

High Efficiency Specifications for Commercial Ice Makers

Effective Date 07/01/2011

Efficiency Requirements for Qualifying Products

Air Cooled Machines

Level	Corresponding Base Specification	Equipment Type	Ice Harvest Rate (H) (lbs of ice/day)	Energy Use Limit (kWh/100lbs of ice)	Potable Water Use Limit (gal/100lbs of ice)
Tier 1	Former Version 1 ENERGY STAR (pre-2/2013) / Former CEE Tier 2 (pre-7/2011)	Cube Type Machines Only: Ice-Making Head	<450	9.23 - 0.0077H	≤25
			≥450	6.20 - 0.0010H	≤25
		Cube Type Machines Only: Remote-Condensing without remote compressor	<1000	8.05 - 0.0035H	≤25
			≥1000	4.64	≤25
		Cube Type Machines Only: Remote-Condensing with remote compressor	<934	8.05 - 0.0035H	≤25
			≥934	4.82	≤25
		Cube Type Machines Only: Self-Contained	<175	16.7 - 0.0436H	≤35
			≥175	9.11	≤35
Tier 2	Approximately 10% More Efficient than Average Performance	Cube and Nugget Type Ice Machines	<175	14 - 0.0347H	≤30
			≥175 and <450	9.6 - 0.0098H	≤20
			≥450 and <1000	5.9 - 0.0016H	≤20
			≥1000	4.5 - 0.0002H	≤20
		Flake Type Ice Machines	<1000	6.5 - 0.0033H	≤20
			≥1000	3.2	≤20

Water Cooled Machines

Level	Corresponding Base Specification	Equipment Type	Ice Harvest Rate (H) (lbs of ice/day)	Energy Use Limit (kWh/100lbs ice)	Potable Water Use Limit (gal/100lbs of ice)
Tier 1	Former CEE Tier 2 (pre-7/2011)	Cube Type Machines Only: Ice-Making Head	<500	7.02 - 0.0049H	≤25
			≥500 and <1436	5.13 - 0.0010H	≤25
			≥1436	3.68	≤25
		Cube Type Machines Only: Self-Contained	<200	10.6 - 0.0177H	≤35
			≥200	7.07	≤35
Tier 2	Approximately 10% More Efficient than Average Performance	Cube and Nugget Type Ice Machines	<175	10.6 - 0.0241H	≤30
			≥175 and <450	7.1 - 0.0062H	≤20
			≥450 and <1000	4.7 - 0.0011H	≤20
			≥1000	3.7 - 0.0002H	≤20
		Flake Type Ice Machines	<1000	4.8 - 0.0017H	≤20
			≥1000	3.1	≤20

* H = Ice harvest rate (lbs of ice/day) at the following test conditions: Ambient temperature 90°F; water inlet temperature 70°F; water inlet pressure .30 ± 3 psig. .

Note: Water-cooled ice machines must be installed using a closed loop system or a system with a remote evaporative condenser, i.e. cooling tower, to meet CEE qualifications. Units installed on once-through or pass through cooling systems do not meet the requirements of this specification.

Definitions

A. Ice Machine: A factory-made assembly (not necessarily shipped in one package) including a condensing unit and ice-making section operating as an integrated unit, with means for making and harvesting ice. It is an assembly that makes no less than 50.0 lbs [22.7 kg.] of ice per day and up to 4,000.0 lbs [1814.4 kg.] of ice per day at Standard Ratings Conditions, as defined in Section 5.2.1 of AHRI Standard 810-2007, and may also include means for storing or dispensing ice, or both.

B. Ice Making Head (IMH): A model with the ice-making mechanism and the condensing unit in a single package, but with a separate ice storage bin.

- C. Remote Condensing Unit (RCU) or Split System Unit: A model in which the ice-making mechanism and condenser or condensing unit are in separate sections.
- D. Self-Contained (SCU): A model in which the ice-making mechanism and storage compartment are in an integral cabinet.
- E. Air-Cooled: An ice machine wherein motor driven fans or centrifugal blowers move air through the condenser to remove heat from the refrigerant.
- F. Water-Cooled: An ice machine wherein water is used to remove heat from the refrigerant.
- G. Cube Type Ice Machine: An ice machine that has alternate freezing and harvesting periods. The word “cube” is not a reference to a specific shape or size.
- H. Continuous Type Ice Machine: An ice machine that continually freezes and harvests ice at the same time.
- I. Flake Type Ice Machine: A type of continuous ice machine. Flake ice machines produce ice continuously, usually in a barrel-shaped evaporator. An auger inside the evaporator scrapes ice off the sides into a storage bin.
- J. Nugget Type Ice Machine: A type of continuous ice machine. Nugget ice machines use the same process as flake machines to make ice but compress the ice flakes into nuggets.
- K. Ice Harvest Rate: The gross weight of ice harvested, stated in multiples of 1, as calculated using AHRI Test Method 810-2007 at the following test conditions: Ambient temperature 90°F; water inlet temperature 70°F; water inlet pressure $.30 \pm 3$ psig.
- L. Energy Consumption Rate: Total energy input rate, stated in kWh/100 lb [kWh/45.0 kg] of ice as determined in AHRI 810-2007 5.2.2.1, stated in multiples of 0.1. For Split System Ice-Makers, total power input shall include condenser fan power.
- M. Potable Water Consumption Rate: The amount of potable water used in making ice, including Dump Water, stated in gal/100 lb of ice, as determined in AHRI 810-2007 5.2.2.1, stated in multiples of 0.1.

Referenced Standards Organizations

- N. AHRI: Air-Conditioning, Heating and Refrigeration Institute

Product Eligibility

O. Included Products: All cube and continuous type ice machines meeting the definition of an Ice Machine as specified herein are eligible for qualification, with the exception of products listed in Section P below.

P. Excluded Products: Ice machines that also dispense chilled water are not eligible for qualification. Water-cooled ice machines installed on once-through or pass-through cooling systems are not eligible for qualification.

Test Methods and Reporting

In measuring energy and water consumption, the following test standard must be used:

- Air-Conditioning, Heating and Refrigeration Institute (AHRI) Standard 810-2007, *Performance Rating of Automatic Commercial Ice-Makers*.

Product Qualification

CEE will develop a qualifying products list by collecting third-party certified or verified performance data from other organizations rather than requiring manufacturers to submit performance data directly to CEE. All third-party certified or verified data sources will be cited on each qualifying products list published quarterly, including organization name and date. Manufacturers not participating in any third-party programs, such as ENERGY STAR® or similar programs are strongly encouraged to do so. If this is not an option, please contact CEE.

Future Specification Revisions

CEE reserves the right to revise this specification as appropriate.