Environmental Product Declaration

According to ISO 14025 and ISO 21930:2017

FleeceBACK® EPDM MEMBRANE

Carlisle SynTec Systems

More than a half century ago, Carlisle revolutionized the commercial roofing industry with its EPDM membrane, establishing a track record of superior performance and quality that would become the company's hallmark. Today, more than 260,000 warranted Carlisle EPDM roof systems comprising over 17.5 billion square feet of membrane have been installed around the world.adp The history of Carlisle is built on EPDM, a preferred membrane choice of consultants, contractors, architects, and building owners in numerous areas. Since the beginning, Carlisle's attention has been devoted to the four pillars of success that customers value most: performance, energy efficiency, environmental sustainability, and innovation. These are the foundation of Carlisle's success and commitment to every customer. Carlisle's decades-long experience with EPDM has allowed the company to define the standards of quality and reliability.

Issue Date: 05-10-2024

Valid Until: 05-10-2029

Declaration Number: ASTM-EPD666

DECLARATION INFORMATION

Declaration	
Program Operator: ASTM International **Company:** Carlisle SynTec Systems, a division of Carlisle Construction Materials 1285 Ritner Hwy Carlisle, PA 17013 www.carlislesyntec.com	**www.astm.org**
Product Information	**Validity / Applicability**
Name: FleeceBACK® EPDM Single-Ply Roofing Membrane **Product Definition:** Fleece-backed ethylene propylene diene monomer (EPDM) Single-Ply Roofing Membrane	**Period of Validity:** This declaration is valid for a period of 5 years from the date of publication.
Declaration Type: Business-to-business (B2B)	**Geographic Scope:** North America
PCR Reference: • Core PCR: ISO 21930:2017 (ISO 21930, 2017) • Sub-category PCR: Product Category Rules for Single-Ply Roofing Membranes (NSF International, 2019)	**PCR Review was conducted by:** • Thomas P. Gloria, Ph.D., Industrial Ecology Consultants • Bill Stough, Sustainable Research Group • Jack Geibig, EcoForm
Product Application and/or Characteristics	
Single-ply, fleece-backed EPDM membrane representative of 100, 115, and 145mil thicknesses are used as a roofing protective layer for building applications.	
Content of the Declaration	
• Product definition and physical building-related data • Details of raw materials and material origin • Description of how the product is manufactured • Life Cycle Assessment results • Additional environmental information	
Verification	
This declaration was independently verified in accordance with ISO 21930:2017, ISO 14025:2006 and the reference PCR by Tim Brooke, ASTM International.	☐ Internal ☒External
This life cycle assessment was independently verified in accordance with ISO 21930:2017 and ISO 14044:2006 and the reference PCR by Lindita Bushi, Ph.D., Athena Sustainable Materials Institute.	
Limitations *The environmental impact results of EPDM products in this document are based on a declared unit and therefore do not provide sufficient information to establish comparisons. The results shall not be used for comparisons without knowledge of how the physical properties of the EPDM product impact the precise function at the construction level. The environmental impact results shall be converted to a functional unit basis before any comparison is attempted. See Section 3.10 for additional EPD comparability guidelines. Environmental declarations from different programs (ISO 14025) may not be comparable.*	

EPD Summary

This document is a Type III environmental product declaration by Carlisle SynTec Systems that is certified by ASTM International (ASTM) as conforming to the requirements of ISO 21930 and ISO 14025. ASTM has assessed that the Life Cycle Assessment (LCA) information fulfills the requirements of ISO 14040 in accordance with the instructions listed in the referenced product category rules. The intent of this document is to further the development of environmentally compatible and sustainable construction methods by providing comprehensive environmental information related to potential impacts in accordance with international standards.

No comparisons or benchmarking are included in this EPD. Environmental declarations from different programs based upon differing PCRs may not be comparable. In general, EPDs may not be used for comparability purposes when not considered in a construction works context. Given that the PCR ensures products meet the same functional requirements, comparability is permissible provided the information given for such comparison is transparent and the limitations of comparability explained. Only EPDs prepared from cradle-to-grave life cycle results, and based on the same function, quantified by the same functional unit, and taking account of replacement based on the product reference service life (RSL) relative to an assumed building service life, can be used to assist purchasers and users in making informed comparisons between products. When comparing EPDs created using this PCR, variations and deviations are possible. Example of variations: Different LCA software and background LCI datasets may lead to different results for upstream or downstream of the life cycle stages declared.

Scope and Boundaries of the Life Cycle Assessment

The Life Cycle Assessment (LCA) was performed according to ISO 14040 (ISO 14040, 2020a) and ISO 14044 (ISO 14044, 2020b) following the requirements of the ASTM EPD Program instructions and the referenced PCR.

System Boundary: Cradle-to-gate

Declared Unit: 1 m^2 of single-ply roofing membrane for a stated product thickness. Environmental performance results therefore represent Carlisle's average production of EPDM, normalized to 1 m^2.

General Information

Description of Company/Organization

Carlisle SynTec Systems, the flagship division of Carlisle Construction Materials, is the largest supplier of commercial roofing products in the world. Carlisle produces high-performance EPDM, TPO, PVC, and FleeceBACK® single-ply roofing membranes, a full line of polyiso and expanded polystyrene insulation, and a wide variety of solvent-based and low-VOC adhesives. With decades of manufacturing experience and billions of square feet of roofing materials sold, Carlisle continues to lead the industry by providing the best products, services, and warranty options available today.

Product Description

Carlisle's FleeceBACK® EPDM demonstrates industry-leading toughness, durability, and versatility. Carlisle FleeceBACK® EPDM systems are preferred for new construction and re-roofing projects, and are particularly well-suited for critical facilities that require superior protection against severe weather, as well as Roof Garden and solar applications. EPDM FleeceBACK® EPDM membranes are installed using Flexible FAST Adhesive for a VOC-free, quiet, low-odor, non-penetrating application and a roof system that offers superior wind uplift.

The product system evaluated in this report is a single-ply FleeceBACK® EPDM roofing membrane at the finished nominal thicknesses produced by Carlisle. See Table 1 for membrane specification and standard.

Table 1 Membrane specification and standard

Roof System	Roof System Component	Declared Thicknesses and Weights, per declared unit	Standard
FleeceBACK® ethylene propylene diene monomer (EPDM)	Membrane	100 mils: 1.73 kg/m^2 115 mils: 2.09 kg/m^2 145 mils: 3.12 kg/m^2	ASTM D4637

Product Average

The 2019 production data used in this EPD considers FleeceBACK® EPDM roofing membranes produced by Carlisle in one (1) site in North America during the year, Carlisle, PA.

Application

FleeceBACK® EPDM membranes are utilized in mechanically-fastened and fully adhered commercial roofing systems and are known to provide added puncture/tear resistance, excellent long term weatherability, and repairability. The thicker 115-mil and 145-mil membranes provide added weathering material and added puncture resistance making them the

natural choice for longer-term performance. Reinforced EPDM membrane is sold with factory-applied splice tape creating a very reliable and productive means to adjoin the sheets on the roof. They are also available in either light or dark colors to fit different geographic climates. Darker-colored EPDM is typically preferred in heating-dominated central and northern climates, whereas white or lighter-colored EPDM is typically preferred in cooling-dominated southern climates.

Material Composition

Table 2 shows the input material for FleeceBACK® EPDM roofing membranes and their material percentages for the three membrane thicknesses.

Table 2 Composition of FleeceBACK® EPDM roofing membrane

Material	100 mil % Composition	115 mil % Composition	145 mil % Composition
Base polymer (EPDM)	26.5	27.4	28.8
Filler	19.7	20.3	21.3
Pigment	18.4	19.0	20.0
Paraffinic oil	15.7	16.2	17.0
Fleece backing	16.0	13.2	8.7
Fire retardant	2.4	2.4	2.6
Others	1.4	1.5	1.6

Manufacturing

The main material input into the manufacturing process is EPDM rubber in the form of pellets and (uncured) scrap. Additional materials include various additives, which aid in the manufacturing process (e.g., accelerators) and which enhance the membrane's performance (e.g., fire retardants and pigments). The mix is heated, stirred, and extruded into a sheet with a reinforcing polyester scrim sandwiched in the middle of two EPDM plies. The sheet is then pressed to achieve the specified thickness, trimmed, and rolled up into a master roll. Uncured EPDM edge trimmings generated during the aforementioned steps can be looped directly back as a material input. Vulcanization entails master rolls of membrane being wrapped and placed into a pressurized oven to crosslink and cure the membrane. Once cured, the membrane sheet maintains its shape and size. After vulcanization, the cured EPDM membrane is cut to the desired length and packaged onto a cardboard core.

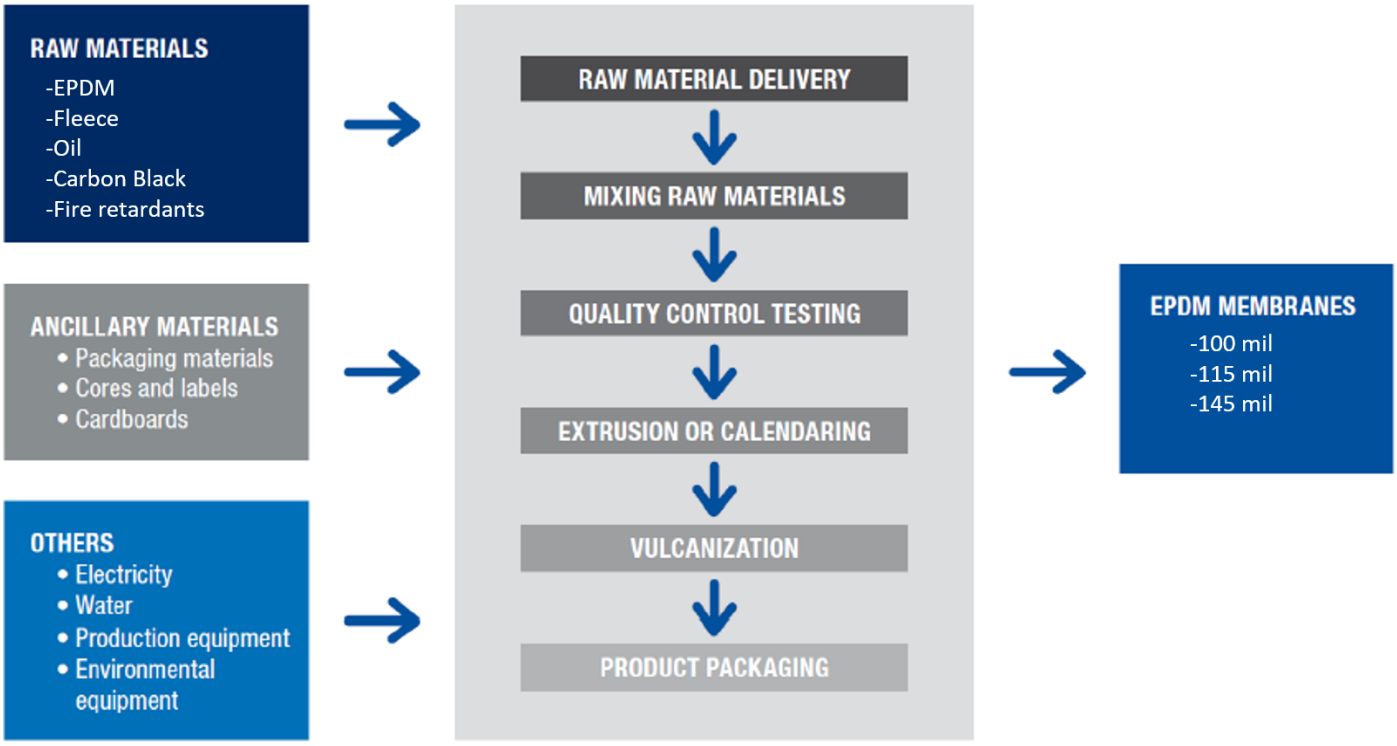

Figure 1: FleeceBACK® EPDM production process map

Transportation

Primary data on inbound transportation of raw materials and packaging material were collected. These materials included base resin (EPDM), fleece backing, fillers, pigments, curatives, activators, processing aids, etc. Transportation to the customer or construction site is outside the scope of this EPD.

Product Installation

Installation is outside the scope of this EPD.

Use

Product use is outside the scope of this EPD.

Reuse, Recycling, and Energy Recovery

Product reuse, recycling, and energy recovery are outside the scope of this EPD.

Recycling – Carlisle continues to research means to increase the use of recycled materials into the membrane and various rubber-related accessory products like rubber pavers and walkway pads.

Energy efficiancy – As a leader in the commercial roofing industry and the largest manufacturer of both white and dark-colored roofing membranes, Carlisle continues to advocate for careful selection of roofing systems based on a building's design, location, and climatic conditions. In general, the heating penalty of white reflective membranes exceeds the cooling benefit in heating-dominated central and northern climates. In the central and northern climates, heating costs are typically 3-5 times greater than cooling costs, and in these climates a dark-colored EPDM roof is typically the energy-efficient choice. In cooling-dominated southern climates a white EPDM roof or a ballasted EPDM roof are typically the energy-efficient choice.

The use of insulating ½" cover boards provide an added 2.5 R-value as another means to enhance the energy efficiency of roofing systems. Cover boards also improve the durability and wind uplift resistance of the roofing assembly.

Specifying the use of multiple layers of insulation with staggered joints in lieu of a single thick layer of insulation is proven to be more thermally efficient.

Utilizing urethane insulation adhesives to bond insulation to the roof deck in lieu of metal fasteners and metal insulation plates eliminates the R-value loss from thermal bridging.

Disposal

Product disposal is outside the scope of this EPD.

METHODOLOGICAL FRAMEWORK

DECLARED UNIT

The declared unit for this study is :

1 m² of single-ply roofing membrane for a stated product thickness.

Environmental performance results therefore represent Carlisle's average production of EPDM, normalized to 1 m^2. The reference service life is not specified. Since the use stage is not included in the system boundary, no reference service life needs to be defined for the analysis.

SYSTEM BOUNDARY

System boundaries are summarized in Figure 2 for the analysis scope of "cradle-to-gate". Excluded modules are indicated by "MND" or "module not declared". As is typical of works of life cycle assessment, the construction and maintenance of capital equipment, such as production equipment in the manufacturing stage, are not included in the system, nor are human labor and employee commute. The use stage is also outside the scope of this study.

PRODUCT STAGE			CONSTRUCT-ION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARY
Raw material supply	Transport	Manufacturing	Transport from gate to site	Assembly/Install	Use	Maintenance	Repair	Replacement	Refurbishment	Building Operational Energy Use During Product Use	Building Operational Water Use During Product Use	Deconstruction	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

Figure 2 Life cycle stages included in system boundary

CUT-OFF RULES

No cut-off criteria had to be applied for this study. All available energy and material flow data were included in the model.

DATA SOURCES

The LCA model was created using the LCA FE software system for life cycle engineering, version 2023.2, developed by Sphera (Sphera, 2023). Background life cycle inventory data for raw materials and processes were obtained from the MLC 2023.2 database. Primary manufacturing data were provided by the participating companies.

Data Quality

As the majority of the relevant foreground data are measured data or calculated based on primary information sources of the owner of the technology, precision is considered to be high. Seasonal variations were balanced out by using yearly averages that were then weighted according to each manufacturer's production volume. All background data are sourced from the MLC databases with the documented precision. Each foreground process was checked for mass balance and completeness of the emission inventory. No data were knowingly omitted. Completeness of foreground unit process data is considered to be high. All background data are sourced from the MLC databases with the documented completeness.

Geographical Coverage

This study represents production at Carlisle facilities in North America. As such, the geographical coverage for this study is based on North American system boundaries for all processes and products.

Regionally specific datasets, where available, were used to represent each manufacturing location's energy consumption. Proxy datasets were used as needed for raw material inputs to address lack of data for a specific material or for a specific geographical region. These proxy datasets were chosen for their technological representativeness of the actual materials.

Period under Review

Primary data collected represent production during the 2019 calendar year. This analysis is intended to represent production in 2019. All secondary data come from the MLC Professional databases and are representative of the years 2017-2022.

Allocation

As several products are often manufactured at the same plant, participating facilities used mass allocation to report data. Mass allocation was selected since the environmental burden in the industrial process (energy consumption, emissions, etc.) is primarily governed by the mass throughput of each sub-process.

Allocation of background data (energy and materials) taken from the MLC 2023 databases is documented online at https://sphera.com/product-sustainability-gabi-data-search/.

Estimates and Assumptions

In cases where no matching life cycle inventories were available to represent a flow, proxy data were applied based on conservative assumptions regarding environmental impacts.

Life Cycle Assessment Results

The environmental impacts associated with the fleece-backed roofing membrane is presented below in Table 3 for the production stage (A1-A3).

Table 3: Environmental impact indicators for 1m² of FleeceBACK® EPDM Single-Ply Roofing Membrane

Indicator	A1	A2	A3	Total
Global Warming Potential [kg CO_2 eq.] – IPCC AR6				
EPDM 100 mils	4.19E+00	2.00E-01	1.28E+00	5.67E+00
EPDM 115 mils	4.98E+00	2.45E-01	1.55E+00	6.77E+00
EPDM 145 mils	7.28E+00	3.76E-01	2.32E+00	9.97E+00
Global Warming Potential [kg CO_2 eq.] – IPCC AR5				
EPDM 100 mils	4.28E+00	2.01E-01	1.30E+00	5.78E+00
EPDM 115 mils	5.09E+00	2.47E-01	1.57E+00	6.91E+00
EPDM 145 mils	7.44E+00	3.80E-01	2.35E+00	1.02E+01
Ozone Depletion Potential [kg CFC-11 eq.]				
EPDM 100 mils	1.93E-13	5.18E-16	1.60E-12	1.80E-12
EPDM 115 mils	2.07E-13	6.34E-16	1.93E-12	2.14E-12
EPDM 145 mils	2.47E-13	9.72E-16	2.89E-12	3.14E-12
Acidification Potential [kg SO2 eq.]				
EPDM 100 mils	6.19E-03	1.46E-03	1.35E-03	9.00E-03
EPDM 115 mils	7.44E-03	1.81E-03	1.63E-03	1.09E-02
EPDM 145 mils	1.11E-02	2.82E-03	2.45E-03	1.64E-02
Eutrophication Potential [kg N eq.]				
EPDM 100 mils	6.99E-04	9.09E-05	1.43E-04	9.34E-04
EPDM 115 mils	8.41E-04	1.12E-04	1.73E-04	1.13E-03
EPDM 145 mils	1.25E-03	1.74E-04	2.59E-04	1.68E-03
Smog Formation Potential [kg O_3 eq.][1]				
EPDM 100 mils	1.14E-01	3.27E-02	2.26E-02	1.69E-01
EPDM 115 mils	1.36E-01	4.06E-02	2.72E-02	2.03E-01
EPDM 145 mils	1.99E-01	6.33E-02	4.08E-02	3.03E-01

The resource use associated with the fleece-backed roofing membrane is presented below in Table 4 for the production stage (A1-A3). Emerging LCA impact categories and inventory items are still under development and can have high levels of uncertainty that preclude international acceptance pending further development. Use caution when interpreting data in these categories (NSF International, 2019).

[1] Per ISO 21930, TRACI Smog Formation Potential (SFP) is reported instead of Photochemical Oxidant Creation Potential (POCP)

Table 4: Resource use indicators for 1m² of FleeceBACK® EPDM Single-Ply Roofing Membrane

Indicator	A1	A2	A3	Total
Renewable Primary Energy Resources as Energy (RPRE) [MJ]				
EPDM 100 mils	5.81E+00	1.05E-01	3.96E+00	9.88E+00
EPDM 115 mils	6.47E+00	1.28E-01	4.78E+00	1.14E+01
EPDM 145 mils	8.36E+00	1.96E-01	7.15E+00	1.57E+01
Renewable Primary Resources as Material (RPRM) [MJ]				
EPDM 100 mils	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EPDM 115 mils	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EPDM 145 mils	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Non-Renewable Primary Resources as Energy (fuel) (NRPRE) [MJ]				
EPDM 100 mils	7.01E+01	2.91E+00	2.15E+01	9.45E+01
EPDM 115 mils	8.46E+01	3.56E+00	2.59E+01	1.14E+02
EPDM 145 mils	1.27E+02	5.47E+00	3.87E+01	1.71E+02
Non-Renewable Primary Resources as Material (NRPRM) [MJ]				
EPDM 100 mils	4.79E+01	0.00E+00	2.82E-01	4.81E+01
EPDM 115 mils	5.65E+01	0.00E+00	3.41E-01	5.68E+01
EPDM 145 mils	8.16E+01	0.00E+00	5.10E-01	8.21E+01
Secondary Materials (SM) [kg]				
EPDM 100 mils	9.77E-02	0.00E+00	8.96E-02	1.87E-01
EPDM 115 mils	1.22E-01	0.00E+00	1.08E-01	2.30E-01
EPDM 145 mils	1.94E-01	0.00E+00	1.62E-01	3.56E-01
Renewable Secondary Fuels (RSF) [MJ]				
EPDM 100 mils	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EPDM 115 mils	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EPDM 145 mils	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Non-Renewable Secondary Fuels (NRSF) [MJ]				
EPDM 100 mils	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EPDM 115 mils	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EPDM 145 mils	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Recovered Energy (RE) [MJ LHV]*				
EPDM 100 mils	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EPDM 115 mils	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EPDM 145 mils	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Abiotic Depletion Potential for Fossil Resources (ADP_{fossil}) [MJ]*				

EPDM 100 mils	1.15E+02	2.88E+00	1.77E+01	1.36E+02
EPDM 115 mils	1.38E+02	3.53E+00	2.13E+01	1.62E+02
EPDM 145 mils	2.03E+02	5.42E+00	3.19E+01	2.41E+02
Use of Net Freshwater Resources (FW) [m^3]*				
EPDM 100 mils	1.88E-02	3.57E-04	7.03E-03	2.62E-02
EPDM 115 mils	2.24E-02	4.36E-04	8.48E-03	3.13E-02
EPDM 145 mils	3.27E-02	6.67E-04	1.27E-02	4.60E-02

*Emerging LCA impact categories and inventory items are still under development and can have high levels of uncertainty that preclude international acceptance pending further development. Use caution when interpreting data in this category.

The waste generation associated with the fleece-backed roofing membrane is presented below in Table 5 for the production stage (A1-A3). Emerging LCA impact categories and inventory items are still under development and can have high levels of uncertainty that preclude international acceptance pending further development. Use caution when interpreting data in these categories (NSF International, 2019).

Table 5: Output flows & waste categories for 1m^2 of FleeceBACK® EPDM Single-Ply Roofing Membrane

Indicator	A1	A2	A3	Total
Hazardous Waste Disposed (HWD) [kg]				
EPDM 100 mils	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EPDM 115 mils	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EPDM 145 mils	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Non-Hazardous Waste Disposed (NHWD) [kg]				
EPDM 100 mils	0.00E+00	0.00E+00	2.34E-01	2.34E-01
EPDM 115 mils	0.00E+00	0.00E+00	2.94E-01	2.94E-01
EPDM 145 mils	0.00E+00	0.00E+00	4.69E-01	4.69E-01
High-Level Radioactive Waste, Conditioned, to Final Repository (HLRW) [kg]*				
EPDM 100 mils	1.21E-06	9.62E-09	1.72E-06	2.94E-06
EPDM 115 mils	1.42E-06	1.18E-08	2.08E-06	3.51E-06
EPDM 145 mils	2.04E-06	1.81E-08	3.11E-06	5.16E-06
Intermediate- and Low-Level Radioactive Waste, Conditioned, to Final Repository (ILLRW) [kg]*				
EPDM 100 mils	1.07E-03	8.10E-06	1.44E-03	2.51E-03
EPDM 115 mils	1.25E-03	9.92E-06	1.74E-03	3.00E-03
EPDM 145 mils	1.78E-03	1.52E-05	2.60E-03	4.40E-03
Components for Re-Use (CRU) [kg]*				
EPDM 100 mils	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EPDM 115 mils	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EPDM 145 mils	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Materials for Recycling (MR) [kg]*				
EPDM 100 mils	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EPDM 115 mils	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EPDM 145 mils	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for Energy Recovery (MER) [kg]*				
EPDM 100 mils	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EPDM 115 mils	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EPDM 145 mils	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Recovered Energy Exported from the Product System (EE) [MJ LHV]*				
EPDM 100 mils	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EPDM 115 mils	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EPDM 145 mils	0.00E+00	0.00E+00	0.00E+00	0.00E+00

*Emerging LCA impact categories and inventory items are still under development and can have high levels of uncertainty that preclude international acceptance pending further development. Use caution when interpreting data in this category.

LCA Interpretation

The major contributor for almost every impact is raw materials (A1) followed by manufacturing (A3) and inbound transportation (A2). There is an exception with ODP, where manufacturing (A3) takes the lead due to the production of bio-based packaging materials, such as cardboard, which make up 84% of the total contribution to ODP. The EPDM material itself contributed the most to AR6 GWP (28-31%), AP (25-28%), and SFP (33-36%) impacts. The carbon black pigment was found to be the second highest contributor to AR6 GWP (17-19%) and AP (18-20%) impacts. Impacts on EP were driven by the stabilizer (22-24%) and EPDM (16-18%) materials.

The EPDs are comparable only if they comply with the document ISO 21930, use the same sub-category PCR where applicable, include all relevant information modules and are based on equivalent scenarios with respect to the context of construction works.

Additional Environmental Information

Safety factor against condensation – In testing completed by Oak Ridge National Labs it was proven that white mechanically fastened roofing systems accumulate twice as much condensate as a black mechanically fastened roofing system (Manfred & Pallin, 2013). This is an important built-in safety factor for black reinforced EPDM in cooler central and northern climates.

UV resistance – EPDM has excellent UV resistance as evidenced in the ASTM G155 Accelerated Xenon Arc Weathering test. Black reinforced EPDM has 1.75 times the UV resistance of various white roofing membranes (35,000 kJ/m^2 compared to 20,000 kJ/m^2).

Puncture resistance – Adding internal reinforcement to the membrane increases the puncture resistance compared to a non-reinforced membrane. Adding external fleece reinforcement gives you the highest amount of puncture resistance and provides a full 1.2,1.5, or 1.9mm of weathering membrane above the fleece reinforcement.

Resistance to unwanted biological growth – All of Carlisle's EPDM roofing membranes provide excellent resistance to unwanted biological growth on the surface of the membrane. In the ASTM G21 test, conducted by MicroStar Labs, our EPDM roofing membranes achieved a zero or "no growth" rating (#R2014-131).

Resistance to hail damage – EPDM roofing membranes have had a great track record of resisting hail damage and keeping water out of buildings, which can cut down on owners' financial losses considerably. EPDM stays flexible throughout its life cycle, providing good hail resistance even at the end of its warranty term. Adhered systems, with a minimum 1.5 mm reinforced EPDM membrane over a cover board set in adhesive, are a practical way to eliminate potential hail damage due to a direct hail strike over a fastener or plate that is required in a mechanically fastened system.

Pollution abatement equipment – The Carlisle plant employs pollution abatement equipment, including scrubbers, filter boxes, and dust collectors.

Clarification regarding hazardous substances in the final product – Per EPDM Safety Data Sheet (SDS), the finished product declared in this EPD is considered "Articles" as defined in OSHA Hazardous Communication Standard. This finished product is not hazardous and does not contain any regulated substances of very high concern. No components in the product are listed under the SDS Section 15 Regulatory Requirements, specifically U.S. Federal Regulations, SARA Section 311/312, California Prop 65, or the Canadian WHMIS IDL. Information on ingredients and regulatory information can be found in the SDS.

Clarification regarding release of dangerous substances from the final product – The finished product declared in the EPD is classified as an article with no release of dangerous substances.

Clarification regarding hazardous waste generated during production – No hazardous waste is generated during the production of the product declared in this EPD.

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