

# Environmental Product Declaration

*according to ISO 14025 and EN 15804*



This declaration is for:  
**De Nieuwe Hollander-V, Verglaasd  
donkere scherf**

Provided by:  
**BMI Monier**



program operator  
**Stichting MRPI®**  
publisher  
**Stichting MRPI®**  
[www.mrpi.nl](http://www.mrpi.nl)

MRPI® registration  
**1.1.00417.2023**  
date of first issue  
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**02-05-2023**  
expiry date  
**02-05-2028**





### COMPANY INFORMATION



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### PRODUCT

De Nieuwe Hollander-V, Verglaasd donkere scherf

### DECLARED UNIT/FUNCTIONAL UNIT

m<sup>2</sup>

### DESCRIPTION OF PRODUCT

One square meter of roofing material applied to a pitched roof, which at least meets the requirements of the Building Decree. Tile battens, counter battens and fasteners are included. Excluding insulation material and roof construction.

### VISUAL PRODUCT



### MORE INFORMATION

<https://www.bmigroup.com/nl/hellend-dak/keramische-dakpannen/de-nieuwe-hollander-v/>

### MRPI® REGISTRATION

1.1.00417.2023

### DATE OF ISSUE

02-05-2023

### EXPIRY DATE

02-05-2028

### SCOPE OF DECLARATION

This MRPI®-EPD certificate is verified by **Kamiel Jansen, Aveco de Bondt**.

The LCA study has been done by **Jan Mussche & Wouter Jan van den Berg, BMI Group**.

The certificate is based on an LCA-dossier according to ISO14025 and EN15804+A2/Bepalingsmethode. It is verified according to the 'MRPI®-EPD verification protocol November 2020.v4.0'. EPDs of construction products may not be comparable if they do not comply with EN15804+A2/Bepalingsmethode. 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®  
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ir. J-P den Hollander, Managing director MRPI®

### DEMONSTRATION OF VERIFICATION

CEN standard EN15804 serves as the core PCR[a]

Independent verification of the declaration and data,

according to EN ISO 14025:2010:

internal: external: X

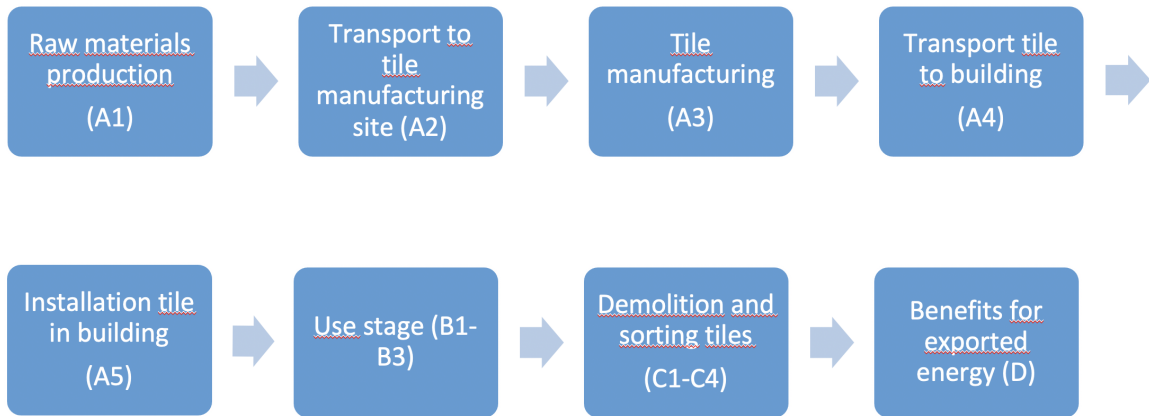
Third party verifier:

Kamiel Jansen, Aveco de Bondt

[a] PCR = Product Category Rules



# LCA Processflow tile production



*LCA process diagram according to EN 15804 (7.2.1)*



## REPRESENTATIVENESS

The input data are representative for De Nieuwe Hollander-V, Verglaasd donkere scherf, a product of BMI (Tegelen, NL). The data are representative for the EU market.

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

	UNIT	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	C1	C2	C3	C4	D
ADPE	kg Sb eq.	3.25 E-4	2.03 E-5	7.11 E-5	4.17 E-4	2.18 E-5	7.14 E-4	0.00	0.00	0.00	0.00	7.30 E-6	1.93 E-7	2.05 E-8	-4.40 E-3
ADPF	MJ	7.98 E+1	1.21 E+1	2.62 E+2	3.54 E+2	1.31 E+1	2.22 E+1	0.00	0.00	0.00	0.00	4.37 E+0	9.95 E-1	6.22 E-2	-9.07 E+0
GWP	kg CO2 eq.	5.04 E+0	7.94 E-1	1.27 E+1	1.86 E+1	8.54 E-1	1.58 E+0	0.00	0.00	0.00	0.00	2.86 E-1	6.77 E-2	2.20 E-3	-6.22 E-1
ODP	kg CFC11 eq.	5.65 E-7	1.41 E-7	1.37 E-6	2.07 E-6	1.52 E-7	1.52 E-7	0.00	0.00	0.00	0.00	5.07 E-8	7.41 E-9	7.32 E-10	-7.78 E-8
POCP	kg ethene eq.	3.56 E-3	4.79 E-4	2.12 E-3	6.16 E-3	5.15 E-4	1.11 E-3	0.00	0.00	0.00	0.00	1.72 E-4	3.86 E-5	2.34 E-6	-7.66 E-4
AP	kg SO2 eq.	2.47 E-2	3.49 E-3	2.44 E-2	5.26 E-2	3.76 E-3	9.04 E-3	0.00	0.00	0.00	0.00	1.26 E-3	3.13 E-4	1.61 E-5	-5.41 E-3
EP	kg (PO4)3- eq.	4.85 E-3	6.86 E-4	3.81 E-3	9.34 E-3	7.38 E-4	1.71 E-3	0.00	0.00	0.00	0.00	2.47 E-4	6.97 E-5	3.10 E-6	-1.29 E-3

Toxicity indicators for Dutch market

HTP	kg DCB eq.	6.39 E+0	3.34 E-1	2.04 E+0	8.76 E+0	3.60 E-1	4.64 E+0	0.00	0.00	0.00	0.00	1.20 E-1	1.61 E-2	9.93 E-4	-5.07 E-1
FAETP	kg DCB eq.	8.69 E-1	9.76 E-3	7.63 E-2	9.55 E-1	1.05 E-2	3.99 E-2	0.00	0.00	0.00	0.00	3.51 E-3	2.77 E-4	2.36 E-5	-1.67 E-2
MAETP	kg DCB eq.	3.04 E+3	3.51 E+1	3.49 E+2	3.42 E+3	3.78 E+1	1.20 E+2	0.00	0.00	0.00	0.00	1.26 E+1	1.04 E+0	8.42 E-2	-3.05 E+1
TETP	kg DCB eq.	8.88 E-3	1.18 E-3	2.81 E-2	3.81 E-2	1.27 E-3	9.91 E-3	0.00	0.00	0.00	0.00	4.25 E-4	1.97 E-4	2.49 E-6	-2.83 E-3
ECI	Euro	1.31 E+0	9.57 E-2	1.02 E+0	2.42 E+0	1.03 E-1	5.66 E-1	0.00	0.00	0.00	0.00	3.44 E-2	6.99 E-3	3.10 E-4	-1.17 E-1
ADPF	kg Sb. eq.	3.84 E-2	5.84 E-3	1.26 E-1	1.70 E-1	6.28 E-3	1.07 E-2	0.00	0.00	0.00	0.00	2.10 E-3	4.79 E-4	2.99 E-5	-4.37 E-3

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 expressed in [kg Sb-eq.]

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

	UNIT	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	C1	C2	C3	C4	D
GWP-total	kg CO2 eq.	5.28 E+0	8.02 E-1	1.27 E+1	1.87 E+1	8.62 E-1	-1.33 E+0	0.00	0.00	0.00	0.00	2.88 E-1	6.89 E-2	2.24 E-3	-6.57 E-1
GWP-fossil	kg CO2 eq.	5.27 E+0	8.01 E-1	1.29 E+1	1.90 E+1	8.61 E-1	1.58 E+0	0.00	0.00	0.00	0.00	2.88 E-1	6.85 E-2	2.24 E-3	-6.34 E-1
GWP-biogenic	kg CO2 eq.	1.27 E-2	3.70 E-4	-2.34 E-1	-2.21 E-1	3.98 E-4	-2.91 E+0	0.00	0.00	0.00	0.00	1.33 E-4	3.96 E-4	4.44 E-6	-2.10 E-2
GWP-luluc	kg CO2 eq.	3.38 E-3	2.93 E-4	5.82 E-3	9.49 E-3	3.16 E-4	4.40 E-3	0.00	0.00	0.00	0.00	1.06 E-4	1.30 E-5	6.24 E-7	-2.27 E-3
ODP	kg CFC11 eq.	5.89 E-7	1.77 E-7	1.54 E-6	2.31 E-6	1.90 E-7	1.75 E-7	0.00	0.00	0.00	0.00	6.36 E-8	8.88 E-9	9.22 E-10	-8.20 E-8
AP	mol H+ eq.	3.02 E-2	4.64 E-3	3.16 E-2	6.65 E-2	5.00 E-3	1.30 E-2	0.00	0.00	0.00	0.00	1.67 E-3	4.30 E-4	2.12 E-5	-7.65 E-3
EP-freshwater	kg PO4 eq.	1.51 E-4	8.08 E-6	9.09 E-5	2.50 E-4	8.69 E-6	6.05 E-5	0.00	0.00	0.00	0.00	2.91 E-6	2.13 E-6	2.51 E-8	-4.34 E-5
EP-marine	kg N eq.	4.63 E-3	1.64 E-3	9.61 E-3	1.59 E-2	1.76 E-3	2.58 E-3	0.00	0.00	0.00	0.00	5.89 E-4	1.71 E-4	7.31 E-6	-2.06 E-3
EP-terrestrial	mol N eq.	5.83 E-2	1.80 E-2	1.06 E-1	1.82 E-1	1.94 E-2	4.62 E-2	0.00	0.00	0.00	0.00	6.49 E-3	1.90 E-3	8.06 E-5	-2.98 E-2
POCP	kg NMVOC eq.	1.78 E-2	5.15 E-3	2.77 E-2	5.07 E-2	5.54 E-3	8.16 E-3	0.00	0.00	0.00	0.00	1.85 E-3	5.16 E-4	2.34 E-5	-6.30 E-3
ADP-minerals & metals	kg Sb eq.	3.25 E-4	2.03 E-5	7.09 E-5	4.17 E-4	2.18 E-5	7.14 E-4	0.00	0.00	0.00	0.00	7.30 E-6	1.93 E-7	2.05 E-8	-4.40 E-3
ADP-fossil	MJ, net calorific value	7.43 E+1	1.21 E+1	2.33 E+2	3.19 E+2	1.30 E+1	2.02 E+1	0.00	0.00	0.00	0.00	4.34 E+0	9.19 E-1	6.26 E-2	-8.44 E+0
WDP	m3 world eq. deprived	3.51 E+0	4.32 E-2	5.44 E-1	4.10 E+0	4.65 E-2	3.34 E-1	0.00	0.00	0.00	0.00	1.55 E-2	4.17 E-3	2.80 E-3	-2.79 E+0

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 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 [2]

ADP-fossil = Abiotic Depletion for fossil resources potential [2]

WDP = Water (user) deprivation potential, deprivation-weighted water consumption [2]

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.

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

	UNIT	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	C1	C2	C3	C4	D
PM	Disease incidence	2.92 E-7	7.20 E-8	1.33 E-7	4.97 E-7	7.75 E-8	2.31 E-7	0.00	0.00	0.00	0.00	2.59 E-8	9.48 E-9	4.13 E-10	-9.33 E-8
IRP	kBq U235 eq.	1.40 E-1	5.06 E-2	8.02 E-2	2.71 E-1	5.44 E-2	5.76 E-2	0.00	0.00	0.00	0.00	1.82 E-2	2.91 E-3	2.57 E-4	-3.55 E-2
ETP-fw	CTUe	7.84 E+2	1.08 E+1	5.65 E+1	8.51 E+2	1.16 E+1	5.24 E+1	0.00	0.00	0.00	0.00	3.87 E+0	7.45 E-1	4.06 E-2	-8.69 E+1
HTP-c	CTUh	4.73 E-9	3.49 E-10	1.69 E-9	6.76 E-9	3.76 E-10	1.32 E-8	0.00	0.00	0.00	0.00	1.26 E-10	1.77 E-11	9.38 E-13	-2.01 E-9
HTP-nc	CTUh	1.68 E-7	1.18 E-8	3.95 E-8	2.20 E-7	1.27 E-8	4.29 E-8	0.00	0.00	0.00	0.00	4.24 E-9	5.00 E-10	2.88 E-11	-5.24 E-8
SQP	---	1.96 E+1	1.05 E+1	2.34 E+1	5.35 E+1	1.13 E+1	5.53 E+2	0.00	0.00	0.00	0.00	3.77 E+0	1.53 E-1	1.31 E-1	-1.65 E+2

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 [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 disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

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.

**RESOURCE USE per functional unit or declared unit (A1 / A2)**

	UNIT	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	C1	C2	C3	C4	D
PERE	MJ	3.77 E+0	1.51 E-1	1.02 E+0	4.94 E+0	1.63 E-1	4.75 E+1	0.00	0.00	0.00	0.00	5.44 E-2	5.23 E-2	5.06 E-4	-3.42 E+1
PERM	MJ	0.00	0.00	3.33 E+0	3.33 E+0	0.00	2.92 E+1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PERT	MJ	3.77 E+0	1.51 E-1	4.35 E+0	8.27 E+0	1.63 E-1	7.67 E+1	0.00	0.00	0.00	0.00	5.44 E-2	5.23 E-2	5.06 E-4	-3.42 E+1
PENRE	MJ	5.34 E+1	1.28 E+1	2.55 E+2	3.22 E+2	1.38 E+1	2.11 E+1	0.00	0.00	0.00	0.00	4.61 E+0	9.80 E-1	6.65 E-2	-8.95 E+0
PENRM	MJ	2.63 E+1	0.00	2.59 E+0	2.89 E+1	0.00	5.78 E-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-6.69 E-2
PENRT	MJ	7.97 E+1	1.28 E+1	2.58 E+2	3.50 E+2	1.38 E+1	2.17 E+1	0.00	0.00	0.00	0.00	4.61 E+0	9.80 E-1	6.65 E-2	-9.02 E+0
SM	kg	0.00	0.00	0.00	0.00	0.00	2.75 E-2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
RSF	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NRSF	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FW	m3	8.92 E-2	1.47 E-3	1.92 E-2	1.10 E-1	1.58 E-3	1.12 E-2	0.00	0.00	0.00	0.00	5.29 E-4	3.07 E-4	6.68 E-5	-6.66 E-2

PERE = Use of renewable energy excluding renewable primary energy resources

PERM = Use of renewable 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

NRSF = Use of non renewable secondary fuels

FW = Use of net fresh water

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

	UNIT	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	C1	C2	C3	C4	D
HWD	kg	8.49 E-5	3.06 E-5	3.00 E-4	4.16 E-4	3.29 E-5	1.41 E-4	0.00	0.00	0.00	0.00	1.10 E-5	1.60 E-6	9.35 E-8	-5.87 E-4
NHWD	kg	5.77 E-1	7.66 E-1	2.55 E-1	1.60 E+0	8.24 E-1	8.08 E-1	0.00	0.00	0.00	0.00	2.76 E-1	1.28 E-1	4.25 E-1	-1.13 E-1
RWD	kg	1.37 E-4	7.93 E-5	1.06 E-4	3.23 E-4	8.53 E-5	6.73 E-5	0.00	0.00	0.00	0.00	2.85 E-5	4.13 E-6	4.11 E-7	-3.46 E-5
CRU	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MFR	kg	0.00	0.00	1.01 E+0	1.01 E+0	0.00	9.66 E-1	0.00	0.00	0.00	0.00	0.00	4.21 E+1	0.00	0.00
MER	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EEE	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.89 E+0
ETE	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.01 E+1

HWD = Hazardous Waste Disposed

RWD = Radioactive Waste Disposed

MFR = Materials for recycling

EEE = Exported Electrical Energy

NHWD = Non Hazardous Waste Disposed

CRU = Components for reuse

MER = Materials for energy recovery

ETE = Exported Thermal Energy



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

	UNIT	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	C1	C2	C3	C4	D
BCCpr	kg C	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BCCpa	kg C	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

BCCpr = Biogenic carbon content in product

BCCpa = Biogenic carbon content in packaging

## CALCULATION RULES

Applicable time period collected data: 2019-2020

## SCENARIOS AND ADDITIONAL TECHNICAL INFORMATION

### *Product Stage (A1-A3)*

The production stage consists of the extraction of raw materials, transportation of the raw materials, processing the raw materials into materials and the production of the product. The required energy for production, external treatments, ancillary materials, packaging material and production emissions are included.

### *Construction process stage (A4-A5)*

This stage consists the transport of the product from production plant to the construction site. It also includes the loss of material during construction. The additional needed production, transport and end-of-life 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 installation of the product including manufacture, transportation and end-of-life of ancillary materials and any energy or water use required for installation or operation of the construction site are taken into account. In order to attach the tiles to the roof nails, hooks, battens and counterbattens are used

### *Use stage (B1-B3)*

This stage consists of the impacts arising from components of the building and construction works during their use. The stage also covers the combination of all planned technical and associated administrative maintenance actions during the service life to maintain the product installed in a building, in a construction works or its parts in a state in which it can perform its required functional and technical performance, as well as preserve the aesthetic qualities of the product. This will include preventative and regular maintenance activities. Product replacement (B4) and renovation (B5) only apply when the product is considered in a lifespan (of a building, work , etc.). Operational water and energy use are not considered.

### *End of life stage (C1-C4)*

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 (March 2022) to the NMD Determination method v1.1 have been used for the various materials in the product.

*Benefits and Loads beyond the system boundary (Module D)*

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 3.6 (2019).



**DECLARATION OF SVHC**

No substances that are listed in the latest Candidate List of substances of Very High Concern for authorisation” are included in the product the exceeds the limit for registration.



**REFERENCES**

ISO 14040

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

ISO 14044

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

ISO 14025

- DIN EN ISO 14025:2011-10: Environmental labels and declarations – Type III environmental declarations – Principles and procedures

EN 15804

- EN 15804:2012-04+A1 2013: Sustainability of construction works – Environmental Product Declarations – Core rules for the product category of construction products



**REMARKS**

none