

NL comments on the Interim report “Ecodesign & Labelling Review Household Regriferation”

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Introduction

The Netherlands welcome the revision of the energy label and eco-design requirements for household refrigeration appliances.

In our opinion the following points are important for this revision:

- The new IEC test method, including definitions
- A critical review of the (number of) product categories and correction factors
- A critical review of the reference lines (standard annual energy consumption)

In this document we present our first ideas and opinions regarding these topics as presented in the interim report and discussed during the stakeholder meeting on July 1, 2015.

Update of the definitions

We agree with the proposal to use the definitions in the IEC 62552:2015 standard (the new IEC standard). However, to take into account the intention of the current definitions to include cold appliances that from a technical point of view are household appliances but used in a non-household environment, e.g. an office, we suggest to add the words “or similar”. Also we suggest to delete parts of the definition that are not needed for the regulation: “and are of suitable size” and “cooled by natural convection or a forced convection system”. This results in the following compact product definition:

Household refrigerating appliance means an insulated cabinet for household or similar use with one or more compartments that are controlled at specific temperatures, cooled by one or more energy-consuming means.

We agree with the definitions of compartment and sub-compartment as provided in the new IEC standard and the characterization of a (sub-)compartment by design temperature.

Furthermore, we recommend to check whether the product definition is aligned with the definitions of commercial and professional refrigeration appliances to ensure that every refrigeration appliance in the scope of these regulations is unambiguously covered by one (and only one) regulation.

Product categories and correction factors

Product categories should only be used to distinguish between products with clear primary functional differences that are related to technical differences that result in different energy consumption.

This constitutes a three stage filter to decide whether a separate product category is justified:

1. Is there a clear primary functional difference?
2. If yes, is this difference related to one or more technical characteristics?
3. If yes, do these different technical characteristics result in different energy consumptions?

If the answer to any of these questions is no, then a separate category is not justified.

The interim report suggests the following product categories:

- Refrigerator
- Refrigerator-freezer
- Freezer upright
- Freezer chest

Furthermore, the interim report discusses other possible categories, e.g. wine storage and built-in appliances, and the following correction factors (included in the current legislation); frost-free, chill compartment and climate class.

Following the filter of a clear primary functional difference, we suggest to use only three product categories:

- Refrigerator
- Refrigerator-freezer
- Freezer

Further secondary functional differences (that are related to different technical characteristics that result in a different energy consumption) can be dealt with by compensation¹ factors. We suggest to take into account the following secondary functional differences (with the reasons between brackets):

- Wine storage (humidity and vibration requirements)
- Built-in (volume restrictions)
- Frost-free (provides energy savings in practice not captured by the test method)
- More than 2 different, i.e. with a different design temperature, compartments² (offers more flexibility and improves food preservation).

This means that in principle that there is no compensation for differentiation in temperature for (sub)compartments, e.g. a chill compartment, other than the equivalent volume factor.

¹ The word “compensation” suggests that this factor is needed to create a level playing field, i.e. a product with a (secondary) function uses more energy than a product without because of this (secondary) and therefore needs compensation to enable fair comparison.

² By definition the word “compartment” refers to an external door.

Reference lines

In the current reference lines, the standard annual energy consumption increases linear with the equivalent volume of the appliance. Furthermore, the equivalent volume has correction factors for built-in, climate class and frost-free, whereas for a chill compartment larger than 15 liter a fixed correction is applied.

In theory energy consumption is linear with the surface area of the product and therefore non-linear with the volume. However in practice we see for smaller volumes (up to around 400 liter) an almost constant energy consumption, because the higher consumption due to the increasing volume is compensated for by the higher efficiency that can be achieved at increasing volumes (larger surface available for the heat exchanger of the condenser, more efficient compressors, more space available for insulation). Above 400 liter (up to the proposed limit of 1000 liter) the energy consumption is more or less linear with the volume.

This leads to the following preliminary proposal for the reference lines for the product categories suggested in the foregoing section:

	SAE: Standard Annual Energy Consumption [kWh]	
	<i>V_{eq}: 400 l and less</i>	<i>V_{eq}: more than 400 l</i>
Refrigerator	125	$0.10 \cdot V_{eq} + 85$
Refrigerator-freezer	250	$0,50 \cdot V_{eq} + 50$
Freezer	275	$0.55 \cdot V_{eq} + 55$

The compensation factors for the four secondary functional differences as suggested in the foregoing section would then be added to the SAE. All in all this would greatly simplify the current structure, while still providing enough flexibility.

Note that the definition of the reference lines does not preempt the setting of minimum efficiency requirements or energy label class levels.

The new IEC test method

The new IEC test method introduces a modular approach with several tests that can be used world wide to evaluate the energy performance of cold appliances. We agree with the proposal not to use the tests for auxiliary energy and load processing energy. We would be in favor of keeping the tests as simple as possible in order not to increase test costs for manufacturers and market surveillance authorities.

The IEC test method requires testing at two ambient temperatures (16 °C and 32 °C). Regions then can choose a weighting factor F (of f) to combine the two test results into an annual energy consumption: $E_{16} \cdot f \cdot 365 + E_{32} \cdot (1-f) \cdot 365$. We would be in favor of choosing a value f that yields on average the same result as the current test. Therefore, we agree with the conclusion of the analysis in Appendix A of the Regent report³ that f=0.5 is suitable.

³ Janssen, Martien. Impact of the new IEC 62552-1,2,3:2015 global standard to cold appliance energy consumption rating (second study). Helmond, 29 May 2015.

Another issue is the conversion between energy consumption measured according to the current standard and the new IEC standard. We appreciate the work undertaken by CECED to measure 73 products according to the new standard and compare the results with the results according to the current standard. The Regent report⁴ shows that the differences are significant for categories 1-3 (19 % increase) and 7 (7-9 % increase, ignoring products with a single control), and a few percent (increase or decrease) for categories 8 and 9. However, it should be noted that the 73 products tested were not “designed” for the new test method. Furthermore, results for category 7 (fridge-freezers) indicate a large spread in the differences: between -2 % and + 20%⁵. So, in principle products are already on the market that achieve the same results regarding energy consumption with both the current and the new standard.

The preliminary conclusion could be that while for the setting of minimum efficiency standards under eco-design the difference between the current and the new standard should be taken into account, for the setting the energy label classes no such precautions need to be taken.

⁴ Ibid.

⁵ Disregarding “product 8” as outlier.