



FLOW-LINER® SYSTEMS
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FLOW-LINER® HVAC CIP-DUCT®

CSI Section:

23 31 00 – HVAC Ducts and Casings

1.0 RECOGNITION

FLOW-LINER® HVAC CIP-Duct® cured-in-place duct lining system has been evaluated for use to rehabilitate ducts within underground HVAC duct systems. The FLOW-LINER® HVAC CIP-Duct® system described in this report is a satisfactory alternative material and method recognized for use under the following codes:

- 2015 Uniform Mechanical Code (UMC)
- 2015 International Mechanical Code® (IMC)

2.0 LIMITATIONS

Use of the FLOW-LINER® HVAC CIP-Duct® system recognized in this report is subject to the following limitations:

- 2.1** The FLOW-LINER® HVAC CIP Duct® system shall be manufactured, identified, and installed in accordance with this report and the applicable code. In the event of a conflict, the most restrictive requirement governs.
- 2.2** The manufacturer’s installation instructions shall be available during the repair operation at all times.
- 2.3** Repair operations and inspections shall be made by individuals trained and certified by FLOW-LINER® Systems.
- 2.4** The use of additives in the resin is beyond the scope of this report.
- 2.5** The FLOW-LINER® HVAC CIP-Duct® system is limited to use as an underground air duct system.
- 2.6** The maximum air temperature shall be limited to 150°F (65.6°C) in ducts lined with the FLOW-LINER® HVAC CIP-Duct® system.
- 2.7** The design of concrete slabs with embedded air duct is beyond the scope of this report.
- 2.8** The installation of the HVAC air duct below the base flood elevation is beyond the scope of this report.

2.9 The FLOWLINER® HVAC CIP-Duct® system shall be installed in air ducts meeting the requirements of Section 603.8.3 of the IMC and Section 603.6 of the UMC.

3.0 PRODUCT USE

3.1 General: The FLOW-LINER® HVAC CIP-Duct® system is used as a non-invasive rehabilitation method to repair and seal underground ducts.

3.2 Design: The size of the duct with the FLOW-LINER® HVAC CIP-Duct® liner shall be in accordance with Section 603.2 of the IMC. The thickness of the liner is determined by the distance of the duct above the water table, the length of the repair, the condition of the duct, and the diameter of the duct.

3.3 Installation:

3.3.1 General: The FLOW-LINER® HVAC CIP-Duct® system shall be installed by trained contractors that have been certified by FLOW-LINER®. Installation shall be in accordance with the manufacturer's installation instructions and the applicable code.

3.3.2 Pre-installation: Before installation of the FLOW-LINER® CIP-Duct® lining, the host duct shall be thoroughly cleaned. The condition of the duct shall then be inspected using a remotely operated video camera. Any damage and obstructions that prevent the insertion of the liner shall be removed.

3.3.3 Application: FLOW-LINER® HVAC CIP-Duct® liner shall be impregnated with the FLOW-LINER® CIP-Duct® resin to thoroughly saturate the liner. The impregnated liner shall be inspected to assure that it is free of pinholes, resin voids, and other defects. The impregnated liner shall be loaded into the inverter pressure apparatus above ground and then the unit containing the liner is introduced into the host duct section through an access opening and is forced through the pipe using a FLOW-LINER® inversion unit. The process uses air or water pressure to invert the liner so that it is forced against the host duct wall. The liner in the pipe is then cured with air, hot water, or steam at a period recommended by FLOW-LINER®. Additional installation instructions can be found in FLOW-LINER’s published general specifications and guidelines for CIP-Duct® lining.

3.3.4 Post-inspection: A video inspection of the finished pipe shall be performed. The liner shall be free of resin dry spots and delamination.

The product described in this Uniform Evaluation Service (UES) Report has been evaluated as an alternative material, design or method of construction in order to satisfy and comply with the intent of the provision of the code, as noted in this report, and for at least equivalence to that prescribed in the code in quality, strength, effectiveness, fire resistance, durability and safety, as applicable, in accordance with IBC Section 104.11. This document shall only be reproduced in its entirety.



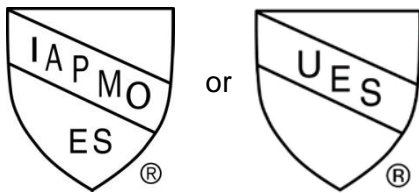


4.0 PRODUCT DESCRIPTION

The FLOW-LINER[®] HVAC CIP-DUCT[®] uses a specially designed polyester felt substrate material with a PVC membrane that is impregnated with the applicable FLOW-LINER[®] HVAC CIP-Duct[®] resin. Once the liner system is installed by the inverted method, it is integrated with the duct. The impregnated liner has a thickness ranging from 1.5 mm to 5 mm after curing. The resin is epoxy-based with the mixture color-tinted to aid in proper mixing.

5.0 IDENTIFICATION

FLOW-LINER[®] HVAC CIP-Duct[®] liner will be identified on the liner and packaging and resin will be identified and the packaging and shall include the FLOW-LINER[®] name and trademark, product name, and evaluation report number (ER-484). The identification may also include the IAPMO Uniform Evaluation Service Mark of Conformity. Either Mark of Conformity may also be used as shown below:



IAPMO UES ER-484

6.0 SUBSTANTIATING DATA

6.1 Reports of performance testing to ASTM F1216-09 – Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Inversion and Curing of a Resin-Impregnated Tube.

6.2 Data in accordance with ICC-ES LC1011 – Rehabilitation of Existing Building Drains and Building Sewers by the Inversion or and Curing of Resin-impregnated Tube, revised October 2010.

6.3 Data in accordance with ICC-ES LC1014 – Underground Plastic Air Ducts, revised 2016.

6.4 Manufacturer’s descriptive literature and installation instructions.

6.5 Test reports are from laboratories in compliance with ISO/IEC 17025.

7.0 STATEMENT OF RECOGNITION

This evaluation report describes the results of research completed by IAPMO Uniform Evaluation Service on Flow-Liner[®] HVAC CIP-Duct[®] lining systems to assess its conformance to the codes shown in Section 1.0 of this report and documents the product’s certification.

For additional information about this evaluation report please visit www.uniform-es.org or email us at info@uniform-es.org