

ENVIRONMENTAL PRODUCT DECLARATION

in accordance with ISO 14025, ISO 21930 and EN 15804

Owner of the declaration:	Fora Form AS
Program operator:	The Norwegian EPD Foundation
Publisher:	The Norwegian EPD Foundation
Declaration number:	NEPD-2848-1540-EN
Registration number:	NEPD-2848-1540-EN
ECO Platform reference number:	-
Issue date:	19.05.2021
Valid to:	19.05.2026

Arena auditorium chair, medium backrest

Fora Form AS

www.epd-norge.no

fora
form



General information

Product:

Arena auditorium chair, medium backrest

Program operator:

The Norwegian EPD Foundation
Pb. 5250 Majorstuen, 0303 Oslo
Phone: +47 23 08 80 00
e-mail: post@epd-norge.no

Declaration number:

NEPD-2848-1540-EN

ECO Platform reference number:

This declaration is based on Product Category Rules:

CEN Standard EN 15804:2012+A1:2013 serves as core PCR
NPCR 026:2018 Part B for furniture

Statement of liability:

The owner of the declaration shall be liable for the underlying information and evidence. EPD Norway shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.

Declared unit:

1 Pcs Arena auditorium chair, medium backrest

Declared unit with option:

A1,A2,A3,A4

Functional unit:

Production of one seating solution provided and maintained for a period of 15 years.

General information on verification of EPD from EPD tools:

Independent verification of data, other environmental information and the declaration according to ISO 14025:2010, § 8.1.3 and § 8.1.4. Individual third party verification of each EPD is not required when the EPD tool is i) integrated into the company's environmental management system, ii) the procedures for use of the EPD tool are approved by EPDNorway, and iii) the process is reviewed annually. See Appendix G of EPD-Norway's General Programme Instructions for further information on EPD tools.

Verification of EPD tool:

Independent third party verification of the EPD tool, background data and test-EPD in accordance with EPDNorway's procedures and guidelines for verification and approval of EPD tools.

Erik Svanes, Norsus AS

(no signature required)

Owner of the declaration:

Fora Form AS
Contact person: Kåre Sætre
Phone: +47 700 46 000
e-mail: info@foraform.com

Manufacturer:

Fora Form AS

Place of production:

Fora Form AS
Mosfaltevegen 6154 Ørsta
Norway

Management system:

NS-EN ISO 14001: 2015 No. 800406. NS-EN ISO 9001: 2015 No. 901268. NS-EN ISO 45001: 2018 No 907167.

Organisation no:

986 581 421

Issue date:

19.05.2021

Valid to:

19.05.2026

Year of study:

2020

Comparability:

EPDs from programmes other than the Norwegian EPD Foundation may not be comparable

Development and verification of EPD:

The declaration has been developed and verified using EPD tool lca.tools ver EPD2020.11, developed by LCA.no AS. The EPD tool is integrated into the company's environmental management system, and has been approved by EPD-Norway

Developer of EPD:

Kristin Røyset

Reviewer of company-specific input data and EPD:

Kåre Sætre

Approved:

Sign



Håkon Hauan, CEO EPD-Norge

Key environmental indicators	Unit	Cradle to gate A1 - A3
Global warming	kg CO2 eqv	57,88
Total energy use	MJ	778,31
Amount of recycled materials	%	1,75

Product

Market:

Worldwide
Norway 90%

Product description:

Arena is an elegant and smart auditorium chair design by Torsteinsen Design. A standardizes auditorium chair that can be used in any project without special customization.

Product specification

Arena is available in three different backrest heights: high, medium and low. Curved seat and backrest with lumbar support, in molded foam. The seat is tilted to an upright position when not in use. The seat stops in the back. Arena is fully pre-assembled, ready to be placed in the auditorium. Interchangeable textilecover. A gap of 20mm between chair attachment and floor for easier cleaning. Single tables or long continuous tables and armrest is available as accessories and can be retrofitted.

<https://foraform.no/produkter/arena>

Materials	kg	%	Recycled share in material (kg)	Recycled share in material (%)
Metal - Steel	5,99	60,65	0,08	1,34
Textile - Wool	0,48	4,86	0,00	0,00
Plastic - Polyurethane (PUR)	1,64	16,59	0,00	0,00
Plastic - Polyoxymethylene (POM)	0,00	0,04	0,00	0,00
Plastic - Polyamide with glass fibre (PAGF30)	1,51	15,32	0,00	0,00
Cardboard	0,25	2,53	0,19	76,30

LCA: Calculation rules

Declared unit:

1 Pcs Arena auditorium chair, medium backrest

Cut-off criteria:

All major raw materials and all the essential energy is included. The production processes for raw materials and energy flows with very small amounts (less than 1%) are not included. These cut-off criteria do not apply for hazardous materials and substances.

Data quality:

Specific data for the product composition are provided by the manufacturer. They represent the production of the declared product and were collected for EPD development in the year of study. Background data is based on registered EPDs according to EN 15804, Ostfold Research databases, ecoinvent and other LCA databases. The data quality of the raw materials in A1 is presented in the table below.

Materials	Source	Data quality	Year
Plastic - Polyoxymethylene (POM)	ecoinvent 3.4	Database	2015
Plastic - Polyurethane (PUR)	ecoinvent 3.4	Database	2015
Metal - Steel	ecoinvent 3.3	Database	2016
Cardboard	ecoinvent 3.4	Database	2017
Metal - Steel	ecoinvent 3.4	Database	2017
Plastic - Polyamide with glass fibre (PAGF30)	ecoinvent 3.4	Database	2017
Process	ecoinvent 3.4	Database	2017
Textile - Wool	ecoinvent 3.4	Database	2017
Metal - Steel	ecoinvent 3.6	Database	2019

Technical data:

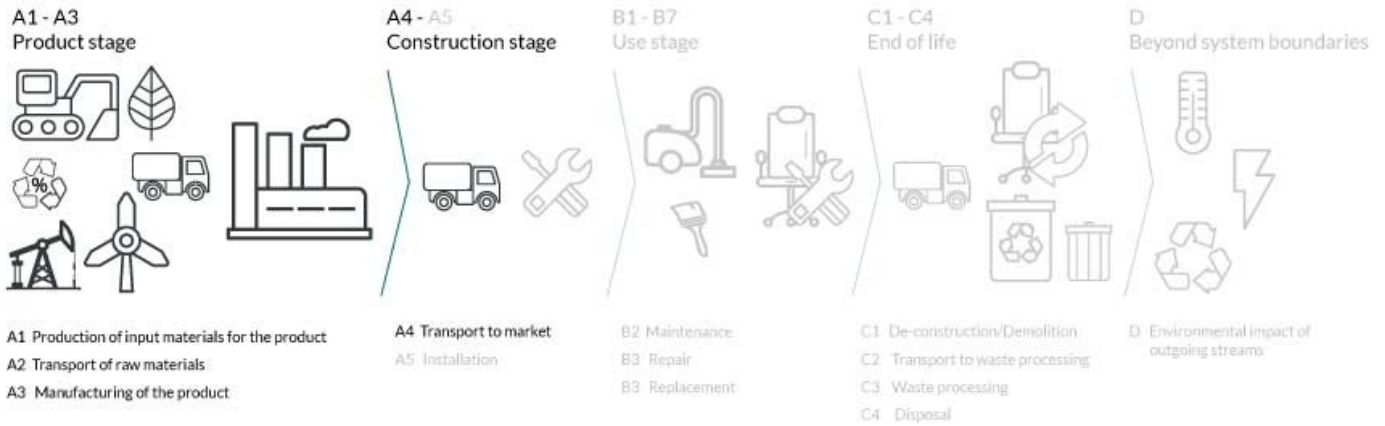
Weight: 9,9kg

Reference service life, product

15 years

Reference service life, building

System boundary:



Additional technical information:

We want you to enjoy your furniture for many years to come. If you follow our advice in this Quality and Maintenance Manual you contribute to prolonged life of your furniture. We only use environmentally friendly materials and processes in our manufacturing unit in Ørsta Norway. Our goal is to manufacture furniture that can last for generations. All furniture made by Fora Form are made of FSC certified wood, manufactured according to ISO 14001, and has an EPD on all products. This ensures sustainability and a "cradle to cradle" philosophy. We actively work to reduce waste. All packing materials and waste are being recycled according to Norsk Gjenvinning.

Norwegian and Swedish Møbelfakta are accredited test facilities where furniture quality, strength, durability, flammability, safety, emissions and materials are tested and documented. A piece of furniture, which lives up to the three areas of requirements of Møbelfakta, has undergone extensive testing, is produced according to ethical guidelines and has been approved according to environmental requirements. Møbelfakta is a guarantee of high quality products. Almost all of Fora Forms collection is Møbelfakta approved.

Fora Form are ISO 9001 quality management, ISO 14001 environmental management and ISO 45001 occupational health and safety management certified. Sustainability is important for Fora Form.

We continuously work to sort and reduce our waste, and collaborate with Norsk Gjenvinning and Grønt Punkt (Green Dot Norway plc) regarding recycling of used packing materials. All wood is FSC certified. Our manufacturing unit in Ørsta use electricity that is 100% originated from renewable sources.

Transportation to an average customer in Oslo is 540 km (A4: average European lorry > 32 tonnes)

The following information describe the scenarios in the different modules of the EPD.

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Transport from production place to user (A4)

Type	Capacity utilisation (incl. return) %	Type of vehicle	Distance km	Fuel/Energy consumption	Unit	Value (l/t)
Truck	38,8 %	Truck, 16-32 tonnes, EURO 4	300	0,044575	l/tkm	13,37
Railway					l/tkm	
Boat					l/tkm	
Other Transportation					l/tkm	

Assembly (A5)

.	Unit	Value
Auxiliary	kg	
Water consumption	m ³	
Electricity consumption	kWh	
Other energy carriers	MJ	
Material loss	kg	
Output materials for waste treatment	kg	
Dust in the air	kg	
VOC emissions	kg	

Use (B1)

.	Unit	Value

Maintenance (B2)/Repair (B3)

.	Unit	Value
Maintenance cycle*		
Auxiliary		
Other resources		
Water consumption	m ³	
Electricity consumption	kWh	
Other energy carriers	MJ	
Material loss	kg	
VOC emissions	kg	

Replacement (B4)/Refurbishment (B5)

.	Unit	Value
Replacement cycle*		
Electricity consumption	kWh	
Replacement of worn parts		

* Described above if relevant

Operational energy (B6) and water consumption (B7)

.	Unit	Value
Water consumption	m ³	
Electricity consumption	kWh	
Other energy carriers	MJ	
Power output of equipment	kW	

End of Life (C1, C2)

.	Unit	Value
Hazardous waste disposed	kg	
Collected as mixed construction waste	kg	
Reuse	kg	
Recycling		
Energy recovery		
To landfill	kg	

Transport to waste processing (C2)

Type	Capacity utilisation (incl. return) %	Type of vehicle	Distance km	Fuel/Energy consumption	Unit	Value (l/t)
Truck					l/tkm	
Railway					l/tkm	
Boat					l/tkm	
Other Transportation					l/tkm	

Scenarios after A1-A4 are not included

LCA: Results

The LCA results are presented below for the declared unit defined on page 2 of the EPD document.

System boundaries (X=included, MND=module not declared, MNR=module not relevant)

Product stage				Construction installation stage	User stage								End of life stage				Beyond the system boundaries
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction 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	
X	X	X	X	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	

Environmental impact

Parameter	Unit	A1	A2	A3	A4
GWP	kg CO ₂ -eq	5,57E+01	2,07E+00	7,46E-02	4,79E-01
ODP	kg CFC11 -eq	2,04E-06	3,85E-07	3,84E-09	8,91E-08
POCP	kg C ₂ H ₄ -eq	1,83E-02	3,39E-04	1,75E-05	7,86E-05
AP	kg SO ₂ -eq	2,86E-01	8,04E-03	3,63E-04	1,86E-03
EP	kg PO ₄ ³⁻ -eq	5,50E-02	1,45E-03	5,05E-05	3,36E-04
ADPM	kg Sb -eq	3,11E-04	6,37E-06	1,26E-07	1,47E-06
ADPE	MJ	5,57E+02	3,14E+01	8,32E-01	7,28E+00

GWP Global warming potential; ODP Depletion potential of the stratospheric ozone layer; POCP Formation potential of tropospheric photochemical oxidants; AP Acidification potential of land and water; EP Eutrophication potential; ADPM Abiotic depletion potential for non fossil resources; ADPE Abiotic depletion potential for fossil resources

Reading example: 9,0 E-03 = 9,0*10⁻³ = 0,009

*INA Indicator Not Assessed

Resource use

Parameter	Unit	A1	A2	A3	A4
RPEE	MJ	6,55E+01	4,58E-01	3,20E-01	1,06E-01
RPEM	MJ	1,10E+01	0,00E+00	0,00E+00	0,00E+00
TPE	MJ	7,66E+01	4,58E-01	3,20E-01	1,06E-01
NRPE	MJ	6,78E+02	3,22E+01	1,41E+00	7,45E+00
NRPM	MJ	7,18E+01	0,00E+00	0,00E+00	0,00E+00
TRPE	MJ	7,50E+02	3,22E+01	1,41E+00	7,45E+00
SM	kg	2,71E-01	0,00E+00	0,00E+00	0,00E+00
RSF	MJ	0,00E+00	0,00E+00	1,59E-05	0,00E+00
NRSF	MJ	0,00E+00	0,00E+00	1,63E-02	0,00E+00
W	m ³	4,87E-01	6,03E-03	1,85E-02	1,40E-03

RPEE Renewable primary energy resources used as energy carrier; RPEM Renewable primary energy resources used as raw materials; TPE Total use of renewable primary energy resources; NRPE Non renewable primary energy resources used as energy carrier; NRPM Non renewable primary energy resources used as materials; TRPE Total use of non renewable primary energy resources; SM Use of secondary materials; RSF Use of renewable secondary fuels; NRSF Use of non renewable secondary fuels; W Use of net fresh water

Reading example: 9,0 E-03 = $9,0 \cdot 10^{-3} = 0,009$

*INA Indicator Not Assessed

End of life - Waste

Parameter	Unit	A1	A2	A3	A4
HW	kg	1,51E-03	1,88E-05	1,71E-06	4,35E-06
NHW	kg	3,66E+01	1,69E+00	1,85E-02	3,92E-01
RW	kg	INA*	INA*	INA*	INA*

HW Hazardous waste disposed; NHW Non hazardous waste disposed; RW Radioactive waste disposed

Reading example: 9,0 E-03 = $9,0 \cdot 10^{-3} = 0,009$

*INA Indicator Not Assessed

End of life - Output flow

Parameter	Unit	A1	A2	A3	A4
CR	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MR	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MER	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EEE	MJ	INA*	INA*	INA*	INA*
ETE	MJ	INA*	INA*	INA*	INA*

CR Components for reuse; MR Materials for recycling; MER Materials for energy recovery; EEE Exported electric energy; ETE Exported thermal energy

Reading example: 9,0 E-03 = $9,0 \cdot 10^{-3} = 0,009$

*INA Indicator Not Assessed

Additional Norwegian requirements

Greenhouse gas emissions from the use of electricity in the manufacturing phase

National production mix from import, low voltage (production of transmission lines, in addition to direct emissions and losses in grid) of applied electricity for the manufacturing process (A3).

Electricity mix	Data source	Amount	Unit
Energy, district heating, Norwegian average (kWh)	Østfoldforskning	19,71	g CO2-ekv/kWh

Dangerous substances

The product contains no substances given by the REACH Candidate list or the Norwegian priority list.

Indoor environment

Our furniture doesn't contain any substances that effect indoor clima.

Additional environmental information

Bibliography

ISO 14025:2010 Environmental labels and declarations - Type III environmental declarations - Principles and procedures.

ISO 14044:2006 Environmental management - Life cycle assessment - Requirements and guidelines.

EN 15804:2012+A1:2013 Environmental product declaration - Core rules for the product category of construction products.

ISO 21930:2017 Sustainability in buildings and civil engineering works - Core rules for environmental product declarations of construction products.





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Vold et al., (2019) EPD generator for Norsk Industri, Background information for industry application and LCA data, LCA.no report number 06.19.

NPCR Part A: Construction products and services. Ver. 1.0. April 2017, EPD-Norge.

NPCR 026 Part B for Furniture. Ver. 2.0 October 2018, EPD-Norge.

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