

SPECIFICATION



INSTALLATION PRACTICE FOR INSIGNIA™ HYDROPHILIC CONNECTION HAT

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Installation Specification for Insignia™ Hydrophilic Connection Hat

1. Intent

It is the intent of this specification to detail a safe, efficient, cost-effective installation method of a hydrophilic pipe connection sealing product called Insignia™ Connection Hat for the junction of a main and lateral pipe. The Insignia™ Connection Hat provides a full-circle compression seal to a substantial area at the main and lateral pipe junction. This hydrophilic sealing product is intended for use in conjunction with most all pipe rehabilitation systems, including but not limited to: inverted CIPP liners, pull-in-place CIPP liners, and fold-and-form plastic pipe liners. The Insignia™ Connection Hat product shall be commercially available from LMK Technologies or a distributor for use as an adjunct to rehabilitative pipe lining projects on a price per kit basis.

2. Overview

- 2.1 The Insignia™ Connection Hat product and process consists of providing a full-circle seal at the junction of a main and lateral pipe tubular hat of hydrophilic material specifically tailored to provide the most safe, efficient, cost-effective, watertight seal at the ends of a rehabilitated pipe. The Insignia™ Connection Hat product and process overcomes major deficiencies of other known products and methods used at the junction of main and lateral pipes. For example, hydrophilic grout is commonly used for sealing the connection of main and lateral pipes. The use of such a grout to seal the junction of the pipes at the manhole may result in inconsistent wall thickness and imprecise placement before and after a liner is installed. Since there are no structural elements to hold the grout in place, the grout tends to smear and spread throughout the pipe. Additionally, the use of hydrophilic grout requires arduous cleaning of the pipe interior before application in an attempt to adhere and retain the seal to the pipe.
- 2.2 The Insignia™ Connection Hat product and process overcomes these deficiencies by the use of a sealing product that provides a hydrophilic material that does not shift or move during installation of a rehabilitative pipe liner. The Insignia™ Connection Hat product provides a uniform seal and consistent wall thickness around the connection after installation of a connection liner. Furthermore, the Insignia™ Connection Hat product does not require arduous cleaning of the pipe end before installation.
- 2.3 The Insignia™ Connection Hat product includes a tubular collar and brim structure constructed of a hydrophilic polymeric material, designed with a specified wall thickness to provide a compression seal at the connection of a lateral and a mainline pipe. A mechanical fastener is provided with the tubular sleeve that is specifically designed to hold the tubular sleeve in place during installation of a pipe liner. The mechanical fastener may utilize a

double-sided adhesive to ensure that neither the tubular sleeve nor the fastener shift during installation.

2.4 The most common method utilized and associated with the Insignia™ Connection Hat includes attaching the hat on the liner by means of the provided rubber fastener. The connection liner is then pulled into place and inflated causing the lateral portion of the liner to invert. The connection hat thus gets embedded between the liner and the junction of the mainline and lateral pipe. After the liner is set in place, the hat will swell in the presence of water, creating a full-circle seal between the newly-installed connection liner and the host pipes for the entire circumference of the junction.

3. Material

3.1 The materials utilized for the Insignia™ Connection Hat shall be provided in kits that are designed to accommodate varying pipe diameters, manhole depths, junction configurations, and pipe liner products. The Insignia™ Connection Hat kits are compatible with most rehabilitative pipe liner products, including cured-in-place, and fold-and-form. Additionally, the Insignia™ Connection Hat kit may be used with many different pipe liner installation and curing methods, including inversion, pull-in-place, hot water curing, steam curing, ultra violet curing, and ambient curing methods. The components of the Insignia™ Connection Hat include a cylindrical hat, and a rubber fastener.

3.2 Tubular Sleeve: The member that creates the Connection Hat is a hydrophilic neoprene rubber of approximately 50 Shore A durometer. The connection hat has a uniform wall thickness of approximately 2 mm and a diameter slightly less than the interior pipe diameter. The hydrophilic neoprene rubber has the following characteristics:

Characteristic	Unit	Value	Test Method
Shore A Hardness	point	50 +/- 5	ASTMD2240
Tensile Strength	psi	177	ASTMD412
Elongation at Break	%	523	ASTMD412
Specific Gravity		1.2	ASTMD297

3.3 Rubber Fastener: The Insignia™ Connection Hat is attached to the liner by the means of the provided rubber fastener. The fastener consists of a stretchable rubber band with metal ties at each end.

4. Installation Recommendations

- 4.1 Access to the ends of the pipe to be rehabilitated: Since the Access a manhole where a main pipe or a lateral pipe connects. A technician may access the manhole interiors via conventional methods to access the main or lateral pipe to be rehabilitated. The pipe interior at the manhole shall be measured from 6:00 to 12:00 and from 3:00 to 9:00. The mean shall be the nominal inner diameter.
- 4.2 Cleaning and Inspection: All roots, deposits, and debris should be removed from the pipe with hydraulically powered equipment, high velocity jet cleaners, or mechanically powered equipment as per NASSCO recommended specifications for sewer collection system rehabilitation. Since the Insignia™ End Seal provides a seal based on compression instead of adhesion, extensive cleaning beyond obvious obstructions is optional. A full-circle seal at the ends of the pipe will be achieved regardless of the presence of fats, oils, and grease which is inherent in sewer pipes even after high velocity jet cleaning. It should be noted that the various pipe rehabilitation installation methods have different installation standards (such as ASTM standards and manufacturer's recommendations), and those installation standards should be observed during installation of the liner.
- 4.3 Placement of the Insignia™ End Seal Product: After the ends of the pipe have been accessed and cleaned and inspected, the Insignia™ End Seal product is placed inside the end of the pipe adjacent the manholes. The mechanical fastener is placed into a conformation such that the outer profile of the mechanical fastener is smaller than the diameter of the pipe to be rehabilitated, and the mechanical fastener is placed within the tubular sleeve. Dual-sided adhesive tape may be applied to the outer surface of the mechanical fastener to adhere the outer surface of the mechanical fastener to the inner surface of the tubular sleeve. The tubular sleeve is then placed inside the end of the pipe, and the mechanical fastener is placed into a conformation where the tubular sleeve is held to the pipe wall.
- 4.4 Installation of a Rehabilitative Liner: After the Insignia™ End Seal product has been placed into the ends of the pipe, a rehabilitative liner product shall be installed into the pipe. The Insignia™ End Seal product is intended for use in conjunction with most pipe rehabilitation systems, including but not limited to: cured-in-place pipe liners and fold-and-form pipe liners. The Insignia™ End Seal kit may be used with many different pipe liner installation and curing methods including, inversion, pull-in-place, hot water curing, steam curing, ultra violet curing, and ambient curing.. Since the Insignia™ End Seal product has a uniform wall thickness and is held firmly within the pipe to be rehabilitated, a compression seal will be provided to a large area of the pipe end adjacent the manhole. Since the Insignia™ End Seal product may be used with a variety of rehabilitative pipe liners, the standard installation practices of each individual pipe liner method should be closely followed. Therefore, procedures should be used that meet applicable NASSCO, ASTM, NACE and SSPC standards and provide quality assurance controls that meet the manufacturer's printed recommendations.