

## ENVIRONMENTAL PRODUCT DECLARATION

in accordance with ISO 14025, ISO 21930 and EN 15804

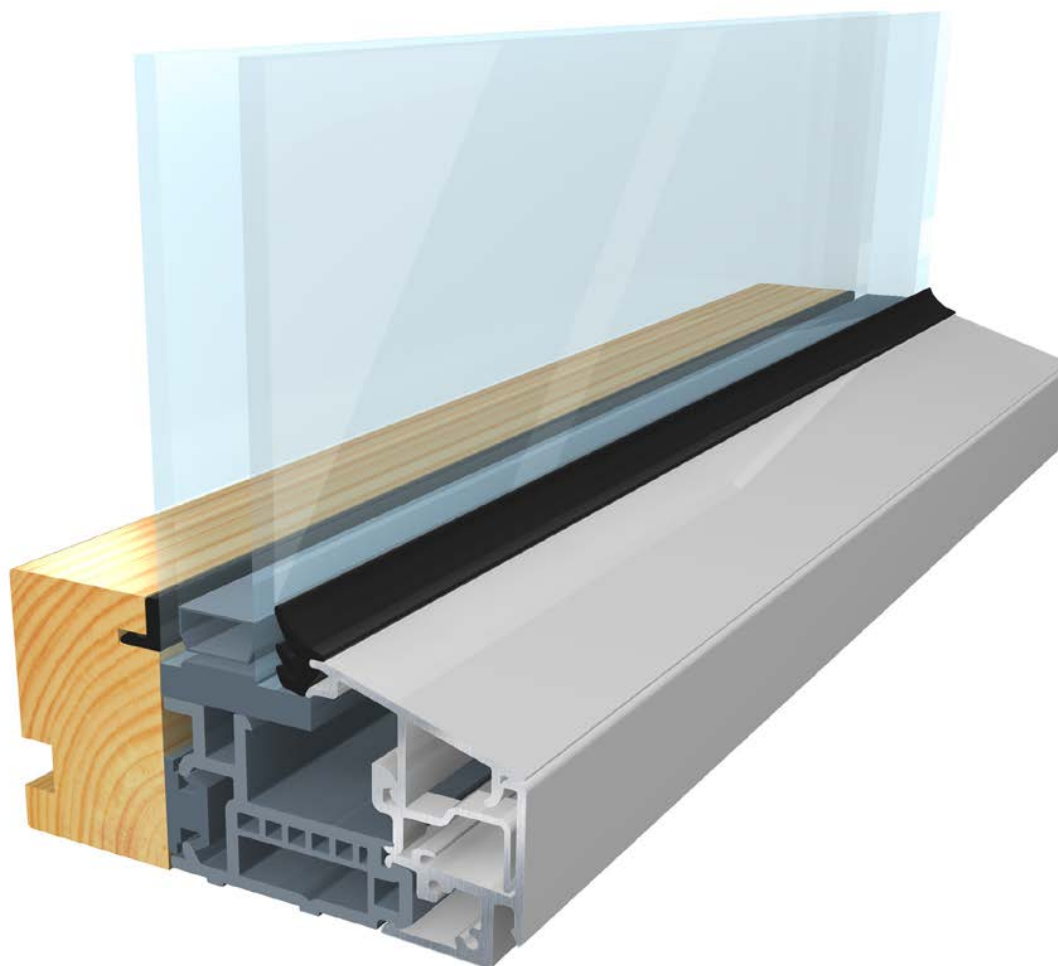
Owner of the declaration	H-vinduet Magnor AS
Program operator	The Norwegian EPD Foundation
Publisher	The Norwegian EPD Foundation
Declaration number	NEPD 00242E
ECO EPD Ref.No.	00000081
Issue date	27.01.2014
Valid to	27.01.2019

H-window 1,23 x 1,48, type AT450E

H-vinduet Magnor AS



[www.epd-norge.no](http://www.epd-norge.no)



## General information

### H-window, 1.23 x 1.48, type AT450E

Product

#### Program holder:

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

#### Declaration number:

BOUOEEG GO

#### This declaration is based on Product Category Rules:

CEN Standard EN 15804 serve as core PCR  
Windows and Doors, NPCR 014 rev1 (2013-2018)

#### Declared unit:

H-window, 1.23 m x 1.48 m type AT450E, with U-value 1.16 W/m<sup>2</sup>K.

#### Declared unit with option:

-

#### Functional unit:

H-window, 1.23 m x 1.48 m, type AT450E, with U-value 1.16 W/m<sup>2</sup>K and an expected service life time of 60 years.

#### The environmental product declaration has been worked out by:

Kari Sørnes,  
SINTEF Byggforsk



#### Verification:

Independent verification of data and other environmental information has been carried out in accordance with ISO14025, 8.1.3.

externally

internally

Christofer Skaar, PhD, MiSA AS  
(Independent verifier approved by EPD Norway)

### H-vinduet Magnor AS

Manufacturer

#### Owner of the declaration:

H-vinduet Magnor AS  
Contact person: Leif Gunnar Borgen  
Phone: +47 982 99 404  
e-mail: [lgb@hvm.no](mailto:lgb@hvm.no)

#### Place of production:

2240 Magnor

#### Management system:

Certified according to NDVK (Norsk Dør- og VindusKontroll)

#### Org. No:

NO 932239000 MVA

#### Issue date:

01.10.2013

#### Valid to:

31.12.2014

#### Comparability:

EPD of construction products may not be comparable if they not comply with EN 15804

#### Year of study:

2013/2014

Approved according to ISO14025, 8.1.4

Dr.ing Sverre Fossdal  
(Chairman of the Verification Group of EPD-Norway)

Declared unit:

H-window, 1.23 m x 1.48 m type AT450E, with U-value 1.16 W/m<sup>2</sup>K.

Key environmental indicators	Unit	Cradle to gate A1 - A3
Global warming	kg CO <sub>2</sub> -eqv	97,4
Energy use	MJ	704,0
Renewable energy use	MJ	272,3
Non-renewable energy use	MJ	279,1
Dangerous substances	*	

Transport to central warehouse Norway
0,95
0,22
0,20
0,01

\* The product contains no substanses from the REACH Candidate list or the Norwegian priority list

## Product

### Product description:

H-window, type AT450E, is a fixed window for installation in exterior walls. The window can be supplied in various widths and heights. Approx. 92% of the window opening is glass. The window frame consists of an outside layer of aluminum, multi-isolator composite material and a layer of wood on the side facing inside.

Different types of glass and dimensions of the interior wood can be used, so that one can get an overall U-value for the whole window of 0.63 W/m<sup>2</sup>K and up. Dimensions presented by the functional unit are put out by PCR and is not the real dimensions that H-vinduet Magnor AS supplies.

### Market:

Norway and parts of Europe

### Reference service life:

60 years

### Technical data:

Weight: 46,5 kg/FU

### Product specification:

Amounts based on allocation rules are given in the table below.

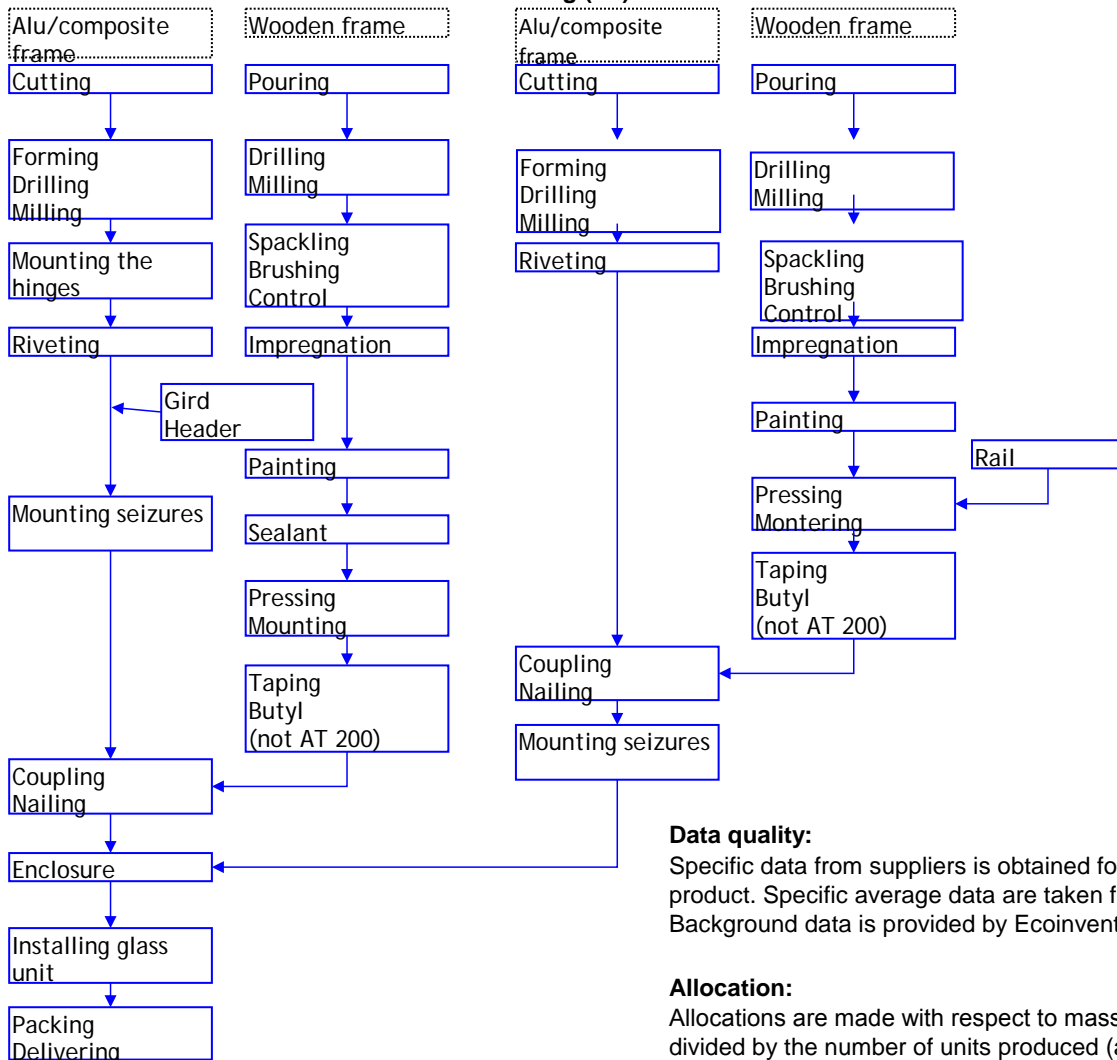
Materials	kg	%
Isolated Glass Unit (IGU)	32,3	69,5
Aluminium profiles (85% rec.)	3,6	7,8
Plastic (PP)	0,4	1,0
EPDM-rubber	0,3	0,6
Impregnant	0,4	0,8
Composite ABS/PVC	3,5	7,6
Pine	6,0	12,8
Paint	0,02	0,0
Glue	0,001	0,0
<b>Total</b>	<b>46,5</b>	<b>100,0</b>

## LCA: Calculation rules

### Functional unit:

H-window, 1.23 m x 1.48 m, type AT450E, with U-value 1.16 W/m<sup>2</sup>K and an expected service life time of 60 years.

### Technical flowsheet related to the manufacturing (A3):



### Data quality:

Specific data from suppliers is obtained for about 85% of the product. Specific average data are taken from the last 1-3 years. Background data is provided by Ecoinvent v2.2.

### Allocation:

Allocations are made with respect to mass: Total consumption divided by the number of units produced (according to PCR)

**Cut-off criteria:** According to PCR

## LCA: Scenarios and additional technical information

The manufacture is located at Magnor, a village in the municipality of Eidskog in Hedmark, Norway. The insulated glass units of Press Glass AS, steel from Stilka Industri AS, aluminum profiles from SAPA Magnor AS and composite from Primo AS, all of which have provided specific data on their production. In addition, pine, painting, impregnating, plastics and adhesives are included in the analysis. Scenarios for A4 to C4 are described below.

### Transport from prouction site to building site (A4)

Type	Capacity utilisation (incl. return) %	Type of vehicle	Distance km	Fuel/Energy consumption	Value (l/t)
Lorry		Diesel, 16-32t, EUR 4	400	3,64 kg/tkm	

### Additional information:

Transport from the production site to the sentral warehouse is 50 km (according to the rules drawn by EPD-Norway).

### End of life (C4)

	Unit	Value
Hazardous waste disposed	kg	
Collected as mixed construction waste	kg	
Reuse	kg	
Recycling	kg	
Energy recovery	kg	
To landfill	kg	54,9

### Maintenance (B2)

	Unit	Value
Detergent pr year (0,5dl each time)	dl	1,5
Water pr year (1 l each time)	l	3

### Transport to waste processing (C2)

Type	Capacity utilisation (incl. return) %	Type of vehicle	Distance km	Fuel/Energy consumption	Value (l/t)
Lorry		Diesel, 16-32t, EUR 4	50	3,64 kg/tkm	

### Installation (A5) and De-construction demolition (C1)

Energy use in the installation (A5) and disassembly (C1) is considered to be small enough to be neglected (using 1% cut-off rule based on PCR). Reason: A typical mounting of a reference window is done manually by lifting the window into the opening. Then it must be adjusted properly in place and screwed with a cordless screwdriver and 4 screws to the wall. When removing it, the same is done just the opposite way, screws are removed or cut across, and the window is lifted out.

## LCA: Results

Under are the system boundaries presented. The life cycle stages which are considered relevant are A1-A4, B2, C2 and C4.

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

System boudaries (X=included, MND=modul not declared, MNR=modul not relevant)																
Product stage			Construction installation stage		Use stage							End of life stage				Beyond the system boundaries
Raw materials	Transport	Manufacturing	Transport	Construction installation stage	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	MIR	MIR	X	MIR	MIR	MIR	MIR	MIR	MIR	X	MIR	X	MID

### Environmental impact

Parameter	A1	A2	A3	A4	B2	C2	C4		
GWP	89,04	7,59	7,93E-01	3,07	6,90	0,38	0,76		
ODP	8,17E-06	1,20E-06	6,96E-08	4,87E-07	5,28E-07	6,08E-08	1,04E-07		
POCP	2,24E-02	9,26E-04	1,52E-04	3,75E-04	6,53E-03	4,69E-05	2,08E-04		
AP	0,50	0,03	3,1E-03	0,01	0,04	0,001	0,00		
EP	0,12	0,01	2,49E-03	0,003	0,02	3,89E-04	0,02		
ADPM	2,12E-04	1,46E-05	2,41E-05	5,93E-06	2,97E-05	7,41E-07	4,18E-07		
ADPE	241,4	0,10	9,92	0,04	0,79	0,01	0,01		

**GWP** Global warming potential (kg CO<sub>2</sub>-eqv.); **ODP** Depletion potential of the stratospheric ozone layer (kg CFC11-eqv.); **POCP** Formation potential of tropospheric photochemical oxidants (kg C<sub>2</sub>H<sub>4</sub>-eqv.); **AP** Acidification potential of land and water (kg SO<sub>2</sub>-eqv.); **EP** Eutrophication potential (kg PO<sub>4</sub><sup>3-</sup>-eqv.); **ADPM** Abiotic depletion potential for non fossil resources (kg Sb -eqv.); **ADPE** Abiotic depletion potential for fossil resources (MJ)

### Resource use

Parameter	A1	A2	A3	A4	B2	C2	C4		
RPEE	202,28	1,62	68,39	0,66	86,73	0,08	0,17		
RPEM	159,46								
TPE	361,74	1,62	68,39	0,66	86,73	0,08	0,17		
NRPE	264,42	0,10	14,60	0,04	8,32	0,01	0,01		
NRPM	115,31								
TRPE	379,73	0,10	14,60	0,04	8,32	0,01	0,01		
SM	3,09								
RSF									
NRSF									
W	194,33	7,05	0,01	2,86	462,44	0,36	10,08		

**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); **TRPE** 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 (m<sup>3</sup>)

### End of life - Waste

Parameter	A1	A2	A3	A4	B2	C2	C4		
HW	0,03								
NHW	0,14		0,36				46,5		
RW									

**HW** Hazardous waste disposed (kg); **NHW** Non hazardous waste disposed (kg); **RW** Radioactive waste disposed (kg)

### End of life - Output flow

Parameter	A1	A2	A3	A4	B2	C2	C4		
CR									
MR			0,36						
MER									
EEE									
ETE									

**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)

Reading example: 9,0 E-03 = 9,0\*10<sup>-3</sup> = 0,009

It is A1 which contribute the most to emissions and energy use. The major emission contributions to A1 are coming from the glass panes (Isolated Glass Units) and the composite material in the frame (mixture of PVC and ABS).

## Specific Norwegian requirements

### Electricity

For the manufacture phase (A3), the Norwegian mean supply electricity mix from 2007-2011 (import included) is used.

GHG emissions: 0,013 kg CO<sub>2</sub> eqv/MJ

### 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 00.01.1900) substances on the Norwegian Priority list (of.00.01.1900) 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.

### Transport fra produksjonssted til sentrallager





Transport from the production site to the sentral warehouse is 50 km (according to the rules drawn by EPD-Norway).

### Indoor environment

No tests has been performed related to indoor environment.

## Bibliography

ISO 14025:2006	<i>Environmental labels and declarations - Type III environmental declarations - Principles and procedures</i>
ISO 14044:2006	<i>Environmental management - Life cycle assessment - Requirements and guidelines</i>
EN 15804:2012	<i>Sustainability of construction works - Environmental product declaration - Core rules for the product category of construction products</i>
ISO 21930:2007	<i>Sustainability in building construction - Environmental declaration of building products</i>
PCR	<i>Windows and Doors, NPCR 014 rev1 (2013-2018)</i>
Report	<i>LCA-report, H-vinduet 1.23 m x 1.48 m Type AT200E, H-vinduet Magnor AS</i>

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