

Draft

COMMISSION DECISION

of

on establishing the ecological criteria for the award of the EU Ecolabel for hydronic central heating generators

(Text with EEA relevance)

THE EUROPEAN COMMISSION,

Having regard to the Treaty on the Functioning of the European Union,

Having regard to Regulation (EC) No 66/2010 of the European Parliament and of the Council of 25 November 2009 on the EU Ecolabel¹, and in particular Article 8(2) thereof,

After consulting the European Union Eco-labelling Board,

Whereas:

- (1) Under Regulation (EC) No 66/2010, the EU Ecolabel may be awarded to those products with a reduced environmental impact during their entire life cycle.
- (2) Regulation (EC) No 66/2010 provides that specific EU Ecolabel criteria are to be established according to product groups.
- (3) The criteria, as well as the related assessment and verification requirements, should be valid for four years from the date of adoption of this Decision.
- (4) The measures provided for in this Decision are in accordance with the opinion of the Committee established by Article 16 of Regulation (EC) No 66/2010.

HAS ADOPTED THIS DECISION:

Article 1

The product group “Hydronic Central Heating Generators” shall comprise a group of products that are used to generate heat as part of a hydronic central heating system, where the heated water is distributed by means of circulators and heat emitters in order to reach and maintain the indoor temperature of an enclosed space such as a building, a dwelling, or a room, at a

¹ OJ L 27, 30.1.2010, p. 1-19

desired level. The operation of the heating generator can be based on a number of processes and technologies, such as:

- Combustion of gaseous, liquid or solid fossil fuels
- Combustion of gaseous, liquid or solid biofuels
- Use of the Joule effect in electric resistance heating elements
- Capture of ambient heat from air, water or ground source, and/or waste heat
- Cogeneration (the simultaneous generation in one process of heat and electricity)
- Solar (auxiliary)
- Hybrid generators: certain combinations of the above

The maximum output power of the hydronic central heating generators shall be 400 kW.

Included in the scope are combination boilers (combi-boilers), provided that their primary function is to provide ambient heat.

Excluded from the scope of this product group are heating generators whose primary function is to provide sanitary hot water.

Although it is not explicitly stated in the definitions above, it may be that the circulator is an integral part of the heating generator. For larger heating generators the circulator is usually supplied separately, and therefore the circulator itself will be out of the scope of this criteria development.

Article 2

The criteria for the product group "Hydronic Central Heating Generators", as well as the related assessment and verification requirements, shall be valid for four years from the date of adoption of this Decision.

Article 3

For administrative purposes the code number assigned to the product group 'Hydronic Central Heating Generators' shall be 'x'.

ANNEX

FRAMEWORK

The aims of the criteria

The criteria aim, in particular, at promoting energy-efficient hydronic central heating generator products, and products with lower emissions of greenhouse gases. The criteria furthermore aim at supporting products manufactured with use of more environmental friendly technologies and proved to be safe for consumers.

CRITERIA

Criteria are set for each of the following aspects:

1. Minimum energy efficiency
2. Greenhouse gas emissions limit
3. Refrigerant and secondary refrigerant
4. Nitrogen oxides (NO_x) emissions limit
5. Organic carbon (OGC) emissions limit
6. Carbon monoxide (CO) emissions limit
7. Particulate matter (PM) emissions limit
8. Noise
9. Hazardous substances and mixtures
10. Substances listed in accordance with Article 59(1) of Regulation (EC) 1907/2006
11. Plastic parts
12. Product design for sustainability
13. Installation and user information
14. Information appearing on the Ecolabel

Table 1. Applicability of the different criteria to each of the heating generator technologies

Heating generator technology Criteria	Gas boiler	Biomass boiler	Gas-driven hydronic heat pump	Electrically-driven hydronic heat pump	Cogeneration
1- Minimum energy efficiency	x	x	x	x	x
2 – Greenhouse gas emissions	x	x	x	x	x
3 – Refrigerant and secondary refrigerant			x	x	
4 – Nitrogen oxides (NOx) emissions limit	x	x	x		x
5 – Organic carbon (OGC) emissions limit		x			
6 – Carbon monoxide (CO) emissions limit	x	x	x		x
7 – Particulate matter (PM) emissions limit		x			
8 – Noise			x	x	
9 – Hazardous substances and materials	x	x	x	x	x
10 – Substances listed in accordance with Article 59(1) of Regulation (EC) 1907/2006	x	x	x	x	x
11- Plastic parts	x	x	x	x	x
12- Product design for sustainability	x	x	x	x	x
13 – Installation and user information	x	x	x	x	x
14 – Information appearing on the Ecolabel	x	x	x	x	x

Assessment and verification

Requirements

The specific assessment and verification requirements are indicated within each criterion.

Where the applicant is required to provide declarations, documentation, analyses test reports, or other evidence to show compliance with the criteria, it is understood that these may originate from the applicant and/or his supplier(s) and/or their supplier(s), et cetera, as appropriate.

Where possible, the testing should be performed by laboratories that meet the general requirements of EN ISO 17025 or equivalent.

Where appropriate, test methods other than those indicated for each criterion may be used if the competent body assessing the application accepts their equivalence.

Where appropriate, competent bodies may require supporting documentation and may carry out independent verifications.

EU ECOLABEL CRITERIA

Criterion 1 – Minimum seasonal space heating efficiency

The energy efficiency of the hydronic central heating generator, measured in units of seasonal space heating efficiency, η_s , shall at a minimum be 90%.

Type of heating generator	Min. seasonal space heating efficiency
All types of hydronic central heating generators, regardless of technology	90%

It is proposed by the IPTS to use the definition of "seasonal space heating efficiency" (η_s , or "etas"), as developed in the Ecodesign Implementing Measures for boilers and described in Annex II of the accompanying technical background report². The "seasonal space heating efficiency" is generally defined as the ratio between the space heating demand pertaining to a designated heating season provided by a boiler, and the annual energy consumption required for its generation, expressed as percentage. According to the methodology developed in Ecodesign Lot 1, the seasonal space heating efficiency, "etas", shall be calculated as the seasonal steady-state space heating efficiency, corrected by contributions accounting for turndown ratio, temperature control, auxiliary electricity consumption, standby heat loss, ignition flame energy consumption, and in addition for cogeneration boilers the seasonal electric efficiency.

For heat pumps, the seasonal space heating efficiency (etas) is obtained through the seasonal coefficient of performance (SCOP) (and corrected by the primary energy factor 2.5 in order to convert to "etas"), and following the methodology developed in Ecodesign Lot 1 and described in the Draft Commission Regulation implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to Ecodesign requirements for boilers, available online³.

² See Annex II: Working documents Ecodesign/Energy Labelling. In: "Development of European Ecolabel and Green Public Procurement Criteria for Hydronic Central Heating Generators. Draft Report. **Policy Analysis**", Nov. 2011, <http://susproc.jrc.ec.europa.eu/heating/stakeholders.html>

³ Draft Commission Regulation implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for boilers, http://www.eceee.org/Eco_design/products/boilers/WD_ecodesign_March_2011

Assessment and verification:

The applicant shall declare the product's compliance with the energy efficiency requirement and specify the minimum seasonal space heating efficiency of at least 90% of the product submitted for labelling procedure together with the testing procedure indicated in respective EN standards for the given kind of product (see Table 2). The testing shall be conducted at both loads of 100%, 30%, following the methodology of seasonal space heating efficiency of Ecodesign Lot 1 and the corresponding testing standard. A mean value of three measurements shall not exceed the respective minimum efficiency established by this criterion, irrespective of heating generator technology. The testing shall be performed by laboratories that meet the general requirements of EN ISO 17025 or equivalent.

A certificate signed by the manufacturer declaring compliance with these requirements shall be submitted to the awarding competent body, together with the relevant documentation.

Table 2. EN standards for energy efficiency relevant for the product group "hydronic central heating generators".

Number	Title
Gas boilers	
FprEN 15502-1: July 2010	Gas-fired heating boilers – Part 1: General requirements and tests (CEN)
Biomass boilers	
EN 303-5	Heating boilers - Part 5: Heating boilers for solid fuels, hand and automatically stocked, nominal heat output of up to 300 kW - Terminology, requirements, testing and marking
Gas-driven heat pumps	
prEN 12309 – 2: 2000	Gas-fired absorption and adsorption air-conditioning and/or heat pump appliances with a net heat input not exceeding 70 kW
Electrically-driven heat pumps	
prEN 14825: June 2010	Air conditioners, liquid chilling packages and heat pumps, with electrically driven compressors, for space heating and cooling – Testing and rating at part load conditions and calculation of seasonal performance.
EN 14511: 2007	Air conditioners, liquid chilling packages and heat pumps with electrically driven compressors for space heating and cooling.
Cogeneration	
prEN 50465: 2010 Draft ed. 2.	Gas appliances – Combined Heat and Power appliance of nominal heat input inferior or equal to 70 kW (CEN)

Note: The efficiency of heat pumps was traditionally tested using EN 14511. For testing at different loads and to obtain the SCOP and seasonal space heating efficiency, prEN 14825 is used.

Criterion 2 – Greenhouse gas emissions limit

The applicant shall demonstrate that the greenhouse gas emissions, expressed in grams of CO₂-equivalents per kWh of heating output calculated using the Total Equivalent Warming Impact (TEWI) formulas defined below, shall not exceed the value(s) established in this criterion. Two options are proposed for discussion.

OPTION 1:

Type of heating generator	Max. greenhouse gas emissions (g CO ₂ -equivalents per kWh of heating output)
All types of hydronic central heating generators, regardless of technology, except biomass boilers	220 g CO ₂ -equivalents per kWh of heating output
<u>Notes:</u> Results from the technical analysis indicate that all biomass boilers emit much lower GHG emissions and therefore a limit is not needed.	

OPTION 2:

Type of heating generator	Max. greenhouse gas emissions (g CO ₂ -equivalents per kWh of heating output)
Gas boiler and gas-driven hydronic heat pumps	220 g CO ₂ -equivalents per kWh of heating output
Electrically-driven hydronic heat pump	180 g CO ₂ -equivalents per kWh of heating output
Cogeneration	220 g CO ₂ -equivalents per kWh of heating output
<u>Notes:</u> Results from the technical analysis indicate that all biomass boilers emit much lower GHG emissions and therefore a limit is not needed.	

The greenhouse gas emissions will be calculated following the TEWI formulas below (different formulations, for electrically-driven heating generators, gas-driven heating generators, cogeneration, and hybrid generators).

Each TEWI formula consists of two parts, one dependent solely on the efficiency of the heating generator (expressed in terms of the seasonal space heating efficiency, η_s) and the carbon intensity of the fuel (represented by $\beta_{elec.}$ and β_{gas} , for electricity and natural gas, respectively), and the second part (which has a value different than zero only for heat pumps) dependent on the greenhouse gas emissions due to refrigerant leakage. The GHG emissions from the refrigerant leakage depend on the global warming potential (GWP_{100}) of the refrigerant, and the refrigerant leakage during use-phase (expressed as an annual leakage rate, ER, in % of the total mass of the refrigerant per year) and at end-of-life (expressed as a percentage of the total mass of the refrigerant, α).

The following TEWI formulas, which provide the GHG emissions in CO₂-equiv per kWh of heat output shall be used:

$$\frac{\text{TEWI}}{\text{kWh heat output}} \left(\frac{\text{gCO}_2 - \text{equiv.}}{\text{kWh heat output}} \right) = \frac{\beta_{elec.} \cdot 2.5}{\eta_s} + \frac{GWP_{100} \cdot m (ER \cdot n + \alpha)}{P \cdot h \cdot n}, \text{ for electrically-driven units}$$

$$\frac{\text{TEWI}}{\text{kWh heat output}} \left(\frac{\text{gCO}_2 - \text{equiv.}}{\text{kWh heat output}} \right) = \frac{\beta_{gas}}{\eta_s} + \frac{GWP_{100} \cdot m (ER \cdot n + \alpha)}{P \cdot h \cdot n}, \text{ for gas-driven units}$$

The parameters in the formulas above are described in the following table:

Parameter	Description of parameter	Units	Constant value or test to be performed in order to obtain the parameter
$\beta_{elec.}$	Carbon emissions of electricity	[g CO ₂ -equiv./kWh _{elec.}]	384
β_{gas}	Carbon emissions of gas	[g CO ₂ -equiv./kWh _{gas}]	202
η_s	Seasonal space heating efficiency	[-]	To be tested and declared by the applicant (Criterion 1)
GWP_{100}	Global warming potential (effect over 100 years)	[-]	According to Annex I of the F-gas regulation
m	Refrigerant mass	[g]	To be declared by the applicant
ER	Refrigerant loss per year	[%/yr]	A value of ER = 2.5%/yr shall be used.

n	Lifetime	[yr]	A value of n = 15 shall be used.
α	Refrigerant loss at end of life (disposal loss)	[%]	A value of α = 5% shall be used.
P	Design load	[kW]	To be tested and declared by the applicant.
h	Full load operating hours	[h/yr]	2000

$$\frac{\text{TEWI}}{\text{kWh heat output}} \left(\frac{\text{gCO}_2 - \text{equiv.}}{\text{kWh heat output}} \right) = \frac{\beta_{\text{gas}}}{\eta_{\text{thermal}}} + \frac{\eta_{\text{cogen}} * \beta_{\text{elec}}}{\eta_{\text{thermal}} * 2.5}, \text{ for cogeneration units}$$

In the formula for cogeneration units, the η_{cogen} and η_{thermal} are obtained as:

$$\eta_{\text{thermal}} = \text{etason} - F(1-5)$$

$$\eta_{\text{cogen}} = F(6), \text{ where } F(6) \text{ is a negative value}$$

The factors F(1-5) and F(6) are used in the derivation of the seasonal space heating efficiency η_s , as developed in Annex II of the accompanying technical background report⁴. F(1-5) applies to the thermal part of the heating generator, F(6) is only relevant for cogeneration and it serves to correct for electricity production. In the cogeneration TEWI formula, β_{elec} is divided by 2.5 to convert to electric savings instead of primary savings.

For a hybrid heating generator, the following formula is proposed:

$$\frac{\text{TEWI}}{\text{kWh heat output}} \left(\frac{\text{gCO}_2 - \text{equiv.}}{\text{kWh heat output}} \right) = \frac{\%gb * \beta_{\text{gas}}}{\eta_{\text{gb}}} + \frac{(1 - \%gb) * \beta_{\text{elec}}}{\eta_{\text{hp}} * 2.5} + \text{GHG}_{\text{direct}}$$

with the corresponding parameters:

⁴ Annex II: Working documents Ecodesign/Energy Labelling. In: "Development of European Ecolabel and Green Public Procurement Criteria for Hydronic Central Heating Generators. Draft Report. **Policy Analysis**", November 2011, <http://susproc.jrc.ec.europa.eu/heating/stakeholders.html>

Parameter	Description of parameter	Units	Constant value or test to be performed in order to obtain the parameter
%gb	The share of gas boiler of the total heat output (fraction with no units)	[-]	Declared by the applicant
$\beta_{elec.}$	Carbon emissions of electricity, corresponding to the electrically-driven heat pump part	[g CO ₂ -equiv./kWh _{elec.}]	384
β_{gas}	Carbon emissions of gas, corresponding to the gas boiler part	[g CO ₂ -equiv./kWh _{gas}]	202
η_{gb}	Seasonal space heating efficiency of the gas boiler part for the typical operating conditions (outside temperature below +3°C)	[-]	To be tested and declared by the applicant (Criterion 1)
η_{hp}	Seasonal space heating efficiency (in primary energy, hence the correction by 2.5 to secondary) of the heat pump part for the typical operating conditions (outside temperature above +3°C)	[-]	To be tested and declared by the applicant (Criterion 1)
GHG _{direct}	Contribution of direct emissions (annual plus end-of-life refrigerant leakage) from the heat pump part	[kg.CO ₂ eq./kWh heat output]	According to Annex I of the F-gas regulation

The applicant shall provide the calculated GHG emissions following the proposed TEWI formulas above. A certificate signed by the manufacturer declaring compliance with these requirements shall be submitted to the awarding competent body, together with the relevant documentation.

Assessment and verification:

The applicant's statement shall include the following information:

- Type of refrigerant and its global warming potential value, GWP₁₀₀.
- Nominal filling quantity of the refrigerant, grams.
- Calculation of grams of CO₂-equivalent in grams/kWh of heat output, following the TEWI formulas provided.
- Calculation and verification data with respect to the seasonal seasonal space heating efficiency, as provided in Criterion 1.

Criterion 3 – Refrigerant and secondary refrigerant

Refrigerant

The global warming potential (GWP₁₀₀) of the refrigerant shall not exceed a GWP₁₀₀ value > 2000 over a 100 year period.

Notes:

- Global warming potential (GWP₁₀₀) means the measure of how much 1 kg of the refrigerant applied in the vapour compression cycle is estimated to contribute to global warming, expressed in kg CO₂ equivalents over a 100 year time horizon.
- GWP₁₀₀ values considered will be those set out in Annex I of Regulation (EC) No 842/2006 of the European Parliament and the Council⁵.

Secondary refrigerant

(Note: Not applicable to all types of heat pumps within this product group)

The secondary refrigerant, brine or additives must not be substances classified as environmentally hazardous or constituting a health hazard as defined by Council Directive 67/548/EEC⁶ concerning environmental hazard and its subsequent amendments.

Assessment and verification:

The names of refrigerant(s) used in the product shall be submitted with the application, along with their GWP₁₀₀ values according to the Regulation above. The GWP₁₀₀ values of refrigerants shall be calculated in terms of the 100-year warming potential of one kilogram of a gas relative to one kilogram of CO₂.

The GWP₁₀₀ values for the refrigerants shall be taken from the following sources:

- GWP values considered will be those set out in Annex 1 of Regulation (EC) No 842/2006 of the European Parliament and of the Council⁷.
- For fluorinated refrigerants, the GWP values shall be those published in the third assessment report (TAR) adopted by the Intergovernmental Panel on Climate Change (2001 IPCC GWP values for a 100 year period)⁸.

⁵ OJ L 161, 14.6.2006, p. 1.

⁶ OJ 196, 16.8.1967, p. 1.

⁷ OJ L 161, 14.6.2006, p. 1.

⁸ IPCC Third Assessment Climate Change 2001. A Report of the Intergovernmental Panel on Climate Change: <http://www.ipcc.ch/pub/reports.htm>

- For non-fluorinated gases, the GWP values are those published in the First IPCC assessment over a 100 year period⁹.
- For refrigerants not included in the above references, the IPCC UNEP 2010 report on Refrigeration, Air Conditioning and Heat Pumps, dated February 2011, or newer, shall be used as a reference¹⁰.
- GWP₁₀₀ values for mixtures of refrigerants shall be based on the formula stated in Annex I of the Regulation 842/2006.

For the secondary refrigerant(s) only

The name(s) of the secondary refrigerant(s) used shall be submitted with the application.

Criterion 4 – Nitrogen oxides (NOx) emissions limit

The content of nitrogen oxides (NOx) in the exhaust gas must not exceed the limit values indicated in Table 3, for each of the heating technologies. The units shall be given in mg/kWh of energy input or in mg/m_N³.

Table 3. Criterion on nitrogen oxides (NOx) emissions limit.

Heating generator technology	NOx emissions
Gas boiler	60 mg/kWh of heat input (condensing) 70 mg/kWh of heat input (non-condensing)
Biomass boiler	<u>Pellet boilers</u> : 150 mg/m _N ³ <u>Wood chip boilers</u> : 190 mg/m _N ³
Gas-driven hydronic heat pump	No limit
Electrically-driven hydronic heat pump	No limit
Cogeneration	120 mg/kWh (gas) 200 mg/kWh (liq)

⁹ Climate Change, The IPCC Scientific Assessment, J. T. Houghton, G. J. Jenkins, J. J. Ephraums (ed.) Cambridge University Press, Cambridge (UK), 1990.

¹⁰ This reference, applicable for refrigerants not included in the above references, is provided in the Draft Commission Regulation for implementing ecodesign requirements for air conditioners and comfort fans, published on 18 July 2011. The Draft Regulation can be accessed at:
<http://register.consilium.europa.eu/pdf/en/11/st13/st13029.en11.pdf>

Assessment and verification:

The NO_x emission data – related to dry exhaust gas – are to be determined as standard emission factors according to the international standards included in Table 4.

A certificate signed by the manufacturer declaring compliance with these requirements shall be submitted to the awarding competent body, together with the relevant documentation.

Table 4. EN-standards for NO_x emissions relevant for the product group "hydronic central heating generators".

Number	Title
Gas boilers	
FprEN 15502-1: July 2010	Gas-fired heating boilers – Part 1: General requirements and tests (CEN) §8.13. NO _x (classification, test and calculation methods)
Biomass boilers	
EN 303-5	Heating boilers - Part 5: Heating boilers for solid fuels, hand and automatically stocked, nominal heat output of up to 300 kW - Terminology, requirements, testing and marking
Gas-driven heat pumps	
prEN 12309 – 2: 2000	Gas-fired absorption and adsorption air-conditioning and/or heat pump appliances with a net heat input not exceeding 70 kW
DIN 4702, Part 8	Central heating boiler; determination of the standard efficiency and the standard emissivity
Electrically-driven heat pumps	
prEN 14825: June 2010	Air conditioners, liquid chilling packages and heat pumps, with electrically driven compressors, for space heating and cooling – Testing and rating at part load conditions and calculation of seasonal performance.
EN 14511: 2007	Air conditioners, liquid chilling packages and heat pumps with electrically driven compressors for space heating and cooling.
Cogeneration	
prEN 50465: 2010 Draft ed. 2.	Gas appliances – Combined Heat and Power appliance of nominal heat input inferior or equal to 70 kW (CEN)

Criterion 5 – Organic carbon (OGC) emissions limit

The organic substance content of the exhaust gas given as total organic carbon (OGC) must not exceed the limit values indicated in Table 5 (this air emissions parameter is only applicable to biomass boilers). The unit of measurement is mg/m³ of dry gas at 10% O₂ at normal conditions (1 atm, and 0 °C).

Table 5. Criterion on organic carbon (OGC) emissions limit

Heating generator technology	Organic carbon (OGC) emissions (mg/m ³ , or mg/kWh)
Biomass boilers	25-70 mg/m ³

Assessment and verification:

A certificate signed by the manufacturer declaring compliance with these requirements shall be submitted to the awarding competent body, together with the relevant documentation.

The assessment and verification will be done following the standard specified in Table 6.

Table 6. EN-standard for organic carbon (OGC) emissions relevant for the product group "hydronic central heating generators"

Number	Title
Biomass boilers	
EN 303-5	Heating boilers - Part 5: Heating boilers for solid fuels, hand and automatically stocked, nominal heat output of up to 300 kW - Terminology, requirements, testing and marking

Note: EN 303-5 is the only standard with specifications on how to test for OGC.

Criterion 6 – Carbon monoxide (CO) emissions limit

The carbon monoxide (CO) content in the exhaust gas must not exceed the values indicated in Table 7. The units shall be given in mg/kWh of energy input or in mg/m_N³.

Table 7. Criterion on carbon monoxide (CO) emissions limit

Heating generator technology	CO emissions
Gas boiler	50 mg/kWh (C) 20 mg/kWh (non-C)
Biomass boiler	400 – 2000 mg/m ³
Gas-driven hydronic heat pump	No limit
Electrically-driven hydronic heat pump	No limit
Cogeneration	No limit

Assessment and verification:

A certificate signed by the manufacturer declaring compliance with these requirements shall be submitted to the awarding competent body, together with the relevant documentation.

The assessment and verification will be done following the standard specified in Table 8.

Table 8. EN-standards for carbon monoxide (CO) emissions relevant for the product group "hydronic central heating generators"

Number	Title
Gas boilers	
FprEN 15502-1: July 2010	Gas-fired heating boilers – Part 1: General requirements and tests (CEN)
Biomass boilers	
EN 303-5	Heating boilers - Part 5: Heating boilers for solid fuels, hand and automatically stocked, nominal heat output of up to 300 kW - Terminology, requirements, testing and marking

Criterion 7 – Particulate matter (PM) emissions limit

The particle matter (PM) content in the exhaust gas must not exceed the values indicated in Table 9. The units shall be given mg/m_N³.

Table 9. Criterion on particulate matter (PM) emissions limit

Heating generator technology	Particle matter (PM)
Gas boiler	No limit
Biomass boiler	40-70 mg/m ³
Gas-driven hydronic heat pump	No limit
Electrically-driven hydronic heat pump	No limit
Cogeneration	No limit
Solar thermal	No limit

Assessment and verification:

A certificate signed by the manufacturer declaring compliance with these requirements shall be submitted to the awarding competent body, together with the relevant documentation.

The assessment and verification will be done following the standard specified in Table 10.

Table 10. EN-standards for particulate matter (PM) emissions relevant for the product group "hydronic central heating generators"

Number	Title
Gas boilers	
FprEN 15502-1: July 2010	Gas-fired heating boilers – Part 1: General requirements and tests (CEN)
Biomass boilers	
EN 303-5	Heating boilers - Part 5: Heating boilers for solid fuels, hand and automatically stocked, nominal heat output of up to 300 kW - Terminology, requirements, testing and marking

Gas-driven heat pumps	
prEN 12309 – 2: 2000	Gas-fired absorption and adsorption air-conditioning and/or heat pump appliances with a net heat input not exceeding 70 kW
Cogeneration	
prEN 50465: 2010 Draft ed. 2.	Gas appliances – Combined Heat and Power appliance of nominal heat input inferior or equal to 70 kW (CEN)

Criterion 8 – Noise

The sound power level(s) shall be tested and stated in dB(A), as indicated in Table 11. The noise level, applicable to all types of medium-to-water heat pumps, shall not exceed a value of 60/65 dB(A) for < 6 kW rated capacity, and 65/70 dB(A) for > 6 kW rated capacity.

Table 11. Criterion on particulate matter (PM) emissions limit

Heating generator technology	Acoustical noise, in dB(A)
Gas boiler	No limit
Biomass boiler	No limit
Gas-driven hydronic heat pump	60/65 dB(A), for < 6 kW rated capacity 65/70 dB(A), for > 6 kW rated capacity
Electrically-driven hydronic heat pump	
Cogeneration	No limit

Assessment and verification:

A certificate signed by the manufacturer declaring compliance with these requirements shall be submitted to the awarding competent body, together with the relevant documentation.

Testing shall be performance in accordance with ENV-12 102. The test report shall be submitted with the application.

Criterion 9 – Hazardous substances and mixtures

In accordance with Article 6(6) of Regulation (EC) No 66/2010, the product or any article of it shall not contain substances referred to in Article 57 of Regulation (EC) No 1907/2006 nor substances or mixtures meeting the criteria for classification in the following hazard classes or categories in accordance with Regulation (EC) No 1272/2008 of the European Parliament and of the Council ⁽¹¹⁾.

List of hazard statements and risk phrases:

Hazard statement ⁽¹²⁾	Risk Phrase ⁽¹³⁾
H300 Fatal if swallowed	R28
H301 Toxic if swallowed	R25
H304 May be fatal if swallowed and enters airways	R65
H310 Fatal in contact with skin	R27
H311 Toxic in contact with skin	R24
H330 Fatal if inhaled	R23/26
H331 Toxic if inhaled	R23
H340 May cause genetic defects	R46
H341 Suspected of causing genetic defects	R68
H350 May cause cancer	R45
H350i May cause cancer by inhalation	R49
H351 Suspected of causing cancer	R40
H360F May damage fertility	R60
H360D May damage the unborn child	R61
H360FD May damage fertility. May damage the unborn child	R60/61/60-61
H360Fd May damage fertility. Suspected of damaging the unborn child	R60/63
H360Df May damage the unborn child. Suspected of damaging fertility	R61/62
H361f Suspected of damaging fertility	R62
H361d Suspected of damaging the unborn child	R63
H361fd May damage fertility. May damage the unborn child	R62-63
H362 May cause harm to breast fed children	R64
H370 Causes damage to organs	R39/23/24/25/26/27/28

⁽¹¹⁾ OJ L 353, 31.12.2008, p. 1.

⁽¹²⁾ As provided for in Regulation (EC) No 1272/2008.

⁽¹³⁾ As provided for in Council Directive 67/548/EEC (OJ 196, 16.8.1967, p. 1).

H371 May cause damage to organs	R68/20/21/22
H372 Causes damage to organs	R48/25/24/23
H373 May cause damage to organs	R48/20/21/22
H400 Very toxic to aquatic life	R50/50-53
H410 Very toxic to aquatic life with long-lasting effects	R50-53
H411 Toxic to aquatic life with long-lasting effects	R51-53
H412 Harmful to aquatic life with long-lasting effects	R52-53
H413 May cause long-lasting effects to aquatic life	R53
EUH059 Hazardous to the ozone layer	R59
EUH029 Contact with water liberates toxic gas	R29
EUH031 Contact with acids liberates toxic gas	R31
EUH032 Contact with acids liberates very toxic gas	R32
EUH070 Toxic by eye contact	R39-41

The use of substances or mixtures in the final product which upon processing change their properties in a way that the identified hazard no longer applies is exempted from the above requirement.

Concentration limits for substances or mixtures meeting the criterion for classification in the hazard classes or categories listed in the table above, and for substances meeting the criterion of Article 57 (a), (b) or (c) of Regulation (EC) No 1907/2006, shall not exceed the generic or specific concentration limits determined in accordance with the Article 10 of Regulation (EC) No 1272/2008. Where specific concentration limits are determined, they shall prevail against the generic ones.

Concentration limits for substances meeting criteria of Article 57 (d), (e) or (f) of Regulation (EC) No 1907/2006 shall not exceed 0.1 % weight by weight.

Derogations: The following substances or mixtures are specifically exempted from this requirement:

Articles with weight below 25 g	All hazard statements and risk phrases
Homogeneous parts of complex articles with weight below 25 g	All hazard statements and risk phrases
Nickel in stainless steel	All hazard statements and risk phrases

Assessment and verification:

For each article and/or homogeneous part of complex articles with weight over 25 g the applicant shall provide a declaration of compliance with this criterion, together with related documentation, such as declarations of compliance signed by the suppliers of substances and copies of relevant Safety Data Sheets in accordance with Annex II to Regulation (EC) No 1907/2006 for substances or mixtures. Concentration limits shall be specified in the Safety Data Sheets in accordance with Article 31 of Regulation (EC) No 1907/2006 for substances and mixtures.

Criterion 10 – Substances listed in accordance with Article 59(1) of Regulation (EC) 1907/2006

No derogation from the exclusion in Article 6(6) may be given concerning substances identified as substances of very high concern and included in the list foreseen in Article 59 of Regulation (EC) No 1907/2006, present in mixtures, in an article or in any homogenous part of a complex article in concentrations higher than 0.1% w/w. Specific concentration limits determined in accordance with Article 10 of Regulation (EC) No 1272/2008 shall apply in case it is lower than 0,1% w/w.

Assessment and verification:

The list of substances identified as substances of very high concern and included in the candidate list in accordance with Article 59 of Regulation (EC) No 1907/2006 can be found here:

http://echa.europa.eu/chem_data/authorisation_process/candidate_list_table_en.asp

Reference to the list shall be made on the date of application.

The applicant shall provide a declaration of compliance with this criterion, together with related documentation, such as declarations of compliance signed by the suppliers of substances and copies of relevant Safety Data Sheets in accordance with Annex II to Regulation (EC) No 1907/2006 for substances or mixtures. Concentration limits shall be specified in the Safety Data Sheets in accordance with Article 31 of Regulation (EC) No 1907/2006 for substances and mixtures.

Criterion 11 – Plastic parts

- a. If any plasticiser substance in the manufacturing process is applied, it must comply with the requirements on hazardous substances set out in Criteria 9 and 10.
- b. Plastic parts of articles or homogeneous parts of complex articles with weight 25 g or more shall not contain a chlorine content greater than 50 % by weight.

- c. Only biocidal products containing biocidal active substances included in Annex IA to Directive 98/8/EC of the European Parliament and of the Council and authorised for use in heating generators, shall be allowed for use.

Assessment and verification:

The applicant shall provide a declaration of compliance with this criterion, together with related documentation, such as declarations of compliance signed by the suppliers of substances and copies of relevant Safety Data Sheets. The applicant shall provide information on the plasticisers used in the product. The applicant shall provide information on the maximum chlorine content of the plastic parts. A declaration of compliance signed by the plastic and biocides suppliers and copies of relevant safety data sheets about materials and substances shall also be provided to the awarding competent body. All biocides used shall be clearly indicated. The applicant shall provide information on the intentionally added substances used as flame retardants.

Criterion 12 – Product design for sustainability

The criterion will consist of two parts:

- Promotion of reuse, recycling and generally sound end-of-life management
- Product quality/usability and lifetime extension

Assessment and verification:

A certificate signed by the manufacturer declaring compliance with these requirements shall be submitted to the awarding competent body, together with the relevant documentation.

Criterion 13 – Installation and user information

The following issues shall appear on the packaging, a leaflet attached to the product, or on a companion website:

- correct installation instruction,
- correct operation instruction,
- information concerning appropriate disposal at end-of-life,
- information on appropriate dimensions of heating generators for different building characteristics/size.

Assessment and verification:

A certificate signed by the manufacturer declaring compliance with these requirements shall be submitted to the awarding competent body, together with the relevant documentation.

Criterion 14 – Information appearing on the Ecolabel

The Ecolabel placed on the packaging shall contain information on the advantages related to the purchase and use of the ecolabelled product vs. other products in the market fulfilling the same function (provision of hydronic central ambient heating).

An optional label with a text box shall contain the following text (proposal):

- Increased energy efficiency
- Reduced greenhouse gas emissions
- Reduced air emissions
- Minimized used of hazardous substances
- Designed to facilitate reuse and recycling

The applicant shall provide a sample of the product packaging showing the label, together with a declaration of compliance with this criterion.