

AMPCO

MODEL N - CHIMNEY LINER (aka VSI-1)

INSTALLATION INSTRUCTION SUPPLEMENT

These instructions are supplemental to the General Installation Instructions for Ampco Model N, VSI, IVSI and ZC – Single Wall, Double Wall Air & Fiber Insulated Positive Pressure Piping System installation instructions. Read and refer (also) to the main instructions when installing Model N as a chimney liner.

Model N is a rigid, stainless steel, single wall, modular, venting system identical in construction to the inner (structural) liner of the Ampco Model VSI and IVSI systems used for a variety of applications.

Ampco Model N sections incorporate a fully welded stainless steel tube construction and the same ½" wide flanged ends as the Model VSI and IVSI system. Model N uses many of the same system parts and accessories as the Model VSI and IVSI systems.

As a chimney liner, Model N is designed for use in masonry or factory-built chimneys to provide the flue gas venting of solid, liquid, and / or gas fired appliances as noted below.

Model N has been tested and Listed (safety certified) to UL-1777 - STANDARD FOR CHIMNEY LINERS for use with gas fired appliances with flue gases up to 570°F and short term exposure up to 1700°F. Model N is Listed and produced under the Follow-Up Service program of Underwriters Laboratories, Inc. and carries the UL LISTING MARK illustrated here.



Model N has been tested and Listed (safety certified) to CAN/ ULC-S635 - STANDARD FOR LINING SYSTEMS FOR EXISTING MASONRY OR FACTORY-BUILT CHIMNEYS AND VENTS for use with gas, liquid and solid fuel fired appliances with maximum continuous flue gas temperatures of 650°C (1200°F) . Model N is Listed and produced under the Follow-Up Service program of Underwriters Laboratories, Inc. and carries the cUL LISTING MARK illustrated here.



GENERAL INSTALLATION CONSIDERATIONS:

1.) Before beginning any installation of Model N chimney liner system, consult the local code inspection authority (Gas Inspection Authority,

Municipal Building Department, Fire Department, etc.) to determine the need to obtain a permit for the installation.

- 2.) These instructions should be observed when installing Model N Chimney Liner. Never substitute liner material. The safe operation of the Model N lining system is based upon the use of parts supplied by Ampco. The use / substitution of parts other than those supplied by Ampco for use with Model N is not recommended, as they could affect the safety / performance of the system.
- 3.) Failure to install this product in accordance with these installation instructions may result in an installation that the local inspection authority will not accept, could void the warranty and / or could result in an unsafe installation.
- 4.) Before installing Model N, the masonry chimney should be thoroughly inspected for any damage such as cracks, void areas, missing bricks or mortar and other defects. Damaged areas should be repaired prior to installation. Care should also be taken to ensure that the masonry chimney is clean and free from any buildup of creosote. Consult a certified Chimney Sweep if necessary.
- 5.) Installed in an existing masonry chimney under the terms of the CAN/ ULC-S635 Listing and in masonry chimneys under the terms of the UL1777 Listing, Model N liner requires only sufficient space within the chimney to accommodate the installation. The minimum internal dimensions necessary for installation will be the liner inside diameter plus approximately 2", to allow for the V-Bands that connect the individual lengths together. (eg. - A 16" Model N liner will require an approximate 18" minimum inside opening within an existing chimney.)
- 6.) If Model N is to be used to line an existing factory-built chimney or vent, such chimney / vent must be thoroughly cleaned and checked for structural defects. Such chimney / vent should also be checked to insure that all parts (supports, radiation shields, firestops, etc.) specified by the chimney / vent manufacturer are installed and that the air space clearances between the chimney or vent exterior casing and

combustible material is in accordance with the installation instructions.

- 7.) Correct sizing of Model N requires reference to the appliance installation instructions and / or conducting a specific sizing assessment. Correct liner size is important for proper venting. Correct sizing is also particularly important when venting appliances with low flue gas temperatures in geographical areas that experience sustained low ambient temperature because they may be susceptible to icing / blockage at the outlet and associated equipment and / or personal safety concerns due to improper appliance venting. Unless a specific sizing assessment is conducted and confirms adequate capacity, no portion of the liner should ever be smaller in diameter than the outlet of the appliance it serves.
- 8.) Ampco Model N liner is Listed per CAN/ ULC-S635 as a "Class 3 Lining System" for use in existing masonry or factory-built chimneys and may be used with oil, gas or solid fuel-fired appliances where the temperature of the flue gas products does not normally exceed 650° C (1200° F). Many common gas, oil or solid fuel fired boilers, hot water heaters, warm air furnaces and some types of process heating or other specialty equipment including certain engine exhausts operate within such flue gas temperature range.

Per its UL1777 Listing, Model N is limited to gas fired equipment applications for flue gas temperatures up to 570°F continuous and short term exposure up to 1700°F.

If there is any question concerning whether Model N is appropriate for use with certain equipment, contact Ampco Technical Support staff for assistance.
- 9.) Model N chimney liner should be sized in a manner to reduce excessive amounts of condensation of moisture, creosote build-up and weak draft. These factors are often consequences of an oversized chimney and can lead to a reduced service life for the system attributable to excessive condensation and premature corrosion of the system compared to a properly sized system. For similar reasons, oversized chimneys used on wood burning appliances can lead to excessive creosote buildup within the flue. Weak draft can lead to operational problems and reduced combustion efficiencies of the appliances.
- 10.) If Model N is also used as a connector between the appliance and the masonry chimney being lined, treat Model N as a single wall connector and follow local code requirements for minimum airspace clearance from combustibles to single wall connectors. If the connector penetrates a combustible wall between the appliance and the inlet to the chimney, follow local code requirements for passing such single wall connector through the wall and / or use a safety certified "Wall Pass-Through Device" for such purpose.
- 11.) The maximum height from Model N will depend upon the diameter of the system being installed and the method of supporting the Model N. See the main installation instructions for support options and use the maximum height limitations specified for Model N.
- 12.) At locations where Model N extends above the existing chimney, a flashing or cover plate (may be generic) is recommended to prevent moisture, debris, etc. from entering the area around the liner. The area surrounding the Model N within the chimney may include an insulating material only if such insulating material is certified for use with Class 3 (all fuel) chimney liner systems and / or is otherwise acceptable to the local code authority.
- 13.) Model N liner should extend a minimum of 1' above the masonry chimney in which it is installed. Follow local code requirements for minimum spacing requirements from chimney terminations to surrounding structures.
- 14.) A Stack Cap or other Ampco Model VSI termination cap option is recommended for use with Model N to reduce moisture access to the inside of the flue. Listed rain caps with bird screens or spark arresters are necessary and / or required in some areas, but may be susceptible to blockage through freezing moisture in areas of low ambient temperature. Consult the authority having jurisdiction for requirements in your area.
- 15.) Inclined portions of the Model N liner system are generally not recommended but can be accommodated with elbows, if there is sufficient access / room for the installation to be made. In such instance, inclined portions of the system should not exceed 30° from vertical. Portions of Model

N used as a connector system (between the appliance outlet and the inlet to the Model N liner / chimney) may be offset virtually horizontal with minimal slope required as per local code.

- 16.) Whereas the UL1777 and CAN/ULC-S635 chimney liner standard contains no specifications for evaluating chimney lining systems for use in positive internal pressure applications, when used as the internal flue liner of Model VSI and IVSI, Model N is safety certified for use in positive internal pressure applications of 15 KPa (60" w.c.). Therefore Model N may be found suitable by the local code authority for use in positive internal pressure applications.
- 17.) Model N chimney liner system may be intermixed with Models VSI and IVSI chimney system components as part of an "engineered" venting system, assuming the proper associated airspace clearances-to-combustibles, transitions, supports, etc. are used for the various portions of the system. Contact Ampco for additional information on combination / engineered venting systems incorporating mixed system usage.
- 18.) **POSTING OF NOTICES:** Upon completion of installation and before the system is put into operation a "Notice" should be posted in the appliance room, near the outlet of the appliance. This "Notice" should contain, as a minimum, the information shown in Fig. 3.

GENERAL MAINTENANCE CONSIDERATIONS:

- 1) Ampco Model N chimney liner systems should be inspected (and cleaned if necessary) periodically (at least once per year) during the course of use. More frequent inspections are appropriate during the first period of use in order to gauge the tendency for any accumulations that may need to be removed. Later, as inspections and cleaning data has been gathered over a period of time, it may be appropriate to reduce the frequency.
- 2) Failure to inspect and clean this chimney liner could result in premature corrosion, the build-up of dangerous deposits within the lining system (See "Creosote" below) and / or other, potentially dangerous, operational problems.
- 3) Access for inspection and cleaning. Depending upon the system layout, Model N liner can be accessed from the top – by removal of the cap, and / or at the base – by removal of a portion

of the connector system. See main instructions for information on joining / separating system parts.

- 4) Ampco Model N liner may be cleaned with conventional chimney brushes of the correct same, nominal diameter as the flue.
- 5) **Creosote - Formation and Need for Removal:**
When wood is burned slowly, it produces tar and other organic vapors, which combine with expelled moisture to form creosote. The creosote vapors condense in the relatively cool chimney flue of a slow burning fire. As a result, creosote residue accumulates on the liner. When ignited, this creosote makes an extremely hot fire.

The liner should be inspected periodically during the heating season to determine if a creosote build-up has occurred. If a significant layer of creosote has accumulated (3 mm or more) it should be removed to reduce the risk of a chimney fire."

If you have any questions concerning this Model chimney liner and its use / application or qualifications, contact Ampco via the contact information included at the end of this document.

Section 1 – General Installation Guidelines

- 1) Determine the location of the point where the vent system will penetrate the masonry wall (the position of the appliance, likely, will have a large impact on this) and prepare an opening through the masonry and any existing liner, large enough to easily accommodate the "Pass Through Device" which Model N will extend through. The opening should be large enough to allow easy access to the Model N for purposes of Plate Support attachment and positioning. It may be necessary to prepare another opening further up for purposes of installing Half or Full Rings for guided support. Consult general installation instructions for proper "F" and "S" dimensions. "S" dimension limitations may be extended or eliminated depending upon the spacing between the Model N and inside face of the masonry chimney. Consult Ampco for further specifics.
- 2) Have the intended support bracing installed at the prepared opening such that when the Plate Support comes to rest on the bracing, the centerline of the snout of the Tee which

attaches to the Plate Support should end up near the centerline of the prepared opening.

- 3) Determine the overall length of the system by measuring from the prepared opening to a point 610mm (2 feet) above the top of the masonry chimney. Add the distance from the appliance outlet to the prepared opening accounting for any bends.
- 4) Select lengths of pipe necessary to accommodate total required length determined by step 3.
- 5) Gather all necessary component parts and locate them near the top of the masonry chimney. This should consist of a Manifold Tee with Tee Cap, Plate Support, Flashing, Storm Collar, Stack Cap, Sealant and the necessary pipe lengths with V-Bands, along with all appropriate safety related equipment.
- 6) (Assuming there is sufficient space around the liner and the inside of the chimney to accommodate the plate support) attach the outlet of Tee to the inlet end of a length of pipe, clamp the Plate Support around the V-Band and start lowering it down the chimney flue. Add lengths of pipe as necessary. See Section 2 for details.

In the event that there is insufficient space to pre-install the plate support to the bottom of the liner assembly before lowering it down through the chimney, it may need to be installed at the base, first, then mated to the bottom end of the liner assembly as it is lowered into place.
- 7) The Plate Support should come to rest on existing bracing which should already be installed. The tee snout should be at the prepared opening with the top portion of the Model N at least 12" (610mm) above the top of the masonry chimney. Bolt the Plate Support to the support bracing.
- 8) Add lengths of pipe necessary to extend from the tee snout to the outlet of the appliance.
- 9) After the system is connected to the appliance and checked for proper installation, including clearances to combustible surfaces, proper support and proper component parts, fill in the void area around the penetration with a non-combustible filler such as ceramic fiber insulation.
- 10) A Trim Collar (may be generic) should be installed to give a finished appearance if desired.

- 11) Weatherize the system at the top with the use of a Flashing, Storm Collar, Stack Cap (or otherwise acceptable cap) and silicone sealant. The Flashing should be attached to the top of the masonry chimney with the use of masonry fasteners. Sealant should be applied around the entire perimeter of the Support Plate or Flashing at the point where it makes contact with the top of the masonry chimney. It should also be applied around the top edge of the Storm collar.

Section 2 - PIPE AND FITTING JOINT ASSEMBLY

- 1) Clean all pipe flanges and V-Band inner surfaces with an appropriate organic solvent.
- 2) Bring parallel flanges together.
- 3) Apply P600 or P-2000 sealant (as appropriate for the application) to the inner groove of the V-Band.
- 4) Clamp the V-Band around the flanges using the end clamp hardware.

Note: Light tapping with a wooden mallet or similar device all around the V-Band while tightening the clamp helps to align and pull flanges together. See Fig. 2

KEEP THESE INSTRUCTIONS FOR FUTURE REFERENCE. THEY INCLUDE IMPORTANT USE AND MAINTENANCE INFORMATION FOR MODEL N CHIMNEY LINER.

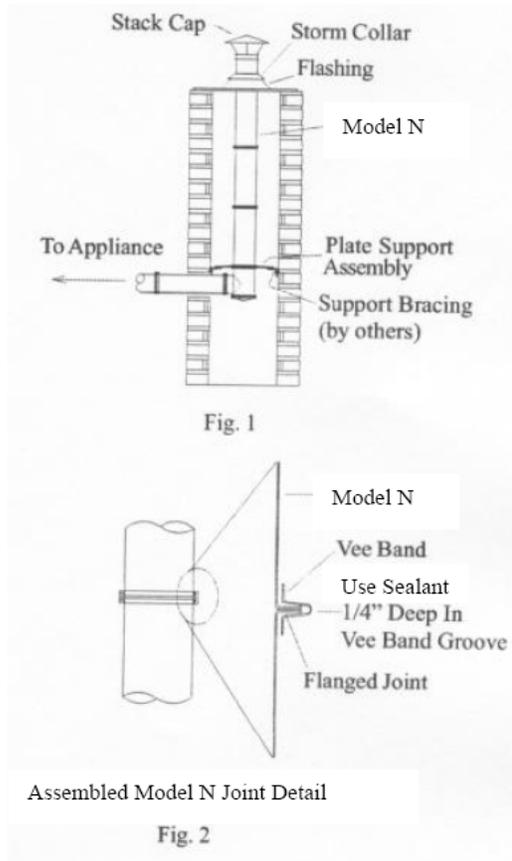


Fig. 3 – Recommended “Notice” for posting near appliance outlet.

NOTICE:

- The chimney liner to which this appliance is attached is Listed per CAN/ULC-S635 as a “Class 3 Lining System” for use in existing masonry or factory-built chimneys and vents. It may be used with oil, gas or solid fuel-fired equipment where the temperature of the flue gas products does not normally exceed 650° C (1200° F).
- The chimney liner to which this appliance is attached is Listed per UL1777 for use with gas fired equipment for flue gas temperatures up to 570°F continuous and short term exposure up to 1700°F.
- Under certain low ambient temperature conditions, some chimney caps can be susceptible to ice buildup. Check cap for ice buildup under such conditions and remove ice if necessary before using the chimney.

• Date of installation: (Fill in)

• Chimney Liner is Model N, manufactured by Ampco

**Ampco c/o
Hart & Cooley, Inc
5030 Corporate Exchange Blvd SE,
Grand Rapids, MI 49512
800-669-3269
www.ampcostacks.com**

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