TOPTEN ACT CRITERIA PAPER

Range Hoods

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Topten ACT aims at transforming the European market of energy-using products towards higher energy efficiency.
Topten ACT identifies the top energy-efficient products in 16 European countries, and makes this information available to consumers and large buyers on tailored national websites. The most energy efficient models in different product categories (such as household appliances, lighting, office equipment, consumer electronics, cars) are presented with comprehensive product information based on official labels and standardized declarations. Topten works with manufacturers and thus increases both market offer and consumer demand of high energy efficiency products. Topten is strictly neutral and independent from manufacturers and retailers, its selection criteria are always published online.
Topten ACT is supported by the European Commission's research and innovation programme Horizon 2020, and many national organisations (energy agencies, environmental and consumer organisations, research institutes). The Topten ACT project involves 17 partners in 16 European countries. It is coordinated by ADEME (Agence de l'Environnement et de la Maîtrise de l'Energie).
More information and access to all national websites on the European site: www.topten.eu

WP2 European Product Analysis , Task 2.1 Determining energy efficiency criteria, D 2.1 Periodic Criteria Papers (first set)

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1. Topten.eu: Range hoods - current selection criteria and products selected

Topten.eu selection criteria since July 2015:
In order to qualify for topten.eu, all range hoods must meet the following criteria:

- Fluid dynamic efficiency class according to EU energy label: at least A
- Lighting efficiency class according to EU energy label: at least A

In addition:
Island range hoods must meet the following criteria:

- Energy efficiency class according to EU energy label: at least A
- Grease filtering efficiency class according to EU energy label: at least B

Wall range hoods must meet the following criteria:

- Energy efficiency class according to EU energy label: at least A+
- Grease filtering efficiency class according to EU energy label: at least C

Telescopic and integrated range hoods must meet the following criteria:

- Energy efficiency class according to EU energy label: at least A
- Grease filtering efficiency class according to EU energy label: at least C

Range Hoods / **Minimum efficiency classes**	Island	Wall	Telescopic	Integrated
Energy	A	A+	A	A
Lighting	A	A	A	A
Fluid dynamic	A	A	A	A
Grease filtering	B	C	C	C

Numbers of range hood models currently on Topten.eu according to efficiency classes:
(last update: June 2015):

Efficiency classes / **Range Hoods**	Energy		Lighting	Fluid dynamic	Grease filtering		
	A+	A	A	A	A	B	C
Island	5	17	22	22	5	17	-
Wall	16	-	16	16	2	4	10
Telescopic	-	4	4	4	-	2	2
Integrated	-	4	4	4	3	-	1
Total	21	25	46	46	10	23	13

Similar models have not been counted if from the same brand.

There are 46 range hood models of 6 different brands on the Topten.eu product list:
Bosch, Gaggenau, Miele, Siemens, WESCO, V-ZUG.

Range Hoods of Bauknecht and Electrolux do not currently meet the Topten criteria.

2. Expected selection criteria in 2016

Topten.eu selection criteria expected for 2016:
Maybe the grease filtering efficiency class could be at least B for all range hoods. The amount of wall range hoods would definitely decrease though in that case.

3. Technical background

3.1 Terms

Topten uses the term “range hood” as in the EU Directive. It is used mostly in Australia, USA and Canada. However there exist more terms:

- cooker hood (UK)
- kitchen hood
- exhaust hood
- extractor hood

3.2 Types of range hoods

- An island range hood is fixed at the ceiling over a freestanding hob accessible from every side.
- A wall range hood is mounted on the wall as an independent device. The cupboards are for example arranged at the right or left hand side of the hood.
- A telescopic range hood is installed directly under a wall cupboard. The flat hood must be pulled out to power on.
- An integrated hood consists of only the uncovered technical core. It is built in a wall cupboard and therefore almost invisible.

There exist as well table hoods, ceiling hoods and downdraft hoods. But they do not meet the selection criteria or are too few to be put on Topten.

3.3 Operation Modes

Most range hoods can be operated in extraction or recirculation mode. This should be decided before the installation to avoid future rebuildings.

Extraction hoods
Extraction hoods evacuate the air over the hob and clean it through a grease filter before releasing it over an outside vent.

Advantages

- Odours are removed more efficiently because the air is released to the outside
- Stronger ventilation makes it more powerful and efficient
- Lower noise level
- Also moisture can be removed
- No odour filter necessary

Disadvantages

- Requires a vent through an outside wall, which is not always possible or not recommendable because of the energy efficiency of the house and can furthermore be expensive to install
- Needs infiltration of air, e.g. through an open window to avoid underpressure. This is especially important if the house is heated with gas, coal, oil or wood. Otherwise, the exhaust fumes could be drawn into the kitchen instead of outside
- Therefore, a chimney sweeper must check if extraction ventilation is possible without danger
- In low-energy or passive houses, extraction hood are not recommended because of the thermic energy loss

Recirculation hoods

Recirculation hoods lead the airflow not only through a grease trap but also through a filter that absorbs unpleasant smells, normally a charcoal filter. Afterwards the odour free air is returned into the kitchen.

Advantages

- Can easily be installed in every kitchen
- Legal regulations concerning the chimney and the face of the building do not matter
- No warm air is lost
- Suitable for low-energy and passive houses

Disadvantages

- Odours are only filtered and not released to the outside
- The charcoal filter has to be replaced regularly, generally every 6 months
- Moisture remains in the room, so airing on a regular basis is necessary
- As the air is blown through a filter, the noise level is higher than of an extraction hood with the same capacity

3.4 Suggestions for utilisation

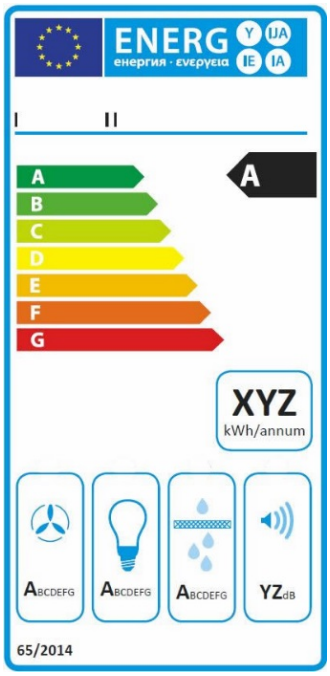
- *Cleaning of the grease filter*
  The metal filters can be cleaned in the dishwasher. Lots of filter systems indicate with optic or acoustic signals the time when cleaning is necessary. When the filter is contaminated with grease, the air cannot flow properly anymore and the motors have to work harder.
- *Regular replacing of the charcoal filter*
  Recirculation hoods come with a charcoal odour filter whose capacity sinks the more it is used.
- *Leave switched on 5 to 10 minutes after cooking*
  This way the air in the room is cleaned properly. Some hoods have an automatic stop delay.
- *Keep openings free*
  It is very important for recirculation ventilation that the openings through which the air is returned into the kitchen, are not blocked.
- *Adjust power level according to amount of odour, grease and moisture*
  Is the power level of an extraction system too high, the air flow resistance is increasing and therefore reduces the exhausting of the air, especially when the canal has curves and narrow points.
  A too higher power level of a recirculation hood reduces the time of the air flow being in contact with the charcoal filter. Odours cannot be removed efficiently in that case.
- *Draw out the shed fully*
  The hood is working better when the extraction zone is at least as big as the hob

4. Policy measures, standards and labels

Apart from the mandatory EU Energy Label, there are no other ecolabels for range hoods (e.g. EU Ecolabel, Blue Angel).

Energy Label
The energy label is based on regulation No. 65/2014 and is mandatory since January 2015. The label shows the following quality aspects:

- The energy efficiency class of the domestic range hood
- Annual energy consumption (AEC hood) in kWh rounded to the nearest integer
- The fluid dynamic efficiency class
- The lighting efficiency class
- The grease filtering efficiency class
- The noise value rounded to the nearest integer



The classes are divided according to an Energy Efficiency Index (EEI) that is calculated as:

$$EEI_{hood} = \frac{AEC_{hood}}{SAEC_{hood}} \times 100$$

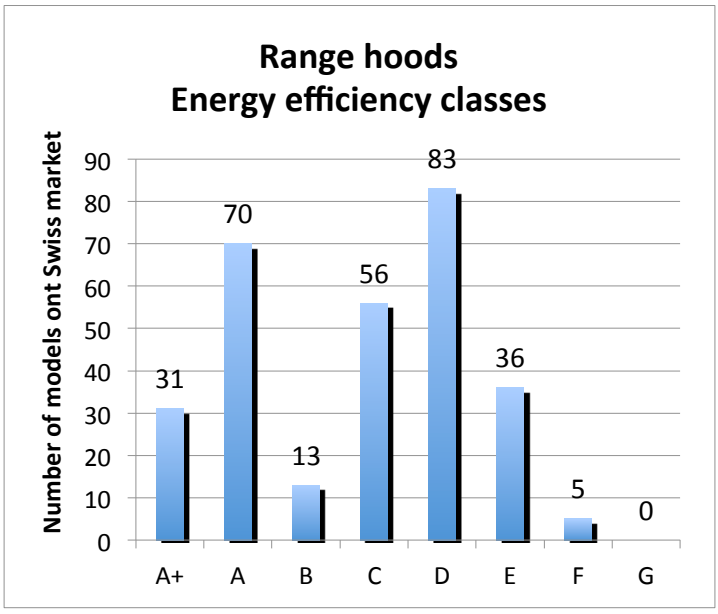
and is rounded to the first decimal place.
Where:
— *SAEC hood* is the Standard Annual Energy consumption of the domestic range hood in kWh/a, rounded to the first decimal place,
— *AEC hood* is the Annual Energy Consumption of the domestic range hood in kWh/a, rounded to the first decimal place.

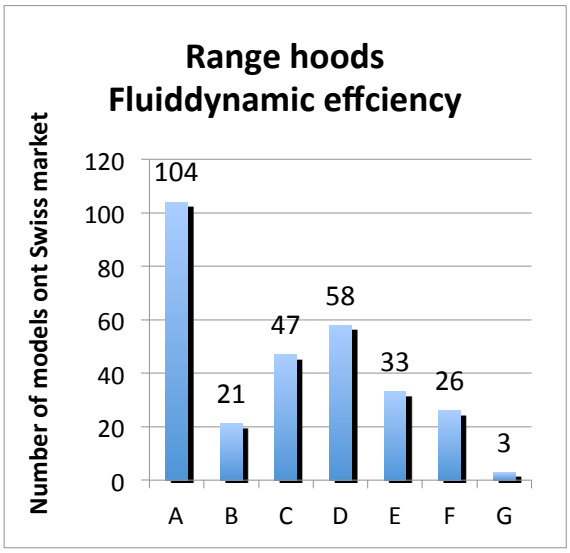
There are altogether four labels, which were and will be introduced in different time intervals
Since January 2015: label 1 and 2
Since January 2016: label 2 and 3
Since January 2018: label 3 and 4
Since January 2020: only label 4

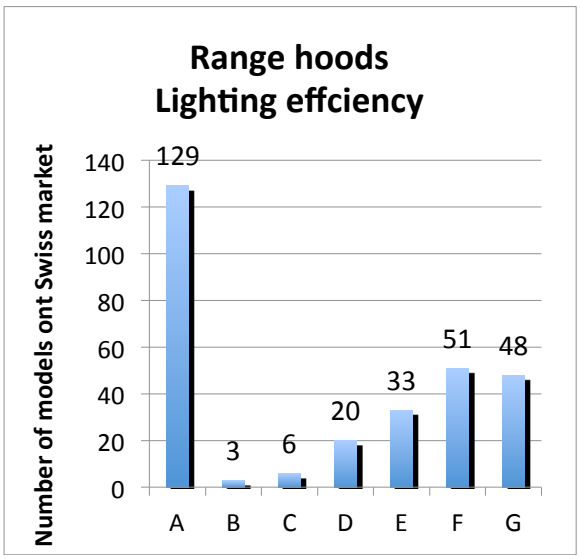
Energy Efficiency Class	Energy Efficiency Index (EEI_{hood})			
	Label 1	Label 2	Label 3	Label 4
A+++ (most efficient)				$EEI_{hood} < 30$
A++			$EEI_{hood} < 37$	$30 \leq EEI_{hood} < 37$
A+		$EEI_{hood} < 45$	$37 \leq EEI_{hood} < 45$	$37 \leq EEI_{hood} < 45$
A	$EEI_{hood} < 55$	$45 \leq EEI_{hood} < 55$	$45 \leq EEI_{hood} < 55$	$45 \leq EEI_{hood} < 55$
B	$55 \leq EEI_{hood} < 70$	$55 \leq EEI_{hood} < 70$	$55 \leq EEI_{hood} < 70$	$55 \leq EEI_{hood} < 70$
C	$70 \leq EEI_{hood} < 85$	$70 \leq EEI_{hood} < 85$	$70 \leq EEI_{hood} < 85$	$70 \leq EEI_{hood} < 85$
D	$85 \leq EEI_{hood} < 100$	$85 \leq EEI_{hood} < 100$	$85 \leq EEI_{hood} < 100$	$EEI_{hood} \geq 85$
E	$100 \leq EEI_{hood} < 110$	$100 \leq EEI_{hood} < 110$	$EEI_{hood} \geq 100$	
F	$110 \leq EEI_{hood} < 120$	$EEI_{hood} \geq 110$		
G (least efficient)	$EEI_{hood} \geq 120$			

4.1. Market analysis

A data collection referring to the Swiss market from March 2015 shows the following results:







5. References and links

Useful links

Topten.eu ovens product lists:

- http://www.topten.eu/english/household/range-hoods/island-range-hoods.html
- http://www.topten.eu/english/household/range-hoods/wall-range-hoods.html
- http://www.topten.eu/english/household/range-hoods/integrated-range-hoods.html
- http://www.topten.eu/english/household/range-hoods/telescopic-range-hoods.html

Topten.eu ovens selection criteria:

- http://www.topten.eu/english/criteria/range-hoods-2.html&fromid=

References

- Commission delegated regulation (EU) No 65/2014 of 1 October 2013 supplementing Directive 2010/30/EU of the European Parliament and of the Council with regard to the energy labelling of domestic ovens and range hoods: http://www.topten.eu/uploads/File/65_2014_EU_Directive_Hoods.pdf

- Commission regulation (EU) No 66/2014 of 14 January 2014 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for domestic ovens, hobs and range hoods: http://www.topten.eu/uploads/File/65_2014_EU_Directive_Hoods.pdf

- Amendment regarding Online Energy Labels: Regulation No. 518/2014: http://www.topten.eu/uploads/File/Online-Energy-Labels-518:2014-EN.pdf

- Directive 2010/30/EU on the indication by labelling and standard product information on the consumption of energy and other resources by energy-related products (recast) http://www.topten.eu/uploads/File/Label%20Directive%20Recast%202010_30_EU.pdf