

Date: 09/26/2011

Amendment #2011-03

Title: Adjustment of Instantaneous Water Heater Efficiency

Proponent: DHW Subcommittee Signature: _____

Organization: RESNET Technical Subcommittee

Mailing Address: _____

City: _____ State: ____ Phone _____

Proposed Revision:

Modify Appendix B Glossary of Terms as follows:

Instantaneous Water Heater - A water heater that initiates heating based on sensing water flow and has a manufacturer's specified storage capacity of less than 2 gallons.

Modify footnote (m) of Table 303.4.1(1) as follows:

(m) For a Rated Home with ~~a non-storage type water heater~~ an Instantaneous Water Heater, a 40-gallon storage-type water heater with the prevailing federal minimum efficiency and with the same fuel as the proposed water heater shall be assumed for the HERS Reference Home. The Energy Factor of the Instantaneous Water Heater in the Rated Home shall be reduced automatically by the Rating Software to 92% of the value recorded by the Rater (from manufacturer's documentation or AHRI Directory of Certified Product Performance). For a Rated Home without a proposed water heater, a 40-gallon storage-type water heater with the prevailing federal minimum efficiency with the same fuel as the predominant heating fuel type shall be assumed for both the Rated and HERS Reference Homes.

Effective Date: This amendment shall become effective 90 days following final approval by the RESNET Board of Directors.

Justification:

There is empirical evidence that instantaneous water heaters do not perform at their rated efficiency when subjected to realistic hot water draw profiles. The DOE procedure for establishing the Energy Factor prescribes six equal, hourly draws totaling 64.3 gallons during the first 5 hours of a 24-hour testing period. Occupants more commonly make dozens of smaller draws throughout a day. Instantaneous water heaters are subject to significant thermal loss directly following a draw. The DOE procedure does not adequately capture the totality of thermal losses stemming from typical residential use. Based on results of lab and field testing conducted by Davis Energy Group, the California Energy Commission adopted into California's Building Energy Efficiency Standards the requirement that code-compliance software apply an

adjustment factor of 0.92 to the Energy Factor for gas, oil and electric instantaneous water heaters.

References

California Energy Commission (2008). 2008 Building Energy Efficiency Standards: Residential Alternative Calculation Method (ACM) Approval Manual.

David Energy Group, Inc. (2006). Field and Laboratory Testing of Tankless Gas Water Heater Performance.

Burch, J.; Hoeschele, M.; Springer, D.; Rudd, A. (2008). [Preliminary Modeling, Testing, and Analysis of a Gas Tankless Water Heater: Preprint](#). 11 pp.; NREL Report No. CP-550-42917.

Maguire, J.; Earle, L.; Booten, C.; Hancock, C. E. [Condensing Hybrid Water Heater Monitoring Field Evaluation](#). ; NREL Report No. TP-5500-52234.