

Technical Report - AM15VL Series “Ventless” Dishmachines

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This document explains the operation of the new Advansys Ventless dishmachines, AM15VL series, and provides information to assist in the Code Plan Review process. **Please Note:** It is imperative that this information, along with supporting documentation such as the specification sheet and independent test report, be provided to the Authority Having Jurisdiction (AHJ) to ensure compliance with current local requirements. Links to these documents can be found on page 5 of this report.

The Advansys Ventless dishmachine does not require a Type II vent hood because it does not produce “excessive” amounts of steam or vapors. Even though it is a high temperature sanitizing dishmachine, it produced almost the exact same amount of latent and sensible heat as a comparable chemical sanitizing or low temperature dishmachine in an independent test.¹

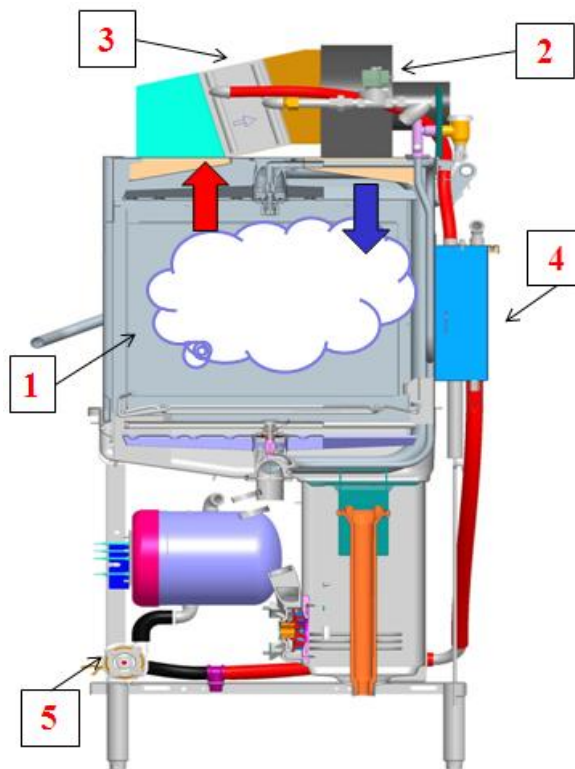
The Ventless Dishmachine has three primary advantages:

1. Bleach is not discharged into the sanitary sewer system
2. A ventilation hood is not required
3. Reduced energy consumption results in a savings of up to \$1,568/year

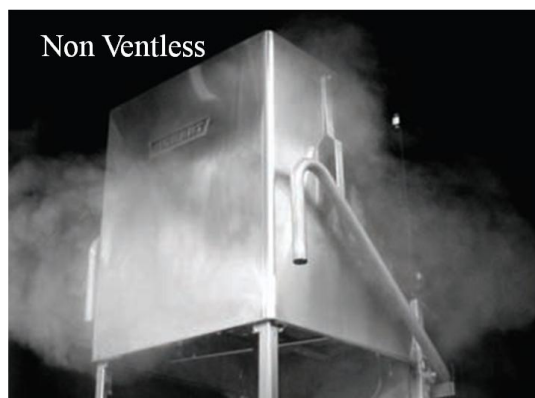
¹ See independent Commercial Kitchen Ventilation Lab (FSTC) Report dated November 2009.

Machine Operation

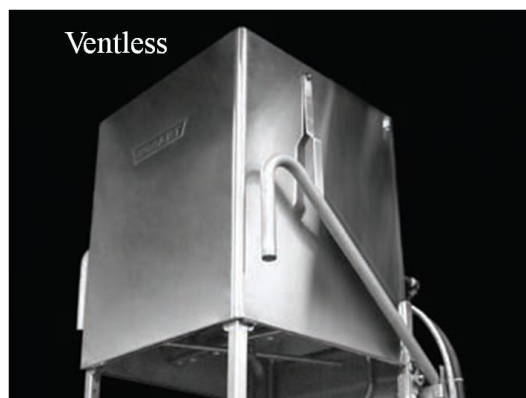
The Advansys Ventless AM15VL has a unique energy recovery condensing cycle that captures water vapor (1) (more commonly referred to as steam) from the wash cycle and condenses it to heat the incoming cold water. A fan (2) circulates the air from the chamber — filled with water vapor — across the fins of the heat exchanger coils (3) filled with cold water at 50 to 80 degrees Fahrenheit. The difference in temperatures causes the water vapor to condense and preheats the inlet water (4) used for final rinsing through the rinse pump (5). The preheated water temperature reaches up to 140 degrees Fahrenheit, which reduces the amount of energy needed to reach the required 180 degree Fahrenheit rinse-water temperature. The energy recovery system allows operation using a cold water supply and uses the hot water line only for the initial fill. After the completion of the 30-second condensing cycle, an indicator light signals the machine is ready for unloading, and then the process starts over.



Results:



Non Ventless



Ventless

ICC Code Opinions

The International Code Council (ICC) has provided the following opinions to Hobart:

1) 2009 International Mechanical Code:

Where the heat and moisture loads from a dishmachine, such as a “commercial-type” with a built-in condensing system, are incorporated into the HVAC system design, a Type II hood is not required to be installed above it.

2) 2006 International Mechanical Code:

It is subject to the code official's approval whether Exception 2 in 2006 IMC Section 507.2.2 was intended to address technology for dishmachines and potwashers that do not exhaust the heat and water vapors "directly" to the outdoors because they are provided with self-contained condensing systems supplied by the manufacturer. In our opinion, it is important to consider the revised provision in Section 507.2.2 of the 2009 IMC that, in essence, clearly establishes "Where the heat and moisture loads from a dishmachine, such as a 'commercial-type' with a built-in condensing system, are incorporated into the HVAC system design, a Type II hood is not required to be installed above it." Please note that Section 105.2 of the 2006 IMC permits the code official the authority to grant approval to use Section 507.2.2 of the 2009 IMC. Therefore, a code official, in our opinion, can grant approval for the aforementioned self-contained exhaust system as long as substantial documentation is submitted indicating the heat and moisture loads are incorporated into the HVAC system design.

These opinions are based on the information which you have provided. We have made no independent effort to verify the accuracy of this information nor have we conducted a review beyond the scope of your question. As this opinion is only advisory, the final decision is the responsibility of the designated authority charged with the administration and enforcement of this code.

- Phillip Grankowski
Senior Technical Staff
International Code Council, Inc.

What does this mean?

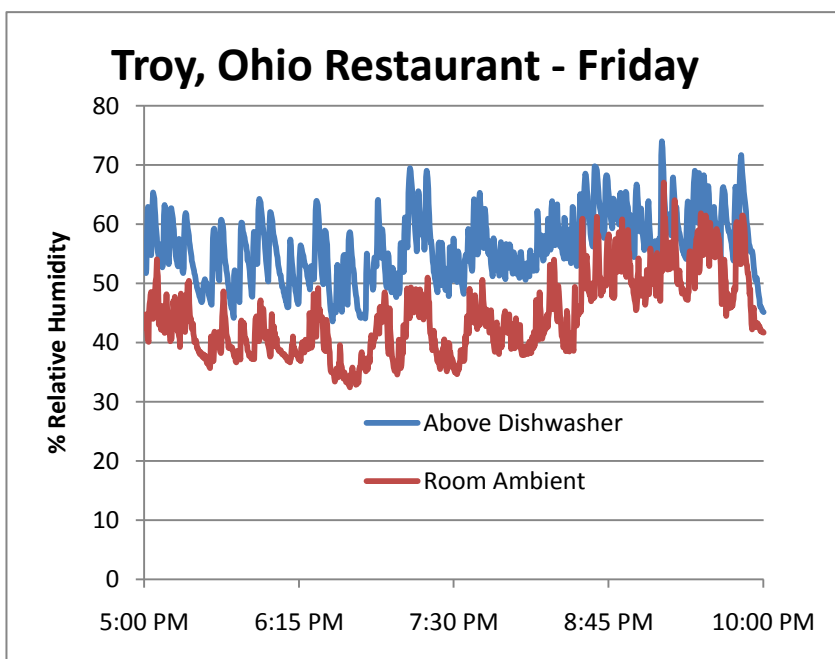
The Ventless AM15VL can be installed without a vent hood if the HVAC system has been sized to handle the heat load. This machine has been designed to match the output heat load of a low temperature model which demonstrates that it meets the intent of the Mechanical Code.

Customer Testing

Prior to launching the Advansys Ventless AM15VL into production, extensive testing was completed at local restaurants to understand the impact on the kitchen.

Case Study – Troy Ohio

The AM15VL machine was installed in a kitchen with approximately 800 square feet of floor space and operated without a vent fan. It ran 125 cycles between 5:00 pm and 10:00 pm on a busy Friday evening. During that time, the average relative humidity level above the dishmachine was 56.2% while the humidity in a central area of the kitchen was 44.1%. While each installation is unique, the data above confirms that it is possible to operate the Ventless AM15VL in a small kitchen and still maintain the industry standard of 65% maximum relative humidity.



Operational Test Report

To better understand the impact of the Ventless AM15VL in an environment comparable to that of traditional high and low temperature machines, Hobart contracted with the Food Service Technology Center Commercial Kitchen Ventilation Lab in Wood Dale, IL. A comparison of the latent and sensible heat gain to space for a Ventless AM15VLT and an AM15T Chemical Sanitizing dishmachine was performed. The results are as follows:

Objective and Scope

The objective of the laboratory testing was to measure the convective heat load (i.e., sensible and latent) generated by the Hobart AM15VLT Ventless commercial dishmachine during the dishwashing process and compare it to the heat load of the same machine operating in low temperature, chemical sanitizing mode. (Note – model AM15VLT was chosen since it is the tallest version of the family and represents a “worst case” condition.)

The convective heat load added to the space was measured indirectly using a canopy hood over the dishmachines to capture and contain the equivalent heat load that would otherwise be added to the space.

Method of Test

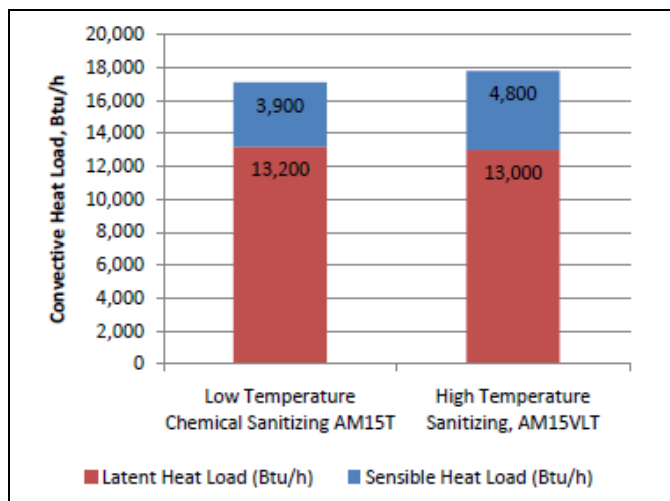
The dishmachines were operated according to the manufacturer’s recommendations and ASTM F1696 Standard Test Method for Energy Performance of Hot Water Sanitizing, Door-Type Commercial Dishwashing Machines.

Operational Parameters

Cycle rate: 30 racks per hour

Cold water supply: approximately 71°F at 40-42 psi

Rack/dish load: approximately 19.5 pounds total



Conclusion:

The total convective heat load released by the Ventless AM15VLT and the chemical sanitizing AM15T are nearly identical (within 4%)

Recommended Steps for Approval and Installation

1. Request a report from an HVAC contractor to show that the heating and air conditioning system in the new or existing facility will adequately accommodate the latent and sensible heat outputs from all appliances in the kitchen, including the Ventless AM15VL. The chart in Table 1 provides the latent and sensible heat output for the Ventless AM15VL models.

	Heat Gain to Space (BTU/HR)	
	Latent	Sensible
AM15VL	9,300	3,400
AM15VLT, AM15VLF	13,000	4,800

Table 1

2. Submit the report from step 1, along with the specification sheet and independent test report (if needed), to the AHJ for the Plan Check Review process. The test report is available at http://www.fishnick.com/publications/appliancereports/dishmachines/Hobart_AM15T_Diswasher_with_Condenser.pdf. The spec sheet can be obtained from the following web sites:
 - a. AM15VL - <https://my.hobartcorp.com/resourcecenter/ProductDocumentation/F40271.pdf>
 - b. AM15VLT - <https://my.hobartcorp.com/resourcecenter/ProductDocumentation/F40272.pdf>
 - c. AM15VLF - <https://my.hobartcorp.com/resourcecenter/ProductDocumentation/F40273.pdf>
3. After the permit approval process is complete, install the unit according to the Hobart instructions. It is highly recommended that Hobart Service Technicians perform this installation so that optimum condensing performance is maintained. When installed by Hobart Technicians, an extended 6 months warranty is offered in addition to a free start-up procedure to conduct basic machine checks and condensing time adjustments.

Explanation of Model Differences

AM15 – Standard height, dual sanitizing mode machine. Requires Type II vent hood when operated in high temp mode, typically does not require vent hood when operated in chemical sanitizing mode.

AM15T – “Tall” version is same as AM15 except provided with chamber 10 inches taller for washing larger trays and pans.

AM15F – “Front load” model is same as taller “T” model above except provided with fold down loading platform when door is opened to load and unload from the front of the machine; typically used in bakery or deli applications.

AM15VL – Same as AM15 above except provided with a cold water inlet and condensing system to reduce the steam and heat output into the room – only available in electric hot water sanitizing mode with internal booster.

AM15VLT – Same as AM15T with a condensing system – Only available in electric hot water sanitizing mode with internal booster.

AM15VLF – Same as AM15F with a condensing system - Only available in electric hot water sanitizing mode with internal booster.

Frequently Asked Questions:

Q: Why do I need a Code Official's approval?

A: The position of the code official is to review the proposed and completed work and to determine whether a mechanical system installation conforms to the code requirements. A mechanical code is a legally enforceable document to safeguard health, safety, property and public welfare. Prior approval is always the best course of action.

Q: How do I know what Codes I need to meet?

A: The local city or county inspection office is the first contact for Code requirements. This information can often be found on a web search.

Q: How do I get a copy of the independent test report referenced in this document?

A: Contact your local Hobart Sales Representative or go to the Hobart web site "www.hobartcorp.com".

Q: How do I obtain the documentation that shows the heat and moisture loads are incorporated into the HVAC system design?

A: The AM15VL specification sheets include the latent and sensible heat output into a room when operating without a vent fan. You must contract with an Architect or HVAC contractor to evaluate your facility and create a report showing that the required temperature and humidity can be maintained while all appliances are operating as intended in the kitchen. This information is often generated using the ASHRAE fundamentals handbook.

Q: What do I do if this is a replacement dishmachine rather than a new facility?

A: Most jurisdictions require a permit to replace or install a new dishmachine in an existing building. Your local Code Official will make that determination.

Q: What if my ground water temperature is too high?

A: If the cold water supply is above 90°F, the AM15VL is not recommended to be used without a vent hood. If the water temperature is between 65°F and 90°F, a Hobart Service Technician can adjust the condensing time to improve the performance upon start up.

Q: What if a Code Official does not allow the installation of this unit without a Type II vent hood?

A: Hobart has resources available to assist in the plan review process. Contact your local Sales Representative for assistance.