

Environmental Product Declaration Type III ITB No. 211/2021

Issuance date: 26.04.2021
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ABACUS, OMEGA, SIGMA STADIUM SEATS LINE

BASIC INFORMATION

This declaration is the type III Environmental Product Declaration (EPD) based on ISO 14040 and ISO 14025. It contains the information on the impacts of the declared product on the environment. Their aspects were verified by the independent body according to ISO 14025.

ITB is the verified member
of The European Platform for EPD
program operators and LCA practitioner
www.eco-platform.org

Life cycle analysis (LCA):

A1-A3, C2-C4 and D modules in accordance with ISO 14040
(Cradle to Gate with options)

The year of preparing the EPD:
2021

Product standard:
EN 12727

Service Life:
5 years for standard product with possibility of 10 years

PCR:
ITB-PCR A

Declared unit:
1 stadium seat

Reasons for performing LCA:
B2B

Representativeness:
Polish product

Owner of the EPD:

Nowy Styl Sp. z o.o.
Address: Pużaka 49, 38-400 Krosno, Poland
Website: <https://pl.nowystyl.com/pl/>
Contact: info@nowystyl.com
Tel.: +48 13 43 76 100,
+48 13 43 62 732

EPD Program Operator:

Instytut Techniki Budowlanej (ITB)
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01/MANUFACTURER

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OUR COMPANY

We are a European manufacturer of furniture solutions for office and public spaces. Our unique business model allows us to provide clients with a comprehensive interior furnishing service, based on an in-depth analysis of the specificity and needs of the client, work efficiency and work organization, ergonomics and acoustics. Thanks to the company's experience as well as technological and production facilities, each offer is made to measure.

An understanding of customers' needs, innovation and an organisational culture open to change has led us to the position of a company in Europe, with sales revenues of over 380 million euro per year. We have our own international distribution network including local sales structure in 16 countries on all major European markets and the Middle East. Hiring local managers and employees, we reach clients adjusting our offer and providing professional service.

01/MANUFACTURER

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We provide furniture for new office buildings, conference centres, cinemas, stadiums, music, sports and multi-functional facilities every day. Our list of references includes multinational corporations such as DS Smith, Honeywell, Deloitte and ABB, cultural institutions such as Polish National Radio Symphony Orchestra in Katowice and the Opera in Munich, as well as the stadiums in Poland and France where European Football Championships were held in 2012 and 2016. Fans of the Football World Cup in Qatar in six out of seven stadiums now under construction for the event will also sit in our seats.

We offer a wide product portfolio adjusted to the needs and expectations of our clients. Our furniture solutions and our know-how in arranging modern offices are exhibited in the Office Inspiration Centre in Kraków, where we meet with clients, provide training and share inspiration. We also have 31 showrooms i.a. in Warsaw, London, Paris, Düsseldorf, Munich, Prague, Bratislava and Dubai.

We make our products in more than a dozen manufacturing plants equipped with cutting-edge technologies, located in Poland, Germany, France, Switzerland, Ukraine, Russia and Turkey.



This assessment applies to those located in Poland, in the region of Podkarpacie (4 plants) in Jasło and 1 in Rzepedź, with a floor area of nearly 100,000 m², including a fully automated office furniture factory opened in 2014. The company also owns Research and Development Centre located in Jasło where innovative production technologies and product solutions are constantly developed.

02/PRODUCT DESCRIPTION

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STADIUM SEATS ABACUS



THREE MODEL VERSIONS:
Bronze, Silver, Gold

Folding seat, beam mounted,
fixed to the floor or to the riser

SEAT AND BACK:
polypropylene with FR, UV additives

CLAMPS:
PA with glassfiber

BEAM:
extruded aluminum

MOUNTING STRUCTURE:
steel profiles and sheets



OPTIONS:
UPHOLSTERED PADS:
PP shell, PU foams, PVC upholstery

UPHOLSTERED CUSHIONS:
PU foams, PVC upholstery

ARMREST:
PA with glassfiber

Folding table made of HPL,
numbering of seats and rows

CERTIFICATES:
GS Safety Certificate, EN 12727, ergonomics tested

APPLICATION:
stadiums, multipurpose halls, arenas, waiting rooms,
cruise ships



02/PRODUCT DESCRIPTION

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STADIUM SEATS OMEGA



Monoblock seat

Two backrest heights:
Mounted on a console, to the beam
or onto the step

MATERIAL:
polypropylene or polyamide - with FR
and UV additives

FIXING:
steel sheets/rods/profiles

CERTIFICATES:
GS Safety Certificate, EN 12727



APPLICATION:
stadiums, multipurpose halls, arenas,
waiting rooms, cruise ships



02/PRODUCT DESCRIPTION

Environmental Product Declaration Type III ITB No. 211/2021

STADIUM SEATS SIGMA

STANDARD AND VIP MODEL

Folding seat, mounted to the beam or on a console, fixed to the floor or to the riser



SEAT AND BACK:
polypropylene or polyamide - with FR and UV additives

BEAM:
steel

MOUNTING STRUCTURE:
steel profiles and sheets

OPTIONS:

UPHOLSTERED PADS:
PP shell, PU foams, PVC upholstery

UPHOLSTERED CUSHIONS:
PU foams, PVC upholstery

ARMREST:
PP, PA or PUR

Numbering of seats and rows

CERTIFICATES:

GS Safety Certificate, EN 12727

APPLICATION:

stadiums, multipurpose halls, arenas, waiting rooms, cruise ships



GENERAL RULES APPLIED

ALLOCATION

The allocation rules used for this EPD are based on general ITB PCR A. Production of the ABACUS, OMEGA and SIGMA stadium seats is a line process carried out in five factories located in Jasło and Rzepedź (Poland). Allocation was done on product mass basis. All impacts from raw materials extraction and processing were allocated in A1 module of the LCA. All impacts from the line production of Nowy Styl Sp. z o.o. were inventoried and were proportionally allocated to the ABACUS, OMEGA and SIGMA stadium seats production. Utilization of packaging material was taken into consideration. Module A2 includes transport of raw materials from their suppliers to factories of Nowy Styl Sp. z o.o. in Jasło and in Rzepedź. Water and energy consumption as well as associated emissions and generated wastes were allocated to module A3.

SYSTEM LIMITS

The life cycle analysis of the declared products covers "Product Stage", A1-A3, C2, C3, C4 and D modules (Cradle to Gate with options) in accordance with ISO 14040 and ITB PCR A. The details of systems limits are provided in product technical report. Energy and water consumption, emissions to air and water as well as information on generated wastes were inventoried and were included in the calculations. It can be assumed that the total sum of omitted processes does not exceed 5% of all impact categories. Machines and facilities (capital goods) required for the production and transportation of employees were not included in LCA.

A1 AND A2 MODULES: RAW MATERIALS SUPPLY AND TRANSPORT

Wood, polymers and polymer-based components (i.a. PE, PU, PP, PA), aluminium, steel components, cartonboard, additives, ancillary materials and packaging materials (tapes, pallets, foils) come from Polish and foreign suppliers. Means of transport include trucks with load: <10t, 10 – 16t and >16t. For calculation purposes Polish and European fuel averages were applied.

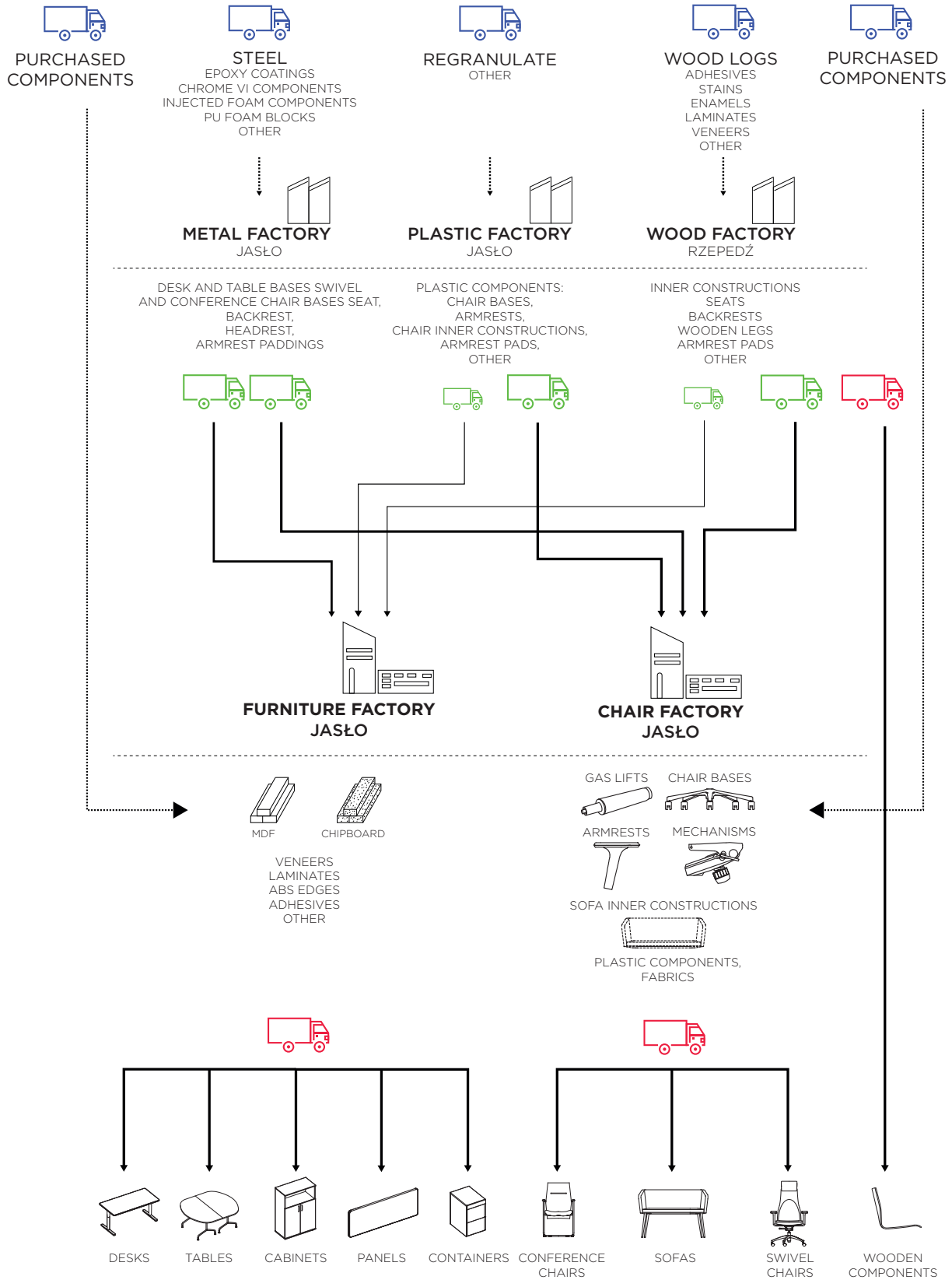
A3 PRODUCTION

As shown in the scheme of manufacturing on page 8 Nowy Styl Sp. z o.o. manufactures products in five factories in Poland. Three of them process purchased materials such as metal, plastic and wood into components. Then, the furniture and chair factories use those components, as well as purchased components to assemble products, which are then ready for distribution. Some of the components made in the wood factory are also sold as finished products.

03/LIFE CYCLE ASSESSMENT (LCA)

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A3 PRODUCTION



LEGEND:



PURCHASED COMPONENTS



PRODUCED COMPONENTS



SOLD PRODUCTS

GENERAL RULES APPLIED

END OF LIFE SCENARIOS

It is assumed that at the end-of-life stage the declared product is dismantled manually or with the use of electrical tools. The transport distance to waste processing plant (C2) is calculated for 75 km on > 16 t loaded lorry with 85% capacity utilization and fuel consumption of 35 L per 100 km. After sorting and cutting/shredding (C3), selectively recovered materials undergo recycling, energy recovery or landfilling according to Polish treatment practice of industrial waste while residual materials are forwarded to landfill in the form of mixed wastes. Environmental burdens declared in module C4 are associated with waste-specific emissions to air, soil and groundwater. Module D includes credits associated with energy recovery and recycling potential.

Table 1 End of life scenario for the declared products

MATERIAL	MATERIAL RECOVERY	ENERGY RECOVERY	RECYCLING	LANDFILLING
POLYMERS	80%	30%	30%	40%
ALUMINIUM	95%	0%	100%	0%
STEEL	95%	0%	100%	0%
WOOD AND WOODEN-BASED COMPONENTS	95%	50%	50%	0%
CARTONBOARD	95%	30%	70%	0%

DATA COLLECTION PERIOD

The data for manufacture of the declared products refer to period between 01.01.2019 - 31.12.2019 (1 year). The life cycle assessments were prepared for Poland as reference area.

DATA QUALITY

The values determined to calculate the LCA originate from verified Nowy Styl Sp. z o.o. inventory data and Ecoinvent v. 3.7.

ASSUMPTIONS AND ESTIMATES

The impacts of the representative ABACUS, OMEGA and SIGMA stadium seats were aggregated using weighted average. Impacts were inventoried and calculated for all products of the ABACUS, OMEGA and SIGMA stadium seat product line.

CALCULATION RULES

LCA was done in accordance with ITB PCR A document.

DATA BASES

The data come from the following databases: Ecoinvent v.3.5, ITB-Database, ÖKOBAUDAT and specific EPDs. Specific data quality analysis was a part of external ISO 14001 audit.

03/LIFE CYCLE ASSESSMENT (LCA)

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RESULTS

DECLARED UNIT

The declaration refers to declared unit (DU) - 1 the ABACUS or OMEGA or SIGMA stadium seats produced by Nowy Styl Sp. z o.o.

Table 2. System boundaries for the environmental characteristic of the ABACUS, OMEGA and SIGMA stadium seats produced by Nowy Styl Sp. z o.o.

PRODUCT STAGE			CONSTRUCTION PROCESS		USE STAGE							END OF LIFE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARY
Raw material supply	Transport	Manufacturing	Transport to construction site	Construction-installation process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction demolition	Transport	Waste processing	Disposal	Reuse-recovery-recycling potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
MD	MD	MD	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MD	MD	MD	MD

Environmental assessment information

(MNA - Module not assessed, MD - Module Declared, INA - Indicator Not Assessed)

03/LIFE CYCLE ASSESSMENT (LCA)

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RESULTS

ABACUS stadium seats					
Environmental impacts: (DU) 1 stadium seat (weight: 8.7 kg*)					
IMPACT CATEGORIES	UNIT	A1	A2	A3	A1-A3
Global warming potential	[kg CO ₂ eq.]	1.88E+01	1.89E-01	3.72E+00	2.28E+01
Ozone layer depletion	[kg CFC 11 eq.]	8.13E-07	0.00E+00	1.02E-09	8.14E-07
Accidification	[kg SO ₂ eq.]	1.03E-01	1.24E-03	9.77E-03	1.14E-01
Formation of tropospheric ozone	[kg Ethene eq.]	8.41E-03	8.02E-05	6.79E-04	9.17E-03
Eutrophication	[kg (PO ₄) ³⁻ eq.]	2.41E-02	2.19E-04	1.20E-03	2.55E-02
Depletion of abiotic resources	[kg Sb eq.]	6.38E-02	0.00E+00	1.38E-05	6.38E-02
Depletion of abiotic resources-fossil fuels	[MJ]	4.59E+02	2.57E+00	3.53E+01	4.97E+02
Environmental impacts: (DU) 1 stadium seat (weight: 8.7 kg*)					
ASPECTS	Unit	A1	A2	A3	A1-A3
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Use of renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw material)	[MJ]	3.36E+01	1.80E-01	4.26E+00	3.81E+01
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Use of non-renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Total use of non renewable primary energy resources (primary energy and primary energy resources used as raw material)	[MJ]	4.61E+02	2.70E+00	3.72E+01	5.01E+02
Use of secondary material	[kg]	1.63E+00	0.00E+00	0.00E+00	1.63E+00
Use of renewable secondary fuels	[MJ]	1.22E-02	1.35E-01	0.00E+00	1.47E-01
Use of non-renewable secondary fuels	[MJ]	7.61E-03	0.00E+00	0.00E+00	7.61E-03
Use of net fresh water	[m ³]	INA	INA	INA	INA
Environmental impacts: (DU) 1 stadium seat (weight: 8.7 kg*)					
WASTES	Unit	A1	A2	A3	A1-A3
Hazardous waste disposed [kg]	[kg]	5.06E-03	6.87E-07	9.88E-03	1.49E-02
Non-hazardous waste disposed [kg]	[kg]	1.72E+00	3.07E-04	4.23E-01	2.14E+00
Radioactive waste disposed [kg]	[kg]	4.01E-04	1.77E-06	0.00E+00	4.02E-04
Components for re-use [kg]	[kg]	6.33E-03	0.00E+00	0.00E+00	6.33E-03
Materials for recycling [kg]	[kg]	3.28E-02	0.00E+00	1.70E+00	1.73E+00
Materials for energy recovery [kg]	[kg]	7.83E-06	0.00E+00	6.27E-01	6.27E-01
Exported energy MJ per energy carrier	[MJ per energy carrier]	INA	INA	INA	INA

*Product weight includes: material, packaging waste and all packaging materials

03/LIFE CYCLE ASSESSMENT (LCA)

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RESULTS

ABACUS stadium seats					
Environmental impacts: (DU) 1 stadium seat (weight: 8.7 kg*)					
IMPACT CATEGORIES	UNIT	C2	C3	C4	D
Global warming potential	[kg CO ₂ eq.]	3.01E-02	1.10E+00	6.97E-01	-7.89E+00
Ozone layer depletion	[kg CFC 11 eq.]	0.00E+00	1.03E-07	8.17E-09	-7.18E-07
Accidification	[kg SO ₂ eq.]	3.60E-04	8.75E-03	1.26E-04	-3.77E-02
Formation of tropospheric ozone	[kg Ethene eq.]	2.63E-05	5.75E-04	1.20E-05	-4.06E-03
Eutrophication	[kg (PO ₄) ³⁻ eq.]	6.35E-05	3.25E-03	6.56E-05	-8.94E-03
Depletion of abiotic resources	[kg Sb eq.]	0.00E+00	3.56E-05	4.71E-09	-4.16E-04
Depletion of abiotic resources-fossil fuels	[MJ]	4.10E-01	2.08E+01	1.08E-01	-7.52E+01
Environmental impacts: (DU) 1 stadium seat (weight: 8.7 kg*)					
ASPECTS	Unit	C2	C3	C4	D
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Use of renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw material)	[MJ]	2.87E-02	2.66E+00	1.80E-03	-2.79E+00
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Use of non-renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Total use of non renewable primary energy resources (primary energy and primary energy resources used as raw material)	[MJ]	4.31E-01	1.96E+01	1.13E-01	-5.96E+01
Use of secondary material	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of renewable secondary fuels	[MJ]	2.15E-02	0.00E+00	0.00E+00	0.00E+00
Use of non-renewable secondary fuels	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of net fresh water	[m ³]	INA	INA	INA	INA
Environmental impacts: (DU) 1 stadium seat (weight: 8.7 kg*)					
WASTES	Unit	C2	C3	C4	D
Hazardous waste disposed [kg]	[kg]	3.28E-06	7.29E-02	2.56E-07	-1.12E-03
Non-hazardous waste disposed [kg]	[kg]	1.47E-03	2.60E+00	2.60E+00	-4.74E-01
Radioactive waste disposed [kg]	[kg]	8.46E-06	7.96E-05	7.46E-08	-6.53E-04
Components for re-use [kg]	[kg]	0.00E+00	4.04E-02	0.00E+00	0.00E+00
Materials for recycling [kg]	[kg]	0.00E+00	4.82E+00	0.00E+00	0.00E+00
Materials for energy recovery [kg]	[kg]	0.00E+00	1.31E+00	0.00E+00	0.00E+00
Exported energy MJ per energy carrier	[MJ per energy carrier]	INA	INA	INA	INA

*Product weight includes: material, packaging waste and all packaging materials

03/LIFE CYCLE ASSESSMENT (LCA)

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RESULTS

OMEGA stadium seats					
Environmental impacts: (DU) 1 stadium seat (weight: 1.6 kg*)					
IMPACT CATEGORIES	UNIT	A1	A2	A3	A1-A3
Global warming potential	[kg CO ₂ eq.]	4.30E+00	2.86E-01	8.80E-01	5.46E+00
Ozone layer depletion	[kg CFC 11 eq.]	2.20E-07	0.00E+00	2.54E-10	2.21E-07
Accidification	[kg SO ₂ eq.]	4.60E-02	2.98E-03	2.30E-03	5.12E-02
Formation of tropospheric ozone	[kg Ethene eq.]	3.38E-03	2.17E-04	1.69E-04	3.76E-03
Eutrophication	[kg (PO ₄) ³⁻ eq.]	6.19E-03	5.25E-04	2.92E-04	7.01E-03
Depletion of abiotic resources	[kg Sb eq.]	3.20E-02	0.00E+00	3.26E-06	3.20E-02
Depletion of abiotic resources-fossil fuels	[MJ]	1.27E+02	3.90E+00	8.48E+00	1.39E+02
Environmental impacts: (DU) 1 stadium seat (weight: 1.6 kg*)					
ASPECTS	Unit	A1	A2	A3	A1-A3
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Use of renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw material)	[MJ]	4.56E+00	2.73E-01	1.02E+00	5.85E+00
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Use of non-renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Total use of non renewable primary energy resources (primary energy and primary energy resources used as raw material)	[MJ]	1.35E+02	4.09E+00	8.91E+00	1.48E+02
Use of secondary material	[kg]	2.83E-01	0.00E+00	0.00E+00	2.83E-01
Use of renewable secondary fuels	[MJ]	3.69E-03	2.05E-01	0.00E+00	2.08E-01
Use of non-renewable secondary fuels	[MJ]	1.79E-03	0.00E+00	0.00E+00	1.79E-03
Use of net fresh water	[m ³]	INA	INA	INA	INA
Environmental impacts: (DU) 1 stadium seat (weight: 1.6 kg*)					
WASTES	Unit	A1	A2	A3	A1-A3
Hazardous waste disposed [kg]	[kg]	1.40E-04	2.16E-07	2.24E-03	2.38E-03
Non-hazardous waste disposed [kg]	[kg]	1.66E-01	9.65E-05	1.08E-01	2.74E-01
Radioactive waste disposed [kg]	[kg]	5.59E-05	5.57E-07	0.00E+00	5.65E-05
Components for re-use [kg]	[kg]	4.86E-05	0.00E+00	0.00E+00	4.86E-05
Materials for recycling [kg]	[kg]	4.75E-03	0.00E+00	4.39E-01	4.43E-01
Materials for energy recovery [kg]	[kg]	3.56E-06	0.00E+00	1.59E-01	1.59E-01
Exported energy MJ per energy carrier	[MJ per energy carrier]	INA	INA	INA	INA

*Product weight includes: material, packaging waste and all packaging materials

03/LIFE CYCLE ASSESSMENT (LCA)

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RESULTS

OMEGA stadium seats					
Environmental impacts: (DU) 1 stadium seat (weight: 1.6 kg*)					
IMPACT CATEGORIES	UNIT	C2	C3	C4	D
Global warming potential	[kg CO ₂ eq.]	5.66E-03	3.15E-01	2.05E-01	-2.73E+00
Depletion potential of the stratospheric ozone layer	[kg CFC 11 eq.]	0.00E+00	2.64E-08	2.39E-09	-1.88E-07
Acidification potential of soil and water	[kg SO ₂ eq.]	6.78E-05	1.65E-03	1.40E-05	-1.05E-02
Formation potential of tropospheric ozone	[kg Ethene eq.]	4.94E-06	1.24E-04	5.55E-07	-2.42E-03
Eutrophication potential	[kg (PO ₄) ³⁻ eq.]	1.20E-05	5.87E-04	3.24E-06	-1.94E-03
Abiotic depletion potential (ADP-elements) for non-fossil resources	[kg Sb eq.]	0.00E+00	5.43E-06	7.85E-10	-9.68E-05
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	[MJ]	7.72E-02	5.29E+00	2.60E-02	-2.44E+01
Environmental impacts: (DU) 1 stadium seat (weight: 1.6 kg*)					
ASPECTS	Unit	C2	C3	C4	D
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Use of renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw material)	[MJ]	5.40E-03	5.03E-01	3.91E-04	7.82E-01
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Use of non-renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Total use of non renewable primary energy resources (primary energy and primary energy resources used as raw material)	[MJ]	8.11E-02	5.06E+00	2.71E-02	-2.56E+01
Use of secondary material	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of renewable secondary fuels	[MJ]	4.05E-03	0.00E+00	0.00E+00	0.00E+00
Use of non-renewable secondary fuels	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of net fresh water	[m ³]	INA	INA	INA	INA
Environmental impacts: (DU) 1 stadium seat (weight: 1.6 kg*)					
WASTES	Unit	C2	C3	C4	D
Hazardous waste disposed [kg]	[kg]	3.28E-06	8.50E-03	6.70E-08	-3.10E-04
Non-hazardous waste disposed [kg]	[kg]	1.47E-03	9.40E-01	7.25E-02	-1.63E-01
Radioactive waste disposed [kg]	[kg]	8.46E-06	2.18E-05	1.73E-07	-6.73E-04
Components for re-use [kg]	[kg]	0.00E+00	1.21E-02	0.00E+00	0.00E+00
Materials for recycling [kg]	[kg]	0.00E+00	5.93E-01	0.00E+00	0.00E+00
Materials for energy recovery [kg]	[kg]	0.00E+00	3.10E-01	0.00E+00	0.00E+00
Exported energy MJ per energy carrier	[MJ per energy carrier]	INA	INA	INA	INA

*Product weight includes: material, packaging waste and all packaging materials

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RESULTS

SIGMA stadium seats					
Environmental impacts: (DU) 1 stadium seat (weight: 11.9 kg*)					
IMPACT CATEGORIES	UNIT	A1	A2	A3	A1-A3
Global warming potential	[kg CO ₂ eq.]	1.75E+01	3.07E-01	3.88E+00	2.17E+01
Ozone layer depletion	[kg CFC 11 eq.]	3.22E-07	0.00E+00	5.59E-10	3.23E-07
Accidification	[kg SO ₂ eq.]	7.67E-02	2.18E-03	1.32E-02	9.20E-02
Formation of tropospheric ozone	[kg Ethene eq.]	6.89E-03	1.44E-04	3.73E-04	7.41E-03
Eutrophication	[kg (PO ₄) ³⁻ eq.]	9.69E-03	3.87E-04	1.85E-03	1.19E-02
Depletion of abiotic resources	[kg Sb eq.]	1.58E-01	0.00E+00	1.44E-05	1.58E-01
Depletion of abiotic resources-fossil fuels	[MJ]	2.75E+02	4.18E+00	3.58E+01	3.15E+02
Environmental impacts: (DU) 1 stadium seat (weight: 11.9 kg*)					
ASPECTS	Unit	A1	A2	A3	A1-A3
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Use of renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw material)	[MJ]	2.13E+01	2.93E-01	4.00E+00	2.56E+01
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Use of non-renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Total use of non renewable primary energy resources (primary energy and primary energy resources used as raw material)	[MJ]	2.87E+02	4.39E+00	3.75E+01	3.29E+02
Use of secondary material	[kg]	9.51E+00	0.00E+00	0.00E+00	9.51E+00
Use of renewable secondary fuels	[MJ]	5.01E-02	2.20E-01	0.00E+00	2.70E-01
Use of non-renewable secondary fuels	[MJ]	3.40E-02	0.00E+00	0.00E+00	3.40E-02
Use of net fresh water	[m ³]	INA	INA	INA	INA
Environmental impacts: (DU) 1 stadium seat (weight: 11.9 kg*)					
WASTES	Unit	A1	A2	A3	A1-A3
Hazardous waste disposed [kg]	[kg]	2.90E-03	7.13E-08	4.23E-02	4.52E-02
Non-hazardous waste disposed [kg]	[kg]	5.54E-01	3.19E-05	2.48E-01	8.02E-01
Radioactive waste disposed [kg]	[kg]	6.17E-04	1.84E-07	0.00E+00	6.17E-04
Components for re-use [kg]	[kg]	2.83E-02	0.00E+00	0.00E+00	2.83E-02
Materials for recycling [kg]	[kg]	1.83E-01	0.00E+00	1.08E+00	1.26E+00
Materials for energy recovery [kg]	[kg]	3.16E-05	0.00E+00	2.26E-01	2.26E-01
Exported energy MJ per energy carrier	[MJ per energy carrier]	INA	INA	INA	INA

*Product weight includes: material, packaging waste and all packaging materials

03/LIFE CYCLE ASSESSMENT (LCA)

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RESULTS

SIGMA stadium seats					
Environmental impacts: (DU) 1 stadium seat (weight: 11.9 kg*)					
IMPACT CATEGORIES	UNIT	C2	C3	C4	D
Global warming potential	[kg CO ₂ eq.]	4.14E-02	4.38E-01	2.70E-01	-3.36E+00
Depletion potential of the stratospheric ozone layer	[kg CFC 11 eq.]	0.00E+00	6.93E-08	3.38E-09	-2.60E-07
Acidification potential of soil and water	[kg SO ₂ eq.]	4.95E-04	9.66E-03	3.28E-05	-1.37E-02
Formation potential of tropospheric ozone	[kg Ethene eq.]	3.61E-05	5.38E-04	1.45E-06	-3.28E-03
Eutrophication potential	[kg (PO ₄) ³⁻ eq.]	8.74E-05	3.78E-03	8.39E-06	-2.58E-03
Abiotic depletion potential (ADP-elements) for non-fossil resources	[kg Sb eq.]	0.00E+00	4.76E-05	1.79E-09	-9.70E-05
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	[MJ]	5.64E-01	1.43E+01	5.83E-02	-3.04E+01
Environmental impacts: (DU) 1 stadium seat (weight: 11.9 kg*)					
ASPECTS	Unit	C2	C3	C4	D
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Use of renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw material)	[MJ]	3.95E-02	2.10E+00	8.82E-04	6.91E-01
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Use of non-renewable primary energy resources used as raw materials	[MJ]	INA	INA	INA	INA
Total use of non renewable primary energy resources (primary energy and primary energy resources used as raw material)	[MJ]	5.93E-01	1.30E+01	6.10E-02	-3.19E+01
Use of secondary material	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of renewable secondary fuels	[MJ]	2.96E-02	0.00E+00	0.00E+00	0.00E+00
Use of non-renewable secondary fuels	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of net fresh water	[m ³]	INA	INA	INA	INA
Environmental impacts: (DU) 1 stadium seat (weight: 11.9 kg*)					
WASTES	Unit	C2	C3	C4	D
Hazardous waste disposed [kg]	[kg]	3.28E-06	1.15E-01	1.50E-07	-3.11E-04
Non-hazardous waste disposed [kg]	[kg]	1.47E-03	1.91E+00	2.52E-05	-2.06E-01
Radioactive waste disposed [kg]	[kg]	8.46E-06	4.43E-05	3.89E-07	-6.74E-04
Components for re-use [kg]	[kg]	0.00E+00	1.59E-02	0.00E+00	0.00E+00
Materials for recycling [kg]	[kg]	0.00E+00	9.60E+00	0.00E+00	0.00E+00
Materials for energy recovery [kg]	[kg]	0.00E+00	6.83E-01	0.00E+00	0.00E+00
Exported energy MJ per energy carrier	[MJ per energy carrier]	INA	INA	INA	INA

*Product weight includes: material, packaging waste and all packaging materials

04/VERIFICATION

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The process of verification of this EPD is in accordance with ISO 14025. After verification, this EPD is valid for a 5-year-period. EPD does not have to be recalculated after 5 years, if the underlying data have not changed significantly.

The basis for LCA analysis was ISO 14040 and ITB PCR A

Independent verification corresponding to ISO 14025 (subclause 8.1.3.)

external internal

External verification of EPD:
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NORMATIVE REFERENCES

- >> ITB PCR A General Product Category Rules for Construction Products
- >> ISO 14025:2006, Environmental labels and declarations – Type III environmental declarations – Principles and procedures
- >> ISO 14040:2006 Environmental management – Life cycle assessment – Principles and framework
- >> ISO 14044:2006 Environmental management – Life cycle assessment – Requirements and guidelines
- >> EN 15804:2012+A1:2013 Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products
- >> PN-EN 15942:2012 Sustainability of construction works – Environmental product declarations – Communication format business-to-business
- >> KOBiZE Wskaźniki emisyjności CO₂, SO₂, NO_x, CO i pyłu całkowitego dla energii elektrycznej, grudzień 2020r.