



Brussels, **XXX**  
[...](2015) **XXX** draft

ANNEXES 1 to 5

## **ANNEXES**

**to the COMMISSION REGULATION (EU) No .../..**

**implementing Directive 2009/125/EC of the European Parliament and of the Council**

**with regard to ecodesign requirements for local space heaters**

**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 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 on energy efficiency<sup>1</sup>; the value of the conversion coefficient is  $CC = 2,5$ ;
3. 'nitrogen oxides emissions' means the emissions of nitrogen oxides at nominal heat output expressed in  $\text{mg/kWh}_{\text{input}}$  based on GCV for gaseous or liquid fuel local space heaters and commercial local space heaters;
4. '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;
5. 'gross calorific value moisture free' (GCV) means the total amount of heat released by a unit quantity of fuel dried of inherent moisture, when it is burned completely with oxygen, and when the products of combustion are returned to ambient temperature; this quantity includes the condensation heat of the water vapour formed by the combustion of any hydrogen contained in the fuel;
6. '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 of a local space heater, expressed in %, whereby:
  - (a) for domestic local space heaters the total energy input is expressed in terms of NCV and/or in terms of final energy multiplied by CC;
  - (b) for commercial local space heaters the total energy input is expressed in terms of GCV and in terms of final energy multiplied by CC;
7. 'electric power requirement at nominal heat output' ( $e_{l_{\text{max}}}$ ) means the electric power consumption of the 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;
8. 'electric power requirement at minimum heat output' ( $e_{l_{\text{min}}}$ ) means the electric power consumption of the 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;
9. 'electric power requirement in standby mode' ( $e_{l_{\text{sb}}}$ ) means the electric power consumption of the product while in standby mode, expressed in kW;
10. 'permanent pilot flame power requirement' ( $P_{\text{pilot}}$ ) means the fuel consumption of gaseous or liquid 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

---

<sup>1</sup> OJ L 315, 14.11.2012, p. 1.

load heat output, when lit for more than 5 minutes before the main burner is on, expressed in kW;

11. 'manual heat charge control, with integrated thermostat' means a manually operated sensing device integrated into the product, which measures and regulates its core temperature to vary the accumulated amount of heat;
12. 'manual heat charge control with room and/or outdoor temperature feedback' means a manually operated sensing device integrated into the product which measures its core temperature and varies the accumulated amount of heat in relation with the room temperature and/or outdoor temperature;
13. 'electronic heat charge control with room and/or external temperature feedback or regulated by energy supplier' means an automatically operated sensing device integrated into the product which measures its core temperature and varies the accumulated amount of heat in relation with the room temperature and/or outdoor temperature or a device whose charging regime can be regulated by the energy supplier;
14. 'fan assisted heat output' means the product is equipped with an integrated and controllable fan (or fans) to vary the heat output to adjust to the heat demand;
15. '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;
16. '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;
17. '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;
18. '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;
19. '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;
20. '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;
21. '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;

22. '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;
23. '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;
24. 'with adaptive start control' means the function which predicts and initiates the optimal start of heating up in order to reach the set-point temperature at the desired time;
25. 'with working time limitation' means the product has a function that automatically deactivates the product after a pre-set period of time;
26. 'with black bulb sensor' means the product is equipped with an electronic device, either integrated or external, that measures air and radiant temperature;
27. 'single stage' means that the product is not capable of automatically varying its heat output;
28. '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;
29. '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;
30. '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;
31. 'tube system heat output' means the combined tube segment heat output of the configuration as it is placed on the market, expressed in kW;
32. 'tube segment heat output' means the heat output of a tube segment which together with other tube segments forms part of a configuration of a tube system, expressed in kW;
33. 'radiant factor, at either nominal or minimum heat output' ( $RF_{nom}$  or  $RF_{min}$  respectively) means the ratio of the infrared heat output of the product compared to the total energy input when providing the nominal or minimum heat output, calculated as infrared energy output divided by total energy input on the basis of the net calorific value (NCV) of the fuel when providing the nominal or minimum heat output, expressed in %;
34. 'envelope insulation' means the level of thermal insulation of the product envelope or jacket as applied to minimise heat losses if the product is allowed to be placed outdoors;

35. 'envelope loss factor' means the thermal losses by that part of the product that is installed outside the enclosed space to be heated and which is determined by the transmittance of the relevant envelope of that part, expressed in %;
36. 'model identifier' means the code, usually alphanumeric, which distinguishes a specific local space heater model from other models with the same trade mark or manufacturer's name;
37. 'moisture content' means the mass of water in the fuel in relation to the total mass of the fuel as used in the local space heater.

**ANNEX II**  
**Ecodesign requirements**

1. Specific ecodesign requirements for seasonal space heating energy efficiency

- (a) Local space heaters shall comply with the following requirements from 1 January 2018:
- i) seasonal space heating energy efficiency of open fronted local space heaters using gaseous or liquid fuel shall not be less than 42%;
  - ii) seasonal space heating energy efficiency of closed fronted local space heaters using gaseous or liquid fuel shall not be less than 72%;
  - iii) seasonal space heating energy efficiency of electric portable local space heaters shall not be less than 36%;
  - iv) seasonal space heating energy efficiency of electric fixed local space heaters with a nominal heat output above 250 W shall not be less than 38%;
  - v) seasonal space heating energy efficiency of electric fixed local space heaters with a nominal heat output equal or below 250 W shall not be less than 34%;
  - vi) seasonal space heating energy efficiency of electric storage local space heaters shall not be less than 38.5%;
  - vii) seasonal space heating energy efficiency of electric underfloor local space heaters shall not be less than 38%;
  - viii) seasonal space heating energy efficiency of electric radiant local space heaters shall not be less than 35%;
  - ix) seasonal space heating energy efficiency of electric visibly glowing radiant local space heaters with a nominal heat output above 1.2 kW shall not be less than 35%;
  - x) seasonal space heating energy efficiency of electric visibly glowing radiant local space heaters with a nominal heat output equal or below 1.2 kW shall not be less than 31%;
  - xi) seasonal space heating energy efficiency of luminous local space heaters shall not be less than 85%;
  - xii) seasonal space heating energy efficiency of tube local space heaters shall not be less than 74%.

2. Specific ecodesign requirements for emissions

- (a) From 1 January 2018 emissions of nitrogen oxides (NO<sub>x</sub>) from liquid and gaseous fuel local space heaters shall not exceed the following values:
- i) emissions of NO<sub>x</sub> by open fronted local space heaters and closed fronted local space heaters using gaseous or liquid fuels shall not exceed 130 mg/kWh<sub>input</sub> based on GCV;
  - ii) emissions of NO<sub>x</sub> by luminous local space heaters and tube local space heaters shall not exceed 200 mg/kWh<sub>input</sub> based on GCV.

3. Requirements for product information

- (a) From 1 January 2018 the following product information on 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) for gaseous or liquid fuel local space heaters, the information set out in Table 1, with its technical parameters measured and calculated in accordance with Annex III and showing the significant figures indicated in the table;
    - (2) for electric local space heaters, the information set out in Table 2, with its technical parameters measured and calculated in accordance with Annex III and showing the significant figures indicated in the table;
    - (3) for commercial local space heaters, the information set out in Table 3, with its technical parameters measured and calculated in accordance with Annex III and showing the significant figures indicated in the table;
    - (4) any specific precautions that must be taken when the local space heater is assembled, installed or maintained;
    - (5) 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 all equivalent models, if applicable;
- (b) From 1 January 2018 the following product information on local space heaters shall be provided:
- i) for flueless local space heaters and open to chimney 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.
  - ii) for electric portable 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 only suitable for well insulated spaces or occasional use.’:

- (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 gaseous/liquid fuel local space heaters

Model identifier(s):			
Indirect heating functionality:[yes/no]			
Direct heat output: ...(kW)			
Indirect heat output: ...(kW)			
<b>Fuel</b>			Space heating emissions *
			NO <sub>x</sub>
Select fuel type	[gaseous / liquid]	[specify]	[mg/kWh <sub>input</sub> ] (GCV)
<b>Item</b>	<b>Symbol</b>	<b>Value</b>	<b>Unit</b>
<b>Heat output</b>			
Nominal heat output	$P_{nom}$	x,x	kW
Minimum heat output (indicative)	$P_{min}$	[x,x / N.A.]	kW
<b>Auxiliary electricity consumption</b>			
At nominal heat output	$el_{max}$	x,xxx	kW
At minimum heat output	$el_{min}$	x,xxx	kW
In standby mode	$el_{SB}$	x,xxx	kW
<b>Permanent pilot flame power requirement</b>			
Pilot flame power requirement (if applicable)	$P_{pilot}$	[x,xxx / N.A.]	kW
Contact details	Name and address of the manufacturer or its authorised representative.		
* NO <sub>x</sub> = nitrogen oxides			

**Table 2:** Information requirements for electric local space heaters

Model identifier(s):																																											
Item	Symbol	Value	Unit																																								
<b>Heat output</b>																																											
Nominal heat output	$P_{nom}$	x,x	kW																																								
Minimum heat output (indicative)	$P_{min}$	[x,x / N.A.]	kW																																								
Maximum continuous heat output	$P_{max,c}$	x,x	kW																																								
<b>Auxiliary electricity consumption</b>																																											
At nominal heat output	$el_{max}$	x,xxx	kW																																								
At minimum heat output	$el_{min}$	x,xxx	kW																																								
In standby mode	$el_{SB}$	x,xxx	kW																																								
<table border="1"> <thead> <tr> <th>Item</th> <th>Unit</th> </tr> </thead> <tbody> <tr> <td colspan="2"><b>Type of heat input, for electric storage local space heaters only (select one)</b></td> </tr> <tr> <td>manual heat charge control, with integrated thermostat</td> <td>[yes/no]</td> </tr> <tr> <td>manual heat charge control with room and/or outdoor temperature feedback</td> <td>[yes/no]</td> </tr> <tr> <td>electronic heat charge control with room and/or outdoor temperature feedback</td> <td>[yes/no]</td> </tr> <tr> <td>fan assisted heat output</td> <td>[yes/no]</td> </tr> <tr> <td colspan="2"><b>Type of heat output / room temperature control (select one)</b></td> </tr> <tr> <td>single stage heat output and no room temperature control</td> <td>[yes/no]</td> </tr> <tr> <td>Two or more manual stages, no room temperature control</td> <td>[yes/no]</td> </tr> <tr> <td>with mechanic thermostat room temperature control</td> <td>[yes/no]</td> </tr> <tr> <td>with electronic room temperature control</td> <td>[yes/no]</td> </tr> <tr> <td>electronic room temperature control plus day timer</td> <td>[yes/no]</td> </tr> <tr> <td>electronic room temperature control plus week timer</td> <td>[yes/no]</td> </tr> <tr> <td colspan="2"><b>Other control options (multiple selections possible)</b></td> </tr> <tr> <td>room temperature control, with presence detection</td> <td>[yes/no]</td> </tr> <tr> <td>room temperature control, with open window detection</td> <td>[yes/no]</td> </tr> <tr> <td>with distance control option</td> <td>[yes/no]</td> </tr> <tr> <td>with adaptive start control</td> <td>[yes/no]</td> </tr> <tr> <td>with working time limitation</td> <td>[yes/no]</td> </tr> <tr> <td>with black bulb sensor</td> <td>[yes/no]</td> </tr> </tbody> </table>				Item	Unit	<b>Type of heat input, for electric storage local space heaters only (select one)</b>		manual heat charge control, with integrated thermostat	[yes/no]	manual heat charge control with room and/or outdoor temperature feedback	[yes/no]	electronic heat charge control with room and/or outdoor temperature feedback	[yes/no]	fan assisted heat output	[yes/no]	<b>Type of heat output / room temperature control (select one)</b>		single stage heat output and no room temperature control	[yes/no]	Two or more manual stages, no room temperature control	[yes/no]	with mechanic thermostat room temperature control	[yes/no]	with electronic room temperature control	[yes/no]	electronic room temperature control plus day timer	[yes/no]	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]	with adaptive start control	[yes/no]	with working time limitation	[yes/no]	with black bulb sensor	[yes/no]
Item	Unit																																										
<b>Type of heat input, for electric storage local space heaters only (select one)</b>																																											
manual heat charge control, with integrated thermostat	[yes/no]																																										
manual heat charge control with room and/or outdoor temperature feedback	[yes/no]																																										
electronic heat charge control with room and/or outdoor temperature feedback	[yes/no]																																										
fan assisted heat output	[yes/no]																																										
<b>Type of heat output / room temperature control (select one)</b>																																											
single stage heat output and no room temperature control	[yes/no]																																										
Two or more manual stages, no room temperature control	[yes/no]																																										
with mechanic thermostat room temperature control	[yes/no]																																										
with electronic room temperature control	[yes/no]																																										
electronic room temperature control plus day timer	[yes/no]																																										
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]																																										
with adaptive start control	[yes/no]																																										
with working time limitation	[yes/no]																																										
with black bulb sensor	[yes/no]																																										
Contact details	Name and address of the manufacturer or its authorised representative.																																										

**Table 3:** Information requirements for commercial local space heaters

Model identifier(s):			
Type of heating:[luminous / radiant tube]			
<b>Fuel</b>	<b>Fuel</b>		Space heating emissions *
			NO <sub>x</sub>
Select fuel type	[gaseous / liquid]	[specify]	<b>mg/kWh<sub>input</sub> (GCV)</b>
<b>Characteristics when operating with the preferred fuel only</b>			
<b>Item</b>	<b>Symbol</b>	<b>Value</b>	<b>Unit</b>
<b>Heat output</b>			
Nominal heat output	$P_{nom}$	[x,x]	kW
Minimum heat output	$P_{min}$	[x,x / N.A.]	kW
Minimum heat output (as percentage of nominal heat output)	..	[x]	%
Nominal tube system heat output (if applicable)	$P_{system}$	x,x	kW
Nominal tube segment heat output (if applicable)	$P_{heater,i}$	[x,x / N.A.]	kW
(repeat for multiple segments, if applicable)	..	[x,x / N.A.]	kW
number of identical tube segments	$n$	[x]	[-]
<b>Radiant factor</b>			
radiant factor at nominal heat output	$RF_{nom}$	[x,x]	[-]
radiant factor at minimum heat output	$RF_{min}$	[x,x]	[-]
radiant factor of tube segment at nominal heat output	$RF_i$	[x,x]	[-]
(repeat for multiple segments, if applicable)	..		
<b>Auxiliary electricity consumption</b>			
At nominal heat output	$el_{max}$	[x,xxx]	kW
At minimum heat output	$el_{min}$	[x,xxx]	kW
In standby mode	$el_{SB}$	[x,xxx]	kW
<b>Permanent pilot flame power requirement</b>			
Pilot flame power requirement (if applicable)	$P_{pilot}$	[x,xxx / N.A.]	kW
Contact details	Name and address of the manufacturer or its authorised representative.		
* NO <sub>x</sub> = nitrogen oxides			
** for luminous local space heaters the weighted thermal efficiency is by default 85.6%			

**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) Declared values for nominal heat output and seasonal space heating energy efficiency shall be rounded to the nearest one decimal place.
  - (b) 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 storage and 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 gaseous and liquid fuel local space heaters the measurement shall take account of emissions of nitrogen oxides ( $NO_x$ ). Emissions of nitrogen oxides shall be calculated as the sum of nitrogen monoxide and nitrogen dioxide, and expressed in nitrogen dioxide.
5. Specific conditions for seasonal space heating energy efficiency
  - (a) The seasonal space heating energy efficiency of all local space heaters except commercial local space heaters is defined as:

$$\eta_S = \eta_{S,on} - 10\% + F(1) + F(2) + F(3) - F(4) - F(5)$$

The seasonal space heating energy efficiency of commercial local space heaters is defined as:

$$\eta_S = \eta_{S,on} - F(1) - F(4) - F(5)$$

Where:

- $\eta_{S,on}$  is the seasonal space heating energy efficiency in active mode, expressed in %, calculated as set out in point 5(b);
- $F(1)$  is a correction factor accounting for a positive contribution to the seasonal space heating energy efficiency of electric storage local space heaters due to adjusted contributions for options for heat storage and output; and a negative contribution to seasonal space heating efficiency for commercial local space heaters due to adjusted contributions for options for the heat output, expressed in %;
- $F(2)$  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:

For all local space heaters except electric local space heaters and commercial local space heaters:

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

Where:

- $\eta_{th,nom}$  is the useful efficiency at nominal heat output, based on NCV.

For electric local space heaters:

$$\eta_{S,on} = \frac{1}{CC} \cdot \eta_{th,on}$$

Where:

- $CC$  is the electric to primary energy ‘conversion coefficient’.
- $\eta_{th,on}$  for electric local space heaters is 100%.

For commercial local space heaters:

$$\eta_{S,on} = \eta_{S,th} \cdot \eta_{S,RF}$$

Where:

- $\eta_{S,th}$  is the weighted thermal efficiency, expressed in %;
- $\eta_{S,RF}$  is the emission efficiency, expressed in %.

For luminous local space heaters,  $\eta_{S,th}$  is 85.6%;

For tube local space heaters:

$$\eta_{S,th} = (0.15 \cdot \eta_{th,nom} + 0.85 \cdot \eta_{th,min}) - F_{env}$$

Where:

- $\eta_{th,nom}$  is the useful efficiency at nominal heat output, expressed in %, based on GCV;
- $\eta_{th,min}$  is the useful efficiency at minimum heat output, expressed in %, based on GCV.
- $F_{env}$  are the envelope losses of the heat generator, expressed in %;

If the heat generator of the tube local space heater is specified by the manufacturer or by the supplier to be installed in the indoor space to be heated, the envelope losses are 0 (zero).

If the heat generator of the tube local space heater is specified by the manufacturer or by the supplier to be installed outside the heated area, the envelope loss factor depends on the thermal transmittance of the envelope of the heat generator according to Table 4.

**Table 4:** Envelope loss factor of the heat generator

Thermal transmittance of envelope (U)	$F_{env}$
$U \leq 0.5$	2.2%
$0.5 < U \leq 1.0$	2.4%
$1.0 < U \leq 1.4$	3.2%
$1.4 < U \leq 2.0$	3.6%
$U > 2.0$	6.0%

The emission efficiency of commercial local space heaters is calculated as follows:

$$\eta_{S,RF} = \frac{(0.94 \cdot RF_S) + 0.19}{(0.46 \cdot RF_S) + 0.45}$$

Where:

- $RF_S$  is the radiant factor of the commercial local space heater, expressed in %.

For all commercial local space heaters except tube systems:

$$RF_S = 0.15 \cdot RF_{nom} + 0.85 \cdot RF_{min}$$

Where:

- $RF_{nom}$ , is the radiant factor at nominal heat output, expressed in %;
- $RF_{min}$ , is the radiant factor at minimum heat output, expressed in %.

For tube systems:

$$RF_S = \sum_{i=1}^n (0.15 \cdot RF_{nom,i} + 0.85 \cdot RF_{min,i}) \cdot \frac{P_{heater,i}}{P_{system}}$$

Where:

- $RF_{nom,i}$ , is the radiant factor per tube segment at nominal heat output, expressed in %;
- $RF_{min,i}$ , is the radiant factor per tube segment at minimum heat output, expressed in %;
- $P_{heater,i}$ , is the heat output per tube segment, expressed in kW, based on GCV;
- $P_{system}$ , is the heat output of the complete tube system, expressed in kW, based on GCV.

The above equation only applies if the construction of the burner, tubes and reflectors of the tube segment as applied in the tube system is identical to a single tube local space heater and the settings that determine the performance of a the tube segment are identical to those of a single tube local space heater.

- (c) The correction factor  $F(1)$  accounting for a positive contribution to the seasonal space heating efficiency due to adjusted contributions of controls for heat input and output and if the heat is distributed through natural or fan assisted convection for electric storage local space heaters and a negative contribution for commercial local space heaters related to the capability of the product of regulating its heat output.

For electric storage local space heaters the heat output correction factor  $F(1)$  is calculated as follows:

In case the product is equipped with one of the (mutually exclusive) options shown in table 5, the correction factor  $F(1)$  shall be increased with the corresponding value of that option.

**Table 5:** Correction factor  $F(1)$  for electric storage local space heaters

<b>If the product is equipped with (only one option may apply):</b>	<b>F(1) is increased by</b>
manual heat charge control, with integrated thermostat	0.0%
manual heat charge control with room and/or outdoor temperature feedback	2.0%
electronic heat charge control with room and/or outdoor temperature feedback or controlled by energy supplier	3.5%

In case the heat output of the electric storage local space heater is assisted by a fan, an additional 1.5% shall be added to  $F(1)$ .

For commercial local space heaters the heat output correction factor is calculated as follows:

**Table 6:** Correction factor  $F(1)$  for commercial local space heaters

<b>If the heat output control type of the products is:</b>	<b>F(1) is calculated as:</b>
single stage	$F(1) = 5\%$
two stage	$F(1) = 5\% - (2.5\% \cdot \frac{P_{nom} - P_{min}}{30\% \cdot P_{nom}})$
modulating	$F(1) = 5\% - (5.0\% \cdot \frac{P_{nom} - P_{min}}{40\% \cdot P_{nom}})$

The minimum value of the correction factor  $F(1)$  for two stage commercial local space heaters is 2.5%, and for modulating commercial local space heaters is 5%.

For local space heaters not being electric storage heaters or commercial local space heaters the correction factor  $F(1)$  shall be 0 (zero).

- (d) 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:

For all local space heaters the correction factor  $F(2)$  is equal to one of the factors according to Table 7, depending on which control characteristic applies. Only one value can be selected.

**Table 7:** Correction factor  $F(2)$

If the product is equipped with (only one option may apply):	F(2)					
	for electric local space heaters					for local space heaters using gaseous or liquid fuels
	Portable	Fixed	Storage	Underfloor	Radiant	
single stage heat output, no room temperature control	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
two or more manual stages, no temperature control	1.0%	0.0%	0.0%	0.0%	2.0%	1.0%
with mechanic thermostat room temperature control	6.0%	1.0%	0.5%	1.0%	1.0%	2.0%
with electronic room temperature control	7.0%	3.0%	1.5%	3.0%	2.0%	4.0%
with electronic room temperature control plus day timer	8.0%	5.0%	2.5%	5.0%	3.0%	6.0%
with electronic room temperature control plus week timer	9.0%	7.0%	3.5%	7.0%	4.0%	7.0%

The  $F(2)$  correction factor does not apply to commercial local space heaters.

- (e) 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 all local space heaters the correction factor  $F(3)$  is the summation of the values according to Table 8, depending on which control characteristic(s) applies.

**Table 8:** Correction factor  $F(3)$

If the product is equipped with (multiple options may apply):	F(3)					
	for electric local space heaters					for local space heaters using gaseous or liquid fuels
	Portable	Fixed	Storage	Underfloor	Radiant	
room temperature control with presence detection	1.0%	0.0%	0.0%	0.0%	2.0%	1.0%
room temperature control with open window detection	0.0%	1.0%	0.5%	1.0%	1.0%	1.0%
with distance control option	0.0%	1.0%	0.5%	1.0%	1.0%	1.0%



with adaptive start control	0.0%	1.0%	0.5%	1.0%	0.0%	0.0%
with working time limitation	0.0%	0.0%	0.0%	0.0%	1.0%	0.0%
with black bulb sensor	0.0%	0.0%	0.0%	0.0%	1.0%	0.0%

(f) 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.

For electric local space heaters the correction is calculated as follows:

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

$$F(4) = CC \cdot \frac{\alpha \cdot el_{sb}}{P_{nom}} \cdot 100[\%]$$

Where:

- $el_{sb}$  is the standby electric power consumption, expressed in kW;
- $P_{nom}$  is the nominal heat output of the product, expressed in kW;
- $\alpha$  is a factor taking into account whether the product complies with Regulation 1275/2008 on implementing Directive 2005/32/EC of the European Parliament and of the Council with regard to ecodesign requirements for standby and off mode electric power consumption of electrical and electronic household and office equipment<sup>2</sup>;
  - If the product complies with the limit values set in Regulation 1275/2008,  $\alpha$  is by default 0 (zero);
  - If the product does not comply with the limit values set in Regulation 1275/2008,  $\alpha$  is by default 1.3.

For local space heaters using gaseous or liquid fuels the auxiliary electricity use correction is calculated as follows:

$$F(4) = CC \cdot \frac{0.2 \cdot el_{max} + 0.8 \cdot el_{min} + 1.3 \cdot el_{sb}}{P_{nom}} \cdot 100[\%]$$

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.

For commercial local space heaters the auxiliary electricity use correction factor is calculated as follows:

<sup>2</sup> OJ L 339, 18.12.2008, p. 45.

$$F(4) = CC \cdot \frac{0.15 \cdot el_{max} + 0.85 \cdot el_{min} + 1.3 \cdot el_{sb}}{P_{nom}} \cdot 100[\%]$$

- (g) 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.

For local space heaters using gaseous or liquid fuels it is calculated as:

$$F(5) = 0.5 \cdot \frac{P_{pilot}}{P_{nom}} \cdot 100[\%]$$

Where:

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

For commercial local space heaters the correction factor is calculated as:

$$F(5) = 4 \cdot \frac{P_{pilot}}{P_{nom}} \cdot 100[\%]$$

In case the product has no permanent pilot light (flame)  $P_{pilot}$  is 0 (zero).

Where:

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

## ANNEX IV

### 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 II:

1. The Member State authorities shall test one single unit per model.
2. The model shall be considered to comply with the applicable requirements set out in Annex II to this Regulation if:
  - (a) the declared values comply with the requirements set out in Annex II;
  - (b) for electric local space heaters, the seasonal space heating energy efficiency  $\eta_s$  cannot be worse than the declared value at the nominal heat output of the unit;
  - (c) for liquid fuel domestic local space heaters, the seasonal space heating energy efficiency  $\eta_s$  is not more than 8% lower than the declared value;
  - (d) for gaseous fuel domestic local space heaters, the seasonal space heating energy efficiency  $\eta_s$  is not more than 8% lower than the declared value;
  - (e) for gaseous and liquid fuel domestic local space heaters the emissions of NO<sub>x</sub> are not more than 10% higher than the declared value;
  - (f) for luminous local space heaters and tube local space heaters the seasonal space heating energy efficiency is not more than 10% lower than the declared value;
  - (g) for luminous local space heaters and tube local space heaters the emissions of NO<sub>x</sub> are not more than 10% higher than the declared value.
3. If the result referred to in point 2(a) or 2(b) is not achieved, the model and all equivalent models shall be considered not to comply with this Regulation. If any of the results referred to in points from 2(c) to 2(i) is not achieved, the Member State authorities shall randomly select three additional units of the same model for testing. As alternative, the three additional units selected may be of one or more equivalent models which have been listed as equivalent product in the manufacturer's technical documentation.
4. The model shall be considered to comply with the applicable requirements set out in Annex II to this Regulation if:
  - (a) the declared values comply with the requirements set out in Annex II;
  - (b) for liquid fuel domestic local space heaters, the average seasonal space heating energy efficiency  $\eta_s$  for the three additional units is not more than 8% lower than the declared value;
  - (c) for gaseous fuel domestic local space heaters, the average seasonal space heating energy efficiency  $\eta_s$  for the three additional units is not more than 8% lower than the declared value;
  - (d) for gaseous and liquid fuel domestic local space heaters, the average emissions of NO<sub>x</sub> of the three additional units are not more than 10% higher than the declared value;
  - (e) for luminous local space heaters and tube local space heaters the average seasonal space heating energy efficiency of the three additional units is not more than 10% lower than the declared value;

(f) for luminous local space heaters and tube local space heaters the average emissions of NO<sub>x</sub> of the three additional units are not more than 10% higher than the declared value.

5. If the results referred to in point 4 are not achieved, the model shall be considered not to comply with this Regulation.

The Member State authorities shall provide the test results and other relevant information to the authorities of the other Member States and to the Commission within one month of the decision being taken on the non-compliance of the model.

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

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 supplier as an allowed tolerance to establish the values in the technical documentation.

## **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 local space heaters in terms of seasonal space heating energy efficiency and emissions of nitrogen oxides was identified as follows:

1. Specific benchmarks for seasonal space heating energy efficiency of local space heaters
  - (a) benchmark for seasonal space heating energy efficiency of open fronted local space heaters using gaseous or liquid fuel: 65%;
  - (b) benchmark for seasonal space heating energy efficiency of closed fronted local space heaters using gaseous or liquid fuel: 88%;
  - (c) benchmark for seasonal space heating energy efficiency of electric local space heaters: more than 39%;
  - (d) benchmark for seasonal space heating energy efficiency of luminous local space heaters: 92%;
  - (e) benchmark for seasonal space heating energy efficiency of tube local space heaters: 88%;
2. Specific benchmarks for emissions of nitrogen oxides (NO<sub>x</sub>) by local space heaters
  - (a) benchmark for emissions of NO<sub>x</sub> by local space heaters using gaseous or liquid fuel: 50 mg/kWh<sub>input</sub> based on GCV;
  - (b) benchmark for emissions of NO<sub>x</sub> by luminous local space heaters and tube local space heaters: 50 mg/kWh<sub>input</sub> based on GCV.

The benchmarks specified in the points 1 and 2 do not necessarily imply that a combination of those values is achievable for a single local space heater.