

[Note: New definitions to add]

TEMPERATURE MAINTENANCE: The system used to maintain the temperature of the building service hot water delivery system, typically by circulation and reheating or by a heat trace system.

[Note: Strike all of Section C404.2.1 and C404.2.2 and replace with the new language below.]

C404.2.1 Service water heating system type. Service hot water shall be provided by an ~~electric~~ air-source heat pump water heating (HPWH) system meeting the requirements of the current version of the Northwest Energy Efficiency Alliance (NEEA) Electric Advanced Water Heating Specification ~~or Gas-Fueled Advanced Water Heating Specification~~. (<https://neea.org/our-work/advanced-water-heating-specification>) and this section.

Exceptions:

1. Solar thermal, wastewater heat recovery, other *approved* waste heat recovery, ground source heat pump, water-source heat pump system utilizing waste heat, and combinations thereof, are permitted to offset all or any portion of the required ~~electric air-source~~ HPWH system capacity where such systems comply with this code and the WA State Plumbing Code.
2. 24 kW plus 0.1 W/SF of building area of stand-alone electric resistance or 82 MBH plus 0.34 Btu/h-SF gas water heating capacity is allowed per building.
3. Commercial dishwashers, commercial food service equipment, laboratory equipment, hospital service water heating and other domestic or commercial *approved* process equipment may utilize internal electric electrical resistance or gas water heaters for service hot water supply water temperatures 140°F or higher.
4. Specific conditions. Portions of buildings that cannot use ~~air-source~~ HPWH are permitted to use electric resistance or gas water heating for specific conditions *approved* by the *code official* for research, health care, process, or other specific needs that cannot practicably be served by heat pump ~~or other~~ water heating systems. This does not constitute a blanket exception for any occupancy type.

5. High input-rated service water heating systems. In new buildings where the combined input rating of the water-heating equipment installed in a building is equal to or greater than 1,000,000 Btu/h (293 kW), the combined input-capacity-weighted-average efficiency of gas water-heating equipment shall have a rated Et of not less than 92 percent as determined by the applicable test procedures in Table C404.2.

C404.2.2 Supplemental water heaters. Supplemental electric resistance or gas water heating is permitted for the following uses:

1. Temperature maintenance of heated-water distribution systems, physically separate from the ~~electric~~ air-source heat pump service water heating system (including circulation systems and heat tracing for temperature maintenance) ~~may utilize electric resistance heat~~. Temperature

maintenance heating capacity shall be no greater than the ~~electric~~ air-source heat pump water heating capacity at entering source dry bulb (or wet bulb if rated for wet bulb temperatures) air temperature of 40°F.

2. Defrost of compressor coils ~~may utilize electric resistance heaters~~.

3. Heat tracing of piping for freeze protection.

4. Emergency or supplemental ~~electric resistance~~ backup for the ~~electric~~ air-source heat pump water heating plant sized no greater than the ~~electrical~~ air-source heat pump service water heating output capacity at entering source dry bulb (or wet bulb if rated for wet bulb temperature) air temperature of 40°F.

Table C406.1

EFFICIENCY PACKAGE CREDITS

Code Section	Commercial Building Occupancy					
	Group R-1	Group R-2	Group B ^a	Group E	Group M	All Other
	Additional Efficiency Credits					
8. High efficiency service water heating in accordance with Sections C406.8.1 and C406.8.2	4 <u>3</u>	5 <u>3</u>	NA	NA	NA	8 <u>3</u>
9. High efficiency service water heating in multifamily buildings systems in accordance with Section C406.9	7 <u>3</u>	8 <u>3</u>	NA	NA	NA	NA <u>3</u>

^a In Group B occupancies, the high-performance service water heating credit applies only to research and production laboratory spaces, and adjacent circulation serving those laboratory spaces, but not to associated office or other space uses.

C406.8.2 Load fraction. Not less than 60 percent of the annual service hot water heating energy use, or not less than 100 percent of the annual service hot water heating energy use in buildings with water-cooled systems subject to the requirements of Section C403.9.5 or qualifying for one of its exceptions, shall be provided by one or more of the following:

1. ~~Service hot water system delivering heating requirements using heat pump technology with a minimum COP of 3.0. For air source equipment, the COP rating will be reported at the design leaving heat pump water temperature with an entering air temperature of 60°F (15.6°C) or lower. For water source equipment, the COP rating will be reported at the design leaving load water temperature with~~

~~an entering water temperature of 74°F (23.3°C) or~~ A heat pump water heating system(s) meeting the requirements of Tier 2 or higher of the Northwest Energy Efficiency Alliance [\(NEEA\) Electric Advanced Water Heating Specification](#), [or Tier 1.0 of the NEEA Gas-Fueled Advanced Water Heating Specification](#).

2. Waste heat recovery from service hot water, heat recovery chillers, building equipment, process equipment, or other *approved* system. Qualifying heat recovery must be above and beyond heat recovery required by other sections of this code.
3. On site renewable energy water-heating systems.

C406.9 High performance service water heating ~~in multifamily buildings~~. For a whole building, building addition, or tenant space with not less than 90 percent of the conditioned floor area being Group [R-1](#), [R-2](#), [A-2](#), [A-3](#), [I-2](#), or [F](#) occupancy, not less than 90 percent of the annual building service hot water energy use shall be provided by a heat pump water heating system(s) meeting the requirements of Tier 3 or higher of the Northwest Energy Efficiency Alliance [\(NEEA\) Electric Advanced Water Heating Specification](#) [or Tier 2.0 of the NEEA Gas-Fueled Advanced Water Heating Specification](#). ~~with a minimum COP of 3.0.~~ This efficiency package is allowed to be taken in addition to Section C406.8-2.