

December 18, 2015

Melissa Fiffer  
Environmental Protection Agency  
1200 Pennsylvania Ave, N.W.  
Washington, DC, 20460

**Re: EPA Energy Star Product Specification for Laboratory Grade Refrigerators and Freezers, Draft 2 Version 1.0.**

Dear Madam,

This document summarizes the comments from Thermo Fisher Scientific, regarding the call for comments due December 18<sup>th</sup>, 2015 regarding the proposed EPA Energy Star Product Specification for Laboratory Grade Refrigerators and Freezers, Eligibility Criteria, Draft 2 Version 1.0.

Thermo Fisher Scientific is the world leader in serving science, with revenues of \$17 billion and 50,000 employees in 50 countries. Our mission is to enable our customers to make the world healthier, cleaner and safer. We help our customers accelerate life sciences research, solve complex analytical challenges, improve patient diagnostics and increase laboratory productivity.

The EPA is endeavoring to establish Energy Star eligibility criteria on the most complex refrigerator / freezer market to date and Thermo Fisher Scientific is committed to helping the EPA develop accurate Energy Star eligibility criteria that takes into consideration all of the critical parameters that are required by the customers served by laboratory grade refrigerators and freezers.

Thermo Fisher Scientific supports the goals of this EPA proposal and is working to significantly reduce the energy consumption of its entire portfolio of laboratory cold storage equipment by 2020. On October 15th, 2015 Thermo Fisher Scientific executives attended a White House meeting with Energy Secretary Ernest Moniz and EPA Administrator Gina McCarthy where Thermo Fisher Scientific announced that it will transition its entire platform to hydrocarbons by 2020. In particular, 20 percent of its entire medical and laboratory cold storage portfolio will be HFC-free by the end of 2016, 65 percent of its refrigeration systems will be HFC-free by the end of 2017, and it will be 80 percent HFC-free on blowing agents by the end of 2017. ***At the same time, it will reduce the energy consumption of its entire cold storage portfolio by more than 50 percent by 2020.***

As a manufacturer of laboratory equipment that supports the clinical, medical, pharmaceutical and scientific research industries, we believe that the current proposal could have a detrimental impact to our customers based on their critical applications and performance requirements. It is our opinion that the current proposal is based on an insufficient data set to accurately represent the global laboratory refrigerator and freezer market resulting in Energy Star eligibility criteria which does not represent real differentiation in energy consumption for this class of products.

**Thermo Fisher Scientific would like to highlight specific areas of concern with the proposed product specification.**

- There are specific customer applications (vaccine storage and pharmaceutical biological storage) of laboratory grade refrigerators which could be negatively affected by the proposal. For example the CDC recommends a maximum cabinet temperature uniformity range of +2°C to +8°C. Therefore the temperature of every location inside the cabinet must stay within the range of +2°C to +8°C. Pharmaceutical customers have very strict IQ/OQ/PQ validation protocols that define specific temperature performance characteristics that are in most cases tighter than the CDC recommendations for vaccine storage above. The EPA Energy Star proposal does not take into consideration the unique uniformity requirements for critical customer applications.
- Thermo Fisher Scientific questions the overall accuracy of the proposed Maximum Daily Energy Consumption (MDEC) for laboratory grade freezers based on some of the conclusions mentioned in the proposal and the equations used to calculate MDEC. It is our experience that there are four significant contributors to energy consumption for a laboratory grade refrigerator or freezer: cabinet internal volume, cabinet internal temperature, defrost method and door type.
  - The proposed MDEC for laboratory grade freezers is established without the recognition of energy consumption as a function of internal cabinet temperature. The temperature set point of a freezer directly impacts the energy consumption of the product. The current proposal only uses the product's AHAM volume to calculate the MDEC for laboratory grade freezers. Laboratory grade freezers, as defined in the EPA Energy Star proposal span a very wide temperature range from 0°C to -40°C. Using one MDEC equation to establish the Energy Star eligibility criteria for the entire 0°C to -40°C laboratory grade freezer market is analogous to using one Energy Star eligibility criteria to cover all laboratory refrigerators, freezers and ultra-low temperature -80°C freezers. Customers of lab grade freezers purchase products to operate at very specific temperature set points. The most common product types purchased are -20°C, -30C, and -40°C freezers. These products are designed and optimized to operate at one of these specific temperature set points ensuring that the products meet the uniformity performance required by our customers. In other words, the products used to serve a customer's -20°C application are significantly different from a product used to serve a customer's -40°C application. **We feel that there should be unique Energy Star MDEC equations for each laboratory grade freezer market segment as defined by the cabinet internal temperature. The Energy Star MDEC equations should be aligned with product temperature set points defined in Table 1 of Section 6.1.B of the EPA Energy Star test method for laboratory grade refrigerators and freezers.**
  - Lines 112-114 of the proposal state that "For refrigerators, products with transparent doors showed better energy performance than those with solid doors. Therefore, EPA is not proposing less rigorous levels for transparent door products." In recent testing at Thermo

Fisher Scientific, we found that changing from a transparent door to a solid door without moving the unit or changing any other variables reduced the energy consumption by 16%.

- Lines 115-117 of the proposal state that “The data showed that there was a significant separation of freezer products based on whether they use manual or automatic defrost, which is reflected in the proposed MDEC requirements below.” Our internal test data does not support the 300% difference in energy consumption between automatic defrost and manual defrost freezers observed by the EPA. Our test results of a 23 cubic foot manual defrost freezer only show a 30% reduction in energy when compared to a 23 cubic foot automatic defrost freezer.
- The dataset used to establish the Energy Star eligibility criteria is not large enough or broad enough to accurately determine the appropriate Energy Star eligibility criteria for the global laboratory grade refrigerator and freezer market.
  - 14 refrigerator test points were used to establish the Energy Star eligibility criteria for product sizes ranging from roughly 1 cubic foot to 50+ cubic feet for global customers.
  - 12 freezer test points were used to establish the Energy Star eligibility criteria for product sizes ranging from roughly 1 cubic foot to 75 cubic feet for global customers.
  - It is unclear how many different manufacturers’ products were used to develop the test set but we think it is important to ensure we have a large enough cross section of the market.
- The coverage of the proposed Energy Star eligibility criteria includes not only the United States but extends into international markets. However, the submitted data set did not include any products designed for international 50Hz markets.

Thermo Fisher Scientific extends an invitation to members of the EPA Energy Star Administration to visit our laboratory refrigerator and freezer manufacturing plant and R&D Center of Excellence in Asheville, North Carolina. The goal of the visit would be to provide details regarding laboratory refrigerator and freezer customer applications along with a review of the technical challenges our R&D team is working through to achieve our sustainability commitments to our customers and the EPA.

Sincerely,



Chris Champlin  
Vice President / General Manager, Controlled Temperature Technologies  
Thermo Fisher Scientific  
Phone: 828-365-1203  
Email: [chris.champlin@thermofisher.com](mailto:chris.champlin@thermofisher.com)