0.3	ND < 0.190
Tetrachloroethene		ND < 0.3	ND < 0.190
Butylacetate		ND < 0.3	ND < 0.190
1,3-Dichloropropane		ND < 0.3	ND < 0.190
Dibromochloromethane		ND < 0.3	ND < 0.190
1,2-Dibromoethane		ND < 0.3	ND < 0.190
Chlorobenzene		ND < 0.3	ND < 0.190
Ethylbenzene		ND < 0.3	ND < 0.190
1,1,1,2-Tetrachloroethane		ND < 0.3	ND < 0.190
m and p - Xylenes		ND < 0.3	ND < 0.190
o-Xylene		ND < 0.3	ND < 0.190
Styrene		ND < 0.3	ND < 0.190
Tribromomethane		ND < 0.3	ND < 0.190
Isopropylbenzene		ND < 0.3	ND < 0.190
Cyclohexanone		ND < 0.3	ND < 0.190
1,1,1,2,2-Tetrachloroethane		ND < 0.3	ND < 0.190
Propylbenzene		ND < 0.3	ND < 0.190
Bromobenzene		ND < 0.3	ND < 0.190
1,2,3-Trichloropropane		ND < 0.3	ND < 0.190
1,3,5-Trimethylbenzene		ND < 0.3	ND < 0.190
2-Chlorotoluene		ND < 0.3	ND < 0.190
4-Chlorotoluene		ND < 0.3	ND < 0.190
t-Butylbenzene		ND < 0.3	ND < 0.190
1,2,3-Trimethylbenzene		ND < 0.3	ND < 0.190
sec-Butylbenzene		ND < 0.3	ND < 0.190
p-Isopropyltoluene		ND < 0.3	ND < 0.190
1,3-Dichlorobenzene		ND < 0.3	ND < 0.190
1,4-Dichlorobenzene		ND < 0.3	ND < 0.190
n-Butylbenzene		ND < 0.3	ND < 0.190
1,2-Dichlorobenzene		ND < 0.3	ND < 0.190
1,2-Dibromo-3-chloropropane		ND < 0.3	ND < 0.190
1,2,4-Trichlorobenzene		ND < 0.3	ND < 0.190
Hexachlorobutadiene		ND < 0.3	ND < 0.190
Naphthalene		ND < 0.3	ND < 0.190
1,2,3-Trichlorobenzene		ND < 0.3	ND < 0.190

Volatile TIC Compounds

RT	CAS	ID	Estimated Concentration	Normalized Concentration
9.56	67-64-1	Acetone	128.99	81.55

Target Analyte	EPA 8270/EPA 625	Result	Normalized
Semi-Volatile Organics	C.A.S. Number	(ug/L)	Result (ug/L)
1,2,4-Trichlorobenzene	120-82-1	ND < 0.50	ND < 0.3144
1,3-Dichlorobenzene	541-73-1	ND < 0.50	ND < 0.3144
1,4-Dichlorobenzene	106-46-7	ND < 0.50	ND < 0.3144
1,2-Dichlorobenzene	95-50-1	ND < 0.50	ND < 0.3144
2,3,4,6-Tetrachlorophenol	58-90-2	ND < 0.50	ND < 0.3144
2,4,5-Trichlorophenol	95-95-4	ND < 1.20	ND < 0.7546
2,4,6-Trichlorophenol	88-06-2	ND < 1.00	ND < 0.6288
2,4-Dichlorophenol	120-83-2	ND < 0.50	ND < 0.3144
2,4-Dimethylphenol	105-67-9	ND < 0.50	ND < 0.3144
2,4-Dinitrophenol	51-28-5	ND < 10.00	ND < 6.2883
2,4-Dinitrotoluene	121-14-2	ND < 0.50	ND < 0.3144
2,6-Dichlorophenol	87-65-0	ND < 0.50	ND < 0.3144
2,6-Dinitrotoluene	606-20-2	ND < 0.50	ND < 0.3144
2-Chlorophenol	95-57-8	ND < 0.50	ND < 0.3144
2-Chloronaphthalene	91-58-7	ND < 0.50	ND < 0.3144
2-Ethylhexylmethacrylate	688-84-6	ND < 0.50	ND < 0.3144
2-Methylphenol	95-48-7	ND < 0.50	ND < 0.3144
2-Nitrophenol	88-75-5	ND < 10.00	ND < 6.2883
2-Phenyl 2-Propanol	617-94-7	ND < 0.50	ND < 0.3144
3-and 4-Methylphenol	108-39-4, 106-44-5	ND < 1.00	ND < 0.6288
4,6-Dinitro-2-methylphenol	534-52-1	ND < 0.70	ND < 0.4402
4-Bromophenylphenylether	101-55-3	ND < 0.50	ND < 0.3144
4-Chloro-3-methylphenol	59-50-7	ND < 0.50	ND < 0.3144
4-Chlorophenyl phenyl ether	7005-72-3	ND < 0.50	ND < 0.3144
4-Nitrophenol	100-02-7	ND < 10.00	ND < 6.2883
Acenaphthene	83-32-9	ND < 0.50	ND < 0.3144
Acenaphthylene	208-96-8	ND < 0.50	ND < 0.3144
Acetophenone	98-86-2	ND < 0.50	ND < 0.3144
Anthracene	120-12-7	ND < 0.50	ND < 0.3144
Azobenzene	103-33-3	ND < 0.50	ND < 0.3144
Benzo(a)anthracene	50-32-8	ND < 0.50	ND < 0.3144
Benzo(a)pyrene	56-55-3	ND < 0.50	ND < 0.3144
Benzo(b)fluoranthene	205-59-2	ND < 0.50	ND < 0.3144
Benzo(ghi)perylene	191-24-2	ND < 0.50	ND < 0.3144
Benzo(k)fluoranthene	207-08-9	ND < 0.50	ND < 0.3144
Benzylbutylphthalate	85-68-7	ND < 5.00	ND < 3.1442

Target Analyte	EPA 8270/EPA 625	Result	Normalized
Semi-Volatile Organics	C.A.S.Number	(ug/L)	Result (ug/L)
Bis(2-Ethylhexyl)adipate	103-23-1	ND < 0.70	ND < 0.4402
bis-2-Chloroethoxy methane	111-91-1	ND < 0.50	ND < 0.3144
bis-2-Chloroethyl ether	111-44-4	ND < 0.50	ND < 0.3144
bis-2-Chloroisopropyl ether	108-60-1	ND < 0.50	ND < 0.3144
bis-2-ethylhexyl phthalate	117-81-7	ND < 1.00	ND < 0.6288
Caprolactam	105-60-2	ND < 0.50	ND < 0.3144
Carbazole	86-74-8	ND < 0.50	ND < 0.3144
Chrysene	218-01-9	ND < 0.50	ND < 0.3144
Dibenz(ah)anthracene	53-70-3	ND < 0.50	ND < 0.3144
Diethylphthalate	84-66-2	ND < 0.50	ND < 0.3144
Dimethylphthalate	131-11-3	ND < 0.50	ND < 0.3144
Di-n-butylphthalate	84-74-2	ND < 1.60	ND < 1.0061
Di-n-octylphthalate	117-84-0	ND < 0.50	ND < 0.3144
Dinoseb	88-85-7	ND < 1.00	ND < 0.6288
Fluoranthene	206-44-0	ND < 0.50	ND < 0.3144
Fluorene	86-73-7	ND < 0.50	ND < 0.3144
Hexachlorobenzene	118-74-1	ND < 0.50	ND < 0.3144
Hexachlorobutadiene	87-68-3	ND < 0.50	ND < 0.3144
Hexachlorocyclopentadiene	77-47-4	ND < 0.50	ND < 0.3144
Hexachloroethane	67-72-1	ND < 0.50	ND < 0.3144
Indeno(1,2,3-cd)pyrene	193-39-5	ND < 0.50	ND < 0.3144
Isophorone	78-58-1	ND < 0.50	ND < 0.3144
Naphthalene	91-20-3	ND < 0.50	ND < 0.3144
Nitrobenzene	98-95-3	ND < 0.50	ND < 0.3144
N-Nitrosodimethylamine	62-75-9	ND < 0.50	ND < 0.3144
N-Nitroso-di-n-propylamine	621-64-7	ND < 0.50	ND < 0.3144
N-Nitrosodiphenylamine	86-30-6	ND < 0.50	ND < 0.3144
Pentachlorophenol	87-86-5	ND < 1.20	ND < 0.7546
Phenanthrene	85-01-8	ND < 0.50	ND < 0.3144
Phenol	108-95-2	ND < 0.50	ND < 0.3144
Pyrene	129-000-0	ND < 0.50	ND < 0.3144

Analysis

Residual Vinyl Chloride Monomer

Result

< 3.2 mg/kg