



Environmental Product Declaration

NOVUM STRUCTURES TÜRKİYE

Steel Profiles and Accessories



In accordance with
ISO 14025 and EN
15804 + A2:2019

PROGRAMME

The International EPD[®] System
www.environdec.com
EPD registered through the fully aligned regional
programme:
EPD Türkiye
www.epdturkey.org

PROGRAMME OPERATOR

EPD International AB
Box 210 60
SE-100 31 Stockholm, Sweden

EPD REGISTRATION NUMBER

S-P-01260

OWNER OF THE EPD

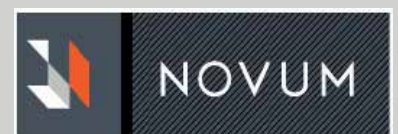
Novum Structures Yapı A.Ş.

PUBLICATION DATE

2023-11-06

VALIDITY DATE

2028-11-05



Programme Information

The International EPD® System EPD International AB Box 210 60 SE-100 31 Stockholm, Sweden

EPD Türkiye www.epdturkey.org info@epdturkey.org managed and run by SÜRATAM www.suratam.org Nef 09 B Blok No:7/15 34415 Kagithane/Istanbul, Türkiye
ISO standard ISO 21930 and CEN standard EN 15804 serves as the core Product Category Rules (PCR).

Product Category Rules (PCR):

2019:14 Version 1.2.5, 2024-12-20, Construction Products and CPC 375 Construction Services, EN 15804:2012+A2:2019/AC:2021 Sustainability of Construction Works

PCR review was conducted by: The Technical Committee of the International EPD® System. Review chair: Claudia A. Peña, University of Concepción, Chile. The review panel may be contacted via the Secretariat www.environdec.com/contact.

The EPD owner has the sole ownership, liability, and responsibility for the EPD. EPDs within the same product category but registered in different EPD programmes may not be comparable. For two EPDs to be comparable, they must be based on the same PCR (including the same 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 equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterisation factors); have equivalent content declarations; and be valid at the time of comparison.

Third-party verification

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

EPD verification by individual verifier

Third party verifier: Prof. Ing. Vladimír Kočí, Ph.D., MBA, LCA Studio Šárecká 5,16000 Prague 6 - Czech Republic

Approved by: The International EPD® System

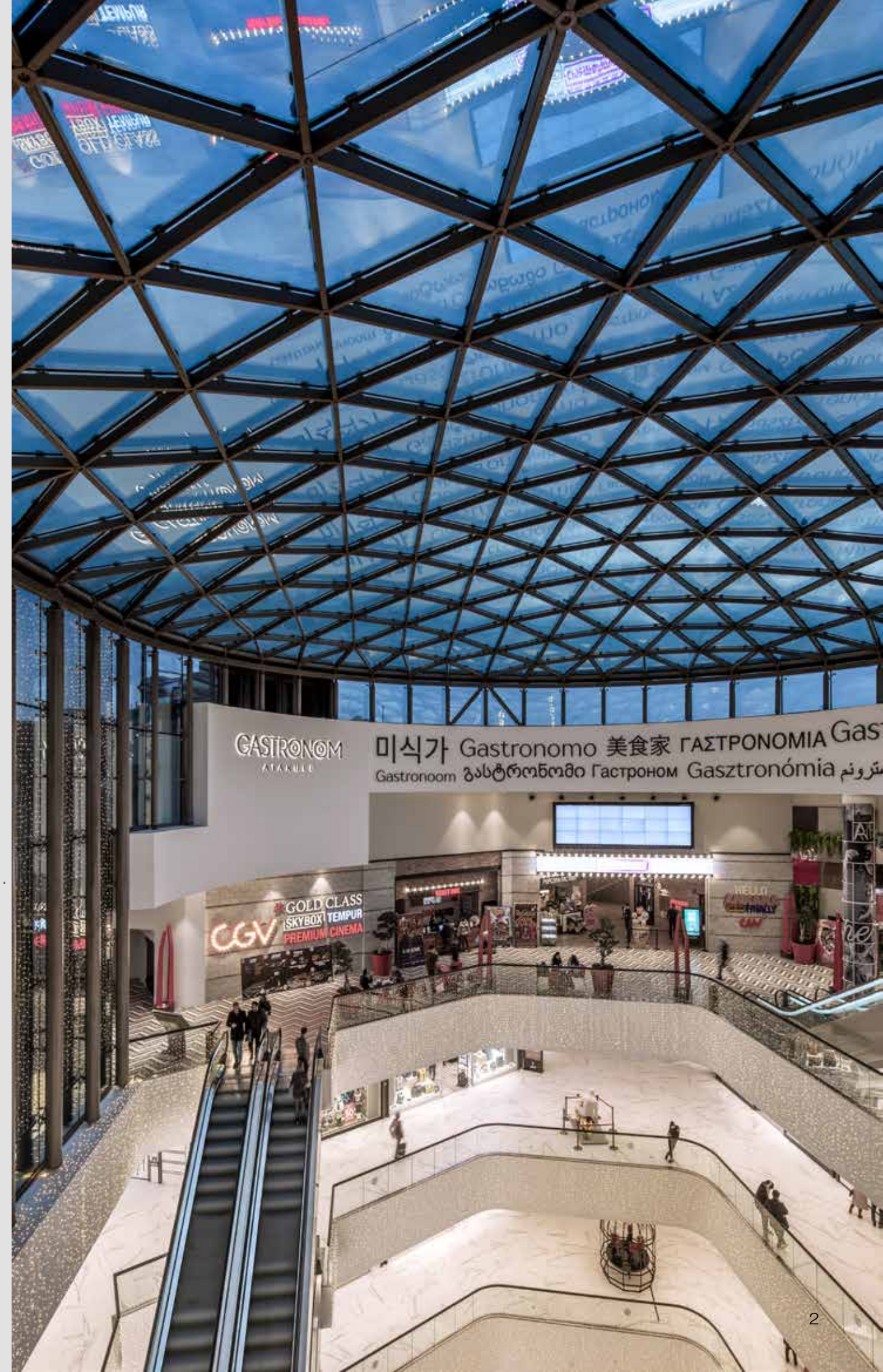
Procedure for follow-up of data during EPD validity involves third party verifier:

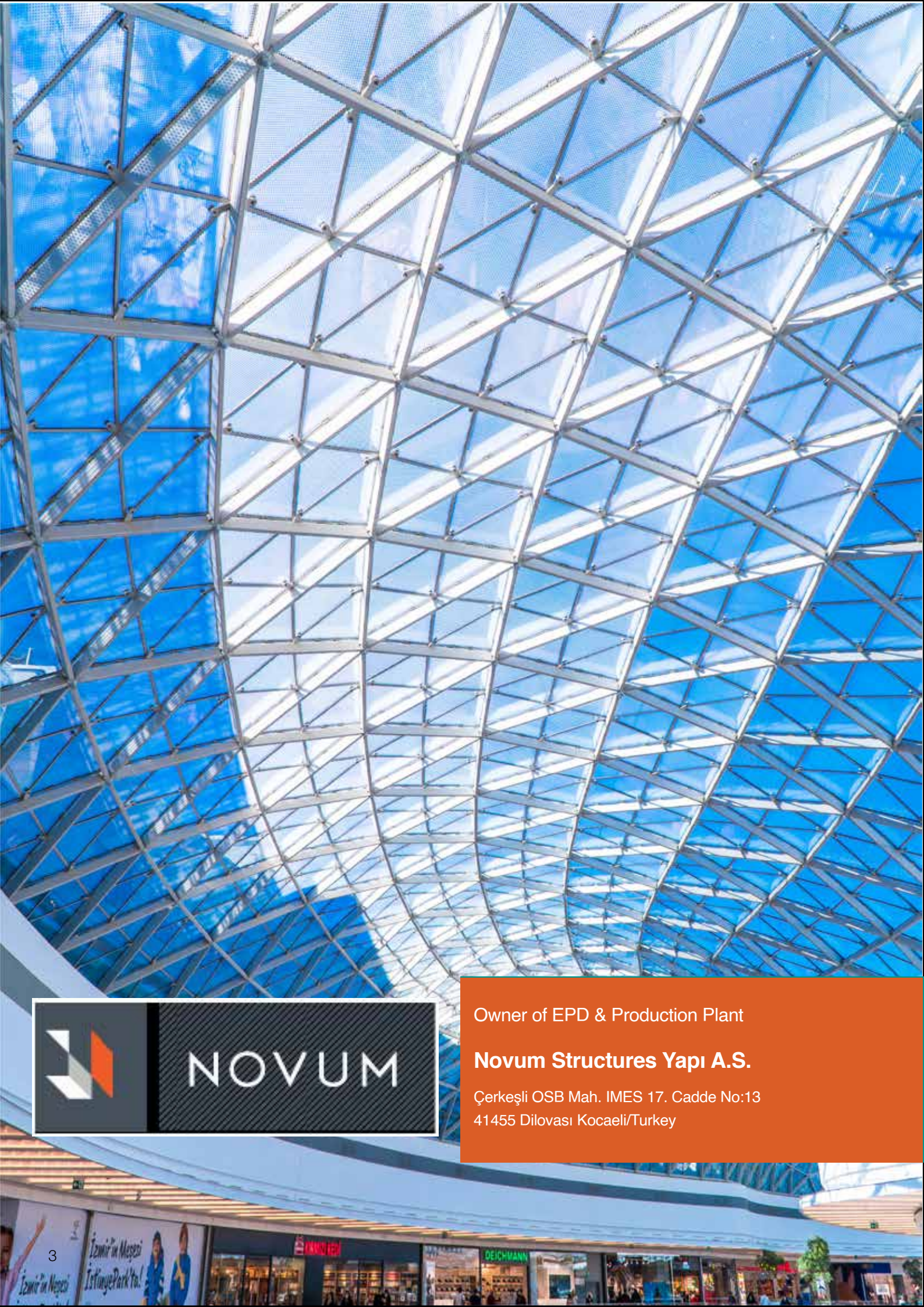
Yes No ☒

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Life Cycle Assessment (LCA)

LCA Practitioner: Metsims Sustainability Consulting





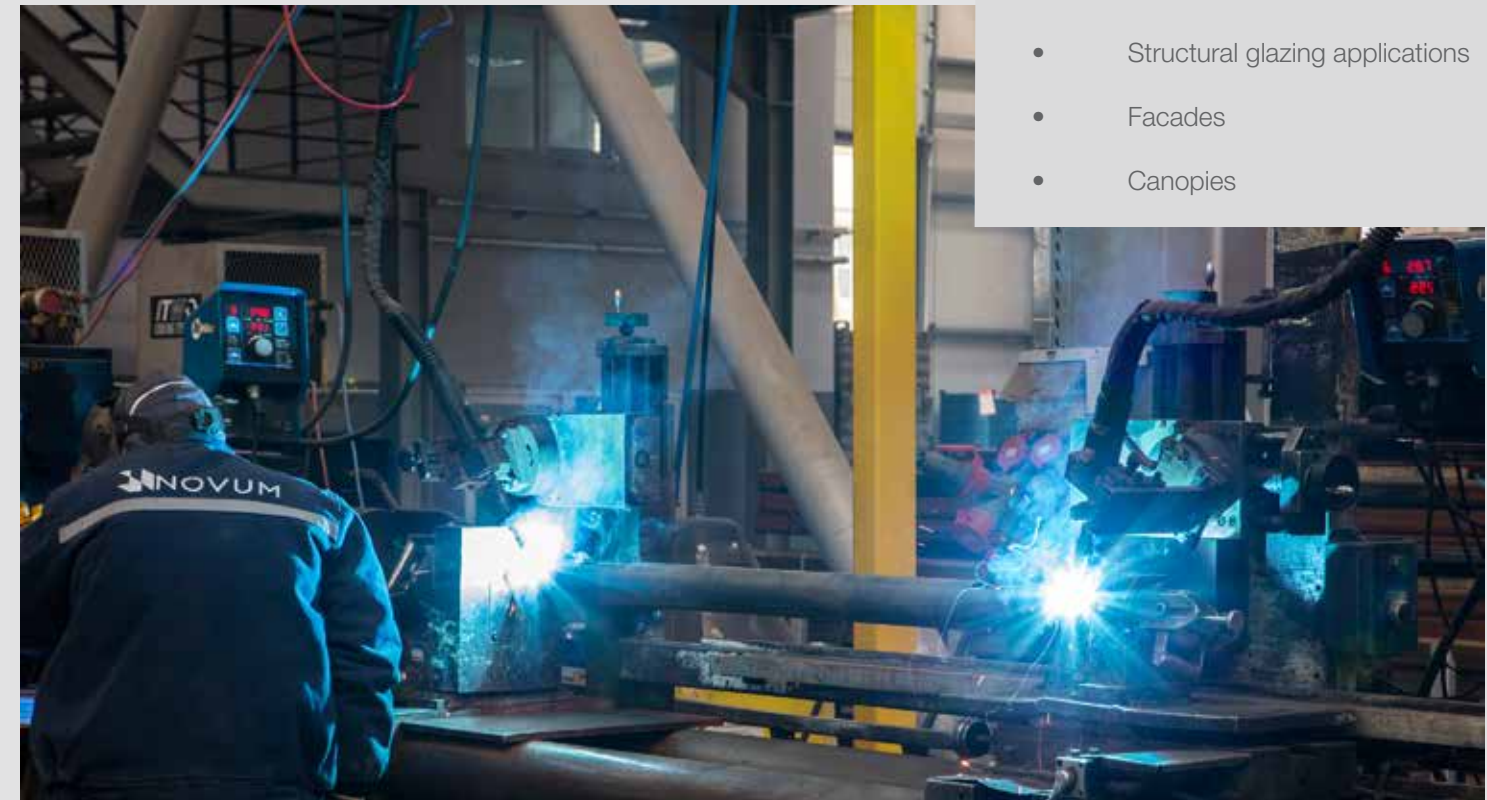
Owner of EPD & Production Plant

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Typical System Applications

- Freeform structures
- Space frame structures
- Roof and atrium structures
- Cable structures
- Structural glazing applications
- Facades
- Canopies



DESCRIPTION of the ORGANIZATION

Novum Structures Türkiye is one of two strategically located workshops, specialising in high precision architectural steel fabrication. Delivering complex fabrications and weldments, serving European, Middle East and North America with precision nodal systems and steel work.

Certified to International and European standards, EN 1090-1, ISO 3834-2, CWB and DNV Welding Workshop. This range of certification allows the facility to serve sectors from construction through to the marine sector.

As part of the single source international specialty contractor group. We provide engineering, fabrication, supply and build most of the projects we execute.

The result of that work was a life-cycle inventory data set for the specialist structural systems range for the AES, BK, FF and KK systems along with the finish of galvanising with data submitted according to ISO 14040/14044. In addition, Novum Structures Türkiye has ISO 9001, ISO 14001 and ISO 45001 certificates. The average energy, resource consumption and emission of substances to the environment, resulting from a LCI of a representative sample of the plant's operation, have been calculated according to the defined system boundaries.

PRODUCT INFORMATION



CPC CODE: 42190

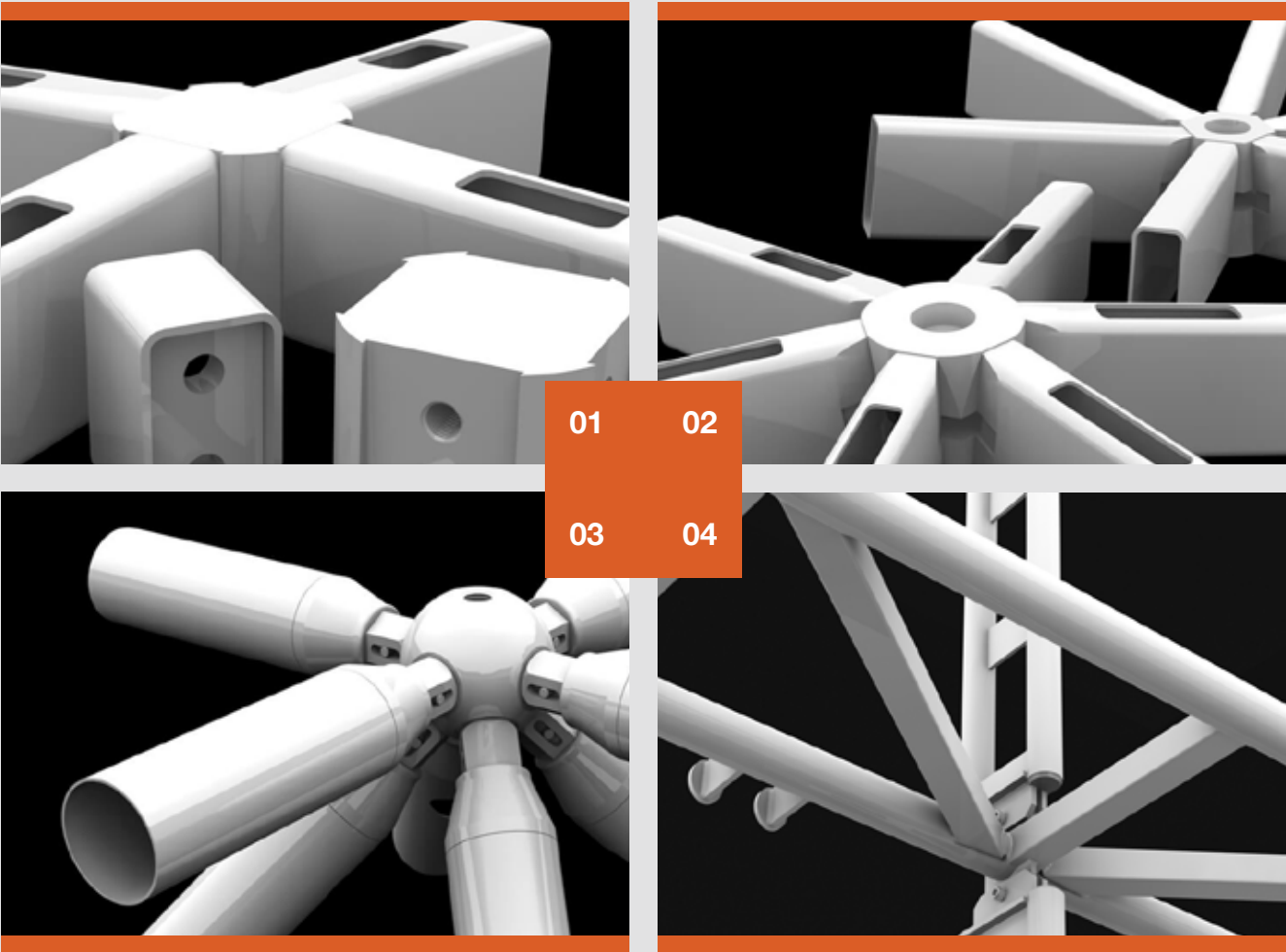
G E O G R A P H I C A L
S C O P E : G L O B A L

Novum Structures specialize in atriums, canopies, facades, stadiums, large roofs, skylights, integrated overhead and vertical glazing, retail signage, walkways, pedestrian bridges and those applications which require architectural feature elements involving quality engineered solutions. Planar, warped, curved, double curved and freeform surfaces are all readily accomplished. Our solutions have featured on commercial, medical, hospitality, condo, retail, sports, museum, institutional, transportation and government facilities. Due to our flexible international capabilities and associated controlled overheads, we are able to execute projects of all shapes and sizes efficiently and in a wide geography.

No substances included in the Candidate List of Substances of Very High Concern for authorisation under the REACH Regulations are present in the steel profiles and accessories manufactured by Novum, either above the threshold for registration with the European Chemicals Agency or above 0.1% (wt/wt).

Steel products and accessories

Novum’s distinctive lightweight structural products were developed to inventively solve demanding architectural challenges. The products share the basic principal of being mechanically fastened on site, achieving a tolerance required for direct cladding and often avoiding the need for a secondary structure. Featuring hidden fasteners, each system product has standard components yet is developed to be custom in application enhancing the range of forms, aesthetics, strengths and costs.



- 01. Block Knoten (block node) (BK-System)
- 02. Free Form (FF-System)
- 03. Kugel Knoten (spherical node) (KK-System)
- 04. Architecturally Exposed Steelwork (AES-System)

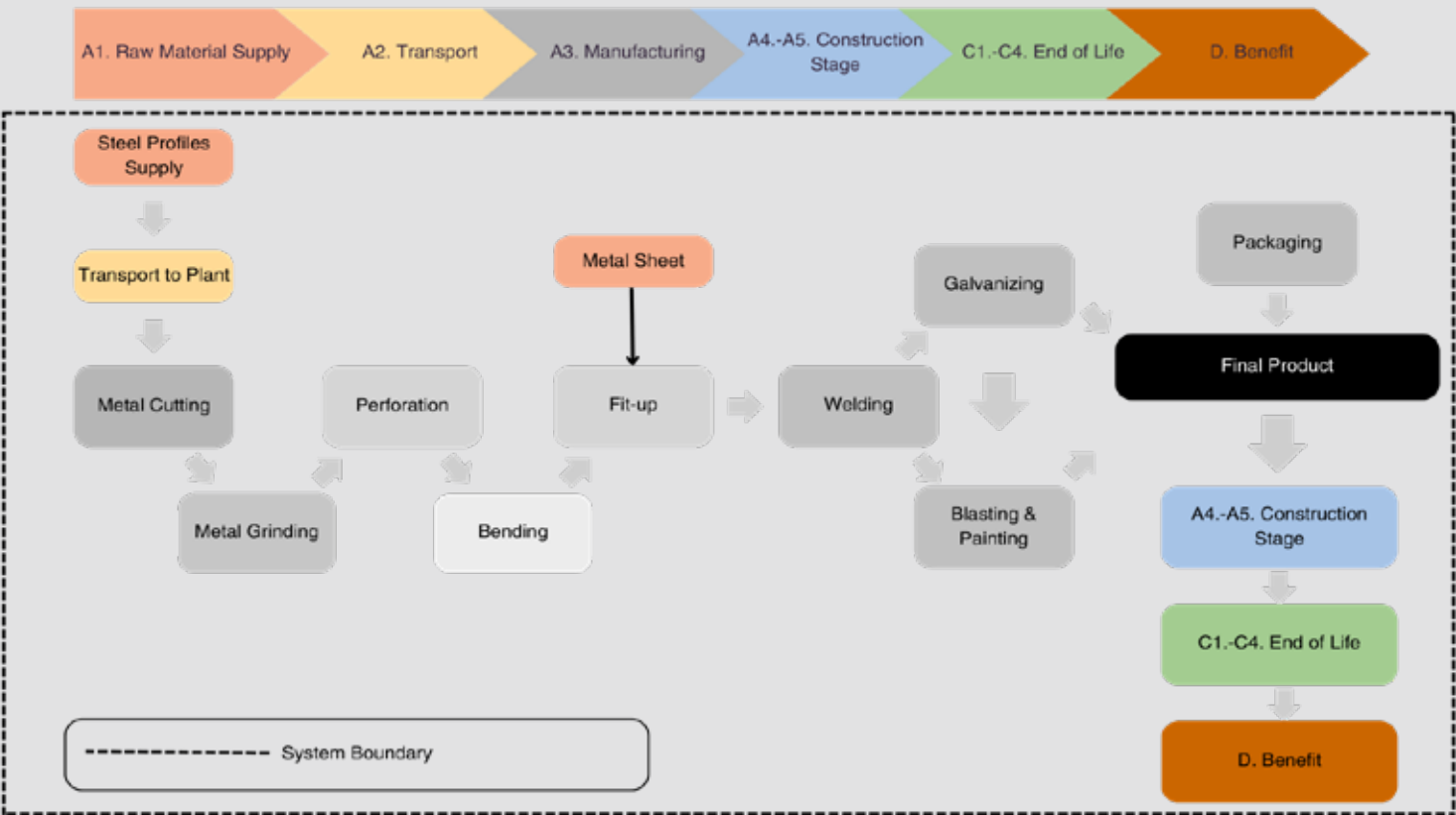
Novum Structural Systems fall into three categories:

Architecturally Exposed Steel work: AES Systems are innovatively sculpted to each project, providing elegant mechanically framed solutions.

Nodal Space frames: BK+FF+KK Systems. Semi rigid nodal space frame systems (BK and FF) are comprised of solid or split nodes and bending capable members suitable for planar to free form surfaces and direct cladding.

All nodal components are designed to be interchangeable, creating an industry leading suite of products for building single and multilayer structures of any size and form.

SYSTEM BOUNDARY



Manufacturing starts with the selection steel profiles required for the project. Profiles are cut into the right sizes and their end points are prepared for welding. Pre-prepared connection points are then welded into the end of the profiles to make a single unit. This unit is then galvanized and/or painted depending on the project requirement. The final product is then packaged and dispatched for assembly in the construction site.

A1. Raw Material Supply	Production starts with locally sourced raw materials. ‘Raw material supply’ includes raw material extraction and pre-treatment processes before production. S355 grade steel and epoxy paint are used for profiles.
A2. Raw Material Transport	Raw material transport is relevant for delivery of raw materials to the plant and the transport of materials within the plant.
A3. Manufacturing	For manufacturing, electric energy is consumed. Natural gas is only using for heating of manufacturing area. Manufacturing includes sizing and painting of profiles parts and assembly. The end products are then packaged to be sold.
A4. Product Transport	Product transport is relevant for delivery of product to the construction site.
A5. Installation	It is assumed that a building machine works for approximately 3 hours to installation of 1 ton steel profile.
C1. Deconstruction	It is assumed that a building machine works for approximately 40 minutes to deconstruction of 1 ton steel profile.
C2. Waste Transport	This step includes the transport of materials after they reach their end-of-life. The average distance was assumed 50 km by truck from demolition site.
C3. Waste Processing	It is assumed that no waste processing is needed after the product reaches its end-of-life.
C4. Disposal	Based on the figures of Word Steel Association (WSA), the recycling rate of steel is around 95%. Based on this, 95% of the steel is assumed to be recycled.
D. Benefits	Approximately 70% of the steel profile product consists of primary steel. Therefore, pig iron benefit of 70% of the product weight is accepted.

LCA INFORMATION

FUNCTIONAL UNIT	1 tonne of steel profiles and accessories
REFERENCE SERVICE LIFE (RSL)	RSL is not relevant for this EPD.
TIME REPRESENTATIVENESS	2022
LCA MODELLING, CALCULATION AND DATA QUALITY	The results of the LCA with the indicators as per EPD requirements are given in the LCA result tables. All energy calculations were obtained using Cumulative Energy Demand (LHV) methodology, while freshwater use is calculated with selected inventory flows in SimaPro according to the PCR. There are no co-product allocations within the LCA study underlying this EPD. The regional energy datasets were used for all energy calculations. The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks.
SYSTEM BOUNDARY	Cradle to grave. The results of the LCA with the indicators as per EPD requirement are given in the following tables for product manufacture (A1, A2, A3), construction process stage (A4, A5), end of life stage (C1, C2, C3, C4) and benefits and load stage (D).
CUT-OFF RULES	1% cut-off is applied.
ALLOCATIONS	There are no co-products in the production of steel profiles and accessories manufactured by Novum Structures. Hence, there was no need for co-product allocation.
DATABASE AND LCA SOFTWARE	Ecoinvent 3.9.1 and SimaPro 9.5
REACH REGULATION	No substances included in the Candidate List of Substances of Very High Concern for authorization under the REACH regulations are present in this product either above the threshold for registration with the European Chemicals Agency or above 0.1% (wt/wt).

EPDs within the same product category but from different programmes may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804+A2 Norm.

The EPD certificate, its background data and the results will be used for business-to-business communications and is expected to be a reliable document for green building designers, architectures, manufacturers of construction products and the other stakeholders in the construction sector to understand the potential environmental impacts caused by Novum Structures Steel Profiles and Accessories.

LCA INFORMATION

	Product Stage			Construction Process Stage		Use Stage							End of LifeStage				Benefits and Loads
	Raw Material Supply	Transport	Manufacturing	Transport	Construction Installationnuring	Use	Maintenance	Repair	Replacement	Returbishment	Operational Energy Use	Operational Water Use	De-construction demolition	Transport	Waste processing	Disposal	Reuse - Recovery - Recycling-potential
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	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X
Geography	GLO	GLO	TR	GLO	GLO	-	-	-	-	-	-	-	GLO	GLO	GLO	GLO	GLO
Specific Data Used	>90%					-	-	-	-	-	-	-	-	-	-	-	-
Variation Products	0%					-	-	-	-	-	-	-	-	-	-	-	-
Variation Sites	0%					-	-	-	-	-	-	-	-	-	-	-	-

(X = Module included, ND = Not declared)

The system boundaries in tabular form for all modules are shown in the table above. The results of the LCA with the indicators as per EPD requirement are given in the following tables for product stage (A1 - A3), construction process (A4. A5), use stage (B1 - B7). and end of life (C1 - C4). Life Cycle Inventory Analysis indicators describing the use of resources are determined respectively to the following impact categories. calculated using CML-IA Baseline (Ver. 3.5) method: Global Warming Potential (GWP) for time span of 100 years, Ozone Layer Depletion Potential (ODP) with time span of infinity, Formation Potential of Tropospheric Ozone Photochemical Oxidants (POCP) with time span of 5 days, Acidification Potential (AP) with time span of eternity. Eutrophication Potential (EP) with time span of eternity, Photochemical Oxidation (POCP) and Abiotic Depletion Potential for Fossil (ADPF) and Non-fossil (ADPE) resources. All energy calculations were done using Cumulative Energy Demand (LHV) methodology. The freshwater use value for manufacturing life cycle was taken from the manufacturer as the net freshwater consumption occurs during the manufacturing stage only.

LCA RESULTS

Environmental Impact Category Indicators According to EN 15804 for Novum Structures Steel Profiles and Accessories

IMPACT CATEGORY	UNIT	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP - Fossil	kg CO ₂ eq	2,047	242	230	51.2	12.2	0	0.591	-1,102
GWP - Biogenic	kg CO ₂ eq	2.29	0.071	0.032	0.007	0.004	0	0.002	3.63
GWP - Luluc	kg CO ₂ eq	1.53	0.139	0.026	0.006	0.006	0	430.1E-6	-0.285
GWP - Total	kg CO ₂ eq	2,051	242	230	51.2	12.2	0	0.593	-1,099
ODP	kg CFC-11 eq	44.4E-6	4.9E-6	3.7E-6	814.5E-9	176.3E-9	0	14.0E-9	-26.6E-6
AP	mol H+ eq	8.59	2.66	2.14	0.475	0.042	0	0.004	-4.16
EP - Freshwater	kg P eq	0.994	0.015	0.007	0.002	977.9E-6	0	154.9E-6	-0.443
EP - Marine	kg N eq	1.90	0.673	0.990	0.220	0.013	0	0.002	-1.01
EP - Terrestrial	mol N eq	20.0	7.36	10.8	2.39	0.143	0	0.017	-10.7
POCP	kg NMVOC	9.51	2.35	3.19	0.708	0.055	0	0.006	-5.93
ADPE	kg Sb eq	0.015	538.9E-6	80.4E-6	17.9E-6	38.1E-6	0	1.2E-6	-614.1E-6
ADPF	MJ	23,679	3,452	3,018	671	168	0	12.8	-11,681
WDP	m³ depriv.	783	14.2	6.50	1.45	0.703	0	0.542	-57.4
PM	disease inc.	154.8E-6	18.7E-6	59.5E-6	13.2E-6	843.9E-9	0	90.6E-9	-77.5E-6
IR	kBq U-235 eq	146	3.63	1.43	0.318	0.145	0	0.017	-14.6
ETP - FW	CTUe	10,188	1,672	1,442	320	96.1	0	5.61	-3,209
HTTP - C	CTUh	19.3E-6	106.7E-9	70.6E-9	15.7E-9	5.0E-9	0	330.0E-12	-6.0E-6
HTTP - NC	CTUh	24.3E-6	2.1E-6	490.6E-9	109.0E-9	115.1E-9	0	3.7E-9	-4.3E-6
SQP	Pt	6,838	2,635	203	45.2	86.5	0	29.2	-2,337
Acronyms	GWPtotal: Climate change, GWP-fossil: Climate change- fossil, GWP-biogenic: Climate change - biogenic, GWP-luluc: Climate change - land use and transformation, ODP: Ozone layer depletion, AP: Acidification terrestrial and freshwater, EP-freshwater: Eutrophication freshwater, EP-marine: Eutrophication marine, EP-terrestrial: Eutrophication terrestrial, POCP: Photochemical oxidation, ADPE: Abiotic depletion - elements, ADPF: Abiotic depletion - fossil resources, WDP: Water scarcity, PM: Respiratory inorganics - particulate matter, IR: Ionising radiation, ETP-FW: Ecotoxicity freshwater, HTTP-c: Cancer human health effects, HTTP-nc: Non-cancer human health effects, SQP: Land use related impacts, soil quality.								
Legend	A1: Raw Material Supply, A2: Transport, A3: Manufacturing, A4: Transport, A5: Installation, C1: Deconstruction / Demolition, C2: Transport, C3: Waste Processing, C4: Disposal, D: Benefits and Loads Beyond the System Boundary								
Disclaimer 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.								
Disclaimer 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.								

Additional Mandatory and Voluntary Impact Category Indicators for Novum Structures Steel Profiles and Accessories

Climate impact									
INDICATOR	UNIT	A1-A3	A4	A5	C1	C2	C3	C4	D
*GHG-GWP	kg CO ₂ eq	2,055	243	231	51.3	12.2	0	0.595	-1,105

GHG-GWP = Global Warming Potential total excl. biogenic carbon following IPCC AR5 methodology
* 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. This indicator is thus equal to the GWP indicator originally defined in EN 15804:2012+A1:2013
A1: Raw Material Supply, A2: Transport, A3: Manufacturing, A4: Transport, A5: Construction, C1: Deconstruction / demolition, C2: Transport, C3: Waste Processing, C4: Disposal, D: Benefits and Loads Beyond the System Boundary

Resource Use Indicators for Novum Structures Steel Profiles and Accessories

Resource use									
IMPACT CATEGORY	UNIT	A1-A3	A4	A5	C1	C2	C3	C4	D
PERE	MJ	2,431	43.5	17.2	3.82	2.26	0	0.220	-238
PERM	MJ	0	0	0	0	0	0	0	0
PERT	MJ	2,431	43.5	17.2	3.82	2.26	0	0.220	-238
PENRE	MJ	23,678	3,452	3,018	671	168	0	12.8	-11,681
PENRM	MJ	0	0	0	0	0	0	0	0
PENRT	MJ	23,678	3,452	3,018	671	168	0	12.8	-11,681
SM	kg	300	0	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0
FW	m³	8.23	0.584	0.254	0.056	0.028	0	0.014	-3.83
Acronyms	PERE: Use of renewable primary energy excluding resources used as raw materials, PERM: Use of renewable primary energy resources used as raw materials, PERT: Total use of renewable primary energy, PENRE: Use of non-renewable primary energy excluding 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, SM: Secondary material, RSF: Renewable secondary fuels, NRSF: Non-renewable secondary fuels, FW: Net use of fresh water.								

Output Flow Indicators for Novum Structures Steel Profiles and Accessories

Waste & Output Flows									
IMPACT CATEGORY	UNIT	A1-A3	A4	A5	C1	C2	C3	C4	D
HWD	kg	0.005	0	0	0	0	0	0	0
NHWD	kg	0.002	0	0.04	0	0	950	50	0
RWD	kg	0	0	0	0	0	0	0	0
CRU	kg	0	0	0	0	0	0	0	0
MFR	kg	0	0	0	0	0	0	950	0
MER	kg	0	0	0	0	0	0	0	0
EE (Electrical)	MJ	0	0	0	0	0	0	0	0
EE (Thermal)	MJ	0	0	0	0	0	0	0	0
Acronyms	HWD: Hazardous waste disposed, NHWD: Non-hazardous waste disposed, RWD: Radioactive waste disposed, CRU: Components for reuse, MFR: Material for recycling, MER: Materials for energy recovery, EE (Electrical): Exported energy electrical, EE (Thermal): Exported energy, Thermal.								

Biogenic Content of Novum Structures Steel Profiles and Accessories

Information on biogenic carbon content according to EN 15804+A2		
Biogenic Carbon Content	Unit	Quantity
Biogenic carbon content in product	kg C	2.26
Biogenic carbon content in packaging	kg C	0.03



REFERENCES

/ISO 9001:2015/ Quality Management Systems

/ISO 50001:2018/ Energy Management Systems

/GPI/ General Programme Instructions of the International EPD® System. Version 4.0.

/ISO 14020:2000/ Environmental Labels and Declarations — General principles

/EN 15804:2012+A2:2019/ Sustainability of construction works - Environmental Product Declarations — Core rules for the product category of construction products

/ISO 14025/ DIN EN ISO 14025:2009-11: Environmental labels and declarations - Type III environmental declarations — Principles and procedures

/ISO 14040/44/ DIN EN ISO 14040:2006-10: Environmental management - Life cycle assessment - Principles and framework

(ISO14040:2006) and Requirements and guidelines (ISO 14044:2006)

PCR for Construction Products and Construction Services/ Prepared by IVL Swedish Environmental Research Institute, Swedish Environmental Protection Agency, SP Trä, Swedish Wood Preservation Institute, Swedisol, SCDA, Svenskt Limträ AB, SSAB,

The International EPD System, 2019:14 Version 1.2.5

/The International EPD® System/ The International EPD® System is a programme for type III environmental declarations, maintaining a system to verify and register EPD@s as well as keeping a library of EPD@s and PCRs in accordance with ISO 14025. www.environdec.com

/Ecoinvent / Ecoinvent Centre, www.ecoinvent.org

/SimaPro/ SimaPro LCA Software, Pré Consultants, the Netherlands, www.pre-sustainability.com

/Metsims/ www.metsims.com

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