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TEST REPORT

Send To: 0D470

Mr. Chris Ras
Perma-Liner Industries, LLC
13000 Automobile Boulevard
Suite 300
Clearwater, FL 33762

Facility: 0D471

Perma-Liner Industries, LLC
13000 Automobile Boulevard
Suite 300
Clearwater FL 33762
United States

Result	PASS	Report Date	14-NOV-2023
Customer Name	Perma-Liner Industries, LLC		
Tested To	ASTM F1216-2022 - per NSF/ANSI 14		
Description	LightRay Lateral Inversion System 4" Pipe with CIPP Liner		
Trade Designation	LightRay Lateral Inversion System		
Test Type	Qualification Retest		
Job Number	J-00471781		
Project Number	W0862292		
Project Manager	Liza Nero		

Thank you for having your product tested by NSF.

Please contact your Project Manager if you have any questions or concerns pertaining to this report.

Report Authorization

Brian Gruber

Date 14-NOV-2023

Brian Gruber - Manager, Physical Test Lab



Summary of Test Results

DCC Number PM24928
Material Type (e.g., PEXa, PVC, PE, PE) CIPP
Physical Description of Sample 4" Pipe with CIPP Liner
Primary DCC Number PM24928
Print Strip NAPCO PIPE & FITTINGS ASTM D3034 4" PSM 35 PVC
12454 GRAVITY... JV 23-APR-2022 15:13 L18 MADE IN USA
759388 101471
Test Description Qualification Performance RETEST - ASTM F1216 - Inversion
System - PM24928
Trade Designation/Model Number LightRay Lateral Inversion System

Test Description	Result
Flex Modulus Test	Pass
Flexural Strength Test	Pass
Gravity Pipe Leakage Test:	Pass



P3084 - Gravity Pipe Leakage Test

Sample Description	4" Pipe with CIPP Liner	
Test Location	NSF Willow Run	
Initial water column	2	feet
Final water column	2	feet
Allowable Leakage	29.75	mL
Actual Leakage	0	mL
Test Duration	60	minutes
Leakage rate	0	g/in/mile/
Actual leakage rate	0	g/in/mile/
Gravity Pipe Leakage Test:	Pass	

P3122 - Flex Modulus

Specimens conditioned for	>40	hours
Specimens conditioned at	73	degrees F
Relative humidity	50	%
Test temperature Required	73	degrees F
Test temperature Actual	73	degrees F
Actual Average Modulus	395000	psi
Flex Modulus Test	Pass	
Test Location – NSF HQ, Ann Arbor	Ann Arbor	

Test Results	Flex Modulus (psi)
Required	250000
Specimen 1	319000
Specimen 2	294000
Specimen 3	461000
Specimen 4	399000
Specimen 5	500000



P3123 - Flexural Strength Test

Specimens conditioned for >40 hours
Specimens conditioned at 73 degrees F
Relative Humidity 50 percent
Required Test Temperature 73 degrees F
Actual Test Temperature 73 degrees F
Average Flexural Strength 9380 psi
Flexural Strength Test Pass
Test Location – NSF HQ, Ann Arbor Ann Arbor

Test Results	Flexural Strength (psi)
Required	4500
Specimen 1	6650
Specimen 2	7560
Specimen 3	10960
Specimen 4	9160
Specimen 5	12590

P3172 - Specimen Fabrication

Test Location – NSF HQ, Ann Arbor NSF Ann Arbor
Specimen Fabrication COMPLETE
Time 2 hours

Test Notes:

Samples were cut from the pipe liner.



Testing Laboratories:

	Flag	Id	Address
All work performed at: (Unless otherwise specified)	----- ----->	NSF_WR	NSF Willow Run 251 Airport Industrial Drive Ypsilanti, MI 48198

References to Testing Procedures:

NSF Reference	Parameter / Test Description
P3084	Gravity Pipe Leakage Test
P3122	Flex Modulus
P3123	Flexural Strength Test
P3172	Specimen Fabrication

Test descriptions preceded by an asterisk "*" indicate that testing has been performed per NSF requirements but is not within its scope of accreditation.

Unless otherwise indicated, method uncertainties are not applied in any determinations of conformity. Testing utilizes the requested sections of any referenced standards, which may not be the entire standard.

Dates of Laboratory Activity: 30-OCT-2023 to 14-NOV-2023