According ISO 14025 and EN 15804

Owner of the Declaration Duracryl International BV

Publisher NIBE Research by

Calculation number EPD-NIBE-20200922-12143

 Issue date
 01-01-2021

 Valid until
 31-12-2025

Durabella Biopolymer Seamless Terrazzo

Duracryl International BV

www.epdnibe.com





According ISO 14025 and EN 15804



1. GENERAL

1.1 COMPANY INFORMATION / DECLARATION OWNER



Manufacturer: Duracryl International BV Production Location: Duracryl international BV

Address: Elandstraat 91

2901BK Capelle aan den IJssel

E-mail: info@duracryl.com Website: www.duracryl.com

1.2 EPD INFORMATION

EPD for: Durabella Biopolymer Seamless Terrazzo

Calculation number: EPD-NIBE-20200922-12143

Date of issue: 01-01-2021
End of validity: 31-12-2025
Version NIBE's EPD Application: v2.0

Version Environmental Profile database: v3.00 (2021-01-13)

PCR: Horizontal PCR INSIDE/INSIDE v1.2 2018-12-10

1.3 SCOPE OF DECLARATION

This is a cradle to grave with options EPD. The life cycle stages included are as shown below: (X = included, MND = module not declared)

A1	A2	A3	A4	A5	B1	B2	B 3	B4	B5	B6	B7	C1	C2	C3	C4	D	
Χ	X	X	Χ	Χ	X	X	Χ	MND	MND	MND	MND	Χ	X	X	Χ	X	

1.4 VERIFICATION OF THE DECLARATION

CEN standard EN 15804:2012 serves as the core PCR Independent verification of the declaration. according to EN ISO 14025:2010. ☒ Internal ☐ External





2. PRODUCT

2.1 PRODUCT DESCRIPTION

2.2 DESCRIPTION OF THE MANUFACTURING PROCESS

Production

Contruction

Transport to the construction stage consists the following:

Transport conveyance	Distance	Weight x distance	
0.02	Lorry (Truck), unspecified (default)	1 km	0.02 tkm

According ISO 14025 and EN 15804



3. CALCULATION RULES

3.1 DECLARED UNIT

m2

One square meter of Durabella Biopolymer Seamless Terrazzo with a thickness of 8mm. Included are production (A1-A3) of the product, assembly in the project (A4 and A5), necessary maintenance (B2) and repairs (B3). Also including the end-of-life scenario (C1-C4) and Module D. The modules B1, B3, B5, B6 and B7 are not applicable and are set equal to 0. As prescribed in the Horizontal PCR of Inside/Inside module A4 is declared for 1 km and modules B2 and B3 are declared for 1 year.

Calculation is made in accordance with the Horizontal PCR of Inside version 1.2 and the Product PCR Floorcovering version 1.0.

3.2 ENVIRONMENTAL PROFILE AND RATINGS REPRESENTIVE

The input data are representative for Durabella Biopolymer Seamless Terrazzo, a product of Duracryl International BV. The data are representative for Netherlands.

3.3 CUT-OFF CRITERIA

In the Life cycle assessment the following is included in this study:

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 of the transport of the product from production gate to the construction/project site. It also includes wastage of construction products (additional production processes to compensate for the loss of wastage of products) and waste processing of the waste from product packaging and product wastage during construction up to the end-of-waste state or disposal of final residues. The installation of the product into the building/project includes manufacturing and transportation of ancillary materials and any energy or water required for installation or operation of the construction site. It also includes on-site operations to the product.

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. Operational energy and water use (B6-B7) 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 prescribed waste scenarios from the horizontal PCR INSIDE/INSIDE have been used for the various materials in the product.

Supplementary information outside the building life cycle (D)

This stage contains the environmental loads and benefits of recycled and re-used of raw materials/products. The loads for recycling are the needed processes from end-of-waste-point up to the point-of-equivalence of the substituted primary raw material.

In addition, the environmental benefits of incineration where energy is generated, are granted at this stage. The amount of avoid energy is based on the Lower Heating Values of the materials and the efficiencies of the incinerators as mentioned in the horizontal PCR INSIDE/INSIDE.



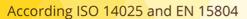


3.4 ALLOCATION

There is no allocation applied for the environmental profiles / datasets used in this LCA.

3.5 SOURCE OF BACKGROUND DATA

Material	Source	Comments
Raw Material profiles		
CO2 Storage	Ecoinvent 3.5	
Vegetable oil	Ecolnvent 3.5	See the projectdossier of
	and Ecolnvent	Duracryl for a full explanation
	3.6	how this profile was set up
Cleaning agent	EcoInvent 3.5	
	(2018)	
Cork flour	NMD/EcoInvent	
	3.4	
Ground water	NIBE/EcoInvent	
	3.5 (2018)	
Mineral Fillers	Ecolnvent 3.5	
	(2018)	
Vegetable oil	Ecolnvent 3.5	See the projectdossier of
		Duracryl for a full explanation
Activator	Ecolnvent 3.5	how this profile was set up
Activator	(2018)	
Polyethylene teraphtalate (PET)	NIBE/EcoInvent	
rolyethylene teraphtalate (FET)	3.5 (2018)	
Aggregates	NMD/EcoInvent	
7,661-6641-65	3.5 (2018)	
Pigment	Ecolnvent 3.5	
	(2018)	
Energy profiles		
Electricity (NL) - low voltage (max 1kV)	Ecolnvent 3.5	
	(2018)	
Waste profiles		
0267-avD&Vermeden energieproductie AVI, o.b.v. FOSSIELE grondstoffen, 18%	NMD/EcoInvent	
elektrisch en 31% thermisch (per MJ LHV)	3.5 (2018)	
0273-reD&Module D, vlakglas per kg NETTO geleverd kringloopglas (79%	NMD/EcoInvent	
verpakkingsglas- en 21% glaswoltoepassing waar primaire grondstoffen	3.5 (2018)	
worden vermeden - niet de energie)		
Glass cullet, sorted {RER} treatment of waste glass from unsorted public	NMD/EcoInvent	
collection, sorting Cut-off, U	3.5 (2018)	
Polyethylene, HDPE, granulate production (EU)	Ecolnvent 3.5	
W	(2018)	
Waste glass {CH} treatment of, inert material landfill Cut-off, U	NMD/EcoInvent	
Westernelisthylane (Furane without Cuitaviland) treetment - furan	3.5 (2018)	
Waste polyethylene {Europe without Switzerland} treatment of waste	NMD/EcoInvent	
polyethylene, sanitary landfill Cut-off, U)	3.5 (2018)	
Waste polyethylene, for recycling, sorted {Europe without Switzerland}	NMD/EcoInvent	
treatment of waste polyethylene, for recycling, unsorted, sorting Cut-off, U Waste treatment of 21% PE, 21% PP, 20% PVC, 17% PS en 21% mixture {CH},	3.5 (2018) NMD/EcoInvent	
municipal incineration Cutt-off, U		
municipal incineration Cutt-on, o	3.5 (2018)	

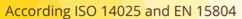




4. RESULTS

4.1 DECLARED UNIT

Impact category	Unit	Total Amount
Depletion of abiotic resources-elements	Kg Sb	8.94E-5
abiotic depletion of fossil resources	MJ	2.71E+2
Acidification of soil and water	Kg SO2 Equiv.	3.25E-1
Ozone layer depletion	Kg CFC-11 Equiv.	3.25E-6
Global warming	Kg CO2 Equiv.	-6.28E+0
Eutrophication	Kg PO43- Equiv.	1.68E-1
Photochemical oxidants creation	Kg Ethene Equiv.	1.48E-2
Parameter	Unit	Total Amount
renewable primary energy ex. raw materials	MJ	9.45E+0
renewable primary energy used as raw materials	MJ	0.00E+0
renewable primary energy total	MJ	1.28E+2
non-renewable primary energy ex. raw materials	MJ	2.00E+2
non-renewable primary energy used as raw materials	MJ	1.93E+1
non-renewable primary energy total	MJ	3.15E+2
use of secondary material	Kg	1.51E-1
use of renewable secondary fuels	MJ	0.00E+0
use of non-renewable secondary fuels	MJ	0.00E+0
use of net fresh water	M3	5.43E-1
hazardous waste disposed	Kg	3.75E-4
non hazardous waste disposed	Kg	8.18E+0
radioactive waste disposed	Kg	1.04E-3
Components for re-use	Kg	0.00E+0
Materials for recycling	Kg	0.00E+0
Materials for energy recovery	Kg	0.00E+0
Exported energy	MJ	4.46E-1
Exported Energy Thermic	MJ	2.82E-1
Exported Energy Electric	MJ	1.64E-1





4.2 PRODUCT STAGE (A1 - 3)

- A1. raw material extraction and processing, processing of secondary material input (e.g. recycling processes
- A2. transport to the manufacturer
- A3. manufacturing

Impact category	Unit	A1	A2	A3
Depletion of abiotic resources-elements	Kg Sb	1.04E-4	4.62E-7	5.65E-7
abiotic depletion of fossil resources	MJ	2.87E+2	2.50E+0	3.04E+0
Acidification of soil and water	Kg SO2 Equiv.	3.40E-1	7.03E-4	6.52E-4
Ozone layer depletion	Kg CFC-11 Equiv.	3.28E-6	3.03E-8	1.13E-8
Global warming	Kg CO2 Equiv.	-2.35E+0	1.62E-1	1.65E-1
Eutrophication	Kg PO43- Equiv.	1.68E-1	1.42E-4	9.38E-5
Photochemical oxidants creation	Kg Ethene Equiv.	1.56E-2	9.62E-5	8.16E-5
Parameter	Unit	A1	A2	A3
renewable primary energy ex. raw materials	MJ	1.21E+1	2.65E-2	2.23E-1
renewable primary energy used as raw materials	MJ	0.00E+0	0.00E+0	0.00E+0
renewable primary energy total	MJ	1.29E+2	2.65E-2	2.23E-1
non-renewable primary energy ex. raw materials	MJ	2.21E+2	2.69E+0	2.65E+0
non-renewable primary energy used as raw materials	MJ	1.77E+1	0.00E+0	1.06E+0
non-renewable primary energy total	MJ	3.34E+2	2.69E+0	3.71E+0
use of secondary material	Kg	1.50E-1	0.00E+0	0.00E+0
use of renewable secondary fuels	MJ	0.00E+0	0.00E+0	0.00E+0
use of non-renewable secondary fuels	MJ	0.00E+0	0.00E+0	0.00E+0
use of net fresh water	M3	5.33E-1	4.78E-4	2.15E-3
hazardous waste disposed	Kg	3.46E-4	1.61E-6	2.56E-5
non hazardous waste disposed	Kg	1.83E+0	1.54E-1	1.35E-2
radioactive waste disposed	Kg	1.05E-3	1.71E-5	8.15E-6
Components for re-use	Kg	0.00E+0	0.00E+0	0.00E+0
Materials for recycling	Kg	0.00E+0	0.00E+0	0.00E+0
Materials for energy recovery	Kg	0.00E+0	0.00E+0	0.00E+0
Exported energy	MJ	0.00E+0	0.00E+0	0.00E+0
Exported Energy Thermic	MJ	0.00E+0	0.00E+0	0.00E+0
Exported Energy Electric	MJ	0.00E+0	0.00E+0	0.00E+0





4.3 CONSTRUCTION PROCES STAGE (A4 - 5)

- A4. transport to the building site
- A5. installation into the building

Instruction of the second	11	0.4	A.F.
Impact category	Unit	A4	A5
Depletion of abiotic resources-elements	Kg Sb	7.63E-9	1.41E-6
abiotic depletion of fossil resources	MJ	4.13E-2	7.07E+0
Acidification of soil and water	Kg SO2 Equiv.	1.16E-5	4.33E-3
Ozone layer depletion	Kg CFC-11 Equiv.	5.00E-10	5.50E-8
Global warming	Kg CO2 Equiv.	2.68E-3	4.09E-1
Eutrophication	Kg PO43- Equiv.	2.34E-6	1.89E-3
Photochemical oxidants creation	Kg Ethene Equiv.	1.59E-6	2.16E-4
Parameter	Unit	A4	A5
renewable primary energy ex. raw materials	MJ	4.39E-4	6.55E-1
renewable primary energy used as raw materials	MJ	0.00E+0	0.00E+0
renewable primary energy total	MJ	4.39E-4	1.83E+0
non-renewable primary energy ex. raw materials	MJ	4.45E-2	7.50E+0
non-renewable primary energy used as raw materials	MJ	0.00E+0	1.88E-1
non-renewable primary energy total	MJ	4.45E-2	8.64E+0
use of secondary material	Kg	0.00E+0	1.50E-3
use of renewable secondary fuels	MJ	0.00E+0	0.00E+0
use of non-renewable secondary fuels	MJ	0.00E+0	0.00E+0
use of net fresh water	M3	7.90E-6	9.37E-3
hazardous waste disposed	Kg	2.66E-8	1.75E-5
non hazardous waste disposed	Kg	2.55E-3	1.06E-1
radioactive waste disposed	Kg	2.82E-7	2.39E-5
Components for re-use	Kg	0.00E+0	0.00E+0
Materials for recycling	Kg	0.00E+0	0.00E+0
Materials for energy recovery	Kg	0.00E+0	0.00E+0
Exported energy	MJ	0.00E+0	0.00E+0
Exported Energy Thermic	MJ	0.00E+0	0.00E+0
Exported Energy Electric	MJ	0.00E+0	0.00E+0

A4. transport to the building site

Parameter	Unit / functional unit
Fuel type and consumption of vehicle – or – vehicle type used	not available
for transport	Lorry (Truck), unspecified (default)
Distance	1 km
Capacity utilisation (including empty returns)	50 % (loaded up and return empty)
Bulk density of transported products	inapplicable
Volume capacity utilisation factor	1

A5. installation of the product in the building

Parameter	Unit / functional unit
Ancillary materials, water use and energy use for installation	- 0.02 kWh Mixer
	- 0.04 kWh Helicopter
	- 0.48 kWh Grinding
	- 0.008 kWh Vacuum cleaner
Waste materials on the building site before waste processing	- 0.032 kg Packaging
generated by the product's installation	
Output materials as result of waste processing at the building	1% of Durabella Biopolymer Seamless Terrazzo

According ISO 14025 and EN 15804



4.4 USE STAGE (B1 - 7)

- B1, use or application of the installed product
- B2, maintenance
- B3, repair
- B4, replacement (m.n.d.)
- B5, refurbishment (m.n.d.)
- B6, operational energy use (m.n.d.)
- B7, operational water use (m.n.d.)

Impact category	Unit	B1	B2	B3
Depletion of abiotic resources-elements	Kg Sb	0.00E+0	1.92E-6	0.00E+0
abiotic depletion of fossil resources	MJ	0.00E+0	1.80E+1	0.00E+0
Acidification of soil and water	Kg SO2 Equiv.	0.00E+0	4.16E-3	0.00E+0
Ozone layer depletion	Kg CFC-11 Equiv.	0.00E+0	8.87E-8	0.00E+0
Global warming	Kg CO2 Equiv.	0.00E+0	1.57E+0	0.00E+0
Eutrophication	Kg PO43- Equiv.	0.00E+0	9.57E-4	0.00E+0
Photochemical oxidants creation	Kg Ethene Equiv.	0.00E+0	2.56E-4	0.00E+0
Parameter	Unit	B1	B2	B3
renewable primary energy ex. raw materials	MJ	0.00E+0	2.31E+0	0.00E+0
renewable primary energy used as raw materials	MJ	0.00E+0	0.00E+0	0.00E+0
renewable primary energy total	MJ	0.00E+0	2.31E+0	0.00E+0
non-renewable primary energy ex. raw materials	MJ	0.00E+0	2.25E+1	0.00E+0
non-renewable primary energy used as raw materials	MJ	0.00E+0	2.99E-1	0.00E+0
non-renewable primary energy total	MJ	0.00E+0	2.28E+1	0.00E+0
use of secondary material	Kg	0.00E+0	0.00E+0	0.00E+0
use of renewable secondary fuels	MJ	0.00E+0	0.00E+0	0.00E+0
use of non-renewable secondary fuels	MJ	0.00E+0	0.00E+0	0.00E+0
use of net fresh water	M3	0.00E+0	7.72E-2	0.00E+0
hazardous waste disposed	Kg	0.00E+0	5.99E-5	0.00E+0
non hazardous waste disposed	Kg	0.00E+0	6.98E-2	0.00E+0
radioactive waste disposed	Kg	0.00E+0	5.59E-5	0.00E+0
Components for re-use	Kg	0.00E+0	0.00E+0	0.00E+0
Materials for recycling	Kg	0.00E+0	0.00E+0	0.00E+0
Materials for energy recovery	Kg	0.00E+0	0.00E+0	0.00E+0
Exported energy	MJ	0.00E+0	0.00E+0	0.00E+0
Exported Energy Thermic	MJ	0.00E+0	0.00E+0	0.00E+0
Exported Energy Electric	MI	0.00E+0	0.00E+0	0.00E+0

B2 Maintanance

Parameter	Unit / functional unit
rarameter	Onit / functional unit
Maintenance process and cycle	- Water 1 years
	- Cleaning agent 1 years
	- Scrubbing machine 1 years
Ancillary materials and energy input for maintenance	- 59 kg Ground water
	- 0.0295 kg Chemicals inorganic production (GLO)
	- 2.36 kWh Electricity (NL) - low voltage (max 1kV)

B3 Repair

Parameter	Unit / functional unit
Repair process	Repair of the parts;
Repair cycle	Amount for product reference service life of 60 years:
Waste materials resulting from repair	Amount for product reference service life of 60 years:

Reference Service Life

Parameter	RSL
Product: Durabella Biopolymer Seamless Terrazzo	60 years
Vegetable oil	60 years
Mineral Fillers	60 years
Activator	60 years
Pigment	60 years



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Aggregates	60 years
CO2 storage	60 years
Cork flour	60 years
Vegetable oil	60 years
Water	1 years
Cleaning agent	1 years
Scrubbing machine	1 years

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4.5 END OF LIFE STAGE (C1 - 4)

- C1. de-construction. Demolition (m.n.d.)
- C2. transport to waste processing
- C3. waste processing for reuse. recovery and/or recycling (m.n.d.)
- C4. disposal

Impact category	Unit	C1	C2	C3	C4
Depletion of abiotic resources-elements	Kg Sb	0.00E+0	4.95E-7	5.19E-7	2.83E-8
abiotic depletion of fossil resources	MJ	0.00E+0	2.68E+0	7.81E-1	8.56E-1
Acidification of soil and water	Kg SO2 Equiv.	0.00E+0	7.53E-4	3.41E-4	1.94E-4
Ozone layer depletion	Kg CFC-11 Equiv.	0.00E+0	3.25E-8	7.92E-9	1.05E-8
Global warming	Kg CO2 Equiv.	0.00E+0	1.74E-1	1.79E-1	2.61E-2
Eutrophication	Kg PO43- Equiv.	0.00E+0	1.52E-4	8.57E-5	4.12E-5
Photochemical oxidants creation	Kg Ethene Equiv.	0.00E+0	1.03E-4	6.84E-5	2.86E-5
Parameter	Unit	C1	C2	C3	C4
renewable primary energy ex. raw materials	MJ	0.00E+0	2.85E-2	9.47E-2	1.15E-2
renewable primary energy used as raw materials	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0
renewable primary energy total	MJ	0.00E+0	2.85E-2	9.47E-2	1.15E-2
non-renewable primary energy ex. raw materials	MJ	0.00E+0	2.89E+0	1.09E+0	9.31E-1
non-renewable primary energy used as raw materials	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0
non-renewable primary energy total	MJ	0.00E+0	2.89E+0	1.09E+0	9.31E-1
use of secondary material	Kg	0.00E+0	0.00E+0	0.00E+0	0.00E+0
use of renewable secondary fuels	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0
use of non-renewable secondary fuels	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0
use of net fresh water	M3	0.00E+0	5.13E-4	2.07E-3	1.03E-3
hazardous waste disposed	Kg	0.00E+0	1.73E-6	1.41E-6	3.00E-7
non hazardous waste disposed	Kg	0.00E+0	1.65E-1	4.31E-1	6.14E+0
radioactive waste disposed	Kg	0.00E+0	1.83E-5	6.53E-6	6.00E-6
Components for re-use	Kg	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Materials for recycling	Kg	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Materials for energy recovery	Kg	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Exported energy	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Exported Energy Thermic	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Exported Energy Electric	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0

End - of - life

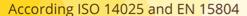
Processes	Unit / functional unit
Recovery system	0.00 kg for re - use
	0.00 kg for recycling
	0.00 kg for energy recovery
Disposal	0.00 kg of materials used in the product





4.6 BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARY (D)

Impact category	Unit	D
Depletion of abiotic resources-elements	Kg Sb	-1.99E-5
abiotic depletion of fossil resources	MJ	-5.15E+1
Acidification of soil and water	Kg SO2 Equiv.	-2.64E-2
Ozone layer depletion	Kg CFC-11 Equiv.	-2.64E-7
Global warming	Kg CO2 Equiv.	-6.62E+0
Eutrophication	Kg PO43- Equiv.	-3.63E-3
Photochemical oxidants creation	Kg Ethene Equiv.	-1.58E-3
Parameter	Unit	D
renewable primary energy ex. raw materials	MJ	-5.99E+0
renewable primary energy used as raw materials	MJ	0.00E+0
renewable primary energy total	MJ	-5.99E+0
non-renewable primary energy ex. raw materials	MJ	-6.13E+1
non-renewable primary energy used as raw materials	MJ	-4.07E-2
non-renewable primary energy total	MJ	-6.13E+1
use of secondary material	Kg	0.00E+0
use of renewable secondary fuels	MJ	0.00E+0
use of non-renewable secondary fuels	MJ	0.00E+0
use of net fresh water	M3	-8.25E-2
hazardous waste disposed	Kg	-7.95E-5
non hazardous waste disposed	Kg	-7.40E-1
radioactive waste disposed	Kg	-1.50E-4
Components for re-use	Kg	0.00E+0
Materials for recycling	Kg	0.00E+0
Materials for energy recovery	Kg	0.00E+0
Exported energy	MJ	4.46E-1
Exported Energy Thermic	MJ	2.82E-1
Exported Energy Electric	MJ	1.64E-1





5. 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

 $\hbox{DIN EN ISO 14025:2011-10: Environmental labels and declarations} - \hbox{Type III environmental declarations} - \hbox{Principles and procedures}$

EN 15804

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

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