
ENVIRONMENTAL PRODUCT DECLARATION

In accordance with ISO 14025

Owner of the declaration
Program holder and publisher
Declaration number
Issue date
Valid to

Fora Form AS
The Norwegian EPD Foundation

Fjell chair / 5 arm base with weels / armrest

Product

Key environmental indicators for variants on page 6

Fora Form AS

Manufacturer

FORA **FORM**



General information
Product

Fjell chair / 5 arm base with weels / armrest

Key environmental indicators for variants on page 6

General Information

The Norwegian EPD Foundation
 Post Box 5250 Majorstuen, 0303 Oslo
 Phone: +4723088000
 e-mail: post@epd-norge.no

Declaration number:
This declaration is based on Product Category Rules:

PCR for furniture, NPCR 021, Norwegian EPD Foundation

Declared unit:

One chair, high back upholster with armrest, aluminium base

Declared unit with option:

No options

Functional unit:

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

This EPD has been worked out by:

The declaration has been developed using Furniture EPD Tool Version 1.3.1, Approval: NEPDT04
 Company specific data collected and registered by:
Kåre Sætre
 Company specific data audited by:
Anders Utgård

Verification:

Independent verification of data, other environmental information and EPD has been carried out in accordance with ISO14024, 8.1.3. and 8.1.4.

externally



Mie Vold, Senior Research Scientist
 (Independent verifier approved by EPD Norway)

Owner of the declaration:

Fora Form AS
 Contact person : Anders Utgård
 Phone + 47 700 46 000
 E mail : au@foraform.com

Manufacturer

Fora Form AS

Place of production:

Mosfløtevegen 6154 Ørsta

Management system:

NS-EN ISO 14001:2015 Certificat No.800406
 NS-EN ISO 9001: 2015 Certificat No.901268

Org. No:

No. 956 581 421

Issue date:
Valid to:
Comparability:

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

Year of study:

2018

Approved

Håkon Hauan
 Manager EPD-Norway

Key environmental indicators	Unit	Cradle to Gate A1-A3
Global warming	kg CO ₂	88
Total energy use	MJ	1320
Amount of recycled materials	%	27 %

Product

Product Description and Application

The Fjell chair is designed by the renowned Norwegian designer Lars Tornøe. The meeting between the strict shapes inspired by steep mountain sides and uncompromising comfort, characterizes the design. The result is a consistent meeting chair with tight lines and soft surfaces. Facilitate inspiring meetings with functional design that makes creativity spark. The chair Fjell is available with different textile/ leather qualities.

The meeting chair also offers an elegant gap the seat and back allowing for easy cleaning.

Technical Data

Total weight : 13 kg (packaging excluded)

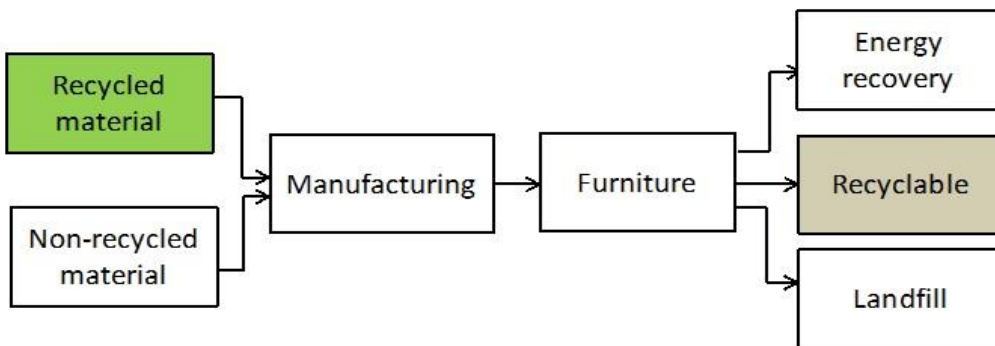
Market

Worldwide

Reference Service Life

15 years

Materials			Recycled material in manufactured product		Recyclable material at end of product life	
Unit	kg	%	%	kg	%	kg
Aluminium	4,70	31 %	50 %	2,35	100 %	4,70
Wood	3,40	23 %	0 %	0,00	0 %	0,00
Steel	2,00	13 %	5 %	0,10	100 %	2,00
Packaging	2,00	13 %	76 %	1,52	100 %	2,00
Textiles	1,50	10 %	0 %	0,00	0 %	0,00
Polyurethane	1,20	8 %	0 %	0,00	100 %	1,20
POM	0,20	1 %	50 %	0,10	100 %	0,20
Total	15,00		27 %		67 %	

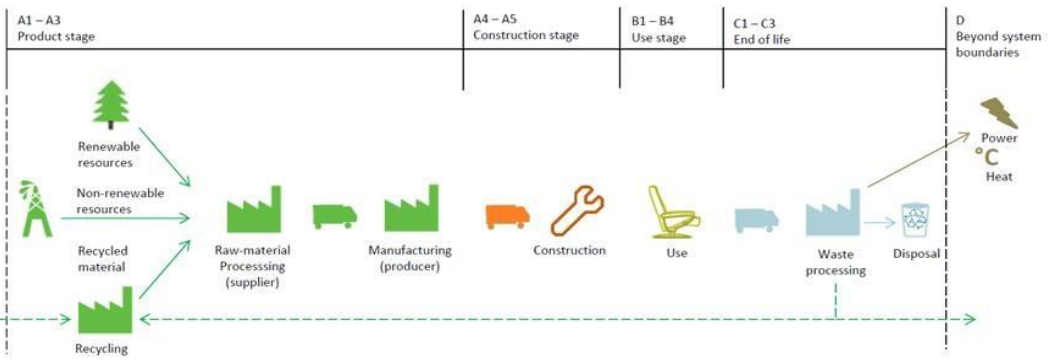


Product manufactured from 27% recycled material
 At end of life product contains 67% recyclable material

LCA: Calculation rules

Declared Unit
One chair, high back upholster with armrest, aluminium base

System Boundary
Life cycle stages included are described in figure and through the corresponding letter and number designations in the



Data quality
Specific manufacturing data from 2014 are used. Data from Ecoinvent 3.0.1. and Østfoldforskning databases are used as the basis for raw materials and energy carrier

Cut-off criteria
All major raw materials and all the essential energy is included. The production processes for raw materials and energy flows that are included with very small amounts (<1%) are not included. This cut-off rule does not apply for hazardous materials and substances

Allocation
Where virgin materials are used, emissions and energy consumption connected with extraction and production are included.
Where recycled materials are used in the product, emissions and energy consumption related to the recycling process are included.
Emissions from incineration are allocated to the product system that uses the recovered energy.
Emissions from incineration of waste are allocated to the product system that uses the recovered energy.

LCA: Scenarios and additional technical information

Transportation to an average customer in Copenhagen is 1000 km (A4: average European lorry > 32 tonnes)

The use stage (B1) is represented by a scenario and includes vacuum cleaning of textile once a month. The PCR does not provide detailed guidelines for what should be included in the use stage. In the end of life stage, the transport distance for waste to waste processing is 72 km (C1). The reuse, recovery and recycling stage is beyond the system boundaries (D). It is assumed that the solution is dismantled and the materials recycled or combusted according to general Norwegian treatment of industrial waste (see the table below). This calculation includes only CO2 emissions (GWP) in the C-modules. The transport distance to reuse, recovery or recycling varies for each material, but the average distance is 373 km. The vehicles used and associated data are described in detail in [5].

	Material recovery	Energy recovery	Disposal
Aluminium	70,1 %	0,0 %	30 %
Steel	70,1 %	0,0 %	30 %
Plastic	64,3 %	30,8 %	5 %
Cardboard	94,5 %	5,5 %	0 %

LCA: Results

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

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

Product stage			Construction stage		Use stage				End of life			Beyond the system boundaries
Raw materials	Transport	Manufacturing	Transport	Construction	Maintenance	Repair	Replacement	Operational energy use	Transport	Waste Processing	Disposal	Reuse-recovery-recycling potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	C1	C2	C3	D
x	x	x	x	MNR	x	MNR	MNR	MNR	x	x	x	x

Environmental impact (INA = Indicator Not Assessed)

Parameter	A1	A2	A3	A1-A3	A4	B1	C1	C2	C3	C1-C3	D
GWP	70,0	4,4	13,4	87,9	0,0	0,0	1,0	9,0	0,9	10,9	-5,1
ODP	2,4E-06	2,8E-07	8,8E-07	3,6E-06	0,0	0,0	INA	INA	INA	INA	-2,5E-07
POCP	2,4E-02	8,8E-04	3,6E-03	2,8E-02	0,0	0,0	INA	INA	INA	INA	-3,7E-03
AP	0,1	4,6E-03	2,2E-02	0,1	0,0	0,0	INA	INA	INA	INA	-4,7E-03
EP	0,4	1,9E-02	0,1	0,5	0,0	0,0	INA	INA	INA	INA	-1,6E-02
ADPM*	9,0E-04	6,2E-06	3,4E-05	9,4E-04	0,0	0,0	INA	INA	INA	INA	-3,6E-05
ADPE	748,8	71,0	151,2	971,0	0,0	0,0	INA	INA	INA	INA	-99,4

GWP Global warming potential (kg CO₂-eqv.); ODP Depletion potential of the stratospheric ozone layer (kg CFC11-eqv.); POCP Formation potential of tropospheric photochemical oxidants (kg C₂H₄-eqv.); AP Acidification potential of land and water (kg SO₂-eqv.); EP Eutrophication potential (kg PO₄-3-eqv.); ADPM Abiotic depletion potential for non fossil resources (kg Sb -eqv.); ADPE Abiotic depletion potential for fossil resources (MJ);

* Some processes use Ecoinvent 3.0.1. and thus data on renewable resources is omitted. The true ADPM, RPEE, RPEM and TPE may be higher than indicated. This issue will be addressed in a new version of Ecoinvent 3, data from which was not available when this declaration was prepared.

Resource use (INA = Indicator Not Assessed)

Parameter	A1	A2	A3	A1-A3	A4	B1	C1	C2	C3	C1-C3	D
RPEE*	239,8	2,7	16,6	259,1	0,0	0,0	INA	INA	INA	INA	-0,9
RPEM*	128,4	0,2	4,8	133,3	0,0	0,0	INA	INA	INA	INA	-3,3
TPE*	368,2	2,9	21,4	392,5	0,0	0,0	INA	INA	INA	INA	-4,2
NRPE	813,8	67,9	179,7	1061,3	0,0	0,0	INA	INA	INA	INA	-98,3
NRPM	15,1	11,4	0,0	26,5	0,0	0,0	INA	INA	INA	INA	0,0
TNRPE	828,9	79,2	179,7	1087,8	0,0	0,0	INA	INA	INA	INA	-98,3
SM	4,1	0,0	0,0	4,1	0,0	0,0	INA	INA	INA	INA	-1,5
RSF	0,0	0,0	0,0	0,0	0,0	0,0	INA	INA	INA	INA	0,0
NRSF	0,0	0,0	0,0	0,0	0,0	0,0	INA	INA	INA	INA	0,0
W	0,0	0,0	0,0	0,0	0,0	0,0	INA	INA	INA	INA	0,0

RPEE Renewable primary energy resources used as energy carrier (MJ); RPEM Renewable primary energy resources used as raw materials (MJ); TPE Total use of renewable primary energy resources (MJ); NRPE Non renewable primary energy resources used as energy carrier (MJ); NRPM Non renewable primary energy resources used as materials (MJ); TNRPE Total use of non renewable primary energy resources (MJ); SM Use of secondary materials (kg); RSF Use of renewable secondary fuels (MJ); NRSF Use of non renewable secondary fuels (MJ); W Use of net fresh water (m³);

End of life - Waste and Output flow (INA = Indicator Not Assessed)

Parameter	A1	A2	A3	A1-A3	A4	B1	C1	C2	C3	C1-C3	D
HW	2,0E-02	1,7E-05	5,4E-04	2,0E-02	0,0	0,0	INA	INA	INA	INA	-0,2
NHW	45,2	2,2	6,8	54,2	0,0	0,0	INA	INA	INA	INA	-1,1
RW	0,0	0,0	0,0	0,0	0,0	0,0	INA	INA	INA	INA	0,0
CR	0,0	0,0	0,0	0,0	0,0	0,0	INA	INA	INA	INA	0,0
MR	1,3E-04	0,0	0,0	1,3E-04	0,0	0,0	INA	INA	INA	INA	0,0
MER	0,0	0,0	0,0	0,0	0,0	0,0	INA	INA	INA	INA	0,0
EEE	0,0	0,0	0,0	0,0	0,0	0,0	INA	INA	INA	INA	0,0
ETE	0,0	0,0	0,0	0,0	0,0	0,0	INA	INA	INA	INA	0,0

HW Hazardous waste disposed (kg); NHW Non hazardous waste disposed (kg); RW Radioactive waste disposed (kg); CR Components for reuse (kg); MR Materials for recycling (kg); MER Materials for energy recovery (kg); EEE Exported electric energy (MJ); ETE Exported thermal energy (MJ);

Specific Norwegian requirements

Electricity

The electricity consumed is Norwegian average electric power and European mix

Dangerous Substances

None of the following substances have been added to the product :

Substances on the REACH Candidate list of substances of very high concern (of '16.06.2014) and substances that lead to the product being classified as hazardous waste. The chemical content of the product complies with regulatory levels as given in the Norwegian Product Regulations

Indoor Environment

Our furniture doesn't contain any substrates that affect indoor climate.

Climate Declaration

Not relevant

Additional environmental information			
Key environmental indicators for variants.		(Packaging included)	
Variant model name and type	Global warming (kg.CO2)	Total energy use (MJ)	Share of recycled
Low back / 5 arm.base/without wheel/without armrest	77	1158	29 %
High back / 4 arm.base / with wheel / with armrest	88	1314	27 %
Low back / 4 arm.base / without wheel / without armrest	77	1151	29 %
High back / 4 leg.base / with armrest	46	892	16 %
Low back / 4 leg.base / with armrest	44	852	17 %
High back / 4 leg.base / without armrest	36	777	17 %
Low back / 4 leg.base / without armrest	35	738	18 %

Bibliography

[1] NS-EN ISO 14025:2006, Environmental labels and declarations-Type III environmental declarations-Principles and procedures.



[2] NS-EN ISO 14044:2006, Environmental management - Life cycle assessment - Requirements and guidelines

[3] EN 15804:2012 + A1:2013 Sustainability of construction works - Environmental product declaration - Core rules for the product category of construction products

[4] Product category rules (PCR) for preparing an environmental product declaration for:
Product Group Seating Solution NPCR 003: 2015; Product Group Plate Furniture NPCR 021: 2012

[5] Raadal, H. L., Modahl, I. S., Lyng, K. A. (2009). Klimaregnskap for avfallshåndtering, Fase I og II. OR 18.09.
ISBN : 978-82-7520-611-2, 82-7520-611-1

[6] Brekke, A., Møller, H., Baxter, J., Askham, C. (2014). Verktøy - miljødeklarasjon for møbel
Dokumentasjon som grunnlag for verifisering, Ostfold Research

	Program Holder and Publisher The Norwegian EPD Foundation Post Box 5250 Majorstuen, 0303 Oslo Norge	Phone: +4723088292 email: post@epd-norge.no web: www.epd-norge.no
	Owner of the Declaration Fora Form AS Mosflatevegen Ørsta	Phone: 700 46 000 email: info@foraform.com web: www.foraform.com
	Author of the Life Cycle Assessment Østfoldforskning AS Stadion 4 1671 Kråkerøy	Phone: +4769351100 email: post@ostfoldforskning.no web: www.ostfoldforskning.no