

Environmental Product Declaration

in accordance with ISO 14025 and EN 15804+A1 for:

3M™ Envision™ Print Wrap Film LX480mC

3M Envision Print Wrap Film LX480mC is a white, printable graphic film that can be used for indoor and outdoor graphics and signs, including point-of-purchase and displays, applied to smooth or moderately textured wall surfaces. Non-construction applications include fleet, vehicle, watercraft and transit graphics; small format original equipment manufacturers (OEM)

1 Program Related Information

EPD Program Holder	The International EPD® System (www.environdec.com) Operated by EPD International AB Box 210 60; SE-100 31 Stockholm, Sweden
Product Category Rules (PCRs)	EN 15804:2012+A1:2013 - Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products PCR 2012:01 version 2.3 - Construction Products and Construction Services (Multiple UN CPC codes, valid until 2020-03-03)
PCR review conducted by	The Technical Committee of the International EPD® System. Chair: Massimo Marino (info@environdec.com)
EPD Registration Number	S-P-01582
Publication Date (Version)	2019-05-06 (Version 1); 2020-07-29 (Version 2)
Valid Until	2024-05-05
Geographical Validity	Europe (CML midpoints) and United States of America (TRACI midpoints)
Independent Verification	<input checked="" type="checkbox"/> EPD Process Certification (Internal) <input type="checkbox"/> EPD Verification (External)
Third Party Verifier	The Epsten Group, Inc.; Accreditation Number 1002 www.epstengroup.com 
Accredited by	A2LA; Certificate #3142.03 
Manufacturer	3M; 3M Center St. Paul, MN 55144-1000
EPD Prepared by	John Furney, LCACP; 3M Product Support Engineer
Calculation Procedure	thinkstep GaBi™ ts Software Program version 8.7.0.18 with database version 8.7 and service pack 36
System Boundaries	<input checked="" type="checkbox"/> Cradle-to-Gate <input type="checkbox"/> Cradle-to-Grave <input type="checkbox"/> Cradle-to-Gate with Options
Data Sources	Specific data collected by the 3M Commercial Solutions Division (CSD), representative of 2018 production. Generic data sources as available in the GaBi™ software and databases.
Disclaimer	The EPD owner has the sole ownership, liability, and responsibility for the EPD. Environmental product declarations within the same product category but from different programs may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804. All values provided in this Environmental Product Declaration are a direct result from the use of characterization factors and calculation rules as defined in the GaBi software. The environmental indicators used for these calculations are based on CML2001 and TRACI 2.1.
Manufacturer Contact Information	For more information about this Environmental Product Declaration or its contents, contact Tani Maruyama with 3M CSD at tkmaruyama@mmm.com ; or Carrie Pearson, 3M EPD process owner, at cpearson2@mmm.com .

2 Product Related Information

2.1 Manufacturing company

With operations employing 93 000 people globally in more than 70 countries, and products sold through four business groups in nearly 200 countries, 3M is a diversified technology company with global sales of \$32.8 billion USD (year-end 2018). 3M's commitment to innovation is reflected in the continued investment of nearly 6 percent of sales back into R&D, an investment that has helped produce more than 115 000 patents in company history. 3M is one of 30 companies in the Dow Jones Industrial Average and is a component of the Standard & Poor's 500 Index.

The product covered by this Environmental Product Declaration (EPD) is manufactured by the 3M Commercial Solutions Division (CSD), for a variety of purposes including, for example, indoor and outdoor graphics and signs, including point-of-sale purchase and displays. The manufacturing site is located in Nevada, Missouri, US. This site holds an ISO 14001 certificate for its environmental management system. A cradle-to-gate Life Cycle Assessment (LCA) was completed as a part of this evaluation for the 3M™ Envision™ Print Wrap Film LX480mC and this LCA was used as a reference for this EPD.

2.2 Specification of the product

3M Envision Print Wrap Film LX480mC (3M product code 75-3472-8892-2) is a white, printable, graphic film that can be used for indoor and outdoor graphics and signs, including point-of-purchase and displays; and smooth and moderately textured wall graphics. This product also has non-construction applications including fleet, vehicle, watercraft and transit graphics; and small format original equipment manufacturers (OEM) decorative and identification graphic, cautionary and safety labeling.

2.2.1 Classification

3M Envision Print Wrap Film LX480mC is classified under CPC code 36920 "Self-adhesive plates, sheets, film foil, tape, strip and other flat shapes, of plastics" in the United Nations Central Product Classification (CPC) System.

Given that this graphic film is used as a construction product, PCR 2012:01 version 2.3 and EN 15804:2012+A1:2013 apply.



2.3 Declared unit

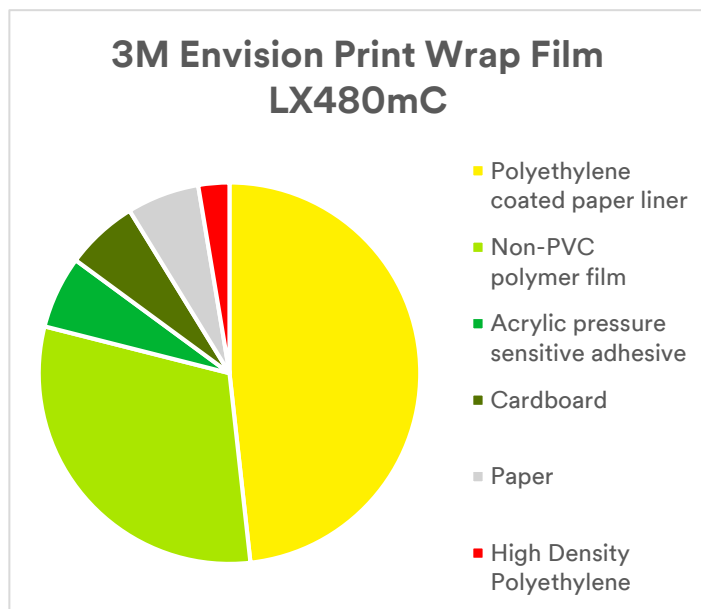
The declared unit in this EPD is one packaged roll (17.6 kg; 1.37 m x 45.7 m, 62.7 m²). Since the amount of 3M Envision Print Wrap Film LX480mC used in any given application is unavailable and printing methods may vary, the precise function of the product or scenarios at the building level is unknown. The reference flow used for this study is the same as the declared unit.

2.4 Content of material and chemical substances

The composition of 3M Envision Print Wrap Film LX480mC (as sold, including packaging) is shown in Table 1. 3M Envision Print Wrap Film LX480mC covered by this Environmental Product Declaration does not contain Substances of Very High Concern (SVHC) included in the REACH candidate list¹ at a concentration at or above 0.1% in weight.

Table 1. Composition of packaged 3M Envision Print Wrap Film LX480mC

Composition	Weight %
Polyethylene coated paper liner	45-55%
Non-PVC polymer film	25-35%
Acrylic pressure sensitive adhesive (PSA)	3-7%
Packaging	--
Cardboard	3-7%
Paper	3-7%
High Density Polyethylene	1-3%



2.5 Units and Quantities

This Environmental Product Declaration uses the International System of Units with a maximum of three significant figures to report all results. Throughout the report, the SI English style for displaying values that need either a thousands separator or a decimal separator is used. The SI English style uses a space for the thousands separator and a period for the decimal separator (Example: 1 234.56).

¹ Candidate list according to article 59 (10) of Regulation (EC) No 1907/2006 (REACH) dated 2019-01-15

3 Environmental Performance Related Information

3.1 Life cycle stages

The LCA study supporting this Environmental Product Declaration is a cradle-to-gate analysis, including the life cycle stages listed in Table 2. Due to the exclusion of the use phase in this cradle-to-gate analysis, the reference service life (RSL) is not specified.

Table 2: Modules of the product life cycle included in the EPD

Product stage			Construction process stage		Use stage							End-of-life stage				Benefits and loads beyond the system boundary
Raw material supply	Transport	Manufacturing	Transport	Construction installation process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction/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	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

(X = declared module; MND = module not declared)

A1 = Upstream module; A2-A3 = Core module; A4-C4 = Downstream module; D = Other environmental information

3.1.1 Raw Material Supply module (A1)

Raw material supply includes the acquisition and processing of resources from nature to create usable raw materials and intermediates, as well as the packaging used to ship these materials.

3.1.2 Transport module (A2)

All raw materials are transported from the source to the 3M manufacturing site by truck, rail, and/or boat. Most of the time, raw materials need to be packed for transportation; however, loading and unloading of raw materials are not included in the study.

3.1.3 Manufacturing module (A3)

The manufacturing module includes all process steps carried out at 3M manufacturing sites to produce the finished product, including utilities used and waste produced. The environmental profile of these energy carriers is modeled for local conditions. Machines and facilities (capital goods) required for and during production are excluded, as is transportation of employees. All materials and energy used in the production of 3M™ Envision™ Print Wrap Film LX480mC were included in the study (no cut-off rule was applied). Proxy data sets were used in the LCA model when specific information was not available and were <0.259% of the product stage total result (A1-A3) for all reported potential environmental impacts.

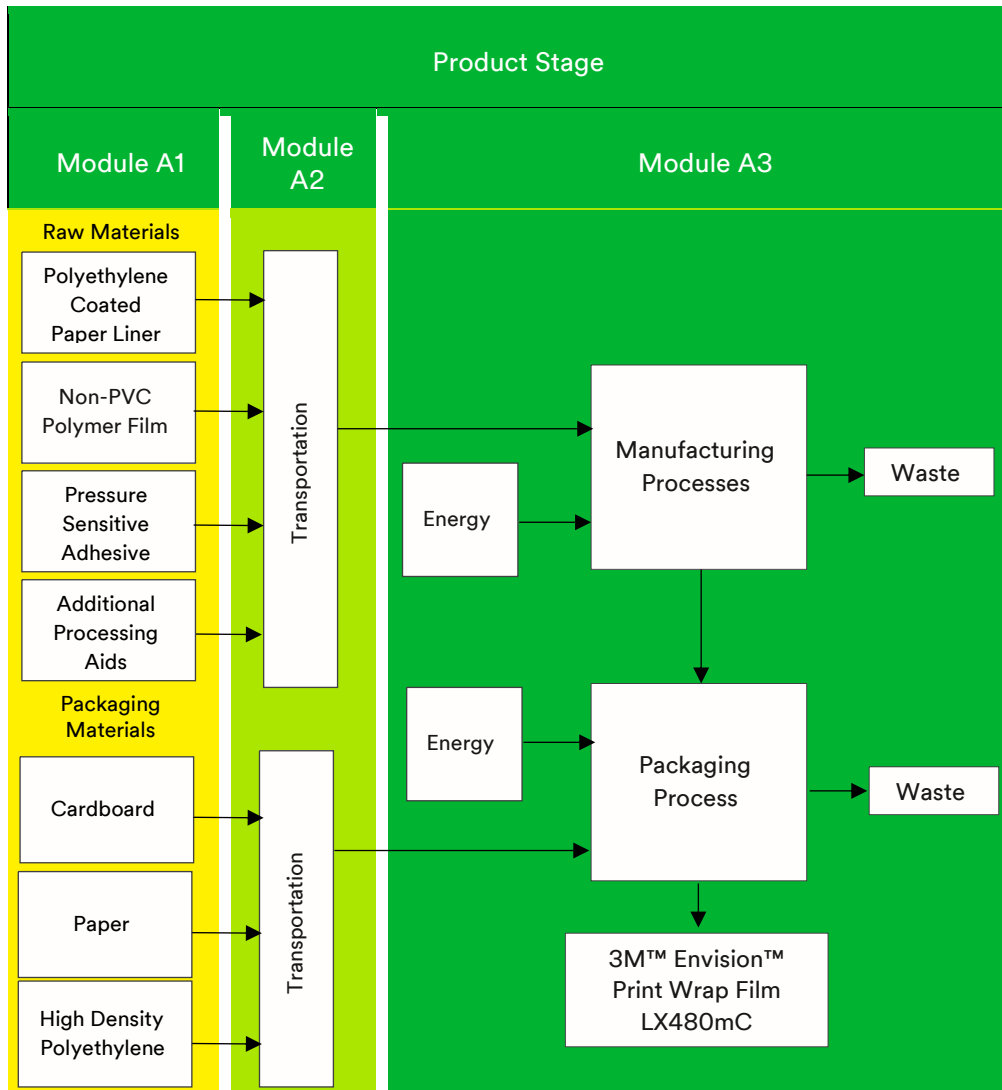


Figure 1: Process flow for the cradle-to-gate life cycle of 3M Envision Print Wrap Film LX480mC for modules A1 (Raw material supply), A2 (Transport), and A3 (Manufacturing).

3.2 Environmental performance-related information

The environmental parameters are declared for the product stage (A1-A3 modules). The overall impact of the product is divided into potential environmental impacts, use of resources, and other indicators. All environmental impacts are reported per declared unit.

3.2.1 Potential environmental impact

The reported environmental impact results from characterization models are applied to the life cycle stages considered in the study. Total emissions from the operations included in the system boundary are reported as potential environmental impacts, using the 2016-01 version of CML 2001 (Table 3) and TRACI 2.1 (Table 4) characterization factors as implemented in GaBi™. Currently, TRACI 2.1 methodology does not include a midpoint for abiotic depletion potential for non-fossil resources. Data are presented per declared unit.

Table 3: Potential environmental impact of one packaged roll of 3M™ Envision™ Print Wrap Film LX480mC using CML 2001.

	Raw Material Supply	Transport	Manufacturing	Product Stage Total
	A1	A2	A3	A1-A3
Abiotic depletion potential for non-fossil resources [kg Sb eq.]	1.10E-03	2.09E-06	4.44E-05	1.15E-03
Abiotic depletion potential for fossil resources [MJ, net calorific value]	3 560	177	2 250	5 980
Acidification potential [kg SO ₂ eq.]	0.707	0.0753	0.235	1.02
Eutrophication potential [kg PO ₄ ³⁻ eq.]	0.180	0.0141	0.0451	0.239
Global warming potential [kg CO ₂ eq.]	163	12.7	214	390
Depletion potential of stratospheric ozone layer [kg CFC-11 eq.]	4.48E-06	4.90E-13	8.07E-11	4.48E-06
Formation potential of tropospheric ozone [kg ethene eq.]	0.0934	5.55E-03	0.139	0.238

Table 4: Potential environmental impact of one packaged roll of 3M Envision Print Wrap Film LX480mC using TRACI 2.1.

	Raw Material Supply	Transport	Manufacturing	Product Stage Total
	A1	A2	A3	A1-A3
Abiotic depletion potential for fossil resources [MJ surplus energy]	428	23.8	190	641
Acidification potential [kg SO ₂ eq.]	0.729	0.0905	0.273	1.09
Eutrophication potential [kg N eq.]	0.202	5.51E-03	0.0346	0.242
Global warming potential [kg CO ₂ eq.]	162	12.7	212	387
Depletion potential of stratospheric ozone layer [kg CFC-11 eq.]	5.20E-06	4.90E-13	8.07E-11	5.20E-06
Formation potential of tropospheric ozone [kg O ₃ eq.]	11.6	2.41	4.67	18.7

3.2.2 Use of resources

The main resource consumption sources for 3M Envision Print Wrap Film LX480mC are reported in Table 5. Use of resources without energy content is expressed in kg or m³ per declared unit. Energy data are expressed in MJ per declared unit, net calorific value. The net calorific value or lower heating value is calculated by subtracting the heat of vaporization of water from the higher heating value. The results from the tables should be interpreted over the different modules and as they are calculated by the GaBi™ software. It is important to note that the renewable energy reported under A3 is not generated by 3M but is part of the energy mix data sets used in the LCA model. The values are presented as calculated in the GaBi™ software.

Table 5: Resource use for one packaged roll of 3M Envision Print Wrap Film LX480mC.

	Raw Material Supply	Transport	Manufacturing	Product Stage Total
	A1	A2	A3	A1-A3
Use of renewable primary energy as energy carrier [MJ]	629	4.22	216	850
Use of renewable primary energy as raw materials [MJ]	0	0	0	0
Total use of renewable primary energy resources [MJ]	629	4.22	216	850
Use of non-renewable primary energy as energy carrier [MJ]	3 840	178	2 440	6 460
Use of non-renewable primary energy as raw materials [MJ]	0	0	0	0
Total use of non-renewable primary energy resources [MJ]	3 840	178	2 440	6 460
Use of secondary material [kg]	0	0	0	0
Use of renewable secondary fuels [MJ]	0	0	0	0
Use of non-renewable secondary fuels [MJ]	0	0	0	0
Use of net fresh water [m ³]	1.83	0.123	0.374	2.33

3.2.3 Output flows and waste categories

The important output flows and waste categories for 3M Envision Print Wrap Film LX480mC are reported in the Table 6. All material flows are expressed in kg per declared unit while the exported energy data is expressed in MJ per declared unit, net calorific value. Components for re-use, materials for recycling, materials for energy

recovery, exported electrical energy, and exported thermal energy are required to be reported following EN 15804. It should be noted that the applicable 3M processes do not produce radioactive waste and the values presented are as calculated in the GaBi™ software based on background data sets.

No information is provided for the release of dangerous substances to indoor air, soil, and water during the use stage according to standards on measurement of release of regulated dangerous substances as this film is a passive product.

Table 6: Output flows and waste categories for one packaged roll of 3M™ Envision™ Print Wrap Film LX480mC.

	Raw Material Supply	Transport	Manufacturing	Product Stage Total
	A1	A2	A3	A1-A3
Hazardous waste disposed [kg]	6.65E-03	1.42E-06	1.19E-06	6.65E-03
Non-hazardous waste disposed [kg]	9.29	6.56E-03	14.8	24.1
Radioactive waste disposed [kg]	0.0641	4.39E-04	0.0754	0.140
Components for re-use [kg]	0	0	0	0
Materials for recycling [kg]	0	0	0	0
Materials for energy recovery [kg]	0	0	0	0
Exported electrical energy [MJ]	0	0	0	0
Exported thermal energy [MJ]	0	0	0	0

3.3 Other environmental information

3.3.1 LCA results interpretation for 3M Envision Print Wrap Film LX480mC

The most significant potential impact of the product's life cycle on the environment, energy use, water, and waste generation is related to the raw material supply (A1), as this stage has the greatest impact for each CML2001 and TRACI 2.1 midpoint, the greatest renewable and non-renewable energy use, the greatest net fresh water use, and the greatest waste generation.

4 Additional Information

4.1 Uncertainty on the environmental indicators

Data quality and uncertainty are mutually dependent. The precision of the data depends on measuring tolerance, assumptions, completion, comprehensiveness of the considered system and the representativeness of the data. Uncertainty is also introduced in the impact assessment phase of the study and will vary according to the impact categories considered.

The uncertainty of the LCIA model is calculated for each midpoint based on a pedigree matrix, using five different data quality indicators, and Monte Carlo analysis. The uncertainty results are presented below in Table 7 (CML 2001) and Table 8 (TRACI 2.1) with 95% confidence and are calculated for the product stage total (A1-A3).

Table 7: Uncertainty results for one packaged roll of 3M Envision Print Wrap Film LX480mC for CML 2001.

	Min	Max	Base	Δ%
Abiotic depletion potential for non-fossil resources [kg Sb eq.]	1.00E-03	1.33E-03	1.15E-03	16%
Abiotic depletion potential for fossil resources [MJ]	5 680	6 290	5 980	10%
Acidification potential [kg SO ₂ eq.]	0.913	1.14	1.02	12%
Eutrophication potential [kg PO ₄ ³⁻ eq.]	0.195	0.296	0.239	24%
Global warming potential [kg CO ₂ eq.]	360	418	390	10%
Depletion potential of stratospheric ozone layer [kg CFC-11 eq.]	3.00E-06	6.31E-06	4.48E-06	41%
Formation potential of tropospheric ozone [kg ethene eq.]	0.220	0.261	0.238	10%

Table 8: Uncertainty results for one packaged roll of 3M™ Envision™ Print Wrap Film LX480mC for TRACI 2.1.

	Min	Max	Base	Δ%
Abiotic depletion potential for fossil resources [MJ surplus energy]	605	679	641	10%
Acidification potential [kg SO ₂ eq.]	0.973	1.25	1.09	15%
Eutrophication potential [kg N eq.]	0.182	0.311	0.242	29%
Global warming potential [kg CO ₂ eq.]	359	415	387	10%
Depletion potential of stratospheric ozone layer [kg CFC-11 eq.]	3.60E-06	7.40E-06	5.20E-06	42%
Formation potential of tropospheric ozone [kg O ₃ eq.]	15.9	23.2	18.7	24%

4.2 Use of EPD Results in Cradle-to-Grave evaluation

If the contents of this EPD are to be used in a cradle-to-grave evaluation or for inquiries specific to 3M Envision Print Wrap Film LX480mC, please contact Tani Maruyama (tkmaruyama@mmm.com).

4.3 Comparisons of EPD within this Product Category

Environmental product declarations within the same product category but from different programs may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804. This Environmental Product Declaration is based on PCR 2012:01 version 2.3 - Construction Products and Construction Services (Multiple UN CPC codes) from the International EPD[®] System which is in accordance with ISO 14025 and EN 15804.

4.4 Validity of the EPD

This Environmental Product Declaration is the second version for this product, see section 4.4.1 for a list of changes made to this EPD. If changes in the products' life cycle result in worsening of the environmental impacts by more than ±10.0% from the numbers reported above, the Environmental Product Declaration shall be adjusted. Regardless, the Environmental Product Declaration shall be reviewed every five years. The next review is planned for 2024.

4.4.1 Changes versus previous versions

Version 1 of this EPD was issued on 2019-05-06.

Version 2 of this EPD (issued on 2020-04-07) includes editorial changes only. No changes were made to the numerical results. In section 1, the current Epsten Group and A2LA logos were added as well as the updated accreditation number/certificate number. Section 4.4.1 was added to include changes from previous versions.

4.5 References

EPD International (2015) General Programme Instructions of the International EPD® System. Version 2.5, dated 2015-05-11.

EPD International (2018) Product Category Rule: Construction Products and Construction Services. PCR 2012:01, version 2.3, dated 2018-11-15.

EN 15804:2012+A1:2013 Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products. CEN; Brussels, Belgium; 2013.

ISO 14040:2006, Environmental management - Life cycle assessment - Principles and framework. ISO; Geneva, Switzerland; 2006.

ISO 14044:2006, Environmental management - Life cycle assessment - Requirements and guidelines. ISO; Geneva, Switzerland; 2006.

ISO 14025:2006, Environmental labels and declarations – Type III environmental declarations – Principles and procedures. ISO; Geneva, Switzerland, 2006.

J. Furney and M. Heder, CF1285: 3M™ Envision™ Print Wrap Film LX480mC, 3M Confidential, Saint Paul, 2019.

GaBi Software-System and Database for Life Cycle Engineering, copyright 1992-2018 thinkstep AG (Program Version 8.7.0.18, Database Version 8.7).

The Epsten Group, Inc. EPD Process Certification, 04/01/2019 - 04/01/2020.

3M United States: LX/SV480mC: 3M™ Envision™ Print Wrap Film LX & SV 480mC. Available: https://www.3m.com/3M/en_US/company-us/all-3m-products/~LX-SV480mC-3M-Envision-Print-Wrap-Film-LX-SV-480mC/?N=5002385+3291516961&rt=rud

For more information on Sustainability at 3M, visit our website:

www.3M.com/sustainability



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