



PEPecopassport® PROGRAM

PSR

SPECIFIC RULES FOR DIRECT, VISIBLE, FIXED ELECTRIC HEATING APPLIANCES

PSR-0002-ed3.0-EN-2023 06 06

According to PSR-model-ed2-EN-2021 11 18

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1. Introduction

This reference document complements and explains the Product Environmental Profile (PEP) Drafting Rules defined by the PEPecopassport® program (PEP-PCR ed.4-EN-2021 09 06), available at <http://www.pep-ecopassport.org>.

It set out the additional requirements applicable to direct, visible, fixed electric heating appliances. Compliance with these requirements is necessary to:

- Qualify the environmental performance of these products on an objective and consistent basis,
- Publish PEPs compliant with the PEP ecopassport® program and international reference standards.¹

This reference document was drawn up in compliance with the open, transparent rules of the PEP ecopassport® program with the support of stakeholders and professionals in the direct, visible, fixed electric heating appliances market professionals and stakeholders.

	www.pep-ecopassport.org
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Critical review	The third-party Critical review was carried out by Marlène DEMICHELI and Olivia DJIRIGUINA, LCA and eco-design consultant, LCIE Bureau Veritas. The declaration of conformity published on 2023/05/16 can be found in the Appendices.
Availability	The Critical review report is available on request from the P.E.P. Association contact@pep-ecopassport.org
Scope of validity	The critical review report and the declaration of conformity remain valid within 5 years or until the PEP Drafting Rules, or the normative reference texts to which they refer, are modified.

¹ISO 14025, ISO 14040 and ISO 14044 standards



2. Scope

In accordance with the general instructions of the PEP ecopassport® program (PEP- General Instructions ed4.1-FR-2017 10 17) and additional to the PCR, "Product Category Rules"(PEP-PCR-ed4-EN-2021 09 06), of the PEPecopassport® environmental product declaration program, this document sets out the specific rules for direct, visible, fixed electric heating appliances and defines the product specifications to be adopted by manufacturers in the development of their Product Environmental Profiles (PEPs) particularly with regard to:

- the technology and its type of application,
- the conventional reference lifetime taken into account for the Life Cycle Assessment (LCA),
- the conventional use scenarios to be adopted during the product use stage.

These specific rules only apply to direct, visible, fixed electric heating appliances fitted with electronic regulators, as described below. These specific rules do not cover other radiant panel electric floor-standing type, radiant plaster ceiling type or modular radiant ceiling type appliances, and in general appliances incorporated into the built structure, since their installation, use and end of life stages, as well as their lifetime are different from those of direct, visible, fixed electric heating appliances.

A permanently installed appliance is an appliance that is intended to be used attached to a stand or otherwise fixed in a specific location (EN 60335-1:2012).

These specific rules may cover the direct, visible, fixed electric heating appliances governed by particular rules, such as those described in paragraph 6.3 - Bibliography of prescriptive rules - of these specific rules.

2.1. Description of covered product families

The NF ELECTRICITE PERFORMANCE norm EN 6033675 : 2015 and EN 60675/A2 :2018 in force on the date these specific rules 6.5 References are validated is used as reference in defining each type of direct, visible, fixed electric heating appliance.

2.1.1. Convector type direct, visible, fixed electric heating appliance

A convector type direct, visible, fixed electric heating appliance may be:

"An appliance in which heating of at least one concealed part still in contact with the air in the room, exceeds 75K in normal use. The air is evacuated by natural convection through one or more exhaust openings.

Note: "Concealed part" means that the part cannot be seen from a point 2m in front of the appliance and 1.2m above the ground when the appliance is installed. ". (cf paragraph 6.3.3.1.1 NF Electricité of this document).

2.1.2. Radiant panel type direct, visible, fixed electric heating appliance

May be called visible stationary direct electrical heating appliances of the radiant type, category 1 heating appliances that are heating appliances in which the warming of at least one visible surface is greater than 75K in standard use

"an appliance in which the heating of at least 80% of the visible surface of the heating element is over 75K in normal use, and for which the ratio between the visible surface area of the heating element and that of the total surface area of the front panel is at least 40%. A metal grille, perforated over at least 50% of its surface will be considered as being transparent to radiation.

Note: "visible surface" is considered to be the surface area of the heating element seen without the grille in place. The visible surface may be seen through a solid material transparent to heat radiation. Materials such as quartz are considered to be transparent to this radiation, but not ordinary glass. "Concealed part" means that the part cannot be seen from a point 2m in front of the appliance and 1.2m above the ground when the appliance is installed." (cf paragraph 6.3.1.1.1 NF electricity of this document)

2.1.3. Electric radiator type direct, visible, fixed heating appliance

An electric radiator type direct, visible, fixed electric heating appliance may be:

"An appliance in which temperature dispersion is controlled, and that complies with the following particular conditions:

- a permanent hot point: temperature variations on the frontage shall not exceed 15K at rated power over an operating period of 2 hours,
 - a limited surface temperature: the heating of the external surfaces shall not exceed 70K at nominal output power,
 - homogeneous heat emission: maximum surface temperature dispersion of 30K. "
- (cf paragraph 6.3.1.1.1 NF Electricité of this document)

2.1.4. Direct, visible, fixed, electric heating appliance, with towel dryer secondary fonction

A direct, visible, fixed electric heating appliance, with towel dryer secondary function (such as towel-dryer radiator) may be:

"Appliance which may be furnished with one or more additional functions, as long as these comply with the following requirements:

- Air output heating: maximum 100K / average 70K
 - External surfaces heating: average 70K at P_n (nominal output power),
 - Timer duration (if function not controlled) 2 hours maximum,
 - Bare wire resistance permitted only for a blower function".
- (cf paragraph 6.3.1.1.1 NF Electricité of this document)

3. Product life cycle assessment

3.1. Fonctionnal unit and reference flow description

These specific rules are additional to section 2.1 "Functional unit and reference flow description" of the PCR in force.

The life cycle assessment analysis carried out and the resulting PEP applies to the devices whose functions and composition are as defined below.

3.1.1. Functional unit

The functional unit is defined below:

« To produce a 1 kW heating power for a reference lifetime of 17 years. »

The expression of energy consumption in the usage stage is specified in kWh of final energy to deliver 1kW of heat, according to the usage scenario in paragraph 3.5.4.1.2. Energy consumption of active components (family 2) of these specific rules.

The whole study shall be performed for a 17 year reference lifetime of the appliance (paragraph 6.5 References of this document).

3.1.2. Declared unit

The declared unit can be used as additional information to assist future users of the PEP. s

For the France perimeter, the declared unit should be applied if no functional unit can be defined.

The declared unit is defined as follow :

"Provide heating with a visible stationary direct electric heater of xx kW for a reference lifetime of 17 years

With xx kW corresponding to the power of the appliance in question. For example:

- For a 1000 W radiator:

"Provide heating with a visible fixed stationary direct electric heater of 1 kW for a reference lifetime of 17 years."

- For a 500 W heater:

"Provide heating with a 0.5 kW visible stationary direct electric heater for a reference lifetime of 17 years."

3.1.3. Reference flow description

The reference flow (energies and materials accounts meeting the UF requirements) is determined in the conditions determined by the UF defined in the paragraph 3.1.1. Functional unit **Erreur ! Source du renvoi introuvable**.of present specific rules.

A "direct, visible, fixed electric heating appliance" (defined in paragraph **Erreur ! Source du renvoi introuvable**. Scope) is understood as being a product with the following elements:

- a casing,
- one or more heating bodies,
- one or more heating units,
- one or more control units,
- one or more sensor components built-in,
- a wall bracket

Two component families from these elements are identified in the appliance:

	Family 1	Family 2
Products family	Passive components	Active components Any direct, visible, fixed electric heating appliance, attached to the built structure with integrated control.
Definition	Components not consuming energy during the use stage	Components consuming energy during the use stage
Examples of components	Wall bracket	Casing, heating element, control units and sensor components of convectors, radiant panel heaters, electric radiators, radiators with a towel dryer secondary function

Table 1 – Product families covered by the PSR

3.2. System boundaries

These specific rules are additional to section 2.2 "System boundaries" of the PCR in application.

All components delivered with the product and ensuring its proper working have to be included in the study scope.

The environmental impacts related to the "connected" function, i.e. related to all the product's remote management and control devices, including network infrastructures and related environmental impacts, are excluded from the study due to the lack of data specific to this product category.

3.2.1. Manufacturing stage

For this stage, the rules defined in the current PCR (PEP-PCR-ed4-EN-2021 09 06) applies.

3.2.2. Distribution stage

For this stage, the rules defined in the current PCR (PEP-PCR-ed4-EN-2021 09 06) applies.

3.2.3. Installation stage

For this stage, the rules defined in the current PCR (PEP-PCR-ed4-EN-2021 09 06) applies.

3.2.4. Use stage

For this stage, the rules defined in the current PCR (PEP-PCR-ed4-EN-2021 09 06) applies.

In case of a decomposition of B module as defined in paragraph 2.2.6 of the current PCR (PEP-PCR-ed4-EN-2021 09 06), the environmental impacts of the use stage shall be decomposed as follows for all product families of the present PSR :

B1 - Use or application of installed product	Not applicable. Module equal to 0.
B2 – Maintenance	Module égal à 0. No maintenance operation required.
B3 – Repair	Not applicable. Module equal to 0.
B4 – Replacement	Not applicable. Module equal to 0.
B5 – Refurbishment	Not applicable. Module equal to 0.
B6 - Energy requirements during the use stage	Electricity consumption of the reference product by applying the utilisation scenario as defined by this PSR.
B7 – Water requirements during the use stage	Not applicable. Module equal to 0.

Note: the decomposition of module B is mandatory for France.

3.2.5. End of life cycle stage

For this stage, the rules defined in the current PCR (PEP-PCR-ed4-EN-2021 09 06) applies.

3.2.6. Benefits and charges beyond the system's boundaries

For this stage, the rules defined in the current PCR (PEP-PCR-ed4-EN-2021 09 06) applies.

Note that the declaration of module D is mandatory for products intended for the French market and to be used in the framework of a life cycle analysis of buildings.

3.3. Cut-off criteria

The rules specified in paragraph 2.3 "Cut-off criteria" of the current CR (PEP-PCR-ed4-EN-2021 09 06) applies.

3.4. Allocation rules between co-products

The rules specified in paragraph 2.4 "Rules for allocation between co-products" of the current PCR (PEP-PCR-ed4-EN-2021 09 06) applies.

These specific rules complement paragraph 2.4 "Rules for allocation between co-products" of the current PCR (PEP-PCR-ed4-EN-2021 09 06)

When a production process generates several co-products, the mass flow allocation rule should be applied on the basis of the mass of the output considered for the study.

As described in the applicable PCR (PEP-PCR-ed4-EN-2021 09 06) if the physical parameter cannot be used, the allocation should be based on economic aspects, such as working hours, operating hours or manufacturing cost.

3.5. Development of scenarios (default scenarios)

These specific rules are complementary to paragraph 2.5 "Development of scenarios (default scenarios)" of the current PCR (PEP-PCR-ed4-EN 2021-09 06).

Any change to the default scenarios defined below must be justified in the accompanying report and mentioned in the PEP.

3.5.1. Accepted justifications for changing default scenarios

This PSR contains default cases and scenarios. If the registrant wishes to use specific data, this data must be justified in the report. These data, transmitted by the manufacturers, are not necessarily certified but based

on chain-of-custody evidence. These supporting documents are the responsibility of the declarant or the supplier or a third party (example of third party: independent certification organism). This evidence should be available if requested.

The recycled content of the raw materials (see paragraph "3.5.1. Manufacturing stage") may, for example, be justified by supplier data (datasheet or supplier declaration) but may not be justified by generic data (sector, unions, ADEME). In the case of no specific justified recycled content, the default data presented in paragraph 3.5.1.1. must be followed.

The scrap levels of raw materials (see paragraph "3.5.1. Manufacturing stage") can be justified by an internal document from the manufacturing unit (e.g. annual balance sheet mentioning the quantity of material entering and leaving the process). In the absence of specific justified rates, the default data presented in paragraph 3.5.1.3. must be followed.

The treatment of waste at the end of its useful life (see paragraphs "3.5.1. Manufacturing stage", "3.5.3. Installation phase", "3.5.6. End of life") can be justified by a certificate from the company in charge of waste treatment in the factory. In absence of specific data or default data provided by this PSR, Table 67 of Annex D of the current PCR (PEP-RCP-ed4-EN 2021 09 06) applies.

3.5.2. Manufacturing stage (module A1-A3)

The manufacturing stage of these specific rules supplements paragraph 2.2 – System boundaries – of PCR. A direct, visible, fixed electric heating appliance consists of components:

- manufactured by the manufacturer itself,
- or ready to assemble.

3.5.2.1. Recycled content in raw materials

In case of lack of specific justified data on the recycled content of materials, a 0% recycled content shall be applied.

3.5.2.2. Raw material and component packaging

The packaging of raw materials and components and their transport to the manufacturing site(s) should be taken into account. Suppliers' data should be used.

In case of lack of justification, an average packaging rate of 5% of the mass of product (product + packaging) shall be considered, divided as follows:

- Wood 50%
- Cardboard 40%
- Low density polyethylene 10%.

The scraps of these packaging are taken into account in this average rate of 5%. On-site reused packaging not taken into account. The end-of-life treatment of packaging is modelled as in paragraph 3.5.3.2 of this PSR.

3.5.2.3. Waste generated during the manufacturing stage

Manufacturing and waste treatment are included in the manufacturing stage.

Manufacturers may remove manufacturing wastes themselves or be responsible for having it removed. The accompanying report will specify how the manufacturer, or anyone working on its behalf or account, should follow these stages identifying hazardous manufacturing waste from non-hazardous manufacturing waste and ensuring that these allegations are substantiated.

When known, removal procedures (energy exploitation, landfill, incineration without exploitation) must be submitted and justified in the accompanying report, and associated environmental impacts taken into account as indicated in the paragraph "Treatment scenarios for a product at its end of life" of the current PCR (PEP-PCR-ed4-EN-2021 09 06).

The justification of treatment processes must then be included, in the accompanying report, with the justification of the treatment channels and the valorization rate retained per waste (example: via an annual report on the treatment of end-of-life equipment by an eco-organization).

Where the manufacturer does not provide evidence of the treatment processes for the waste generated during the manufacturing stage of the equipment deployed, the treatment is to be calculated by default as follows:

- For raw materials and components generating non-hazardous waste, the quantity of waste generated is calculated by multiplying the quantity of material of the total product (finished product and associated packaging) quantity of material of the bare product excluding packaging by 0.05 for plastic and elastomer injection processes and 0.3 for other manufacturing processes. The treatment of the non-hazardous waste generated is modelled as follows: 100% incinerated waste (without energy recovery).
- For raw materials and components generating hazardous waste, the quantity of waste generated is calculated by multiplying the quantity of material of the total product (finished product and associated packaging) quantity of material of the bare product excluding packaging by 0.05 for the plastic and elastomer injection processes and 0.3 for the other manufacturing processes. The treatment of the hazardous waste generated is modelled as follows: 100% incinerated waste (without energy recovery).

Where relevant, as this is a default penalty value, no energy recovery is taken into account. Production of this waste material must be taken into account.

The following table summarises the default level of scrap, for any constituent material of the total product (finished product and associated packaging):

Process	Default fall rate	Mass of material after manufacture	Mass of material to be considered with off-cuts
Plastic and elastomer injection	5%	19,2kg	20,2kg
Other process	30%	14,4kg	20,6kg

Table 2 : Default fall rate for any constituent material of the total product (finished product and associated packaging)

Example of application of the default scenario :

If 1 kg of a total product (final mass of the piece excluding packaging) is composed of 0.8 kg of steel and 0.2 kg of electronic board:

For materials generating non-hazardous waste (0,8kg steel):

Mass of waste = Mass of steel x 0.30 = 0.8 kg x 0.30 = 0.24 kg of waste incinerated (without energy recovery)

For materials generating hazardous waste (0.2 kg of electronic card) :

Mass of waste = Mass of electronic board x 0.30 = 0.2 kg x 0.30 = 0.06 kg of waste incinerated (without energy recovery)

This means a total waste mass of 0.3 kg and an initial mass of 1.3 kg, which corresponds to a level of scrap of 23%.

Any other waste treatment scenario in the manufacturing stage taken into account for the calculation must be justified in the accompanying report and mentioned in the PEP.

By sectoral convention, the transport stage of this waste is to be taken into account assuming a transport distance of 100 km by truck.

3.5.3. Distribution stage (module A4)

For this stage, the rules defined in paragraph 2.2.4 "Distribution stage " of the current PCR (PEP-PCR-ed4-EN-2021 09 06) applies.

3.5.3.1. Waste generated during distribution stage

During distribution stage, no additional rule than paragraph 2.2 – System boundaries – from PCR is required.

3.5.4. Installation stage (module A5)

The installation stage of these specific rules supplements paragraph 2.2 – System boundaries – of PCR.

These installation conditions do not include use of particular consumables and/or products, to be listed if there is a wall support used as pattern for installation, already covered by the manufacturing stage LCA.

3.5.4.1. Waste generated during installation stage

If there is no wall support pattern, the LCA report specifies all the components used to install direct, visible, fixed electric heating appliances. These elements must be described and listed in the installation stage of the LCA report.

Packaging waste from direct, visible, fixed electric heating appliances and installation components produced during the installation stage is removed, in principle, by the installer, once the direct, visible, fixed electric heating appliance has been installed.

The end-of-life of packaging, whose production has been taken into account in the manufacturing stage, is taken into account in the installation stage.

Packaging waste generated during the installation stage is classified as non-hazardous waste and is usually destroyed by the installer once the product or equipment is installed.

If no evidence of a specific end-of-life is available, the treatment scenarios presented in the table below should be applied by default. The tables below are representative for the year 2019. More recent consolidated Eurostat data can be used if available from the information provided by the Eurostat database. The reference year of the data used should be mentioned in the PEP.

For France, the following default values should be used:

	Recycling rate	Incineration with energy efficiency	Incineration without energy efficiency	Landfill rate
Metal	83	1	0	16
Steel	88	0	0	12
Aluminium	60	7	0	33
Paper and cardboard	91	5	0	4
Wood	7	31	0	62
Plastic	27	43	0	30

Table 3 : Default scenarios for end-of-life treatment of packaging in France.

For the European perimeter, the following default values are to be used:

	Recycling rate	Incineration with energy efficiency	Incineration without energy efficiency	Landfill rate
Metal	77	2	0	21
Paper and cardboard	82	9	0	9
Wood	31	31	0	38
Plastic	41	37	0	23

Table 4 : Default scenarios for end-of-life treatment of packaging in France.

For other perimeters, the waste should be treated according to the default waste treatment scenario of the current PCR (PEP-PCR-ed4-EN-2021 09 06), paragraph 2.5.6.

By sectoral convention, the transport stage of this waste is to be considered on the assumption that it will be transported by truck for 100 km.

Strapping of any kind, packing slips, labels or any other paper material on or in the packaging are considered negligible and are not included in the life cycle assessment of packaging waste, if they represent in total less than 10% of the total mass of the packaging.

3.5.5. Use stage (module B1-B7)

The use stage of these specific rules supplements paragraph 2.2 – System boundaries – of PCR.

3.5.6. Energy consumption (module B6)

Once the appliance is installed, the use stage for direct, visible, fixed electric heating appliances includes: the electricity consumption, the transformation of electrical energy into heat, with a yield of 100%, the functions for optimizing energy consumption.

The local energy model is adopted as the production model for the electricity to be used to characterize environmental impacts from the use stage (or from use).

Energy consumption of a direct, visible, fixed electric heating appliance is expressed in kWh of final energy to deliver 1kW of heat, as specified for the reference product study specifications, described in paragraph 3.1 Functional unit and reference flow description **Erreur ! Source du renvoi introuvable.** of these specific rules, using the component families identified below.

	Family 1	Family 2
Products family	Passive components	Active components Any direct, visible, fixed electric heating appliance, attached to the built structure with integrated control.
Rules for calculating consumption	Use rate: 100 %	Use rate: 14% per year* (or 28% for 6 months of heating)
Duration of use	Reference lifetime: 17 years	

Table 5 – Specificities of the energetic consumption by products' family

Energy consumption of passive components (first family)

There is no energy consumption during the use stage for this component family

Energy consumption of active components (second family)

For products compliant with Regulation No. 2015/1188, the following formula is used to calculate the final energy consumption required for a visible stationary direct electric heater during its reference lifetime:

$$C = RLT \times \left(\frac{P}{\eta_S}\right) \times t_{heating}$$

With:

- C: Final energy consumption for heating over the reference lifetime, expressed in kWh,
- RLT: Number of annuities, as defined by the reference lifetime of the reference product, expressed in years,
- P: Power of the reference product in kW or P_{nom} according to EU regulation n°2015/1188
- t_{heating}: equivalent number of hours of annual operation of the appliance in active heating mode, or 2066 hours-
- η_S: The seasonal energy efficiency for space heating of all decentralised heating systems, except for commercial decentralised heating systems. It is defined as follows:

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

Or

- η_{S,on} : final energy yield, equal to 1- F(1) : facteur de correction non applicable à ces produits ; il est égal à 0.
- F(2): correction factor, expressed in %, representing a positive contribution to the seasonal energy efficiency for space heating corresponding to the room thermal comfort control devices, whose values are exclusive of each other and cannot be added to each other. The possible values for F(2) are :

If the product is equipped with only one option applicable:	F(2)
Control of heat output at one stage, no room temperature control	0%
Manual two or more step control, no temperature control	0%
Room temperature control with mechanical thermostat	1%
Electronic control of the room temperature	3%
Electronic room temperature control and daily programming	5%
Electronic room temperature control and weekly programming	7%

- F(3): correction factor, expressed in %, representing a positive contribution to seasonal energy efficiency for space heating corresponding to the room thermal comfort control devices, whose values can be added together. The possible values for F(3) are :

If the product is equipped with (several options applicable) :	F(3)
Room temperature control with detection sensor	0%
Room temperature control with open window sensor	1%
Remote monitoring option	1%
Adaptive control of activation	1%
Limitation of the activation period	0%
Black globe sensor	0%

- F(4): correction factor, expressed in %, representing a negative contribution of auxiliary electricity consumption to the seasonal energy efficiency for space heating related to the standby consumption

of the product; it shall be equal to 0 if the product complies with Regulation No 1275/2008, otherwise formula of Regulation No 2015/1088 must be apply

- F(5): correction factor, expressed as a %, representing a negative contribution of the energy consumption of the standing pilot to the seasonal energy efficiency. For space heating, which does not apply to these products, it is equal to 0.

Another scenario valid for the French market only:

When the products are also certified according to the NF ELECTRICITE PERFORMANCE label N°LCIE 103-13/G, the formula for calculation of the final energy consumption required for a direct electric heating appliance with a visible fixed position, during its reference lifetime is as follows

$$C = RLT * n * (1 - (A + 0.5 B))$$

Where:

- **C**: Final energy consumption to heat for 17 years, expressed in kWh,
- **RLT**: Number of annual periods defined by the reference lifetime of the reference product,
- **n = 8760 * P * R * 0,14** : 1-year consumption by a direct, visible, fixed electric heating appliance as described in the following table expressed in kWh /an,
- **A**: Bonus related to type "A" energy saving functions not requiring a predetermined action by the consumer, as described below, expressed in %,
- **B**: Bonus related to type "B" energy saving functions requiring a predetermined action by the consumer, as described below, expressed in %,

C	kWh	Final energy consumption expressed for the RLT	
RLT	years	17	Reference lifetime (constant)
N	kWh/year, calculated from:	8760	hours per year (365 days X 24 hours)
		P	Thermal power of the reference product in kW i.e. Pnom according to EU regulation n°2015/1188
		R=100%	Yield rate (performance) of the reference product in %
		14%*	Average annual working rate (constant)*
For example, consumption of a 1kW, without type A or B energy saving functions, is equal to: n = 1 226 kWh/year (or 8760hr * 1kW * 100% performance * 14% operating rate)			
A	Percentage of energy saving achieved by type "A" functions	Value of bonus from energy saving functions without predetermined action by the consumer, expressed as % (see table below).	

B	Percentage of energy saving achieved by type "B" functions	Value of bonus from energy saving functions with predetermined action by the consumer, expressed as % (see table below).
0,5	Coefficient applicable to type "B" functions:	A weighting coefficient of 0.5 is applied to the bonus percentage for type "B" functions. This energy saving functions necessarily imply a specific behavior from the end user. - Coefficient assumed by convention, while awaiting further studies

Table 6 : Energy consumption calculation description

Values of the A and B coefficients are as follows:

Energy saving functions type "A" and "B"		
Type "A" functions: Energy saving functions without predetermined consumer action		
Description of the function		Bonus (in %)
A1	Certified on-board absence detection system	17 %
A2	Bi-directional communication device with energy manager	17 %
A3	On-board auto-programming system	17 %
A4	Certified on-board window opening and closing detection system	6 %
A5	Radiator with 2 heating elements	9 %
A6	Radiator with 1 heating elements	5 %
A7	Radiant	4 %
A8	Convector	0 %
A9	Certified Time Variation between 1.00 and 0.50	0 %
A10	Certified Time Variation between 10,49 and 0,30	2 %
A11	Certified Time Variation between 1 0,29 and 0,15	3 %
A12	Certified Time Variation between 10,14 and 0,10	4 %
Type "B" functions: Energy saving functions requiring a predetermined action by the consumer		
Description of the function		Bonus (in %)
B1	On-board consumption indicator	9 %
B2	Return function to recommended setpoint temperatures	9 %
B3	Programming function	13 %

Table 7 – Energy saving functions type "A" and "B"

Type "A" and "B" energy saving functions:

Type "A" functions: Energy saving functions without pre-determined action by the consumer		
	Description of function	Bonus (in %)
A1	Certified on-board absence detection function	17%
A2	Appliance with two-way communication with energy manager	17%
A3	On-board auto-programming system	17%
A4	Certified on-board window opening/closing detection system	6%
A5	Electric radiator with 2 heating bodies	9%
A6	Electric radiator with 1 heating body	5%
A7	Radiant panel	4%
A8	Convactor	0%
A9	Variation over time certified between 1 and 0.50	0%
A10	Variation over time certified between 0.50 and 0.30	2%
A11	Variation over time certified between 0.29 et 0	4%

Type "B" functions: Energy saving functions requiring a pre-determined action by the consumer		
	Description of function	Bonus (in %)
B1	On-board consumption indicator	9%
B2	Function for reset to recommended temperature settings	9%
B3	Programming function	13%

A1: Definition of an on-board absence detector system certified by an independent laboratory, related to the category of products covered by this PSR.

System built into the direct, visible, fixed electric heating appliance to detect the presence of people in a room. This detection system means that the appliance can automatically adapt its mode and/or setting temperature.

A2: Definition of a two-way communication appliance with an energy controller

Communication system between a direct, visible, fixed electric heating appliance and an energy controller for sending and receiving information to assist in particular in making energy savings.

A3: Definition of an on-board auto-programming system

System for defining automatic programming rules, independent of the user's action.

A4: Definition of an on-board window opening/closing detector system certified by an independent laboratory, related to the category of products covered by this PSR.

On-board system for automatically detecting opening and closing of a window and adjusting its operation accordingly.

A5 to A8: Definition of the type of direct, visible, fixed electric heating appliance

The type of direct, visible, fixed electric heating appliance is linked to a performance level of the appliance's technology, whose performance in terms of comfort and distribution of heat lead the user to alter the various temperature settings.

Note: 2-body radiators must be fitted with an appropriate control system to manage the 2 bodies separately in order to qualify for the bonus.

A9 to A12: Definition of Over-time variation (VT)

Value defining the the ability coefficient of an electronic controller, taken into account in heat control values of environmental regulation of new buildings 2020.

A value of VT may be chosen once:

- 1) it has been certified by an independent laboratory, related to the category of products covered by this PSR,
- 2) it is determined according to the following formula: $VT = ((0.5 \times DM + AM) / 2) \times 1.44$.

Where:

- MD (Mean deviation) = mean deviation values calculated from individual results obtained from certification tests for all products in a homogeneous family declared and defined by the applicant, according to the EN 60675 standard

- MA (Mean amplitude) = mean amplitude values calculated from individual results obtained from certification tests for all products in a homogeneous family declared and defined by the applicant, according to the EN 60675 standard

B1: Definition of an on-board consumption indicator

On-board indicator intended to encourage users of direct, visible, fixed electric heating appliances to set these appliances at a Comfort temperature of 19.0°C or an Eco temperature of 15.5°C.

B2: Definition of a reset function for recommended temperature settings

Automatic system for simultaneous reset of temperature settings to the recommended values (Comfort temperature at 19.0°C or Eco temperature setting at 15.5°C).

B3: Definition of a programming system

System for defining timer setting rules for the heating mode by the user or using pre-defined factory settings.

Any request for altering values noted in the specific rules applied to direct, visible, fixed electric heating appliances, made to the PEP Ecopassport program, must be accompanied by a technical dossier justifying the modification. The PEP Ecopassport program pronounces these requests according to the organisation's rules.

3.5.6.1. Maintenance

Direct, visible, fixed electric heating appliances do not involve maintenance by a professional or servicing during the use stage. Mean time between failures is not considered for this type of appliance.

If a new product on the market requires frequent maintenance or consumables, these elements will be incorporated in the study.

3.5.6.2. Waste generated during use stage

No waste is considered here.

3.5.7. End of life stage (module C1-C4)

The end of life stage of these specific rules supplements paragraph 2.2 – System boundaries – of PCR (PEP-PCR-ed4-FR 2021-09 06).

Once at the end of its life, the direct, visible, fixed electric heating appliance enters the category of DEEE.

The end user is the final holder of the product.

The disposal route for this hazardous waste must comply with international, regional and local legal requirements.

Within the European Union, direct, visible, fixed electric heating appliance waste comes into the WEEE category (Waste from Electrical and Electronic Equipment) and obeys a restrictive, specific regulation noted in paragraph 6.2 **Erreur ! Source du renvoi introuvable.** of present specific rules.

For a France/Europe scope, the end-of-life treatment of a direct electric stationary heater visible in France and Europe should be modelled with the life cycle inventory modules provided in the public EcoSystem database (called ESR) if they are available in the LCA software used by the registrant.

Note: the Ecosystem database is the only database that assesses the environmental footprint of electrical and electronic equipment at end-of-life. As WEEE treatment technologies are globally harmonised in Europe, this database is sufficiently representative to also cover the European perimeter.

At international level, the following prohibitions are in place:

- The Basel Convention ((scope: OECD countries²): prohibition on transfer of hazardous waste produced by OECD member countries to non-OECD countries, and restrictions on the shipment of other waste.

² <http://www.oecd.org/fr/apropos/membresetpartenaires/liste-des-pays-de-l-ocde.htm> (consulted on October 9th 2017)

- Lomé Accords (scope: countries of the European Union and ACP³ (African, Caribbean and Pacific) countries): prohibition on transfer of hazardous waste produced by European Union member countries to ACP countries, and restrictions on the shipment of other waste.

In the case of a PEP carried out for a perimeter outside France/Europe or an inability to access the ESR database: refer to table 6 of annex D of PEP-PCR-ed4-EN-2021 09 06. For all materials not included in the table, consider 100% incineration without energy recovery.

By sectoral convention, the transport stage of the product at the end of its life is to be taken into account by considering a transport hypothesis of 100 km by truck.

3.5.8. Profit and loss stage beyond system boundaries (module D)

For this stage, the rules defined in the current PCR (PEP-PCR-ed4-EN-2021 09 06) applies.

3.6. Rules of extrapolation to a homogeneous environmental family

These rules are additional to section 2.6 "Rule(s) for extrapolation to a homogeneous environmental family" of the PCR (PEP-PCR-ed4-FR-2021 09 06).

When developing a PEP valid for a homogeneous family of direct, visible, fixed electric heating appliances, a weighting coefficient for environmental impact is applied to all power levels in one product homogeneous family, according to paragraph 3.1 - Functional unit and reference flow description - in these specific rules.

3.6.1. Rules for extrapolation applied on manufacturing, distribution, installation and end of life stage

For all stages except for the use stage, a mass homothetic transformation coefficient is calculated for any power level of a homogeneous family, as following:

Coefficient at functional unit level	$\left(\frac{\text{total mass of considered product (kg)}}{\text{total mass of reference product (kg)}} \right) \times \left(\frac{\text{Power of the reference product (kW)}}{\text{Power of the considered product (kW)}} \right)$
Coefficient at declared unit level (additional information)	$\left(\frac{\text{total mass of considered product (kg)}}{\text{total mass of reference product (kg)}} \right)$

³ <http://www.acp.int/fr/content/fag> (consulted on October 9th 2017)

The mass of the product is considered as its total mass with or without its packaging, expressed in kilogram (kg). For each stage, total mass is expressed below:

- Manufacturing: total mass of the product including packaging
- Distribution: total mass of the product including packaging
- Installation: product packaging mass
- End of life: product mass without packaging
- Benefits and costs beyond the system boundaries: mass of the product with its packaging

Note: After a documented sensitivity study, it has been shown that the environmental impacts of these schemes on phases A1-C4 are broadly proportional to their mass.

An extrapolation method for all life cycle phases (A1-C4) has been established and is shown in the tables above. The parameters that influence the module D are:

- The amount of recycled content in the raw materials used to manufacture the products,
- The amount of losses and waste generated throughout the life cycle and their treatment.

These parameters are directly related to the mass of the product and are not supposed to vary within a homogeneous environmental family (according to paragraph 2.6. of the current RCP (PEP-PCR-ed4-EN-2021 09 06): "similar manufacturing technology: same type of materials and manufacturing process".

Therefore, the extrapolation rule based on the mass of the product can also be applied to module D.

3.6.2. Extrapolation rule applied in use stage

Environmental impacts generated in use stage are directly correlated to the product power.

For the use stage, the energy extrapolation coefficient to use for any other power of the same family is as follow:

Coefficient at functional unit level	$\left(\frac{\text{Final energetic consumption of the considered product (kWh)}}{\text{Final energetic consumption of the reference product (kWh)}} \right) \times \left(\frac{\text{Power of the reference product (kW)}}{\text{Power of the considered product (kW)}} \right)$
Coefficient at declared unit level (additional information)	$\left(\frac{\text{Final energetic consumption of the considered product (kWh)}}{\text{Final energetic consumption of the reference product (kWh)}} \right)$

3.7. Rules applying to joint environmental declarations

This PSR is complementary to section 2.7 "Rules applying to joint environmental declarations of PCR (PEP-PCR-ed4-FR-2021 09 06).

For joint environmental declarations, the study shall be conducted on a typical product, that shall be a 1000 W model, or the product closest to this level.

In addition, it is necessary to mention in the PEP the framework of validity for application of the extrapolation rules on the basis of technical criteria allowing to verify that the products belong to the same homogeneous environmental family as the typical product.

3.8. Environmental data requirements

The rules defined in paragraph 2.9 of the PCR (PEP-PCR-ed4-FR-2021 09 06) applies.

The ICV module used for modelling the raw material or component may contain a default fall rate.

- If the level of scrap included in the ICV module is modifiable, the default values of paragraph 3.5.1.3. shall apply.
- If the sink rate included in the ICV module is not modifiable:
 - The level of scrap is lower than the default values of paragraph 3.5.1.3: this level of scrap should be entered in the accompanying report and the modelling should be adapted as far as possible to take into account the difference in waste generated (hazardous or non-hazardous).
 - The fall rate is higher than the default values of paragraph 3.5.1.3: this fall rate must be filled in the accompanying report.

3.9. Environmental impact calculation

If the reference product has a different power than 1000W, and in order to match the functional unit as defined in paragraph 3.1.1 Functional unit of the present specific rules, environmental impacts of manufacturing, distribution, installation, use and end of life stages must be calculated at the FU level as following:

$$\text{Environmental impacts of the PEP} = \frac{\text{Environmental impacts of reference product}}{\text{Power of reference product (kW)}}$$

If the amount of biogenic carbon stored in kg is stated, both assessment methodologies 0/0 or -1/+1 are accepted until the environmental databases are updated.

The methodology and version of the environmental database used must be stated on the PEP and in the accompanying report (including the EF (Environmental Footprint) version number).

4. Drawing up the Product Environmental Profile

4.1. General information

Rules specified in paragraph 4.1 « General information » of PCR (PEP-PCR-ed4-FR-2021 09 06) applies.

The PEP must include:

- The subcategory and characteristics to declare according to paragraph 3.1.2
- The list of function assumed by the product(s) and option(s) proposed
- The use profile considered in use stage following paragraph 3.5.4
- Any other scenario different from the default scenario
- For a PEP covering a range of devices, the extrapolation rules or coefficients.

4.2. Constituent materials

Rules specified in paragraph 4.2 « Constituent materials » of PCR (PEP-PCR-ed4-FR-2021 09 06) applies.

4.3. Additional environmental information

Rules specified in paragraph 4.3 « Additional environmental information” of PCR (PEP-PCR-ed4-FR-2021 09 06) applies.

4.4. Environmental impacts

The present specific rules complete the paragraph 4.4 “Environmental impacts” of PCR (PEP-PCR-ed4-FR-2021 09 06).

The table of environmental impacts represents the environmental impact at UF level as defined in paragraph 3.9 Environmental impact calculation at FU level of the present specific rules.

So the total impact of the product in a real situation must be calculated by PEP user knowing the power of device by multiplying the considered impact by the power associated to the study reference flow by the total number of kW of the device. This calculation is relevant only if the PEP does not include in the additional environmental information the table of impact indicators at product level.

$$\text{Environmental impacts of PEP for 1kW} = \frac{\text{Environmental impacts of the reference product}}{\text{Reference product power (kW)}}$$

The following statement must be completed and presented in the PEP, before the impact indicator table at functional unit level, in order to ensure clarity and transparency for the user:

The present declaration was developed considering the supply of 1 kW of heat. The real impact of the life cycle stages of the product installed in a real situation must be calculated by the declaration user by multiplying the considered impact by the total heating power of the device, in kW.

In the case of using extrapolation rules, following statement must be mentioned:

Extrapolation coefficients are given for the functional unit impact that is emission of 1 kW of heat. For each stage of the life cycle, impacts of the product are calculated by multiplying impacts of the declaration corresponding to the reference product by the coefficient of extrapolation. The column « Sum » must be calculated by adding the environmental impacts of each stage of the life cycle.

In case of use of PEP result to proceed to a Life Cycle assessment at building level, environmental impacts of equipment must be taken at the product level, and impacts due to energy consumption in use stage must be treated separately. Then the PEP may include:

- The environmental impacts table of the reference product, expressed at product level (or declared unit) in complement to the environmental impact values declared at FU level (see paragraph 3.10 Environmental impact calculation at FU level for these specific rules).
- Values must be indicated in numerical values, expressed in their appropriate units with 3 significant digits (and optionally in percent) for each stage of the life cycle, and the total for each indicator of the complete life cycle assessment.

The following provisions should then be indicated in the PIP, before each table of indicators, to ensure clarity and transparency for the user:

- The environmental impacts table of the reference product, expressed at product level (or declared unit), the following statement shall appear: "per kW of heating corresponding to the functional unit".
- For environmental impacts expressed per unit declared, the following statement shall be included: "per equipment corresponding to the reference product".
- - The rules for extrapolation to the level of the declared product.

5. PEP update rules

Any PEP registered with the PEPecopassport® program must be updated and re-registered when the direct, visible, fixed electric heating appliance to which it refers is modified, by an increase or reduction of more than 5% in:

- mass,
- new subcomponents,
- its environmental indicators considered as important,
- any other element considered as important.

6. Appendix

6.1. Example of application of extrapolation rules

For all the examples below of calculation of the grossing-up coefficients, the product with a packed weight of 5.5kg is the reference product.

As an example, a homogeneous family of visible stationary direct electric heaters with the following power ratings would use the following mass homotheticity coefficients for the manufacturing and distribution stages:

Power of visible stationary direct electrical energy appliances	Packed weight, in kg	Mass homotheticity coefficient (UFuf), calculated from the weight of the reference product, which is 5.50 kg	Mass homotheticity coefficient (UD), calculated from the weight of the reference product, which is 5.50 kg
750 W	4,30	1,04	0,78
1000 W	5,50	1,00	1,00
2000 W	10,00	0,91	1,82

Table 9 – Example of the extrapolation rule in the manufacturing, distribution phase

As an example, a homogeneous family of direct electric stationary visible heaters with the following power ratings would have the following use-phase extrapolation coefficients for 100% efficiency R, without energy saving functions of type A or B:

Power of visible stationary direct electrical energy appliances	Final energy consumption, in kWh	Energy extrapolation coefficient (UF)	Energy extrapolation coefficient (UD)
750 W	15636,6	1,00	0,75
1000 W	20848,8	1,00	1,00
2000 W	41697,6	1,00	2,00

Table 10 – Example of extrapolation rule in use

6.2. Bibliography

These specific rules cover direct, visible, fixed electric heating appliances governed by particular international, European or local regulations, specified below.

The application of this document outside France may be the subject of an introduction to specific regulations that can be used in the country of sale, as given in paragraph 6.2.3 - Local standards of these specific rules.

This is not a complete list of the standards concerned. Their current versions must be used.

6.2.1. International standard

Standards relating to domestic electrical equipment and similar, as specified by the French Union Technique de l'Électricité (UTE), member of CENELEC (European Committee for Electro-technical standardisation) and the International Electro-technical Commission (IEC), may be applied.

These standards are also applicable at European and national level in NF EN version (see paragraph 6.2.2 European Directives and paragraph 6.2.3 Local Standards of these specific rules)

.

EN 60335-1:2012 Household and similar electrical appliances - Safety - Part 1: General requirements

EN 60675:2015 Direct acting domestic electrical space heating appliances - Methods of measurement of performance

EN 60675/A2:2018 Direct acting household electrical space heating appliances - Methods of measurement of performance

6.3. European directives

The current version of the following European directives must be used:

Directive on waste from electrical and electronic equipment (WEEE) (directive 2012/19/EU, OJ L197 du 24/07/2012),

6.3.1. Local standard

6.3.1.1. Local standard / France

6.3.1.1.1. NF Electricity mark

Direct, visible, fixed electric heating appliances may be covered by NF Electricity marking requirements, as described in NF089 - Rules for certification of NF Electricity and NF Electricity Performance marks

The NF Electricity mark is applied to appliances that comply with regulation safety standards.

6.3.1.1.2. NF Electricity Performance mark

Direct, visible, fixed electric heating appliances may be covered by NF Electricity Performance marking requirements, as described by the specification N° LCIE 103-13.

The certification granted by AFNOR and checked by LCIE is used to certify conformity:

- Of suitability for the function
- With the requirements of the NF Electricity Performance marking specifications.

6.4. Glossary

Acronym	Definition
LCA	Life Cycle Assessment
ACP	Africa Caribbean Pacific
ADEME	French Environment and Energy Management Agency
AFNOR	Association Française de Normalisation [French Standards Agency]
C	Final energy consumption
EC	European Community
CEF	Comité Electrotechnique Français (French Electrotechnical Committee)
IEC	International Electrotechnical Commission
EMC	Directive 2004/108/CE, "ELECTROMAGNETIC COMPATIBILITY"
CENELEC	Comité Européen de la Normalisation Electrotechnique (European Committee for Electrotechnical Standardization)
WEEE	Waste Electrical and Electronic Equipment
UTD	Unified technical documents
EEE	Electrical and Electronic Equipment
Final energy	Final or available energy is the energy supplied to the consumer for consumption (petrol at the pump, electricity to the home, etc.)
LCI	Life cycle inventory
K	Degrees Kelvin: degrees of heating
kWh	Kilowatt hour
LCIE	Laboratoire Central des Industries Electriques (French Electricity Industries Central Laboratory)
NF	Norme Française
OECD	Organization for Economic Cooperation and Development
PCR	Product Category Rules
PEP	Product Environmental Profile

Pn	Nominal output power of appliance: electrical power an electrical appliance receives when subject to its nominal voltage (1000W as regards the reference product for these specific rules).
RoO	Rate of operation
T°	Temperature in Celsius degrees
UD	Unit Declared
FU	Functional Unit
UTE	Union Technique de l'Electricité (French Technical Electricity Union)
VT	Over-time variation
W	Watt

6.5. References

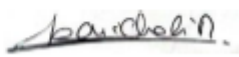

Ref paragraph PSR	Descriptif	Source used
2	Note on the definition of fixed appliances	EN 60335-1:2012 Household and similar electrical appliances - Safety - Part 1: General requirements
2.1	Definition of target product family	EN 60675:2015 Direct acting domestic electrical space heating appliances - Methods of measurement of performance EN 60675/A2:2018 Direct acting domestic electrical space heating appliances - Methods of measurement of performance
2.1.1	Direct electrical heating appliance of the visible stationary convector type	EN 60675:2015 Direct acting domestic electrical space heating appliances - Methods of measurement of performance
2.1.2	Direct electrical heating appliance of the visible stationary radiant type	COMMISSION REGULATION (EU) 2015/1188 of 28 April 2015 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for decentralised heating devices
2.1.3	Direct electrical heating appliance with a visible fixed position of the radiator type	NF electricity in effect at the date of registration of these specific rules
2.1.4	Direct electrical heating appliance with a visible fixed position and a secondary towel drying function	NF electricity in effect at the date of registration of these specific rules
3.1	Unit quantifying the function under study	NF electricity in effect at the date of registration of these specific rules

		Reference lifetime: UNECE, Operation No. BAR-TH-158
		EN 60675: 2015 Direct operated domestic electrical space heating appliances - Methods of measurement of performance
3.1	Reference product	Eurostat : https://ec.europa.eu/eurostat/databrowser/view/ENV_WASPAC_custom_3801295/default/bar?lang=fr
3.5.3.1	Recovery of packaging waste from the visible stationary direct electrical energy appliance	COMMISSION REGULATION (EU) 2015/1188 of 28 April 2015 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for decentralised heating devices
3.5.4.2.1	Energy consumption	www.ute-fr.com
6.3.1	International standards	www.eur-lex.europa.eu
6.3.2	EU Directives	

6.6. Critical review certificate



Attestation de revue critique des « Règles spécifiques aux appareils de chauffage a énergie électrique directe a poste fixe visibles »

Chargée de revue critique	Marlène DEMICHELI et Olivia DJIRIGUIAN	
Document revu	PSR - Règles spécifiques aux appareils de chauffage a énergie électrique directe a poste fixe visibles	
Etabli par	CSTB	
Version et date	PSR-0002-ed3.0-FR-2023 05 16	
Période de revue	Janvier 2023 – Mai 2023	
Référentiels de revue	<p>L'objectif de la revue critique est de vérifier la conformité du document avec les référentiels suivants :</p> <ul style="list-style-type: none"> - Le programme PEP ecopassport, : PCR-ed4-FR-2021 090 06 - Les normes NF EN ISO 14020-2002 et NF EN ISO 14025-2010 ; - Les normes NF EN ISO 14040 et 14044-2006 	
Conclusion	<p>Le document revu ne comporte pas de non-conformité par rapports aux référentiels. Ainsi, le PSR relatifs aux appareils de chauffage a énergie électrique directe a poste fixe visibles est conforme aux exigences des référentiels.</p>	
	<p>Marlène DEMICHELI Consultante ACV et éco-conception</p>  <p>Le 16/05/2023</p>	<p>Olivia DJIRIGUIAN Consultante ACV et éco-conception</p>  <p>Le 16/05/2023</p> 

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