epd-norge
Global program operatør

Environmental product declaration

in accordance with ISO 14025 and EN 15804+A2

KU-K30



The Norwegian EPD Foundation

Owner of the declaration:
TROX Group

Product:
KU-K30

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: 61693

General information

Product

KU-K30

Owner of the declaration:

TROX Group
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Program operator:

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Manufacturer:

TROX Group
Heinrich-Trox-Platz 1
47506 Neukirchen-Vluyn, Germany

Declaration number:

Place of production:

TROX SE - Werk Anholt
Gendringer Str. 85
46419 Isselburg, Germany

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

Management system:

ISO 9001, ISO 14001:2015, ISO 50001:2018

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.

Organisation no:

DE 120250070

Declared unit:

1 pcs KU-K30

Issue date:

Declared unit with option:

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

Valid to:

Year of study:

2022

Functional unit:

Comparability:

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

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

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.

Developer of EPD: Michael Weise

Reviewer of company-specific input data and EPD: Doeres Heuvens

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)

Approved:

Product

Product description:

For diffusers in suspended F30 ceilings.

Square fire damper for installation in suspended fire-resistant F30 ceilings.
For the isolation of duct penetrations between fire compartments, available in five nominal sizes.

For more informations see: https://www.trox.de/en/fire-dampers/ku-k30-3f6f443b80edfea1

Product specification

Square fire damper for the isolation of ducts in self supporting fire-resistant suspended ceilings. Satisfies high ventilation requirements when combined with a non-combustible ceiling diffuser or swirl diffuser. Suitable for supply and extract air Ready-for-operation unit, which includes a fire-resistant damper blade and a release mechanism.
Fire resistance class: K30-UType KU-K30 (or variant L-KU-K30) suitable for installation in the following independently fire-resistant suspended ceilings F30:Knauf tile ceilings in screwed and smoothed version, according to general building authority test certificate P-2100/199/15-MPA BS Promat metal ceiling F 30 according to general building authority test certificate P-3582/2800-MPA BS in a screwed and smoothed ceiling frieze Lindner metal ceiling, type LMD F30 type 3, 4, 8, 9 according to general building authority test certificate P-2101/336/18-MPA BS Lindner metal ceiling, type LMD F 30 type 1/5 according to general building authority test certificate P-2101/341/18-MPA BS Knauf metal ceilings, type "Knauf Corridor F 30 Swing", "Knauf Corridor F 30 Swing mineral wool free" as well as "Knauf Corridor F 30" in accordance with general building authority test certificates P2101/339/18-MPA BS or P-2101/344/18-MPA BS Thermal or thermoelectric release at 72°C or 95°C (warm air ventilation systems), release temperature. Constructions with spring return actuator for opening and closing the fire damper, independent of the nominal size and even while the ventilation system is running, e. g. for a functional test.

This EPD includes the environmental data of the product series KU-K30.
The following represents a representative dataset of the most sold variant in the declared sales year (KU-K30/300x160/Z43).

Materials	kg	%
Chemical	8,54	63,36
Fire-, heat- and UV-stabilizers	0,067	0,49
Glass fibre reinforced plastic, polyamide	0,0071	0,052
Metal - Aluminium	0,010	0,074
Metal - Galvanized Steel	2,89	21,45
Metal - Stainless steel	0,23	1,76
Motor	1,20	8,89
Plastic	0,022	0,16
Plastic - Polyamide	0,00015	0,0011
Plastic - Polycarbonate (PC)	0,0012	0,0088
Plastic - Polyethylene (LDPE)	0,00015	0,0011
Plastic - Polyethylene terephthalate (PET)	0,50	3,70
Rubber, synthetic	0,0010	0,0074
Total	13,48	100,00

Packaging	kg	%
Packaging - Cardboard	2,00	11,76
Packaging - Pallet	15,00	88,22
Packaging - Plastic	0,00	0,01
Total incl. packaging	30,49	100,00

Technical data:

Nominal sizes – fire damper: 300, 400, 500, 600, 625 mm.
Nominal sizes – spigot: 160, 200, 250, 315 mm.
Differential pressure range: Depends on the spigot and diffuser.
Operating temperature: at least 0 – 50 °C **.
Release temperature 72 °C or 95 °C (for use in warm air ventilation systems).
Upstream velocity: Depends on the spigot and diffuser, usually about 3 – 5 m/s.
** Temperatures may differ for units with attachments.

Market:

Europe.

Reference service life, product

20-25 years.

Reference service life, building or construction works

60 years.

LCA: Calculation rules

Declared unit:

1 pcs KU-K30

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:

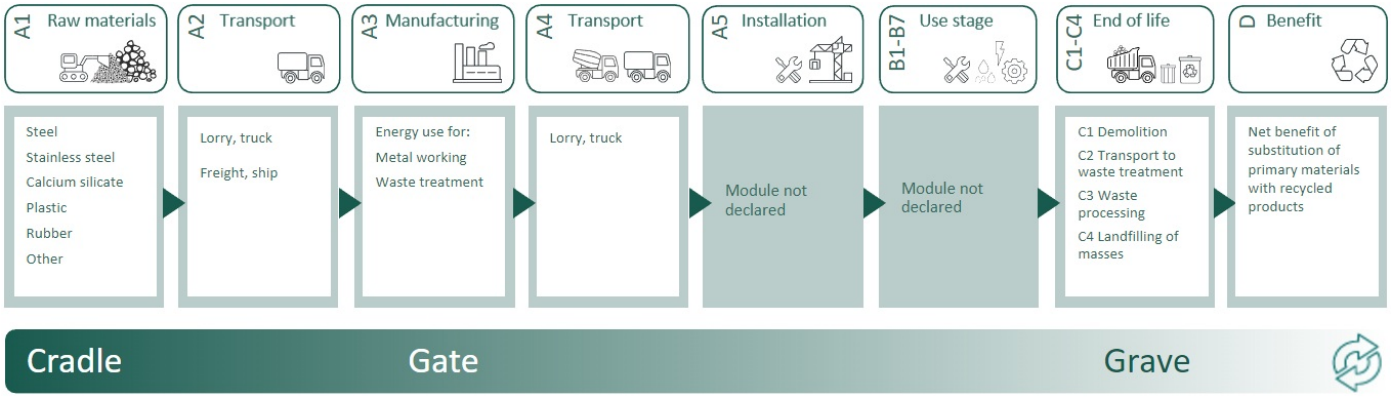
Specific data for the product composition are provided by the manufacturer. The data represent the production of the declared product and were collected for EPD development in the year of study. Background data is based on EPDs according to EN 15804 and different LCA databases. The data quality of the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

Materials	Source	Data quality	Year
Chemical	ecoinvent 3.6	Database	2019
Fire-, heat- and UV-stabilizers	ecoinvent 3.6	Database	2019
Glass fibre reinforced plastic, polyamide	Modified ecoinvent 3.6	Database	2019
Metal - Aluminium	ecoinvent 3.6	Database	2019
Metal - Galvanized Steel	ecoinvent 3.6	Database	2020
Metal - Stainless steel	ecoinvent 3.6	Database	2019
Motor	Modified ecoinvent 3.6	Database	2019
Packaging - Cardboard	ecoinvent 3.6	Database	2019
Packaging - Pallet	ecoinvent 3.6	Database	2019
Packaging - Plastic	ecoinvent 3.6	Database	2019
Plastic	ecoinvent 3.6	Database	2019
Plastic - Polyamide	ecoinvent 3.6	Database	2019
Plastic - Polycarbonate (PC)	ecoinvent 3.6	Database	2019
Plastic - Polyethylene (LDPE)	ecoinvent 3.6	Database	2019
Plastic - Polyethylene terephthalate (PET)	ecoinvent 3.6	Database	2019
Rubber, synthetic	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	MND	MND	MND	MND	MND	MND	MND	X	X	X	X	X

System boundary:



Additional technical information:

Square fire damper for installation in suspended fire-resistant F30 ceilings.
For the isolation of duct penetrations between fire compartments, available in five nominal nominal sizes.
Nominal sizes for diffusers sized 300 × 300 – 625 × 625 mm.
Satisfies high ventilation requirements when combined with a diffuser.
Coated construction meets high hygiene requirementsIntegration into the central BMS with TROXNETCOM.

Optional equipment and accessories:
Ceiling diffusers/swirl diffusers.
External fusible link, 72 °C.
Electric actuator.
Release temperature 72/95 °C.

LCA: Scenarios and additional technical information

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

Transport from production place to user (A4)	Capacity utilisation (incl. return) %	Distance (km)	Fuel/Energy Consumption	Unit	Value (Liter/tonne)
Truck, 16-32 tonnes, EURO 6 (km)	36,7 %	800	0,043	l/tkm	34,40

De-construction demolition (C1)	Unit	Value			
Demolition of building per kg of ventilation product (kg)	kg/DU	12,98			

Transport to waste processing (C2)	Capacity utilisation (incl. return) %	Distance (km)	Fuel/Energy Consumption	Unit	Value (Liter/tonne)
Truck, 16-32 tonnes, EURO 6 (km)	36,7 %	50	0,043	l/tkm	2,15

Waste processing (C3)	Unit	Value			
Waste treatment per kg Polyethylene terephthalate (PET), incineration with fly ash extraction (kg)	kg	0,25			
Waste treatment per kg Plastics, incineration (kg)	kg	0,015			
Waste treatment per kg Hazardous waste, incineration (kg)	kg	0,033			
Waste treatment per kg Bulk iron waste, excluding reinforcement, sorting plant (kg)	kg	1,20			
Waste treatment per kg Rubber, municipal incineration with fly ash extraction (kg)	kg	0,00050			
Waste treatment per kg Polyethylene (PE), incineration (kg)	kg	0,000075			
Materials to recycling (kg)	kg	3,91			

Disposal (C4)	Unit	Value			
Waste treatment per kg Copper slag, to landfill, residual material landfill (kg)	kg	0,019			
Landfilling of ashes from incineration of Polyethylene (PE), process per kg ashes and residues (kg)	kg	0,0000026			
Landfilling of ashes from incineration per kg Hazardous waste, from incineration (kg)	kg	0,0063			
Waste, aluminium, to landfill (kg)	kg	0,0082			
Waste, hazardous waste, to average treatment - A3, inkl. transp. (kg)	kg	0,033			
Landfilling of ashes from incineration of Polyethylene terephthalate (PET), process per kg ashes and residues (kg)	kg	0,0055			
Waste, hazardous waste, to landfill (kg)	kg	8,54			
Landfilling of ashes from incineration of Rubber, municipal incineration with fly ash extraction (kg)	kg	0,000026			
Landfilling of ashes from incineration of Plastics, process per kg ashes and residues (kg)	kg	0,00035			
Waste, plastic, mixture, to landfill (kg)	kg	0,26			
Waste, scrap steel, to landfill (kg)	kg	0,40			

Benefits and loads beyond the system boundaries (D)	Unit	Value			
Substitution of primary copper with net scrap (kg)	kg	0,073			
Substitution of primary steel with net scrap (kg)	kg	1,39			
Substitution of electricity (MJ)	MJ	0,26			
Substitution of primary aluminium with net scrap (kg)	kg	0,10			
Substitution of thermal energy, district heating (MJ)	MJ	3,98			

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	3,57E+01	3,99E+00	1,71E-02	2,49E-01	6,28E-01	1,90E+00	-2,71E+00
	GWP-fossil	kg CO_2 -eq	3,53E+01	3,98E+00	1,71E-02	2,49E-01	6,27E-01	1,88E+00	-2,68E+00
	GWP-biogenic	kg CO_2 -eq	4,18E-01	1,65E-03	3,21E-06	1,03E-04	1,97E-04	1,65E-03	-6,07E-03
	GWP-luluc	kg CO_2 -eq	5,86E-02	1,42E-03	1,35E-06	8,86E-05	2,08E-05	1,61E-02	-1,97E-02
	ODP	kg CFC11 -eq	2,95E-06	9,02E-07	3,70E-09	5,64E-08	9,36E-09	9,65E-08	-1,68E-03
	AP	mol H+ -eq	3,15E-01	1,14E-02	1,79E-04	7,16E-04	2,15E-04	8,61E-03	-4,37E-02
	EP-FreshWater	kg P -eq	2,32E-03	3,18E-05	6,23E-08	1,99E-06	1,89E-06	8,19E-05	-3,32E-04
	EP-Marine	kg N -eq	4,12E-02	2,27E-03	7,91E-05	1,42E-04	7,67E-05	1,78E-03	-3,66E-03
	EP-Terrestial	mol N -eq	7,48E-01	2,53E-02	8,68E-04	1,58E-03	7,99E-04	1,87E-02	-4,45E-02
	POCP	kg NMVOC -eq	1,48E-01	9,71E-03	2,39E-04	6,07E-04	2,02E-04	9,13E-03	-1,60E-02
	ADP-minerals&metals[1]	kg Sb-eq	1,14E-02	1,10E-04	2,63E-08	6,88E-06	2,97E-07	1,06E-05	-1,90E-04
	ADP-fossil[1]	MJ	4,68E+02	6,02E+01	2,36E-01	3,76E+00	3,81E-01	2,03E+01	-2,69E+01
	WDP[1]	m^3	1,83E+03	5,83E+01	5,01E-02	3,64E+00	3,00E+00	1,59E+01	-4,58E+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

Additional environmental impact indicators

Indicator		Unit	A1-A3	A4	C1	C2	C3	C4	D
	PM	Disease incidence	3,09E-06	2,44E-07	4,74E-09	1,52E-08	2,26E-09	1,57E-07	-2,64E-07
	IRP[2]	kgBq U235 -eq	1,55E+00	2,63E-01	1,01E-03	1,65E-02	1,77E-03	3,06E-02	-5,10E-02
	ETP-fw[1]	CTUe	1,89E+03	4,47E+01	1,29E-01	2,79E+00	1,71E+00	5,75E+01	-3,73E+02
	HTP-c[1]	CTUh	1,35E-07	0,00E+00	0,00E+00	0,00E+00	8,90E-11	8,64E-09	-1,36E-08
	HTP-nc[1]	CTUh	2,10E-06	4,88E-08	1,17E-10	3,05E-09	1,28E-09	8,80E-08	-1,97E-07
	SQP[1]	dimensionless	2,65E+03	4,21E+01	2,99E-02	2,63E+00	1,43E-01	5,15E+01	-6,72E+00

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	1,90E+02	8,62E-01	1,27E-03	5,39E-02	6,62E-02	7,08E+00	-8,08E+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	4,15E+02	8,62E-01	1,27E-03	5,39E-02	6,62E-02	7,08E+00	-8,08E+00
	PENRE	MJ	4,57E+02	6,02E+01	2,36E-01	3,77E+00	3,81E-01	2,03E+01	-2,69E+01
	PENRM	MJ	1,24E+01	0,00E+00	0,00E+00	0,00E+00	-1,24E+01	0,00E+00	0,00E+00
	PENRT	MJ	4,69E+02	6,02E+01	2,36E-01	3,77E+00	-1,20E+01	2,03E+01	-2,69E+01
	SM	kg	3,46E+00	0,00E+00	1,16E-04	0,00E+00	1,32E-05	1,85E-01	5,13E-02
	RSF	MJ	1,75E+00	3,08E-02	3,14E-05	1,93E-03	1,46E-03	1,54E-02	5,82E-02
	NRSF	MJ	5,26E+00	1,10E-01	4,62E-04	6,89E-03	1,41E-05	1,60E+00	1,51E+00
	FW	m^3	4,07E-01	6,44E-03	1,21E-05	4,03E-04	4,24E-04	1,10E-02	-3,38E-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	2,72E-01	3,11E-03	6,94E-06	1,94E-04	1,53E-06	8,57E+00	-5,99E-03
	NHWD	kg	1,10E+01	2,93E+00	2,79E-04	1,83E-01	3,35E-02	7,10E-01	-9,95E-01
	RWD	kg	1,53E-03	4,10E-04	1,64E-06	2,56E-05	1,55E-07	1,01E-06	-4,85E-05

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

"Reading example: 9,0 E-03 = 9,0*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	7,51E-01	0,00E+00	1,14E-04	0,00E+00	3,91E+00	6,90E-03	-2,01E-03
	MER	kg	2,99E-02	0,00E+00	3,52E-07	0,00E+00	2,84E-01	7,93E-03	-2,64E-04
	EEE	MJ	2,16E-02	0,00E+00	1,21E-06	0,00E+00	2,64E-01	4,76E-05	-6,48E-04
	EET	MJ	3,27E-01	0,00E+00	1,83E-05	0,00E+00	3,99E+00	7,21E-04	-9,80E-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*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, market mix (kWh) - Germany	ecoinvent 3.6	585,93	g CO2-eq/kWh

Dangerous substances

The product contains dangerous substances, more than 0,1% by weight, given by the REACH Candidate List, see table:

Name	CASNo	Amount
Lead	7439-92-1	> 0.1% w/w
2-methylimidazole	693-98-1	> 0.1% w/w
Diboron trioxide	1303-86-2	> 0.1% w/w
Lead monoxide (lead oxide)	1317-36-8	> 0.1% w/w

Indoor environment

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	3,58E+01	3,99E+00	1,71E-02	2,49E-01	6,27E-01	1,89E+00	-3,33E+00

GWP-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.

Bibliography

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ISO 21930:2017 Sustainability in buildings and civil engineering works - Core rules for environmental product declarations of construction products.
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NPCR 030 Part B for Ventilation components, Ver. 1.0, 18.05.2021, EPD Norway.

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