ICC-ES PMG Product Certificate

PMG-1273

Effective Date: January 2022
Revision Date: May 24, 2022
This listing is subject to re-examination in one year.

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CSI: DIVISION: 22 00 00—PLUMBING
Section: 22 13 16—Sanitary Waste and Vent Piping

Product certification system:

The ICC-ES product certification system includes testing samples taken from the market or supplier's stock, or a combination of both, to verify compliance with applicable codes and standards. The system also involves factory inspections, and assessment and surveillance of the supplier's quality system.

Products: HammerHead® Cured-In-Place Pipe (CIPP) Lining System

Listee: Hammerhead Trenchless
500 South C.P. Avenue
Lake Mills, Wisconsin 53551
www.hammerheadtrenchless.com
www.hammerheadshop.com

Compliance with the following codes:

2021, 2018, 2015, 2012, 2009 *International Plumbing Code*® (IPC)
2021, 2018, 2015, 2012, 2009 *International Residential Code*® (IRC)
2021, 2018, 2015, 2012, 2009 Uniform Plumbing Code® (UPC)*
**Uniform Plumbing Code is a copyrighted publication of the International Association of Plumbing and Mechanical Officials*

Compliance with the following standards:

ICC-ES LC1011 (October 2010), ICC-ES PMG Listing Criteria for the Rehabilitation of Existing Building Drains and Building Sewers by the Inversion and Curing of Resin-impregnated Tube.
ASTM F1216-2016, Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Inversion and Curing of Resin-Impregnated Tube.
NSF/ANSI 14-2020, Plastic Piping System Components and Related Materials
NSF SE 130004-2013, Rehabilitation for Small Diameter Pipelines

Code Alternate:

LC1011 was approved by the ICC-ES PMG listing committee based on several factors which include the following: (1) ASTM F1216 is a consensus standard but not referenced in the code; (2) the code prohibits drainage line size reduction in the direction of flow. HammerHead's installation does not constitute a reduction to a smaller nominal pipe size, further the resulting surface affords less friction loss which provides equivalent flow capacity despite the small reduction in diameter; (3) the use of this system restores the treated pipe capacity to minimum requirements in the code. Note this analysis only applies to systems evaluated by ICC-ES in accordance with LC1011.

Identification:

The HammerHead® Cured-in-place Pipe Lining materials are stamped indicating the product name, the ICC-ES PMG listing mark, repeating the mark continuously over the entire length of the liner material (See Figure 1). A label must be attached, located at a maximum of 20 feet (6096 mm) apart along the length of the lined pipe or tube and at each fixture connection, indicating the listing holder's name, the ICC-ES PMG listing mark, and the words "Caution: CIPP Lined Pipe." The label must include a warning against using flame or heat when repairing any part of the system. See figure 2.

HammerHead® Resins (A) and Hardeners (B): Each container bears a label with the product name, the manufacturer's name, and the ICC-ES PMG listing mark. See figure 3.

Installation:

Installation must comply with the manufacturer's published installation instructions and the applicable codes.

The HammerHead® Cured-in-place Pipe (CIPP) Lining Systems must be applied by installers trained and certified by Hammerhead Trenchless.

Cleaning and Inspection:
Prior to entering access areas such as manholes, and performing inspection or cleaning operations, an evaluation of the atmosphere to determine the presence of toxic or flammable vapors or lack of oxygen must be undertaken in accordance with local, state, or federal safety regulations.

The pipe must be clean of all debris, roots and possible obstructions that would block proper inversion of the CIPP. The cleaning must be done with a high-pressure jetting system or with mechanically powered cleaning equipment.

Inspection of the pipe must be performed by experienced personnel trained in locating breaks, obstacles and service connections using by closed circuit television (CCTV) camera. The interior of the pipe must be carefully inspected to determine the location of any conditions that may prevent proper installation of the CIPP liner into the pipe. Conditions such as protruding service taps, collapsed or crushed pipe, reductions in the cross-sectional area of more than 40 percent, or other obstructions must be corrected. If inspection reveals a condition that cannot be removed by conventional sewer cleaning equipment, then a point repair excavation should be made to uncover and remove or repair the obstruction.

HammerHead® Cured-in-place Pipe (CIPP) – Heat Cured Epoxy Lining Systems

Epoxy Preparation and Wet out of Liner:
Liner shall be set up in accordance with manufacturer's published installation instructions.

The quantity of the specified HammerHead® Resin and Hardener required must be calculated in accordance with the manufacturer's formula based on pipe diameter, length, and liner thickness.
Resin and Hardener must be mixed in accordance with the manufacturer's recommendations.

The tube should be vacuum impregnated with resin (wet-out) under controlled conditions. The volume of resin used should be sufficient to fill all voids in the tube material at nominal thickness and diameter. The volume should be adjusted by adding 5 to 10 % excess resin for the change in resin volume due to polymerization and to allow for any migration of resin into the cracks and joints in the original pipe.

Inversion
The wet-out tube should be inserted through an existing manhole or other approved access by means of an inversion process and the application of air pressure sufficient to fully extend it to the next designated manhole or termination point. The tube should be connected by an attachment at the upper end of the guide chute so that a leak-proof seal is created and with the impermeable plastic membranes side out. As the tube enters the guide chute, the tube should be turned inside out. The inversion air pressure should be adjusted to be of sufficient pressure to cause the impregnated tube to invert from point of inversion to point of termination and hold the tube tight to the pipe wall, producing dimples at side connections. Care should be taken during the inversion so as not to overstress the woven and nonwoven materials.

Curing
Ambient Air: Liner should be pressurized to the pressure recommended by the manufacturer and curing time should be obtained from manufacturer's published data sheet "HammerHead Calculator".

Hot Water: Hot water curing should be completed with the temperatures and time as set out in the manufacturer's data sheet for the resin system being used. Maximum temperature should not exceed 130 °F (54 °C) when using extension tubes, or 176 °F (80 °C) when using drum and reduction bend/fittings without extension hoses. After running hot water for the required amount of time, cool water should be pumped through the system until temperature cools down to a minimum of 86 °F / 30 °C and hold for a minimum of 10 minutes.

HammerHead® Cured-in-place Pipe (CIPP) – LED Cured Lining Systems

Resin Preparation and Wet out of Liner:
Liner shall be set up in accordance with manufacturer's published installation instructions.

The quantity of the specified HammerHead® LED Resin required must be calculated in accordance with the manufacturer's formula based on pipe diameter, length and liner thickness.
Resin must be stored and handled in accordance with the manufacturer's recommendations.

The tube should be vacuum impregnated with resin (wet-out) under controlled conditions. The volume of resin used should be sufficient to fill all voids in the tube material at nominal thickness and diameter. The volume should be adjusted by adding 5 to 10% excess resin for the change in resin volume due to polymerization and to allow for any migration of resin into the cracks and joints in the original pipe.

Inversion
The wet-out tube should be inserted through an existing manhole or other approved access by means of an inversion process and the application of air pressure sufficient to fully extend it to the next designated manhole or termination point. The tube should be connected by an attachment at the upper end of the guide chute so that a leak-proof seal is created and with the impermeable plastic membranes side out. As the tube enters the guide chute, the tube should be turned inside out. The inversion air pressure should be adjusted to be of sufficient pressure to cause the impregnated tube to invert from point of inversion to point of termination and hold the tube tight to the pipe wall, producing dimples at side connections. Care should be taken during the inversion so as not to overstress the woven and nonwoven materials.

Curing
LED Light: Liner should be pressurized to the pressure recommended by the manufacturer, and LED light travel speed should be controlled via the BlueLight system computer to obtain the proper exposure/cure time based upon liner diameter and thickness. Following exposure to LED light the liner should be cooled as recommended by the manufacturer.
Final Inspection and Recording
Finished liner must be inspected in accordance with the manufacturer's published installation instructions using equipment approved by the manufacturer. A final CCTV inspection is performed and recorded in accordance with Item 6 of the Conditions of Listing section.

Models:

HammerHead®: The system consists of components tested to comply with NSF/ASNI 14 and ASTM F1216 including Appendix X2 Chemical Resistance Tests.

HammerHead® Cured-in-place Pipe (CIPP) – Heat Cured Epoxy Lining Systems§

LINER
HH Scrim liner made of polyester with polyurethane coating is suitable for rehabilitating pipe without bend or diameter transitions, to be cured by ambient air or hot water.

HH SCRIM LINER	
Description	Part Number
4.00" HH Scrim Liner, 4mm, 328' (100m)	922-8204
5.00" HH Scrim Liner, 4mm, 328' (100m)	922-8205
6.00" HH Scrim Liner, 4mm, 328' (100m)	922-8206
8.00" HH Scrim Liner, 4mm, 328' (100m)	922-8208
10.00" HH Scrim Liner, 4mm, 328' (100m)	922-8210
12.00" HH Scrim Liner, 4mm, 328' (100m)	922-8212

Highly Flexible HH FLEX liner made of polyester with a polyurethane (PU) external coating material is suitable for rehabilitating pipe with 45° and sweeping 90° bends and/or single diameter transitions, to be cured by ambient air or hot water.

HH FLEX LINER	
Description	Part Number
3.00" HH Flex Liner, 3mm, 328' (100m)	922-5038
4.00" HH Flex Liner, 4mm, 328' (100m)	922-5020
5.00" HH Flex Liner, 4mm, 328' (100m)	922-5030
6.00" HH Flex Liner, 4mm, 328' (100m)	922-5021
8.00" HH Flex Liner, 4mm, 328' (100m)	922-5022

HH Super Flex Liner made of polyester with polyurethane coating is suitable for rehabilitating pipe without bend or diameter transitions, to be cured by ambient air or hot water.

HH SUPER FLEX LINER	
Description	Part Number
3.00" HH Super Flex Liner, 3mm, 328' (100m)	922-8193
4.00" HH Super Flex Liner, 4mm, 328' (100m)	922-8194
5.00" HH Super Flex Liner, 4mm, 328' (100m)	922-8195
6.00" HH Super Flex Liner, 4mm, 328' (100m)	922-8196
8.00" HH Super Flex Liner, 4mm, 328' (100m)	922-8198

HH BRAWOLINER consists of a lengthwise and transversal elastic PET textile tube coated with PU foil. The liner can be installed with an inversion pressure as low as 2.9psi (20kPa).

HH BRAWOLINER	
Description	Part Number
3.00" HH Brawoliner, 3mm, 328' (100m)	922-5253
4.00" HH Brawoliner, 4mm, 328' (100m)	922-5254
5.00" HH Brawoliner, 4mm, 328' (100m)	922-5255
6.00" HH Brawoliner, 4mm, 328' (100m)	922-5256
8.00" HH Brawoliner, 4mm, 328' (100m)	922-5258

HH HELIAM Scrim liner made of polyester with PVC coating is suitable for rehabilitating sewer pipe as recommended by the manufacturer, to be used with ambient, hot water or LED light cured resin systems.

HH HELIAM Scrim	
Description	Part Number
4" HH HELIAM Scrim, 3mm, 165' (50m)	927-4001
4" HH HELIAM Scrim, 3mm, 330' (100m)	927-4002
6" HH HELIAM Scrim, 3mm, 165' (50m)	927-6001
6" HH HELIAM Scrim, 3mm, 330' (100m)	927-6002

EPOXY

Standard Epoxy is a single resin system with multiple choices of 4:1 (by volume) curing agent hardeners. All combinations are suitable for ambient air, steam or hot water cure.

EPOXY RESIN (4:1 RESIN TO HARDENER)	
Description	Part Number
HH Epoxy Resin, 5 Gal (net 45 lb)	922-5500
HH Epoxy Resin, 55 Gal (net 495 lb)	922-5510
HH Epoxy Resin, 275 Gal (net 2,475 lb)	922-5520
STANDARD HARDENER (4:1 RESIN TO HARDENER)	
Description	Part Number

HH Std Hardener, 5 Gal (net 40 lb)	922-5501
HH Std Hardener, 55 Gal (net 440 lb)	922-5511
HH Std Hardener, 275 Gal (net 2,200 lb)	922-5521
WINTER HARDENER (4:1 RESIN TO HARDENER) *	
Description	Part Number
HL Winter Hardener, 5 Gal (net 40 lb)	922-5502
HH Winter Hardener, 55 Gal (net 440 lb)	922-5513
HH Winter Hardener, 275 Gal (net 2,200 lb)	922-5523
SUMMER HARDENER (4:1 RESIN TO HARDENER) *	
Description	Part Number
HH Summer Hardener, 5 Gal (net 40 lb)	922-5503
HH Summer Hardener, 55 Gal (net 440 lb)	922-5512
HH Summer Hardener, 275 Gal (net 2,200 lb)	922-5522

Extended Epoxy resin is formulated for longer working time in long runs and large diameter pipe or high temperature working conditions, suitable for hot water and steam cure.

EXT. EPOXY RESIN (100:30 RESIN TO HARDENER) *	
Description	Part Number
HH Ext Epoxy Resin, 5 Gal, (net 43 lb)	922-5530
HH Ext Epoxy Resin, 55 Gal (net 495 lb)	922-5532
HH Ext Epoxy Resin, 275 Gal (net (2,475 lb)	922-5534
EXT. EPOXY HARDENER (4:1 RESIN TO HARDENER) *	
Description	Part Number
HH Extended Hardener, 5 Gal (net 40 lb)	922-5531
HH Extended Hardener, 55 Gal (net 440 lb)	922-5533
HH Extended Hardener, 275 Gal (net 2,200 lb)	922-5535

Ambient Epoxy is formulated for ambient cure.

AMBIENT RESIN (2:1 RESIN TO HARDENER)	
Description	Part Number
Ambient Epoxy Part A, 5 Gal (net 45 lb)	922-5504
Ambient Epoxy Part A, 55 Gal (net 495 lb)	922-5514
Ambient Epoxy Part A, 275 Gal (net 2,475 lb)	922-5524
AMBIENT HARDENER (2:1 RESIN TO HARDENER)	
Description	Part Number
Ambient Hardener Standard Part B, 5 Gal (net 40 lb)	922-5505
Ambient Hardener Standard Part B, 55 Gal (net 440 lb)	922-5515
Ambient Hardener Standard Part B, 275 Gal (net 2,200 lb)	922-5525

HH Resin Base is a resin system with multiple choices of 4:1 (by weight) curing agent hardeners. All combinations are suitable for steam or hot water cure.

EPOXY BASE RESIN (4:1 RESIN TO HARDENER)	
Description	Part Number
HH Resin Base NT, 5 Gal (net 44 lb)	922-7803
HH Resin Base NT, 55 Gal (net 475 lb)	922-7804
HH Resin Base NT, 275 Gal (net 2000 lb)	922-7805
HH Resin Base Yellow, 5 Gal (net 44 lb)	922-7807
HH Resin Base Yellow, 55 Gal (net 475 lb)	922-7808
HH Resin Base Yellow, 275 Gal (net 2000 lb)	922-7809

STANDARD HARDENER (4:1 RESIN TO HARDENER)	
Description	Part Number
HH Standard 60 NT, 5 Gal (net 40 lb)	922-7819
HH Standard 60 NT, 55 Gal (net 410 lb)	922-7820
HH Standard 60 NT, 275 Gal (net 2025 lb)	922-7821
HH Standard 60 Blue, 5 Gal (net 40 lb)	922-7823
HH Standard 60 Blue, 55 Gal (net 410 lb)	922-7824
HH Standard 60 Blue, 275 Gal (net 2025 lb)	922-7825

SUMMER 90 HARDENER (4:1 RESIN TO HARDENER)	
Description	Part Number
HH Summer 90 NT, 5 Gal (net 40 lb)	922-7827
HH Summer 90 NT, 55 Gal (net 410 lb)	922-7828
HH Summer 90 NT, 275 Gal (net 2164 lb)	922-7829
HH Summer 90 Blue, 5 Gal (net 40 lb)	922-7831
HH Summer 90 Blue, 55 Gal (net 410 lb)	922-7832
HH Summer 90 Blue, 275 Gal (net 2164 lb)	922-7833

WINTER 30 HARDENER (4:1 RESIN TO HARDENER)	
Description	Part Number
HH Winter 30 NT, 5 Gal (net 40 lb)	922-7811
HH Winter 30 NT, 55 Gal (net 410 lb)	922-7812
HH Winter 30 NT, 275 Gal (net 2065 lb)	922-7813
HH Winter 30 Blue, 5 Gal (net 40 lb)	922-7815
HH Winter 30 Blue, 55 Gal (net 410 lb)	922-7816
HH Winter 30 Blue, 275 Gal (net 2065 lb)	922-7817

HammerHead® Cured-in-place Pipe (CIPP) – LED Cured Lining Systems

LINER

HH LED liner made of polyester with polyurethane coating is suitable for rehabilitating pipe as recommended by the manufacturer, to be cured by LED light.

HH LED LINER	
Description	Part Number
4.00" HH LED Liner, 328' (100m)	934-0036
5.00" HH LED Liner, 328' (100m)	934-0037
6.00" HH LED Liner, 328' (100m)	934-0038
6.00" HH LED Liner, 4.5mm, 328' (100m)	934-0039
8.00" HH LED Liner, 4.5mm, 328' (100m)	934-0040
10.00" HH LED Liner, 4.5mm, 328' (100m)	934-0041
4.00" HH LED Liner 3D, 328' (100m)	934-8242

HH FLEX LED LINER	
Description	Part Number
3.00" HH FLEX LED Liner, 328' (100m)	934-0786
4.00" HH FLEX LED Liner, 328' (100m)	934-0787

HH HELIAM Scrim liner made of polyester with PVC coating is suitable for rehabilitating sewer pipe as recommended by the manufacturer, to be used with ambient, hot water or LED light cured resin systems.

HH HELIAM Scrim	
Description	Part Number
4" HH HELIAM Scrim, 3mm, 165' (50m)	927-4001
4" HH HELIAM Scrim, 3mm, 330' (100m)	927-4002
6" HH HELIAM Scrim, 3mm, 165' (50m)	927-6001
6" HH HELIAM Scrim, 3mm, 330' (100m)	927-6002

RESIN

HH LED Resin is a single component resin system suitable for LED light cure.

HH LED RESIN	
Description	Part Number
HH BlueLight Resin, per lb	934-0503
HH BlueLight Resin, 5 Gal	934-0502
HH BlueLight Resin, 55 Gal	934-0501
HH BlueLight Resin, 2200 Lbs	934-0500

Conditions of Listing:

1. Installation must be performed by installers trained and certified by Hammerhead Trenchless.
2. The HammerHead® CIPP System may be used to line pipe with a minimum diameter of 4 inches (102 mm) up to a maximum diameter of 12 inches (305 mm).
3. The minimum thickness of the liner must meet the design parameters of each individual application using the ASTM F1216 Appendix X1 Design Method.
4. The pipe must be inspected and cleaned in accordance with the Inspection and Cleaning section of this listing and the manufacturer's published installation instructions.
5. Final video inspection in accordance with ASTM F1216 must be performed and witnessed by the code official or his designated representative. The final inspection must verify that the liner is continuous over the entire length of the inversion and is free of dry spots, lifts and delamination's. HammerHead® CIPP System materials are manufactured by Hammerhead Trenchless in Lake Mills, Wisconsin under a quality control program with annual inspection by ICC-ES.