



ENERGY STAR® Program Requirements for Commercial Dishwashers

Partner Commitments

Following are the terms of the ENERGY STAR Partnership Agreement as it pertains to the manufacture and labeling of ENERGY STAR certified products. The ENERGY STAR Partner must adhere to the following partner commitments:

Qualifying Products

1. **Comply with current ENERGY STAR Eligibility Criteria**, which define performance requirements and test procedures for Commercial Dishwashers. A list of eligible products and their corresponding Eligibility Criteria can be found at www.energystar.gov/specifications.
2. **Prior to associating the ENERGY STAR name or mark with any product**, obtain written certification of ENERGY STAR certification from a Certification Body recognized by EPA for Commercial Dishwashers. As part of this certification process, products must be tested in a laboratory recognized by EPA to perform Commercial Dishwashers testing. A list of EPA-recognized laboratories and certification bodies can be found at www.energystar.gov/testingandverification.

Using the ENERGY STAR Name and Marks

3. Comply with current ENERGY STAR Brand Book, which define how the ENERGY STAR name and marks may be used. Partner is responsible for adhering to these guidelines and ensuring that its authorized representatives, such as advertising agencies, dealers, and distributors, are also in compliance. The ENERGY STAR Brand Book are available at www.energystar.gov/logouse.
4. Use the ENERGY STAR name and marks only in association with certified products. Partner may not refer to itself as an ENERGY STAR Partner unless at least one product is certified and offered for sale in the U.S. and/or ENERGY STAR partner countries.
5. Provide clear and consistent labeling of ENERGY STAR certified Commercial Dishwashers. The ENERGY STAR mark must be clearly displayed on the Commercial Dishwashers top/front of the product, in product literature (i.e., user manuals, spec sheets, etc.), on product packaging, and on the manufacturer's Internet site where information about ENERGY STAR certified models is displayed.

Verifying Ongoing Product Certification

6. Participate in third-party verification testing through a Certification Body recognized by EPA for Commercial Dishwashers, providing full cooperation and timely responses. EPA/DOE may also, at its discretion, conduct tests on products that are referred to as ENERGY STAR certified. These products may be obtained on the open market, or voluntarily supplied by Partner at the government's request.

Providing Information to EPA

7. Provide unit shipment data or other market indicators to EPA annually to assist with creation of ENERGY STAR market penetration estimates, as follows:
 - 7.1. Partner must submit the total number of ENERGY STAR certified Commercial Dishwashers shipped in the calendar year or an equivalent measurement as agreed to in advance by EPA and Partner. Partner shall exclude shipments to organizations that rebrand and resell the shipments (unaffiliated private labelers).

7.2. Partner must provide unit shipment data segmented by meaningful product characteristics (e.g., type, capacity, presence of additional functions) as prescribed by EPA.

7.3. Partner must submit unit shipment data for each calendar year to EPA or an EPA-authorized third party, preferably in electronic format, no later than March 1 of the following year.

Submitted unit shipment data will be used by EPA only for program evaluation purposes and will be closely controlled. If requested under the Freedom of Information Act (FOIA), EPA will argue that the data is exempt. Any information used will be masked by EPA so as to protect the confidentiality of the Partner.

8. Report to EPA any attempts by recognized laboratories or Certification Bodies (CBs) to influence testing or certification results or to engage in discriminatory practices.

9. Notify EPA of a change in the designated responsible party or contacts within 30 days using the My ENERGY STAR Account tool (MESA) available at www.energystar.gov/mesa.

Performance for Special Distinction

In order to receive additional recognition and/or support from EPA for its efforts within the Partnership, the ENERGY STAR Partner may consider the following voluntary measures, and should keep EPA informed on the progress of these efforts:

- Provide quarterly, written updates to EPA as to the efforts undertaken by Partner to increase availability of ENERGY STAR certified products, and to promote awareness of ENERGY STAR and its message.
- Consider energy efficiency improvements in company facilities and pursue benchmarking buildings through the ENERGY STAR Buildings program.
- Purchase ENERGY STAR certified products. Revise the company purchasing or procurement specifications to include ENERGY STAR. Provide procurement officials' contact information to EPA for periodic updates and coordination. Circulate general ENERGY STAR certified product information to employees for use when purchasing products for their homes.
- Feature the ENERGY STAR mark(s) on Partner website and other promotional materials. If information concerning ENERGY STAR is provided on the Partner website as specified by the ENERGY STAR Web Linking Policy (available in the Partner Resources section of the ENERGY STAR website), EPA may provide links where appropriate to the Partner website.
- Ensure the power management feature is enabled on all ENERGY STAR certified displays and computers in use in company facilities, particularly upon installation and after service is performed.
- Provide general information about the ENERGY STAR program to employees whose jobs are relevant to the development, marketing, sales, and service of current ENERGY STAR certified products.
- Provide a simple plan to EPA outlining specific measures Partner plans to undertake beyond the program requirements listed above. By doing so, EPA may be able to coordinate and communicate Partner's activities, provide an EPA representative, or include news about the event in the ENERGY STAR newsletter, on the ENERGY STAR website, etc. The plan may be as simple as providing a list of planned activities or milestones of which Partner would like EPA to be aware. For example, activities may include: (1) increasing the availability of ENERGY STAR certified products by converting the entire product line within two years to meet ENERGY STAR guidelines; (2) demonstrating the economic and environmental benefits of energy efficiency through special in-store displays twice a year; (3) providing information to users (via the website and user's manual) about energy-saving features and operating characteristics of ENERGY STAR certified products; and (4) building awareness of the ENERGY STAR Partnership and brand identity by collaborating with EPA on one print advertorial and one live press event.

- Join EPA's SmartWay Transport Partnership to improve the environmental performance of the company's shipping operations. The SmartWay Transport Partnership works with freight carriers, shippers, and other stakeholders in the goods movement industry to reduce fuel consumption, greenhouse gases, and air pollution. For more information on SmartWay, visit www.epa.gov/smartway.
- Join EPA's Green Power Partnership. EPA's Green Power Partnership encourages organizations to buy green power as a way to reduce the environmental impacts associated with traditional fossil fuel-based electricity use. The partnership includes a diverse set of organizations including Fortune 500 companies, small and medium businesses, government institutions as well as a growing number of colleges and universities. For more information on Green Power, visit www.epa.gov/greenpower



ENERGY STAR® Program Requirements Product Specification for Commercial Dishwashers

Eligibility Criteria Version 3.0

Following is the **Version 3.0** product specification for ENERGY STAR certified commercial dishwashers. A product shall meet all of the identified criteria if it is to earn the ENERGY STAR.

1) **Definitions:**¹ Provided below are the definitions of the relevant terms in this document.

- A. **Dishwashing Machine:** A machine designed to clean and sanitize plates, pots, pans, glasses, cups, bowls, utensils, and trays by applying sprays of detergent solution (with or without blasting media granules) and a sanitizing rinse.

Machine Types

- B. **Stationary Rack Machine:** A warewashing machine in which a rack of dishes remains stationary within the machine while subjected to sequential wash and rinse sprays. This term also applies to machines in which the rack revolves on an axis during the wash and rinse cycles.
- a) **Under Counter:** A stationary rack machine with an overall height of 38 inches or less, designed to be installed under food preparation workspaces. Under counter dishwashers can be either chemical or hot water sanitizing, with an internal or external booster heater for the latter.²
 - i. **Glasswashing:** A stationary rack, under counter machine specifically designed to clean and sanitize glasses.
 - b) **Single Tank, Door Type:** A stationary rack machine designed to accept a standard 20 inch x 20 inch dish rack which requires the raising of a door to place the rack into the wash/rinse chamber. Closing of the door typically initiates the wash cycle. Subcategories of single tank, stationary door type machines include: single rack; double rack; pot, pan and utensil washers (PPU); chemical dump and fill type; and, hooded wash compartment ("hood type").³ Single tank, door type models can be either chemical or hot water sanitizing, with an internal or external booster heater for the latter.⁴
 - i. **Pot, Pan, and Utensil (PPU):** A stationary rack, door type machine designed to clean and sanitize pots, pans, and kitchen utensils.
 - ii. **Dump and Fill:** A machine type where after the wash cycle, the drain automatically opens to 'dump' the wash water to a holding tank or to a drain. The rinse tank fill then becomes the water for the next wash cycle.⁵
- C. **Conveyor Machine:** A dishwashing machine that employs a conveyor or similar mechanism to carry dishes through a series of wash and rinse sprays within the machine.

¹ Additional terms found throughout this document, and related to machine components and operation, are defined in NSF/ANSI 170-2019 *Glossary of Food Equipment Terminology*, unless otherwise cited.

² ASTM F1696-20 3.1.38

³ Hood: A device intended for collecting vapors, mists, particulate matter, fumes, smoke, steam or heat before entering an exhaust system (NSF/ANSI 170-2019 3.109).

⁴ ASTM F1696-20 3.1.39

⁵ ASTM F953-2019 9.3 Operation Cycle

- a) Single Tank Conveyor: A conveyor machine that includes a tank for wash water followed by a sanitizing rinse (pumped or fresh water). This type of machine does not have a pumped rinse tank. This type of machine may include a prewashing section ahead of the washing section and an auxiliary rinse section, for purposes of reusing the sanitizing rinse water, between the wash and sanitizing rinse sections. Single tank conveyor dishwashers can be either chemical or hot water sanitizing, with an internal or external booster heater for the latter.⁶
 - b) Multiple Tank Conveyor: A conveyor type machine that includes one or more tanks for wash water and one or more tanks for pumped rinse water, followed by a sanitizing rinse. This type of machine may include a pre-washing section before the washing section and an auxiliary rinse section, for purposes of reusing the sanitizing rinse water, between the power rinse and sanitizing rinse section. Multiple tank conveyor dishwashers can be either chemical or hot water sanitizing, with an internal or external booster heater for the latter.⁷
 - c) Flight Type Conveyor: A conveyor machine where the dishes are loaded directly on the conveyor rather than transported within a rack. This machine is also referred to as a rackless conveyor.⁸
- D. Heat Recovery Machine: Warewashing equipment with heat recovery systems; a heat exchanger that recovers energy from other sources for the purpose of heating potable water. This includes but is not limited to drain water-, wash compartment-, and/or exhaust heat exchangers; and supplemental heat pumps.⁹ The equipment must meet all the following requirements to qualify for the hot water energy offset:
- a) Use a minimum of 95% of water volume from the cold-water inlet for the wash and rinse cycle. The machine can have both cold-water and hot-water inlets, but a maximum of 5% of wash and rinse cycle water shall come from the hot water during testing;
 - b) The temperature of the water at the dishwasher's inlet must be 70°F ± 3°F during testing; and
 - c) The dishwasher must operate at or above 180°F rinse temperature.

Sanitation Methods

- E. Hot Water Sanitizing (High Temp) Machine: A machine that applies hot water to the surfaces of dishes to achieve sanitization.
- F. Chemical Sanitizing (Low Temp) Machine: A machine that applies a chemical sanitizing solution to the surfaces of dishes to achieve sanitization.
- G. Chemical Dump and Fill Type Machine: A low temp, stationary rack machine with a pumped recirculated sanitizing rinse and with or without a dedicated tank heater.¹⁰
- H. Dual Sanitizing Machine: A machine designed to operate as either a high temp or low temp machine.

⁶ ASTM F1920-20 3.1.35

⁷ ASTM F1920-20 3.1.23

⁸ ASTM F1920-20 3.1.16

⁹ NSF 170-2019. Section 3.103 heat recovery equipment; and, Section 3.1.44 in ASTM F1696-20 and F1920-20.

¹⁰ Some dump and fill models may be equipped with a sustainer heater that re-heats stored water if operating interval is too long between cycles.

Heaters

- I. Circulating Water Heater: A water heater that is used with an external storage tank and is thermostatically controlled to circulate water through the external storage tank and back to the heater to be reheated.
- J. Instantaneous Water Heater:
 - a) Tank Type Instantaneous Water Heater: An automatic, thermostatically controlled water heater that has an input rating of at least 4,000 Btu/hr per gal of stored water.
 - b) Watertube Type Instantaneous Water Heater: An automatic, self-contained water heater that requires water flow to activate the heat source and does not utilize a separate hot water storage tank.
- K. Storage Water Heater: A water heater that heats and stores water within the appliance at a thermostatically controlled temperature for delivery on demand, and that has an input rating of less than 4,000 Btu/hr per gal of stored water.
- L. Booster Heater: A water heater that raises the temperature of preheated water 40 to 80°F. The preheated water is supplied to the unit [booster heater] at temperatures that are typically between 100 and 140°F.¹¹ This booster heater can be either integral to the dishwasher, or externally connected.¹²

Modes and Metrics

- M. Wash Mode: For stationary rack machines, the dishwasher is in wash mode when it is actively running a cycle and is spraying wash water (i.e., water that is neither part of the sanitizing rinse, post sanitizing rinse, nor the prewashing unit).¹³
- N. Rinse Mode: For stationary rack machines, the dishwasher is in rinse mode when it is at the end of the actively running cycle and is spraying hot water or chemical sanitizing rinse water or a post-sanitizing rinse. If there is a post-sanitizing rinse, it shall be included in rinse mode.¹⁴
 - a) Pumped Rinse: Recirculated water that is pumped from a tank and sprayed onto dishes after washing and before the final sanitizing rinse is applied.
 - b) Auxiliary Rinse: Recirculated water pumped from a tank or sump and sprayed onto dishes after the wash or pumped rinse cycle and before the sanitizing rinse is applied.
 - c) Nonrecirculating Pumped Final Sanitizing Rinse: A freshwater rinse that is pumped once over wares and achieves sanitization using either chemical sanitizers or high temperature.
 - d) Recirculating Final Sanitizing Rinse: Fresh water that is pumped repeatedly over wares and achieves sanitization using either chemical sanitizers or high temperature.
 - e) Post Sanitizing Rinse: Using sprays of fresh, potable water applied after the sanitizing step.

¹¹ NSF/ANSI 170-2019.3.237.1. Note that in warewashing, final rinse for high temp machines is 180-195 °F.

¹² ASTM F1696-20, 10.7.6.3. If possible, sub-monitor the energy of the booster heater during the washing energy performance test.

¹³ ASTM F1696-20 3.1.42

¹⁴ ASTM F1696-20 3.1.31

- O. Dwell Mode: For stationary rack machines, the dishwasher is in dwell mode when it is actively running a cycle but is not in wash or rinse modes¹⁵ (e.g., the period of time between the wash mode and the rinse mode).
- P. Idle Mode: For all dishwasher types, the dishwasher is in idle mode when it is not actively running but is still powered on and ready to wash dishes at the required temperature.¹⁶
- Q. Energy Saver Mode: An operational setting that is designed to reduce energy during idle mode through temporary shut-down of certain machine components (pumps or belt motors) or reduction of certain temperature set points.¹⁷
- R. Idle Energy Rate: The rate of energy consumed by the dishwasher while “holding” or maintaining wash tank water at the thermostat(s) set point during the time period specified¹⁸ and outside of an active cycle.
- S. Washing Energy: The rate of energy consumed by the dishwasher while “washing” or “sanitizing” dish loads, as expressed in kWh/rack.¹⁹ **Note:** Rinse modes detailed in *Section 1 N. Rinse Mode* are included in washing energy calculations.
- T. Water Consumption:²⁰ Gallons per rack, per square foot, or per hour depending on the machine type monitored during testing to determine the rate of water usage. Note: measurement begins after dishwasher is stabilized, therefore excludes water for filling or replenishing tanks.²¹

Certification Terms

- U. Product Family: Variations within a product line must be limited to: finish/color; length of pre-wash section, voltage, and orientation (e.g. corner, straight through models). The test model shall be configured such that it reflects worst-case energy performance for the product line. Sanitizing and post sanitizing rinse water consumption, idle energy rate, and washing energy shall be the same across the product family.

2) Scope:

- A. Included Products: Products that meet the definition of a commercial dishwasher as specified herein are eligible for ENERGY STAR certification, with the exception of products listed in Section 2.B. The following product types are eligible: under counter; single tank, door type; single tank conveyor; multiple tank conveyor and high temp flight type conveyor machines. Glasswashing machines; high temp PPU machines; non-PPU, dual sanitizing; and heat recovery machines are also eligible. Only those under counter machines designed for wash cycles of 10 minutes or less are eligible for ENERGY STAR. This Version 3.0 specification only covers electric models.
- B. Excluded Products: Dishwashers intended for use in residential or laboratory applications are not eligible for ENERGY STAR under this product specification. PPU and Flight Type products which are only rated for low temp operation; steam, gas, and other non-electric models are not eligible for ENERGY STAR certification under this Version 3.0.

¹⁵ ASTM F1696-20 3.1.11

¹⁶ ASTM F1696-20 3.1.19

¹⁷ ASTM F1696-20 3.1.12

¹⁸ ASTM F1696-20 3.1.36

¹⁹ ASTM F1920-20. 10.8.2.2 For flight type machines, kWh is measured over 5 batches of 10 dish loads, with the first (6th batch) ignored for stabilization.

²⁰ NSF/ANSI 3 rating and ENERGY STAR certification water consumption measures may vary slightly due to subtle differences in testing.

²¹ ASTM F1696-20: 10.7.6.1 To begin stabilizing the dishwasher, load the dishwasher with an empty rack and initiate 5 consecutive wash cycles...engage the next wash cycle for a total of 10 racks...record total water consumption.

3) Certification Criteria:

A. Energy and Water Efficiency Requirements:

Table 1: ENERGY STAR Requirements for Commercial Dishwashers			
Machine Type	Low Temperature Efficiency Requirements		
	Idle Energy Rate*	Washing Energy	Water Consumption**
Under Counter	≤ 0.25 kW	≤ 0.15 kWh/rack	≤ 1.19 GPR
Stationary Single Tank Door	≤ 0.30 kW	≤ 0.15 kWh/rack	≤ 1.18 GPR
Single Tank Conveyor	≤ 0.85 kW	≤ 0.16 kWh/rack	≤ 0.79 GPR
Multiple Tank Conveyor	≤ 1.00 kW	≤ 0.22 kWh/rack	≤ 0.54 GPR

Table 2: ENERGY STAR Requirements for Commercial Dishwashers			
Machine Type	High Temperature Efficiency Requirements		
	Idle Energy Rate*	Washing Energy	Water Consumption**
Under Counter	≤ 0.30 kW	≤ 0.35 kWh/rack	≤ 0.86 GPR
Stationary Single Tank Door	≤ 0.55 kW	≤ 0.35 kWh/rack	≤ 0.89 GPR
Pot, Pan, and Utensil (PPU)	≤ 0.90 kW	≤ 0.55 + 0.05 x SF _{rack} †	≤ 0.58 GPSF
Single Tank Conveyor	≤ 1.20 kW	≤ 0.36 kWh/rack	≤ 0.70 GPR
Multiple Tank Conveyor	≤ 1.85 kW	≤ 0.36 kWh/rack	≤ 0.54 GPR
Single Tank Flight Type	Reported	Reported	GPH ≤ 2.975x + 55.00
Multiple Tank Flight Type	Reported	Reported	GPH ≤ 4.96x + 17.00

* Idle results should be measured with the **door closed** and represent the total idle energy consumed by the machine including all tank heater(s) and controls. The most energy consumptive configuration in the product family shall be selected to test the idle energy rate. Booster heater (internal or external) energy consumption shall be measured and reported separately, if possible, per ASTM F1696-20 and ASTM F1920-20 Sections 10.8 and 10.9, respectively.

However, if booster energy cannot be measured separately it will be included in the idle energy rate measurements. ** GPR = gallons per rack; GPSF = gallons per square foot of rack; GPH = gallons per hour; x = maximum conveyor speed (feet/min as verified through NSF 3 certification) x conveyor belt width (feet).

† PPU Washing Energy is still in format kWh/rack when evaluated; SF_{rack} is Square Feet of rack area, same as in PPU water consumption metric.

B. Washing Energy: The total washing energy shall include internal or external booster heater energy in addition to the tank, heat, motor, control, and any additional auxiliary energy, expressed in kWh/rack. If a high-temperature dishwasher contains an applicable heat recovery feature, the hot water offset value calculated in Equation 1, below, shall be subtracted from the ASTM measured washing energy value to obtain an adjusted value which shall be used to meet the washing energy requirements in Tables 1 and 2, above.

a. Hot Water Energy Offset: Calculate and report the primary hot water energy offset by the high-temperature heat recovery dishwasher fed by the cold-water inlet²² during the washing energy rate based on Equation 1:

²² ASTM F1696-20 11.8.5 and ASTM F1920-20 11.9.5

Equation 1: Hot Water Energy Offset

$$E_{\text{primaryoffset}} = \left(\frac{(V_{\text{water}} \times 583.1)}{0.77} \right) \times 0.000293$$

Where:

- $E_{\text{primaryoffset}}$ = Calculated primary hot water energy offset in kWh/rack
 - V_{water} = measured water volume consumed by dishwasher (gallons/rack)
- B. User-Adjustable Conveyor Machines: Conveyor machines that offer multiple speeds adjustable by the end user must meet the ENERGY STAR requirements using the maximum conveyor speed setting tested to and certified to NSF/ANSI Standard 3. Water consumption values using the maximum conveyor speed setting shall be used for certification purposes. Water consumption using the slowest conveyor speed shall also be reported to EPA.
- C. Dual-Sanitizing Machines: As defined in Section 1, these machines shall meet both the high temp and low temp requirements presented in Tables 1 and 2, above, to earn ENERGY STAR certification.
- D. Dual-Purpose Door Type Machines: Machines designed to be used either as a standard door type machine or a PPU machine shall meet the performance requirements for both of those subcategories. Testing of these machines shall be performed in all conditions that qualifies the machine for the applicable subcategory.
- E. Post Sanitizing Machines: Machines offering a post sanitizing rinse will be evaluated for ENERGY STAR certification with the post sanitizing rinse turned on during testing. The final rinse water consumption will include both sanitizing and post sanitizing rinses.
- F. Industry Standard Certifications: All machines shall be certified to the NSF/ANSI 3-2019 Standard, *Commercial Warewashing Equipment*, OR a more recent NSF/ANSI 3 published standard.

4) Test Requirements:

- A. Representative Models: shall be selected for testing per the following requirements:
- a. For certification of an individual product model, the representative model shall be equivalent to that which is intended to be marketed and labeled as ENERGY STAR.
 - b. For certification of a product family, any model within that product family can be tested and serve as the representative model.
- B. Test Methods: When testing commercial dishwashers, the following test methods shall be used to determine ENERGY STAR certification:

Table 3: Test Methods for ENERGY STAR Certification	
Dishwasher Category	Test Method Reference
Under-counter; stationary single tank door; pot-pan-utensil	ASTM F1696-20, <i>Standard Test Method for Energy Performance of Stationary-Rack, Door-Type Commercial Dishwashing Machines</i>
Single tank conveyor; multiple tank conveyor; single tank flight; multiple tank flight	ASTM F1920-20, <i>Standard Test Method for Energy Performance of Rack Conveyor Commercial Dishwashing Machines</i>

C. Multiple Voltages: For dishwashers with multiple voltage-versatility and those that are available in different voltage configurations, the representative model shall be tested at the most energy consumptive (worst case scenario) rating, according to the manufacturer.

D. Significant Digits and Rounding:

- a. All calculations shall be carried out with directly measured (unrounded) values.
- b. Unless otherwise specified, compliance with specification limits shall be evaluated using directly measured or calculated values without any benefit from rounding.
- c. Directly measured or calculated values that are submitted for reporting on the ENERGY STAR website shall be rounded to the second decimal place.

E. Additional Reporting Requirement:

- a. For dish machines with heat recovery systems applying the energy offset, report the percentage of hot water supply (maximum of 5%) per section 1.D.a., above.

5) **Effective Date**: The ENERGY STAR Commercial Dishwasher Specification shall take effect on **July 27, 2021**. To certify for ENERGY STAR, a product model shall meet the ENERGY STAR specification in effect on the model's date of manufacture. The date of manufacture is specific to each unit and is the date on which a unit is considered to be completely assembled.

6) **Future Specification Revisions**: EPA reserves the right to change the specification should technological and/or market changes affect its usefulness to consumers, industry, or the environment. In keeping with current policy, revisions to the specification are arrived at through industry discussions. In the event of a specification revision, please note that the ENERGY STAR certification is not automatically granted for the life of a product model.

A. Considerations for Future Revisions: EPA is committed to continuing to develop performance requirements for commercial dishwashers that more accurately reflect in-the-field performance and new technology that provides energy and water benefits to consumers.

a. New Performance Data Collected

- i. Booster heater idle energy
- ii. Primary hot water energy use
- iii. Hot water energy offset
- iv. Flight type washing energy

b. New Categorization Data Collected

- i. Dump and fill
- ii. Energy recovery
- iii. Flight type, single vs. dual-sanitizing
- iv. PPU, Low-temp and dual-sanitizing

c. Industry Test Procedures

- i. NSF 3 – Rinseability metric

d. Other Considerations

- i. Applications of the hot water energy offset
- ii. Heat recovery re-definition
- iii. Drainwater tempering savings
- iv. Cycles between recirculating tank flush (adaptive solids removal)
- v. Heat pump applications
- vi. Ventilation reduction