Environmental declaration
Nordic timber industry
Nr. 310181/3 Norwegian Institute of Wood Technology

NorDan®
HG Fully reversible

MANUFACTURER

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Environmental information

NorDan use timber material sourced from PEFC and/or FSC approved suppliers, and have their own PEFC chain of custody certificate.

PRODUCT

An environmental audit has been carried out on a fully reversible window M12×M12. It is outward opening sash and includes double glazing with argon gas insulation, vacuum impregnated sash and frame and is factory pre-finished.

Technical properties

Technical property details and cross section drawings are available in NorDan's technical manual.

Inventory	kg/window
Glass	20,0
Pine, impregnated profile [1)]	15,7
Aluminium	1,1
Steel	0,01
Galvanized steel	0,44
Chromated steel	2,23
PVAC-glue	0,015
Polymer [3)]	0,064
PVC	0,197
Surface finish [2)]	0,55
EPDM	0,44
Sikaflex	0,04
Polysulphide [4)]	0,28

Packaging	kg/window
Wood	1,23
Steel	0,12
Stretch plastic	0,06

1) Gori vac TH102
2) US-GRUND/US a-55 NCS S0502Y
3) POM
4) Terostat 998 R90, 2 komp.
5) POM

PRODUCTION

Wood

Sawn pine is mostly obtained from Nordic forests. All production timber is procured from sustainable forests. The wood is sawn and dried to approx.12 % before it is delivered to NorDan.

Glass

The main raw material of glass comes from rich natural resources. Apart from the environmental impact related to energy use, process-related wastes arise from raw materials used in the glass. Glass arrives at NorDan in large sheets, which is cut to production sizes.

Factory

At the factory the wood is profiled and prepared. Then windows are vacuum impregnated, prefinished and finally assembled. The factory produce their own sealed units, which are inserted into products immediately before the final stage of packaging.

NorDan has changed from using wet- to a drybox-systems for painting of products. This contributes to less degassing and a reduction of hazardous waste, both environmental profits for NorDan.

USE

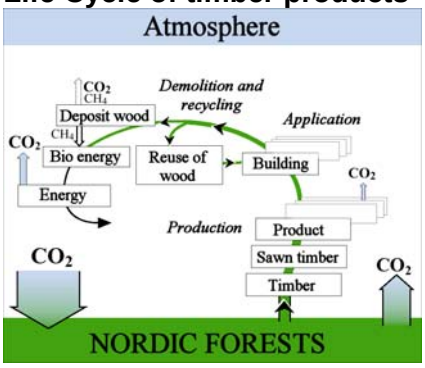
Lifetime

The lifetime of the window depends on the quality of installation and detail, the degree of exposure, humidity controls in the building and maintenance. Life expectancy for the window is minimum 30 years. NorDan provides a 10-year guarantee.

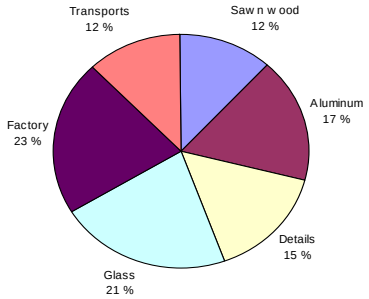
Energy in the household

U-value describes the window insulation properties. Lower U-values offer better utilisation of energy. The energy flux through a window and

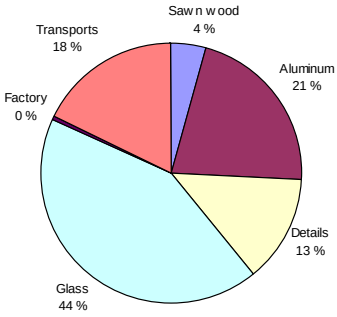
Life Cycle of timber products



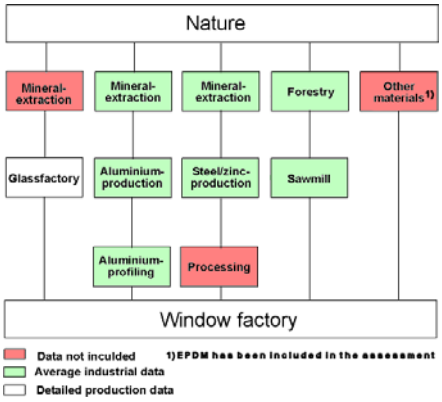
Contribution to Energy use



Contribution to global warming, GWP 100



In-data in environmental profile



the method of energy generation has the biggest environmental impacts if the total life cycle of the product is considered.

Residential environment

The window has many functions in a dwelling. Most important is to allow light in and to provide an outlook. At the same time keeping unpleasant weather out so that the dwelling is warm and dry inside. Sound insulation is important in areas with heavy noise.

RECYCLING

Packaging

All packaging components can be returned to an approved waste treatment centre and recycled.

Reuse

A timber window is a product that can be repaired and maintained 100%, thus extending its useful lifetime with a positive environmental contribution.

Recycling

Aluminium, glass and steel /zinc mountings have good potential for material recycling. Sash and frame can be recycled for instance as a base material for producing insulating boards or energy efficient flooring.

Energy recovery

Polymer materials, such as plastics and rubbers, can be used for energy production. Burning wood for heat does not affect global warming provided that it originates from sustainable forests.

Land-fill

Glass waste is collected from NorDan and recycled. Glass can be deposited on an approved land-fill. The remaining components should be reused or recycled/energy recycled.

ENVIRONMENTAL PROFILE

The environmental profile applies to a fully reversible window M12×M12, produced by NorDan AS at Otta. The inventory starts at resource outtake and ends at factory gate. Packaging is not included.

Emission to air	g/window
Dust	52
CO_2	39 900
CO	202
VOC	417
NO_x	306
SO_2	136
Terpenes	26
Methane	28
PAH	0,09
HCl	1,0

Emission to water	g/window
COD	1,6
Total-N	0,8
Total-P	0,2
Dissolved substances	11
Suspended substances	8,8
Metals	5,1

Emission to ground	g/window
Slag and ash	1310
Industrial waste	1000
Dangerous waste	60

Energy use	MJ/window
Hydro power	305
Bio energy	86
Diesel	23
Oil	27
Natural gas	139
Propane	99
Coal	115

Primary resource use	kg/window
Raw oil	6,1
Coal	4,2
Natural gas	4,2
Round wood	45
Bauxite	4,7
Iron ore	2,7
Zinc ore	0,1
Limestone	1,3

Profile comments

- Certain window components have not been included from resource outtake to production. These materials contribute to less than 1 % of the weight.
- Summary of data used can be found in a background report (in Norwegian only). (4)
- Methodology for the environmental profile appears from report (2) and (5).
- Primary resources used for energy production have also been accounted for under outtake of primary resources (such as crude oil to diesel, oil and gasoline).

ADDITIONAL INFORMATION

Waste plan

NorDan AS has introduced a waste plan for its factory at Otta, Norway.

References

(1) Life Cycle Assessment of Multi-Glazed Windows. Gillian F. Weir, 1999.

(2) Methodology for Wood Based Products, M Erlandson, Trätek 1996.

(3) Environmental Profile Report for the European Aluminum Industry. EAA, 2000

(4) Environmental declarations of windows made by NorDan AS. NTI 2001 (Norwegian only)

(5) Environmental declarations of wood industry products. Nordic Wood 1997 (Norwegian only)

Design and methodology for Environmental Declaration in the Nordic wooden industry have been prepared in a joint Nordic project.

This environmental declaration has been assembled (03-09-2001) by Jarle Svanes, Norwegian Institute of Wood Technology, Telephone 22 96 55 00.