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Product: Central Air Conditioners and Heat Pumps

Sub-Product: Split and package systems

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The following is a draft U.S. Department of Energy (DOE or the Department) guidance document regarding the test procedure for central air conditioners. This draft guidance document represents the Department's interpretation of its existing regulations and is exempt from the notice and comment requirements of the Administrative Procedure Act. See 5 U.S.C. § 553(b)(A). Nonetheless, the Department is accepting comments and suggestions from the public until **September 20, 2014**. Comments and suggestions should be provided in WordPerfect, Microsoft Word, PDF, or text file format by sending an email to CACHeatPumpGuidance2014GUID0032@ee.doe.gov. Please also include the docket number EERE-2014-BT-GUID-0032. Submitted comments are public and may be reviewed at [Docket EERE-2014-BT-GUID-0032](http://www.regulations.gov) on regulations.gov; if you wish to submit confidential business information as part of your comment, please contact DOE at the above email address. At the end of the comment period, this draft guidance document may be adopted, revised, or withdrawn.

Q: How do I select units for testing, rating, and certifying a split-system central air conditioner or heat pump combination? Is each basic model of split-system central air conditioner and heat pump required to meet the applicable standard? Are condensing units and evaporator coils sold separately for replacement installation subject to standards?

A: Unit selection

Certified ratings for split-system central air conditioners and heat pumps are determined pursuant to the provisions of 10 C.F.R. § 429.16. Pursuant to that regulation, for each basic model of split-system central air conditioner and heat pump that is selected for testing (rather than rated with an alternative rating method or "ARM"), a sample of sufficient size, but not less than two units, must be tested to demonstrate compliance with the applicable standard for certification purposes, in accordance with the sampling provisions set forth in 10 C.F.R. §§ 429.11 and 429.16(a). When selecting which units to test, a unit of each outdoor model must be paired with a unit of one selected indoor model and tested to the DOE test procedure. 10 C.F.R. § 429.16(a)(2)(i). The manufacturer *must* test the condenser-evaporator coil combination that includes the model of evaporator coil that is likely to have the largest volume of retail sales with the particular model of condensing unit. 10 C.F.R. § 429.16(a)(2)(ii). (This combination is

also known as the highest sales volume combination or HSVC.) That is, the HSVC for each condensing unit may not be rated using an ARM.

For any other split-system combination that includes the same outdoor unit model but a different indoor unit model than the HSVC, manufacturers may determine represented values of energy efficiency (including values represented in certifications to DOE) of a split-system central air conditioner or heat pump basic model combination either by testing the combination in accordance with the DOE test procedure as set forth in 10 C.F.R. part 430, subpart B, appendix M, or by applying an ARM that has been approved by DOE in accordance with the provisions of § 429.70(e)(1) and (2). 10 C.F.R. § 429.16(a)(ii)(A) and (B)(1). If a manufacturer does not have a DOE-approved ARM, the second option is not applicable and the manufacturer must certify each basic model based on the results of testing in accordance with the DOE test procedure and sampling plan. In any event, every split-system central air conditioner and heat pump basic model (not just the HSVC) must be subjected either to testing to the DOE test procedure and sampling plan or application of a DOE-approved ARM, and must be certified as compliant with the applicable DOE standard based on the results of testing of the combination or ARM application to the combination, prior distribution in commerce.

By way of example, a manufacturer has a DOE-approved ARM and manufactures only two models of outdoor units, models A and B. Each of models A and B can be paired with any of the three models of indoor unit the company manufactures – models 1, 2, and 3. The company must certify each basic model as compliant with applicable DOE energy conservation standards prior to distributing the combination in commerce. In this case, since the company intends to claim the ratings for each combination and distribute all possible model combinations as separate basic models, it must certify compliance with the standards for combinations A-1, A-2, A-3, B-1, B-2, and B-3 prior to distribution. For both models A and B, the company has determined that the indoor unit that is likely to have the largest volume of retail sales with the model of outdoor unit is model 1. (In other words, basic model combinations A-1 and B-1 are both HSVCs.) Since combinations A-1 and B-1 are HSVCs, those combinations must be certified based on test results obtained by testing in accordance with the DOE test procedure and sampling plan. For model combinations A-2, A-3, B-2, and B-3, the company has the option of certifying these combinations based on test results obtained by testing in accordance with the DOE test procedure or by the results obtained through application of the company's DOE-approved ARM.

In the above example, if the manufacturer did not have a DOE-approved ARM, the manufacturer would be required to base its certifications for all six basic model combinations (A-1, A-2, A-3, B-1, B-2 and B-3) on the results of testing a sample of sufficient size of each of the six combinations in accordance with the DOE test procedure.

Alternatively, as described in the next section, the company could have elected to make combinations A-2 and A-3 part of basic model A-1 and combinations B-2 and B-3 part of basic model B-1, thereby alleviating the need for additional testing or rating using an ARM for those individual combinations. In doing so, the manufacturer would represent the efficiency of A-1, A-2, and A-3 with the same certified ratings, rated at the least efficient combination in the basic model and B-1, B-2, and B-3 with the same

certified ratings, rated at the least efficient combination in the basic model. The manufacturer would claim this association on its certification report.

Basic model and certification

Under current DOE regulations, manufacturers of split-system central air conditioners and heat pumps must certify each basic model as compliant with the applicable energy conservation standard(s) prior to distributing the basic model in commerce. 10 C.F.R. § 429.12(a). With respect to central air conditioners and heat pumps, basic model means all units of a given type (or class thereof) having the same primary energy source, and which have essentially identical electrical, physical, and functional characteristics that affect energy efficiency. 10 C.F.R. § 430.2. For a split-system central air conditioner or heat pump, this includes a combination of a condensing unit (outdoor unit) and a coil-only or blower-coil (indoor unit). (See also [draft guidance related to testing of blower-coils](#).) This means that different combinations of components of similar design may be included within the same basic model, provided the different component combinations, when considered together, meet the definition of a basic model. All combinations (*i.e.*, individual models) within a basic model must share the same certified rating and that rating must be representative of the least-efficient combination in the basic model. 76 FR 12422, 12429 (Mar. 7, 2011). While manufacturers are given leeway in determining how to group their individual combinations into basic models as long as the basic model definition is satisfied, manufacturers must declare this association on their certification report.

Compliance

Currently, central air conditioners and heat pumps shall have a seasonal energy efficiency ratio (SEER) and a heating seasonal performance factor (HSPF) of no less than 13 and 7.7, respectively. For units of split-system central air conditioning heat pumps manufactured on or after January 1, 2015, these standards raise to 14 and 8.2, respectively, and to 14 SEER for split-system air conditioners installed in certain parts of the U.S. See 10 C.F.R. § 430.32(c). Compliance with standards is based on the statistical concept that an entire population of units (where “unit” refers to a complete system) of a basic model must meet the standard, recognizing that some individual units may perform slightly better or worse than the design due to manufacturing or testing variation. Manufacturers apply the statistical formula in 10 C.F.R. § 429.16 to demonstrate compliance, and DOE applies the statistical formula in 10 C.F.R., Subpart C, Appendix A to determine compliance.

Individual Coils or Condensing Units Sold as Replacements

An individual condensing unit or coil must meet the current Federal standard (National or regional) when paired with the appropriate other new part to make a system when tested in accordance with the DOE test procedure and sampling plan. DOE understands that an individual condensing unit/coil may not meet the current Federal standard when installed as a replacement in the field. However, a new condensing unit or coil must have the capability of meeting the current standard when tested and rated as a new system, regardless of whether it is ultimately installed as part of a new system or as a replacement in an existing system. Further, the only condensing units and coils that may be installed in

the region are those that can meet the regional standard when tested and rated as a new system in accordance with the test procedure and sampling plan as described above.