



NEPD-nr: 143E

Verified in accordance with ISO14025, § 8.1.4: February 16th, 2010
Valid until: February 16th, 2015

Svein Fossdal

Verification of data:

Independent verification of LCA data and other environmental information in this declaration is performed by Professor Annik Magerholm Fet, Global & Local in accordance with ISO 14025 § 8.1.3.

Verified by:

Annik Magerholm Fet

This declaration has been compiled by:

Siv.Ing. Kjetil Wiig (Savo) and Christofer Skaar (NTNU)

PCR: Product category rules for seating (NPRC003, 2008)

About the EPD:

EPDs from other program operators than EPD-Norge are not necessarily comparable

Key performance indicators

From raw material extraction to used product:

Global warming: 108,34 kg CO₂-Eq.
Energy consumption: 1711,83 MJ
Guarantee period: 5 years

Information about the producer:

EFG European Furniture Group AB
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www.efg.se

Org.no.: 556236-7259

Information about the product: Savo Ikon 3 LN (version with black base and armrests). This EPD also covers the chair Savo Maxikon 3 LN (version with higher back)

Functional unit: Seating produced and maintained for 15 years

Included life cycle stages: This declaration covers environmental impacts from raw material extraction to use and maintenance. The declaration does not cover product disassembly or disposal, and is therefore not comparable to declarations that cover the entire product life cycle (see Table 1 and Figure 6)

Performance year: 2009

Data development year: LCA-data is generated with the aid of GaBi 4 in the period 2008-2009

Assumed market: Europe

Contact person: Kjetil Wiig: (+47) 98 60 30 49

Product specification:

Table 1: Product composition

| Materials | Mass (kg) | Share (%) | Share from contractors with certified EMS | Share of components with environmental declaration | System boundaries (See last page for specification) |
|--------------|--------------|----------------|---|--|---|
| Steel | 4,47 | 23,5 % | | | A-G |
| Aluminium | 5,38 | 28,3 % | | | A-G |
| Other metals | | | | | A-G |
| PUR | 0,98 | 5,1 % | | | A-G |
| Plastic | 8,07 | 42,4 % | | | A-G |
| Wood | | | | | A-G |
| Textile | 0,13 | 0,7 % | | | A-G |
| Cardboard | | | | | A-G |
| Total | 19,03 | 100,0 % | | | |

Resource consumption:

Table 2: Material resource consumption per life cycle stage

| Category | Resource | Raw material production [kg] | Transport [kg] | Production [kg] | Use [kg] | Total [kg] |
|----------------------------------|-----------------------------|------------------------------|----------------|-----------------|-------------|----------------|
| Renewable materials | Air | 283,50 | 0,32 | 7,68 | 0,39 | 291,90 |
| | Other biomass | 0,12 | | | | 0,12 |
| | Water (fresh) | 1121,49 | 0,88 | 8,78 | 0,45 | 1131,60 |
| | Wood | 0,04 | | | 0,00 | 0,04 |
| Non-renewable materials | Aluminum | 4,22 | | | | 4,22 |
| | Clay | 0,01 | | | | 0,01 |
| | Colemanite | 0,25 | | | | 0,25 |
| | Crude oil | 6,94 | 0,85 | 0,03 | | 7,83 |
| | Dolomite | 0,20 | | | | 0,20 |
| | Fluorspar | 0,12 | | | | 0,12 |
| | Hard coal | 13,67 | 0,01 | 0,20 | 0,01 | 13,89 |
| | Heavy spar | 0,04 | 0,01 | | | 0,04 |
| | Inert rock | 136,05 | 0,18 | 2,36 | 0,12 | 138,72 |
| | Iron | 2,34 | | | | 2,34 |
| | Kaolin | 0,45 | | | | 0,45 |
| | Lignite | 5,76 | | 0,01 | | 5,78 |
| | Limestone | 3,29 | | 0,03 | | 3,33 |
| | Manganese | 0,03 | | | | 0,03 |
| | Minerals and ore | 86,89 | 0,08 | 0,44 | 0,02 | 87,43 |
| | Natural gas | 8,62 | 0,07 | 0,09 | 0,01 | 8,79 |
| | Peat | 0,03 | | 0,09 | 0,01 | 0,12 |
| | Phosphorus | 0,02 | | | | 0,02 |
| | Potassium chloride | 0,01 | | | | 0,01 |
| | Quartz sand | 1,86 | | | | 1,86 |
| | Sodium chloride (rock salt) | 2,05 | | | | 2,05 |
| | Soil | 1,05 | | 0,02 | | 1,07 |
| | Sulphur | 0,62 | | | | 0,62 |
| Recycled renewable materials | Water | 25,16 | | | | 25,16 |
| Recycled non-renewable materials | Aluminum | 1,79 | | | | 1,79 |
| | Iron and steel | 0,44 | | | | 0,44 |
| | Other unspecified | 40,70 | | | | 40,70 |
| | Plastics | 4,84 | | | | 4,84 |
| Total | | 1752,59 | 2,41 | 19,74 | 1,01 | 1775,76 |

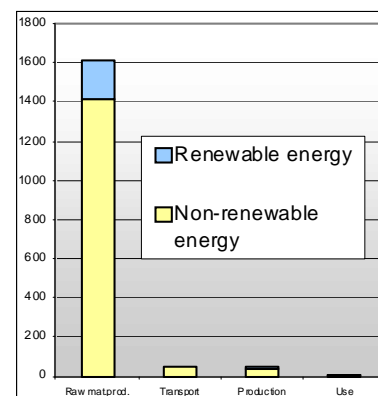
Land use has not been included. Water consumption is included in table 2.

Energy resources:

Table 3: Energy resource consumption (in MJ) per life cycle stage

| Category | Resource | Raw material production | Transport | Production | Use | Total |
|------------------|----------------|-------------------------|--------------|--------------|-------------|----------------|
| Fossile energy | Coal | 450,64 | 0,33 | 5,85 | 0,30 | 457,12 |
| | Fossil oil | 326,80 | 40,12 | 1,56 | 0,08 | 368,56 |
| | Natural gas | 436,61 | 3,35 | 4,98 | 0,26 | 445,21 |
| Nuclear energy | Nuclear energy | 189,66 | 0,22 | 19,56 | 1,00 | 210,43 |
| Renewable energy | Biomass | 2,50 | | | | 2,51 |
| | Hydro | 175,79 | 0,04 | 15,81 | 0,81 | 192,45 |
| | Wind and solar | 21,43 | 0,01 | 2,72 | 0,14 | 24,31 |
| Misc. energy | Miscellaneous | 11,24 | 0,00 | 1,13 | | 11,24 |
| Total | | 1614,68 | 44,08 | 51,61 | 2,58 | 1711,83 |

Figure 2: Energy carriers specified in total MJ used per life cycle stage.



Output and environmental impacts:

Table 4: Environmental impact categories

| | Environmental impact | Unit | Raw material production | Transport | Production | Use |
|---|--------------------------------------|--------------------------------------|-------------------------|-----------|------------|------|
| 1 | Acidification Potential | kg SO ₂ -Eq | 0,55 | 0,10 | | |
| 2 | Eutrophication Potential | kg PO ₄ -Eq | 0,04 | 0,01 | | |
| 3 | Global Warming Potential (100 years) | kg CO ₂ -Eq | 103,60 | 3,22 | 1,45 | 0,07 |
| 4 | Ozone Layer Depletion Potential | kg R11-Eq | | | | |
| 5 | Photochem. Ozone Creation Potential | kg C ₂ H ₄ -Eq | 0,05 | 0,01 | | |

Figure 3: Percent distribution of environmental impact for each cycle phase

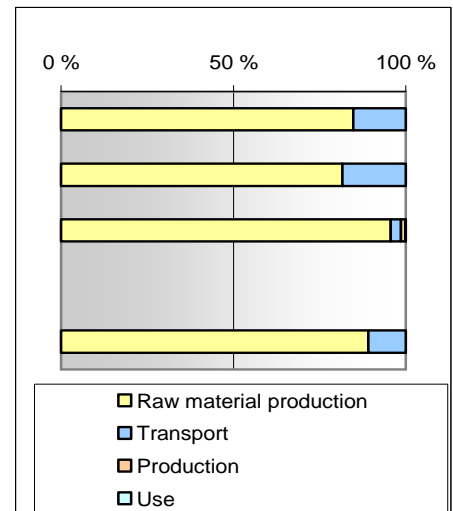


Table 5: Wastes and emissions

| | Wastes and emissions | Raw material production [kg] | Transport [kg] | Production [kg] | Use [kg] | Total [kg] |
|---------------------------|----------------------|------------------------------|----------------|-----------------|----------|------------|
| Wastes | Energy recovery | 0,05 | | | | 0,05 |
| | Material recovery | 15,68 | | | | 15,68 |
| | Hazardous waste | 5,18 | | 0,01 | | 5,19 |
| | Landfill | 139,40 | 0,18 | 2,38 | 0,12 | 142,08 |
| Emissions to air | Carbon dioxide | 86,28 | 3,14 | 1,37 | 0,07 | 90,86 |
| | Carbon monoxide | 0,42 | 0,01 | | | 0,43 |
| | Dioxins | | | | | |
| | Heavy metals | | | | | |
| | Methane | 0,27 | | | | 0,28 |
| | Nitrogen oxides | 0,15 | 0,07 | | | 0,22 |
| | Nitrous oxide | 0,02 | | | | 0,02 |
| | NMVOG | 0,03 | | | | 0,03 |
| | Steam | 123,41 | 0,12 | 4,21 | 0,22 | 127,95 |
| | Sulphur oxides | 0,39 | 0,05 | | | 0,44 |
| Emissions to water | BOD | 0,01 | | | | 0,01 |
| | COD | 0,05 | | | | 0,05 |
| | Dioxins | | | | | |
| | Hydrocarbons | | | | | |
| | Nitrates | 0,01 | | | | 0,01 |
| | Particles | 0,11 | 0,01 | | | 0,11 |
| | Phosphates | | | | | |
| | Waste water | 14,52 | | | | 14,52 |

Additional information

This environmental product declaration has been created according to the product category rules for seating.

The lifetime of an average piece of furniture is estimated to be 15 years according to the PCR. This is the average lifetime in the possession of the first consumer. The furniture will usually have longer technical lifetime.

Environmental issues are included from the start in the development of new Savo chairs. Savo Ikon is constructed in modules to easily adapt to different office environments, and is assembled/disassembled without using special tools. It is not used any screws or nuts in Savo Ikon, which make the chair feel as "tight" as new after many years of use. The textiles and foam, on the other hand, will be worn down. The module construction of the chair makes it possible to change the seat and back easily at your own office. This possibility extends the lifetime of the chair considerably. More than 50% of the plastic in Savo Ikon is recycled material. All parts can be separated, and the plastic parts are also marked according to ISO 11469 for easy recycling.

- Savo Ikon is approved according to EN-1335 (Dimensional, performance and safety requirements for office work chairs used 8 hours a day)
- Savo Ikon is also approved according to BS-5459 (Performance and safety requirements for office work chairs used 24 hours a day for persons weighing up to 150kg)

EFG is ISO-14001 certified.

Treatment of wastes from the final product

Figure 4 and 5 shows the assumed waste management based on the material composition from Table 1. The waste management are based on Norwegian statistics for waste management. This statistics shows an average recycling percentage, while the share of recyclable material in the product is more than 90%.

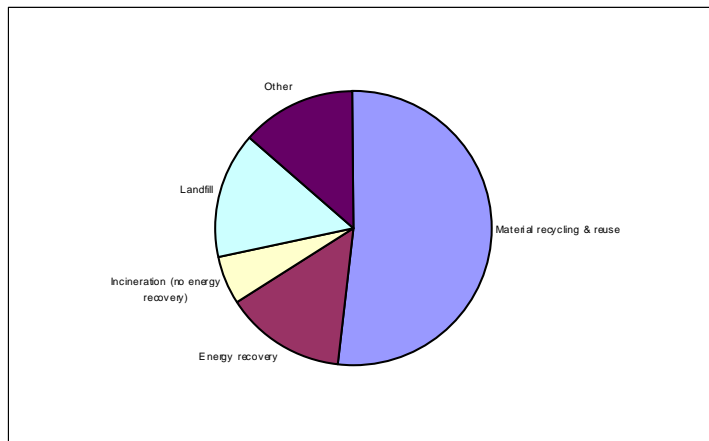


Figure 4: Waste management for Savo Ikon 3LN.

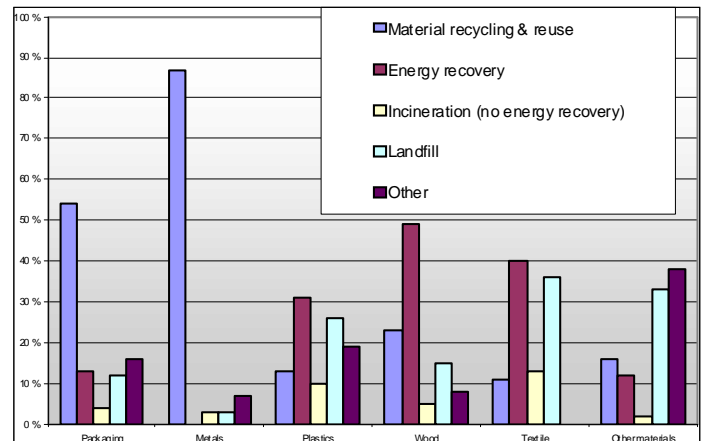


Figure 5: Statistical waste management for different materials [SSB].

Methodological decisions

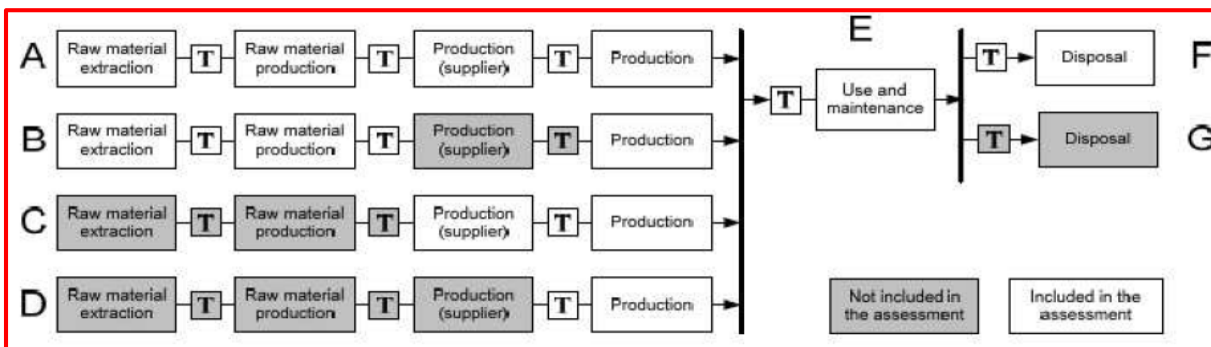


Figure 6: System boundaries. See table 1 for specification of system boundaries for this declaration.

- Cut-off criteria:** Processes and activities that contribute to less than 1 % of the total environmental impact for any impact category can be omitted.
- Use phase:** The use phase are based on vacuum cleaning every second year for 15 years. (A total of 1,125 MJ)
The transport to the market/customer (before the use phase) is also included in this declaration, and is set to an average of 500km
- Disposal phase:** Not included (see previous page and above for waste management)
- Allocation rules:** For virgin resources are raw materials and production processes included. The recycling process is included for input of recycled resources. Where economic allocation has not been possible, the allocation has been based on production volume. Detailed information on allocation is available in the documentation for the Norwegian Furniture Database.

References

- EFG LCA Report v1 - Global & Local Report #1 - 2010 (January 2010)
NPCR003 Product Category Rules for Seating solution, 2008