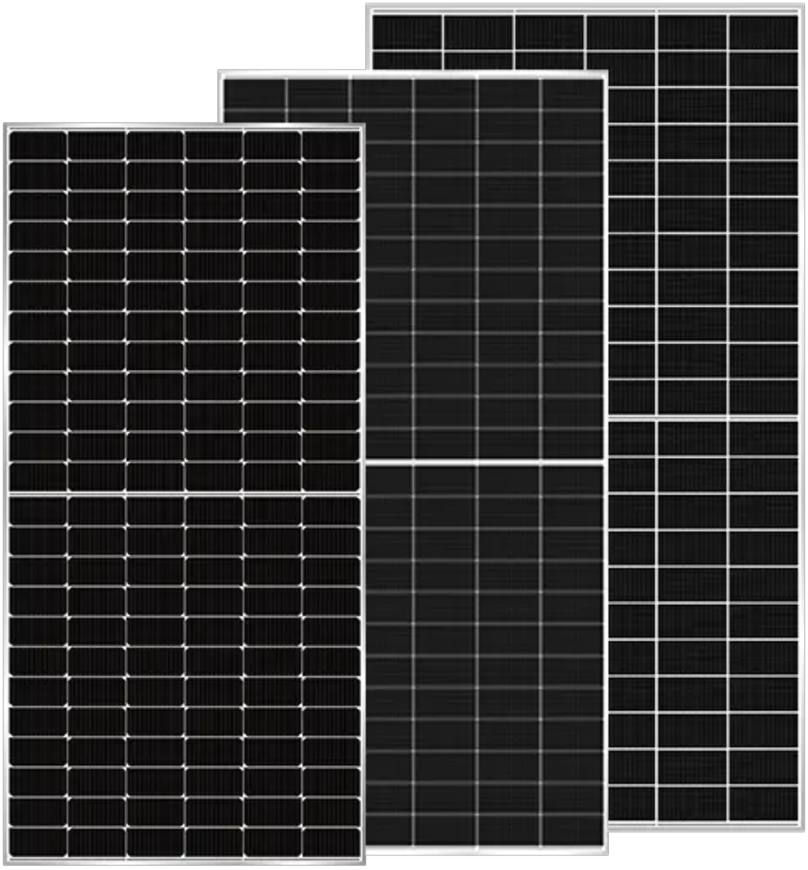
epd-norway
Global Program Operator

ECO PLATFORM EPD VERIFIED

Environmental Product Declaration

In accordance with ISO14025:2006 and EN15804:2012+A2:2019

HUASUN 210mm MONOCRYSTALLINE HJT MODULE



HUASUN

Owner of the declaration:
Anhui Huasun Energy Co., Ltd.

Product name:
Heterojunction (HJT) PV bifacial module

Declared unit:
1 m^2

Product category /PCR:
NPCR 029:2022 Part B for photovoltaic modules used in the building and construction industry, including production of cell, wafer, ingot block, solar grade silicon, solar substrates, solar superstrates and other solar grade semiconductor materials. Version 1.2

Program holder and publisher:
The Norwegian EPD foundation

Declaration number:
NEPD-6763-6082-EN

Registration number:
NEPD-6763-6082-EN

Issue date: 31.05.2024

Valid to: 31.05.2029

The Norwegian
EPD Foundation

General information

Product:
HS-210-B132DSxxx (Power range:690~725W)

Program operator:
The Norwegian EPD Foundation
Post Box 5250 Majorstuen, 0303 Oslo, Norway
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Declaration number:
NEPD-6763-6082-EN

This declaration is based on Product Category Rules:
NPCR 029 version 1.2

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, life cycle assessment data and evidences.

Declared unit:
1m²

Functional unit:
1Wp

Verification:
Independent verification of the declaration and data, according to ISO14025:2010

internal ☐ external √

Kristine Bjordal

Independent verifier approved by EPD Norway

Owner of the declaration:
Anhui Huasun Energy Co., Ltd.
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e-mail: sales@huasunsolar.com

Manufacturer:
Anhui Huasun Energy Co., Ltd.
No.99, Qingliu Road, Xuancheng Economic and Technological Development Zone, Xuanzhou District, Xuancheng City, Anhui Province, China
Phone: +86 025 86216170
e-mail: sales@huasunsolar.com

Place of production:
China

Management system:
ISO 9001, ISO 14001, ISO 45001

Organisation no:
91341800MA2W1EY93F

Issue date:
31.05.2024

Valid to:
31.05.2029

Year of study:
2022.10-2023.09

Comparability:
EPD of construction products may not be able to compare if they do not comply with EN 15804 and are seen in a building context.

The EPD has been worked out by:
TÜV SÜD Certification and Testing (China) Co., Ltd. Shanghai Branch

Approved

Manager of EPD Norway

Product

Product description:

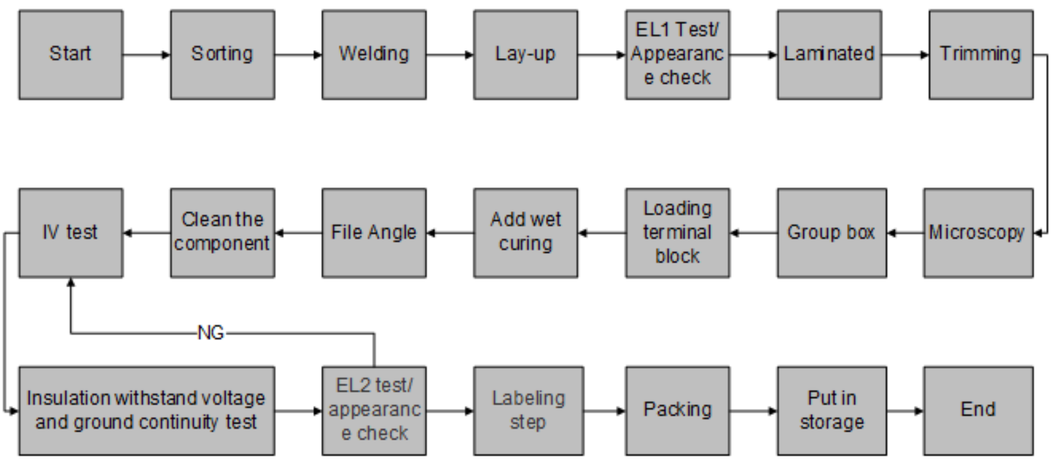
Heterojunction (HJT) is a N-type bifacial solar cell technology that combines the advantages of crystalline silicon and amorphous silicon thin-film technologies. Huasun HJT solar PV modules are distinguished by their high power, high efficiency and high reliability. The per watt power generation gain can reach 3% to 4% higher than TOPCon bifacial solar module. The bifaciality of Huasun HJT module owns a distinct advantage in power generation, particularly in high-temperature and weak-light environments. Enhanced by Huasun's unique sealing technology, the bifacial double glass module exhibits better water vapor resistance and longer life time. Featuring half-cut cell technology, these modules minimize degradation, ensuring longevity and backed by a leading warranty. With over 85% bifaciality and PIB sealing, Huasun HJT solar modules deliver superior power. Incorporating cutting-edge technology, Huasun HJT solar PV modules provide a versatile and reliable choice for residential rooftops, commercial installations, off-grid solutions, and solar farms. Their exceptional bifaciality, PIB sealing, and robust design ensure consistent and efficient power supply across diverse environmental conditions, establishing them as a dependable solution for sustainable energy needs.

Product specification:

Materials compositions and technical data for the declared product are shown below.

Materials	HS-210-B132DSxxx	
	kg/FU	%
Solar glass	3.09E+01	76.93
EVA	3.09E+00	7.70
Frame	2.78E+00	6.93
Solder	3.33E-01	0.83
Solar cell	7.68E-01	1.92
Junction box	2.30E-01	0.57
Flux	1.47E-02	0.04
Silicone gel	3.33E-01	0.83
Rubber	9.69E-02	0.24
Packaging: Pallet	1.00E+00	2.50
Packaging: Corrugated board	4.04E-01	1.01
Packaging: paper	1.05E-01	0.26
Packaging: bag	6.42E-02	0.16
Packaging: LDPE Film	3.47E-02	0.09

Description of production processes:



Step 1: Sorting

Sort the batteries which meet the requirements of the order and check whether they conform to the standards. Prepare for welding procedure.

Step 2: Welding

Solder the positive and negative electrodes of the single-welded batteries together to form a battery string and prepare for the lamination process. Repair the nonconforming battery string.

Step 3: Lay-up

Connect the soldered battery strings with busbar, and play glass, EVA film,

TPT or glass back plate to protect the battery.

Step 4: EL1 test/Appearance check

Conduct appearance and Electroluminescent imaging (El) inspection on the PV modules before lamination.

Step 5: Laminated

The lamination process is to melt EVA and solidify the laminate at a certain temperature. Laminating process is a key step of component production, which has a key influence on the quality of component products.

Step 6: Trimming

Trim the laminated components to prepare the frame.

Step 7: Microscopy

Re-check the laminated components, isolate the defective products timely and give feedback to improve the quality of components

Step 8: Group box

The profile and junction box are mounted with sealed silicone on laminates to increase component strength, further seal the battery assembly, and extend the service life of the components. Put the automatic glue uneven secondary tonic. Install aluminum frame and junction box on the laminate with sealed silica gel, increase the strength of the component, further seal the battery component, and extend the service life of the component.

Step 9: Loading terminal block

The junction box is glued with silicone to the back of the assembly and the lead-out wire is welded to make the assembly and the wire box work. Then in the AB glue potting.

Step 10: Add wet curing

Solidify the assembled components, and place the poor sealing of components to prepare for cleaning.

Step 11: File Angle

Fix and polish the four corners of the component.

Step 12: Clean the component

The silica gel and other dirt on the surface of the component shall be cleaned with alcohol to make the appearance of the component clean and beautiful, and check whether the appearance of the component meets the standards.

Step 13: IV test

Verify the output power of the battery component, test its output characteristics, and determine the power level of the component.

Step 14: Insulation withstand voltage and ground continuity test

Insulation test: test whether the current-carrying part of the component is well insulated with the frame or external; Voltage withstand test: the insulation material and insulation structure of the voltage withstand test; Grounding test: to determine whether the safety grounding wire can bear the current flow of the fault under the condition of the fault of the measured object.

Step 15: EL2 test/appearance check

Check whether there is any problem with battery cells in the component, such as hidden cracking, fragment, black plate, etc., and determine the level of component EL.

Step 16: Labeling step

Separate components in different gear positions to prepare for packaging.

Step 17: Packing

Packing finished components in specified quantity for easy transportation and sale.

Step 18: Put in storage

Put the packed components into the warehouse procedure.

Technical data:

Series	HS-210-B132DSxxx
Power output range (W)	690-725
Dimensions (mm^3)	2384*1303*35
Area (m^2)	3.106
Converting factor (Wp/m^2)	233.42
Module efficiency (%)	20.28-23.18
Weight (kg)	38.1
Weight (incl. package)	40.28
First year degradation (%)	≤1
Annual degradation (%)	≤0.3

Market:

Europe, Middle East, and China

Reference service life, product:

25 years

LCA: Calculation rules

Functional unit:

Functional unit is 1 Wp of manufactured photovoltaic module, with activities needed for a study period for a defined reference service life (≥80% of the labelled power output).

Cut-off criteria:

For the processes within the system boundary, all available energy and material flow data have been included in the model. In cases where no matching life cycle inventories are available to represent a flow, proxy data have been applied based on conservative assumptions regarding environmental impacts.

Allocation:

The allocation is made in accordance with the provisions of EN 15804. Incoming energy and water and waste production in-house is allocated equally among all products through power output allocation. For the end-of-life allocation of background data (energy and materials), the model "allocation cut-off by classification (ISO standard) is used. As for the end-of-life stage of the solar PV modules, the load and benefit of reuse, recycling, and recovery processes is reported separately following the PCR's recommendation.

Data quality:

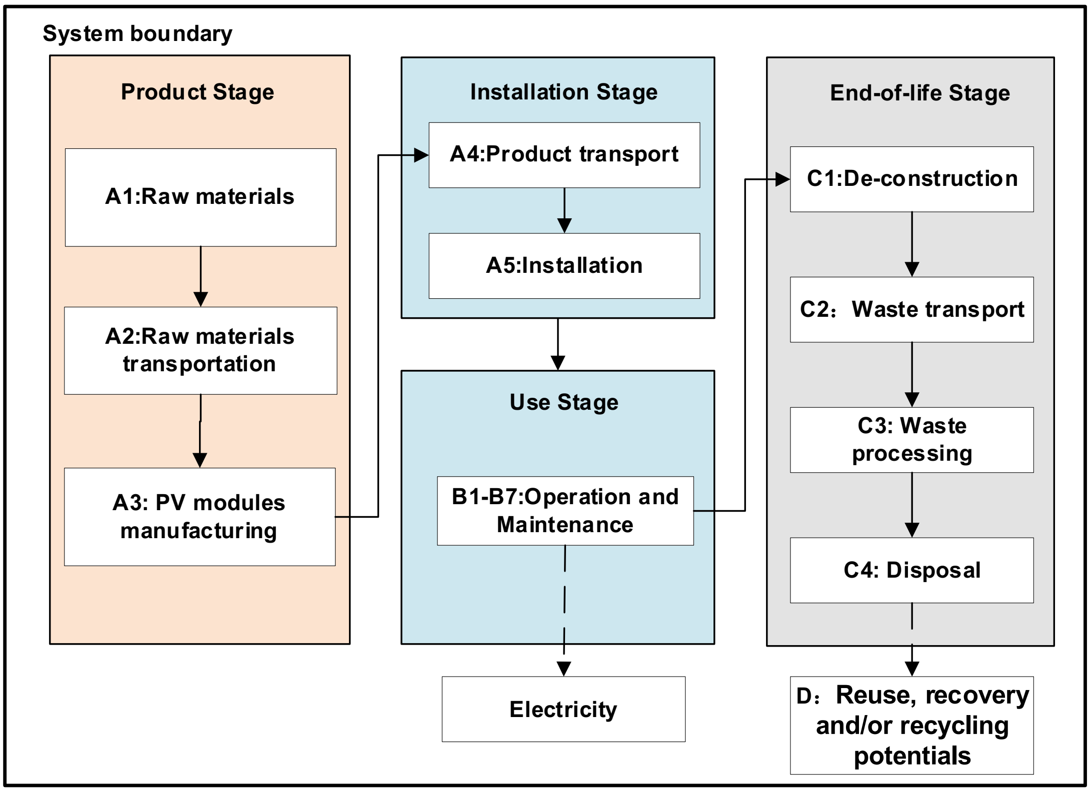
Primary data (such as materials or energy flows that enter and leave the production system) is from Huasun manufacturing facilities for the period spanning October 2022 to September 2023 (annual average). Generic data related to the life cycle impacts of the material or energy flows that enter and leave the production system is sourced from Ecoinvent 3.9 "allocation, cut-off by classification- unit" database.

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

Product stage			Assembly stage		Use stage							End of life stage				Benefits & loads beyond system boundary
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	X	X	X	X	X	X	X	X	X	X	X	X	X

System boundary:

The system boundary for this LCA study of Huasun's PV modules encompasses product stage, installation stage, use stage, and end-of-life stage, from cradle to grave and module D.



LCA: Scenarios and additional technical information

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

Transport from production place to assembly/user (A4)

Transport from production place to assembly/user (A4)	Capacity utilisation (incl. return) %	Distance (km)	Fuel/Energy consumption	Unit	Value
Truck	36.7	1366	Diesel	kg/tkm	0.036
Railway	-	-	-	-	-
Boat	70	9364	Heavy oil	kg/tkm	0.0025

Note: the distance values in the table are aggregated values based on market ratio of different region and respective transportation distance

45.4% of the product is distributed to Europe, with a road distance of 377 km and an ocean distance of 19448 km. 5.7% is sent to the Middle East, with a road distance of 377 km and an ocean distance of 9371 km. The remaining is distributed within China, with a road distance of 2400 km.

Assembly (A5)

A5 Assembly	Unit	Value
Water consumption	m3/FU	-
Electricity consumption	kWh/FU	6.32E-5
Other energy carriers	MJ/FU	Diesel: 1.35E-2
Material loss	kg/FU	-
Output materials from waste treatment	kg/FU	1.04E-3

According to PCR, mounting structures and electrical components will not be included in this stage, only energy consumption, waste generation and treatment of packaging materials will be considered. A proxy process of photovoltaic plant installation with a capacity of 570kWp from Ecoinvent3.9 database is referred to. Electricity and diesel consumption are downscaled to the power output of the product analyzed in this study. The waste from the products' packaging is considered in this stage, and waste treatment of wood pallet is modeled as 75% recycling and 25% incineration. Other packaging materials including paper and plastic film are modeled with 100% incineration.

Use (B1)

There are no material or energy inputs, nor emissions during the use phase (B1) of the PV module.

Maintenance (B2)/Repair (B3)

	Unit	Value
Water consumption	m3/FU	0.00046
Electricity consumption	kWh/FU	-

As for the maintenance stage (B2), water used for cleaning to maintain the performance is considered, 0.23L water used per module each time, and 2 times in a year are assumed as mentioned in the assumption section. During the operation of PV module, no repair (B3) is required.

Replacement (B4)/Refurbishment (B5)

It is assumed that the PV module itself does not require replacement and refurbishment during its RSL.

Operational energy (B6) and water consumption (B7)

It is assumed that there is no operational electricity (B6) or water consumption (B7). To calculate the expected energy production over the lifetime of the panels, the following formula may be used:

$$E_1 = S_{\mathrm{rad}} * A * y * PR * (1 - \deg)$$

Where:

E$_1$= Energy produced in the first year of operation, kWh/year

S$_{rad}$ = Site specific annual average solar radiation on module (shadings not included), kWh/kWp/year. The annual radiation must take into consideration the specific inclination (slope, tilt) and orientation.

A = Area of module, m^2.

y = Module yield: electrical power, kWp for standard test conditions (STC) of the module divided by the area of the module.

STC: The ratio is given for standard test conditions: irradiance 1000 W/m^2, cell temperature 25 °C, wind speed 1 m/s, AM1.5.

PR = Performance ratio, coefficient for losses. Site specific performance ratio can be modelled with PV simulation software tools, such as PVSYST or similar.

Energy production second year of operation:

$$E_2 = E_1 * (1 - \deg)$$

Energy production n year of operation:

$$E_n = E_1 * (1 - \deg)^{n-1}$$

Energy production over reference service life of module, assuming linear annual degradation:

$$E_{RSL} = E_1 * (1 + \sum_{n=1}^{RSL-1} (1 - deg)^n)$$

End of Life (C1, C3, C4)

	Unit	Value
Hazardous waste disposed	kg/FU	-
Collected as mixed construction waste	kg/FU	5.26E-02
Reuse	kg/FU	-

Recycling	kg/FU	3.62E-02
Energy recovery	kg/FU	3.17E-04
To landfill	kg/FU	7.44E-03

Assumptions are made for C1, C3 and C4 stage. Decommissioning stage (C1) of PV modules is assumed to be taken with same energy and fuel consumption as for installation stage. Waste processing (C3) stage is assumed to be mechanically treated to yield the bulk materials. Modelling of disposal stage (C4) refers to legal requirements issued by Waste Electrical and Electronic Equipment (WEEE) under the EU scenario.

Transport to waste processing (C2)

Transport from production place to assembly/user (C2)	Capacity utilisation (incl. return) %	Distance (km)	Fuel/Energy consumption	Unit	Value
Truck	36.7	50	Diesel	kg/tkm	0.036

50km transportation distance from the plant site to waste treatment site (C2) is assumed according to PCR.

Benefits and loads beyond the system boundaries (D)

Benefits and loads beyond the system boundaries (D)	Unit	Value
Substitution of electricity	kWh/FU	5.05E-04
Substitution of thermal energy, district heating	MJ/FU	3.27E-03
Substitution of converter aluminum with net scrap	kg/FU	9.96E-04
Substitution of primary silver with net scrap	kg/FU	1.19E-05
Substitution of primary copper with net scrap	kg/FU	1.20E-05
Substitution of primary glass with glass gullets	kg/FU	3.08E-02
Substitution of primary wood pallet with recycled wood	kg/FU	1.04E-03

100% aluminium scrap 95% copper and silver, 75% wooden pallet, and 85% of glass scrap will be recycled. The remain wood pallet and plastic components are incinerated with energy recovery. Efforts required by secondary production, loss of materials and quality are considered.

LCA: Results

The LCA results show the environmental impacts and resource input and output flows calculated according to EN 15804:2012+A2. The results are shown per functional unit (1Wp). The LCA results have been calculated using the LCA software SimaPro 9.5.

Core environmental impact indicators (HS-210-B132DS725)

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3-B7	C1	C2	C3	C4	D
GWP - total	kg CO2 eq	3.85E-01	1.86E-02	3.23E-03	0.00E+00	4.98E-06	0.00E+00	1.38E-03	4.86E-04	1.03E-02	7.00E-04	-7.34E-02
GWP - biogenic	kg CO2 eq	-9.71E-04	3.72E-06	1.61E-03	0.00E+00	1.02E-07	0.00E+00	5.38E-07	4.45E-07	5.34E-05	1.85E-06	2.33E-03
GWP - fossil	kg CO2 eq	3.86E-01	1.86E-02	1.62E-03	0.00E+00	4.86E-06	0.00E+00	1.38E-03	4.85E-04	1.03E-02	6.98E-04	-7.55E-02
GWP - luluc	kg CO2 eq	3.70E-04	1.10E-05	2.98E-07	0.00E+00	8.49E-09	0.00E+00	2.43E-07	2.40E-07	2.14E-05	7.12E-08	-1.53E-04
ODP	kg CFC11 eq	6.90E-09	2.90E-10	2.75E-11	0.00E+00	1.38E-13	0.00E+00	2.15E-11	1.06E-11	6.68E-11	1.53E-11	-9.74E-10
AP	molc H+ eq	2.21E-03	1.84E-04	1.31E-05	0.00E+00	2.66E-08	0.00E+00	1.26E-05	1.06E-06	5.02E-05	6.87E-07	-4.36E-04
EP-freshwater	kg P eq	1.17E-04	1.28E-06	7.30E-08	0.00E+00	3.22E-09	0.00E+00	6.12E-08	3.45E-08	4.65E-06	2.76E-08	-2.68E-06
EP - marine	kg N eq	4.70E-04	4.58E-05	6.01E-06	0.00E+00	5.19E-09	0.00E+00	5.78E-06	2.68E-07	1.00E-05	2.54E-07	-9.12E-05
EP - terrestrial	molc N eq	4.87E-03	5.00E-04	6.50E-05	0.00E+00	4.98E-08	0.00E+00	6.28E-05	2.72E-06	1.00E-04	2.48E-06	-1.11E-03
POCP	kg NMVOC eq	1.43E-03	1.57E-04	1.93E-05	0.00E+00	1.82E-08	0.00E+00	1.86E-05	1.65E-06	2.98E-05	9.25E-07	-3.13E-04
ADP-M&M[2]	kg Sb-Eq	2.24E-05	4.89E-08	8.51E-10	0.00E+00	2.56E-11	0.00E+00	5.07E-10	1.59E-09	9.34E-09	4.28E-10	-4.60E-06
ADP-fossil[2]	MJ	4.59E+00	2.52E-01	1.94E-02	0.00E+00	8.74E-05	0.00E+00	1.81E-02	6.89E-03	1.33E-01	2.09E-03	-9.69E-01
WDP[2]	m^3	3.80E-01	9.88E-04	5.89E-05	0.00E+00	6.67E-04	0.00E+00	4.52E-05	2.84E-05	1.72E-03	7.50E-05	-1.15E-02

GWP-total: *Global Warming Potential;* ***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; See "additional Norwegian requirements" for indicator given as PO4 eq.* ***EP-marine:*** *Eutrophication potential, fraction of nutrients reaching freshwater end compartment;* ***EP-terrestrial:*** *Eutrophication potential, Accumulated Exceedance;* ***POCP****: Formation potential of tropospheric ozone;* ***ADP-M&M****: Abiotic depletion potential for non-fossil resources (minerals and metals);* ***ADP-fossil:*** *Abiotic depletion potential for fossil resources;* ***WDP:*** *Water deprivation potential, deprivation weighted water counsumption*

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

Additional environmental impact indicators (HS-210-B132DS725)

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3-B7	C1	C2	C3	C4	D
PM	Disease incidence	2.79E-08	1.16E-09	3.56E-10	0.00E+00	2.76E-13	0.00E+00	3.47E-10	3.62E-11	4.38E-10	1.06E-11	-4.13E-09
IRP[1]	kBq U235 eq.	1.87E-02	1.94E-04	1.74E-05	0.00E+00	1.85E-06	0.00E+00	1.47E-05	9.33E-06	1.47E-03	7.45E-06	-3.13E-03
ETP-fw[2]	CTUe	2.35E+00	1.35E-01	1.06E-02	0.00E+00	2.23E-05	0.00E+00	8.47E-03	3.41E-03	2.55E-02	3.97E-02	-2.86E-01
HTP-c[2]	CTUh	1.99E-10	8.32E-12	7.09E-13	0.00E+00	2.15E-14	0.00E+00	4.19E-13	2.21E-13	2.32E-12	1.12E-13	-4.35E-11
HTP-nc[2]	CTUh	4.34E-09	1.56E-10	5.85E-12	0.00E+00	2.81E-13	0.00E+00	3.21E-12	4.89E-12	8.39E-11	3.64E-12	-7.06E-10
SQP[2]	Dimensionless	1.37E+00	1.20E-01	2.00E-03	0.00E+00	1.91E-05	0.00E+00	1.26E-03	4.17E-03	1.97E-02	2.90E-03	-5.51E-01

PM*: Particulate matter emissions;* ***IRP****: Ionising radiation, human health;* ***ETP-fw****: Ecotoxicity (freshwater);* ***ETP-c****: Human toxicity, cancer effects;* ***HTP-nc****: Human toxicity, non-cancer effects;* ***SQP****: Land use related impacts / soil quality*

[1] 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.

[2] 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

Resource use (HS-210-B132DS725)

Parameter	Unit	A1-A3	A4	A5	B1	B2	B3-B7	C1	C2	C3	C4	D
RPEE	MJ	7.32E-01	2.91E-03	2.24E-02	0.00E+00	1.29E-05	0.00E+00	1.70E-04	1.09E-04	1.62E-02	1.38E-04	-1.56E-01
RPEM	MJ	2.22E-02	0.00E+00	-2.22E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TPE	MJ	7.32E-01	2.91E-03	2.03E-04	0.00E+00	1.29E-05	0.00E+00	1.70E-04	1.09E-04	1.62E-02	1.38E-04	-1.56E-01
NRPE	MJ	5.52E+00	2.49E-01	1.88E-02	0.00E+00	5.99E-05	0.00E+00	1.75E-02	6.66E-03	1.40E-01	1.67E-01	-1.04E+00
NRPM	MJ	1.65E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-1.65E-01	0.00E+00
TRPE	MJ	5.52E+00	2.49E-01	1.88E-02	0.00E+00	5.99E-05	0.00E+00	1.75E-02	6.66E-03	1.40E-01	2.00E-03	-1.04E+00
SM	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
W	m^3	9.79E-03	3.24E-05	2.44E-06	0.00E+00	1.56E-05	0.00E+00	1.68E-06	9.93E-07	7.11E-05	2.13E-05	-4.36E-04

***RPEE** Renewable primary energy resources used as energy carrier; **RPEM** Renewable primary energy resources used as raw materials; **TPE** Total use of renewable primary energy resources; **NRPE** Nonrenewable primary energy resources used as energy carrier; **NRPM** Nonrenewable primary energy resources used as materials; **TRPE** 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; **W** Use of net fresh water.*

End of life – Waste (HS-210-B132DS725)

Parameter	Unit	A1-A3	A4	A5	B1	B2	B3-B7	C1	C2	C3	C4	D
HW	kg	4.63E-04	1.54E-06	1.27E-07	0.00E+00	2.54E-10	0.00E+00	1.19E-07	4.39E-08	2.03E-07	1.10E-08	-1.02E-06
NHW	kg	3.36E-02	9.56E-03	9.48E-05	0.00E+00	1.01E-06	0.00E+00	2.77E-05	3.43E-04	3.62E-02	7.76E-03	-9.38E-03
RW	kg	4.54E-06	4.58E-08	4.15E-09	0.00E+00	4.74E-10	0.00E+00	3.47E-09	2.27E-09	3.59E-07	1.82E-09	-1.80E-06

***HW** Hazardous waste disposed; **NHW** Non-hazardous waste disposed; **RW** Radioactive waste disposed.*

End of life – output flow (HS-210-B132DS725)

Parameter	Unit	A1-A3	A4	A5	B1	B2	B3-B7	C1	C2	C3	C4	D
CR	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MR	kg	0.00E+00	0.00E+00	1.04E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.00E-02	0.00E+00
MER	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ETE	MJ	0.00E+00	0.00E+00	3.98E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.95E-03	0.00E+00
EEE	MJ	0.00E+00	0.00E+00	2.21E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.08E-03	0.00E+00

***CR** Components for reuse; **MR** Materials for recycling; **MER** Materials for energy recovery; **EEE** Exported electric energy; **ETE** Exported thermal energy.*

Information describing the biogenic carbon content at the factory gate

Biogenic carbon content	Unit	Value
Biogenic carbon content in product	kg C	0
Biogenic carbon content in the accompanying packaging	kg C	7.82E-04

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO_2

Additional requirements

Location based electricity mix from the use of electricity in manufacturing

In the context of China, a market-based approach is not applicable due to the absence of a Guarantee of Origin system. Therefore, a location-based approach is employed to assess the environmental impact of electricity in this EPD. Regional production mix from import, medium voltage (production of transmission lines, in addition to direct emissions and losses in grid) of applied electricity for the manufacturing process (A3).

National electricity grid	Data source	GWP_{total} [kg CO2 -eq/kWh]
Electricity, medium voltage {CN-ECGC}| market for electricity, medium voltage | Cut-off, U	ecoinvent 3.9	0.852

Additional environmental impact indicators required for construction products

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.

Parameter	Unit	A1-A3	A4	A5	B1	B2	B3-B7	C1	C2	C3	C4	D
GWP-IOBC	kg	3.86E-01	1.86E-02	1.62E-03	0.00E+00	4.87E-06	0.00E+00	1.38E-03	4.86E-04	1.03E-02	6.98E-04	-7.57E-02

GWP-IOBC *Global warming potential calculated according to the principle of instantaneous oxidation.*

Hazardous substances

The declaration is based upon reference to threshold values and/or test results and/or material safety data sheets provided to EPD verifiers. Documentation available upon request to EPD owner.

- ✓ The product contains substances given by the REACH Candidate list that are less than 0,1 % by weight.

Indoor environment

This is not relevant to the product under study.

Carbon footprint (A1-C4)

The carbon footprint (per Wp) for HS-210-B132DS725 is 4.20E-01 kg CO_2 eq./Wp.

Bibliography

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