



ITEM	TRADITIONAL STEAM OR WATER CURED CIPP	 UV CURED CIPP 
<b>GENERAL</b>		
DIAMETER RANGES	Stated range 4" to 108" Practical range 4" to 72"	6" to 54"
LENGTH	Up to 1000' is standard Rare instances up to 2100'	Up to 1000' is standard Rare instances up to 2100'
PIPE SHAPES	All the standard pipe shapes	All the standard pipe shapes
TYPICAL THICKNESS 8" PIPES	Currently 4.5mm Historically done at 6.0mm	3 mm
TUBE MATERIAL	Needled Polyester felt fibers	Fiberglass
OUTER FILM	Inversion installations Not typically provided	YES
INNER FILM	Left in place Integral to felt fiber matrix	Removed after installation
PRODUCT LIFE EXPECTANCY	50 year design life, typical	70 + years expected life, typical
ASTM INSTALLATION STANDARDS	F1216 F1743	F2019
ISO STANDARDS	11296-4	11296-4
MANUFACTURER VARIABILITY	Materials are typically component sourced	RELINER AMERICA®
SHELF LIFE BEFORE INSTALLATION	Hours to several weeks with refrigeration	6 months no refrigeration Longer possible with sample testing
RESIN	Polyester / Vinylester/ Epoxy	Corrosion performance enhanced Polyester / Vinylester
<b>PHYSICAL PROPERTIES</b>		
CIRCUMFERENTIAL MODULUS (ISO 1228)		ALPHALINER 500 : 1 377 500 psi ALPHALINER 1500 : 1 740 000 psi
CURVED BEAM FLEXURAL MODULUS (ISO 178)		ALPHALINER 500 : 1 218 000 psi ALPHALINER 1500 : 1 653 000 psi
CURVED BEAM FLEXURAL STRENGTH (ISO 178)		ALPHALINER 500 : 26 110 psi ALPHALINER 1500 : 30 460 psi
RETENTION FACTOR	50 %	ALPHALINER 500 : 62.50 % ALPHALINER 1500 : 75.00 %
FLAT-PLATE MODULUS (ASTM D790)	250 000 à 400 000 psi	ALPHALINER 500 : 1 372 500 psi with proper glass orientation.
FLAT-PLATE FLEXURAL STRENGTH (ASTM D790)	4 500 à 5 000 psi	ALPHALINER 500 : 29 670 psi with proper glass orientation.
STRAIN CORROSION (PER ISO 11296-4)	Not required for PET fiber liners	0.68%
LINER REINFORCEMENT	None	ECR Fiberglass
CHEMICAL RESISTANCE	Excellent	Excellent
POROSITY OF THE CURED LINER PIPE WALL	Not tight	Tight

<b>LINER FABRICATION</b>		
TUBE IMPREGNATION	Resin distributed into tube Discrete point injection	Raw materials impregnated using resin bath
RESIN TUBE FABRICATION	Vacuum impregnation after construction	Tube manufactured from impregnated material during construction
LINER SEAM	Stitched or heat bonded Welded closure	None required Spiral wrapped construction
<b>EQUIPMENT FOR INSTALLATION</b>		
WATER JET CLEANER	YES	YES
CCTV / CUTTER EQUIPMENT	YES	YES
INSTALLATION PRESSURE UNIT	YES	YES
CURING TRUCK	NO	YES
REFRIGERATOR TRUCK	YES	NO
BOILER TRUCK	YES	NO
TYPICAL EQUIPMENT NOISE LEVELS	MEDIUM	LOW
PORTABLE EQUIPMENT	YES	YES
<b>INSTALLATION</b>		
INSTALLER QUALIFICATIONS	Varies with the installer	RELIN AMERICA® provides an annual accreditation program and an updated certification.
INSTALLATION	Inverted or Pull-in	Pull-in
INFLATION	Water or air	Air
LINER INSPECTION BEFORE CURING	None	CCTV Inspected after inflation and before curing is started
RESIN DRAIN	Some migration at the end and at branch connections is typical	NO RESIN MIGRATION (ENCAPSULATED)
RESIN SLUGS IN LATERALS	Inversion-Yes	NO RESIN MIGRATION (ENCAPSULATED)
CURING MEDIUM	Hot water or hot air (using steam)	Ultra Violet Lights
CURING DOCUMENTATION	Temperature manually recorded at access points	Infrared sensors and thermocouple. Automatically record entire process.
INNER LINER FILM	Plastic coating remains in place	Plastic film removed after installation
MATERIAL WASTE	Varies by the installer	LOW
ENERGY USAGE	Medium	LOW
INSTALLATION NOISE	Medium	LOW
SHRINKAGE	Moderate depending on adherence to curing schedule by installer	LOW
INSTALLATION RATE	Total installation time 3 to 4 hours for small diameters	Total installation time 1.5 to 2.0 hours for small diameters
COLD SPOTS IN SOIL	Additional cure time required to assure the level of curing is achieved	NO EFFECT
WATER USAGE	Medium to high	NONE
<b>MATERIAL TESTING</b>		
LINER THICKNESS	YES	YES
PHYSICAL PROPERTIES	YES	YES
CHEMICAL RESISTANCE	YES	YES
VISUAL APPEARANCE	YES	YES
WATER POROSITY TEST-PIPE WALL	NOT TYPICALLY DONE	TYPICAL TEST TO ASSURE WATER TIGHTNESS