Thermo Fisher Scientific
Controlled Temperature Technologies
275 Aiken Road
Asheville, NC 28804

www.thermofisher.com

November 23, 2016

Melissa Fiffer
Environmental Protection Agency
1200 Pennsylvania Ave, N.W.
Washington, DC, 20460
Submitted via: labgraderefrigeration@energystar.gov

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

To whom it may concern,

This document summarizes the comments from Thermo Fisher Scientific, regarding the call for comments due November 23rd, 2016 regarding the proposed Final EPA Energy Star Product Specification for Laboratory Grade Refrigerators and Freezers, Eligibility Criteria, Final Draft 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. ***At the same time, it will reduce the energy consumption of its entire cold storage portfolio by more than 50 percent by 2020.***

ThermoFisher SCIENTIFIC

As a manufacturer of laboratory equipment that supports the clinical, medical, pharmaceutical and scientific research industries, we agree with the EPA's proposal in the final draft to use 6°C maximum peak temperature variation as the differentiator between high performance and general purpose refrigerators. However we still have the same concerns from our comments to draft 2.0 version 1 of the proposed standard. The final draft does not recognize the significant difference in energy consumption between a solid door and glass door laboratory refrigerator which we have measured to be at least 16%. Additionally, it is still our conclusion that the final draft proposal as written can have a detrimental impact to our customers based on their critical applications and performance requirements which are listed below. 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. It is our opinion that the Energy Star brand is globally recognized as the tool customers can use to compare the energy performance of similar products. The proposed final draft specification does not capture the unique temperature driven product segments and performance attributes that are critical purchasing factors used by our customers. Lastly we are concerned about the practical customer communication and education required to explain the differences between a high performance energy star rated product and a general purpose energy star rated product. For example, will a high performance energy star refrigerator have a different energy star label than a general purpose energy star refrigerator? We request that this topic be addressed and agreed by stakeholders before releasing an energy star standard for laboratory refrigerators in order that we avoid creating confusion with customers.

Thermo Fisher Scientific would like to highlight the specific areas of concern with the final draft of the proposed laboratory refrigerator and freezer specification.

- The proposed final draft energy star laboratory freezer specification uses 10°C peak temperature variation as the differentiator between a high performance freezer and a general purpose freezer. We would like to understand the rationale used to establish these criteria as it does not accurately reflect the peak variation expectations of all high performance laboratory freezers. Establishing a 10°C peak variation as the differentiator between a high performance freezer and a general purpose freezer will penalize high performance freezer customers that require -30°C average cabinet temperature and the convenience of auto defrost. -30°C Auto Defrost high performance freezers cannot meet the 10°C peak variation energy star requirement due to the temperature peak during defrost. The only products that meet the 10°C peak variation in the high performance laboratory freezer segment are manual defrost freezers. Graphs 1 & 2 in the appendix highlight the peak temperature variation differences between auto-defrost and manual defrost in the -20 / -30 °C high performance freezer segment.

ThermoFisher SCIENTIFIC

- Thermo Fisher Scientific challenges the overall accuracy of the proposed Maximum Daily Energy Consumption (MDEC) for laboratory grade freezers. It is our experience that there are four significant contributors to energy consumption for a laboratory grade refrigerators and freezers: cabinet internal volume, cabinet internal temperature, defrost method and door type.

  - We cannot support the use of one MDEC equation to determine the Energy Star rating of laboratory freezers operating between 0°C and -40°C. Our customers purchase laboratory freezers based on the cabinet temperature their application requires, the most common freezer temperatures specified by our customers are -20°C, -30°C & -40°C. 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. 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 all of the performance requirements by our customers for their specific applications. 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.**

  - The final draft of the proposed laboratory refrigerator specification does not differentiate between the energy performance of a glass door laboratory refrigerator and a solid door laboratory refrigerator. **We have included our comments to draft 2.0 for reference:** *Lines 112-114 of draft 2.0 states 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%.*

  - The final draft of the proposed laboratory freezer standard does not clearly differentiate between high performance and general purpose freezers to enable our customers to compare the energy performance of similar products on the market. In draft 2.0 the proposed differentiator between the application of the 2 freezer MDEC equations was Auto defrost and manual defrost. The final draft now differentiates the application of the 2 freezer MDEC equations between high performance and general purpose laboratory freezer using the proposed 10°C peak variation specification. **We have included our comments to draft 2.0 for reference:** *Lines 115-117 of Draft 2.0 Version1 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.

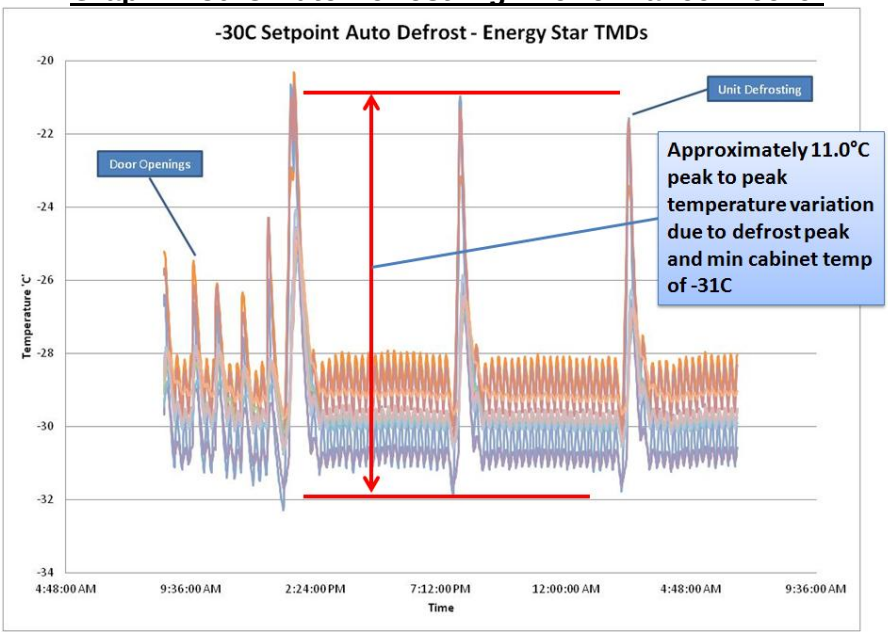
Thermo Fisher Scientific extends an invitation to members of the EPA Energy Star Administration to visit our laboratory refrigerator and freezer manufacturing plant and R&D Center of Excellence in Asheville, North Carolina. The goal of the visit would be to provide details regarding laboratory refrigerator 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

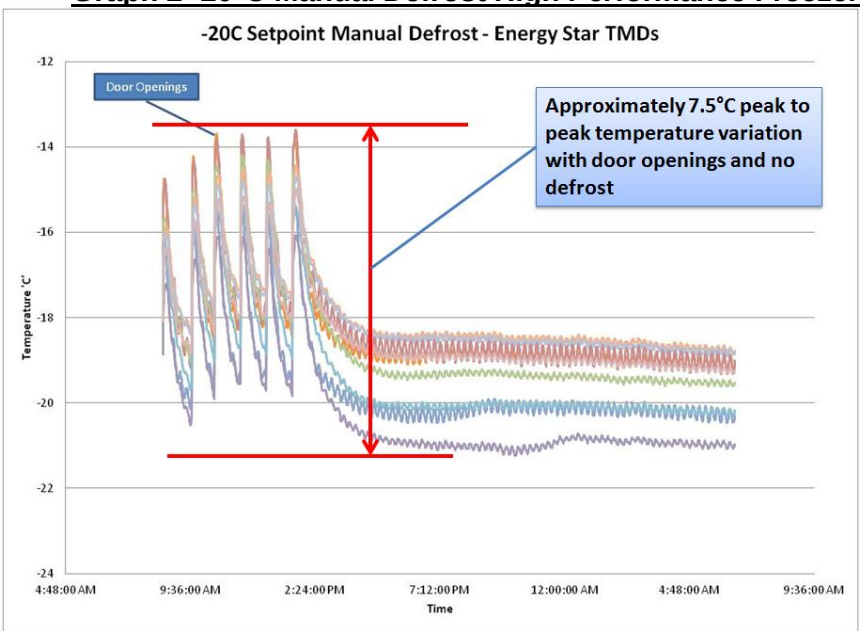
Appendix

Graph 1 -30°C Auto Defrost High Performance Freezer



Graph 1 shows the impact on peak temperature variation caused by the defrost cycle in an automatic defrost high performance freezer.

Graph 2 -20°C Manual Defrost High Performance Freezer



Graph 2 shows the smaller peak temperature variation in a -20C manual defrost freezer even during door openings but primarily due to the lack of a defrost cycle.