

ENERGY STAR Compliance-Electric Tankless Water Heater Category
Submitted by Eemax Inc., May 29,2007

ENERGY STAR Objectives

- Electric tankless water heater technology can meet the ENERGY STAR Objectives. The ENERGY STAR label is granted to a technology category based on qualifications for criteria specifically designed for that category. The qualifications should put primary influence on “**energy efficiency**” alone.
 - For example, air conditioning with 16 SEER, 12.5 EER receives the energy star label + a \$600 rebate without consideration for the cost of the system nor the amount of BTU’s required.

ENERGY STAR Criteria

- Each technology category has its own specific set of criteria established to meet the ENERGY STAR Objectives. Currently, the ‘Draft Criteria’ were written specifically for gas tankless technology by the gas tankless manufacturers. It was not designed to apply to electric tankless heaters nor any other technology category except gas tankless.
- For example, the flow rate criteria for the gas tankless heaters is 3.5 gpm minimum; however, the solar category has provision for flow rate at 55 gph maximum on delivery.
 - Electric tankless heaters can provide 3.5 gpm without energy limitation just like the gas tankless. A lower flow rate can be selected to limit kw demand if desired.
 - Using a lower flow rate (conserving water and energy) shower of 2 gpm, with 57 deg f inlet yielding 108 deg f outlet, requires 14.9 kW.
- **Therefore, the electric tankless water heater category needs its own defined criteria.** The minimum criteria for electric tankless category should be:
 - Minimum energy factor of 0.98
 - Minimum flow of 2.0 GPM at 51 °F rise
 - Minimum 10 year warranty

Performance of Electric Tankless Water Heaters

- Electric tankless water heaters should be included in the Energy Star branding program based on the following:
 - Gas tankless is included in the program with a power factor of 0.80 or higher, with no energy input limitations.
 - However, electric tankless is excluded, with the highest rating of 0.99, the most efficient of any gas or electric water heater.
 - Energy input is not limited to 12kW=(40,968 BTU/hr)
 - Gas tankless typical input is 199,000-235,000 BTU/hr. This requires a dedicated 1” line feed for lengths of 21-80 feet from main gas line, not always available on existing installations.
- Standby loss, which currently is not considered in the energy savings calculations, must be included in the calculations as it is a real factor in the normal, every day use of hot water in the home. It represents a major factor of cost savings to the consumer and cannot be ignored. Several independent studies have corroborated the important cost savings of electric tankless technology. For example, when comparing conventional electric tank performance to electric tankless performance, the studies show the following cost savings:
 - **DOE report** updated 8/11/2003 has estimated **10-20% kWh savings** for standby loss. Ref:www.eren.doe.gov/consumerinfo/refbriefs/bc1.html.
 - **Hope Park Cabin** study results (intermittent usage) determined **40% kWh savings** by independent testing of the park staff.
 - Independent testing by a local **northeast power company** did a recent House study that showed daily usage cost savings of **14% kWh**.

Conclusion

ENERGY STAR should propose criteria for the electric tankless category based on the following:

- Extremely high efficient rating of 0.99, greatly surpassing that of conventional gas and electric tank heaters and gas tankless technology.
- Documented annual cost saving of between 14% and 40% compared to conventional electric tank heaters.

- New installations can start saving energy immediately, with the cost of tank vs. instantaneous is comparable. New installations can provide the necessary electrical service at inception and rap substantial cost savings and short payback periods.
- Existing installations can run 14.9 kW on 100-amp service. If the consumer desires additional capacity, electrical service can be upgraded and consumer will still achieve substantial cost savings and have payback periods commensurate with other ENERGY STAR technologies.