

Environmental product declaration

in accordance with ISO 14025 and EN 15804+A2

EK-JZ



TROX® TECHNIK
The art of handling air

The Norwegian EPD Foundation

Owner of the declaration:

TROX Group

Product:

EK-JZ

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:

NEPD-5610-4924-EN

Registration number:

NEPD-5610-4924-EN

Issue date: 19.12.2023

Valid to: 19.12.2028

EPD Software:

LCA.no EPD generator ID: 138558

General information

Product

EK-JZ

Program operator:

Post Box 5250 Majorstuen, 0303 Oslo, Norway
The Norwegian EPD Foundation
Phone: +47 23 08 80 00
web: post@epd-norge.no

Declaration number: NEPD-5610-4924-EN

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 EK-JZ

Declared unit with option:

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

Functional unit:

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 EPD Norway'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:

TROX Group
Contact person: Dirk Scherder
Phone: +49 2845 2020
e-mail: productsustainability-de@troxgroup.com

Manufacturer:

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

Place of production:

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

Management system:

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

Organisation no:

DE 120250070

Issue date: 19.12.2023

Valid to: 19.12.2028

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.

Developer of EPD: Doeres Heuvers

Reviewer of company-specific input data and EPD: Michael Weise

Approved:



Håkon Hauan
Managing Director of EPD-Norway

Product

Product description:

Rectangular smoke control dampers including ventilation function with low installation depth and large cross section area for smoke and heat exhaust via mechanical smoke extract systems, for the provision of additional supply air, and in pressurised ventilation systems.

For more information see: <https://www.troxuk.co.uk/smoke-control-dampers/ek-jz-2fc96b4ab05bfd04#downloads>

Product specification

Rectangular or square smoke control dampers acc. to product standard EN 12101-8, tested acc. to EN 1366-10 and EN 1366-2, for use in smoke extract systems. In addition to removing smoke, heat and combustion products from a fire compartment, smoke control dampers enable the controlled removal of released hazardous and toxic combustion and fire suppression gases. The EK-JZ smoke control dampers can also be used in pressurised ventilation systems and venting devices of overpressure systems as well as pressure relief dampers for gas extinguishing systems. Also for extracting smoke gases and for providing additional supply air for the mechanical smoke extract of one or more fire compartments and in all listed systems of the same type that need to fulfil modulation applications. EK-JZ can be used in combined smoke exhaust systems which have been approved for controlled ventilation.

The fire-resistant smoke control damper for multiple compartments is suitable for installation in and on fire-resistant smoke extract ducts or smoke extract shafts and in fire-resistant standard supporting constructions. The OPEN-CLOSE actuators can be controlled either with ready-wired actuator control modules or bus modules inside the temperature-resistant actuator encasing.

Materials	kg	%
Chemical	137,89	92,65
Fire-, heat- and UV-stabilizers	0,63	0,42
Glass fibre reinforced plastic, polyamide	0,07	0,05
Metal - Aluminium	0,02	0,01
Metal - Brass	0,48	0,32
Metal - Galvanized Steel	2,71	1,82
Metal - Stainless steel	0,67	0,45
Metal - Steel	2,95	1,98
Mineral	0,14	0,10
Motor	2,80	1,88
Rubber, synthetic	0,46	0,31
Total	148,82	

Packaging	kg	%
Packaging - Pallet	34,00	91,46
Packaging - Paper	2,50	6,72
Packaging - Plastic	0,60	1,61
Packaging - Polystyrene	0,08	0,20
Total incl. packaging	186,00	

Technical data:

Nominal sizes B × H: 200 × 230 mm – 1200 × 2030 mm.

Casing length [mm]: 250 mm.

Flow rate range at maximum upstream velocity: up to 920 l/s or up to 3312 m³/h - up to 36540 l/s or up to 131544 m³/h.

Differential pressure range: Pressure level 2: -1000 – 500 Pa.

Operating temperature: at least -30 to 50 °C; the temperature should not fall below the dew point.

Upstream velocity*: up to 15 m/s for maximum dimension and 20 m/s for damper sizes up to 1200 x 1830 mm, otherwise technical clarification required.

*Data applies to uniform upstream and downstream conditions for smoke control dampers.

For more information see: <https://www.troxuk.co.uk/smoke-control-dampers/ek-jz-2fc96b4ab05bfd04#downloads>.

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 EK-JZ

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:

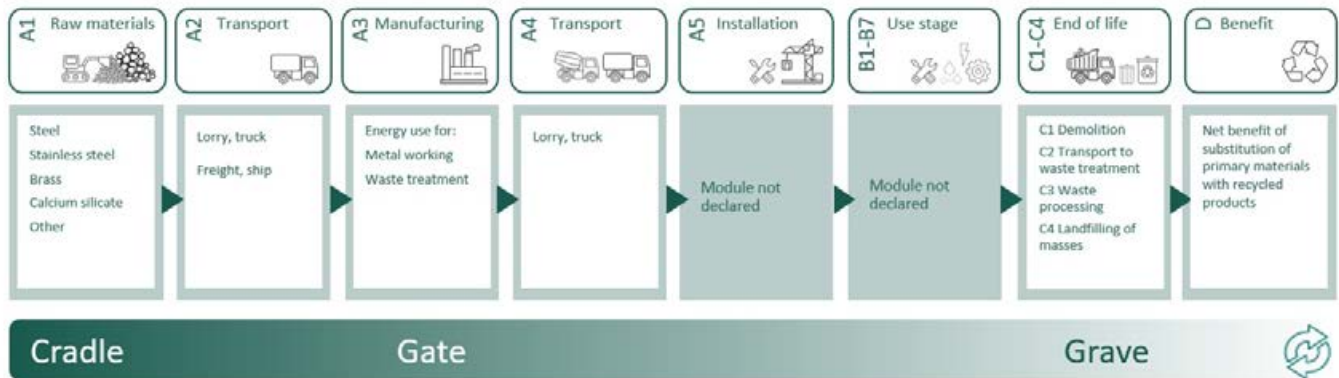
Specific data for the product composition are provided by the manufacturer. The data represent the production of the declared product and were collected for EPD development in the year of study. Background data is based on EPDs according to EN 15804 and different LCA databases. The data quality of the 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
Metal - Aluminium	ecoinvent 3.6	Database	2019
Metal - Brass	ecoinvent 3.6	Database	2019
Metal - Stainless steel	ecoinvent 3.6	Database	2019
Metal - Steel	ecoinvent 3.6	Database	2019
Packaging - Pallet	ecoinvent 3.6	Database	2019
Packaging - Paper	ecoinvent 3.6	Database	2019
Packaging - Plastic	ecoinvent 3.6	Database	2019
Packaging - Polystyrene	ecoinvent 3.6	Database	2019
Rubber, synthetic	ecoinvent 3.6	Database	2019
Metal - Galvanized Steel	ecoinvent 3.6	Database	2020
Glass fibre reinforced plastic, polyamide	Modified ecoinvent 3.6	Database	2019
Mineral	Modified ecoinvent 3.6	Database	2019
Motor	Modified 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:

- Accessibility optionally in air direction or on the side.
- Simple and quick installation in and on components.
- Casing, damper blades and actuator encasing made of calcium silicate.
- Pressure level 2 (operating pressure -1000 to 500 Pa).
- Automatic release (AA), option of manual override (MA).
- For smoke extract ducts from 35 mm wall thickness.
- Closed blade air leakage acc. to EN 1751, class 3.
- Casing air leakage acc. to EN 1751, class C.

Optional equipment and accessories:

- Cover grille (various constructions).
- Connecting subframe for calcium silicate and sheet steel smoke extract ducts.
- Integration into the central BMS with TROXNETCOM.
- External encasing for associated fire-tested control or communication modules.
- Coating for use in exterior wall areas.
- Cmod = for smoke extract and ventilation function in combined systems, which allows for pneumatic flow rate balancing possible by taking intermediate positions.














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	148,82		
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		
Materials to recycling (kg)		kg	8,67		
Waste treatment per kg Bulk iron waste, excluding reinforcement, sorting plant (kg)		kg	2,80		
Waste treatment per kg Hazardous waste, incineration (kg)		kg	0,32		
Waste treatment per kg Plastics, incineration (kg)		kg	0,04		
Waste treatment per kg Rubber, municipal incineration with fly ash extraction (kg)		kg	0,23		
Disposal (C4)		Unit	Value		
Landfilling of ashes from incineration of Plastics, process per kg ashes and residues (kg)		kg	0,00		
Landfilling of ashes from incineration of Rubber, municipal incineration with fly ash extraction (kg)		kg	0,01		
Landfilling of ashes from incineration per kg Hazardous waste, from incineration (kg)		kg	0,06		
Waste treatment per kg Brass slag, to landfill, residual material landfill (kg)		kg	0,05		
Waste treatment per kg Copper slag, to landfill, residual material landfill (kg)		kg	0,04		
Waste, aluminium, to landfill (kg)		kg	0,02		
Waste, hazardous waste, to average treatment - A3, inkl. transp. (kg)		kg	0,32		
Waste, hazardous waste, to landfill (kg)		kg	137,89		
Waste, inert waste, to landfill (kg)		kg	0,14		
Waste, plastic, mixture, to landfill (kg)		kg	0,27		
Waste, scrap steel, to landfill (kg)		kg	0,84		
Benefits and loads beyond the system boundaries (D)		Unit	Value		
Substitution of electricity (MJ)		MJ	0,32		
Substitution of primary aluminium with net scrap (kg)		kg	0,25		
Substitution of primary Brass with net scrap (kg)		kg	0,22		
Substitution of primary copper with net scrap (kg)		kg	0,17		
Substitution of primary steel with net scrap (kg)		kg	3,53		
Substitution of thermal energy, district heating (MJ)		MJ	4,77		

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	1,05E+02	2,43E+01	1,96E-01	1,52E+00	1,51E+00	2,99E+01	-7,51E+00	
 GWP-fossil	kg CO ₂ -eq	1,60E+02	2,43E+01	1,96E-01	1,52E+00	1,50E+00	2,96E+01	-7,44E+00	
 GWP-biogenic	kg CO ₂ -eq	-5,49E+01	1,01E-02	3,68E-05	6,29E-04	1,78E-03	2,62E-02	-1,93E-02	
 GWP-luluc	kg CO ₂ -eq	1,79E-01	8,65E-03	1,55E-05	5,41E-04	1,82E-04	2,60E-01	-4,62E-02	
 ODP	kg CFC11 -eq	1,13E-05	5,51E-06	4,24E-08	3,44E-07	8,21E-08	1,51E-06	-2,01E-03	
 AP	mol H ⁺ -eq	1,40E+00	6,99E-02	2,05E-03	4,37E-03	1,14E-03	1,38E-01	-1,90E-01	
 EP-FreshWater	kg P -eq	1,03E-02	1,94E-04	7,14E-07	1,21E-05	1,70E-05	1,32E-03	-1,48E-03	
 EP-Marine	kg N -eq	1,59E-01	1,38E-02	9,06E-04	8,64E-04	2,56E-04	2,79E-02	-1,31E-02	
 EP-Terrestrial	mol N -eq	2,64E+00	1,55E-01	9,94E-03	9,66E-03	2,87E-03	2,98E-01	-1,70E-01	
 POCP	kg NMVOC -eq	5,66E-01	5,92E-02	2,73E-03	3,70E-03	7,88E-04	1,46E-01	-5,55E-02	
 ADP-minerals&metals ¹	kg Sb -eq	3,38E-02	6,71E-04	3,01E-07	4,20E-05	2,55E-06	1,71E-04	-6,01E-03	
 ADP-fossil ¹	MJ	1,75E+03	3,67E+02	2,70E+00	2,30E+01	3,05E+00	3,24E+02	-7,53E+01	
 WDP ¹	m ³	5,09E+03	3,55E+02	5,74E-01	2,22E+01	1,56E+01	2,41E+02	-1,04E+03	

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	1,18E-05	1,49E-06	5,43E-08	9,30E-08	1,63E-08	2,51E-06	-8,16E-07
 IRP ²	kgBq U235 -eq	4,97E+00	1,61E+00	1,16E-02	1,00E-01	1,42E-02	4,82E-01	-1,59E-01
 ETP-fw ¹	CTUe	9,23E+03	2,72E+02	1,48E+00	1,70E+01	1,57E+01	8,50E+02	-1,72E+03
 HTP-c ¹	CTUh	3,82E-07	0,00E+00	0,00E+00	0,00E+00	6,85E-10	1,34E-07	-4,58E-08
 HTP-nc ¹	CTUh	8,57E-06	2,98E-07	1,34E-09	1,86E-08	4,73E-09	1,07E-06	-1,43E-06
 SQP ¹	dimensionless	7,22E+03	2,57E+02	3,43E-01	1,61E+01	1,20E+00	8,23E+02	-2,35E+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	6,09E+02	5,26E+00	1,46E-02	3,29E-01	5,54E-01	1,14E+02	-1,94E+01	
 PERM	MJ	5,07E+02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	
 PERT	MJ	1,12E+03	5,26E+00	1,46E-02	3,29E-01	5,54E-01	1,14E+02	-1,94E+01	
 PENRE	MJ	1,72E+03	3,68E+02	2,70E+00	2,30E+01	3,05E+00	3,25E+02	-7,53E+01	
 PENRM	MJ	4,86E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	
 PENRT	MJ	1,76E+03	3,68E+02	2,70E+00	2,30E+01	3,05E+00	3,25E+02	-7,53E+01	
 SM	kg	5,66E+00	0,00E+00	1,33E-03	0,00E+00	3,09E-05	2,98E+00	4,96E-02	
 RSF	MJ	2,41E+00	1,88E-01	3,59E-04	1,18E-02	1,22E-02	2,44E-01	1,26E-01	
 NRSF	MJ	6,12E+00	6,73E-01	5,29E-03	4,21E-02	3,28E-05	2,58E+01	3,97E+00	
 FW	m ³	2,06E+00	3,93E-02	1,39E-04	2,46E-03	3,53E-03	1,75E-01	-9,78E-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	1,16E+00	1,90E-02	7,95E-05	1,18E-03	3,58E-06	1,38E+02	-2,48E-02
	NHWD	kg	3,73E+01	1,79E+01	3,20E-03	1,12E+00	3,15E-01	1,48E+00	-2,75E+00
	RWD	kg	5,24E-03	2,50E-03	1,88E-05	1,56E-04	3,63E-07	5,88E-06	-1,46E-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	7,51E-01	0,00E+00	1,30E-03	0,00E+00	8,67E+00	6,87E-02	-1,41E-02
	MER	kg	3,03E-07	0,00E+00	4,04E-06	0,00E+00	5,45E-01	3,01E-05	-1,76E-03
	EEE	MJ	2,16E-02	0,00E+00	1,38E-05	0,00E+00	3,15E-01	1,56E-04	-8,68E-03
	EET	MJ	3,27E-01	0,00E+00	2,09E-04	0,00E+00	4,77E+00	2,36E-03	-1,31E-01

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	1,52E+01

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	Data source	Amount	Unit
Electricity, market mix (kWh) - Germany	ecoinvent 3.6	585,93	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

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	1,61E+02	2,43E+01	1,96E-01	1,52E+00	1,51E+00	2,99E+01	-9,11E+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.

Bibliography

ISO 14025:2010 Environmental labels and declarations - Type III environmental declarations - Principles and procedures.

ISO 14044:2006 Environmental management - Life cycle assessment - Requirements and guidelines.

EN 15804:2012+A2:2019 Environmental product declaration - Core rules for the product category of construction products.

ISO 21930:2017 Sustainability in buildings and civil engineering works - Core rules for environmental product declarations of construction products.






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