

To whom it may concern,

AGA Marvel is a manufacturer of household as well as scientific grade under counter refrigerators, refrigerator - freezers, and freezers. As such we have been doing energy testing on the household side for many years. It is our view point the following should be considered in developing a test method for Lab Grade refrigeration product.

- 1) Since energy testing guidelines have been already developed for household product; using already established test methods would be advantageous for testing Laboratory Grade refrigerators, refrigerator – freezers, and freezers. Our scientific product operates very similar to our household product with exception to tighter control parameters to satisfy our scientific customers.
- 2) From the webinar there appears to be many different types of refrigeration equipment being used for laboratory use. Therefore there may need to be more specific test procedures for different product types. Manual defrost freezers should have a different test procedure than a frost free model. A refrigerator with no freezer might need to be tested different from a refrigerator – freezer. On the household side there are product classes (types) and each are given multipliers for determining the energy usage for each.
- 3) Using bare thermocouples will make it much more difficult to maintain temperatures in the  $\pm 1^{\circ}\text{C}$  range. Thus requiring more energy due to more compressor on time. A 1.125 x 1 inch brass lug is used as a mass to give a more stable temperature in household energy testing. Since we are trying to achieve an energy usage number and not necessarily looking at performance, it is more important to develop a consistent method of testing regardless of the product to be stored.
- 4) Though a 75°F ambient was suggested, a 90°F ambient with an empty cabinet eliminates the need for door openings as it put a high load on the system. The higher ambient compensates for door openings, which may not be consistently done.
- 5) A single temperature energy point is difficult to reproduce and would be very timely to achieve. In household product a temperature of 38°F is used as the “target” temperature, but testing is done at the midpoint setting of the control first. Then depending on whether the average temperature is above or below the “target” temperature you adjust the control to the warmest or coldest set point. Then by using the energy usage of the two points the target energy can be calculated. This makes it much easier to determine the energy of the product.
- 6) Multiple samples should be used to calculate the average energy usage for the product. Typically with household product a minimum sample size of 4 units is required for certification.

Respectfully,

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