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Q: When do the DOE principles of interpretation located at 10 CFR 430.23(a)(10) and 10 CFR 430.23(b)(7) (the "anti-circumvention" provisions) require a manufacturer to apply for a test procedure waiver?

A: Whether a manufacturer must apply for a test procedure waiver depends on a number of factors. This answer (1) provides relevant background information related to this issue and (2) explains the process for determining whether the provisions found at 10 CFR 430.23(a)(10) or 10 CFR 430.23(b)(7) require a waiver for a specific component or feature. (The term "component" refers, throughout this guidance document, to both components and features.)

1. Background on DOE's "Anti-Circumvention" Provisions

This question refers to the principles of interpretation of the DOE test procedure for assessing the energy consumption of residential refrigerators and refrigerator freezers found in 10 CFR 430.23(a)(10) and the same provisions for residential freezers in 10 CFR 430.23(b)(7). The provisions in 10 CFR 430.23(a)(10) and 10 CFR 430.23(b)(7), which DOE has previously referred to generally as the "anti-circumvention" provisions, were adopted in a final rule published on December 16, 2010. *See* 77 FR 3559, 3568. References in this guidance document to the anti-circumvention language refer to 10 CFR 430.23(a)(10) and the provisions in 10 CFR 431.23(b)(7), since the provisions in these two sections are identical. In addition, unless otherwise specified, references in this document to the DOE test procedures for these products are to the test procedures in 10 CFR part 430, subpart B, appendix A1 for residential refrigerators and refrigerator-freezers and in appendix B1 for freezers. The interpretations in this document also apply to the amended versions of these procedures, found in appendix A and appendix B of subpart B to part 430.

As explained in the December 16, 2010 final rule, DOE adopted the anti-circumvention provisions to reflect DOE's view of the objective of the test procedure, which is to measure the product's energy consumption during a representative average use cycle or period of use. DOE's test procedures are carefully designed and circumscribed to attain an overall calculated measurement of average energy consumption during representative use, though certain conditions may not individually appear to be representative of the average use cycle. DOE has held the consistent view that products should not be designed in a way that would cause energy consumption to drop during testing as a result of these

apparently unrepresentative conditions. Doing so would result in a biased measurement that would be unrepresentative of average consumer use and would circumvent the total test procedure.

With respect to the representativeness of the test procedure for residential refrigerators, refrigerator-freezers, and freezers, DOE specified certain conditions that are deemed to be typical conditions of consumer use, among them being the ambient temperature at which the product is expected to be used by the consumer. As explained in the introductory text of the anti-circumvention provisions, the test is designed to simulate typical room conditions of approximately 70 ˚F (21 ˚C) with door openings by testing at an ambient temperature of 90 ˚F (32.2 ˚C) without door openings. Except for operating characteristics that are affected by ambient temperature, such as compressor percent run time, the unit, when tested under the DOE test procedure, shall operate in a manner equivalent to the unit in typical room conditions. Energy consuming components that operate in typical room conditions, including as a result of door openings or as a function of humidity, and that are not exempted by the DOE test procedure, shall operate in an equivalent manner during energy testing under the DOE test procedure, or be accounted for by all calculations as provided for in the DOE test procedure.

The language that follows this introductory text identifies operating characteristics for components that would violate these underlying principles and that would prevent the test from providing a representative value of expected energy consumption under conditions of typical consumer use. Essentially, if a basic model contains energy consuming components that operate differently during the prescribed testing than they would during representative average consumer use, and applying the prescribed test to that basic model would evaluate it in a manner that is unrepresentative of its true energy consumption (thereby providing materially inaccurate comparative data), a manufacturer must obtain a waiver in accordance with the relevant provisions of 10 CFR part 430 (found in section 430.27). The purpose of a waiver would be to provide a means for testing the basic model. Those means could involve disabling the component during testing or accounting for the difference in energy use through calculations.

2. Process to Determine Whether the Anti-Circumvention Provisions Require a Waiver

Step 1:

Q: Does the relevant component in fact operate differently during the prescribed testing than it would during representative average consumer use?

(If the answer is "no," the anti-circumvention provisions do not require a waiver. If the answer is "yes," move on to "Step 2.")

A: To determine whether the anti-circumvention provisions apply to the operation of a particular component, DOE first considers whether the component operates differently during the prescribed testing than it would during representative average consumer use. In some cases, this can be determined based solely on whether its operating state changes based upon ambient temperature, since this is the principal difference between the test conditions and expected conditions of consumer use other than the absence of door openings, which is specifically addressed by the anti-circumvention language. If the component would operate in the same manner during either the test or during consumer use, it is unaffected by these provisions.

Note that, in general, evaluating potential circumvention associated with ambient temperature involves consideration only of operating characteristics in typical room ambient temperature expected for consumer use and in the ambient temperature of the test. That is, if differences in component operation occur only at ambient temperatures that are either significantly colder than the typical room ambient of 70 °F specified in the anti-circumvention language or significantly higher than the 90 °F ambient temperature at which the basic model is tested, DOE will, in most cases, consider the modified operation to be exempt from the anti-circumvention provisions. DOE may, in certain cases, apply the anti-circumvention provisions to components that function outside this range if it appears likely that the component will function during a significant portion of consumer use, or at temperatures very close to 70 °F or 90 °F, to ensure that the test provides a representative value of energy use.

Step 2:

Q: Is the component covered by the exemption for "operating characteristics that are affected by ambient temperature"?

(If the answer is "yes," the anti-circumvention provisions do not require a waiver. If the answer is "no," move on to Step 3.)

If a component would operate differently during the test than during conditions of expected consumer use, DOE then considers whether it falls within the exemption for operating characteristics that are affected by ambient temperature. As noted in the introductory text of the anti-circumvention provisions, this exemption applies to aspects of operation such as compressor run-time, which is affected directly by ambient temperature but in a necessary and predictable manner. DOE considers this to be a "passive" change in operating characteristics, in that it is not "actively" implemented by the control system—rather, it is the response of the thermostat to the more rapid warm-up of the cabinet interior due to the increased thermal load associated with the 90° F ambient temperature. The thermostat responds no differently to this increase in cabinet temperature than it would in a 70° F ambient temperature—it just starts the compressor sooner because of the warmer ambient temperature. Examples of other functions that DOE would consider to be passive changes include the frequency of defrost cycles in basic models with timer-based defrost systems and changes in the thermal resistance of the basic model's insulation.

Conversely, a change in a basic model's operating state initiated automatically by its control system in response to a change in ambient temperature is considered an "active" change. DOE considers this type of change in operating characteristics to be covered by the anti-circumvention provisions. The intent, as expressed in the anti-circumvention provisions, is to reduce the probability that manufacturers could design a basic model that is able to sense test conditions and change its operating state to obtain a more favorable test result or for any other reason that may result in a value of tested energy use that is not representative of the conditions of consumer use that the test was designed to simulate. In such cases, DOE would require the manufacturer to obtain a waiver to test and rate the basic model properly.

Step 3:

Q: Would testing the basic model using the prescribed test procedure yield results that are unrepresentative of the basic model's true energy consumption (thus providing materially inaccurate comparative data)?

(If the answer is "yes," the anti-circumvention provisions require a waiver. If the answer is "no," the anti-circumvention provisions do not require a waiver.)

A: DOE emphasizes that the anti-circumvention provisions do not automatically and uniformly require a waiver for any component that could be viewed as actively changing a basic model's operating state. Specifically, the provisions apply only if the control action would make the prescribed test unrepresentative of the basic model's true energy consumption, as described in 10 CFR 430.23(a)(10)(ii). In evaluating such components, DOE will consider the magnitude of the change in expected product performance resulting from use of the component in question to determine whether its impact justifies the need for a waiver.

DOE recognizes that certain features and control schemes that involve an active change in operating state are designed for a legitimate purpose unrelated to circumventing the test procedure. DOE emphasizes that the anti-circumvention provisions are in no way intended to limit innovations that may yield legitimate improvements in product performance or utility to consumers.

Finally, in any case in which a manufacturer suspects that a feature or operational characteristic of a new basic model may require a waiver, DOE recommends that the manufacturer consult with DOE prior to testing and rating the basic model to ensure that it is fully in compliance with DOE regulations prior to its introduction into commerce. To make its determination, DOE may request additional technical details about the basic model's design and operating characteristics so that any decision will be based upon full and fair evaluation.

Example:

A basic model of refrigerator-freezer has a feature that automatically increases the condenser fan speed when the ambient temperature exceeds a threshold temperature that is between 70 ˚F and 90 ˚F. The purpose of such a feature is to improve the efficiency of heat rejection from the condenser, which improves the efficiency of the refrigeration system by reducing the frequency and length of compressor cycles and thus reduces the energy consumption that would otherwise have occurred without the change in fan speed. Since the resulting reduction in energy use of the refrigeration system's compressor is likely to be greater in magnitude than the additional energy use of the fan, the overall operating efficiency of the basic model is effectively improved at 90 ˚F compared with operation under the same conditions without it. If evaluating this feature using the process described in this guidance, the basic model would satisfy the requirements for step 1 and not be exempted in step 2, leading to evaluation under step 3.

Because this feature represents an active change in operating state that is likely to result in operational performance at test conditions that is unrepresentative of consumer use, it satisfies the requirement for step 3 of the process, meaning that DOE would consider a feature like this to be subject to the anti-circumvention provisions. More specifically, the value of energy consumption resulting from the test would be unrepresentative of consumer use because the tested energy use of a basic model with this feature is likely to be different than that of an identical basic model without this feature, and this feature does not operate at conditions of expected consumer use. Therefore, DOE's view is that the test procedure does not account for the effects of this type of feature and would generally require a basic model with a feature like this to be tested using a waiver that in some way accounts for this difference in operational performance.