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**COMMISSION REGULATION (EU) 2015/1185**

**of 24 April 2015**

**implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for solid fuel local space heaters**

(Text with EEA relevance)

(OJ L 193, 21.7.2015, p. 1)

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### *Article 1*

#### **Subject matter and scope**

1. This Regulation establishes ecodesign requirements for the placing on the market and putting into service of solid fuel local space heaters with a nominal heat output of 50 kW or less.
2. This Regulation shall not apply to:
  - (a) solid fuel local space heaters that are specified for the combustion of non-woody biomass only;
  - (b) solid fuel local space heaters that are specified for outdoor use only;
  - (c) solid fuel local space heaters of which the direct heat output is less than 6 % of the combined direct and indirect heat output at nominal heat output;
  - (d) solid fuel local space heaters that are not factory assembled, or are not provided as prefabricated components or parts by a single manufacturer which are to be assembled on site.
  - (e) air heating products;
  - (f) sauna stoves.

### *Article 2*

#### **Definitions**

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

- (1) ‘solid fuel local space heater’ means a space heating device that emits heat by direct heat transfer or by direct heat transfer in combination with heat transfer to a fluid, in order to reach and maintain a certain level of human thermal comfort within an enclosed space in which the product is situated, possibly combined with a heat output to other spaces, and is equipped with one or more heat generators that convert solid fuels directly into heat;
- (2) ‘open fronted solid fuel local space heater’ means a solid fuel local space heater of which the fire bed and combustion gases are not sealed from the space in which the product is fitted and which is sealed to a chimney or fireplace opening or requires a flue duct for the evacuation of products of combustion;

**▼B**

- (3) ‘closed fronted solid fuel local space heater’ means a solid fuel local space heater of which the fire bed and combustion gases can be sealed from the space in which the product is fitted and which is sealed to a chimney or fireplace opening or requires a flue duct for the evacuation of products of combustion;
- (4) ‘cooker’ means a solid fuel local space heater, using solid fuels, that integrates in one enclosure the function of a solid fuel local space heater, and a hob an oven or both to be used for preparation of food and which is sealed to a chimney or fireplace opening or requires a flue duct for the evacuation of products of combustion;
- (5) ‘flueless solid fuel local space heater’ means a solid fuel local space heater emitting the products of combustion into the space where the product is situated;
- (6) ‘open to chimney solid fuel local space heater’ means a solid fuel local space heater intended to sit under a chimney or in a fireplace without sealing between the product and the chimney or fireplace opening, and allowing the products of combustion pass unrestricted from the fire bed to the chimney or flue;
- (7) ‘sauna stove’ means a solid fuel local space heater, incorporated in, or declared to be used in, dry or wet sauna's or similar environments;
- (8) ‘air heating product’ means a product providing heat to an air-based heating system only that can be ducted and is designed to be used while fastened or secured in a specific location or wall mounted which distributes the air by means of an air moving device in order to reach and maintain a certain level of human thermal comfort within an enclosed space in which the product is situated;
- (9) ‘solid fuel’ means a fuel which is solid at normal indoor room temperatures, including solid biomass and solid fossil fuel;
- (10) ‘biomass’ means the biodegradable fraction of products, waste and residues from biological origin from agriculture (including vegetal and animal substances), forestry and related industries including fisheries and aquaculture, as well as the biodegradable fraction of industrial and municipal waste;
- (11) ‘woody biomass’ means biomass originating from trees, bushes and shrubs, including log wood, chipped wood, compressed wood in the form of pellets, compressed wood in the form of briquettes, and sawdust;
- (12) ‘non-woody biomass’ means biomass other than woody biomass, including, inter alia, straw, miscanthus, reeds, kernels, grains, olive stones, olive cakes and nut shells;

**▼ B**

- (13) ‘fossil solid fuel’ means solid fuel other than biomass, including anthracite and dry steam coal, hard coke, low temperature coke, bituminous coal, lignite, a blend of fossil fuels or a blend of biomass and fossil fuel; for the purposes of this Regulation it also includes peat;
- (14) ‘preferred fuel’ means the single fuel for which is to be preferably used for the solid fuel local space heater according to the manufacturer's instructions;
- (15) ‘other suitable fuel’ means a fuel, other than the preferred fuel, which can be used in the solid fuel local space heater according to the manufacturer's instructions and includes any fuel that is mentioned in the instruction manual for installers and end-users, on free access websites of manufacturers and suppliers, in technical or promotional material and in advertisements;
- (16) ‘direct heat output’ means the heat output of the product by radiation and convection of heat, as emitted by or from the product itself to air excluding the heat output of the product to a heat transfer fluid, expressed in kW;
- (17) ‘indirect heat output’ means the heat output of the product to a heat transfer fluid by the same heat generation process that provides the direct heat output of the product, expressed in kW;
- (18) ‘indirect heating functionality’ means the product is capable of transferring part of the total heat output to a heat transfer fluid, for use as space heating or domestic hot water generation;
- (19) ‘nominal heat output’ ( $P_{nom}$ ) means the heat output of a solid fuel local space heater comprising both direct heat output and indirect heat output (where applicable), when operating at the setting for the maximum heat output that can be maintained over an extended period, as declared by the manufacturer, expressed in kW;
- (20) ‘minimum heat output’ ( $P_{min}$ ) means the heat output of a solid fuel local space heater comprising both direct heat output and indirect heat output (where applicable), when operating at the setting for the lowest heat output, as declared by the manufacturer, expressed in kW;
- (21) ‘intended for outdoor use’ means the product is suitable for safe operation outside enclosed spaces, including possible use in outdoor conditions;
- (22) ‘particulate matter’ means particles of various shape, structure and density scattered in the gaseous phase of the flue gas;
- (23) ‘equivalent model’ means a model placed on the market with the same technical parameters set out in Table 1 of point 3 of Annex II as another model placed on the market by the same manufacturer.

For Annexes II to V, additional definitions are set out in Annex I.

**▼B***Article 3***Ecodesign requirements and timetable**

1. The ecodesign requirements for solid fuel local space heaters are set out in Annex II.
2. Solid fuel local space heaters shall meet the requirements set out in Annex II from 1 January 2022.
3. Compliance with ecodesign requirements shall be measured and calculated in accordance with the methods set out in Annex III.

*Article 4***Conformity assessment**

1. The conformity assessment procedure referred to in Article 8(2) of Directive 2009/125/EC shall be the internal design control 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 the conformity assessment pursuant to Article 8 of Directive 2009/125/EC, the technical documentation shall contain the information set out in point 3 of 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 models, 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 the models that served as the basis for the extrapolation and of all other models where the information contained in the technical documentation was obtained on the same basis.

*Article 5***Verification procedure for market surveillance purposes**

Member States shall apply the verification procedure set out in Annex IV to this Regulation when performing the market surveillance checks referred to in Article 3(2) of Directive 2009/125/EC to ensure compliance with the requirements set out in Annex II to this Regulation.

*Article 6***Indicative benchmarks**

The indicative benchmarks for best-performing solid fuel local space heaters available on the market at the time of entry into force of this Regulation are set out in Annex V.

**▼B***Article 7***Review**

1. The Commission shall review this Regulation in the light of technological progress and present the result of that review to the Consultation Forum no later than 1 January 2024. In particular, the review shall assess:

- whether it is appropriate to set stricter ecodesign requirements for energy efficiency and for emissions of particulate matter (PM), organic gaseous compounds (OGCs), carbon monoxide (CO) and nitrogen oxides (NO<sub>x</sub>),
- whether the verification tolerances should be modified.

2. The Commission shall review whether it is appropriate to introduce third party certification for solid fuel local space heaters and present the result of that review to the Consultation Forum no later than 22 August 2018.

*Article 8***Transitional provisions**

Until 1 January 2022 Member States may allow the placing on the market and putting into service of solid fuel local space heaters which are in conformity with the national provisions in force regarding seasonal space heating energy efficiency, emissions of particulate matter, emissions of organic gaseous compounds, emissions of carbon monoxide and emissions of nitrogen oxides.

*Article 9***Entry into force**

This Regulation shall enter into force on the twentieth day following that of its publication in the *Official Journal of the European Union*.

This Regulation shall be binding in its entirety and directly applicable in all Member States.



ANNEX I

**Definitions applicable for Annexes II to V**

For the purpose of Annexes II to V the following definitions shall apply:

- (1) 'seasonal space heating energy efficiency' ( $\eta_s$ ) means the ratio between the space heating demand, supplied by a solid fuel local space heater and the annual energy consumption required to meet this demand, expressed in %;
- (2) 'conversion coefficient' (CC) means a coefficient reflecting the estimated 40 % average EU generation efficiency referred to in Directive 2012/27/EU of the European Parliament and of the Council<sup>(1)</sup>; the value of the conversion coefficient is  $CC = 2,5$ ;
- (3) 'particulate matter emissions' means the emissions of particulate matter at nominal heat output, expressed in  $\text{mg}/\text{m}^3$  dry flue gas calculated to 273 K and 1 013 mbar at 13 %  $\text{O}_2$  or the weighted average emission of particulate matter over up to four burn rates, expressed in  $\text{g}/\text{kg}$ , dry matter;
- (4) 'carbon monoxide emissions' means the emissions of carbon monoxide at nominal heat output, expressed in  $\text{mg}/\text{m}^3$  flue gas calculated to 273 K and 1 013 mbar at 13 %  $\text{O}_2$ ;
- (5) 'organic gaseous compounds emissions' means the emissions of organic gaseous compounds at nominal heat output expressed in  $\text{mgC}/\text{m}^3$  flue gas calculated to 273 K and 1 013 mbar at 13 %  $\text{O}_2$ ;
- (6) 'nitrogen oxides emissions' means the emissions of nitrogen oxides at nominal heat output, expressed in  $\text{mg}/\text{m}^3$  flue gas expressed as  $\text{NO}_2$  calculated to 273 K and 1 013 mbar at 13 %  $\text{O}_2$ ;
- (7) 'net calorific value' (NCV) means the total amount of heat released by a unit quantity of fuel containing the appropriate moisture of the fuel, when it is burned completely with oxygen, and when the products of combustion are not returned to ambient temperature;
- (8) 'useful efficiency, at either nominal or minimum heat output', ( $\eta_{\text{th,nom}}$  or  $\eta_{\text{th,min}}$  respectively) means the ratio of the useful heat output and the total energy input expressed in terms of NCV of a solid fuel local space heater, expressed in %;
- (9) 'electric power requirement at nominal heat output' ( $e_{\text{l,max}}$ ) means the electric power consumption of the solid fuel local space heater while providing the nominal heat output. The electric power consumption shall be established without consideration of the power consumption of a circulator in case the product offers indirect heating functionality and a circulator is incorporated, expressed in kW;
- (10) 'electric power requirement at minimum heat output' ( $e_{\text{l,min}}$ ) means the electric power consumption of the solid fuel local space heater while providing the minimum heat output. The electric power consumption shall be established without consideration of the power consumption of a circulator in case the product offers indirect heating functionality and a circulator is incorporated, expressed in kW;
- (11) 'electric power requirement in standby mode' ( $e_{\text{l,sb}}$ ) means the electric power consumption of the product while in standby mode, expressed in kW;

<sup>(1)</sup> Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012 on energy efficiency, amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC (OJ L 315, 14.11.2012, p. 1).

**▼ B**

- (12) ‘permanent pilot flame power requirement’ ( $P_{\text{pilot}}$ ) means the fuel consumption of solid fuel of the product for the provision of a flame to serve as an ignition source for the more powerful combustion process needed for nominal or part load heat output, when lit for more than 5 minutes before the main burner is on, expressed in kW;
- (13) ‘single stage heat output, no room temperature control’ means the product is not capable of varying its heat output automatically and that no feedback of room temperature is present to adapt the heat output automatically;
- (14) ‘two or more manual stages, no room temperature control’ means the product is capable of varying its heat output manually by two or more levels of heat output and is not equipped with a device that automatically regulates the heat output in relation to a desired indoor temperature;
- (15) ‘with mechanic thermostat room temperature control’ means the product is equipped with a non-electronic device that allows the product to automatically vary its heat output over a certain time period, in relation to a certain required level of indoor heating comfort;
- (16) ‘with electronic room temperature control’ means the product is equipped with an electronic device, either integrated or external, that allows the product to automatically vary its heat output over a certain time period, in relation to a certain required level of indoor heating comfort;
- (17) ‘with electronic room temperature control plus day timer’ means the product is equipped with an electronic device, either integrated or external, that allows the product to automatically vary its heat output over a certain time period, in relation to a certain required level of indoor heating comfort, and allows the setting of timing and temperature level for a 24-hours timer interval;
- (18) ‘with electronic room temperature control plus week timer’ means the product is equipped with an electronic device, either integrated or external, that allows the product to automatically vary its heat output over a certain time period, in relation to a certain required level of indoor heating comfort, and allows the setting of timing and temperature levels for a full week. During the 7-day period the settings must allow a variation on a day-to-day basis;
- (19) ‘room temperature control, with presence detection’ means the product is equipped with an electronic device, either integrated or external, that automatically reduces the set-point for the room temperature when no person is detected in the room;
- (20) ‘room temperature control, with open window detection’ means the product is equipped with an electronic device, either integrated or external, that reduces the heat output when a window or door has been opened. Whenever a sensor is used to detect the opening of a window or door, it can be installed with the product, externally to the product, built into the building structure or as a combination of those options;
- (21) ‘with distance control option’ means the function that allows remote interaction from outside the building in which the product is installed with the control of the product;
- (22) ‘single stage’ means that the product is not capable of automatically varying its heat output;



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- (23) 'two stage' means the product is capable of automatically regulating its heat output in two distinct levels, in relation to the actual indoor air temperature and a desired indoor air temperature, controlled through temperature sensing devices and an interface which is not necessarily integral to the product itself;
- (24) 'modulating' means the product is capable of automatically regulating its heat output in three or more distinct levels, in relation to the actual indoor air temperature and a desired indoor air temperature, controlled through temperature sensing devices and an interface which is not necessarily integral to the product itself;
- (25) 'standby mode' means a condition where the product 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;
- (26) 'other fossil fuel' means fossil fuel other than anthracite and dry steam coal, hard coke, low temperature coke, bituminous coal, lignite, peat or blended fossil fuel briquettes;
- (27) 'other woody biomass' means woody biomass other than log wood with a moisture content of 25 % or lower, briquetted fuel with a moisture content below 14 % or compressed wood with a moisture content below 12 %;
- (28) 'model identifier' means the code, usually alphanumeric, which distinguishes a specific solid fuel local space heater model from other models with the same trade mark or manufacturer's name;
- (29) 'moisture content' means the mass of water in the fuel in relation to the total mass of the fuel as used in the solid fuel local space heater.

*ANNEX II***Ecodesign requirements****1. Specific ecodesign requirements for seasonal space heating energy efficiency**

- (a) Solid fuel local space heaters shall comply with the following requirements from 1 January 2022:
- (i) seasonal space heating energy efficiency of open fronted solid fuel local space heaters shall not be less than 30 %;
  - (ii) seasonal space heating energy efficiency of closed fronted solid fuel local space heaters using solid fuel other than compressed wood in the form of pellets shall not be less than 65 %;
  - (iii) seasonal space heating energy efficiency of closed fronted solid fuel local space heaters using compressed wood in the form of pellets shall not be less than 79 %;
  - (iv) seasonal space heating energy efficiency of cookers shall not be less than 65 %.

**2. Specific ecodesign requirements for emissions.**

- (a) From 1 January 2022 emissions of particulate matter (PM) from solid fuel local space heaters shall not exceed the following values:
- (i) emissions of PM by open fronted solid fuel local space heaters shall not exceed  $50 \text{ mg/m}^3$  at 13 %  $\text{O}_2$  when measured according to the method described in Annex III, point 4(a)(i)(1) or 6 g/kg (dry matter) when measured according to the method described in Annex III, point 4(a)(i)(2);
  - (ii) emissions of PM by closed fronted solid fuel local space heaters using solid fuel other than compressed wood in the form of pellets and cookers shall not exceed  $40 \text{ mg/m}^3$  at 13 %  $\text{O}_2$  when measured according to the method described in Annex III, point 4(a)(i)(1) or 5 g/kg (dry matter) when measured according to the method described in Annex III, point 4(a)(i)(2) or 2,4 g/kg (dry matter) for biomass or 5,0 g/kg (dry matter) for solid fossil fuel when measured according to the method described in Annex III, point 4(a)(i)(3);
  - (iii) emissions of PM by closed fronted solid fuel local space heaters using compressed wood in form of pellets shall not exceed  $20 \text{ mg/m}^3$  at 13 %  $\text{O}_2$  when measured according to the method described in Annex III, point 4(a)(i)(1) or 2,5 g/kg (dry matter) when measured according to the method described in Annex III, point 4(a)(i)(2) or 1,2 g/kg (dry matter) when measured according to the method described in Annex III, point 4(a)(i)(3).
- (b) From 1 January 2022 emissions of organic gaseous compounds (OGCs) from solid fuel local space heaters shall not exceed the following values:
- (i) emissions of OGCs by open fronted solid fuel local space heaters, closed fronted solid fuel local space heaters using solid fuel other than compressed wood in the form of pellets and cookers shall not exceed  $120 \text{ mgC/m}^3$  at 13 %  $\text{O}_2$ ;
  - (ii) emissions of OGCs by closed fronted solid fuel local space heaters using compressed wood in form of pellets shall not exceed  $60 \text{ mgC/m}^3$  at 13 %  $\text{O}_2$ .

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- (c) From 1 January 2022 emissions of carbon monoxide (CO) from solid fuel local space heaters shall not exceed the following values:
- (i) emissions of CO by open fronted solid fuel local space heaters shall not exceed 2 000 mg/m<sup>3</sup> at 13 % O<sub>2</sub>;
  - (ii) emissions of CO by closed fronted solid fuel local space heaters using solid fuel other than compressed wood in the form of pellets and cookers shall not exceed 1 500 mg/m<sup>3</sup> at 13 % O<sub>2</sub>;
  - (iii) emissions of CO by closed fronted solid fuel local space heaters using compressed wood in form of pellets shall not exceed 300 mg/m<sup>3</sup> at 13 % O<sub>2</sub>.
- (d) From 1 January 2022 emissions of nitrogen oxides (NO<sub>x</sub>) from solid fuel local space heaters shall not exceed the following values:
- (i) emissions of NO<sub>x</sub> by open fronted solid fuel local space heaters, closed fronted solid fuel local space heaters and cookers using biomass shall not exceed 200 mg/m<sup>3</sup> expressed as NO<sub>2</sub> at 13 % O<sub>2</sub>;
  - (ii) emissions of NO<sub>x</sub> by open fronted solid fuel local space heaters, closed fronted solid fuel local space heaters and cookers using fossil solid fuel shall not exceed 300 mg/m<sup>3</sup> expressed as NO<sub>2</sub> at 13 % O<sub>2</sub>.

**3. Requirements for product information**

- (a) From 1 January 2022 the following product information on solid fuel local space heaters shall be provided:
- (i) the instruction manuals for installers and end-users, and free access websites of manufacturers, their authorised representatives and importers shall contain the following elements:
    - (1) the technical information included in Table 1, with its technical parameters measured and calculated in accordance with Annex III and showing the number of significant figures indicated in the table;
    - (2) any specific precautions that must be taken when the solid fuel local space heater is assembled, installed or maintained;
    - (3) information relevant to disassembly, recycling and/or disposal at end-of-life.
  - (ii) the technical documentation for the purposes of conformity assessment pursuant to Article 4 shall contain the following elements:
    - (1) the elements specified in point (a);
    - (2) a list of equivalent models, if applicable;
    - (3) where the preferred fuel or any other suitable fuel is other woody biomass, non-woody biomass, other fossil fuel or other blend of biomass and fossil fuel as referred to in Table 1, a description of the fuel sufficient for its unambiguous identification and the technical standard or specification of the fuel, including the measured moisture content and the measured ash content, and for other fossil fuel also the measured volatile content of the fuel.

**▼ B**

- (b) From 1 January 2022 the following product information on solid fuel local space heaters shall be provided:
- (i) for flueless solid fuel local space heaters and open to chimney solid fuel local space heaters only: the instruction manual for end-users, free access websites of manufacturers and the product packaging shall incorporate the following sentence in such a way to ensure clear visibility and legibility and in a language easily understood by the end-users of the Member State where the product is marketed: ‘This product is not suitable for primary heating purposes’:
- (1) for the instruction manual for end-users this sentence shall be on the cover page of the manual;
- (2) for free-access websites of manufacturers this sentence shall be displayed together with the other characteristics of the product;
- (3) for the product packaging the sentence shall be placed in a prominent position in the packaging when displayed to the end-user prior to purchase.

Table 1

**Information requirements for solid fuel local space heaters**

Model identifier(s):											
Indirect heating functionality:[yes/no]											
Direct heat output: ...(kW)											
Indirect heat output: ...(kW)											
Fuel	Preferred fuel (only one):	Other suitable fuel(s):	$\eta_s$ [%]:	Space heating emissions at nominal heat output (*)				Space heating emissions at minimum heat output (*) (**)			
				PM	OGC	CO	NO <sub>x</sub>	PM	OGC	CO	NO <sub>x</sub>
				[x] mg/Nm <sup>3</sup> (13 % O <sub>2</sub> )				[x] mg/Nm <sup>3</sup> (13 % O <sub>2</sub> )			
Wood logs with moisture content ≤ 25 %	[yes/no]	[yes/no]									
Compressed wood with moisture content < 12 %	[yes/no]	[yes/no]									
Other woody biomass	[yes/no]	[yes/no]									
Non-woody biomass	[yes/no]	[yes/no]									
Anthracite and dry steam coal	[yes/no]	[yes/no]									
Hard coke	[yes/no]	[yes/no]									
Low temperature coke	[yes/no]	[yes/no]									
Bituminous coal	[yes/no]	[yes/no]									
Lignite briquettes	[yes/no]	[yes/no]									
Peat briquettes	[yes/no]	[yes/no]									

## ▼ B

Blended fossil fuel briquettes	[yes/no]	[yes/no]										
Other fossil fuel	[yes/no]	[yes/no]										
Blended biomass and fossil fuel briquettes	[yes/no]	[yes/no]										
Other blend of biomass and solid fuel	[yes/no]	[yes/no]										

**Characteristics when operating with the preferred fuel only**

Item	Symbol	Value	Unit	Item	Symbol	Value	Unit
<b>Heat output</b>				<b>Useful efficiency (NCV as received)</b>			
Nominal heat output	$P_{nom}$	x	kW	Useful efficiency at nominal heat output	$\eta_{th,nom}$	x,x	%
Minimum heat output (indicative)	$P_{min}$	[x,x/N.A.]	kW	Useful efficiency at minimum heat output (indicative)	$\eta_{th,min}$	[x,x/N.A.]	%
<b>Auxiliary electricity consumption</b>				<b>Type of heat output/room temperature control (select one)</b>			
At nominal heat output	$e_{l,max}$	x,xxx	kW	single stage heat output, no room temperature control		[yes/no]	
At minimum heat output	$e_{l,min}$	x,xxx	kW	two or more manual stages, no room temperature control		[yes/no]	
In standby mode	$e_{l,SB}$	x,xxx	kW	with mechanic thermostat room temperature control		[yes/no]	
<b>Permanent pilot flame power requirement</b>				with electronic room temperature control		[yes/no]	
Pilot flame power requirement (if applicable)	$P_{pilot}$	[x,xxx/N.A.]	kW	with electronic room temperature control plus day timer		[yes/no]	
				with electronic room temperature control plus week timer		[yes/no]	
				<b>Other control options (multiple selections possible)</b>			
				room temperature control, with presence detection		[yes/no]	
				room temperature control, with open window detection		[yes/no]	
				with distance control option		[yes/no]	
Contact details	Name and address of the manufacturer or its authorised representative.						

(\*) PM = particulate matter, OGCs = organic gaseous compounds, CO = carbon monoxide, NO<sub>x</sub> = nitrogen oxides

(\*\*) Only required if correction factors F(2) or F(3) are applied.



### ANNEX III

#### Measurements and calculations

1. For the purposes of compliance and verification of compliance with the requirements of this Regulation, measurements and calculations shall be made using harmonised standards the reference numbers of which have been published for this purpose in the *Official Journal of the European Union*, or using other reliable, accurate and reproducible methods that take into account the generally recognised state-of-the-art methods. They shall meet the conditions set out in points 2 to 5.
2. **General conditions for measurements and calculations**
  - (a) Solid fuel local space heaters shall be tested for the preferred fuel and any other suitable fuels indicated in Table 1 of Annex II.
  - (b) Declared values for nominal heat output and seasonal space heating energy efficiency shall be rounded to the nearest one decimal place.
  - (c) Declared values for emissions shall be rounded to the nearest integer.
3. **General conditions for seasonal space heating energy efficiency**
  - (a) The seasonal space heating energy efficiency ( $\eta_s$ ) shall be calculated as the seasonal space heating energy efficiency in active mode ( $\eta_{s,on}$ ), corrected by contributions accounting for heat output control, auxiliary electricity consumption and permanent pilot flame energy consumption.
  - (b) The consumption of electricity shall be multiplied by a conversion coefficient ( $CC$ ) of 2,5.
4. **General conditions for emissions**
  - (a) For solid fuel local space heaters, the measurement shall take account of emissions of particulate matter (PM), organic gaseous compounds (OGC), carbon monoxide (CO) and nitrogen oxides (NO<sub>x</sub>), measured simultaneously with each other and with space heating energy efficiency, except for PM if method 4(a)(i)(2) or 4(a)(i)(3) is used.
    - (i) Three methods are allowed for measuring PM emissions, each with its own requirements, only one of the methods needs to be used:
      - (1) PM measurement by sampling a partial dry flue gas sample over a heated filter. PM measurement as measured in the combustion products of the appliance shall be carried out while the product is providing its nominal output and if appropriate at part load;
      - (2) PM measurement by sampling, over the full burn cycle, a partial flue gas sample, using natural draft, from a diluted flue gas using a full flow dilution tunnel and a filter at ambient temperature;
      - (3) PM measurement by sampling, over a 30-minute period, a partial flue gas sample, using a fixed flue draft at 12 Pa, from a diluted flue gas using a full flow dilution tunnel and a filter at ambient temperature or an electrostatic precipitator.
    - (ii) OGC measurement as measured in the combustion products of the appliance shall be extractive and continuous and be based on the use of a flame ionisation detector. The result obtained is expressed in milligrams of carbon. OGC measurement as measured in the combustion products of the appliance shall be carried out while the product is providing its nominal output and if appropriate at part load.

**▼ B**

- (iii) CO measurement as measured in the combustion products of the appliance shall be extractive and continuous and be based on the use of an infrared detector. CO measurement as measured in the combustion products of the appliance shall be carried out while the product is providing its nominal output and if appropriate at part load.
- (iv) NO<sub>x</sub> measurement as measured in the combustion products of the appliance shall be extractive and continuous and be based on chemiluminescent detection. Emissions of nitrogen oxides shall be measured as the sum of nitrogen monoxide and nitrogen dioxide, and expressed in nitrogen dioxide. NO<sub>x</sub> measurement as measured in the combustion products of the appliance shall be carried out while the product is providing its nominal output and if appropriate at part load.
- (b) Declared values for nominal heat output, seasonal space heating energy efficiency and emissions shall be rounded to the nearest integer.

**5. Specific conditions for seasonal space heating energy efficiency**

- (a) The seasonal space heating energy efficiency of solid fuel local space heaters is defined as:

$$\eta_S = \eta_{S,on} - 10\% + F(2) + F(3) - F(4) - F(5)$$

Where:

- $\eta_{S,on}$  is the seasonal space heating energy efficiency in active mode, expressed in %, calculated as set out in point 5(b),
- $F(2)$  is a correction factor accounting for a positive contribution to the seasonal space heating energy efficiency due to adjusted contributions of controls of indoor heating comfort, the values of which are mutually exclusive, cannot be added to each other, expressed in %,
- $F(3)$  is a correction factor accounting for a positive contribution to the seasonal space heating energy efficiency due to adjusted contributions of controls for indoor heating comfort the values of which can be added to each other, expressed in %,
- $F(4)$  is a correction factor accounting for a negative contribution to the seasonal space heating energy efficiency by auxiliary electricity consumption, expressed in %,
- $F(5)$  is a correction factor accounting for a negative contribution to the seasonal space heating energy efficiency by energy consumption of a permanent pilot flame, expressed in %.
- (b) The seasonal space heating energy efficiency in active mode is calculated as:

$$\eta_{S,on} = \eta_{th,nom}$$

Where:

- $\eta_{th,nom}$  is the useful efficiency at nominal heat output, based on NCV.
- (c) The correction factor  $F(2)$  accounting for a positive contribution to the seasonal space heating efficiency due to adjusted contributions of controls for indoor heating comfort, the values of which are mutually exclusive or cannot be added to each other, is calculated as follows:

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For solid fuel local space heaters the correction factor  $F(2)$  is equal to one of the factors according to Table 2, depending on which control characteristic applies. Only one value can be selected.

Table 2

**Correction factor  $F(2)$** 

<b>If the product is equipped with (only one option may apply):</b>	<b>F(2)</b>
single stage heat output, no room temperature control	0,0 %
two or more manual stages, no temperature control	1,0 %
with mechanic thermostat room temperature control	2,0 %
with electronic room temperature control	4,0 %
with electronic room temperature control plus day timer	6,0 %
with electronic room temperature control plus week timer	7,0 %

$F(2)$  shall be zero for solid fuel local space heaters not complying with the requirements set out in Annex II, point 2 on emissions where the temperature control is set at the minimum heat output. The heat output in this setting must not be higher than 50 % of the nominal heat output.

- (d) The correction factor  $F(3)$  accounting for a positive contribution to the seasonal space heating efficiency due to adjusted contributions of controls for indoor heating comfort, the values of which can be added to each other, is calculated as follows:

For solid fuel local space heaters the correction factor  $F(3)$  is the summation of the values according to Table 3, depending on which control characteristic(s) applies.

Table 3

**Correction factor  $F(3)$** 

<b>If the product is equipped with (multiple options may apply):</b>	<b>F(3)</b>
room temperature control with presence detection	1,0 %
room temperature control with open window detection	1,0 %
with distance control option	1,0 %

$F(3)$  shall be zero for solid fuel local space heaters not complying with the requirements set out in Annex II, point 2 on emissions where the temperature control is set at the minimum heat output. The heat output in this setting must not be higher than 50 % of the nominal heat output.



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- (e) The auxiliary electricity use correction factor  $F(4)$  is calculated as:

This correction factor takes into account the auxiliary electricity use during on-mode and standby-mode operation.

$$F(4) = CC \cdot \frac{0,2 \cdot el_{max} + 0,8 \cdot el_{min} + 1,3 \cdot el_{sb}}{P_{nom}} \cdot 100[\%]$$

Where:

- $el_{max}$  is the electric power consumption at nominal heat output, expressed in kW,
  - $el_{min}$  is the electric power consumption at minimum heat output, expressed in kW. In case the product does not offer a minimum heat output the value for the electric power consumption at nominal heat output shall be used,
  - $el_{sb}$  is the electric power consumption of the product while in standby mode, expressed in kW,
  - $P_{nom}$  is the nominal heat output of the product, expressed in kW.
- (f) The correction factor  $F(5)$  related to the energy consumption of a permanent pilot flame is calculated as follows:

This correction factor takes into account the permanent pilot flame power requirement.

$$F(5) = 0,5 \cdot \frac{P_{pilot}}{P_{nom}} \cdot 100[\%]$$

Where:

- $P_{pilot}$  is the pilot flame consumption, expressed in kW;
- $P_{nom}$  is the nominal heat output of the product, expressed in kW.

**▼ M1***ANNEX IV***Product compliance verification by market surveillance authorities**

The verification tolerances defined in this Annex relate only to the verification of the measured parameters by Member State authorities and shall not be used by the manufacturer or importer as an allowed tolerance to establish the values in the technical documentation or in interpreting these values with a view to achieving compliance or to communicate better performance by any means.

When verifying the compliance of a product model with the requirements laid down in this Regulation pursuant to Article 3(2) of Directive 2009/125/EC, for the requirements referred to in this Annex, the authorities of the Member States shall apply the following procedure:

- (1) The Member State authorities shall verify one single unit of the model.
- (2) The model shall be considered to comply with the applicable requirements if:
  - (a) the values given in the technical documentation pursuant to point 2 of Annex IV to Directive 2009/125/EC (declared values), and, where applicable, the values used to calculate these values, are not more favourable for the manufacturer or importer than the results of the corresponding measurements carried out pursuant to paragraph (g) thereof; and
  - (b) the declared values meet any requirements laid down in this Regulation, and any required product information published by the manufacturer or importer does not contain values that are more favourable for the manufacturer or importer than the declared values; and
  - (c) when the Member State authorities test the unit of the model, the determined values (the values of the relevant parameters as measured in testing and the values calculated from these measurements) comply with the respective verification tolerances as given in Table 4. The unit shall be tested with one or more fuels with characteristics in the same range as the fuel(s) that were used by the manufacturer to perform the measurements described in Annex III.
- (3) If the results referred to in point 2(a) or (b) are not achieved, the model and all models that have been listed as equivalent models in the manufacturer's or importer's technical documentation shall be considered not to comply with this Regulation.
- (4) If the result referred to in point 2(c) is not achieved, the Member State authorities shall select three additional units of the same model for testing. As an alternative, the three additional units selected may be of one or more different models that have been listed as equivalent models in the manufacturer's or importer's technical documentation.
- (5) The model shall be considered to comply with the applicable requirements if, for these three units, the arithmetical mean of the determined values complies with the respective verification tolerances given in Table 4.
- (6) If the result referred to in point 5 is not achieved, the model and all models that have been listed as equivalent models in the manufacturer's or importer's technical documentation shall be considered not to comply with this Regulation.

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- (7) The Member State authorities shall provide all relevant information to the authorities of the other Member States and to the Commission without delay after a decision being taken on the non-compliance of the model according to points 3 and 6.

The Member State authorities shall use the measurement and calculation methods set out in Annex III.

The Member State authorities shall only apply the verification tolerances that are set out in Table 4 and shall only use the procedure described in points 1 to 7 for the requirements referred to in this Annex. No other tolerances, such as those set out in harmonised standards or in any other measurement method, shall be applied.

Table 4

**Verification tolerances**

Parameters	Verification tolerances
Seasonal space-heating energy efficiency, $\eta_s$	The determined value shall not be lower than the declared value by more than 5 %.
Emissions of particulate matter	<p>The determined value shall not exceed the declared value by more than 20 mg/m<sup>3</sup> at 13 % O<sub>2</sub> for open fronted solid fuel local space heaters, closed fronted solid fuel local space heaters using solid fuel other than compressed wood in the form of pellets and cookers when measured according to the method described in Annex III, point 4(a)(i)(1).</p> <p>The determined value shall not exceed the declared value by more than 10 mg/m<sup>3</sup> at 13 % O<sub>2</sub> for closed fronted solid fuel local space heaters using compressed wood in the form of pellets when measured according to the method described in Annex III, point (4)(a)(i)(1).</p> <p>The determined value shall not exceed the declared value by more than 1 g/kg when measured according to the method described in Annex III, point (4)(a)(i)(2).</p> <p>The determined value shall not exceed the declared value by more than 0,8 g/kg when measured according to the method described in Annex III, point (4)(a)(i)(3).</p>
Emissions of organic gaseous compounds	<p>The determined value shall not exceed the declared value by more than 25 mgC/m<sup>3</sup> at 13 % O<sub>2</sub> for open fronted solid fuel local space heaters, closed fronted solid fuel local space heaters using solid fuel other than compressed wood in the form of pellets and cookers.</p> <p>The determined value shall not exceed the declared value by more than 15 mgC/m<sup>3</sup> at 13 % O<sub>2</sub> for closed fronted solid fuel local space heaters using compressed wood in the form of pellets.</p>
Emissions of carbon monoxide	<p>The determined value shall not exceed the declared value by more than 275 mg/m<sup>3</sup> at 13 % O<sub>2</sub> for open fronted solid fuel local space heaters, closed fronted solid fuel local space heaters using solid fuel other than compressed wood in the form of pellets and cookers.</p> <p>The determined value shall not exceed the declared value by more than 60 mg/m<sup>3</sup> at 13 % O<sub>2</sub> for closed fronted solid fuel local space heaters using compressed wood in the form of pellets.</p>
Emissions of nitrogen oxides	The determined value shall not exceed the declared value by more than 30 mg/m <sup>3</sup> expressed as NO <sub>2</sub> at 13 % O <sub>2</sub> .

*ANNEX V***Indicative benchmarks referred to in Article 6**

At the time of entry into force of this Regulation, the best available technology on the market for solid fuel local space heaters in terms of seasonal space heating energy efficiency and emissions of particulate matter, carbon monoxide, organic gaseous compounds and nitrogen oxides was identified as follows. At the time of entry into force of this Regulation, no single solid fuel local space heater was identified meeting all the values specified in points 1 to 5. Several solid fuel local space heaters met one or more of these values:

1. Specific benchmarks for seasonal space heating energy efficiency of solid fuel local space heaters.
  - (a) benchmark for seasonal space heating energy efficiency of open fronted solid fuel local space heaters: 47 %;
  - (b) benchmark for seasonal space heating energy efficiency of closed fronted solid fuel local space heaters using solid fuel other than compressed wood in the form of pellets: 86 %;
  - (c) benchmark for seasonal space heating energy efficiency of closed fronted solid fuel local space heaters using compressed wood in the form of pellets: 94 %;
  - (d) benchmark for seasonal space heating energy efficiency of cookers using solid fuel: 75 %.
2. Specific benchmarks for emissions of particulate matter (PM) by solid fuel local space heaters.
  - (a) benchmark for emissions of PM by open fronted solid fuel local space heaters, closed fronted solid fuel local space heaters using solid fuel other than compressed wood in the form of pellets and cookers: 20 mg/m<sup>3</sup> at 13 % O<sub>2</sub> when measured according to the method described in Annex III, point 4(a)(i)(1);
  - (b) benchmark for emissions of PM by closed fronted solid fuel local space heaters using compressed wood in the form of pellets: 10 mg/m<sup>3</sup> at 13 % O<sub>2</sub> when measured according to the method described in Annex III, point 4(a)(i)(1).
3. Specific benchmarks for emissions of organic gaseous compounds (OGCs) by solid fuel local space heaters.
  - (a) benchmark for emissions of OGCs by open fronted solid fuel local space heaters, closed fronted solid fuel local space heaters using solid fuel other than compressed wood in the form of pellets and cookers: 30 mg/m<sup>3</sup> at 13 % O<sub>2</sub>;
  - (b) benchmark for emissions of OGCs by closed fronted solid fuel local space heaters using compressed wood in the form of pellets: 10 mg/m<sup>3</sup> at 13 % O<sub>2</sub>.
4. Specific benchmarks for emissions of carbon monoxide (CO) by solid fuel local space heaters.
  - (a) benchmark for emissions of CO by open fronted solid fuel local space heaters, closed fronted solid fuel local space heaters using solid fuel other than compressed wood in the form of pellets and cookers: 500 mg/m<sup>3</sup> at 13 % O<sub>2</sub>;

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- (b) benchmark for emissions of CO by closed fronted solid fuel local space heaters using solid fuel other than compressed wood in the form of pellets: 250 mg/m<sup>3</sup> at 13 % O<sub>2</sub>.
5. Specific benchmarks for emissions of nitrogen oxides (NO<sub>x</sub>) by solid fuel local space heaters.
- (a) benchmark for emissions of NO<sub>x</sub> by open fronted solid fuel local space heaters, closed fronted solid fuel local space heaters and cookers: 50 mg/m<sup>3</sup> at 13 % O<sub>2</sub>.

The benchmarks specified in points 1 to 5 do not necessarily imply that a combination of those values is achievable for a single solid fuel local space heater.

For closed fronted solid fuel local space heaters using solid fuel other than compressed wood in the form of pellets an example of a good combination is an existing model with a seasonal space heating efficiency of 83 %, emissions of particulate matter of 33 mg/m<sup>3</sup> at 13 % O<sub>2</sub>, emissions of organic gaseous compounds of 69 mg/m<sup>3</sup> at 13 % O<sub>2</sub>, of emissions carbon monoxide of 1 125 mg/m<sup>3</sup> at 13 % O<sub>2</sub> and emissions of nitrogen oxides of 115 mg/m<sup>3</sup> at 13 % O<sub>2</sub>.

For closed fronted solid fuel local space heaters using compressed wood in the form of pellets an example of a good combination is an existing model with a seasonal space heating efficiency of 91 %, emissions of particulate matter of 22 mg/m<sup>3</sup> at 13 % O<sub>2</sub>, emissions of organic gaseous compounds of 6 mg/m<sup>3</sup> at 13 % O<sub>2</sub>, emissions of carbon monoxide of 312 mg/m<sup>3</sup> at 13 % O<sub>2</sub> and emissions of nitrogen oxides of 121 mg/m<sup>3</sup> at 13 % O<sub>2</sub>.

For cookers an example of a good combination is an existing model with a seasonal space heating efficiency of 78 %, emissions of particulate matter of 38 mg/m<sup>3</sup> at 13 % O<sub>2</sub>, emissions of organic gaseous compounds of 66 mg/m<sup>3</sup> at 13 % O<sub>2</sub>, emissions of carbon monoxide of 1 375 mg/m<sup>3</sup> at 13 % O<sub>2</sub> and emissions of nitrogen oxides of 71 mg/m<sup>3</sup> at 13 % O<sub>2</sub>.