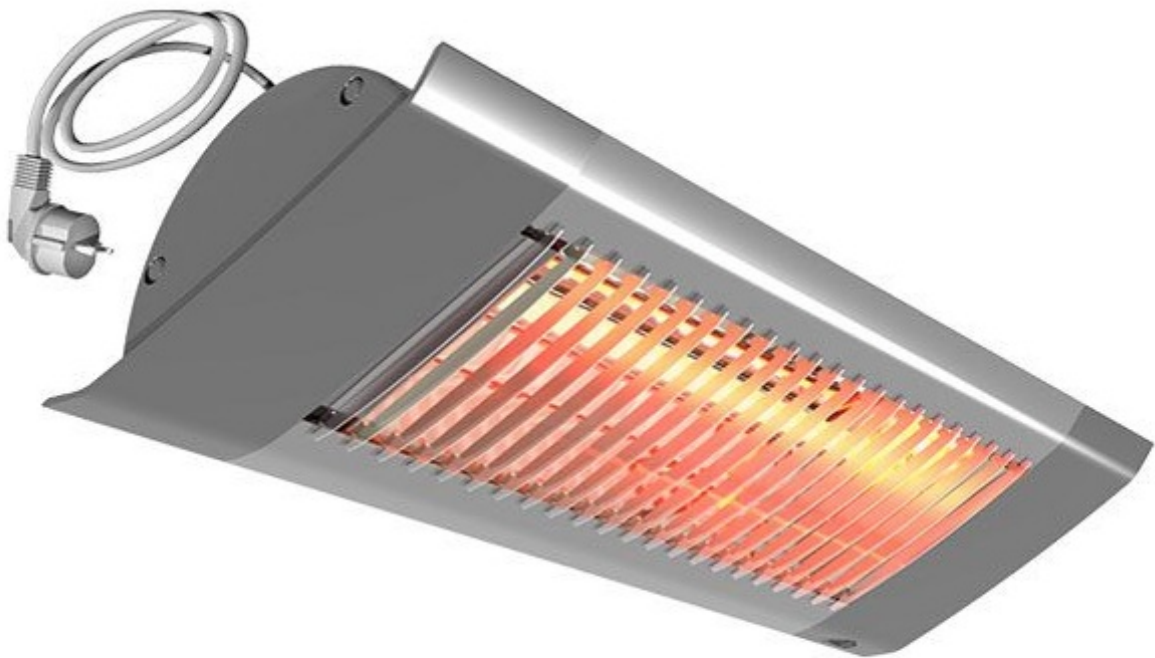


Environmental product declaration

in accordance with ISO 14025 and EN 15804+A2

IHC12 Infrared Heater



The Norwegian EPD Foundation

Owner of the declaration:

Frico AB

Product:

IHC12 Infrared Heater

Declared unit:

1 pcs

This declaration is based on Product Category Rules:

CEN Standard EN 15804:2012+A2:2019 serves as core PCR

NPCR 030:2021 Part B for ventilation components

Program operator:

The Norwegian EPD Foundation

Declaration number:

Registration number:

Issue date:

Valid to:

EPD software:

LCAno EPD generator ID: 706560

General information

Product

IHC12 Infrared Heater

Program operator:

The Norwegian EPD Foundation
Post Box 5250 Majorstuen, 0303 Oslo, Norway
Phone: +47 977 22 020
web: www.epd-norge.no

Declaration number:

This declaration is based on Product Category Rules:

CEN Standard EN 15804:2012+A2:2019 serves as core PCR
NPCR 030:2021 Part B for ventilation components

Statement of liability:

The owner of the declaration shall be liable for the underlying information and evidence. EPD Norway shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.

Declared unit:

1 pcs IHC12 Infrared Heater

Declared unit with option:

A1-A3,A4,C1,C2,C3,C4,D

Functional unit:

Not declared

General information on verification of EPD from EPD tools:

Independent verification of data, other environmental information and the declaration according to ISO 14025:2010, § 8.1.3 and § 8.1.4. Verification of each EPD is made according to EPD-Norway's guidelines for verification and approval requiring that tools are i) integrated into the company's environmental management system, ii) the procedures for use of the EPD tool are approved by EPD-Norway, and iii) the process is reviewed annually by an independent third party verifier. See Appendix G of EPD-Norway's General Programme Instructions for further information on EPD tools

Verification of EPD tool:

Independent third party verification of the EPD tool, background data and test-EPD in accordance with EPDNorway's procedures and guidelines for verification and approval of EPD tools.

Third party verifier:

Alexander Borg, Asplan Viak AS

(no signature required)

Owner of the declaration:

Frico AB
Contact person: Marie W. Andersson
Phone: + 46 31336 86 92
e-mail: mailbox@frico.se

Manufacturer:

Frico AB
, Sweden

Place of production:

Frico AB
Industrivägen 3
793 30 Skinnskatteberg, Sweden

Management system:

ISO 9001

Organisation no:

556573-3812

Issue date:

Valid to:

Year of study:

2022

Comparability:

EPD of construction products may not be comparable if they not comply with EN 15804 and seen in a building context.

Development and verification of EPD:

The declaration is created using EPD tool lca.tools ver EPD2022.03, developed by LCA.no. The EPD tool is integrated in the company's management system and has been approved by EPD Norway. NEPDT75 Systemair AB

Developer of EPD: Jimmy Frisk

Reviewer of company-specific input data and EPD: Karolina Persson

Approved:



Håkon Hauan, CEO EPD-Norge

Product

Product description:

IHC is an infrared heater that produces a gentle and direct heat together with a soft glow, ideal for outdoor use.

Product specification

The EPD data is provided for size 12 (reference).

Materials	kg	%
Electronic - Unspecified	0,12	5,25
Metal - Steel with magnelis coating	0,11	5,02
Plastic - Polyamide	0,01	0,37
Plastic - Polyethylene	0,00	0,05
Metal - Aluminium	0,70	31,96
Metal - Stainless steel	0,37	16,99
Metal - Steel	0,02	0,78
Metal - Zinc	0,70	31,96
Other	0,12	5,48
Plastics	0,05	2,15
Total	2,19	100,00

Packaging	kg	%
Packaging - Cardboard	0,39	91,78
Packaging - Paper	0,04	8,22
Total incl. packaging	2,62	100,00

Technical data:

For complete technical data including dynamic energy performance calculations, please refer to the product page on Frico.net.

Size	Weight [kg]	GWP tot. (A1-A3) [kg CO2 eq]	Factor [-]
12	2.6	19	1.00
18	3.0	22	1.15

Market:

Europe

Reference service life, product

Not declared. Dependent on the application of the product.

Reference service life, building or construction works

Not declared.

LCA: Calculation rules

Declared unit:

1 pcs IHC12 Infrared Heater

Cut-off criteria:

All major raw materials and all the essential energy is included. The production processes for raw materials and energy flows with very small amounts (less than 1%) are not included. These cut-off criteria do not apply for hazardous materials and substances.

Allocation:

The allocation is made in accordance with the provisions of EN 15804. Energy, water and waste production in-house is allocated equally among all products through mass allocation. Effects of primary production of recycled materials is allocated to the main product in which the material was used. The recycling process and transportation of the material is allocated to this analysis.

Data quality:

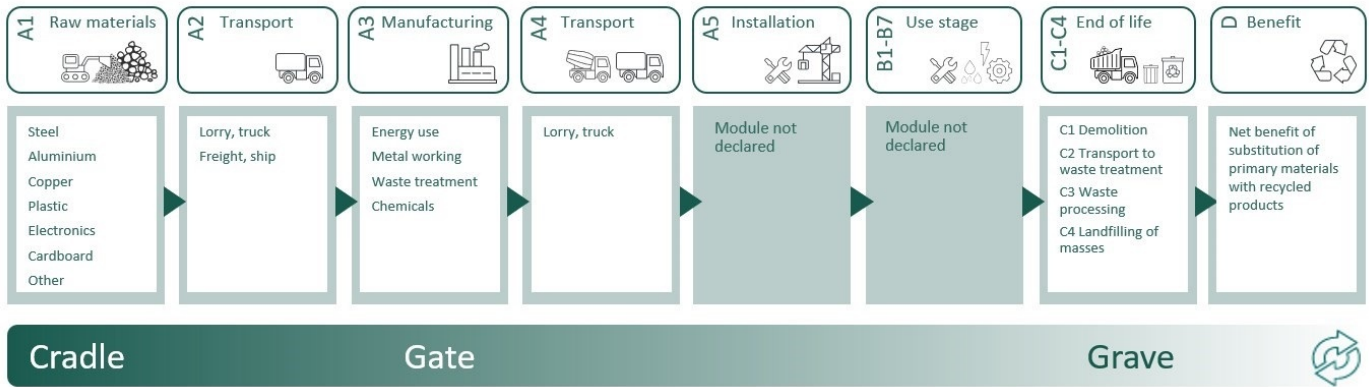
Specific data for the product composition are provided by the manufacturer. The data represent the production of the declared product and were collected for EPD development in the year of study. Background data is based on EPDs according to EN 15804 and different LCA databases. The data quality of the raw materials in A1 is presented in the table below.

Materials	Source	Data quality	Year
Electronic - Unspecified	ecoinvent 3.6	Database	2019
Metal - Aluminium	ecoinvent 3.6	database	2019
Metal - Stainless steel	Modified ecoinvent 3.6	Database	2019
Metal - Steel	ecoinvent 3.6	Database	2019
Metal - Steel with magnelis coating	Modified ecoinvent 3.6	Database	2019
Metal - Zinc	Modified ecoinvent 3.6	Database	2019
Other	Material composition + ecoinvent 3.6	Supplier data + database	2019
Packaging - Cardboard	ecoinvent 3.6	Database	2019
Packaging - Paper	ecoinvent 3.6	Database	2019
Plastic - Polyamide	ecoinvent 3.6	Database	2019
Plastic - Polyethylene	ecoinvent 3.6	Database	2019
Plastics	ecoinvent 3.6	Database	2019

System boundaries (X=included, MND=module not declared, MNR=module not relevant)

Product stage			Construction installation stage	Use stage								End of life stage				Beyond the system boundaries
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	MND	MNR	MND	MND	MND	MND	MND	MND	X	X	X	X	X

System boundary:



Additional technical information:

Complete project specific technical documentation is generated using our online product selection tool. Please refer to the Frico website for more information.

LCA: Scenarios and additional technical information

The following information describe the scenarios in the different modules of the EPD.














For A4 a generic transportation distance (EURO6 truck) of 300 km is declared. True transportation distance can be provided in project specific EPD.

For C2 a generic transportation distance (EURO6 truck) of 50 km is declared. True transportation distance can be provided in project specific EPD

Transport from production place to user (A4)	Capacity utilisation (incl. return) %	Distance (km)	Fuel/Energy Consumption	Unit	Value (Liter/tonne)
Truck, over 32 tonnes, EURO 6 (km)	53,3 %	300	0,023	l/tkm	6,90
De-construction demolition (C1)					
Demolition of building per kg of ventilation product (kg)	Unit	Value			
	kg	2,20			
Transport to waste processing (C2)					
Truck, over 32 tonnes, EURO 6 (km)	Capacity utilisation (incl. return) %	Distance (km)	Fuel/Energy Consumption	Unit	Value (Liter/tonne)
	53,3 %	50	0,023	l/tkm	1,15
Waste processing (C3)					
Materials to recycling (kg)	Unit	Value			
	kg	1,78			
Waste treatment per kg wire plastic, municipal incineration (kg)	Unit	Value			
	kg	0,027			
Waste treatment per kg Electronics scrap, Control units, incineration (kg)	Unit	Value			
	kg	0,11			
Waste treatment per kg Plastics, from incineration (kg)	Unit	Value			
	kg	0,027			
Waste treatment per kg Polyethylene (PE), incineration (kg)	Unit	Value			
	kg	0,00050			
Disposal (C4)					
Waste, aluminium, to landfill (kg)	Unit	Value			
	kg	0,049			
Waste, plastic, mixture, to landfill (kg)	Unit	Value			
	kg	0,055			
Waste, copper, to landfill (kg)	Unit	Value			
	kg	0,0063			
Landfilling of ashes from incineration per kg wire plastic, process per kg ashes and residues (kg)	Unit	Value			
	kg	0,0041			
Landfilling of ashes from incineration of Electronics scrap, Control units, process of ashes and residues (kg)	Unit	Value			
	kg	0,080			
Landfilling of ashes from incineration of Plastics, process per kg ashes and residues (kg)	Unit	Value			
	kg	0,00064			
Landfilling of ashes from incineration of Polyethylene (PE), process per kg ashes and residues (kg)	Unit	Value			
	kg	0,000017			
Waste, stainless steel, to landfill (kg)	Unit	Value			
	kg	0,037			
Waste, steel, to landfill (kg)	Unit	Value			
	kg	0,012			
Waste, scrap zinc, to landfill (kg)	Unit	Value			
	kg	0,070			
Benefits and loads beyond the system boundaries (D)					
Substitution of primary aluminium with net scrap (kg)	Unit	Value			
	kg	0,049			
Substitution of primary copper with net scrap (kg)	Unit	Value			
	kg	0,046			
Substitution of thermal energy, district heating (MJ)	Unit	Value			
	MJ	0,54			
Substitution of electricity (MJ)	Unit	Value			
	MJ	0,035			
Substitution of primary other ferrous metals with net scrap (kg)	Unit	Value			
	kg	0,20			
Substitution of primary steel with net scrap (kg)	Unit	Value			
	kg	0,077			
Substitution of primary zinc with net scrap (kg)	Unit	Value			
	kg	0,63			

LCA: Results

The LCA results are presented below for the declared unit defined on page 2 of the EPD document.

Environmental impact									
Indicator	Unit	A1-A3	A4	C1	C2	C3	C4	D	
 GWP-total	kg CO ₂ -eq	1,93E+01	6,80E-02	2,90E-03	1,13E-02	2,49E-01	1,83E-02	-2,78E+00	
 GWP-fossil	kg CO ₂ -eq	1,90E+01	6,79E-02	2,90E-03	1,13E-02	2,49E-01	1,83E-02	-2,75E+00	
 GWP-biogenic	kg CO ₂ -eq	1,47E-01	2,91E-05	5,44E-07	4,85E-06	1,01E-04	1,96E-05	-2,10E-02	
 GWP-luluc	kg CO ₂ -eq	1,49E-01	2,07E-05	2,29E-07	3,45E-06	8,41E-06	4,55E-06	-1,50E-02	
 ODP	kg CFC11 -eq	1,71E-06	1,64E-08	6,27E-10	2,73E-09	2,20E-09	1,14E-09	-2,28E-04	
 AP	mol H+ -eq	1,54E-01	2,19E-04	3,03E-05	3,65E-05	8,16E-05	3,64E-05	-4,18E-02	
 EP-FreshWater	kg P -eq	1,93E-03	5,41E-07	1,06E-08	9,01E-08	3,02E-07	1,56E-07	-3,79E-04	
 EP-Marine	kg N -eq	2,43E-02	4,79E-05	1,34E-05	7,98E-06	2,95E-05	1,75E-05	-5,59E-03	
 EP-Terrestrial	mol N -eq	2,87E-01	5,34E-04	1,47E-04	8,90E-05	3,05E-04	1,21E-04	-6,58E-02	
 POCP	kg NMVOC -eq	7,93E-02	2,10E-04	4,04E-05	3,50E-05	7,72E-05	3,52E-05	-1,78E-02	
 ADP-minerals&metals ¹	kg Sb-eq	9,37E-02	1,21E-06	4,45E-09	2,02E-07	1,79E-07	1,25E-07	-4,88E-02	
 ADP-fossil ¹	MJ	2,71E+02	1,10E+00	3,99E-02	1,84E-01	1,20E-01	9,74E-02	-3,72E+01	
 WDP ¹	m ³	3,16E+03	8,46E-01	8,48E-03	1,41E-01	3,30E-01	6,94E-01	-2,99E+02	

GWP-total = Global Warming Potential total; GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption

"Reading example: 9,0 E-03 = 9,0*10⁻³ = 0,009"

*INA Indicator Not Assessed

1. The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator







Remarks to environmental impacts

This product uses a carbon lamp and distributes thermal energy via infrared radiation.

Total environmental impact is project specific and vary depending on several variables such as:

- Climate
- Energy source

Additional environmental impact indicators

Indicator	Unit	A1-A3	A4	C1	C2	C3	C4	D
 PM	Disease incidence	4,28E-06	6,24E-09	8,03E-10	1,04E-09	5,04E-10	5,09E-10	-1,69E-07
 IRP ²	kgBq U235 -eq	1,55E+00	4,82E-03	1,71E-04	8,04E-04	4,56E-04	4,61E-04	-2,32E-01
 ETP-fw ¹	CTUe	1,07E+03	8,07E-01	2,18E-02	1,34E-01	2,61E+00	3,07E+01	-2,94E+02
 HTP-c ¹	CTUh	9,44E-08	0,00E+00	0,00E+00	0,00E+00	2,40E-11	1,51E-10	-1,59E-08
 HTP-nc ¹	CTUh	1,49E-06	7,80E-10	2,00E-11	1,30E-10	1,67E-09	1,04E-08	-5,04E-07
 SQP ¹	dimensionless	1,10E+02	1,26E+00	5,07E-03	2,11E-01	4,16E-02	1,88E-01	-1,58E+01

PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Potential Soil Quality Index (dimensionless)

"Reading example: 9,0 E-03 = 9,0*10⁻³ = 0,009"

*INA Indicator Not Assessed

1. The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator
2. This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

Resource use									
Indicator	Unit	A1-A3	A4	C1	C2	C3	C4	D	
PERE	MJ	6,04E+01	1,39E-02	2,16E-04	2,31E-03	9,78E-03	6,71E-03	-6,63E+00	
PERM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	
PERT	MJ	6,04E+01	1,39E-02	2,16E-04	2,31E-03	9,78E-03	6,71E-03	-6,63E+00	
PENRE	MJ	2,69E+02	1,10E+00	3,99E-02	1,84E-01	1,20E-01	9,74E-02	-3,72E+01	
PENRM	MJ	2,64E+00	0,00E+00	0,00E+00	0,00E+00	-1,86E+00	0,00E+00	0,00E+00	
PENRT	MJ	2,71E+02	1,10E+00	3,99E-02	1,84E-01	-1,74E+00	9,74E-02	-3,72E+01	
SM	kg	4,53E-01	0,00E+00	1,96E-05	0,00E+00	0,00E+00	2,48E-06	3,25E-02	
RSF	MJ	8,16E-01	4,86E-04	5,31E-06	8,09E-05	1,94E-04	1,50E-04	-8,90E-02	
NRSF	MJ	4,01E-01	1,63E-03	7,82E-05	2,71E-04	-7,19E-05	5,76E-05	2,17E-01	
FW	m ³	4,61E-01	1,26E-04	2,05E-06	2,09E-05	1,95E-03	2,71E-04	-7,42E-02	

PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non renewable primary energy resources used as raw materials; PENRT = Total use of non renewable primary energy resources; SM = Use of secondary materials; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Net use of fresh water

"Reading example: 9,0 E-03 = 9,0*10⁻³ = 0,009"

*INA Indicator Not Assessed

End of life - Waste

Indicator	Unit	A1-A3	A4	C1	C2	C3	C4	D
HWD	kg	1,67E-01	6,04E-05	1,18E-06	1,01E-05	3,82E-04	3,59E-03	-2,70E-02
NHWD	kg	6,51E+00	9,59E-02	4,73E-05	1,60E-02	5,44E-02	2,93E-01	-5,80E-01
RWD	kg	1,27E-03	7,53E-06	2,77E-07	1,26E-06	2,19E-07	3,26E-07	-1,69E-04

HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed

*Reading example: 9,0 E-03 = $9,0 \cdot 10^{-3} = 0,009$

*INA Indicator Not Assessed

End of life - Output flow

Indicator	Unit	A1-A3	A4	C1	C2	C3	C4	D
CRU	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	kg	6,94E-02	0,00E+00	1,93E-05	0,00E+00	1,79E+00	6,88E-06	-1,27E-03
MER	kg	8,61E-02	0,00E+00	5,97E-08	0,00E+00	2,85E-02	1,97E-07	-1,67E-04
EEE	MJ	5,09E-02	0,00E+00	2,05E-07	0,00E+00	1,01E-01	8,23E-06	-4,10E-04
EET	MJ	7,70E-01	0,00E+00	3,10E-06	0,00E+00	1,52E+00	1,25E-04	-6,20E-03

CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported energy electrical; EET = Exported energy thermal

*Reading example: 9,0 E-03 = $9,0 \cdot 10^{-3} = 0,009$

*INA Indicator Not Assessed

Biogenic Carbon Content

Indicator	Unit	At the factory gate
Biogenic carbon content in product	kg C	0,00E+00
Biogenic carbon content in accompanying packaging	kg C	0,00E+00

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO₂

Additional requirements

Greenhouse gas emissions from the use of electricity in the manufacturing phase

National production mix from import, low voltage (production of transmission lines, in addition to direct emissions and losses in grid) of applied electricity for the manufacturing process (A3).

Electricity mix	Source	Amount	Unit
Electricity, Vattenfall Nordic Hydropower (kWh) - SE - S-P-00088	S-P-00088	7,26	g CO ₂ -eq/kWh

Dangerous substances

The product contains no substances on the REACH Candidate list at or above 100 ppm, 0,01 % by weight.

Indoor environment

IHC infrared heater provides heating to the outdoor environment, distributed by infrared radiation.

IHC with external control offers heating for outdoor climate.






Additional Environmental Information

Additional environmental impact indicators required in NPCR Part A for construction products								
Indicator	Unit	A1-A3	A4	C1	C2	C3	C4	D
GWPIOBC	kg CO ₂ -eq	1,92E+01	6,80E-02	2,90E-03	1,13E-02	2,49E-01	1,84E-02	-2,86E+00

GWPI-IOBC: Global warming potential calculated according to the principle of instantaneous oxidation. In order to increase the transparency of biogenic carbon contribution to climate impact, the indicator GWP-IOBC is required as it declares climate impacts calculated according to the principle of instantaneous oxidation. GWP-IOBC is also referred to as GWP-GHG in context to Swedish public procurement legislation.

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 NPCR 030 Part B for Ventilation components, Ver. 1.0, 18.05.2021, EPD Norway.

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