# Guidelines for Front Runner Public Procurers

# Refrigerators

Yuri Vandresen, June 2021

## Why follow Topten criteria?

- Topten.eco.br (**www.topten.eco.br**) is a Brazilian web portal helping buyers, professionals, public procurers and large buyers to find **the most energy efficient products available in Brazil**. The products are selected and updated continuously, according to their high energy and environmental performances, independently from the manufacturers.
- All refrigerators displayed on **www.topten.eco.br** meet the criteria contained in these guidelines. Procurers can therefore use the website to check the availability and assortment of products currently on the market, which meet the **Topten selection criteria**.

## How much can you save?

Considering refrigerators listed on www.topten.eco.br and the following assumptions, it is possible to achieve the savings indicated in the next table.

Assumptions
- Lifetime expectation: 10 years
- Daily use: Constantly on
- Electricity cost: 0.59 R$/kWh

| | Topten model | Inefficient model |
|---|---|---|
| Refrigerated volume | 262 litres | 260 litres |
| Energy class | A | A |
| **Electricity consumption** | 288 kWh/year | 461 kWh/year |
| **Use cost (electricity in 10 years)** | R$ 1699 | R$ 2720 |
| **Savings in 10 years** | **37,5% energy / unit ⇨ R$ 1021 / unit** | |

As the example shows, total savings can reach a 37,5% reduction, and they should be multiplied by the number of units included in the tender.

It's worth mentioning that refrigerators vary greatly in regards to their refrigeration volumes, freezing capacity and energy consumption. The analysis mentioned above is a comparison between models of high and low efficiency with the volume of the most popular models in Brazil. Refrigerators with higher volumes are likely to consume more energy, thus a similar percent reduction in energy consumption equals a greater absolute cost reduction.

# Procurement criteria

The following criteria can be inserted directly into tendering documents. The Topten selection criteria and the product lists are updated regularly. The newest versions are always available at **www.topten.eco.br**.

**SUBJECT: HIGHLY ENERGY-EFFICIENT REFRIGERATORS**

## TECHNICAL SPECIFICATIONS

### 1. Energy Efficiency Index

According to INMETRO Ordinance nº 20/2006, refrigerator efficiency is calculated via an index called EEI – Energy Efficiency Index. This number reflects the overall electrical energy consumption efficiency, and is calculated through a formula expressing the relation of the declared energy consumption (C) and the standard energy consumption (Cp). The latter takes into account the adjusted volume of the model and the equivalent energy consumption for this volume.

### 2. Refrigerator categories

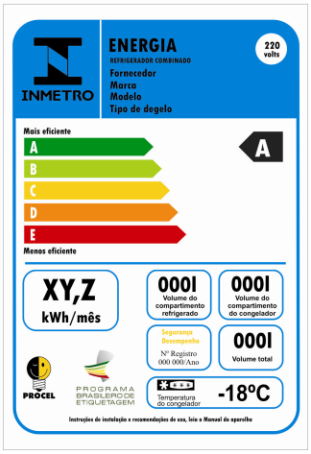
According to the same INMETRO Ordinance, refrigerators are split into 6 different categories, which take into account their refrigerating and freezing characteristics, as well as the presence of a frost-free feature. The categories and their equivalent ISO reference are these:

| Category | Nomenclature | Coverage |
|---|---|---|
| 1 | Refrigerators | All refrigerators of one and two stars (Models covered by ISO 7371) |
| 2 | Combined Refrigerator | Models covered by ISO 8187 |
| 3 | Frost-free Combined Refrigerator | Models covered by ISO 8561 |
| 4 | Vertical Freezer | Models covered by ISO 5155 |
| 5 | Frost-free Vertical Freezer | Models covered by ISO 8561 |
| 6 | Horizontal Freezer | Models covered by ISO 5155 |

### 3. Energy label

Energy labels for refrigerators are also regulated by INMETRO Ordinance nº 20/2006. The regulation defines an energy label scale from A to E, being A the most efficient and E the least efficient category.

Refrigerators are categorised based on their Energy Efficiency Indexes (EEI), according to the table below:




| INMETRO ORDINANCE Nº 20/2006 | |
|---|---|
| **Energy efficiency class** | **Energy efficiency index** |
| A | EEI ≤ 0,820 |
| B | 0.820 ≤ EEI < 0.893 |
| C | 0.893 ≤ EEI < 1.059 |
| D | 0.972 ≤ EEI < 1.059 |
| E | 1.059 ≤ EEI |

**PROCEL Label**

The PROCEL (National Electrical Energy Conservation Program) recognises products that have a higher energy efficiency amongst their competitors. It guarantees lower energy consumption during use and minimum energy efficiency class A.

For a refrigerator model to receive the PROCEL Label, its Energy Efficiency Index must be lower than the defined maximum values, as per the table below:

| **Category** | **Maximum EEI** |
|---|---|
| Vertical or Horizontal Freezer | 0.815 |
| Frost-free Vertical Freezer | 0.812 |
| Minibar or Refrigerator | 0.840 |
| Frost-free Refrigerator | 0.820 |
| Combined Refrigerator | 0.820 |
| Frost-free Combined Refrigerator | 0.800 |

# Advice and support

If you would like further assistance in using the information presented here in your own procurement actions or more information on Topten.eco.br please contact your national Topten team (find the links on Topten.eco.br).

The PROCEL and INMETRO websites also contain valuable legal and practical guidance together with procurement criteria for a range of commonly procured products and services.

The elaboration of these procurement guidelines has been supported by funding from WWF Switzerland. The sole responsibility for the content of the Topten procurement guidelines lies with the authors.

Topten ACT has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement nº649647. The sole responsibility for the content of the Topten Pro procurement guidelines lies with the authors. It does not necessarily reflect the opinion of the European Union. Neither EASME, nor European Commission and project partners are responsible for any use that may be made of the information contained therein.