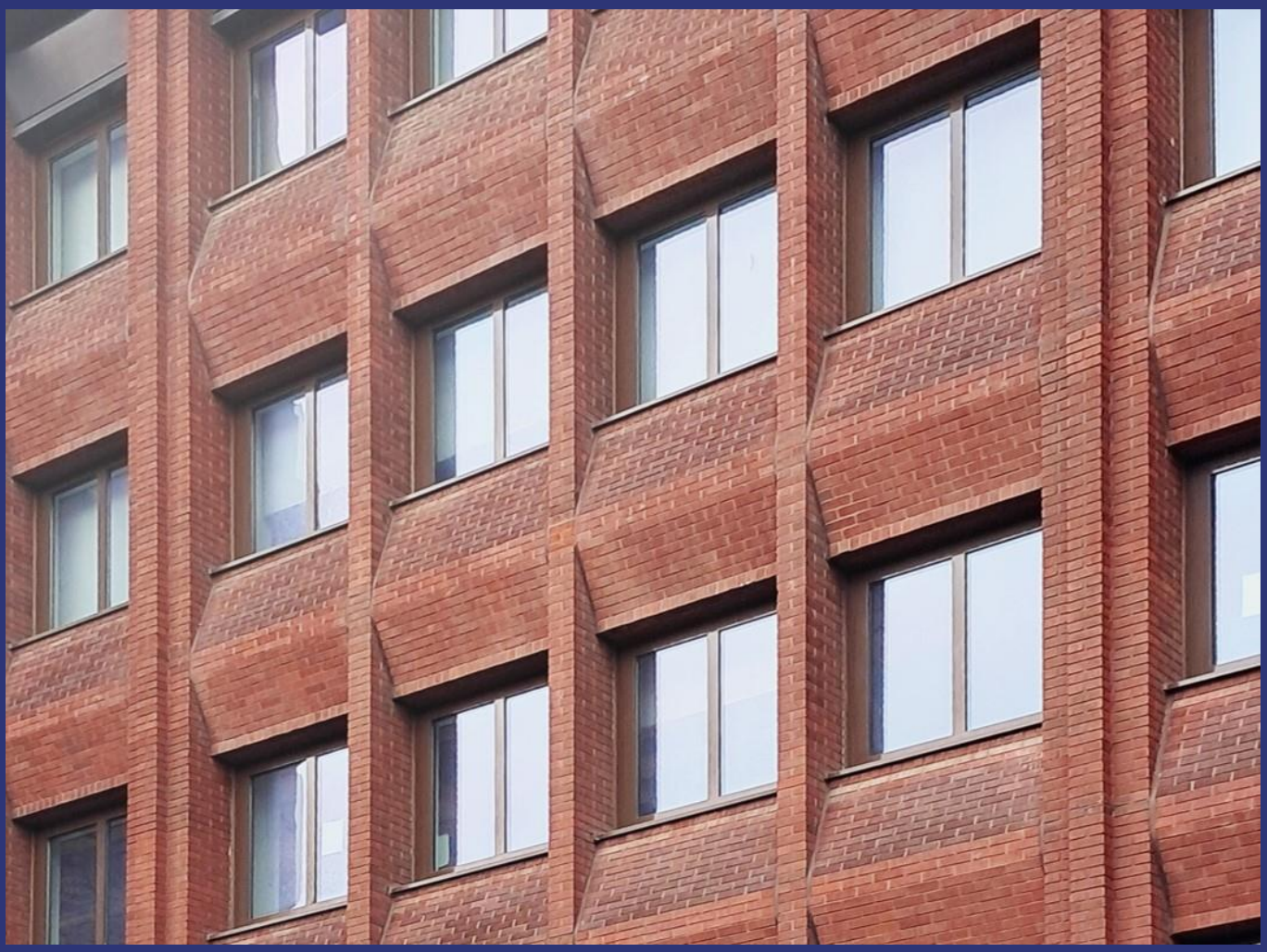
PERMASTEELISA GROUP

Environmental
Product
Declaration

According to ISO14025+EN15804 A2 (+indicators A1)

This declaration is for:
Refurbished window - Circular Facades pilot

Provided by:
Scheldebouw b.v. - Permasteelisa Group



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ECO PLATFORM EPD VERIFIED

Nationale MILIEUDATABASE

MRPI milieu relevante product informatie

PERMASTEELISA GROUP

COMPANY INFORMATION

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MRPI® REGISTRATION

1.1.01036.2025

DATE OF THIS ISSUE

27-11-2025

EXPIRY DATE

27-11-2030

SCOPE OF DECLARATION

This MRPI®-EPD certificate is verified by B. Roijen, SGS INTRON b.v.. The LCA study has been done by L. Ceyhan-van Munster, Nibe b.v.. The certificate is based on an LCA-dossier according to ISO14025+EN15804 A2 (+indicators A1). It is verified according to the 'Verification protocol for MRPI LCA project report & EPD 21th of May 2025, V. 5.2'. EPDs of construction products may not be comparable if they do not comply with EN15804+A2. Declaration of SVHC that are listed on the 'Candidate list of Substances of Very High Concern for authorisation' when content exceeds the limits for registration with ECHA.

PROGRAM OPERATOR

Stichting MRPI®
Kingsfordweg 151
1043 GR
Amsterdam

PRODUCT

Refurbished window - Circular Facades pilot

DECLARED UNIT / FUNCTIONAL UNIT

1 Piece

DESCRIPTION OF PRODUCT

One refurbished window of 5-7 years old with a size of 1660 x 1717 mm, sourced form a high-end project in London.

VISUAL PRODUCT

MORE INFORMATION

https://scheldebouw.permasteelisagroup.com

Ing. L. L. Oosterveen MSc. MBA Managing Director MRPI	DEMONSTRATION OF VERIFICATION
	CEN standard EN15804 serves as the core PCR [1]
	Independent verification of the declaration and data according to ISO14025+EN15804 A2 (+indicators A1) Internal: External: X
	Third party verifier: B. Roijen, SGS INTRON b.v.
	[1] PCR = Product Category Rules

DETAILED PRODUCT DESCRIPTION

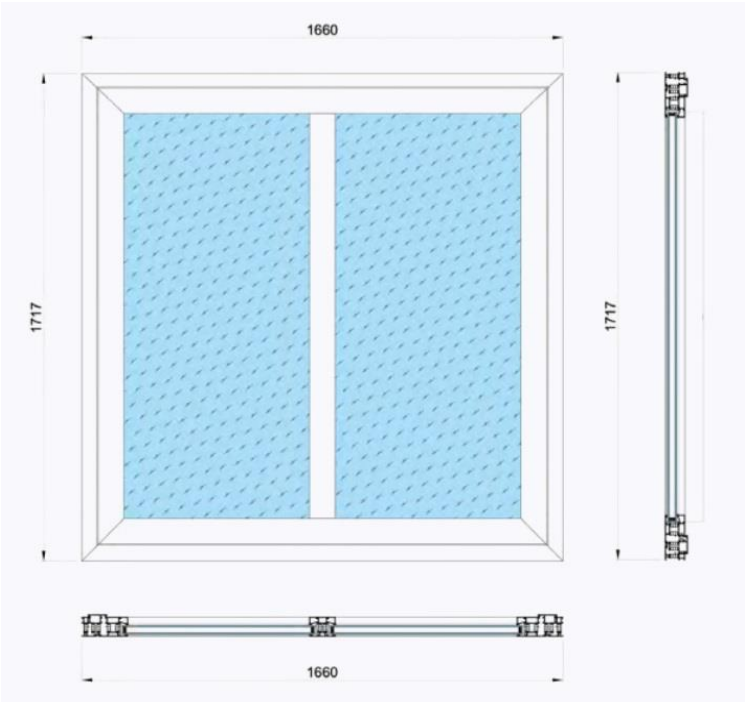
One refurbished window of 5-7 years old with the size (w x h) 1660 x 1717 mm and the following performance:

Thermal insulation:
Uw = 1.6 W/m2K
Ug = 1.2 W/m2K

Acoustic insulation:
Glazing: Rw (C;Ctr) = 35 (-2;-5) dB
Window: Rw (C;Ctr) = 32 (-2;-6) dB

Tightness:
Air permeability: Class 4
Water tightness: Class 4A

Glazing properties:
Lt = 70%
g-value = 34%



DETAILED PRODUCT DESCRIPTION

The reference service life (RSL) of the product and its constituent parts in the LCA is based on the estimated service life, as defined in BS ISO 15686-1, which Permasteelisa Group provides to the client in their general guarantees and warranties schedule.

The standard reference service life of windows and facades for Permasteelisa Group is 60 years. This means that after a service life of 5 years, a remaining service life of > 50 years can be assumed in line with the PCR for windows. Glazing and gaskets need to be replaced after 30 years due to aging of the materials, of which 25 years remain for the glazing. Both will be replaced once during the remaining service life of 50 years.

In the software R<THINK the replacement of these parts is accounted for in life cycle stage B3. (In other software packages this might be stage B4.) The complete end-of-life treatment of the replaced component and the production and installation of the new component are accounted for in this stage, multiplied by the number of replacement cycles. Unpredictable repair and replacement due to incidents is not taken into account in the EPD.

Product part	RSL
Laminated double glazing	25 years
EPDM gaskets	25 years
All other parts	50 years

Material	Original mass [kg]	Replaced mass [kg]
Laminated double glazing (6-20-33.1)	59,3	
Aluminium profiles, powdercoated	30,4	
Thermal breaks	5,4	
EPDM gaskets	2	4
Fasteners and iron mongory (stainless steel)	2,9	
Sealant	0,3	
Total	100,3	102,3

SCOPE AND TYPE

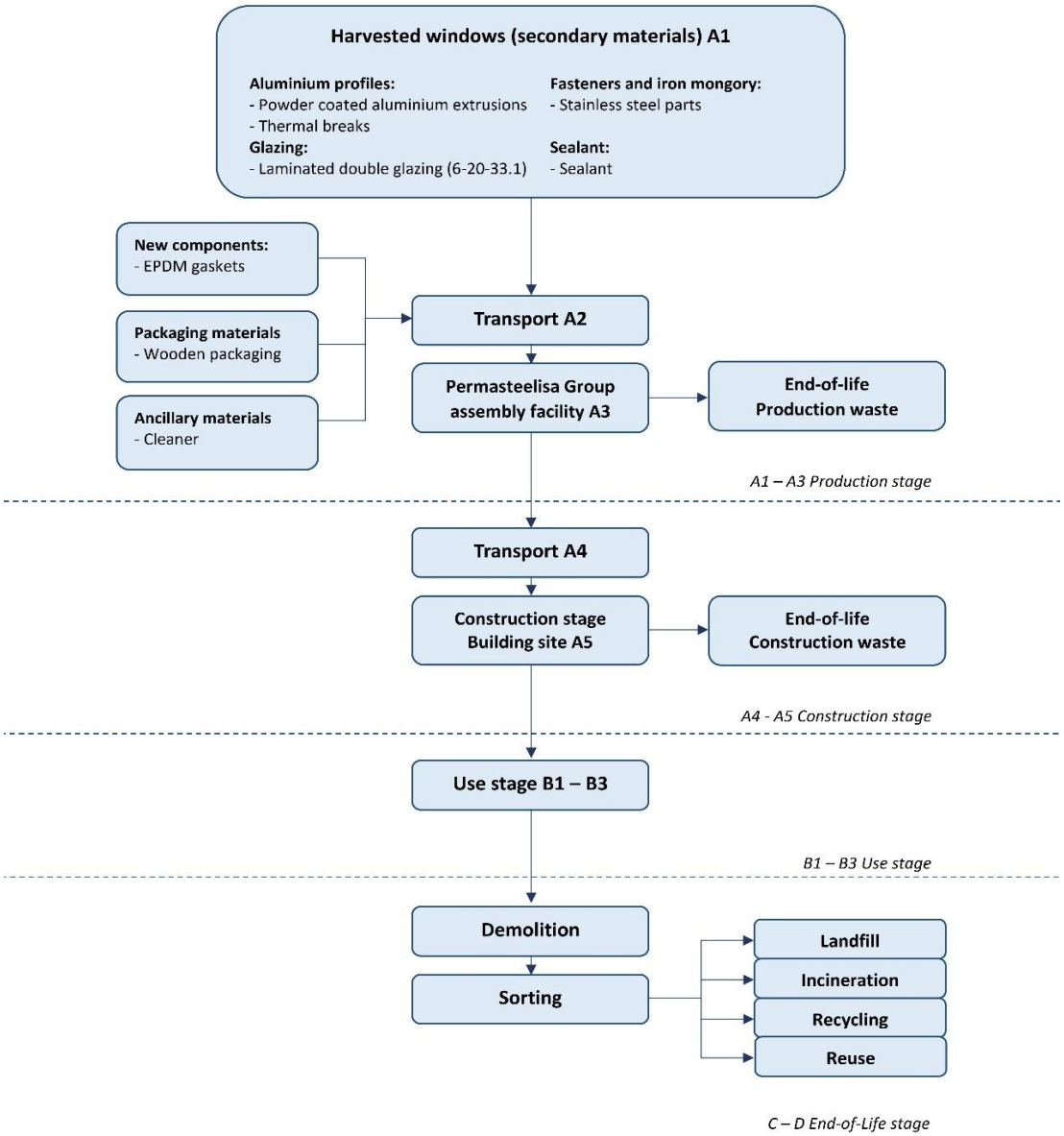
The input data are representative for the Refurbished Window as part of the Circular Facades pilot project by Scheldebouw B.V. in Middelburg, The Netherlands. The data are derived from the standard assumptions of our organisation's new-built EPDs and this specifically conducted case study. The Dutch predefined waste / end-of-life scenarios are used, because they are deemed most representative.

LCA method R<THINK: NMD Determination method v1.2 | set 1+2
LCA software**: Simapro 9.6
Characterisation method: Bepalingsmethode 'set1', 'set 2'& param (NMD 3.4) v1.00
LCA database profiles: EcoInvent version 3.9.1 (version 3.6 for set 1)
Version database: v3.20b (2025-11-18)
(**) Used for calculating the characterised results of the environmental profiles within R<THINK.

PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARIES
Raw material supply	Transport	Manufacturing	Transport gate to site	Assembly	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	x	x	x	x	ND	ND	ND	ND	x	x	x	x	x

X = Modules Assessed

ND = Not Declared



REPRESENTATIVENESS

The input data are representative for the Refurbished Window as part of the Circular Facades pilot project by Scheldebouw B.V. in Middelburg, The Netherlands.

ENVIRONMENTAL IMPACT per functional unit or declared unit (indicators A1)

	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
ADPE	kg Sb eq.	4,19E-03	4,44E-05	1,25E-03	5,49E-03	9,09E-05	5,38E-04	0,00E+00	2,36E-04	1,09E-02	ND	ND	ND	ND	2,11E-05	2,40E-05	1,82E-04	1,12E-06	1,17E-01
ADPF	MJ	2,98E+02	2,87E+01	1,02E+03	1,34E+03	5,44E+01	1,32E+03	0,00E+00	9,51E+01	2,14E+03	ND	ND	ND	ND	8,07E+01	1,44E+01	7,94E+01	3,35E+00	-9,79E+01
GWP	kg CO2 eq.	9,57E+00	1,92E+00	6,14E+01	7,29E+01	3,56E+00	8,53E+01	0,00E+00	1,70E+01	1,55E+02	ND	ND	ND	ND	5,16E+00	9,39E-01	3,21E+01	2,80E-01	-2,87E+00
ODP	kg CFC11 eq.	2,20E-06	3,37E-07	4,65E-06	7,19E-06	6,31E-07	4,54E-06	0,00E+00	9,65E-07	2,04E-05	ND	ND	ND	ND	2,55E-07	1,67E-07	9,47E-07	3,68E-08	-7,77E-07
POCP	kg ethene eq.	1,25E-02	1,35E-03	5,39E-02	6,78E-02	2,15E-03	1,78E-02	0,00E+00	5,99E-03	7,39E-02	ND	ND	ND	ND	7,68E-04	5,67E-04	3,27E-03	1,45E-04	-8,35E-03
AP	kg SO2 eq.	4,71E-02	1,41E-02	1,90E-01	2,51E-01	1,56E-02	1,79E-01	0,00E+00	3,77E-02	9,25E-01	ND	ND	ND	ND	9,66E-03	4,13E-03	3,72E-02	8,53E-04	-4,10E-02
EP	kg (PO4) 3 eq.	5,59E-03	2,18E-03	4,09E-02	4,86E-02	3,07E-03	3,74E-02	0,00E+00	2,30E-02	9,67E-02	ND	ND	ND	ND	1,99E-03	8,11E-04	4,70E-03	1,94E-04	-2,26E-02

Toxicity indicators and ECI (Dutch market)

HTP	kg DCB eq.	4,40E+00	8,46E-01	5,73E+01	6,25E+01	1,50E+00	1,34E+01	0,00E+00	5,50E+00	7,48E+01	ND	ND	ND	ND	5,80E-01	3,95E-01	7,04E+00	6,18E-02	-2,23E-01
FAETP	kg DCB eq.	9,80E-02	2,28E-02	2,55E+00	2,67E+00	4,37E-02	3,66E-01	0,00E+00	3,38E+01	1,31E+00	ND	ND	ND	ND	1,60E-02	1,15E-02	2,22E-01	1,12E-02	3,35E-01
MAETP	kg DCB eq.	3,34E+02	8,48E+01	1,26E+03	1,68E+03	1,57E+02	1,21E+03	0,00E+00	2,58E+02	5,54E+03	ND	ND	ND	ND	6,75E+01	4,15E+01	5,10E+02	1,41E+01	6,82E+02
TETP	kg DCB eq.	1,48E-02	2,90E-03	6,92E-01	7,10E-01	5,30E-03	4,30E-01	0,00E+00	1,50E+01	2,36E-01	ND	ND	ND	ND	2,63E-02	1,40E-03	1,68E-02	1,80E-04	-1,89E-02
ECI	euro	1,20E+00	2,63E-01	9,78E+00	1,12E+01	4,29E-01	6,82E+00	0,00E+00	3,66E+00	2,00E+01	ND	ND	ND	ND	3,83E-01	1,13E-01	2,50E+00	2,70E-02	-4,59E-01
ADPF	kg Sb eq.	1,43E-01	1,38E-02	4,89E-01	6,46E-01	2,62E-02	6,34E-01	0,00E+00	4,58E-02	1,03E+00	ND	ND	ND	ND	3,88E-02	6,91E-03	3,82E-02	1,61E-03	-4,71E-02

ADPE = Abiotic Depletion Potential for non-fossil resources
ADPF = Abiotic Depletion Potential for fossil resources
GWP = Global Warming Potential
ODP = Depletion potential of the stratospheric ozone layer
POCP = Formation potential of tropospheric ozone photochemical oxidants
AP = Acidification Potential of land and water
EP = Eutrophication Potential
HTP = Human Toxicity Potential
FAETP = Fresh water aquatic ecotoxicity potential
MAETP = Marine aquatic ecotoxicity potential
TETP = Terrestrial ecotoxicity potential
ECI = Environmental Cost Indicator
ADPF = Abiotic Depletion Potential for fossil resources

ENVIRONMENTAL IMPACT per functional unit or declared unit (core indicators A2)

	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP-total	kg CO2 eq.	1,02E+01	2,13E+00	-7,45E+01	-6,22E+01	3,96E+00	1,92E+02	0,00E+00	1,80E+01	1,55E+02	ND	ND	ND	ND	3,95E+00	1,05E+00	3,24E+01	3,07E-01	-2,85E+00
GWP-fossil	kg CO2 eq.	1,02E+01	2,13E+00	4,86E+01	6,09E+01	3,95E+00	6,59E+01	0,00E+00	1,40E+01	1,54E+02	ND	ND	ND	ND	3,94E+00	1,04E+00	3,22E+01	3,07E-01	-2,84E+00
GWP-biogenic	kg CO2 eq.	2,34E-02	6,57E-04	-1,25E+02	-1,25E+02	1,29E-03	1,26E+02	0,00E+00	3,23E-02	7,78E-01	ND	ND	ND	ND	7,68E-03	3,39E-04	1,64E-01	2,45E-04	6,66E-03
GWP-luluc	kg CO2 eq.	8,22E-03	6,79E-03	1,75E+00	1,77E+00	1,41E-02	8,28E-02	0,00E+00	3,97E+00	1,85E-01	ND	ND	ND	ND	1,49E-03	3,71E-03	9,77E-03	7,19E-05	-2,20E-02
ODP	kg CFC11 eq.	2,78E-07	3,71E-08	1,34E-06	1,66E-06	7,02E-08	2,05E-06	0,00E+00	4,22E-07	7,71E-06	ND	ND	ND	ND	1,24E-07	1,85E-08	4,35E-07	4,32E-09	-5,80E-07
AP	mol H+ eq.	4,75E-02	1,72E-02	1,80E-01	2,44E-01	1,89E-02	1,78E-01	0,00E+00	5,10E-02	1,04E+00	ND	ND	ND	ND	9,11E-03	4,99E-03	4,35E-02	1,01E-03	-8,25E-02
EP-fresh water	kg P eq.	3,22E-04	1,95E-05	3,10E-03	3,44E-03	3,93E-05	2,67E-03	0,00E+00	5,60E-04	4,08E-03	ND	ND	ND	ND	1,64E-04	1,04E-05	2,23E-04	2,01E-06	-3,87E-04
EP-marine	kg N eq.	7,82E-03	5,45E-03	5,72E-02	7,05E-02	7,18E-03	4,50E-02	0,00E+00	4,20E-02	1,92E-01	ND	ND	ND	ND	1,91E-03	1,90E-03	8,91E-03	4,45E-04	-2,64E-02
EP-terrestrial	mol N eq.	8,44E-02	5,90E-02	5,56E-01	6,99E-01	7,66E-02	5,20E-01	0,00E+00	1,80E-01	2,21E+00	ND	ND	ND	ND	2,27E-02	2,02E-02	9,94E-02	4,18E-03	-5,37E-01
POCP	kg NMVOC eq.	5,64E-02	1,85E-02	2,27E-01	3,01E-01	2,62E-02	1,58E-01	0,00E+00	3,27E-02	6,96E-01	ND	ND	ND	ND	6,89E-03	6,90E-03	3,17E-02	1,63E-03	-7,15E-02
ADP-minerals & metals	kg Sb eq.	1,55E-04	6,05E-06	3,20E-04	4,81E-04	1,24E-05	5,76E-04	0,00E+00	8,12E-05	1,08E-03	ND	ND	ND	ND	3,57E-05	3,26E-06	1,98E-04	2,15E-07	2,53E-03
ADP-fossil	MJ, net calorific value	3,09E+02	2,99E+01	7,39E+02	1,08E+03	5,65E+01	9,45E+02	0,00E+00	9,56E+01	2,02E+03	ND	ND	ND	ND	5,70E+01	1,49E+01	7,92E+01	3,45E+00	-6,76E+01
WDP	m3 world eq. Deprived	6,22E+00	1,52E-01	1,52E+01	2,16E+01	3,09E-01	9,49E+00	0,00E+00	8,61E+00	3,85E+01	ND	ND	ND	ND	5,46E-01	8,15E-02	1,54E+00	3,86E-02	2,05E+01

GWP-total	=	Global Warming Potential total
GWP-fossil	=	Global Warming Potential fossil fuels
GWP-biogenic	=	Global Warming Potential biogenictotal
GWP-luluc	=	Global Warming Potential land use and land use change
ODP	=	Depletion potential of the stratospheric ozone layer
AP	=	Acidification Potential, Accumulated Exceedence
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 Exceedence
POCP	=	Formation potential of tropospheric ozone photochemical oxidants
ADP-minerals & metals	=	Abiotic Depletion Potential for non-fossil resources [1]
ADP-fossil	=	Abiotic Depletion for fossil resources potential [1]
WDP	=	Water (user) deprivation potential, deprivation-weighted water consumption [1]

Disclaimer [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 experience with the indicator.

ENVIRONMENTAL IMPACT per functional unit or declared unit (additional indicators A2)

	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PM	Disease inci-dence	6,83E-07	1,90E-07	2,47E-06	3,35E-06	3,90E-07	1,11E-06	0,00E+00	7,12E-07	1,19E-05	ND	ND	ND	ND	4,15E-08	1,03E-07	6,56E-07	2,26E-08	-1,38E-06
IRP	kBq U235 eq.	4,62E-01	1,10E-02	1,46E+00	1,93E+00	2,21E-02	2,10E+00	0,00E+00	1,82E-01	4,09E+00	ND	ND	ND	ND	1,30E-01	5,82E-03	2,21E-01	2,07E-03	2,67E-01
ETP-fw	CTUe	1,14E+02	2,12E+01	3,06E+02	4,41E+02	4,17E+01	1,90E+02	0,00E+00	2,07E+02	1,21E+03	ND	ND	ND	ND	9,25E+00	1,10E+01	2,00E+02	9,65E+00	4,68E+02
HTP-c	CTUh	5,00E-09	1,10E-09	1,71E-07	1,77E-07	2,09E-09	4,61E-08	0,00E+00	1,93E-08	9,79E-08	ND	ND	ND	ND	1,31E-09	5,52E-10	9,26E-09	7,70E-11	2,07E-08
HTP-nc	CTUh	1,12E-07	2,22E-08	5,47E-07	6,82E-07	4,54E-08	8,23E-07	0,00E+00	2,88E-07	1,76E-06	ND	ND	ND	ND	4,78E-08	1,20E-08	2,57E-07	1,25E-09	5,94E-07
SQP	-	4,27E+01	2,11E+01	1,09E+04	1,10E+04	4,46E+01	5,48E+02	0,00E+00	3,19E+02	6,46E+02	ND	ND	ND	ND	1,23E+01	1,18E+01	6,50E+01	6,78E+00	-2,50E+03

PM = Potential incidence of disease due to PM emissions
IRP = Potential Human exposure efficiency relative to U235 [1]
ETP-fw = Potential Comparative Toxic Unit for ecosystems [2]
HTP-c = Potential Comparative Toxic Unit for humans, cancer [2]
HTP-nc = Potential Comparative Toxic Unit for humans, non-cancer [2]
SQP = Potential soil quality index [2]

Disclaimer [1]:

- 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.

Disclaimer [2]:

- 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 experience with the indicator.

OUTPUT FLOWS AND WASTE CATEGORIES per functional unit or declared unit (A1 en A2)

	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
HWD	kg	8,63E-04	1,86E-04	2,78E-03	3,82E-03	3,61E-04	8,82E-03	0,00E+00	4,31E-04	1,17E-02	ND	ND	ND	ND	1,84E-04	9,51E-05	1,89E-01	1,61E-05	2,21E-01
NHWD	kg	7,84E-01	1,76E+00	9,35E+00	1,19E+01	3,74E+00	8,01E+01	0,00E+00	4,03E+01	5,79E+01	ND	ND	ND	ND	2,09E-01	9,86E-01	1,32E+01	2,02E+01	1,32E+00
RWD	kg	3,56E-04	6,43E-06	1,21E-03	1,57E-03	1,29E-05	1,84E-03	0,00E+00	1,48E-04	3,07E-03	ND	ND	ND	ND	1,14E-04	3,41E-06	1,67E-04	1,23E-06	1,70E-04
CRU	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	kg	0,00E+00	0,00E+00	3,00E-02	3,00E-02	0,00E+00	6,06E+00	0,00E+00	0,00E+00	4,30E+01	ND	ND	ND	ND	0,00E+00	0,00E+00	7,32E+01	0,00E+00	0,00E+00
MER	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EEE	MJ	0,00E+00	0,00E+00	2,50E+00	2,50E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,04E+02
ETE	MJ	0,00E+00	0,00E+00	4,30E+00	4,30E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,51E+02

HWD = Hazardous Waste Disposed
NHWD = Non Hazardous Waste Disposed
RWD = Radioactive Waste Disposed
CRU = Components for reuse
MFR = Materials for recycling
MER = Materials for energy recovery
EEE = Exported Electrical Energy
ETE = Exported Thermal Energy

RESOURCE USE per functional unit or declared unit (A1 and A2)

	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	MJ	1,41E+01	3,98E-01	1,01E+03	1,03E+03	7,99E-01	1,89E+02	0,00E+00	1,70E+02	1,40E+02	ND	ND	ND	ND	1,02E+01	2,11E-01	8,72E+00	9,24E-02	-6,01E+02
PERM	MJ	0,00E+00	0,00E+00	1,05E+03	1,05E+03	0,00E+00	3,15E+01	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	1,41E+01	3,98E-01	2,06E+03	2,08E+03	7,99E-01	2,20E+02	0,00E+00	1,70E+02	1,40E+02	ND	ND	ND	ND	1,02E+01	2,11E-01	8,72E+00	9,24E-02	-6,01E+02
PENRE	MJ	2,00E+02	2,99E+01	7,25E+02	9,55E+02	5,66E+01	9,42E+02	0,00E+00	1,01E+02	1,89E+03	ND	ND	ND	ND	5,70E+01	1,49E+01	7,93E+01	3,45E+00	-5,50E+01
PENRM	MJ	1,17E+02	0,00E+00	1,55E+01	1,32E+02	0,00E+00	4,00E+00	0,00E+00	0,00E+00	1,29E+02	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-1,26E+01
PENRT	MJ	3,17E+02	2,99E+01	7,41E+02	1,09E+03	5,66E+01	9,46E+02	0,00E+00	1,01E+02	2,02E+03	ND	ND	ND	ND	5,70E+01	1,49E+01	7,93E+01	3,45E+00	-6,77E+01
SM	kg	9,83E+01	0,00E+00	0,00E+00	9,83E+01	0,00E+00	2,95E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NSRF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m3	1,71E-01	6,66E-03	5,50E-01	7,27E-01	1,37E-02	5,19E-01	0,00E+00	3,91E-01	1,16E+00	ND	ND	ND	ND	2,96E-02	3,61E-03	7,11E-02	3,77E-03	5,32E-01

PERE = Use of renewable primary energy excluding renewable primary energy 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 resources excluding non-renewable 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
NSRF = Use of non-renewable secondary fuels
FW = Use of net fresh water

BIOGENIC CARBON CONTENT per functional unit or declared unit (A1 and A2)

	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
BBCpr	kg C	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
BCCpa	kg C	0,00E+00	0,00E+00	1,25E+02	1,25E+02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	ND	ND	ND	ND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

BCCpr = Biogenic carbon content in product
BCCpa = Biogenic carbon content in packaging

CALCULATION RULES

CUT-OFF CRITERIA
There is no cut-off applied for the inputs or outputs of any of the processes.

TIME PERIOD DATA COLLECTION
Background data is primarily based on EcoInvent 3.9.1 (EcoInvent 3.6 for set 1). Foreground data is <2 years and background data <10 years. The data quality is considered to be good.
Material quantities: design specific
Suppliers: FY2024
Factory: FY2024
Building site: following CWCT
Emissions: n/a
Fiscal Year 2024 (referred to FY2024 henceforth) refers to the financial year starting from 1st of April 2023, and ending on 31st of March 2024.

ALLOCATION
Allocation is applied for recycling at end-of-life of various materials according to EN 15804 rules.

SCENARIOS AND ADDITIONAL TECHNICAL INFORMATION

Life cycle stages A1-A3 (production)
Scheldebouw B.V. will refurbish the windows in their factory in Middelburg. The complete windows are harvested from a high-end project in London, transported to Middelburg and enter the factory to be inspected for any damages or defects. The existing gaskets are removed and replaced by a newer model in order to improve the thermal performance of the window. The cleaned facade elements are then packed in especially developed wooden crates and made ready for transport to the building site in The Netherlands.
All secondary materials are included in stage A1 of this LCA study free of burden. The transport movements between the donor project in London and Scheldebouw are included in stage A2 and all activities in the Scheldebouw refurbishment location in Middelburg are included in stage A3.
Additionally for the new gaskets the production stage consists of the extraction of the raw materials, transportation of the raw materials (257 km from supplier to factory), processing the raw materials into sub-components and the replacement of the gaskets in the end-product. The required energy for production, external treatments, ancillary materials, packaging material and production emissions are included and teh quantities are based on a test run.

Transportation from donor building to factory (stage A2)	Distance
Lorry (truck): London-Purfleet	31 km
Transoceanic ship: Purfleet-Rotterdam	282 km
Lorry (truck): Rotterdam-Middelburg	85 km
Total:	398 km

Life cycle stages A4-A5 (construction)
This stage consists of the transport of the product from the factory in Middelburg to the construction site in The Netherlands (default distance 150 km). It also includes the loss of material during construction (3%). The additional needed production, transport and end-of-life treatment of the lost material during construction is included. The end-of-life of packaging material up to the end-of-waste state or disposal of final residues is also included. The energy use for installation of the product is taken into account following the CWCT methodology.
The transport movements between Scheldebouw Middelburg and the building site are included in stage A4. All activities on the building site are included in stage A5.

Life cycle stages B1-B3 (use stage)
This stage consists of the impacts arising from components of the building and construction works during their use. The window itself is assumed to have negligible environmental impact during its use stage B1. Cleaning of the window needs to be done twice a year and is modelled in stage B2 following CWCT in accordance with EN 17074.
The window consists of various parts with different service lifetimes. During the reference service life (RSL) of the window (50 years) the glazing and gaskets will be replaced once (after approx. 25 years). The replacement of these parts has been accounted for in life cycle stage B3.
Product replacement (B4) and renovation (B5) are not considered. Operational water and energy use (B6-7) are not considered.

Life cycle stages C1-C4 (end of life)
When the end of the life stage of the building is reached, the de-construction/demolition begins. This EPD includes de-construction/demolition (C1), the necessary transport (C2) from the demolition site to the sorting location and distance to final disposal. The end of life stage includes the final disposal to landfill (C4), incineration (C3) and needed recycling processes up to the end-of-waste point (C3). Loads and benefits of recycling, re-use and exported energy are part of module D.
The default end-of-life scenarios of the annex (november 2020) to the NMD Determination method v1.1 have been used for the various materials in the product.

Life cycle stage D (benefits and loads beyond the system boundary)
This stage contains the potential loads and benefits of recycling and re-use of raw materials/products. The loads contain the needed recycling processes from end-of-waste-point up to the point-of-equivalence of the substituted primary raw material and a load for secondary material that will be lost at the end-of-life stage. The loads and benefits of recycling and reuse are included in this module. The benefits are calculated based on the primary content and the primary equivalent. In addition, the benefits of energy recovery are granted at this stage. The amount of avoided energy is based on the Lower Heating Values of the materials and the efficiencies of the incinerators as mentioned in the NMD Determination method v1.1 or EcoInvent 3.9.1 (2019).

DECLARATION OF SVHC

The product does not contain any substances listed in the “Candidate List of Substances of Very High Concern (SVHC) for authorisation” exceeding 0.1% of the weight of the product.

REFERENCES

CWCT
Centre for Window and Cladding Technology
"How to calculate the embodied carbon of facades: A methodology", Issue 1, September 2022

EN 15804+A2
EN 15804+A2: 2019: Sustainability of construction works — Environmental Product Declarations — Core rules for the product category of construction products

ISO 14040
ISO 14040:2006-10, Environmental management - Life cycle assessment - Principles and framework; EN ISO 14040:2006

ISO 14044
ISO 14044:2006-10, Environmental management - Life cycle assessment - Requirements and guidelines; EN ISO 14040:2006

ISO 14025
ISO 14025:2011-10: Environmental labels and declarations — Type III environmental declarations — Principles and procedures

NMD
Nationale Milieu Database (Dutch National Environmental Database) Determination method v1.2

MRPI verification protocol
MRPI®-EPD verification protocol November 2020.v4.0

REMARKS

This declaration is only valid for the specific design of this project and facade type.