

Form GS/STD 810 (7-80)

LAB No. 98-514-2
REC'D 1-27-97
REPT'D 8-22-97
TO Mr. Robert Horii
City Engineer

CITY OF LOS ANGELES
DEPARTMENT OF GENERAL SERVICES
STANDARDS
219 DORRIS PLACE
LOS ANGELES, CA 90031
415-2862

RECEIVED

cc: Mr. Clark W. Robins

Mr. Hugh Lee

Mr. Walter Shioji STRUCTURAL & GEOTECHNICAL
ENGINEERING DIVISION

AUG 27 1997

Chemical Resistance Test of
"Insituform: Interplastic VE8319 vinyl ester resin"
Pipe Lining System

At the request of the Bureau of Engineering, Structural Division and Collection Systems Engineering Division, chemical resistance and physical properties tests were conducted on a set of "Insituform" Pipe Lining System samples. The test specimens were prepared by Insituform Technologies Inc., 1705 Cherokee Blvd., Memphis, TN 38111 and were submitted by Mr. Richard Anthony of Insituform Southwest, 9445 Ann Street, Santa Fe Spring, CA 90670.

- Project Title : "Insituform" Pipe Lining System
- Project No. : BD001341
- Source : Insituform Technologies, Inc.
- Engineers : Hugh Lee / Walter Shioji
- Material ID : VE8319 vinyl ester resin

The samples were tested for weight change and physical properties before and after exposure to chemical solutions in accordance with the Standard Specifications for Public Works Construction 1994 Edition, section 210-2.3.3.

Test results sheets are attached.

[Signature]
PAPKIN K. HOVASAPIAN, Director
General Services/Standards

PKH:KSN:MKL



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Chemical Resistance Test of
"Insituform: Interplastic VE8319 vinyl ester resin"
Pipe Lining System

Project Title: "Insituform" Lining Material
Project No: BD001341
Engineer: Hugh Lee / Walter Shioji
Source: Insituform Southwest Inc.
Date Received: 1-27-97
Specification: SSPWC Section 210-2.3.3, 1994
Description: Insituform composite weight change coupons (3" x 1" x 6mm) utilizing Interplastic VE8319 vinyl ester resin which incorporates a lamina of polyethylene (0.024") on the flat surfaces and two edges protected by a layer (1/8" nominal) of epoxy resin (Shell, Epon 9215/9269)

SOLUTION	RESULTS				REQUIREMENTS
	CONDITIONED WEIGHT CHANGE				
	% maximum				
	Days Immersion				
	28	56	84	112	
Sulfuric Acid, 20%	0.1454	0.1861	0.1757	0.2427	All Solutions and Periods ±1.5 % max
Sodium Hydroxide, 5%	0.0594	-0.0435	-0.5151	-0.7293	
Ammonium Hydroxide, 5%	0.1916	0.2648	0.2702	0.3980	
Nitric Acid, 1%	0.1784	0.2484	0.2522	0.3568	
Ferric Chloride, 1%	0.1633	0.2382	0.2286	0.3494	
Soap, 0.1%	0.1875	0.2581	0.2482	0.3662	
Detergent, 0.1%	0.1797	0.2456	0.2489	0.3493	
BOD, >700ppm	0.1763	0.2302	0.2303	0.3438	
Bleach, 1%	0.1674	0.1607	0.0755	0.1107	

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SOLUTION	RESULTS CONDITIONED HARDNESS CHANGE maximum Days Immersion	REQUIREMENTS
	112	
Sulfuric Acid, 20%	+2	For Information Only
Sodium Hydroxide, 5%	+1	
Ammonium Hydroxide, 5%	+1	
Nitric Acid, 1%	-2	
Ferric Chloride, 1%	-1	
Soap, 0.1%	+1	
Detergent, 0.1%	+1	
BOD, ≥700ppm	+2	
Bleach, 1%	+2	
PHYSICAL PROPERTY	INITIAL RESULT	
Hardness, Shore "D" ASTM D2240	68	

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Engineer: Hugh Lee / Walter Shioji
Source: Insituform Southwest Inc.
Date Received: 1-27-97
Specification: SSPWC Section 210-2.3.3, 1994, ASTM D638
Description: Insituform Interplastic VE8319 vinyl ester resin composite dog-bone coupons.

SOLUTION	RESULTS		SPECIFICATION REQUIREMENT
	Minimum Tensile Strength, psi	Minimum Elongation, %	
	Days Immersion		
Sulfuric Acid, 20%	6569	2.6	For Information Only
Sodium Hydroxide, 5%	6219	2.1	
Ammonium Hydroxide, 5%	6465	2.1	
Nitric Acid, 1%	6276	2.2	
Ferric Chloride, 1%	6384	2.0	
Soap, 0.1%	6197	2.2	
Detergent, 0.1%	6602	1.9	
BOD, ≥700ppm	6212	2.0	
Bleach, 1%	6479	1.8	
PHYSICAL PROPERTIES			INITIAL RESULTS
Initial Tensile Strength, psi	6455		For Information only
Initial Elongation, %	2.3		