

Product

Product description:

Fredrik A. Kayser foremost designs are characterised by a Danish inspired and Scandinavian tone. Among them is the armchair MODELL 711. Despite having clear references to the mid-century design era, the chair stands out as a timeless piece. MODELL 711 is just as relevant today as it was when it was designed, and its Nordic aesthetic makes it easily adapt to modern architecture. MODELL 711 stands out as a Norwegian design icon that will last for years to come.

Product specification

Materials	kg	%	Recycled share in material (kg)	Recycled share in material (%)
Wood - Solid walnut	4,80	46,29	0,00	0,00
Leather	1,17	11,28	0,00	0,00
Plastic - Polyurethane (PUR)	0,80	7,71	0,00	0,00
Plastic - Polystyrene expandable (EPS)	0,70	6,75	0,00	0,00
Wood - Solid pine	2,90	27,97	0,00	0,00
Total	10,37		0,00	

Packaging	kg	%	Recycled share in material (kg)	Recycled share in material (%)
Packaging - Cardboard	3,25	100,00	1,17	36,00
Total incl. packaging	13,62		1,17	

Technical data:

Width: 70 cm
 Depth: 74 cm
 Height: 75 cm
 Seat Height: 42 cm

Weight: 10,5 kg

Market:

Worldwide

Reference service life, product

15 years.

Reference service life, building

LCA: Calculation rules

Declared unit:

1 pcs 711 stol, Eik, Ubeh.

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.

Allocation:

The allocation is made in accordance with the provisions of EN 15804. Incoming energy and water and waste production in-house is allocated equally among all products through mass allocation. Effects of primary production of recycled materials is allocated to the main product in which the material was used. The recycling process and transportation of the material is allocated to this analysis.

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
Packaging - Cardboard	ecoinvent 3.6	Database	2019
Plastic - Polystyrene expandable (EPS)	ecoinvent 3.6	Database	2019
Plastic - Polyurethane (PUR)	ecoinvent 3.6	Database	2019
Leather	Modified ecoinvent 3.6	Database	2019
Wood - Solid pine	modified ecoinvent 3.6	Database	2019
Wood - Solid walnut	modified ecoinvent 3.6	Database	2019

LCA: Scenarios and additional technical information

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

Transport from production place to user (A4)	Capacity utilisation (incl. return) %	Distance (km)	Fuel/Energy Consumption	Unit	Value (Liter/tonne)
Truck, over 32 tonnes, EURO 6 (km)	53,3 %	600	0,023	l/tkm	13,80
Assembly (A5)					
	Unit	Value			
Waste, packaging, corrugated board box, to average treatment (kg)	kg	3,25			
Transport to waste processing (C2)					
	Capacity utilisation (incl. return) %	Distance (km)	Fuel/Energy Consumption	Unit	Value (Liter/tonne)
Truck, 16-32 tonnes, EURO 6 (km)	36,7 %	85	0,043	l/tkm	3,66
Waste processing (C3)					
	Unit	Value			
Waste treatment per kg Expanded Polystyrene (EPS), incineration - C3 (kg)	kg	0,70			
Waste treatment per kg Non-hazardous waste, incineration with fly ash extraction - C3 (kg)	kg	1,17			
Waste treatment per kg Polyurethane (PU), incineration (kg)	kg	0,80			
Waste treatment per kg Wood, incineration with fly ash extraction (kg)	kg	7,70			
Disposal (C4)					
	Unit	Value			
Landfilling of ashes from incineration of expanded polystyrene (EPS), process per kg ashes and residues - C4 (kg)	kg	0,03			
Landfilling of ashes from incineration of Non-hazardous waste, process per kg ashes and residues - C4 (kg)	kg	0,28			
Landfilling of ashes from incineration of Polyurethane (PU), process per kg ashes and residues - C4 (kg)	kg	0,03			
Landfilling of ashes from incineration of Wood, process per kg ashes and residues (kg)	kg	0,09			
Benefits and loads beyond the system boundaries (D)					
	Unit	Value			
Substitution of electricity, in Norway (MJ)	MJ	8,24			
Substitution of thermal energy, district heating, in Norway (MJ)	MJ	124,66			

LCA: Results

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

Environmental impact							
Indicator	Unit	A1-A3	A4	A5	B2	B3	
GWP-total	kg CO ₂ -eq	1,29E+01	7,06E-01	5,57E+00	0	0	
GWP-fossil	kg CO ₂ -eq	2,08E+01	7,05E-01	5,26E-02	0	0	
GWP-biogenic	kg CO ₂ -eq	-8,70E+00	3,02E-04	5,52E+00	0	0	
GWP-luluc	kg CO ₂ -eq	7,90E-01	2,15E-04	1,74E-05	0	0	
ODP	kg CFC11 -eq	1,15E-06	1,70E-07	1,11E-08	0	0	
AP	mol H+ -eq	1,67E-01	2,27E-03	2,49E-04	0	0	
EP-FreshWater	kg P -eq	1,92E-03	5,61E-06	4,32E-07	0	0	
EP-Marine	kg N -eq	9,13E-02	4,97E-04	8,23E-05	0	0	
EP-Terrestrial	mol N -eq	5,54E-01	5,55E-03	8,91E-04	0	0	
POCP	kg NMVOC -eq	6,60E-02	2,18E-03	2,56E-04	0	0	
ADP-minerals&metals ¹	kg Sb -eq	3,03E-04	1,26E-05	1,28E-06	0	0	
ADP-fossil ¹	MJ	2,74E+02	1,15E+01	7,35E-01	0	0	
WDP ¹	m ³	3,51E+03	8,79E+00	9,32E-01	0	0	

Indicator	Unit	B4	C1	C2	C3	C4	D
GWP-total	kg CO ₂ -eq	0	0	1,88E-01	1,99E+01	8,74E-03	-7,49E-01
GWP-fossil	kg CO ₂ -eq	0	0	1,87E-01	7,21E+00	8,74E-03	-7,23E-01
GWP-biogenic	kg CO ₂ -eq	0	0	7,76E-05	1,27E+01	4,20E-06	-1,49E-03
GWP-luluc	kg CO ₂ -eq	0	0	6,67E-05	7,50E-05	1,44E-06	-2,49E-02
ODP	kg CFC11 -eq	0	0	4,25E-08	3,82E-08	1,09E-09	-5,27E-02
AP	mol H+ -eq	0	0	5,39E-04	3,70E-03	3,32E-05	-5,95E-03
EP-FreshWater	kg P -eq	0	0	1,50E-06	4,14E-06	1,16E-07	-6,42E-05
EP-Marine	kg N -eq	0	0	1,07E-04	1,89E-03	1,06E-05	-1,95E-03
EP-Terrestrial	mol N -eq	0	0	1,19E-03	1,88E-02	1,20E-04	-2,10E-02
POCP	kg NMVOC -eq	0	0	4,57E-04	4,52E-03	3,33E-05	-5,81E-03
ADP-minerals&metals ¹	kg Sb -eq	0	0	5,18E-06	1,56E-06	5,67E-08	-7,19E-06
ADP-fossil ¹	MJ	0	0	2,83E+00	2,21E+00	8,94E-02	-1,03E+01
WDP ¹	m ³	0	0	2,74E+00	-3,06E+00	7,94E-01	-1,29E+02







GWP-total = Global Warming Potential total; GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption







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

*INA Indicator Not Assessed

1. 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

Remarks to environmental impacts

Additional environmental impact indicators							
Indicator	Unit	A1-A3	A4	A5	B2	B3	
 PM	Disease incidence	1,95E-06	6,48E-08	3,67E-09	0	0	
 IRP ²	kgBq U235 -eq	8,25E-01	5,01E-02	3,15E-03	0	0	
 ETP-fw ¹	CTUe	1,27E+03	8,38E+00	9,81E-01	0	0	
 HTP-c ¹	CTUh	1,13E-07	0,00E+00	2,90E-11	0	0	
 HTP-nc ¹	CTUh	1,36E-05	8,10E-09	1,23E-09	0	0	
 SQP ¹	dimensionless	-3,54E+03	1,31E+01	4,93E-01	0	0	

Indicator	Unit	B4	C1	C2	C3	C4	D
 PM	Disease incidence	0	0	1,15E-08	2,15E-08	4,39E-10	-3,61E-07
 IRP ²	kgBq U235 -eq	0	0	1,24E-02	4,80E-03	4,13E-04	-6,60E-02
 ETP-fw ¹	CTUe	0	0	2,10E+00	1,45E+01	1,53E-01	-5,62E+01
 HTP-c ¹	CTUh	0	0	0,00E+00	7,22E-10	7,00E-12	-1,03E-09
 HTP-nc ¹	CTUh	0	0	2,30E-09	2,75E-08	2,86E-10	-5,39E-08
 SQP ¹	dimensionless	0	0	1,98E+00	3,13E-01	2,43E-01	-6,91E+01

PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Soil Quality (dimensionless)

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

*INA Indicator Not Assessed

1. 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
2. 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.

Resource use								
Indicator		Unit	A1-A3	A4	A5	B2	B3	
	PERE	MJ	3,44E+02	1,44E-01	1,21E-02	0	0	
	PERM	MJ	1,34E+02	0,00E+00	-2,67E+01	0	0	
	PERT	MJ	4,79E+02	1,44E-01	-2,66E+01	0	0	
	PENRE	MJ	2,29E+02	1,15E+01	7,36E-01	0	0	
	PENRM	MJ	5,16E+01	0,00E+00	0,00E+00	0	0	
	PENRT	MJ	2,80E+02	1,15E+01	7,36E-01	0	0	
	SM	kg	1,17E+00	0,00E+00	0,00E+00	0	0	
	RSF	MJ	3,44E-01	5,04E-03	4,02E-04	0	0	
	NRSF	MJ	3,91E-01	1,69E-02	1,66E-03	0	0	
	FW	m ³	1,81E+00	1,30E-03	3,47E-04	0	0	

Indicator		Unit	B4	C1	C2	C3	C4	D
	PERE	MJ	0	0	4,06E-02	9,79E-02	4,58E-03	-6,38E+01
	PERM	MJ	0	0	0,00E+00	-1,08E+02	0,00E+00	0,00E+00
	PERT	MJ	0	0	4,06E-02	-1,08E+02	4,58E-03	-6,38E+01
	PENRE	MJ	0	0	2,83E+00	2,33E+00	8,95E-02	-1,03E+01
	PENRM	MJ	0	0	0,00E+00	-5,16E+01	0,00E+00	0,00E+00
	PENRT	MJ	0	0	2,83E+00	-4,93E+01	8,95E-02	-1,03E+01
	SM	kg	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	RSF	MJ	0	0	1,45E-03	2,41E-03	1,14E-04	-1,12E-02
	NRSF	MJ	0	0	5,19E-03	0,00E+00	3,30E-02	-3,78E+00
	FW	m ³	0	0	3,03E-04	6,19E-03	8,23E-05	-7,69E-02

PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non renewable primary energy excluding non-renewable primary energy 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 resources; SM = Use of secondary materials; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Net use of fresh water

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

*INA Indicator Not Assessed

End of life - Waste							
Indicator		Unit	A1-A3	A4	A5	B2	B3
	HWD	kg	7,05E-01	6,27E-04	0,00E+00	0	0
	NHWD	kg	3,15E+00	9,96E-01	3,25E+00	0	0
	RWD	kg	7,29E-04	7,82E-05	0,00E+00	0	0

Indicator		Unit	B4	C1	C2	C3	C4	D
	HWD	kg	0	0	1,46E-04	0,00E+00	3,46E-01	-4,86E-04
	NHWD	kg	0	0	1,38E-01	1,17E+00	1,00E-01	-2,44E-01
	RWD	kg	0	0	1,93E-05	0,00E+00	8,31E-07	-5,41E-05

HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = 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							
Indicator		Unit	A1-A3	A4	A5	B2	B3
	CRU	kg	0,00E+00	0,00E+00	0,00E+00	0	0
	MFR	kg	8,00E-01	0,00E+00	3,02E+00	0	0
	MER	kg	1,89E-05	0,00E+00	2,27E-01	0	0
	EEE	MJ	1,79E+00	0,00E+00	1,86E-01	0	0
	EET	MJ	2,71E+01	0,00E+00	2,81E+00	0	0

Indicator		Unit	B4	C1	C2	C3	C4	D
	CRU	kg	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	MFR	kg	0	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	MER	kg	0	0	0,00E+00	1,04E+01	0,00E+00	0,00E+00
	EEE	MJ	0	0	0,00E+00	7,54E+00	0,00E+00	0,00E+00
	EET	MJ	0	0	0,00E+00	1,14E+02	0,00E+00	0,00E+00

CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported energy electrical; EET = Exported energy thermal

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

*INA Indicator Not Assessed

Biogenic Carbon Content		
Indicator	Unit	At the factory gate
Biogenic carbon content in product	kg C	3,46E+00
Biogenic carbon content in accompanying packaging	kg C	1,50E+00

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO₂

Additional 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
Electricity, Norway (kWh)	ecoinvent 3.6	24,33	g CO ₂ -eq/kWh

Dangerous substances

No substances given by the REACH Candidate list or the Norwegian priority list are intentionally added to the product.

Indoor environment

Our furniture does not contain any substrates that affect indoor climate.

Additional Environmental Information

Additional environmental impact indicators required in NPCR Part A for construction products							
Indicator	Unit	A1-A3	A4	A5	B2	B3	
GWPIOBC	kg CO ₂ -eq	2,85E+01	7,06E-01	0,00E+00	0	0	
Indicator	Unit	B4	C1	C2	C3	C4	D
GWPIOBC	kg CO ₂ -eq	0	0	1,88E-01	5,94E+00	1,14E-02	-7,38E-01






GWPI-IOBC: Global warming potential calculated according to the principle of instantaneous oxidation. In order to increase the transparency of biogenic carbon contribution to climate impact, the indicator GWP-IOBC is required as it declares climate impacts calculated according to the principle of instantaneous oxidation. GWP-IOBC is also referred to as GWP-GHG in context to Swedish public procurement legislation.

Key Environmental Indicators

Indicator	Unit	A1-A3	A4	A1-C4	A1-D
GWPtotal	kg CO ₂ -eq	12,93	0,71	39,30	38,55
Total energy consumption	MJ	573,62	11,63	591,44	513,47
Amount of recycled materials	%	8,58			

Bibliography

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