



ENERGY STAR® Program Requirements Product Specification for Automatic Commercial Ice Makers

Draft Test Method Rev. Jan-2012

1 OVERVIEW

The following test method shall be used for determining product compliance with requirements in the ENERGY STAR Eligibility Criteria for Automatic Commercial Ice Makers (ACIM).

2 APPLICABILITY

ENERGY STAR test requirements are dependent upon the feature set of the product under evaluation. The following guidelines shall be used to determine the applicability of each section of this document:

- All sections of this test method apply to all products covered in the scope defined in ENERGY STAR Eligibility Criteria for Commercial Ice Makers:
 - Air-cooled batch and continuous type, Ice Making Head (IMH), Remote Condensing Units (RCU) with dedicated condensing units, and Self-contained Units (SCU).
 - Air-cooled RCU units designed for connection to remote rack compressors.

3 DEFINITIONS

Unless otherwise specified, all terms used in this document are consistent with the definitions in the ENERGY STAR Eligibility Criteria for Automatic Commercial Ice Makers.

- Variable Purge Setting: A setting that allows for the increase or decrease of purge water used during ice making to accommodate for different water hardness levels.

Note: DOE has included test requirements for ACIMs with variable purge settings and has drafted the above definition. DOE is interested in stakeholder feedback on the proposed definition.

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4 TEST CONDUCT

4.1 ENERGY STAR Guidance for Implementation of 10 Code of Federal Regulations (CFR) Part 431, Subpart H

Note: DOE published a test procedure final rule for ACIM on January 11, 2012 (77 Federal Register (FR) 1591), with an effective date of February 10, 2012. DOE has updated the reference to 10 CFR 431 Subpart H to refer to the newly published final rule.

- A) Testing of RCUs designed for connection to remote rack compressors:
- 1) Manufacturers shall provide an appropriately sized remote condenser unit for all remote rack connected ice machines. The unit provided shall be the least efficient model available.

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- 26 2) Units shall be tested according to 10 CFR Part 431 Subpart H for units with a dedicated remote
27 condenser.
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29 3) The energy use of the ice making mechanism, the compressor, and the condenser shall be
30 reported as part of the energy consumption rate.
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Note: DOE understands that RCUs designed for connection to remote rack compressors are not sold or used with appropriately-sized, least-efficient condenser units; however, DOE believes this is a straightforward and consistent approach to testing all RCU units. DOE is interested in stakeholder feedback on the following:

- 1) How would an oversized or undersized remote condensing unit impact the performance and energy consumption of the unit?
- 2) What requirements, if any, would ensure that the provided remote condenser is appropriately sized without impacting the performance?
- 3) Are all remote rack connected units continuous type ice machines?
- 4) Are these types of units normally operated using an evaporator pressure regulator when connected to a remote rack compressor?

DOE has proposed that the remote condensing unit provided be the least efficient model available to align with other ENERGY STAR programs that test the most energy consumptive configuration. DOE is interested in feedback regarding the "least efficient" requirement, as well as any other possible requirements, to ensure the most energy consumptive configuration.

DOE is considering a second option for testing remote rack compressor connected units similar to that used for commercial refrigeration equipment (CRE) designed for connection to a remote rack compressor. CRE units are tested using a remote rack compressor similar to that used for normal operation; however, the energy consumption of the rack is not measured. This method measures the refrigerant flow to and from the ice making mechanism to determine the cooling delivered. A default factor would then be applied to the ice making mechanism to determine the energy consumption of the remote compressor rack. This approach is expected to be more representative of how units are sold and operated. It would also allow labs to use one remote rack compressor for all units tested. However, DOE believes this approach may create additional burden since the measurements required for this method are not currently captured in 10 CFR Part 431 Subpart H. Furthermore, additional research is required to determine the default factors that would be used for ACIMs.

DOE welcomes stakeholder feedback regarding the proposed methods for testing remote rack connected units.

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33 B) Purge Setting:

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35 All variable purge settings shall be set in accordance with AHRI Standard 810-2007, *Performance Rating*
36 *of Automatic Commercial Ice-Makers*.

37 5 TEST CONDITIONS

38 Unless otherwise specified within this Test Method, the test conditions for all portions of this method shall
39 be in accordance with 10 CFR Part 431 Subpart H.

40 **6 UNIT UNDER TEST (UUT) SETUP AND INITIALIZATION**

41 **6.1 Test Setup and Instrumentation**

42 A) Unless otherwise specified within this Test Method, the test setup and instrumentation for all portions
43 of this method shall be in accordance with the following:

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45 1) 10 CFR Part 431 Subpart H.

46 **7 TEST METHOD**

47 When testing Automatic Commercial Ice Makers, the following test method(s) shall be used to determine
48 ENERGY STAR qualification:

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Table 1: Test Methods for ENERGY STAR Qualification	
ENERGY STAR Requirement	Test Method Reference
Energy Consumption Rate (kWh/100 lbs ice)	10 CFR Part 431 Subpart H, with the guidance included in Section Error! Reference source not found..
Potable Water Use (gal/100 lbs ice)	AHRI Standard 810-2007, <i>Performance Rating of Automatic Commercial Ice Makers</i> with the guidance included in Section Error! Reference source not found.

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51 **8 REFERENCES**

- 52 A) AHRI 810-2007 with Addendum 1. Performance Rating of Automatic Commercial Ice-Makers. March
53 2011.
54 B) 10 CFR Part 431 Subpart H, Automatic Commercial Ice Makers. 77 FR 1591. January 11, 2012.