

Methodology

Topten.eu presents the most energy efficient refrigerated vending machines on the European market. All listed products use natural climate-friendly refrigerants.

Scope

The refrigerated vending machines listed:

- are plug-in cabinets (remote cabinets are not considered)
- are available on the European market

Technical criteria

All models on Topten.eu meet the following criteria:

- Natural refrigerant with global warming potential (GWP) ≤ 3 (e.g. R290/propane, R600a/isobutane, R744/CO₂)
- Maximum draft energy index of 75

Energy consumption

- Measurement according to European standard for beverage coolers (EN 50597:2015) while measured at 25°C, 60% relative humidity (climate class 3)
- in a transitional phase, measurements are also accepted according to standard EVA EMP 3.1a.

Data sources

Data according to the above standards is provided by manufacturers.

Calculation of the draft energy index (EEI)

$$EEI = (AEC/SAEC) * 100 = (TEC * 365 / ((M + N * Y) * 365)) * 100$$

Category	Value for M	Value for N	Value for Y
Refrigerated Vending Machines	4.1	0.004	Vn

TEC = energy consumption over 24h

Vn = net volume in litres

Order of presentation

Products are ranked according to draft energy index. The order of presentation can be changed by clicking on the rows' headings. Compare models by checking them and clicking on compare.

Glossary

Brand, Model, Other models

Brand with link to website. All other models (different sizes etc.) that are named meet the Topten technical criteria as well.

Electricity costs

Costs for electricity during product's life time. Assumptions:

- Typical life time: 8 years
- Annual energy consumption: Value from product list in kWh/year
- Tariff of electricity: 0.2 €/kWh (there however can be large differences depending on country or electrical utility)

Net volume, Gross volume

Net / gross volume in litres.

Storage temperatures

Storage temperature range in °C.

Energy

Annual energy consumption in kWh/year. Accepted measuring protocols see above.

Refrigerant

- R600a (isobutane, climate-friendly refrigerant)
- R290 (propane, climate-friendly refrigerant)
- R744 (CO₂, climate-friendly refrigerant)
- Inefficient models: R134a, R404A or R507 (fluorinated refrigerants with high global warming potential)

Cooling

- Static
- Forced-air

Dimensions

Width x depth x height in cm.

Countries available

This item displays the availability of models in European countries according to producers' information. "EU" means that the model is available in all or most European countries. If the model is available in a number of countries only they are indicated by country codes according to [ISO](#). "On demand" means that producers could not indicate the availability and that consumers have to ask in their countries on their own.

Infoplus

Publications

- Commercial and Professional Refrigeration Products: Promoting Energy Efficiency with Legislation, Empowered Stakeholders and Rebates. Eva Geilinger, Eric Bush. EEDAL 2015, [presentation](#) and [paper](#).
- Best available technology of plug-in refrigerated cabinets, beverage coolers and ice cream freezers and the challenges of measuring and comparing energy efficiency. Eva Geilinger, Martien Janssen, Per Henrik Pedersen, Paul Huggins, Eric Bush. EEDAL 2013, [presentation](#) and [paper](#).

Standards and labels

- EN 50597 Energy consumption of Vending Machines - Classification, requirements and test conditions
- European Committee for Standardization (CEN) and European Committee for Electrotechnical Standardization (CENELEC), [CEN-CENELEC](#)

Energy label and ecodesign requirements:

- European Vending Association (EVA), <http://www.vending-europe.eu> > Standards & Protocols > EVA EMP – Energy Measurement Protocol.
- Ecodesign for Commercial Refrigeration, [Preparatory study update published report](#), August 2014 by the European Commission Joint Research Centre (JRC).
- Project homepage for [EU Ecodesign for commercial refrigeration](#) by Joint Research Centre's Institute for Prospective Technological Studies (JRC-IPTS). Download Final reports of Preparatory study and update.

Links

- [Energy efficiency](#) measures by the European Commission.
- [eceee](#), the european council for an energy efficient economy, provides a status overview on all products in the Ecodesign & Energy Labelling process.
- [Coolproducts](#) informs about the EU ecodesign process. It is a coalition of NGOs' campaign for a stronger, fast Ecodesign Directive to save the climate and money.

Manufacturers and dealers are kindly asked to contact [info\(at\)topten.eu](mailto:info(at)topten.eu) to inform about more products meeting the Topten selection criteria.

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