

## Summary and Response to Stakeholder Comments

### ENERGY STAR Program Test Method for Determining Pool Pump Energy Use Version 1.0 Final Draft

Issue No.	Document Section	Topic	Subtopic	Comment	Response
1	4.1	Test Setup	Input Voltage Requirements	Stakeholders recommended updating the voltage input requirements to allow testing units at 230 Volts (V)/60 hertz (Hz), as that is the voltage/frequency combination used in the U.S for residential Pool Pumps.	DOE received this comment on ENERGY STAR Version 1.0 Pool Pumps Draft 2 Test Method (Draft 2 Test Method) and after the Final Draft Test Method was published. DOE updated the table to include 230 V/60 Hz instead of 230 V/50 Hz in the ENERGY STAR Version 1.0 Pool Pumps Final Draft Test Method (Final Draft Test Method). Voltage input requirements remain at 230 V/60 Hz in the ENERGY STAR Version 1.0 Pool Pumps Final Test Method (Final Test Method).nse to the comment to this box
2	4.2	Test Setup	Measurement Equipment Accuracy	Stakeholders requested that measurement equipment accuracy be specified instead of measurement uncertainty, as accuracy is the only value reported by manufacturers for this type of equipment.	DOE agrees that accuracy is a better method of specifying requirements for measurement equipment and has updated the Final Test Method to specify an accuracy of $\pm 1.5\%$ for both power and flow rate meters. This change aligns with ANSI/HI 1.6-2000: <i>"Centrifugal Pumps,"</i> which is referenced by both ANSI/APSP/ICC-15-2011, <i>"American National Standard for Residential Swimming Pool and Spa Energy Efficiency"</i> and the California Energy Commission's (CEC) Title 20.
3	5.1	Test Conduct	Test Speeds	Stakeholders requested that a definition be included for "most efficient speed."	DOE and EPA received this comment on the Draft 2 Test Method and after the Final Draft Test Method was published. EPA included a definition for Most Efficient Speed in the ENERGY STAR Version 1.0 Pool Pumps Draft 2 Specification. The definition for Most Efficient Speed in the Final Draft Specification is the same as that proposed in the Draft 2 Specification..

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4	5.2	Test Requirements	Reporting Requirements	Stakeholders expressed confusion regarding whether to take measurements at all three Pool Curves or just Pool Curve A.	While only the measurements at Curve A are used for ENERGY STAR qualification, EPA and DOE have required reporting at the other curves to collect data on pump operation and any other capabilities that may influence future ENERGY STAR Pool Pumps program versions. The requirement to report at all curves also aligns with ANSI/APSP/ICC-15 2011 and CEC Title 20. DOE has maintained the reporting requirements in the Final Test Method.
5	6.1	Unit Initialization	Pump System Setup	A stakeholder commented that the reference to ANSI/HI 1.6-2000 should be updated to reference ANSI/HI 14.6-2011 “Rotodynamic Pumps for Hydraulic Performance Acceptance Tests,” as it supercedes ANSI/HI 1.6-2000.	DOE recognizes that ANSI/HI 14.6-2011 supercedes ANSI/HI 1.6. However, both ANSI/APSP/ICC-15-2011 and CEC Title 20 reference ANSI/HI 1.6. Furthermore, DOE has validated the referenced section of ANSI/HI 1.6, Section 1.6.5.5 Performance test setup, and believes the language is sufficient for Pool Pump testing. To ensure rapid publication of a Pool Pumps specific ation, DOE has maintained the reference to ANSI/HI 1.6 in the Final Test Method. DOE will consider ANSI/HI 14.6 – 2011 for Version 2.0.

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6	6.1	Unit Initialization	Stabilization	Stakeholders requested that DOE remove the proposed 30 minute stabilization period between speed changes during testing.	<p>DOE performed additional analysis on data obtained during validation testing. DOE concluded that the additional 30 minute stabilization is necessary for some pumps and not others. DOE considered including conditional stabilization requirements that would allow the 30 minute period to be reduced for pumps that reach stabilization earlier. However, DOE decided not to propose new stabilization requirements since this is a Final Test Method and stakeholders would not have a chance to provide feedback.</p> <p>DOE believes the current stabilization requirements will ensure that all test results are repeatable and representative of normal operation. As such, stabilization requirements in the Final Test Method remain unchanged from the Final Draft Test Method. Stakeholders are encouraged to provide data on pump stabilization to help DOE reevaluate the stabilization requirements during the next revision to the Test Method.</p>

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7	6.2	Pump Flow Testing	Flow Rates for Measurement	Stakeholders recommended including tolerances for the proposed flow rates for testing to reduce burden.	DOE agrees that a flow rate tolerance should be included to reduce test burden. DOE performed additional analysis on validation testing data to determine a tolerance that would provide repeatable results and minimize variation in the final reported power consumption, while reducing additional test burden, and would also help to. In DOE's analysis, the final reported power value varied by less than 3% for all pumps tested with a flow rate tolerance of $\pm 2.5\%$ , regardless of the speed tested. In addition, DOE found that, after stabilization, all pumps tested were capable of operating within that tolerance. DOE has therefore included a flow rate tolerance of $\pm 2.5\%$ in the Final Test Method.