

**CONFIDENTIAL**

Issued By: Mark Bulkovshteyn

Date: 02/24/03

Test Report No.: HS-T-004

Product/Process Description: Link-Pipe HydroSeal™Test Request: (Customer/**Department**): EngineeringRepeat Observation: yes no (check one)**Description of Process:****1. Verification of the design changes and manufacturability of Link-Pipe HydroSeal™.****The design changes:**

- SST core with Constant Diameter 12"
- Implementation of the Epoxy Resin T-301
- Additional 3 Felt straps saturated by Epoxy Resin T-301
- Gap 7.75 mm

2. Verification of the installation pressure.**3. Verification of the installation process.****4. Test the sealing performances of the modified HydroSeal™ Sleeve with T-301 Epoxy Resin under internal water pressure 550 psi.**

TEST PROCEDURE**STEP 1.** Assemble test apparatus as per **DWG HS-T-004****STEP 2.** Assemble Link-Pipe HydroSeal™ as per **DWG HS-T-004**

- Saturate the Felt by Epoxy resin T-301. Volume of the epoxy resin must be 1.2 of the volume of the felt.
- Saturate the Felt Straps by Epoxy resin T-301. Volume of the epoxy resin must be 1.2 of the volume of the felt.
- Attach the felt straps to sleeve
- Coil the sleeve and fix by tape
- Wrap the sleeve with felt

STEP 3. Insert the Sleeve into test apparatus, after 30 minutes from mixing of the resin.

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STEP 4. Lock the sleeve by inflating the installation plug and monitor the installation pressure.

STEP 5. Place the test apparatus in the cold area (7-12 °C)

STEP 6. After 72 hrs pressurize the test apparatus (air pressure up to 110 psi) and monitor the sealing performance of the sleeve.

STEP 7. Pressurize the test apparatus (water pressure up to 550 psi) and monitor the sealing performances of the sleeve.

STEP 8. Record results in Testing Record Table

Authorized By: Mark Bulkovshteyn**Date: 02/21/2003****Record Table.**

Step	Description	Time	Note
1	Assemble test apparatus as per DWG HS-T-004	02/21/04	
2	Assemble Link-Pipe HydroSeal™ as per DWG HS-T-004	1:49 PM	
	Mix the Epoxy Resin T-301 and saturate the felt.	1:50 PM	
	Saturate the felt straps by Epoxy resin T-301.	1:55 PM	
	Attach the felt straps to sleeve	2:03 PM	
	Coil the sleeve and fix by tape	2:05 PM	
	Wrap the sleeve with felt	2:06 PM	
3	Insert the Sleeve into test apparatus after 30 minutes from mixing the resin.	2:17 PM	
4	Lock the Sleeve by inflating the installation plug and monitor the installation pressure.	2:20 PM	Calibration pressure 18 psi, installation pressure 60 psi
5	The test apparatus was placed in the cold area (7-12 °C) for 72 hrs.	02/21/03	
6 02/24/03	The test apparatus was pressurized up to 112 psi by the air.	10:10 AM 10:15 AM 10:20 AM 10:25 AM 10:30 AM	15 psi -no leak 30 psi- no leak 45 psi -no leak 60 psi- no leak 75 psi- no leak



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		10:35 AM	90 psi- no leak
		10:40 AM	105 psi- no leak
		10:45 AM	112 psi- no leak
7	The test apparatus was pressurized up to 550 psi by the water.	12:00 PM	50 psi -no leak
		1:05 PM	100 psi -no leak
		1:10 PM	200 psi -no leak
		1:15 PM	550 psi -no leak

Recorded By: Tommy Mak_____

Date: 02/24/03

Test Results:

The test was set up in our pressure test apparatus under working pressure 550psi, with 3/8" open joint. The test results have proven conclusively that the specified leaks in the pressure test apparatus were reliably sealed. The design changes of the HydroSeal™ sleeve verified. The Epoxy Resin T-301 can be recommended for HydroSeal™ Sleeve application.

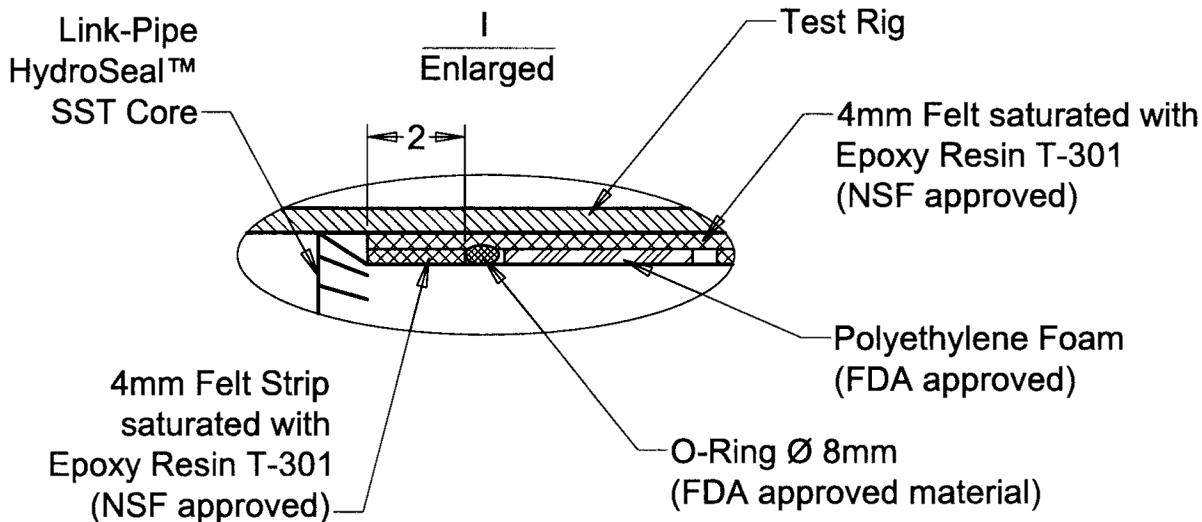
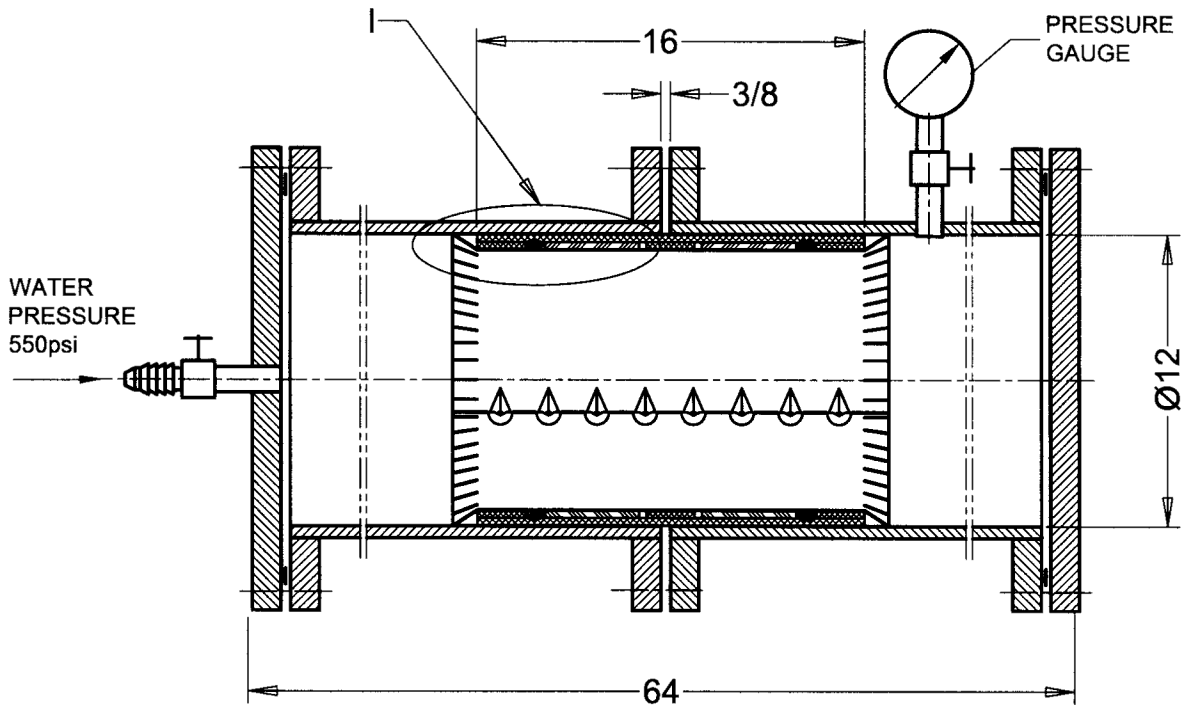
Corrective Action:


N/A

Mark Bulkovshteyn

Date: 02/24/2003

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED



UNLESS OTHERWISE SPECIFIED		NAME	DATE (M/D/Y)	SIGNATURE	DRAWING NUMBER:	 LINK-PIPE INC. Tel: (905) 886-0335 Fax: (905) 886-7323 27 West Beaver Creek Rd., Unit #2, Richmond Hill, Ontario L4B 1M8 E-mail: lnkpipe@msn.com			
DIGITS ON DECIMAL DIMENSIONS		DESIGNED BY			HS-T-004				
MM	INCH.	MM	INCH.		TITLE:	<input type="checkbox"/> MM <input checked="" type="checkbox"/> INCH		QTY PER ASSY:	TOTAL QTY.
X	X.X	±0.5	±.02	Gladstein	HydroSeal™ System Test			xxx	xxx
X.X	X.XX	±0.25	±.010		(For Potable Water)				
X.XX	X.XXX	±0.025	±.001	Bulkovshteyn	MATERIAL:	HARDNESS:	FINISH:		
X.XXX	X.XXXX	±0.0025	±.0001						
FRACTIONAL DIMENSIONS ±1/16		APPROVED BY			CUSTOMER: Link-Pipe Inc.	JOB#	SCALE 1:8		SHEET 1 OF 1
ANGLE DIMENSIONS ± 0°30'		L.Maimets	02/20/03			xxx			SIZE A4
MACHINE SURFACES 125 ✓									



LINK-PIPE®

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Manufacturer of No-Dig Pipe Repair Products

To:	Mr. Warren	From:	Mark Bulkovshteyn
Company:	Warren Environmental, Inc.	Pages:	5
Fax:	508-866-7172	Date:	July 7, 2003

Dear Mr. Warren

Per our telephone conversation please find attached Test Report.

Best Regards

Mark Bulkovshteyn

Project Manager

Link-Pipe Inc.

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LINK-PIPE®, GasSealer™, GROUTING SLEEVE™ are trademarks of Link-Pipe Inc. GROUTING SLEEVE™ is protected by U.S. Patent No. 6,351,720, European Patent No. 0630458, Australian Patent No. 672764, Canadian and PCT Patents Pending. GasSealer™ is protected by US Patent No 6,138,718. Pressure Sleeve is protected by Canadian and International Patents Pending.

