

Commission Working Document on possible Ecodesign Requirements for domestic and commercial ovens, hobs, grills and domestic range hoods

- (1) Under Directive 2009/125/EC ecodesign requirements should be set by the Commission for energy-related products representing significant volumes of sales and trade, having significant environmental impact and presenting significant potential for improvement through design in terms of their environmental impact, without entailing excessive costs.
- (2) Article 16(1), second indent, of Directive 2009/125/EC provides that in accordance with the procedure referred to in Article 19(3) and the criteria set out in Article 15(2), and after consulting the Ecodesign Consultation Forum, the Commission shall, as appropriate, introduce implementing measures which are considered as priorities.
- (3) The Commission has carried out preparatory studies to analyse the technical, environmental and economic aspects of domestic and commercial kitchen appliances typically used in households and commercial establishments such as domestic and commercial ovens, hobs, grills and domestic range hoods. The studies have been developed together with stakeholders and interested parties from the EU and third countries, and the results have been made publicly available.
- (4) The environmental aspect of the products covered, identified as significant for the purposes of this Regulation, is energy consumption in form of direct or indirect emissions in the use phase in the use phase, due to its impacts on consumption of non-renewable resources and the emissions related to conversion of energy.
- (5) Standby and off-mode functions can be responsible for an important part of the total power consumption of these appliances. For domestic kitchen appliances, power consumption of these functions is part of the minimum energy performance requirements. Standby and off-mode requirements for domestic ovens and hobs are set on the basis of the Ecodesign requirements of Commission Regulation 1275/2008/EC¹.
- (6) The annual energy consumption of products subject to this Regulation was estimated to have been 314.7 TWh (primary energy) (270556 M_{toe}) in the EU in 2005. Unless specific measures are taken, annual energy consumption is predicted to be 327.4 TWh (primary energy) (281445 M_{toe}) in 2030. The preparatory studies show that the energy consumption of products subject to this Regulation can be significantly reduced. In total the savings potential of the proposed measures amounts to 13.6 TWh (primary energy) (11677 M_{toe}) between 2012 and 2030 compared to the situation if no measures were taken.
- (7) The preparatory studies shows that requirements regarding other ecodesign parameters referred to in Annex I, Part 1, of Directive 2009/125/EC are not necessary as

¹ OJ L 339, 18.12.2008, p. 45.

electricity and gas consumption of domestic and commercial kitchen appliances in the use phase is by far the most significant environmental aspect.

- (8) Products subject to this Regulation should be made more energy efficient by applying existing non-proprietary cost-effective technologies that can reduce the combined costs of purchasing and operating these products.
- (9) The ecodesign requirements should not affect functionality from the end-user's perspective and should not negatively affect health, safety or the environment. In particular, the benefits of reducing energy consumption during the use phase should more than offset any possible additional environmental impact during the production phase.
- (10) The ecodesign requirements should be introduced gradually in order to provide a sufficient timeframe for manufacturers to re-design products subject to this Regulation. The timing should be such as to avoid negative impacts on the functionalities of equipment on the market, and to take into account cost impacts for end-users and manufacturers, in particular small and medium-sized enterprises, while ensuring timely achievement of the objectives of this Regulation.
- (11) Measurements of the relevant product parameters should be performed through reliable, accurate and reproducible measurement methods, which take into account the recognised state of the art measurement methods including, where available, harmonised standards adopted by the European standardisation bodies, as listed in Annex I to Directive 98/34/EC of the European Parliament and of the Council of 22 June 1998 laying down a procedure for the provision of information in the field of technical standards and regulations and of rules on Information Society services².
- (12) In accordance with Article 8 of Directive 2009/125/EC, this Regulation specifies the applicable conformity assessment procedures.
- (13) In order to facilitate compliance checks, manufacturers should provide information in the technical documentation referred to in Annexes V and VI of Directive 2009/125/EC insofar as this information relates to the requirements laid down in this Regulation.
- (14) In addition to the legally binding requirements laid down in this Regulation, indicative benchmarks for best available technologies should be identified to ensure the wide availability and easy accessibility of information on the most relevant environmental aspects in the life-cycle environmental performance of products subject to this Regulation.
- (15) The measures provided for in this Regulation are in accordance with the opinion of the Committee established by Article 19(1) of Directive 2009/125/EC.

² OJ L 204, 21.7.1998, p. 37.

Subject matter and scope

1. This Regulation establishes eco-design requirements for the placing on the market and putting into service of domestic and commercial hobs, grills, and electric mains-operated domestic range hoods also when used for non-domestic purposes, and domestic and commercial ovens including when incorporated in cookers.
2. This Regulation shall not apply to:
 - a) appliances that use energy sources other than electric energy or gas;
 - b) appliances that operate only with microwaves for heating food;
 - c) free standing ovens with a product mass of 18 kilograms or less;
 - d) ovens with a cavity volume of 750 litres or less;
 - e) domestic range hoods without motor.

Definitions

In addition to the definitions set out in Article 2 of Directive 2009/125/EC, the following definitions shall apply:

- (1) 'Domestic' means for household use;
- (2) 'Commercial' means for use in commercial kitchens or other food processing facilities;
- (3) 'Oven' means an appliance or part of an appliance which incorporates one or more cavities using gas and/or electric energy to operate;
- (4) 'Cavity' means the enclosed compartment in which the temperature can be controlled for preparation of food;
- (5) 'Hob' means an 'electric hob', 'gas hob' or a combination of both;
- (6) 'Cooking zone' means part of a hob or area visible or marked on the surface of the hob where pans or pots are placed for cooking;
- (7) 'Electric hob' means an appliance or part of an appliance which incorporates one or more cooking zones heated by electric energy, where a cooking zone is part of the hob or area marked on the surface of the hob where pans are placed for heating;
- (8) 'Gas hob' means an appliance or part of an appliance which incorporates one or more cooking zones, heated by gas burners;

- (9) 'Grill' means an appliance or part of an appliance in/on/under which food is cooked by radiant or contact heat;
- (10) 'Cooker' means an appliance consisting of an oven and a hob using gas or electric energy;
- (11) 'Commercial oven' means an oven intended for commercial use having a volume up to 750 litres per cavity;
- (12) 'Domestic range hood' means a motor operated appliance intended to collect contaminated air from above a hob or includes a downdraft system intended for installation adjacent to domestic cooking ranges, hobs and similar cooking appliances, that draws vapour down into an internal exhaust duct. The blower of the domestic range hood may be internal or external, provided that is controlled by the domestic range hood. The air may be ducted away or discharged back into the room after filtration;
- (13) 'Domestic range hood without motor' means an appliance intended to collect contaminated air from above a hob connected to a ventilation appliance not controlled by the range hood.
- (14) 'Equivalent domestic range hood' means a model of domestic range hood placed on the market with the same technical and performance characteristics, energy consumption and airborne acoustical noise emissions as another model of domestic range hoods placed on the market under a different commercial code number by the same supplier.

Ecodesign requirements

The ecodesign requirements for domestic and commercial kitchen appliances are set out in Annex I, points 2, 3 and 4.

Conformity assessment

1. The conformity assessment procedure referred to in Article 8 of Directive 2009/125/EC shall be the internal design control system set out in Annex IV to that Directive or the management system set out in Annex V to that Directive.
2. For the purposes of conformity assessment pursuant to Article 8 of Directive 2009/125/EC, the technical documentation file shall contain a copy of the calculation set out in Annex II to this Regulation.
3. Where the information included in the technical documentation for a model has been obtained by calculation on the basis of design, or extrapolation from other equivalent appliance, or both, the technical documentation shall include details of such calculations or extrapolations, or both, and of tests undertaken by manufacturers to verify the accuracy of the calculations undertaken. In such cases, the technical documentation shall also include a list of all other equivalent models where the information included in the technical documentation was obtained on the same basis.

Verification procedure for market surveillance purposes

When performing the market surveillance checks referred to in Article 3(2) of Directive 2009/125/EC for compliance with requirements set out in Annex I to this Regulation, the Member States authorities shall apply the verification procedure described in Annex III to this Regulation.

Benchmarks

The indicative benchmarks for best-performing commercial appliances available on the market at the time of entry into force of this Regulation are set out in Annex IV.

Revision

The Commission shall review this Regulation in the light of technological progress no later than seven years after its entry into force and present the result of this review to the Ecodesign Consultation Forum. The review shall in particular assess the scope of the Regulation, especially with regards to ovens with a cavity volume of 20 litres or less and/or a product mass of 18 kilograms or less, the efficiency requirements and the verification tolerances set out in Annex III.

Entry into force

1. This Regulation shall enter into force on the twentieth day following that of its publication in the *Official Journal of the European Union*.
2. The ecodesign requirements for domestic ovens and hobs set out in Annex I.2 shall apply from 1 January 2014 (1st tier), respectively 1 January 2016 (2nd tier).

The ecodesign requirements for commercial ovens and hobs set out in Annex I.2 shall apply from 1 January 2014 (1st tier), respectively 1 January 2019 (2nd tier).

The ecodesign requirements for domestic range hoods set out in Annex I.2 shall apply from 1 January 2014 (1st tier), respectively 1 January 2015 (2nd tier), respectively 1 January 2018 (3rd tier) and respectively 1 January 2020 (4th tier).

3. The ecodesign requirements for domestic ovens and hobs set out in Annex I.3 shall apply from 1 January 2013.

The ecodesign requirements for domestic range hoods set out in Annex I.3 shall apply from 1 January 2015 (1st tier), respectively 1 January 2018 (2nd tier).

4. The ecodesign requirements for domestic ovens and hobs set out in Annex I.4 shall apply from 1 January 2014.

The ecodesign requirements for commercial ovens and hobs set out in Annex I.4 shall apply from 1 January 2014.

The ecodesign requirements for domestic and commercial grills set out in Annex I.4 shall apply from 1 January 2014.

The ecodesign requirements for domestic range hoods set out in Annex I.4 shall apply from 1 January 2014.

ANNEX I
Ecodesign requirements

1 Definitions for the purposes of Annex I

- 1) 'Conventional mode' means the operation mode of an oven only using natural convection for circulation of heated air;
- 2) 'Fan-forced mode' means a mode when a built-in fan circulates heated air inside the cavity of the oven;
- 3) 'Idle mode' means the mode in which a commercial oven maintains a cavity temperature of 200°C after pre-heating and between or after cooking cycles while empty;
- 4) 'Operation mode' means the status of the oven, hob or grill during use;
- 5) 'Steam mode' means the operation mode of an oven when extra moisture is put into the cavity;
- 6) 'Automatic functioning mode during the cooking period' means a condition in which the air flow of the domestic range hood during the cooking period is automatically controlled through sensor(s), such as humidity, temperature, etc.;
- 7) 'Cycle' means the period of heating a standardised load starting at room temperature and ending at set temperature;
- 8) 'Energy consumption' means the energy consumption per measured cycle of the appliance or the energy consumption measured in one hour in 'idle mode';
- 9) 'Heat source' means the main energy form for heating an oven, hob or grill;
- 10) 'Combi-steamer oven' means an oven in which hot air and steam can be used separately, together, or in sequence in a temperature range from 30°C to 300°C and a moisture range from 0 percent to 100 percent in a non-pressurised atmosphere where the cooking and preparing processes are operating successively or in isolation as programmed without interrupting the cooking process;
- 11) 'Commercial deck oven' means an oven used for thermal treatment of food and consists of one or more cavities that form a structural unit and is fitted at one or both sides with doors or flaps to open and close the cavity;
- 12) 'Commercial Fan-forced oven' means a fan-forced oven for thermal treatment of food in which circulation of hot air takes place in a large chamber that can be loaded with a vertical array of shelves;
- 13) 'Fully automatic range hoods' means a domestic range hood in which the air flow and/or other functions are automatically controlled through sensor(s) during the 24h hours including the cooking period.
- 14) 'Eh' means the energy consumption required to heat an oven during a cycle;

- 15) 'EEI_{dom oven}' is the energy efficiency index of a domestic oven;
- 16) 'EEI_{com oven}' is the energy efficiency index of a commercial oven;
- 17) 'EEI_{dom hob}' is the energy efficiency index of a cooking zone in a domestic hob;
- 18) 'EEI_{com hob}' is the energy efficiency index of a cooking zone in a commercial hob;
- 19) 'Fluid Dynamic Efficiency' (FDE) is the fluid dynamic efficiency of the domestic range hood at its best efficiency point (BEP);
- 20) 'Best efficiency point' (BEP) identifies the domestic range hood operating point with maximum fluid dynamic efficiency;
- 21) 'Air flow at the BEP' (QBEP), identifies the air flow at best efficiency point of a domestic range hood (in m³/h);
- 22) 'Static pressure at the BEP' (PBEP) identifies the pressure at best efficiency point of a domestic range hood (in Pa);
- 23) 'Electric power consumption at BEP' (WBEP) identifies the electric power consumption at best efficiency point of a domestic range hood (in Watt);
- 24) 'Annual Energy Consumption' (AEC) is the annual energy consumption of the domestic range hood in kWh/year and rounded to the first decimal place;
- 25) 'Standard Annual Energy Consumption' (SAEC) is the standard annual energy consumption of the domestic range hood in kWh/year and rounded to the first decimal place;
- 26) 'Energy Efficiency Index hoods' (EEI_{hoods}) is the ratio between AEC and SAEC rounded to the first decimal place for domestic range hoods;
- 27) 'Off mode' is a condition in which the equipment is connected to the mains power source and is not providing any function. Also considered as off mode are conditions providing only an indication of off mode condition, as well as conditions providing only functionalities intended to ensure electromagnetic compatibility pursuant to Directive 2004/108/EC of the European Parliament and of the Council³;
- 28) 'Standby mode' means a condition where the equipment is connected to the mains power source, depends on energy input from the mains power source to work as intended and provides only the following functions, which may persist for an indefinite time: reactivation function, or reactivation function and only an indication of enabled reactivation function, and/or information or status display;

³ OJ L 390 of 31.12.2004, p. 24.

29) 'Reactivation function' means a function facilitating the activation of other modes, including active mode, by remote switch including remote control, internal sensor, timer to a condition providing additional functions, including the main function;

30) 'Information or status display' is a continuous function providing information or indicating the status of the equipment on a display, including clocks.

2. PRODUCT EFFICIENCY REQUIREMENTS

a) The minimum efficiency requirements for domestic ovens including when incorporated in cookers are set out in Table 1.

Table 1: Minimum energy efficiency performance requirements domestic ovens		
	Electric	Gas fired
Parameter	EEI _{dom oven}	EEI _{dom oven}
1 year after entry into force	≥ 120	≥ 110
3 years after entry into force	≥ 110	≥ 92.5

b) The minimum efficiency requirements for domestic hobs are set out in Table 2.

Table 2: Minimum energy efficiency performance requirements domestic hobs		
	Electric	Gas fired
Parameter	EEI _{dom hob}	EEI _{dom hob}
1 year after entry into force	< 60 %	< 52 %
3 years after entry into force	< 60 %	< 60 %

c) The minimum efficiency requirements for commercial electric ovens are set out in Table 3.

Table 3: Minimum energy efficiency performance requirements commercial electric ovens			
Type	Combination electric oven	Fan-forced electric oven	Multiple deck electric oven
Parameter	EEI _{com oven}	EEI _{com oven}	EEI _{com oven}
1 year after entry into force	≤ 2	≤ 2	≤ 2

6 years after entry into force	≤ 1.6	≤ 1.6	≤ 1.6
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- d) The minimum efficiency requirements for commercial gas ovens are set out in Table 4.

Table 4: Minimum energy efficiency performance requirements commercial gas ovens			
Type	Combination gas oven	Fan-forced gas oven	Multiple deck gas oven
Parameter	EEI _{com oven}	EEI _{com oven}	EEI _{com oven}
1 year after entry into force	≤ 1	≤ 1	≤ 1
6 years after entry into force	≤ 0.8	≤ 0.8	≤ 0.8

- e) The minimum efficiency requirements for commercial hobs are set out in Table 5.

Table 5: Minimum energy efficiency performance requirements commercial hobs		
	Electric	Gas fired
Parameter	EEI _{com hob}	EEI _{com hob}
1 year after entry into force	$\leq 60 \%$	$\leq 52 \%$
6 years after entry into force	$\leq 60 \%$	$\leq 60 \%$

- f) The minimum efficiency requirements for domestic range hoods are set out in Table 6.

Table 6: Minimum energy efficiency performance requirements domestic range hoods		
	Electric	
Parameter	EEI _{dom hood}	FDEI _{dom hood}
2 years after entry into force	≤ 120	≤ 4
5 years after entry into force	≤ 110	≤ 8
7 years after entry into force	≤ 100	≤ 8

- (1) From [date to be inserted: 12 months after the entry into force of the Regulation]:

- a) Domestic range hoods with a maximum air flow in any of the available setting higher than 650 m³/h shall automatically revert to an air flow lower than or equal to 650 m³/h in a time t as defined in the following formula:

$$V = \int_0^t \frac{Q_{\max}}{60} \times d(t)$$

where

- V is the air volume and is equal to 100 m³
- Q_{\max} is the maximum air flow of the domestic range hood, including intensive/boost if present, in m³/h and rounded to the first decimal place
- t is the time, in minutes and rounded to the integer
- $d(t)$ is the total time till the air volume of 100m³ has been reached

The mere presence of a manual switch or setting decreasing the appliance air flow to a value lower than or equal to 650 m³/h is not considered fulfilling this requirement.

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- b) For domestic range hoods with automatic functioning mode during the cooking period:
- the activation of the automatic functioning mode shall be possible only through a manual operation by the user, either on the hood or elsewhere
 - the automatic functioning mode shall revert to manual control after no more than 10 minutes from the moment the automatic function switches off the motor

(2) From [*date to be inserted: 2 years after the entry into force of the Regulation*]:

- a) The Fluid Dynamic Efficiency Index shall be higher than 4.
- b) The Energy Efficiency Index shall be lower than 120.

(3) From [*date to be inserted: 5 years after the entry into force of the Regulation*]:

- a) The Fluid Dynamic Efficiency Index shall be higher than 8.
- b) The Energy Efficiency Index shall be lower than 110.

(4) From [*date to be inserted: 7 years after the entry into force of the Regulation*]:

- a) The Energy Efficiency Index shall be lower than 100.

The Fluid Dynamic Efficiency Index and the Energy Efficiency Index of domestic range hoods are calculated as described in Annex II.

3. POWER CONSUMPTION REQUIREMENTS

a) The off-mode and standby requirements for domestic ovens and domestic hobs are set out below.

i) Power consumption in off mode:

Power consumption of domestic appliances in any off mode condition shall not exceed 0,50 W.

ii) Power consumption in standby mode(s):

The power consumption of domestic appliances in any condition providing only a reactivation function, or providing only a reactivation function and a mere indication of enabled reactivation function, shall not exceed 0.50 W.

The power consumption of domestic appliances in any condition providing only information or status display, or providing only a combination of reactivation function and information or status display, shall not exceed 1.00 W.

iii) Availability of off mode and/or standby mode:

Domestic appliances shall, except where this is inappropriate for the intended use, provide off mode and/or standby mode, and/or another condition which does not exceed the applicable power consumption requirements for off mode and/or standby mode when the equipment is connected to the mains power source.

iv) Power management:

When the domestic appliance is not providing the main function, or when other energy-using product(s) are not dependent on its functions, the appliance shall, unless inappropriate for the intended use, offer a power management function, or a similar function, that switches the domestic appliance after the shortest possible period of time appropriate for the intended use of the domestic appliance, automatically into

- standby mode, or
- off mode, or
- another condition which does not exceed the applicable power consumption requirements for off mode and/or standby mode when the domestic appliance is connected to the mains power source. The power management function shall be activated before delivery.

b) The off-mode and standby requirements for domestic range hoods are set out below.

(1) From [*date to be inserted: 2 years after the entry into force of the Regulation*]

- i) Power consumption in ‘off mode’: the power consumption in any off-mode condition shall not exceed 1,00 W.

- ii) Power consumption in ‘standby mode(s)’:

The power consumption in any condition providing only a reactivation function, or providing only a reactivation function and a mere indication of enabled reactivation function, shall not exceed 1,00 W.

The power consumption of equipment in any condition providing only information or status display, or providing only a combination of reactivation function and information or status display, shall not exceed 2,00 W.

- iii) Availability of ‘off mode’ and/or ‘standby mode’: domestic range hoods shall, except where this is inappropriate for the intended use (i.e. full automatic range hoods), provide ‘off mode’ and/or ‘standby mode’, and/or another condition which does not exceed the applicable power consumption requirements for off mode and/or standby mode when the equipment is connected to the mains power source.

- (2) From [*date to be inserted: 5 years after the entry into force of the Regulation*]:

- i) Power consumption in ‘off mode’: the power consumption in any off mode condition shall not exceed 0,50 W.

- ii) Power consumption in ‘standby mode(s)’: the power consumption in any condition providing only a reactivation function, or providing only a reactivation function and a mere indication of enabled reactivation function, shall not exceed 0,50 W.

The power consumption of equipment in any condition providing only information or status display, or providing only a combination of reactivation function and information or status display shall not exceed 1,00 W.

- iii) Domestic range hoods shall, provide off mode and/or standby mode, and/or another condition which does not exceed the applicable power consumption requirements for off mode and/or standby mode when the equipment is connected to the mains power source.
- iv) Power management: when domestic range hoods are not providing the main function, or when other energy-using product(s) are not dependent on its functions, equipment shall, unless inappropriate for the intended use, offer a power management function, or a similar function, that switches equipment after the shortest possible period of time appropriate for the intended use of the equipment, automatically into:
- standby mode, or
 - off mode, or
 - another condition which does not exceed the applicable power consumption requirements for off mode and/or standby mode when the equipment is connected to the mains power source.

The power management function shall be activated before delivery.

4. PRODUCT INFORMATION REQUIREMENTS

The information on domestic and commercial kitchen appliances set out in points below shall be visibly displayed on:

- (a) the technical documentation of the product;
- (b) free access websites of manufacturers of domestic and commercial kitchen appliances;

From 1 year after the regulation has entered into force the following product information related to domestic ovens shall be provided:

Model identification			
Type of oven			
Number of cavities		X	
Heat source per cavity			
Operation mode(s) per cavity			
	Symbol	Value	Unit
Volume per cavity	V	X	l
Mass of the appliance	M	X	kg
Electric energy consumption per cycle in conventional mode per cavity	Ee	X	kWh/cycle
Gas energy consumption per cycle in conventional mode per cavity	Eg	X	kWh/cycle
Electric energy consumption per cycle in fan forced mode per cavity	Ee	X	kWh/cycle
Gas energy consumption per cycle in fan forced mode per cavity	Eg	X	kWh/cycle

From 1 year after the regulation has entered into force the following product information related to commercial ovens shall be provided:

Model identification			
Type of oven			
Operation modes of the oven conventional mode fan-forced convection mode steam mode			
Operation mode of the oven used for energy label declaration			
	Symbol	Value	Unit
Rated number of shelves		X	
Surface area per shelf	A	X	cm ²
Load per cycle	L	X	kg
Energy consumption for heating the oven	E _h	X	kWh/cycle
Time needed for heating the oven	t	X	Min
Electric energy consumption in idle mode	E _{e_i}	X	kWh
Gas energy consumption in idle mode	E _{g_i}	X	kWh
Electric energy consumption in conventional mode	E _e	X	kWh/cycle
Gas energy consumption in conventional mode	E _g	X	kWh/cycle
Electric energy consumption in fan forced mode	E _e	X	kWh/cycle
Gas energy consumption in fan forced mode	E _g	X	kWh/cycle
Energy consumption in steam mode	E _e	X	kWh/cycle

Gas energy consumption in steam mode	E_g	X	kWh/cycle
Water consumption in steam mode	V	X	l/cycle

From 1 year after the regulation has entered into force the following product information related to domestic and commercial hobs shall be provided:

Model identification			
Type of hob			
Number of cooking zones		X	
Heat source per cooking zone			
	Symbol	Value	Unit
Power per cooking zone	P	X	kWh
Diameter of useful surface area per electric heated cooking zone	∅	X	cm
Energy efficiency index per cooking zone (for commercial hobs)	EEI _{com hob}		
Energy efficiency index per cooking zone (for domestic hobs)	EEI _{dom hob}		

From 1 year after the regulation has entered into force the following product information related to domestic and commercial grills shall be provided:

Model identification			
Type of grill			
Heat source			
	Symbol	Value	Unit
Power	P	X	kWh
Energy consumption during one hour of operation including heating	E	X	kWh
Used method for measuring and calculating the energy consumption			

The technical documentation of domestic range hoods shall include:

Model identification			
	Symbol	Value	Unit
Annual Energy Consumption	AEC	X	kWh
Increase factor	f	X	
Fluid Dynamic Efficiency	FDE	X	%
Standard Annual Energy Consumption	(SAEC)	X	kWh/year
Energy Efficiency Index	EEI		%
Measured air flow at best efficiency point	Q_{BEP}		m ³ /h
Measured air pressure at best efficiency point	P_{BEP}		Pa
Maximum air flow	Q_{max}		m ³ /h
Measured power at best efficiency point	W_{BEP}		W
Nominal power of the lighting system	W_L		W
Measured power consumption in standby mode	$P_{standby}$		W
Description of how the standby mode is selected or programmed			
Measured power consumption off mode	P_{off}		W
Description of how the off mode is selected or programmed			
Notes regarding operation of the equipment			

ANNEX II Measurements and calculations

For the purposes of compliance and verification of compliance with the requirements of this Regulation, measurements and calculations shall be made using a reliable, accurate and reproducible method, which takes into account the generally recognised state of the art methods, and whose results are deemed to be of low uncertainty, including methods set out in documents the reference numbers of which have been published for that purpose in the Official Journal of the European Union. They shall fulfil all of the following technical parameters.

a) Heating of an oven shall be done with a load of hydrated Hipor bricks with outside width x length x height dimensions of 114 x 230 x 64 mm, soaked with water.

The energy consumption of a domestic oven shall be measured for one cycle by heating a wet brick. The total consumption of gas and electric energy of the oven shall be taken into account as well as the compensation factor when using a gas oven.

Two alternative ways of estimating the compensation factor are presented:

i) The compensation factor is calculated to be the energy consumption of extra ventilation estimated to be a fixed number of 0.346 kWh primary energy per cycle of a gas oven, consisting of energy for operating the cooker hood and the heat removed with the exhaust gases.

For domestic ovens, the Energy Efficiency Index EEI shall be calculated according to these formulas:

$$SEC = 0,0158 * V + 1,274$$

$$EEI_{gas} = EC / SEC * 100$$

Whereas:

SEC = Specific Energy Consumption

V = the volume of the cavity

EEI_{gas} = Energy Efficiency Index

EC = the measured energy consumption, for gas ovens including the compensation factor

EC is expressed in kWh primary energy, whereby electric energy is converted to primary energy with a conversion factor of 2.5

ii) The compensation factor is calculated to be the extra energy consumption required to remove the exhaust gases and humidity and is estimated to be 25% of the gas energy consumption of the gas oven. A gas oven uses 29% more energy than an electric oven.

For domestic ovens, the Energy Efficiency Index EEI shall be calculated according to these formulas:

$$SEC = 0,0158 * V + 1,274$$

$$EEI_{\text{gas}} = EC * 1,25 / SEC * 100$$

Whereas:

SEC = Specific Energy Consumption

V = the volume of the cavity

EEI_{gas} = Energy Efficiency Index

EC = the measured energy consumption, for gas ovens including the compensation factor

EC is expressed in kWh primary energy, whereby electric energy is converted to primary energy with a conversion factor of 2.5

The number of Hipor bricks per cavity of a commercial oven depends on the number of trays and the surface area per tray. The number of bricks loaded in the oven is calculated with the following formula:

$$N = \left(\frac{\text{tray width in cm} * \text{tray depth in cm}}{(60\text{cm} * 40\text{cm})} \right) * \text{number of trays}$$

in which N is the number of bricks in units. Fractions are rounded up to the nearest integer.

b) Measuring the efficiency of a hob is done with a pot filled with water. The size of the pot and amount of water depends for electric hobs on the diameter of the useful surface of the cooking zone and for gas hobs on the rated power of the cooking zone.

The sizes of the pots and amount of water to measure the efficiency of domestic electric hobs are given in Table 1.

Table 1: sizes and water volume for measuring efficiency of domestic electric hobs			
Diameter useful surface area (mm)	Diameter pot (mm)	Height pot (mm)	Quantity of water (l)
≤ 145	145	140	1
> 145 ≤ 180	180	140	1.5
> 180 ≤ 220	220	140	2

The energy efficiency of commercial electric hobs shall be measured with a pot with measures according to Table 2.

Table 2: sizes and water volume for measuring efficiency of commercial electric hobs		
Diameter pot (mm)	Height pot (mm)	Quantity of water (g)
200	125	1852
220	125	2240
240	125	2267
260	125	3130
280	125	3630
300	125	4167
320	125	4741
340	125	5352

The measuring of the efficiency of domestic gas hobs shall be done with a stainless steel pot. The sizes of the pots and amount of water shall be fit to the size of the gas hobs according to the sizes in Table 3.

Table 3: sizes and water volume for measuring efficiency of domestic gas hobs		
Maximum power of the cooking zone (kW)	Internal diameter pot (mm)	Quantity of water (kg)
$\leq 1.16 < 1.64$	220	3.7
$\leq 1.64 < 1.98$	240	4.8
$\leq 1.99 < 4.20$	260	6.1

The measuring of the efficiency of commercial gas hobs shall be done with a stainless steel pot. The sizes of the pots and amount of water shall be fit to the size of the gas hobs according to the sizes in Table 4.

Table 4: sizes and water volume for measuring efficiency of commercial gas hobs		
Maximum power of the cooking zone	Internal diameter pot (mm)	Quantity of water (kg)

(kW)		
1.79	220	3.7
2.13	240	4.9
2.50	260	6.1
2.91	280	7.8
3.33	300	9.4
3.80	320	11.8
4.28	340	13.6
5.35	380	18.7
6.53	420	24.9
7.84	460	32.4
9.26	500	41.2

c) The energy consumption of a commercial oven in each operation mode and in idle mode shall be determined according to commonly used measurement methods and the following calculation.

The total energy consumption of a commercial oven used in one heating cycle shall be divided by the total number of heated bricks in one cycle. The Energy Efficiency of the commercial oven and Energy Efficiency Index of the oven are determined according to the following formulas:

$$EC_b = EC_t / 1.5 * n$$

$$EEI = EC/c$$

Where

EC_t = Total energy consumption of the oven for heating a complete load

EC_b = Energy consumption of the oven for heating one brick

n = the number of heated bricks in one load

EEI = energy efficiency index

c = constant of 0.866 kWh, the average energy consumption of a domestic oven.

d) The energy consumption of a domestic or commercial grill shall be measured without load. The energy consumption will be measured during one hour of operation, including heating and shall be performed according to commonly used measurement methods and in commonly used circumstances. The grill shall be heated in working mode or with a setting leading to stationary temperature of or as near as possible to 200°C.

e) Calculation of the Fluid Dynamic Efficiency, Energy Efficiency Index and Annual Energy Consumption of domestic range hoods are set out below.

i) *Calculation of the Fluid Dynamic Efficiency*

The Fluid Dynamic Efficiency (*FDE*) at the best efficiency point is calculated by the following formula, and is rounded to the first decimal place:

$$FDE = \frac{Q_{BEP} \times P_{BEP}}{3600 \times W_{BEP}} \times 100 \quad (\text{eq. 1})$$

where

- Q_{BEP} is the air flow at best efficiency point, in m³/h and rounded to the integer
- P_{BEP} is the static pressure at best efficiency point, in Pa and rounded to the integer
- W_{BEP} is the electric power consumption at the best efficiency point, in Watt and rounded to the first decimal place.

ii) *Calculation of the Energy Efficiency Index*

The Energy **Efficiency Index** (*EEI_{dom hood}*) is calculated as:

$$EEI_{domhood} = \frac{AEC}{SAEC} \times 100 \text{ and is rounded to the first decimal place} \quad (\text{eq. 2})$$

2)

where:

- *AEC* = annual energy consumption of the domestic range hood in kWh/year and rounded to the first decimal place
- *SAEC* = standard annual energy consumption of the domestic range hood in kWh/year and rounded to the first decimal place.

The **Annual Energy Consumption (AEC)** of a domestic range hood is calculated, in kWh/year and recorded to the first decimal place, as:

- for the fully automatic range hoods:

$$AEC = \left[\frac{W_{BEP} \times 60 \times f}{60 \times 1.000} + \frac{W_L \times t_L}{60 \times 1.000} + \frac{P_o \times (440 - 60 \times f)}{2 \times 60 \times 1.000} + \frac{P_s \times (440 - 60 \times f)}{2 \times 60 \times 1.000} \right] \times 365 \quad (\text{eq. 3})$$

where

- W_{BEP} is the electric power consumption at the best efficiency point, in Watt and rounded to the first decimal place
- W_L is the nominal power consumption of the lighting system on the cooking surface, in Watt and rounded to the first decimal place
- t_L is the average lighting time per day, in minutes, $t_L = 120$
- t_H is the average running time per day for domestic range hoods, in minutes, $t_H = 60$
- P_o is the power consumption in off-mode for domestic range hoods, in Watt and rounded to the second decimal place
- P_s is the power consumption in standby mode for domestic old range hoods, in Watt and rounded to the second decimal place
- f is the time increase factor, rounded to the first decimal place, as:

$$f = \frac{-3,6 \times FDE}{100} + 2 \quad (\text{eq. 4})$$

- for all other domestic range hoods:

$$AEC = \frac{[W_{BEP} \times t_H \times f + W_L \times t_L]}{60 \times 1000} \times 365 \quad (\text{eq. 5})$$

5)

where

- W_{BEP} is the electric power consumption at the best efficiency point, in Watt and rounded to the first decimal place
- W_L is the nominal power consumption of the lighting system on the cooking surface (in Watt and rounded to the first decimal place)
- t_L is the average lighting time per day, in minutes, $t_L = 120$
- t_H is the average running time per day for domestic range hoods, in minutes, $t_H = 60$
- f is the time increase factor, rounded to the first decimal place.

The **Standard Annual Energy Consumption (SAEC)** of a domestic range hood shall be calculated, in kWh/year and rounded to the first decimal places, as:

$$SAEC = 0,55 \times [W_{BEP} + W_L] \times 15,3 \quad (\text{eq. 5})$$

The test parameters above shall be assessed in accordance with the definitions in Chapter 2 and Annex I.2, complemented by reliable, accurate and reproducible measurement procedures, which take into account the generally recognised state of the art measurement methods, including methods set out in documents the reference numbers of which have been published for that purpose in the Official Journal of the European Union.

ANNEX III
Verification procedure for market surveillance purposes

When performing the market surveillance checks referred to in Article 3 (2) of Directive 2009/125/EC, the authorities of the Member States shall apply the following verification procedure for the requirements set out in Annex I.

1. The authorities of the Member State shall test one single unit and provide the information testing results to the authorities of the other Member States except if the result referred to in point 2 is not achieved, then information about the testing result under point 3 shall be provided.
2. The model shall be considered to comply with the applicable requirements set out in annex II to this regulation:
 - a. If the declared values comply with the requirements set out in annex II;
 - b. If the $EEI_{dom\ oven}$, $EEI_{com\ oven}$, $EEI_{dom\ hob}$, $EEI_{com\ hob}$ or $EEI_{dom\ hood}$ is not less than the declared value minus 8%;
 - c. If the FDE is not less than the declared value minus 7%;
 - d. If the $AEC_{dom\ hood}$ is not less than the declared value minus 5%;
 - e. If the time $_{dom\ hood}$ (t) is not more than the limit value by more than 1%;
 - f. If the air flow $_{dom\ hood}$ is not less than the declared value minus 10%;
 - g. If the declared power consumption $_{dom\ hood}$ is not higher than the rated values by more than 5%.
3. If the result referred to in point two is not achieved, the member state authorities shall randomly select three additional units of the same model for testing and provide the information about testing results to the authorities of the other Member States and to the Commission within one month of testing.
4. The model shall be considered to comply with the applicable requirements set out in annex II to this regulation:
 - a. If the declared values comply with the requirements set out in annex II;
 - b. If the average $EEI_{dom\ oven}$, $EEI_{com\ oven}$, $EEI_{dom\ hob}$, $EEI_{com\ hob}$ or $EEI_{dom\ hood}$ is not less than the declared value minus 8%;
 - c. If the average FDE is not less than the declared value minus 7%;
 - d. If the average $AEC_{dom\ hood}$ is not less than the declared value minus 5%;
 - e. If the average time $_{dom\ hood}$ (t) is not more than the limit value by more than 1%;
 - f. If the average air flow $_{dom\ hood}$ is not less than the declared value minus 10%;
 - g. If the declared power consumption $_{dom\ hood}$ is not higher than the rated values by more than 5%.
5. If the result referred to in point two is not achieved, the model shall be considered not to comply with this regulation.

Member State authorities shall use the measurements and calculation methods set out in annex III.

For the purposes of checking conformity with the requirements of this Regulation, Member States shall apply the procedures referred to in Annex II, and reliable, accurate and reproducible calculation and measurement methods, which take into account the generally recognised state-of-the-art, including methods set in calculation methods and standards the references and reference numbers of which have been published for that purpose in the Official Journal of the European Union.

ANNEX IV Benchmarks

At the time of entry into force of this Regulation, the best available technology on the market for domestic and commercial hobs, and ovens including when incorporated in cookers in terms of their energy performance was identified as follows:

Ovens	Domestic	Electric	EEI = 67.5
		Gas	EEI = 75.0 or 72.7 (depending on calculation)
	Commercial combi-steamer oven	Electric	
		Gas	
	Commercial fan-forced oven	Electric	
		Gas	
	Commercial multiple deck oven	Electric	
		Gas	
Hobs	Domestic	Electric	
		Gas	
	Commercial	Electric	Efficiency = 90%
		Gas	Efficiency = 60%
Range hoods		< 280 W	FDE = 22
		≥ 280 W	FDE = 24,5
		Noise	51dBA at 550 m ³ /h
		Noise	57 dBA at maximal setting
		Grease	Filtration = 91%
		Lighting	Efficiency = 29%