



ENVIRONMENTAL PRODUCT DECLARATION

In accordance with ISO 14025:2006 and EN 15804:2012+A2:2019/AC:2021 for:

The International EPD®

Programme operator: The International EPD® System – India Regional Hub

Registration number: **EPD-IES-0024244**



EPD of multiple products, based on a representative product

“An EPD may be updated or de published if conditions change. To find the latest version of the EPD and to confirm its validity, see

www.environdec.com

Manufacturer: Saint-Gobain India PVT Ltd. – Vetrotech Business

VERSION 01

Date of publication:
2025/11/06

Validity:
5 years

Valid until:
2030/11/05

Scope of the EPD®:
India & Southeast Asia



VDS® SWING DOOR FRAME

2000 mmx2400 mm , 1800mm x 2400 mm, 1800 mm x 2400mm (with drop seal), 1990 mm x 2089 mm, 2300 x 2700 mm



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General information

Programme information

PROGRAMME:	The International EPD® System
ADDRESS:	EPD International AB - Box 210 60 - SE-100 31 Stockholm - Sweden
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PCR information

Product Category rules (PCR)

CEN standard EN 15804:2012+A2:2019/AC:2021 as the Core Product Category Rules (PCR),

Product category rules (PCR): PCR 2019:14 Construction Products, version 2.0

Complementary PCR: cPCR 007: Windows and doors (EN 17213) (c-PCR to PCR 2019:14) (1.0.0)

PCR review was conducted by: The Technical Committee of the International EPD® System
See www.environdec.com for a list of members.

Chairs of the PCR review: Rob Rouwette (chair), Noa Meron (co-chair).

Verification

External and independent ('third-party') verification of the declaration and data, according to ISO 14025:2006, via

EPD verification through:

- Individual EPD verification without a pre-verified LCA/EPD tool
- Individual EPD verification with a pre-verified LCA/EPD tool
- EPD process certification* without a pre-verified LCA/EPD tool
- EPD process certification* with a pre-verified LCA/EPD tool
- Fully pre-verified EPD tool

Independent third-party verification of the declaration and data, according to ISO 14025:2006:

- EPD verification by individual verifier

Third party verifier: Sunil Kumar C S

Email: sunilkumar@chakra4.in

Approved by: The International EPD® System

Procedure for follow-up of data during EPD validity involves third part verifier: Yes No

Ownership and limitations on use of EPD

The EPD owner has the sole ownership, liability, and responsibility for the EPD.

EPDs within the same product category but published in different EPD programmes, may not be comparable. For two EPDs to be comparable, they shall be based on the same PCR (including the same first-digit version number) or be based on fully aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have identical scope in terms of included life-cycle stages (unless the excluded life-cycle stage is demonstrated to be insignificant); apply identical impact assessment methods (including the same version of characterization factors); and be valid at the time of comparison.

Information about EPD owner

Address and contact information of the EPD owner: Saint-Gobain India Pvt. Ltd. - Vetrotech Business, No. 18/3, 7th Floor, Sigapi Aachi Building, Rukmani Lakshmi pathi Rd, Egmore, Chennai, Tamil Nadu 600008

Name of the EPD Owner: S P Narayanan (Narayanan.SP@saint-gobain.com, Saint Gobain India Pvt. Ltd. – VETROTECH Business)

Management system-related certification:

ISO 9001:2015 Valid till 07/09/2028

ISO 45001:2018 Valid till 07/09/2028

ISO 14001:2015 Valid till 07/09/2028

LCA practitioner: Sreekavya Vadapalli (Sreekavya.Vadapalli@saint-gobain.com, Saint Gobain Research India)

Communication: The intended use of this EPD is for B2B communication

Product information

Product name: VDS® SWING DOOR frame

UN CPC CODE: 4212 – Doors, windows and their frames and thresholds for doors, of iron, steel or aluminium

Manufacturing site(s): Vetrotech Saint-Gobain Plot A-1, Sipcot Industrial Park, Kancheepuram, Tamil Nadu – 602105

Product description

VDS® by Forster Profile Systems are certified in compliance to EN 1363-1, 1363-2, Standard Test Method Requirements for Fire Tests of Materials used in Building Construction.

EN 1364-1 specify the method for determining the fire resistance of non-load bearing walls.

EN 1627-1630 Burglar Resistant classifications using test methods for determination of resistance under static loading, dynamic loading, and manual burglary attempts.

Technical data/physical characteristics:

Essential Characteristics	Actual Performance	Conformance Standard
Fire Resistance	Upto 120 Minutes	EN 13501-2
Resistance to wind load	Upto Class C3	EN 12210
Air Permeability	Upto Class 4	EN 12207
Water Tightness	Upto Class 8A	EN 12208
Impact Resistance	Upto Class 5	EN 13049

Product Components	2000 mm x 2400 mm	1800 mm x 2400 mm	1800 mm x 2400 mm with dropseal	1990 mm x 2085 mm	2300 mm x 2700mm
Weight(kg/m ²)	18.33	19.74	20.48	19.26	16.05
Width (m)	2000	1800	1800	1990	2300
Length (m)	2400	2400	2400	2085	2700
Reaction to fire	EW	EW	EW	EW	EW
Thermal conductivity	45 W/(MK)	45 W/(MK)	45 W/(MK)	45 W/(MK)	45 W/(MK)

The VDS® Swing Door frame with dimensions **2000 mm x 2400 mm** is considered to be the representative product used in this EPD. This product is the best seller of the brand and all results are displayed for it.

Content declaration

Description of the main components and/or materials: Quantity for 1 functional unit is 1m² of installed VDS® Swing Door frame with a weight of around 18.33 kg and fire resistance upto 120 minutes against a heat radiation of 10 KW/m² with useful life of 30 years.

All raw materials contributing more than 5% to any environmental impact for VDS® Swing Door frame are listed in the following table.

Product components/materials	Weight (kg/FU)	Biogenic material weight(kg C/FU)
Hot dipped galvanized steel profile	10-15	0
Reinforcement	1-5	0
Glazing Bead	1-3	0
Hinge	0-1	0
Powder	0.3-0.8	0
Welding Material	0.1-0.5	0
Gasket	0.1-0.5	0
Steel Stud	0.02-0.05	0
Sum	18.33	0
Packaging materials	Weight (kg/FU)	Biogenic material weight(kg C/FU)
Bubble wrap	0.1-0.5	0
Cellotapes	0.1-0.5	0
Cardboard	2-3	0.8 – 1.3
Wooden Crate	1-5	0.4 – 1.7
Paper for Label	<0.1	0.043

Hazardous substances

During the life cycle of the product, no hazardous substance listed in the “Candidate List of Substances of Very High Concern (SVHC) for authorization” has been used in a percentage higher than 0,1% of the weight of the product. The verifier and the program operator do not make any claim nor have any responsibility of the legality of the product.

LCA information

TYPE OF EPD	Cradle to grave and module D
FUNCTIONAL UNIT	1m ² of installed VDS® Swing Door frame with a weight of around 18.33 kg and fire resistance upto 120 minutes against a heat radiation of 10 KW/m ² with useful life of 30 years
SYSTEM BOUNDARIES	Cradle to grave + Module D
REFERENCE SERVICE LIFE (RSL)	The Reference Service Life (RSL) of the VDS® Swing Door frame is 30 years. This value of 30 years is the expected lifespan of the product without refurbishment and corresponds to the standard building design life.
CUT-OFF RULES	<p>In the case that there is not enough information, the process energy and materials representing less than 1% of the whole energy and mass used can be excluded (if they do not cause significant impacts). The addition of all the inputs and outputs excluded cannot be bigger than 5% of the whole mass and energy used, as well as of the emissions to environment.</p> <p>Flows related to human activities such as employee transport are excluded.</p> <p>The construction of plants, production of machines and transportation systems are excluded since the related flows are supposed to be negligible compared to the production of the building product when compared at these systems lifetime level.</p>
ALLOCATIONS	<p>Allocation criteria are based on mass.</p> <p>The polluter pays principle as well as the modularity principle have been followed.</p>
GEOGRAPHICAL COVERAGE AND TIME PERIOD	<p>Scope: India and South East Asia</p> <p>Data is representative of one production site Sriperambudur located in India</p> <p>Data is representative of the year 2023</p>
BACKGROUND DATA SOURCE	Databases GaBi 2022 and ecoinvent v.3.11
SOFTWARE	GaBi 10

According to EN 15804:2012+A2:2019, EPDs of construction products may not be comparable if they do not comply with this standard.

Description of system boundaries

System boundaries (X=included. MND=module not declared)

	PRODUCT STAGE			CONSTRUCTION STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARY
	Raw material supply	Transport	Manufacturing	Transport	Construction-Installation process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-recovery
Module	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Modules declared	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Geography	GLO	GLO	IN	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO
Specific data used	8% GWP- GHG																
Variation products	Maximum variability: +13% to -17%																
Variation sites	0%																

Data quality declaration

Process	Source Type	Source	Reference year	Data Category	Share of primary data, of GWP - GHG results for A1-A3
Production of Steel Coil	Database	Ecoinvent 3.11	2021	Representative secondary data	52%
Production of Steel Reinforcement	Database	Ecoinvent 3.11	2021	Representative secondary data	28%
Transportation of Steel Coil through sea route to facility	Database	Ecoinvent 3.11	2023	Primary data	5%
Production of Coating Powder	Database	Gabi v2022.2	2022	Representative Secondary data	3%
Generation of Electricity	Database	Central Electricity Authority India and Ecoinvent 3.11	2022	Primary data	3%
Other processes	Databases	Ecoinvent 3.11 Gabi v2022.2	2019-2024	Representative Secondary data, proxy data	<10%
Total share of primary specific data, of GWP-GHG results for A1-A3					8%

“The share of primary data is calculated based on GWP-GHG results. It is a simplified indicator for data quality that supports the use of more primary data, to increase the representativeness of and comparability between EPDs. Note that the indicator does not capture all relevant aspects of data quality and is not comparable across product categories.”

Life cycle stages

A1-A3, Product stage

Description of the stage: The product stage is subdivided into 3 modules A1, A2 and A3 respectively Raw material supply, Transport to the manufacturer and “Manufacturing”.

A1, Raw materials supply

This module includes the extraction and transformation of raw materials and packaging.

A2, Transport to the manufacturer

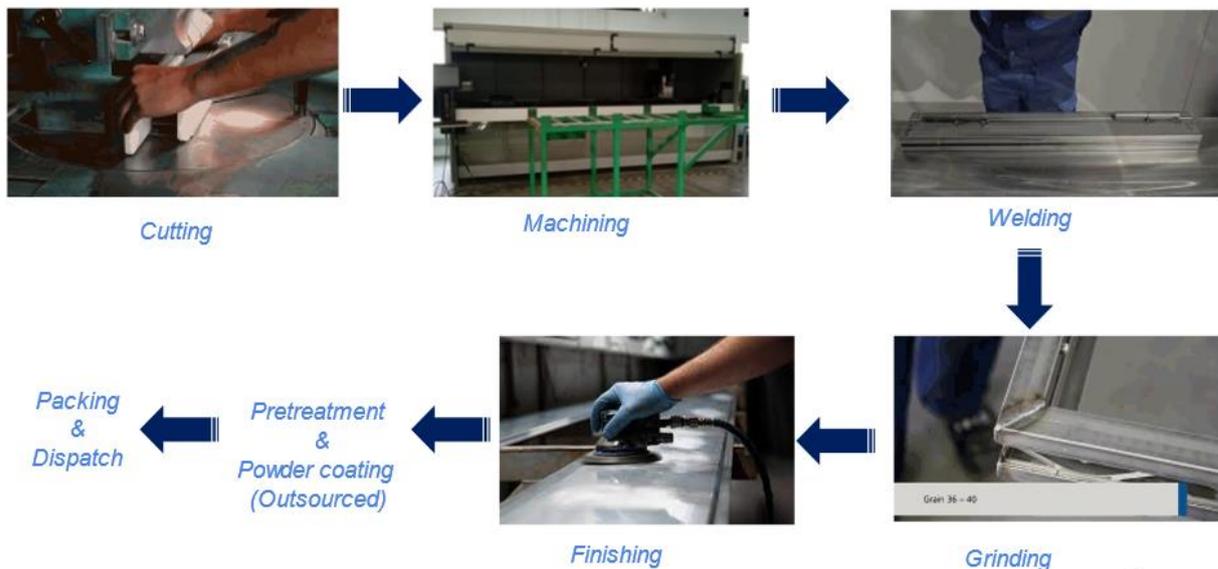
This module includes the transportation of raw materials and packaging to the manufacturing site. The modelling includes road, ship and/or train transportations.

A3, Manufacturing

This module includes the manufacturing of products. The processing of any waste arising from this stage is also included.

Manufacturing process flow diagram

System diagram:



Manufacturing in detail:

The raw materials are cut to the required sizes as per the approved drawing given by customer, it is machined to create provisions to mount the hardware. After inspection of the machined component the profiles are assembled as per the manufacturing diagram and welded together. The welded component is ground to remove the excess weld bead, and it is finished with sanding pads to remove surface defects. It is then subjected to inspection followed by transportation to a powder coating facility where it is treated with chemicals to remove surface contaminants and make

the surface effective for powder adhesion. Post chemical treatment the Electrostatically charged powder is sprayed on the component followed by heating to complete the polymerisation process. The powder coated components are inspected and packed to be dispatched to the customers.

A4-A5, Construction process stage

Description of the stage: The construction process is divided into 2 modules: A4, Transport to the building site and A5, Installation in the building.

A4, Transport to the building site This module includes the transport from the manufacturing site to the building site. Transport is calculated based on a scenario with the parameters described in the following table.

PARAMETER	VALUE
Fuel type and consumption of vehicle or vehicle type used for transport e.g. long distance truck, boat, etc.	Truck, maximum payload capacity of 27 t and consumption of 0.45 liters per km
Distance	1012 km
Capacity utilisation (including empty returns)	85% (30% of empty return)
Bulk density of transported products	7850 kg/m ³
Volume capacity utilisation factor	1

PARAMETER	VALUE
Fuel type and consumption of vehicle or vehicle type used for transport e.g. long distance truck, boat, etc.	Heavy fuel oil driven, cargo container ship, 5.000 to 200.000 dwt payload capacity for deep sea transport
Distance	5583 km
Dead Weight Tonnage	52.134 DWT
Bulk density of transported products	7850 kg/m ³
Volume capacity utilisation factor	1

A5, Installation in the building

This module includes the installation materials and the management and processing of waste generated during the installation. The parameters are presented in the following table.

PARAMETER	VALUE (expressed per declared unit)
Ancillary materials for installation (specified by materials)	None
Water use	None
Other resource use	None
Quantitative description of energy type (regional mix) and consumption during the installation process	Electricity: 0.0266 kWh/m ² of Sphera Indian electricity grid mix
Wastage of materials on the building site before waste processing, generated by the product's installation (specified by type)	VDS® Swing Door frame losses: Steel losses - 0.45% Packaging losses: 0.199 kg/FU (5%) Bubble Wrap: 0.015 kg/FU Cardboard corners: 0.026 kg/FU Wooden pallet: 0.064 kg/FU PP strap/Cello tape: 0.008 kg/FU

	Corrugated pad : 0.086 kg/FU VDS® Swing Door frame losses: 0.45% Steel losses Packaging losses : 0.199 kg/FU (5%) Bubble Wrap: 0.015 kg/FU Cardboard corners: 0.026 kg/FU Wooden pallet: 0.064 kg/FU PP strap/Cello tape: 0.008 kg/FU Corrugated pad : 0.086 kg/FU
Output materials (specified by type) as results of waste processing at the building site e.g. of collection for recycling, for energy recovering, disposal (specified by route)	Metal scraps are considered 85% recycled and 15% landfilled Plastic straps are landfilled. Wooden bearers, Bubble wrap and cardboard corners are landfilled. Metal strips are landfilled.
Direct emissions to ambient air, soil and water	None

As the steel frame losses are calculated to be less than 1%, it is included in cut-off rules and not included in modelling

B1-B7, Use stage (excluding potential savings)

Description of the stage:

The use stage is divided into the following modules:

- B1, Use
- B2, Maintenance
- B3, Repair
- B4, Replacement
- B5, Refurbishment
- B6, Operational energy use
- B7, Operational water use

Description of the scenarios and additional technical information:

The product has a reference service life of 30 years. It is assumed that the product will last in situ with no requirements for maintenance, repair, replacement, or refurbishment throughout this period. Therefore, it has no impact at this stage.

C1-C4, End of Life Stage

Description of the stage:

This stage includes the following modules:

- C1, Deconstruction, demolition: The de-construction and/or dismantling of the product take part of the demolition of the entire building. For the studied product, these impacts are negligible
- C2, Transport to waste processing
- C3, Waste processing for reuse, recovery and/or recycling
- C4, Disposal, including provision and all transport, provision of all materials, products and related energy and water use.

Description of the scenarios and additional technical information for the end of life:

PARAMETER	VALUE/DESCRIPTION
Collection process specified by type	18.33 kg collected with mixed deconstruction and demolition waste (including metal profile)
Recovery system specified by type	15.59 kg for recycling (metal frame) (85% frame)
Disposal specified by type	2.74 kg to landfill(15% frame)
Assumptions for scenario development (e.g. transportation)	The Frames are recycled by sorting and remelting

(Reference: 2017 worldsteel LCI methodology report Section 3.6.2)

D, Reuse/recovery/recycling potential

This module includes the loads and benefits resulting from reuse, energy recovery or recycling beyond the system boundary. Module D is assessed for recycling of steel materials.

Module D is covered in this LCA. There are net benefits from net flows leaving the product system. Benefits of these avoided impacts, or loads associated with processing of waste steel, are associated with “Value of Scrap” as described in the WorldSteel methodology (2017 worldsteel LCI methodology report Section 3.6.2).

Environmental performance

As specified in EN 15804:2012+A2:2019/AC:2021 and the Product-Category Rules, the environmental impacts are declared and reported using the baseline characterization factors based on EF 3.1. Raw materials and energy consumption, as well as transport distances have been taken directly from the manufacturing plant.

The estimated impact results are only relative statements which do not indicate the end points of the impact categories, exceeding threshold values, safety margins or risks.

The results of the end-of-life stage (modules C1-C4) should be considered when using the results of the product stage (modules A1-A3).

Disclaimer 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 following indicators:

- Resource use, mineral and metals [kg Sb eq.]
- Resource use, energy carriers [MJ]
- Water deprivation potential [m³ world equiv.]
- Land use [Pt]
- Human toxicity (cancer) [CTUh]
- Human toxicity(noncancer) [CTUh]
- Ecotoxicity (freshwater) [CTUe]

Disclaimer 2: The impact category Ionizing radiation, human health [kBq U235 eq.] 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 material is also not measured by this indicator.

Disclaimer 3: The assumptions for the modules are in accordance with the project report (LCA study).

Disclaimer 4: The biogenic carbon leaving the product system in module A5 leaving the product system, have already been accounted for and balanced in modules A1–A3. No additional credit or burden is assigned in modules A5 for these flows.

Disclaimer 5: The product is considered to be 100% landfilled post useful service life.

The following non-mandatory additional environmental indicators are not declared:

- Ecotoxicity freshwater [CTUe]
- Particulate Matter emissions [Disease incidence]
- Cancer human health effects [CTUh]
- Ionizing radiation - human health [kBq U235 eq.]
- Non-cancer human health effects [CTUh]
- Land Use [Pt]

Disclaimer:

The use of the results of modules A1-A3 (A1-A5 for services) without considering the results of module C is not encouraged because module C is included in the EPD

LCA results

As specified in EN 15804:2012+A2:2019/AC:2021 and the Product-Category Rules, the environmental impacts are declared and reported using the baseline characterization factors from the PEF (EF 3.1). Specific data has been supplied by the plant, and generic data come from GaBi and ecoinvent databases.

All emissions to air, water, and soil, and all materials and energy used have been included.

The estimated impact results are only relative statements which do not indicate the end points of the impact categories, exceeding threshold values, safety margins or risks.

All figures refer to a functional unit of 1m² of installed VDS® Swing Door frame with a weight of around 18.33 kg and fire resistance upto 120 minutes against a heat radiation of 10 KW/m² with useful life of 30 years

The results of the end-of-life stage (modules C1-C4) should be considered when using the results of the “A1-A5” stages.

The following results corresponds to a product manufactured in a single plant:

Environmental Impacts

Environmental Indicators		PRODUCT STAGE	CONSTRUCTION STAGE		USE STAGE							END OF LIFE STAGE				REUSE, RECOVERY RECYCLING
		A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	D Reuse, recovery, recycling
	Climate Change [kg CO2 eq.]	7.54E+01	3.39E+00	3.68E+00	0	0	0	0	0	0	0	0.00E+00	9.39E-02	4.32E-02	4.13E-02	-5.44E+01
	Climate Change (fossil) [kg CO2 eq.]	8.03E+01	3.37E+00	1.68E-01	0	0	0	0	0	0	0	0.00E+00	9.27E-02	4.27E-02	4.11E-02	-5.42E+01
	Climate Change (biogenic) [kg CO2 eq.]	-5.02E+00	4.89E-03	5.54E+00	0	0	0	0	0	0	0	0.00E+00	1.98E-04	1.25E-04	1.05E-04	-1.17E-01
	Climate Change (land use change) [kg CO2 eq.]	8.06E-02	1.78E-02	4.71E-04	0	0	0	0	0	0	0	0.00E+00	9.79E-04	3.68E-04	1.20E-04	-4.25E-02
	Ozone depletion [kg CFC-11 eq.]	3.51E-06	3.60E-13	1.38E-08	0	0	0	0	0	0	0	0.00E+00	1.12E-14	8.40E-14	1.55E-16	-7.60E-09
	Acidification terrestrial and freshwater [Mole of H+ eq.]	7.83E-01	5.67E-02	1.00E-03	0	0	0	0	0	0	0	0.00E+00	5.44E-04	2.16E-04	2.99E-04	-1.24E-01
	Eutrophication freshwater [kg P eq.]	2.13E-02	5.09E-06	1.75E-05	0	0	0	0	0	0	0	0.00E+00	2.57E-07	1.07E-07	7.16E-08	7.06E-04
	Eutrophication marine [kg N eq.]	1.35E-01	1.37E-02	5.05E-03	0	0	0	0	0	0	0	0.00E+00	2.69E-04	1.01E-04	7.70E-05	-3.15E-02
	Eutrophication terrestrial [Mole of N eq.]	1.74E+00	1.49E-01	2.30E-03	0	0	0	0	0	0	0	0.00E+00	2.93E-03	1.09E-03	8.46E-04	-3.15E-01
	Photochemical ozone formation - human health [kg NMVOC eq.]	3.76E-01	3.86E-02	1.96E-03	0	0	0	0	0	0	0	0.00E+00	4.98E-04	2.68E-04	2.33E-04	-1.02E-01
	Resource use, mineral and metals [kg Sb eq.] ¹	4.79E-03	1.56E-07	2.42E-07	0	0	0	0	0	0	0	0.00E+00	6.30E-09	4.34E-08	3.75E-09	-5.86E-06
	Resource use, energy carriers [MJ] ¹	9.79E+02	4.13E+01	1.95E+00	0	0	0	0	0	0	0	0.00E+00	1.21E+00	7.89E-01	5.47E-01	-4.65E+02
	Water deprivation potential [m ³ world equiv.] ¹	4.19E+01	9.99E-03	5.50E-02	0	0	0	0	0	0	0	0.00E+00	3.81E-04	7.60E-03	4.37E-03	-1.74E+00

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

Resources Use

Resources Use Indicators	PRODUCT STAGE	CONSTRUCTION STAGE		USE STAGE							END OF LIFE STAGE				D REUSE, RECOVERY, RECYCLING
	A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	D Reuse, recovery, recycling
 Use of renewable primary energy (PERE) [MJ]	1.34E+02	1.72E+00	1.27E-01	0	0	0	0	0	0	0	0.00E+00	8.91E-02	7.74E-02	7.17E-02	1.05E+02
 Primary energy resources used as raw materials (PERM) [MJ]	4.99E+01	0.00E+00	0.00E+00	0	0	0	0	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
 Total use of renewable primary energy resources (PERT) [MJ]	1.84E+02	1.72E+00	1.27E-01	0	0	0	0	0	0	0	0.00E+00	8.91E-02	7.74E-02	7.17E-02	1.05E+02
 Use of non-renewable primary energy (PENRE) [MJ]	9.59E+02	4.13E+01	1.95E+00	0	0	0	0	0	0	0	0.00E+00	1.21E+00	7.89E-01	5.47E-01	-4.65E+02
 Non-renewable primary energy resources used as raw materials (PENRM) [MJ]	1.97E+01	0.00E+00	0.00E+00	0	0	0	0	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
 Total use of non-renewable primary energy resources (PENRT) [MJ]	9.80E+02	4.13E+01	1.96E+00	0	0	0	0	0	0	0	0.00E+00	1.21E+00	7.89E-01	5.47E-01	-4.65E+02
 Input of secondary material (SM) [kg]	4.00E+00	0.00E+00	0.00E+00	0	0	0	0	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
 Use of renewable secondary fuels (RSF) [MJ]	0.00E+00	0.00E+00	0.00E+00	0	0	0	0	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
 Use of non-renewable secondary fuels (NRSF) [MJ]	0.00E+00	0.00E+00	0.00E+00	0	0	0	0	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
 Use of net fresh water (FW) [m3]	9.84E-01	8.98E-04	1.31E-03	0	0	0	0	0	0	0	0.00E+00	4.29E-05	2.07E-04	1.38E-04	-6.27E-02

Waste Category & Output flows

Waste Category & Output Flows	PRODUCT STAGE	CONSTRUCTION STAGE		USE STAGE							END OF LIFE STAGE				D REUSE, RECOVERY, RECYCLING
	A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	D Reuse, recovery, recycling
 Hazardous waste disposed (HWD) [kg]	5.68E-03	1.47E-09	1.71E-06	0	0	0	0	0	0	0	0.00E+00	4.38E-11	1.09E-10	8.34E-09	-2.38E-06
 Non-hazardous waste disposed (NHWD) [kg]	7.45E+01	4.45E-03	4.63E+00	0	0	0	0	0	0	0	0.00E+00	1.59E-04	1.99E-04	2.75E+00	-7.45E-01
 Radioactive waste disposed (RWD) [kg]	2.91E-03	5.18E-05	9.86E-06	0	0	0	0	0	0	0	0.00E+00	1.59E-06	1.00E-05	6.23E-06	6.62E-03
 Components for re-use (CRU) [kg]	0.00E+00	0.00E+00	0.00E+00	0	0	0	0	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
 Materials for Recycling (MFR) [kg]	0.00E+00	0.00E+00	0.00E+00	0	0	0	0	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
 Material for Energy Recovery (MER) [kg]	0.00E+00	0.00E+00	0.00E+00	0	0	0	0	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
 Exported electrical energy (EEE) [MJ]	0.00E+00	0.00E+00	0.00E+00	0	0	0	0	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
 Exported thermal energy (EET) [MJ]	0.00E+00	0.00E+00	0.00E+00	0	0	0	0	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Additional voluntary indicator (GWP total without biogenic CO₂)

Environmental Indicators	PRODUCT STAGE	CONSTRUCTION STAGE		USE STAGE							END OF LIFE STAGE				REUSE, RECOVERY RECYCLING
	A1 / A2 / A3	A4 Transport	A5 Installation	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Operational energy use	B7 Operational water use	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	D Reuse, recovery, recycling
 Climate Change [kg CO ₂ eq.] ²	8.07E+01	3.39E+00	3.68E+00	0	0	0	0	0	0	0	0.00E+00	9.39E-02	4.32E-02	4.13E-02	-5.44E+01

² The indicator includes all greenhouse gases included in GWP-total but excludes biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product.

Information on biogenic carbon content

		PRODUCT STAGE
Biogenic Carbon Content		A1 / A2 / A3
	Biogenic carbon content in product [kg]	0.00 E+00
	Biogenic carbon content in packaging [kg]	1.44 E+00

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

The product does not contain any biogenic carbon. Regarding packaging, biogenic carbon is quantified due to wooden crates and cardboard usage.

Alternative End of life scenarios

As per world steel methodology, and standard practice followed in India for steel recycling, it is assumed that 85% of steel is recycled and 15% is landfilled. The scenario results for 100% recycling and 100% landfill are as presented below:

EOL scenario 100 % recycled	End of life stage				Benefits and loads beyond the life cycle
	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	
Environmental impacts					D output 100% recycling
Climate Change [kg CO ₂ eq.]	0.00E+00	9.39E-02	5.08E-02	0.00E+00	-3.03E+01
Climate Change (fossil) [kg CO ₂ eq.]	0.00E+00	9.27E-02	5.03E-02	0.00E+00	-3.03E+01
Climate Change (biogenic) [kg CO ₂ eq.]	0.00E+00	1.98E-04	1.47E-04	0.00E+00	4.26E-03
Climate Change (land use change) [kg CO ₂ eq.]	0.00E+00	9.79E-04	4.33E-04	0.00E+00	-1.48E-02
Ozone depletion [kg CFC-11 eq.]	0.00E+00	1.12E-14	9.89E-14	0.00E+00	-1.55E-11
Acidification terrestrial and freshwater [Mole of H ⁺ eq.]	0.00E+00	5.44E-04	2.55E-04	0.00E+00	-6.98E-02
Eutrophication freshwater [kg P eq.]	0.00E+00	2.57E-07	1.26E-07	0.00E+00	-1.06E-05
Eutrophication marine [kg N eq.]	0.00E+00	2.69E-04	1.19E-04	0.00E+00	-1.68E-02
Eutrophication terrestrial [Mole of N eq.]	0.00E+00	2.93E-03	1.28E-03	0.00E+00	-1.81E-01
Photochemical ozone formation - human health [kg NMVOC eq.]	0.00E+00	4.98E-04	3.16E-04	0.00E+00	-5.63E-02
Resource use, mineral and metals [kg Sb eq.]	0.00E+00	6.30E-09	5.11E-08	0.00E+00	-3.00E-07
Resource use, energy carriers [MJ]	0.00E+00	1.21E+00	9.29E-01	0.00E+00	-2.30E+02
Water deprivation potential [m ³ world equiv.]	0.00E+00	3.81E-04	8.94E-03	0.00E+00	-2.13E-01

EOL scenario 100 % recycled	End of life stage				Benefits and loads beyond the life cycle
Resource Use indicators	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	D output 100% recycling
Use of renewable primary energy (PERE) [MJ]	0.00E+00	8.91E-02	9.11E-02	0.00E+00	3.62E+01
Primary energy resources used as raw materials (PERM) [MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of renewable primary energy resources (PERT) [MJ]	0.00E+00	8.91E-02	9.11E-02	0.00E+00	3.62E+01
Use of non-renewable primary energy (PENRE) [MJ]	0.00E+00	1.21E+00	9.29E-01	0.00E+00	-2.30E+02
Non-renewable primary energy resources used as raw materials (PENRM) [MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of non-renewable primary energy resources (PENRT) [MJ]	0.00E+00	1.21E+00	9.29E-01	0.00E+00	-2.30E+02
Use of secondary material (SM) [kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of renewable secondary fuels (RSF) [MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of non renewable secondary fuels (NRSF) [MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of net fresh water (FW) [m3]	0.00E+00	4.29E-05	2.43E-04	0.00E+00	-1.76E-02

EOL scenario 100 % recycled	End of life stage				Benefits and loads beyond the life cycle
Output Flows and waste category	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	D output 100% recycling
Hazardous waste disposed (HWD) [[kg]	0.00E+00	4.38E-11	1.28E-10	0.00E+00	8.61E-08
Non-hazardous waste disposed (NHWD) [[kg]	0.00E+00	1.59E-04	2.34E-04	0.00E+00	-4.67E-01
Radioactive waste disposed (RWD) [[kg]	0.00E+00	1.59E-06	1.18E-05	0.00E+00	3.82E-03
Components for re-use (CRU) [kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for Recycling (MFR) [kg]	0.00E+00	0.00E+00	1.83E+01	0.00E+00	0.00E+00
Material for Energy Recovery (MER) [kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported electrical energy (EEE) [MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported thermal energy (EET) [MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

EOL scenario 100 % landfilled	End of life stage				Benefits and loads beyond the life cycle
	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	
Environmental impacts					D output 100% landfill
Climate Change [kg CO2 eq.]	0.00E+00	9.39E-02	0.00E+00	2.75E-01	0.00E+00
Climate Change (fossil) [kg CO2 eq.]	0.00E+00	9.27E-02	0.00E+00	2.74E-01	0.00E+00
Climate Change (biogenic) [kg CO2 eq.]	0.00E+00	1.98E-04	0.00E+00	6.99E-04	0.00E+00
Climate Change (land use change) [kg CO2 eq.]	0.00E+00	9.79E-04	0.00E+00	8.00E-04	0.00E+00
Ozone depletion [kg CFC-11 eq.]	0.00E+00	1.12E-14	0.00E+00	1.03E-15	0.00E+00
Acidification terrestrial and freshwater [Mole of H+ eq.]	0.00E+00	5.44E-04	0.00E+00	1.99E-03	0.00E+00
Eutrophication freshwater [kg P eq.]	0.00E+00	2.57E-07	0.00E+00	4.78E-07	0.00E+00
Eutrophication marine [kg N eq.]	0.00E+00	2.69E-04	0.00E+00	5.13E-04	0.00E+00
Eutrophication terrestrial [Mole of N eq.]	0.00E+00	2.93E-03	0.00E+00	5.64E-03	0.00E+00
Photochemical ozone formation - human health [kg NMVOC eq.]	0.00E+00	4.98E-04	0.00E+00	1.55E-03	0.00E+00
Resource use, mineral and metals [kg Sb eq.]	0.00E+00	6.30E-09	0.00E+00	2.50E-08	0.00E+00
Resource use, energy carriers [MJ]	0.00E+00	1.21E+00	0.00E+00	3.65E+00	0.00E+00
Water deprivation potential [m³ world equiv.]	0.00E+00	3.81E-04	0.00E+00	2.91E-02	0.00E+00

EOL scenario 100 % landfilled	End of life stage				Benefits and loads beyond the life cycle
	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	
Resources Use indicators					D output 100% landfill
Use of renewable primary energy (PERE) [MJ]	0.00E+00	8.91E-02	0.00E+00	4.78E-01	0.00E+00
Primary energy resources used as raw materials (PERM) [MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of renewable primary energy resources (PERT) [MJ]	0.00E+00	8.91E-02	0.00E+00	4.78E-01	0.00E+00
Use of non-renewable primary energy (PENRE) [MJ]	0.00E+00	1.21E+00	0.00E+00	3.65E+00	0.00E+00
Non-renewable primary energy resources used as raw materials (PENRM) [MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of non-renewable primary energy resources (PENRT) [MJ]	0.00E+00	1.21E+00	0.00E+00	3.65E+00	0.00E+00
Use of secondary material (SM) [kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of renewable secondary fuels (RSF) [MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of non renewable secondary fuels (NRSF) [MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of net fresh water (FW) [m3]	0.00E+00	4.29E-05	0.00E+00	9.20E-04	0.00E+00

EOL scenario 100 % landfilled	End of life stage				Benefits and loads beyond the life cycle
	C1 Deconstruction / demolition	C2 Transport	C3 Waste processing	C4 Disposal	
Hazardous waste disposed (HWD) [[kg]	0.00E+00	4.38E-11	0.00E+00	5.56E-08	0.00E+00
Non-hazardous waste disposed (NHWD) [[kg]	0.00E+00	1.59E-04	0.00E+00	1.83E+01	0.00E+00
Radioactive waste disposed (RWD) [[kg]	0.00E+00	1.59E-06	0.00E+00	4.15E-05	0.00E+00
Components for re-use (CRU) [kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for Recycling (MFR) [kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Material for Energy Recovery (MER) [kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported electrical energy (EEE) [MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported thermal energy (EET) [MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Declaration of variation

Variation between products

According to PCR 2.0.1, since this EPD is multi-product, the variation of impact between products shall be declared.

The following table provides this variation of impact between the products under study with representative product:

Indicator	Unit	A-C	Variation % w.r.t Representative product			
		Representative Product dimensions 2000 x 2400 mm	1800 x 2400 mm with Dropseal	1800 x 2400 mm	1990 x 2085 mm	2300 x 2700 mm
GWP-total	kg CO2 eq.	8.26E+01	-17%	-8%	-17%	13%
GWP-fossil	kg CO2 eq.	8.40E+01	-18%	-8%	-18%	13%
GWP-biogenic	kg CO2 eq.	-1.49E+00	-16%	-8%	-16%	13%
GWP-luluc	kg CO2 eq.	1.00E-01	-11%	-8%	-11%	12%
ODP	kg CFC 11 eq.	3.52E-06	-9%	-7%	-9%	12%
AP	mol H+ eq.	8.41E-01	-12%	-7%	-12%	12%
EP-freshwater	kg P eq.	2.13E-02	-10%	-8%	-10%	13%
EP-marine	kg N eq.	1.54E-01	-14%	-7%	-14%	12%
EP-terrestrial	mol N eq.	1.90E+00	-14%	-8%	-13%	12%
POCP	kg NMVOC eq.	4.18E-01	-15%	-8%	-14%	13%
ADP-minerals&metals	kg Sb eq.	4.79E-03	-10%	-7%	-10%	12%
ADP-fossil	MJ	1.02E+03	-18%	-8%	-18%	12%
WDP	m3	4.20E+01	-9%	-7%	-9%	12%

LCA results interpretation

Global Warming Potential (Climate Change) (GWP)

The majority of contribution to this environmental impact is from the production modules (A1-A3). This is primarily because the sources of greenhouse gas emissions are predominant in this part of the life cycle. The CO₂-intensive blast furnace steel greatly contributes to this value. CO₂ is also generated upstream from the production of electricity. We can see that other sections of the life cycle also contribute to the GWP; however, the production modules contribute to around 90% of the contribution. Combustion of fuel in transport vehicles will generate the second highest percentage of greenhouse gas emissions together with the waste during the installation stage.

Non-renewable resources consumptions

The consumption of non – renewable resources is once more found to have the highest value in the production modules. Due to coke, diesel and natural gas consumption within the factory. For non – renewable fuels such as coal and oil are used to generate electricity during manufacturing. The contribution to this impact from the other modules is very small and primarily due to the non – renewable resources consumed during installation.

Energy Consumptions

Modules A1-A3 have the highest contribution to total energy consumption. Energy in the form of electricity, natural gas or other fossil energy is consumed in a vast quantity during the manufacture of steel product so we would expect the production modules to contribute the most to this impact category.

Water Consumption

Water is used within the manufacturing facility and the steel production plant. Therefore, we see the highest contribution in the production phase.

Waste Production

Waste production does not follow the same trend as the above environmental impacts. The largest contributor is the end-of-life module. Despite an important recycling a ratio, there is still some amounts of landfilled materials. There is also an impact associated with the production module, since we do generate waste on site, the impact associated with installation is due to the loss rate of product during implementation.

Additional information:

Electricity information

TYPE OF INFORMATION	DESCRIPTION
Location	Representative of residual production in India
Geographical representativeness	average national or region-specific electricity mix including main activity producers and auto producers as well as electricity imports
Reference year	2019
Type of dataset	Cradle to gate from Sphera databases
Source	SPHERA-ts database
CO ₂ emission kg CO ₂ eq. / MJ	1.06– based on climate change fossil indicator

Data quality

Inventory data quality is judged by geographical, temporal, and technological representativeness. To cover these requirements and to ensure reliable results, first-hand industry data crossed with LCA background datasets were used. The data was collected from internal records and reporting documents from 2023. After evaluating the inventory, according to the defined ranking in the LCA report, the assessment reflects good inventory data quality.

Abbreviations

DU	Declared unit
EPD	Environmental Product Declaration
eq.	equivalents
FU	Functional unit
g	gram
GJ	Giga Joules (as Net Calorific Value)
IOBC	Instantaneous Oxidation of Biogenic Carbon

EF	Environmental Footprint
kg	kilogram
kWh	kilowatt-hour
L	liter
LCA	Life Cycle Assessment
LCI	Life Cycle Inventory Analysis
LCIA	Life Cycle Impact Assessment
MJ	Mega Joules (as Net Calorific Value)
PCR	Product Category Rules
RSL	Reference Service Life (in years)
Ton	Metric ton

References

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7. European Chemical Agency, Candidate List of substances of very high concern for Authorization.
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Version History

Original Version of the EPD, 2025-11-04 : Version number 1