

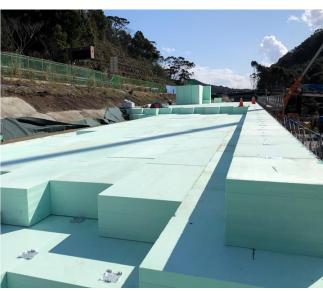


### **ENVIRONMENTAL PRODUCT DECLARATION**

IN ACCORDANCE WITH ISO 21930 & ISO 14025

STYRODIA®BLOCK DX JSP Corporation

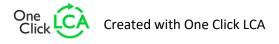




### EPD HUB, HUB-3612

Published on 08.07.2025, last updated on 08.07.2025, valid until 07.07.2030

Life Cycle Assessment study has been performed in accordance with the requirements of EN 15804, EPD Hub PCR version 1.1 (5 Dec 2023) and JRC characterization factors EF 3.1.









## 一般情報 - GENERAL INFORMATION

### メーカー - MANUFACTURER

メーカー名 Manufacturer	JSP Corporation
住所 Address	Shin Nisseki Building, 3-4-2 Marunouchi,Chiyoda-ku, Tokyo Japan
問い合わせ先 Contact details	jsp-MF-EPD@co-jsp.co.jp
ウェブサイト Website	https://www.co-jsp.co.jp

# EPD 規格、スコープ、認証機関 - EPD STANDARDS, SCOPE AND VERIFICATION

プログラムオペ レータ Program operator	EPD Hub, hub@epdhub.com
参照規格 Reference standard	ISO 21930:2017 and ISO 14025
PCR PCR	EPD Hub Core PCR Version 1.1 (5 Dec 2023)
製品カテゴリ Sector	Construction product
EPD カテゴリ Category of EPD	Third party verified EPD
EPD のスコープ Scope of the EPD	Cradle to gate
EPD 申請者 EPD author	Itaru Tomori
EPD 検証 EPD verification	Independent verification of this EPD and data, according to ISO 14025:  ☐ Internal verification ☑ External verification

EPD	検証	
EPD v	erifier	

Haiha Nguyen, as an authorized verifier acting for EPD Hub Limited

This EPD is intended for business-to-business and/or business-to-consumer communication. The manufacturer has the sole ownership, liability, and responsibility for the EPD. EPDs within the same product category but from different programs may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804 and if they are not compared in a building context.





### 製品 - PRODUCT

表面 PRODUCT	
製品名 Product name	STYRODIA®BLOCK DX
追加ラベル Additional labels	-
参照製品 Product reference	DX
原材料の原産地 Place(s) of raw material origin	Japan
製造地 Place of production	Hokkaido Plant, Kanuma Miraform Plant, Kansai Plant
設置場所および使用場所 Place(s) of installation and use	Japan
データ取得年 Period for data	2023/04~2024/3
EPD 平均化 Averaging in EPD	Multiple factories
A1-A3 の GWP-fossil 変動率 Variation in GWP-fossil for A1-A3 (%)	0.8~4.9
A1-A3 特定データ(%) A1-A3 Specific data (%)	18,1

### 環境影響データ概要 - ENVIRONMENTAL DATA SUMMARY

- N- 20 W E / 2 W E - C - C - C - C - C - C - C - C - C -	
宣言単位	1 m3
Declared unit	
宣言単位あたりの質量	26,52 kg
Declared unit mass	
GWP-fossil, A1-A3 (kgCO2e)	1,31E+02
GWP-fossil, A1-A3 (kgCO2e)	
GWP-total, A1-A3 (kgCO2e)	1,32E+02
GWP-total, A1-A3 (kgCO2e)	
副資材の投入(%)	13,9
Secondary material, inputs (%)	
副資材のアウトプット(%)	0
Secondary material, outputs (%)	
エネルギー使用量計, A1-A3 (kWh)	412
Total anargy use A1 A2 (k)M/h)	
Total energy use, A1-A3 (kWh) 水使用量計、A1-A3 (m3)	1,53
Net fresh water use, A1-A3 (m3)	1,00







## 製品とメーカー-product and MANUFACTURER

### メーカーの概要 - ABOUT THE MANUFACTURER

As a foamed resin manufacturer, JSP provides products such as packaging materials, protective materials, building components, as well as various related services to a wide range of fields, including food packaging containers, IT and electronic equipment, automobile parts, and civil engineering and construction. Starting from polystyrene paper business in 1962, JSP was the first in the world to develop and commercialize its unique EPS products such as non-cross-linked foamed polyethylene sheets and expanded polypropylene beads, etc. With the strength of its technology and products, JSP is currently expanding its business globally to North America, South America, Europe, China, Korea and Southeast Asia. In addition, we are contributing to the reduction of environmental loads and CO<sub>2</sub> emissions through the lightweight, resource-saving, thermal insulation, shock-absorbing, and sound insulation/absorption of our foam resin products. We have acquired ISO 14001 certification as part of global environment conservation.

We will be committed to achieving symbiosis between our business and the natural environment by implementing energy-saving measures, enhancing resource recovery, and developing and improving recycling technologies.

### 製品説明 - PRODUCT DESCRIPTION

We offer two types of EPS blocks for civil engineering: in-mold and extruded. Our STYRODIA®BLOCK DX is an extruded type. It is a lightweight fill material for civil engineering method, which was developed in Norway and introduced to Japan in 1986.

The expanded polystyrene is well known for shock-absorbing and thermal insulating properties, but it also has excellent lightweight, self-supporting, and compression-resistant properties. It is utilized as lightweight fill blocks

to form roads on soft ground, landslides, and narrow land. It minimizes the impact of the embankment on the existing ground, making it effective in protecting the natural environment.

Furthermore, the extrusion foaming method used to manufacture STYRODIA®BLOCK DX has superior compression resistance compared to the in-mold foaming method. Since polystyrene and foaming agent are mixed at the factory, transportation between factories is reduced, resulting in a high performance product with a low environmental impact.

Further information can be found at:

https://www.co-jsp.co.jp

#### 主な原材料構成 - PRODUCT RAW MATERIAL MAIN COMPOSITION

原材料カテゴリ Raw material category	量、質量 - % Amount, mass- %	原材料源 Material origin
金属 Metals	0	-
<mark>鉱物</mark> Minerals	0,1	Domestic
化石原料 Fossil materials	99,9	Domestic
バイオマス原料 Bio-based materials	0	-

### 生物起源 CO2 含有量 - BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

製品の生物起源 CO2 含有量、kg C Biogenic carbon content in product, kg C	-
梱包の生物起源 CO2 含有量、kg C Biogenic carbon content in packaging, kg C	-



Created with One Click LCA

STYRODIA®BLOCK DX





### 機能単位と耐用年数 - FUNCTIONAL UNIT AND SERVICE LIFE

宣言単位 Declared unit	1 m3
宣言単位あたりの質量 Mass per declared unit	26,52 kg
機能単位 Functional unit	-
参照耐用年数 Reference service life	-

### 化学物質、REACH 高懸念物質 - SUBSTANCES, REACH - VERY HIGH CONCERN

The product does not contain any REACH SVHC substances in amounts greater than 0,1 % (1000 ppm).





## 製品のライフサイクル - PRODUCT LIFE-CYCLE

### システム境界 - SYSTEM BOUNDARY

This EPD covers the life-cycle modules listed in the following table.

,																					
Pro	duct s	tage		embl age		Use stage I						End of life stage			Beyond the system boundaries		1				
<b>A1</b>	A2	А3	A4	A5	B1	B1 B2 B3 B4 B5 B6 B7 C1 C2 C3 C4									D						
x	x	x	MN D	MN D	MN D	MN D	MN D	MN D	MN D	MN D	MN D	MN D	MN D	MN D	MN D	MNE	MND				
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational	Operational water use	Deconstr./demol.	Transport	Waste processing	Disposal	Reuse	Recovery	Recycling			

Modules not declared = MND, Modules not relevant = MNR.

### 製造と梱包 - MANUFACTURING AND PACKAGING (A1-A3)

The environmental impacts considered for the product stage cover the manufacturing of raw materials used in the production as well as packaging materials and other ancillary materials. Also, fuels used by machines, and handling of waste formed in the production processes at the manufacturing facilities are included in this stage. The study also considers the material losses occurring during the manufacturing processes as well as losses during electricity transmission.

A market-based approach is used in modelling the electricity mix utilized in the factory.

This product is made by laminating extruded polystyrene foam boards (base boards) into a block shape. The polystyrene foam is composed of polystyrene mixed with mineral additives, flame retardants, and foaming agents. These materials are foamed and extruded into board shapes.

Raw materials are transported to the Kanuma Miraform Plant and the

Kansai Plant. At these plants, base boards are manufactured and then laminated to produce the final product.

The Hokkaido Plant does not manufacture base boards. Instead, it produces the final product using base boards manufactured at the Kanuma Miraform Plant.

Electricity is required for each facility in the manufacturing process. No packaging or other materials are used in the final product.

### 輸送と据付 - TRANSPORT AND INSTALLATION (A4-A5)

Transportation impacts occurred from final products delivery to construction site (A4) cover fuel direct exhaust emissions, environmental impacts of fuel production, as well as related infrastructure emissions.

This EPD excludes the transport and installation stages. It is not common in Japan to include A4-A5 in declaration as well as we do not have data for calculations. These stages are excluded because their impacts are assumed to be very small, and their inclusion is not mandated by the standards.

### 製品使用とメンテナンス - PRODUCT USE AND MAINTENANCE (B1-B7)

This EPD excludes the use stage.

Air, soil, and water impacts during the use phase have not been studied.

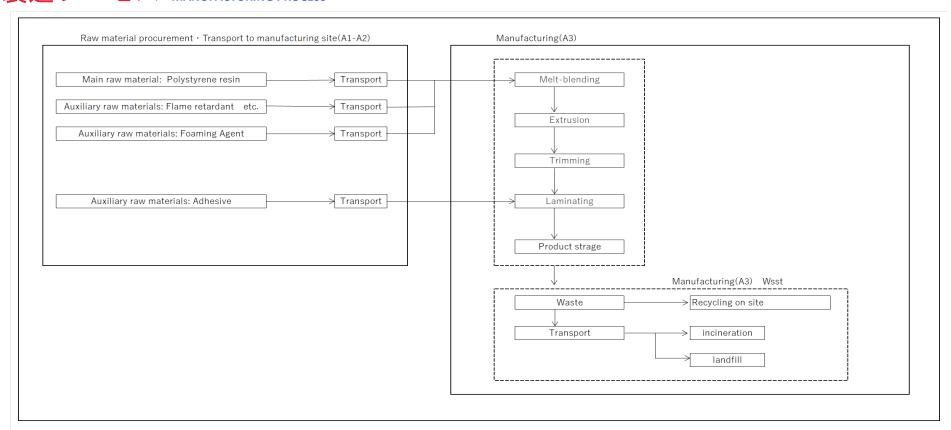
### 製品の廃棄・リサイクル段階 - PRODUCT END OF LIFE (C1-C4, D)

This EPD excludes the end of life stage. This is the cradle to gate EPD in accordance with requirements defined in ISO 21930:2017.





# 製造プロセス - MANUFACTURING PROCESS







### ライフサイクルアセスメント-LIFE-CYCLE

#### **ASSESSMENT**

#### カットオフ基準 - CUT-OFF CRITERIA

The study does not exclude any modules or processes which are stated mandatory in the reference standard and the applied PCR. The study does not exclude any hazardous materials or substances. The study includes all major raw material and energy consumption. All inputs and outputs of the unit processes, for which data is available for, are included in the calculation. There is no neglected unit process more than 1% of total mass or energy flows. The module specific total neglected input and output flows also do not exceed 5% of energy usage or mass.

The production of capital equipment, construction activities, and infrastructure, maintenance and operation of capital equipment, personnel-related activities, energy and water use related to company management and sales activities are excluded.

This LCA study includes all raw material, transportation, energy and waste in the product. All processes from raw material procurement and pre-processing to production are included. Activities related to the production of capital goods, infrastructure, transportation of products to storage at the manufacturing site, production of manufacturing equipment, and personnel were excluded from this calculation.

### データの検証 - VALIDATION OF DATA

Data collection for production, transport, and packaging was conducted using time and site-specific information, as defined in the general information section on page 1 and 2. Upstream process calculations rely on generic data as defined in the Bibliography section. Manufacturer-provided specific and generic data were used for the product's manufacturing stage. The analysis was performed in One Click LCA EPD Generator, with the 'Cut-Off, EN 15804+A2' allocation method, and

characterization factors according to EN 15804:2012+A2:2019/AC:2021 and JRC EF 3.1.

#### 配分、推定 - ALLOCATION, ESTIMATES AND ASSUMPTIONS

Allocation is required if some material, energy, and waste data cannot be measured separately for the product under investigation. All allocations are done as per the reference standards and the applied PCR. In this study, allocation has been done in the following ways:

データタイプ - Data type	配分 - Allocation
原材料 - Raw materials	No allocation
梱包材 - Packaging materials	No allocation
補助材料 - Ancillary materials	No allocation
製造エネルギーと廃棄物 - Manufacturing energy and waste	Allocated by mass or volume

# 製品と製造拠点のグループ化 - PRODUCT & MANUFACTURING SITES GROUPING

グループ化の種類 - Type of grouping	Multiple factories
グループ化方法 - Grouping method	Based on a representative product
A1-A3 における GWP-fossil の 変動率 - Variation in GWP-fossil for A1-A3 (%)	0.8~4.9

Base boards are produced at the Kanuma and Kansai Plants. The final products are then manufactured at these two plants and the Hokkaido

8





Plant. Since the raw materials and production processes are the same at all plants, the Kansai plant, which has the largest share by production volume, is used as the representative case in this EPD. The difference in environmental impact between the three plants is that the GWP-fossil A1-A3 per m3 is less than 10%.

### LCA ソフトウェアと参考文献 - LCA SOFTWARE AND BIBLIOGRAPHY

This EPD has been created using One Click LCA EPD Generator. The LCA and EPD have been prepared according to the reference standards and ISO 14040/14044. Ecoinvent v3.10.1 and One Click LCA databases were used as sources of environmental data. Allocation used in Ecoinvent 3.10.1 environmental data sources follow the methodology 'allocation, Cut-off, EN 15804+A2'.







# 環境影響データ - ENVIRONMENTAL IMPACT DATA

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.

#### 主な環境影響指標 - CORE ENVIRONMENTAL IMPACT INDICATORS - EN 15804+A2, EF 3.1

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	В3	B4	B5	B6	B7	C1	C2	С3	C4	D
GWP – total <sup>1)</sup>	kg CO₂e	1,08E+02	1,15E+00	2,28E+01	1,32E+02	MND													
GWP – fossil	kg CO₂e	1,07E+02	1,15E+00	2,28E+01	1,31E+02	MND													
GWP – biogenic	kg CO₂e	5,33E-01	5,63E-04	2,90E-03	5,36E-01	MND													
GWP – LULUC	kg CO₂e	1,27E-02	8,62E-04	2,33E-03	1,59E-02	MND													
Ozone depletion pot.	kg CFC <sub>-11</sub> e	5,89E-07	1,60E-08	4,12E-07	1,02E-06	MND													
Acidification potential	mol H⁺e	4,40E-01	3,06E-03	1,08E-01	5,51E-01	MND													
EP-freshwater <sup>2)</sup>	kg Pe	2,07E-02	1,41E-04	4,56E-03	2,54E-02	MND													
EP-marine	kg Ne	7,74E-02	7,14E-04	1,84E-02	9,66E-02	MND													
EP-terrestrial	mol Ne	8,16E-01	7,63E-03	1,95E-01	1,02E+00	MND													
POCP ("smog") <sup>3)</sup>	kg NMVOCe	3,34E-01	3,76E-03	6,15E-02	3,99E-01	MND													
ADP-minerals & metals <sup>4)</sup>	kg Sbe	1,66E-04	3,83E-06	2,48E-05	1,95E-04	MND													
ADP-fossil resources	MJ	2,35E+03	1,59E+01	2,90E+02	2,65E+03	MND													
Water use <sup>5)</sup>	m³e depr.	9,28E+01	1,13E-01	2,66E+00	9,56E+01	MND													

1) GWP = Global Warming Potential; 2) EP = Eutrophication potential. Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO4e; 3) POCP = Photochemical ozone formation; 4) ADP = Abiotic depletion potential; 5) EN 15804+A2 disclaimer for Abiotic depletion and Water use and optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.





### 追加(オプション)の環境影響指標 - ADDITIONAL (OPTIONAL) ENVIRONMENTAL IMPACT INDICATORS - EN 15804+A2, EF 3.1

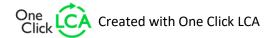
Impact category	Unit	A1	A2	А3	A1-A3	A4	A5	B1	B2	В3	B4	B5	B6	В7	C1	C2	С3	C4	D
Particulate matter	Incidence	4,76E-06	7,61E-08	2,63E-07	5,10E-06	MND													
Ionizing radiation <sup>6)</sup>	kBq U235e	8,23E-01	3,01E-02	1,66E+00	2,51E+00	MND													
Ecotoxicity (freshwater)	CTUe	3,00E+02	2,79E+00	3,45E+01	3,38E+02	MND													
Human toxicity, cancer	CTUh	2,24E-08	2,12E-10	3,91E-09	2,65E-08	MND													
Human tox. non- cancer	CTUh	2,34E-07	9,69E-09	1,08E-07	3,52E-07	MND													
SQP <sup>7)</sup>	-	5,40E+01	9,14E+00	7,52E+01	1,38E+02	MND													

<sup>6)</sup> EN 15804+A2 disclaimer for Ionizing radiation, human health. 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; 7) SQP = Land use related impacts/soil quality.

### 天然資源の利用 - USE OF NATURAL RESOURCES

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	В3	B4	B5	B6	B7	C1	C2	С3	C4	D
Renew. PER as energy <sup>8)</sup>	MJ	2,17E+01	4,73E-01	2,98E+01	5,19E+01	MND													
Renew. PER as material	МЈ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND													
Total use of renew. PER	МЈ	2,17E+01	4,73E-01	2,98E+01	5,19E+01	MND													
Non-re. PER as energy	МЈ	1,13E+03	1,59E+01	2,89E+02	1,43E+03	MND													
Non-re. PER as material	МЈ	1,22E+03	0,00E+00	1,14E+00	1,22E+03	MND													
Total use of non-re. PER	MJ	2,35E+03	1,59E+01	2,90E+02	2,65E+03	MND													
Secondary materials	kg	3,69E+00	9,71E-03	3,75E-02	3,73E+00	MND													
Renew. secondary fuels	MJ	1,06E-02	8,63E-05	1,25E-04	1,08E-02	MND													
Non-ren. secondary fuels	МЈ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND													
Use of net fresh water	m³	1,37E+00	3,09E-03	1,55E-01	1,53E+00	MND													

<sup>8)</sup> PER = Primary energy resources.







### 廃棄・リサイクル段階 — 廃棄 - END OF LIFE - WASTE

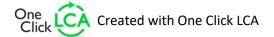
Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	В3	B4	B5	В6	B7	C1	C2	С3	C4	D
Hazardous waste	kg	2,09E+00	3,87E-02	1,24E+00	3,37E+00	MND													
Non-hazardous waste	kg	3,73E+01	8,03E-01	2,52E+01	6,32E+01	MND													
Radioactive waste	kg	2,09E-04	7,32E-06	3,60E-04	5,76E-04	MND													

### 廃棄・リサイクル段階 — 出力フロー - END OF LIFE - OUTPUT FLOWS

Impact category	Unit	A1	A2	А3	A1-A3	A4	A5	B1	B2	В3	B4	B5	В6	В7	C1	C2	С3	C4	D
Components for re-use	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND													
Materials for recycling	kg	0,00E+00	0,00E+00	9,44E+00	9,44E+00	MND													
Materials for energy rec	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND													
Exported energy	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND													
Exported energy – Electricity	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND													
Exported energy – Heat	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND													

### 環境影響 - ENVIRONMENTAL IMPACTS - EN 15804+A1, CML / ISO 21930

Impact category	Unit	A1	A2	А3	A1-A3	A4	A5	B1	B2	В3	B4	B5	B6	B7	C1	C2	C3	C4	D
Global Warming Pot.	kg CO₂e	1,07E+02	1,14E+00	2,27E+01	1,30E+02	MND													
Ozone depletion Pot.	kg CFC-11e	5,14E-07	1,28E-08	3,36E-07	8,64E-07	MND													
Acidification	kg SO₂e	3,68E-01	2,47E-03	9,09E-02	4,62E-01	MND													
Eutrophication	kg PO₄³e	7,62E-01	5,26E-04	8,61E-03	7,71E-01	MND													
POCP ("smog")	kg C <sub>2</sub> H <sub>4</sub> e	3,02E-02	2,19E-04	4,96E-03	3,53E-02	MND													
ADP-elements	kg Sbe	8,08E-03	3,73E-06	2,18E-05	8,11E-03	MND													
ADP-fossil	MJ	2,26E+03	1,54E+01	2,67E+02	2,54E+03	MND													







### 検証報告 - THIRD-PARTY VERIFICATION STATEMENT

#### **VERIFICATION PROCESS FOR THIS EPD**

This EPD has been verified in accordance with ISO 14025 by an independent, third-party verifier by reviewing results, documents and compliancy with reference standard, ISO 14025 and ISO 14040/14044, following the process and checklists of the program operator for:

- This Environmental Product Declaration
- The Life-Cycle Assessment used in this EPD
- The digital background data for this EPD

Why does verification transparency matter? Read more online

This EPD has been generated by One Click LCA EPD generator, which has been verified and approved by the EPD Hub.

#### THIRD-PARTY VERIFICATION STATEMENT

I hereby confirm that, following detailed examination, I have not established any relevant deviations by the studied Environmental Product Declaration (EPD), its LCA and project report, in terms of the data collected and used in the LCA calculations, the way the LCA-based calculations have been carried out, the presentation of environmental data in the EPD, and other additional environmental information, as present with respect to the procedural and methodological requirements in ISO 14025:2010 and reference standard.

I confirm that the company-specific data has been examined as regards plausibility and consistency; the declaration owner is responsible for its factual integrity and legal compliance.

I confirm that I have sufficient knowledge and experience of construction products, this specific product category, the construction industry, relevant standards, and the geographical area of the EPD to carry out this verification.

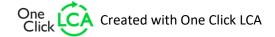
I confirm my independence in my role as verifier; I have not been involved in the execution of the LCA or in the development of the declaration and have no conflicts of interest regarding this verification.

HaiHa Nguyen, as an authorized verifier acting for EPD Hub Limited

08.07.2025











# 付属文書-ANNEX

Below is a list of STYRODIA®BLOCK DX by product number and their corresponding mass.

Using the "A1-A3 GWP CML/ISO21930" value, the carbon emissions attributed to each product has been determined below.

	Product	Product	A1-A3 GWP
Product	Thickness	Weight	CML/ISO21930
	(mm)	(kg/m3)	(kgCO2e/m3)
DX-24H	500	26.10	128.41
DX-29	500	29.60	145.63
DX-35	500	35.57	175.00
DX-45	500	45.00	221.40