

SUSTAINABILITY CONTRIBUTION DECLARATION

LEED v4® -

Leadership in Energy and Environmental Design

NOWOFOL® Kunststoffprodukte GmbH & Co. KG



Nowoflon®-ET film

NOWOFLON® ET film is a flexible and strong film, made of a fluorinated copolymer. NOWOFLON® ET films are characterized by a number of positive properties, e.g.:

- Excellent mechanical strength, particularly tear strength and tensile strength
- Excellent weather resistance
- High transparency of both visible and UV light
- Due to its anti-adhesive surface the film has anti-graffiti and self-cleaning properties
- The film can be colored or tinted in different shades to meet each customer's specifications
- Film can be printed in different designs
- Available as heat absorbing film (IRcut)
- Flame resistant and self-extinguishing

This allows them to be used in applications for which a highly-capable, hardwearing and durable material is required.

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Sustainable Sites (SS)

Heat Island Reduction

→ To minimize effects on microclimates and human and wildlife habitats by reducing heat islands.

Product information

Item	Value	Unit
solar reflectance index (SRI) value (roofing materials)	1-60 *	%

*Solar Reflectance Index (SRI) is dependent on the optical performance of the film (clear, colored, printed or IRcut), thus a range of values is given for the SRI value. Construction of the layers, color and printing all influence the final values. The project-specific values can be determined upon request.



Innovation (IN)

→ To encourage projects to achieve exceptional or innovative performance.

Description:

- Extremely light weight, reducing substructure strength requirements.
- Low energy demand for production (*see LCA results in section MR*).
- The variant "IRcut" film absorbs the heat in the film with high transparency at the same time, so that heating of the interior is reduced; therefore considerable savings in air-conditioning can be achieved.
- Similar savings are possible due to pigmentation or printing.

None of the existing pilots for the innovation credit apply – for a specific certification project, the detailed data will be provided by NOWOFOL.

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Materials & Resources (MR)

Building product disclosure and optimization - environmental product declarations

→ To encourage the use of products and materials for which life-cycle information is available and that have environmentally, economically, and socially preferable life-cycle impacts.

Item	Value
Critically reviewed LCA acc. to ISO 14044?	No. Manufacturer's declaration.
Author of the LCA	thinkstep AG, Hauptstraße 111-113, 70771 Leinfelden-Echterdingen, Germany
Declared unit	1 m ² (90 µm; 0.157 kg/m ²)*
Declared modules (EN 15804)	A1 - A3 (Product stage)
Results of the LCA – ENVIRONMENTAL IMPACTS	
GWP [kg CO ₂ -eq.]	1.88E+00
ODP [kg CFC11-eq.]	2.90E-07
AP [kg SO ₂ -eq.]	6.14E-03
EP [kg PO ₄ ³⁻ -eq.]	4.83E-04
POCP [kg ethene-eq.]	4.57E-04
ADPE [kg Sb-eq.]	5.66E-06
ADPF [MJ]	3.28E+01
Results of the LCA – RESOURCE USE	
PERE [MJ]	3.12E+00
PERM [MJ]	0
PERT [MJ]	3.12E+00
PENRE [MJ]	1.87E+01
PENRM [MJ]	1.44E+01
PENRT [MJ]	3.31E+01
SM [MJ]	0
RSF [MJ]	0
NRSF [MJ]	0
FW [MJ]	1.25E-02
Results of the LCA – OUTPUT FLOWS AND WASTE CATEGORIES	
HWD [kg]	6.01E-03
NHWD [kg]	3.19E-02
RWD [kg]	1.66E-03
CRU [kg]	0
MFR [kg]	0
MER [kg]	0
EEE [MJ]	0
EET [MJ]	0

Note: Detailed names of the given abbreviations can be found in the Glossary.

*The LCA results can be scaled as an approximation on a linear basis according to the thickness or surface weight (e.g. for results for the thickness of 100 µm all results have to be multiplied by 1.11 (=100/90)).

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Materials & Resources (MR)

Building product disclosure and optimization – sourcing of raw materials (2 points)
 → To encourage the use of products and materials for which life-cycle information is available and that have environmentally, economically and socially preferable life-cycle impacts and sourcing.

Product information

Option 1. raw material source and extraction reporting (1 point)	Description / Unit	
Third-party verified corporate sustainability report (CSR)?	no	
Option 2. leadership extraction practices (1 point)	Description / Unit	
Participation in an extended producer responsibility program?	no	
Postconsumer recycled content	0	%
Preconsumer recycled content	0	%

Building product disclosure and optimization – material ingredients (2 points)
 → To reward the selection of products verified to minimize the use and generation of harmful substances based on an accepted methodology for chemical ingredient listing.

Product information

Type of reporting	Certification program (e.g. Green screen, cradle to cradle version/level, REACH)	Value/Comment
Option 1: material ingredient reporting	Health Product Declaration	No
	Manufacturer Inventory	No
	GreenScreen v1.2 Benchmark	No
	Cradle to Cradle Certified	No
Option 2: Material ingredient optimization	International Alternative Compliance Path – REACH Optimization	Yes The films do not contain substances that meet REACH criteria for substances of very high concern (see also Safety data sheet).
	USGBC approved program	No



Indoor Environmental Quality (IEQ)

Low-emitting materials

→ To reduce concentrations of chemical contaminants that can damage air quality, human health, productivity, and the environment.

Product information

Item	Value
Test institute / organization	Environmental Institute „Bremer Umweltinstitut – Gesellschaft für Schadstoffanalysen und Begutachtung mbH“ (commissioned by Vector Foiltec GmbH)
Test method applied	At 23 °C and a surface specific air throughput rate of 0.5 m ³ /(m ² h) and load of 2 m ² /m ³ .
SVOC (C16 – C22)	< 5 µg/m ³
TVOC (C6 – C16, 28 days)	27 µg/m ³ (no formaldehyde, as the film doesn't contain any; CAS number is 74499-71-1)
Criteria	Committee for Health-related evaluation of Building Products (AgBB) 2010

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General Information

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Date:	09.02.2017

Technical data

Following technical data at delivery state are relevant for the declared product:

Name	Thickness [μm]	Surface weight [kg/m^2]
NOWOFLON®-ET film	12 – 500*	21 – 875*
Composition	100 % ETFE	(CAS number 74499-71-1)

*The LCA results can be scaled on a linear basis according to the thickness or surface weight.

Structural data for an exemplary thickness of 200 μm and a basis weight of 350 g/m^2 :

Name	Value	Unit
Melting range (ASTM D 4591-07)	265 \pm 10	°C
Tensile strength (DIN EN ISO 527-1)	> 40	N/mm ²
Strain at 10 % elongation (DIN EN ISO 527-1)	> 18	N/mm ²
Elongation at rupture (DIN EN ISO 527-1)	> 300	%
Tear growth resistance (DIN 53363)	> 300	N/mm
Weld seam strength (DIN 527-1)	\geq 33	N/mm ²
Weatherability (ISO 4892-2)	No change of mech. values.	

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Glossary

GWP	Global warming potential
ODP	Depletion potential of the stratospheric ozone layer
AP	Acidification potential of land and water
EP	Eutrophication potential
POCP	Formation potential of tropospheric ozone photochemical oxidants
ADPE	Abiotic depletion potential for non-fossil resources
ADPF	Abiotic depletion potential for fossil resources
PERE	Use of renewable primary energy excluding renewable primary energy resources 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 excluding non-renewable primary 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 material
RSF	Use of renewable secondary fuels
NRSF	Use of non-renewable secondary fuels
FW	Use of net fresh water
HWD	Hazardous waste disposed
NHWD	Non-hazardous waste disposed
RWD	Radioactive waste disposed
CRU	Components for re-use
MFR	Materials for recycling
MER	Materials for energy recovery
EEE	Exported energy per energy carrier (electric)
EET	Exported energy per energy carrier (thermal)

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