

Selection Criteria for Beverage Coolers

Methodology

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

Scope

The beverage coolers listed:

- are plug-in cabinets (remote cabinets are not considered)
- have forced-air circulation or are capable of pulling down temperature within 4 hours, respectively
- have doors (because open cabinets cannot meet the efficiency criteria)
- are available on the European market

Technical criteria

All models on Topten.eu meet the following criteria:

- Natural refrigerant with global warming potential (GWP) below 3 (e.g. R290/propane, R600a/isobutane, R744/CO₂)
- Maximum draft energy index of 30
R744 models with a maximum draft energy index of 50

Energy consumption

- Measurement at climate class 3 (25°C, 60% relative humidity)
- Temperature class must be one of the following: M1 or M2 (EN ISO 23953); K1, K2, K3 or K4 (EN 16902)
- Primarily according to the new European standard for beverage coolers (EN 16902)
- In a transitional phase, measurements are also accepted according to:
 - EN ISO 23953-2:2005 /A1:2012
- In a transitional phase, the temperature class requirement does not apply to models submitted before May 2015

Data sources

Data according to the above standards is provided by manufacturers.

Calculation of the draft energy index (EEI)

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

Category	Value for M	Value for N	Value for Y
Beverage coolers	1.0	0.013	V

TEC = energy consumption over 24h

V = 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 liters.

Storage temperatures

Storage temperature range in °C.

Temperature class

Temperatures measured inside the cabinet during the energy consumption test.

According to the prEN 16902 standard for beverage coolers:

K1	0 °C to +7 °C, $\varnothing \leq +3.5$ °C
K2	-1 °C to +6 °C, $\varnothing \leq +2.5$ °C
K3	-3.5 °C to +1 °C, $\varnothing \leq -1$ °C
K4	+1 °C to +9 °C, $\varnothing \leq +5$ °C
S	other

According to EN ISO 23953:

M1	-1 °C to +5 °C
M2	-1 °C to +7 °C

Energy

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

Refrigerant

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

Cooling

- Static
- Forced-air

Ambient temperature

Suitable ambient temperature range in °C as recommended by the manufacturer.

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

- prEN 16902 Commercial beverage coolers - Classification, requirements and test conditions
- European Committee for Standardization (CEN) and European Committee for Electrotechnical Standardization (CENELEC), [CEN-CENELEC](#)

Energy label and ecodesign requirements:

- 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.

Other public product lists with standard data:

- [Enhanced Capital Allowance Scheme](#): Product lists 'Commercial Service Cabinets' and 'Refrigerated Display Cabinets' (Energy Technology List ETL).

- [Energy Rating Australia / New Zealand](#): Product lists 'Commercial Refrigerators'

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@topten.eu) to inform about more products meeting the Topten selection criteria.

01/2016 Geilinger