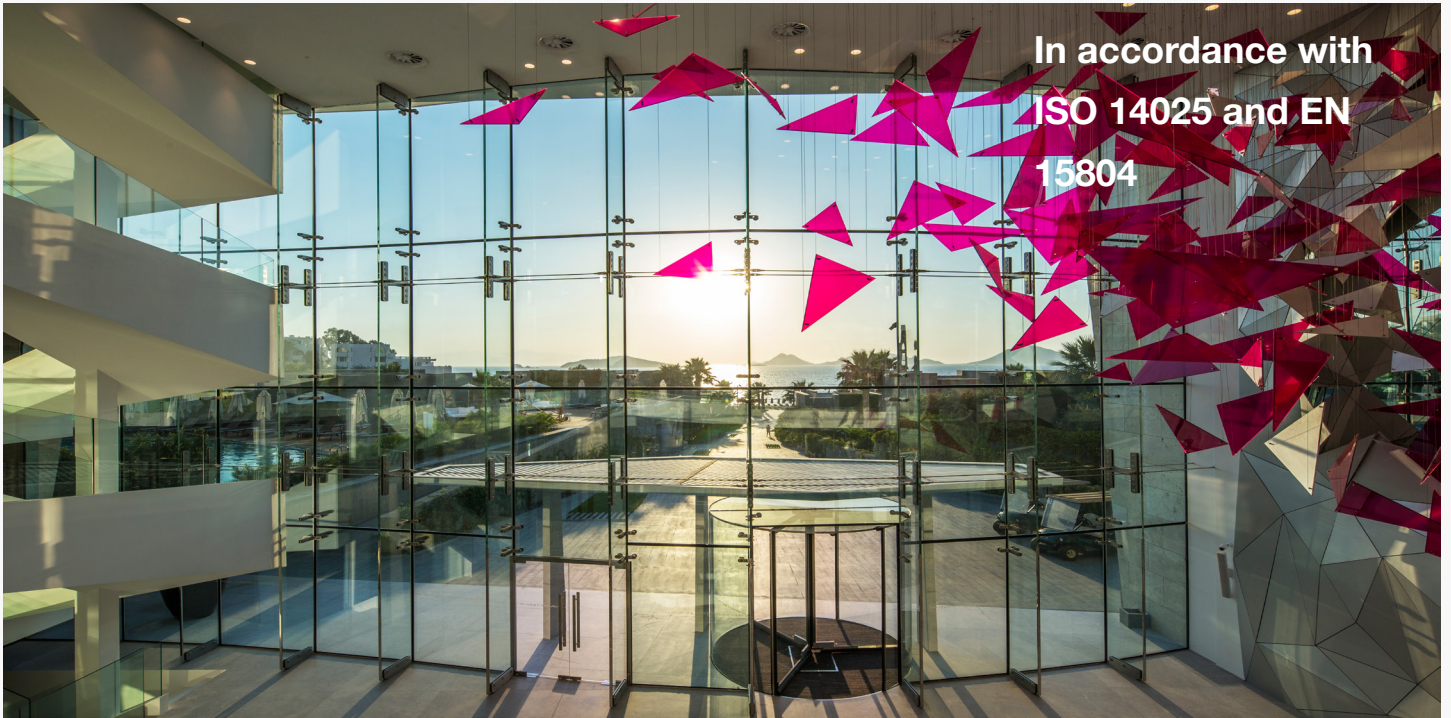


Environmental Product Declaration

NOVUM STRUCTURES

Steel Profiles and Accessories



PROGRAMME

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



PROGRAMME OPERATOR

EPD International AB
Box 210 60
SE-100 31 Stockholm, Sweden
EPD Turkey
SÜRATAM-Turkish Centre for Sustainable Production Research & Design
Nef 09 B Blok No:7/15, 34415
Kağıthane / İstanbul, Turkey
www.suratam.org



EPD REGISTRATION NUMBER

S-P-01260

OWNER OF THE EPD

Novum Structures Yapı A.Ş.



PUBLICATION DATE

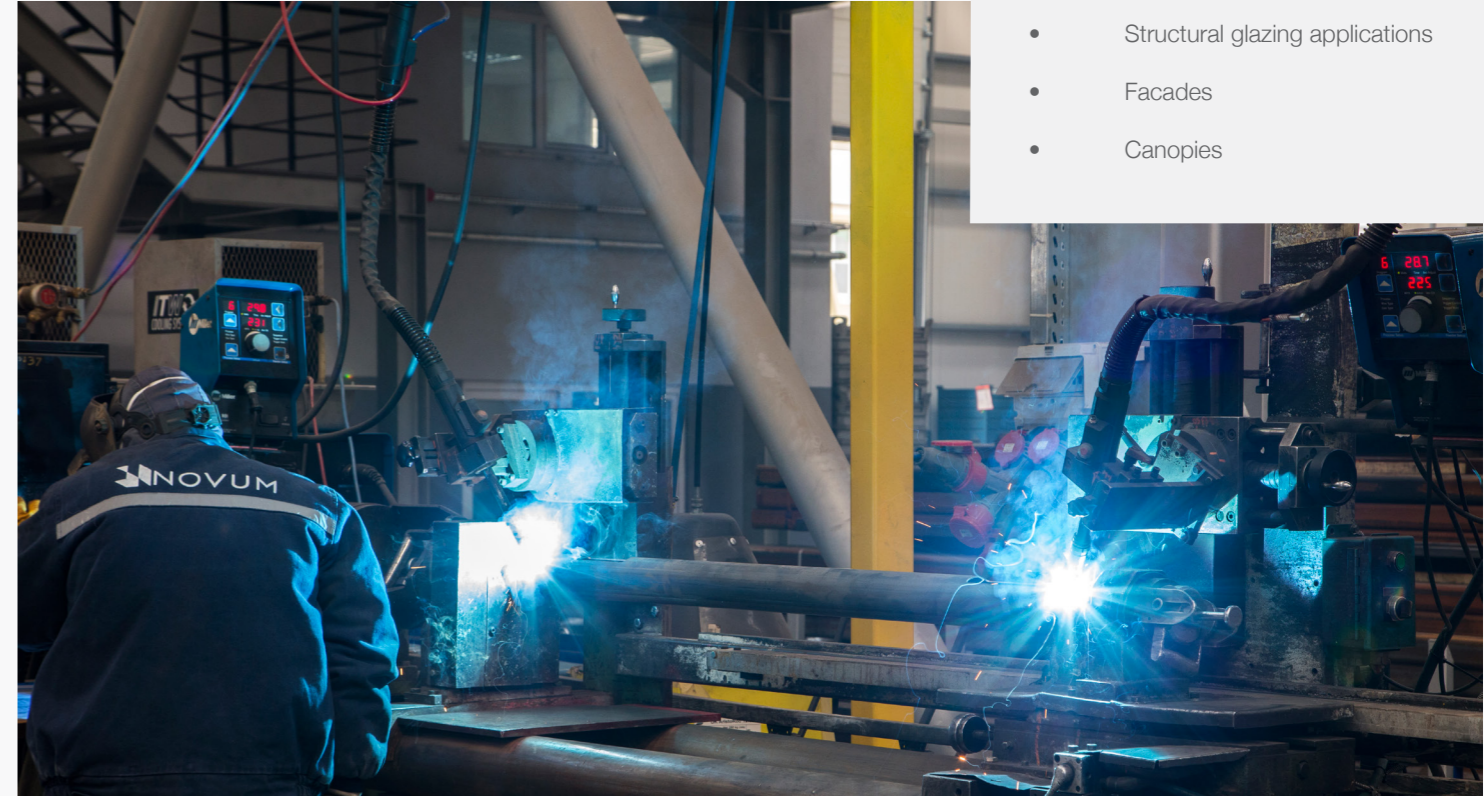
18.09.2018

VALIDITY DATE

31.08.2023

Typical System Applications

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



DESCRIPTION of the ORGANIZATION

Novum Turkey is one of three 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 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. 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.

Owner of EPD & Production Plant

Novum Structures Yapı A.S

Çerkeşli OSB Mah. IMES 17. Cadde No:13
41455 Dilovası Kocaeli/Turkey



PRODUCT INFORMATION



CPC CODE:42190

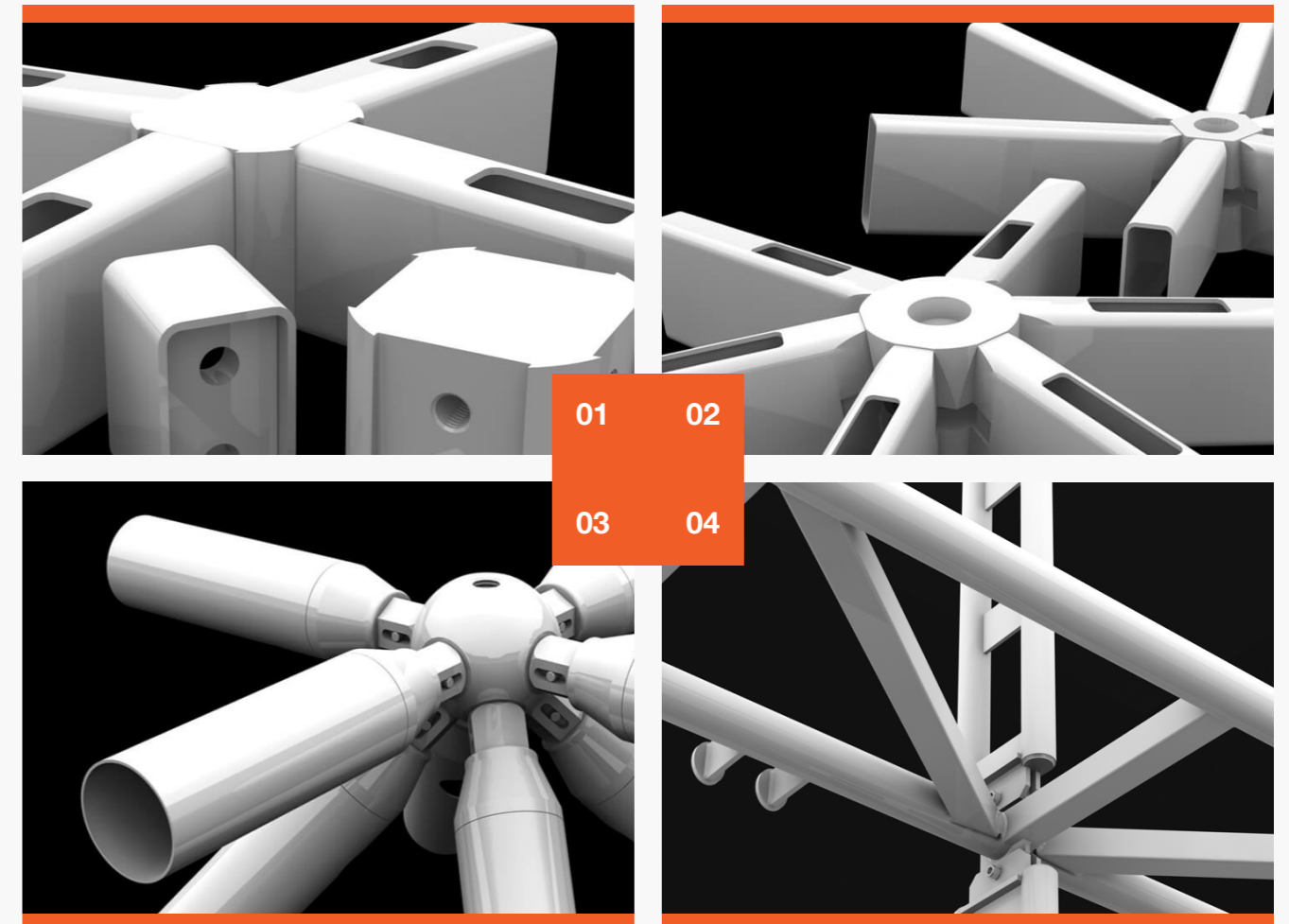
GEOGRAPHICAL
SCOPE: GLOBAL

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 principle 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.

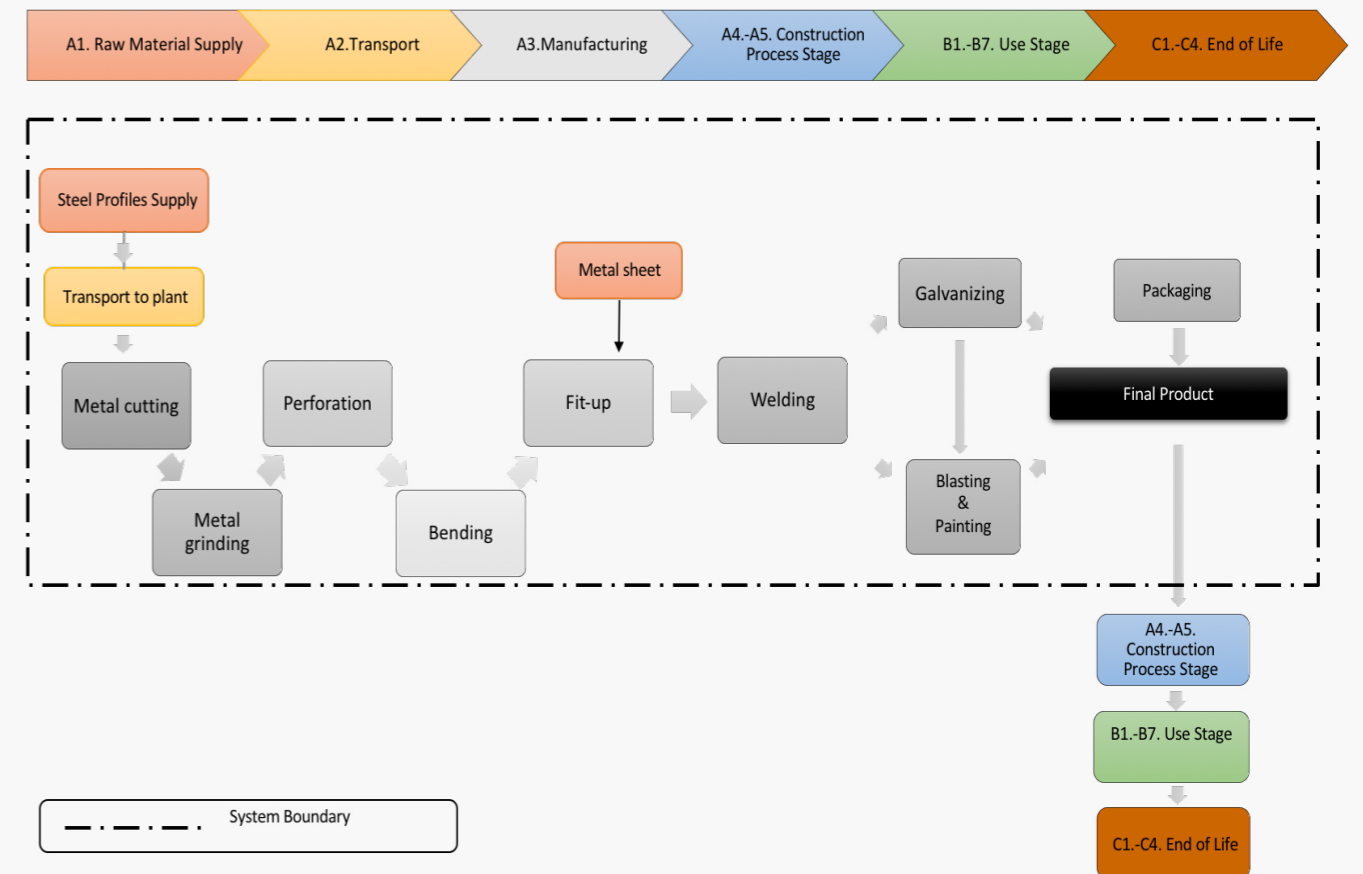
LCA INFORMATION

FUNCTIONAL UNIT	1 ton steel profiles and accessories
REFERENCE SERVICE LIFE (RSL)	RSL is not relevant for this EPD.
TIME REPRESENTATIVENESS	2017
DATABASE(S) AND LCA SOFTWARE USED	The inventory for the LCA study is based on the 2017 production figures from Novum Structures's one manufacturing plant located in province of Kocaeli in Turkey. Raw materials, electricity, natural gas, water use and waste generation data were collected from Novum Structures. For local data specific for Turkey, Turkish Life Cycle Inventory Database (TLCID 1.0) 2014 developed by SÜRATAM - Turkish Centre for Sustainable Production Research and Design was used. For any other background data, the latest version of the Ecoinvent database (3.4) was used. The LCA was modelled with SimaPro 8.5.
SYSTEM BOUNDARY	Cradle to gate
EXCLUDED LIFE CYCLE STAGES	The life cycle stages A4,A5, B1-B7 and C1-C4 was excluded from the LCA study.
CUT-OFF RULES	No cut-off criteria was 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.
EPD Based on the Product Category Rules (PCR)	The CEN standard EN 15804 serves as the core PCR The International EPD® System's PCR 2012:01 Construction products and Construction services, Version 2.2, 2017-05-30
DATA QUALITY	Data for raw material usage, energy consumption, water consumption and transport data for products, materials and waste are collected from Novum Structures.
MORE INFORMATION	All energy calculations were obtained using Cumulative Energy Demand v1.10 methodology. Biogenic Carbon Stored in Products, Global Warming Potential(Land-Use and land transformation), Global Warming Potential(Fossil) were calculated with IPCC GWP 100 while other environmental impacts were calculated with the CML-IA baseline v4.2 within SimaPro LCA Software. Water scarcity potential is calculated by AWARE method.

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 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.

SYSTEM BOUNDARIES



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 is used for profiles.
A2. Transport	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.

CONTENT DECLARATION

PRODUCT STAGE			CONSTRUCTION PROCESS		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM
Raw Materials Supply	Transport	Manufacturing	Transport from the gate to the site	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction	Transport	Waste processing	Transport	Reuse-Recycling-Recovery Potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

Description of the system boundary

(X = Included in LCA, MNA= Module Not Declared)

The results of the LCA with the indicators as per EPD requirement are given in the following tables for product product stage (A1 - A3), cradle to gate. The system boundaries in tabular form for all modules are shown in the table above.

LCA RESULTS

ENVIRONMENTAL IMPACTS		
Parameter	Unit	A1-A3
Global warming potential (GWP ₁₀₀)	Fossil	1843
	Biogenic	0.804
	Land Use&Transformation	1.39
	Total	1856
Ozone depletion potential	[kg CFC 11 eq.]	0.103E-03
Acidification of land and water	[kg SO ₂ eq.]	8.10
Eutrophication	[kg PO ₄ ³⁻ eq.]	2.32
Photochemical ozone creation	[kg C ₂ H ₄ eq.]	0.808
Depletion of abiotic resources (elements)	[kg Sb eq.]	0.119
Depletion of abiotic resources (fossil)	[MJ]	18675
Water scarcity potential	m ³ eq.	2205

RESOURCE USE		
Parameter	Unit	A1-A3
Renewable primary energy excluding resources used as raw materials	[MJ]	956
Renewable primary energy excluding resources used as raw materials	[MJ]	124
Renewable primary energy resources	[MJ]	1080
Non-renewable primary energy excluding resources used as raw materials	[MJ]	22.2E+03
Non-renewable primary energy resources used as raw materials	[MJ]	170
Non-renewable primary energy resources	[MJ]	22.4E+03
Secondary material	[MJ]	0
Renewable secondary fuels	[kg]	0
Non-renewable secondary fuels	[MJ]	0
Net fresh water	[m ³]	9.64



OUTPUT FLOWS AND WASTE CATEGORIES

Parameter	Unit	A1-A3
Hazardous waste disposed	[kg]	30.0
Non-hazardous waste disposed	[kg]	0.325
Radioactive waste disposed	[kg]	0
Components for reuse	[kg]	-
Material for recycling	[kg]	30.3
Materials for energy recovery	[kg]	0
Exported energy, electricity	[MJ]	0
Exported energy, thermal	[MJ]	0

PROGRAMME-RELATED INFORMATION

PROGRAMME	<p>The International EPD® System www.environdec.com</p> <p>EPD registered through the fully aligned regional programme:</p> <p>EPD Turkey www.epdturkey.org</p>  
PROGRAMME OPERATOR	<p>EPD International AB Box 210 60 SE-100 31 Stockholm, Sweden</p> <p>EPD Turkey SÜRATAM-Turkish Centre for Sustainable Production Research & Design Nef 09 B Blok No:7/15, 34415 Kağıthane / İstanbul, Turkey www.suratam.org</p>
EPD REGISTRATION NUMBER	S-P-01260
PUBLICATION DATE	18.09.2018
VALID UNTIL	31.08.2023
PRODUCT CATEGORY RULES	PCR 2012:01. Construction Products and Construction Services. v. 2.2.
PCR REVIEW WAS CONDUCTED BY	Martin Erlandsson, IVL Swedish Environmental Research Institute martin.erlandsson@ivl.se
REFERENCE YEAR OF DATA	2017
INDEPENDENT THIRD-PARTY VERIFICATION OF THE DECLARATION AND DATA, ACCORDING TO ISO 14025:2006	<input type="checkbox"/> Internal Certification <input checked="" type="checkbox"/> External <input type="checkbox"/> EPD® Process

REFERENCES

- /ISO 9001:2015/ Quality Management System
- /ISO 10002:2006/ Customer Satisfaction Management System
- /ISO 14001:2015/ Environmental Management System
- /ISO 50001/ Energy Management System
- /ISO 27001/ Information Security Management System
- /OHSAS 18001:2014/ Occupational Health and Safety Management System
- /ISO 14020:2000/ Environmental labels and declarations - General principles
- /EN 1090-1/ Requirements for conformity assessment for structural components
- / ISO 3834-2:2005/ Quality requirements for fusion welding of metallic materials
- /EN 15804/ EN 15804:2012+A1:2013/ 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 (ISO 14040:2006) 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, 2012:01 Version 2.2, Date 2017-05-30.
- /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.Eco-invent.org
- /TLCID/ Turkish Life Cycle Inventory Database, SÜRATAM -Turkish Centre for Sustainable Production Research & Design, www.suratam.org
- /SimaPro/ SimaPro LCA Package, Pré Consultants, the Netherlands, www.pre-sustainability.com

VERIFICATION & REGISTRATION

PROGRAMME

The International EPD® System

www.environdec.com

EPD registered through the fully aligned regional programme:

EPD Turkey

www.epdturkey.org



THE INTERNATIONAL EPD® SYSTEM



ENVIRONMENTAL PRODUCT DECLARATIONS

PROGRAMME OPERATOR

EPD International AB

Box 210 60
SE-100 31 Stockholm, Sweden

EPD Turkey

SÜRATAM-Turkish Centre for Sustainable Production Research & Design
Nef 09 B Blok No:7/15, 34415 Kağıthane / İstanbul, Turkey
www.suratam.org

THIRD PARTY VERIFIER

LCA studio

Vladimír Kočí, PhD
Šárecká 5, 16000
Prague 6 - Czech Republic
www.lcastudio.cz



OWNER OF THE DECLARATION

Novum Structures Yapı A.S

Çerkeşli OSB Mah. IMES 17. Cadde No:13
41455 Dilovası Kocaeli/Turkey
https://novumstructures.com/

Contact person: Özge Özer
ozge.ozer@novumstructures.com



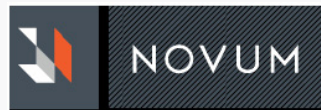
LCA AUTHOR AND EPD GRAPHIC DESIGN

Metsims Sustainability Consulting

Lalegül Sok. No:7/18
34415 4.Levent
Istanbul - Turkey
https://www.metsims.com/tr/

4 Clear Water Place
Oxford OX2 7NL
United Kingdom
https://www.metsims.com/





Novum Structures Yapı A.S

Çerkeşli OSB Mah. IMES 17. Cadde
No:13 PK:41455 Dilovası Kocaeli/Turkey
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