

## ENVIRONMENTAL PRODUCT DECLARATION

# SYMPHONY<sup>®</sup> f

CERTAINTEED

SYMPHONY f FIBERGLASS CEILING PANELS



*Symphony f has a clean monolithic appearance with a balanced mix of acoustical, performance and environmental properties to meet your needs in office, healthcare and education buildings.*

**CertainTeed**  
SAINT-GOBAIN

### Ceilings

CertainTeed Corporation, a subsidiary of Saint-Gobain, is a leading North American manufacturer of interior building materials including gypsum, ceilings, and insulation as well as exterior building materials which include roofing, vinyl and fiber cement siding, trim, fence, railing, decking, foundations, and pipe products. CertainTeed respects the environment through the responsible development of sustainable building products and systems.

Architects, contractors and manufacturers continue to look for ways to reduce our industry's impact on the environment while meeting customer demand for products that deliver beauty, comfort, and performance. CertainTeed Ceilings' respect for the environment is reflected in our ongoing emphasis on sustainable building products and systems. Open sharing of the data we gather on these effects - as embodied in Environmental Product Declarations - is central to the process, and sets CertainTeed Ceilings apart.

For more information visit  
<http://www.certainteed.com>



# ENVIRONMENTAL PRODUCT DECLARATION



Symphony® f  
Fiberglass Ceiling Panels

According to ISO 14025

This declaration is an environmental product declaration in accordance with ISO 14025 that describes the environmental characteristics of the aforementioned product. It promotes the development of sustainable products. This is a certified declaration and all relevant environmental information is disclosed.




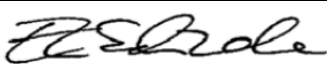
PROGRAM OPERATOR	UL Environment
DECLARATION HOLDER	CertainTeed Ceilings
DECLARATION NUMBER	12CA16994.105.1
DECLARED PRODUCT	Symphony® f Fiberglass Ceiling Panels
REFERENCE PCR	Institut Bauen und Umwelt e.V. PCR for Ceiling panels for suspended ceiling systems

DATE OF ISSUE	September 29, 2012
PERIOD OF VALIDITY	5 years

CONTENTS OF THE DECLARATION	<p>Product definition and information about building physics</p> <p>Information about basic material and the material's origin</p> <p>Description of the product's manufacture</p> <p>Indication of product processing</p> <p>Information about the in-use conditions</p> <p>Life cycle assessment results</p> <p>Testing results and verifications</p>
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The PCR review was conducted by:	Institut Bauen und Umwelt e.V.
	PCR confirmed by SVA Rheinufer 108 D-53639 Königswinter Germany Tel.: +49 (0)2223 296679-0 Fax: +49 (0)2223 296679-1 Email: info@bau-umwelt.com

This declaration was independently verified by Underwriters Laboratories in accordance with ISO 14025  <input type="checkbox"/> INTERNAL <input checked="" type="checkbox"/> EXTERNAL	 Loretta Tam
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This life cycle assessment was independently verified by in accordance with ISO 14044 and the reference PCR	 Eva Schmincke
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## Product Definition

### Product Description

The Symphony *f* product contains a fiberglass core with post-consumer recycled content that is finished in Plymouth, WI. This product has a standard fiberglass (glass wool) core with a reinforced mat and finish coatings. This Environmental Product Declaration (EPD) examines the Symphony *f* (1" thickness) product. The coatings modeled include the edge and top coatings that are specific for the Symphony *f* product line.

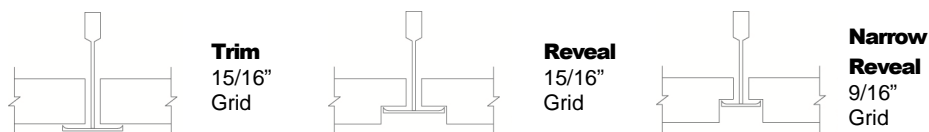
VOC-Compliant Symphony *f* has been submitted to an independent laboratory for testing according to California Department of Public Health CDPH/EHLB/Standard Method Version 1.1, 2010 and found to be compliant to that testing standard (Emission testing method for CA Specification 01350). Visit [certainteed.com](http://certainteed.com) to view the Certificate of Compliance.

The Symphony *f* product contains between 29%-34% post-consumer recycled content (varies by panel thickness). The core is purchased and then shipped to Plymouth, WI for finishing. This EPD is developed for the ceiling panels only and does not include ceiling grid.

### Visual and Installed Cost

- Overtone® finish provides a clean, monolithic appearance
- Relative Installed Cost: \$\$\$\$

### Available Edge Profiles and Grid Interface



### Application

Modular installation of suspended ceilings in commercial buildings.

### Codes of Practice

- ASTM E1264- Classification For Acoustic Ceilings
- ASTM E84- Surface Burning Characteristics: pursuant to test certificate
- ASTM C423 - sound absorption: coefficient data of product and surface
- ASTM E1414 - sound insulation: product and system related data of sound insulation
- ASTM C518-10- Thermal conductivity: [ft<sup>2</sup>·°F·h/Btu]

### Suitable for commercial interior installations:

- Open plan areas or spaces in:
  - Office buildings
  - Education buildings
  - Healthcare buildings
- Symphony *f* panels (glass wool products) are exceptional sound absorbers.
- Best used with Symphony *m* (mineral fiber, visually coordinated product family) to block sound in closed areas.

### Features and Benefits

- Outstanding sound absorption (NRC 0.80 & NRC 0.95)
- Exceptional surface durability and washability
- Inorganic substrate is naturally resistive to mold and mildew growth and is sag and moisture resistive
- Superior noise reduction to maximize interzone attenuation
- Perfect for enhanced speech privacy and exceptional productivity in open plan environments
- High light reflectance maximizes performance when using indirect lighting systems
- Specify with other available mineral fiber and gypsum Overtone finish products for best acoustical results





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## Quality Assurance

- ISO 9001 Quality Management System
- GreenCircle Certified (<http://www.greencirclecertified.com/>)
- Certificate of Compliance for VOC Emissions: Berkeley Analytical



## Delivery Condition

Relative shipping distances for the base raw materials are shown below in Table 3. Final product is typically sold within the continental United States and transported by truck.

Characteristics		
Type of Manufacture	Fiberglass Ceiling Panel	
Product Specifications	Thickness – 1”, Density – 4 pcf	
Core Type	Fiberglass with recycled content	
Characteristics	Material	Weight Percent
Base Material Composition	Glass Fibers	< 85%
	Organic Binder	< 15%
	Scrim	< 5%
	Adhesive	<2%
Auxiliary Substances - Coatings and Finishes	Finish Coatings	<1%

Table 1. Specification of product construction

## Technical Data

### Fire Performance

ASTM E1264- Class A  
ASTM E84- Flame spread of 25 or less, Smoke developed of 50 or less

### Water Damage

This product is subject to water damage. No water or water vapor from sources including, but not limited to, condensation, leaking pipes and/or ducts, or steam should be allowed to come in contact with the ceiling panels.

### Mechanical Damage

This product is intended for commercial applications. Use and practice information can be found in *Acoustical Ceilings: Use and Practice* published by Ceilings & Interior Systems Construction Association (CISCA). The product should be installed according to CertainTeed Ceilings installation instructions.





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Base Materials

TOP VIEW      SIDE VIEW



Material Definitions

**Finish Coatings** A durable, high light-reflecting finish paint coating is applied to the scrim.

**Scrim** A non-woven facing is attached to the fiberglass core with a latex adhesive.

**Fiberglass Core** Consists of glass fibers and an organic resin.

Layer	Component	Material	Function	Recycled Resource	Mineral Resource	Non Renewable	Renewable	Abundant	Origin	Transportation Distance (miles)
Fiberglass Core Composition	Ceiling Panel Core	Glass Fibers	Acoustics	Y		Y		Y	US	< 350
		Organic Binder	Binder			Y			US	< 350
Scrim	Fiberglass Mat	Fiberglass	Finish		Y	Y		Y	Netherlands	< 5,000
	Adhesive	Latex Adhesive	Adhesive			Y			US	< 350
Top and Edge Coatings	Coatings	Finish Coatings	Finish			Y			US and Canada	< 1000

Table 2: Material Content of the Symphony f Final Product

Raw Material Extraction and Origin

**Fiberglass Core (post-consumer)**

Fiberglass is derived from an abundant mineral. The core used in the Symphony f product contains post-consumer recycled glass fibers and an organic binder.

**Scrim**

A fiberglass filament mat made from an abundant mineral. The mat used in this product is sourced from the Netherlands.



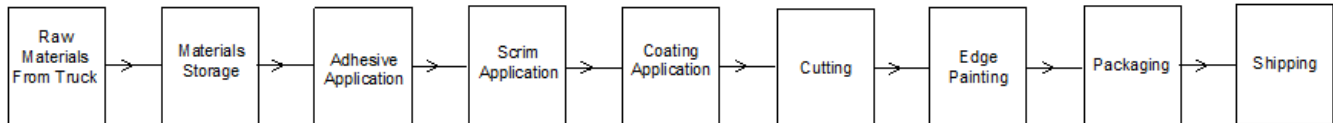


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## Production Process

Plymouth, Wisconsin (USA)



## Health, Safety, and Environmental Aspects during Production

CertainTeed has well-established Environmental, Health, and Safety, (EHS) and product stewardship programs, which help to enforce proper evaluation and monitoring of chemicals chosen to manufacture products. These programs ensure that all environmental and OSHA requirements are met or exceeded to ensure the health and safety of all employees and contractors.



## Installation of Ceiling Panels



### Installation Recommendations

The ceiling panels must be installed in accordance with all CertainTeed installation guidelines applicable at the time of installation. Approved installation procedures are also described in the ceiling systems handbook, *Acoustical Ceilings: Use and Practice*, published by the Ceilings & Interior Systems Construction Association and must be followed.

Installation of CertainTeed ceiling panels is accomplished by manual labor and typically does not require any coating or finishing. Cutting is accomplished by using hand held cutting tools. This EPD covers the ceiling panels only and does not include grid.

## Health, Safety, and Environmental Aspects during Installation

There are no apparent risks involved with the installation of ceiling panels since no coating or finishing is required. While installing panels, the installer should wear safety glasses to avoid debris falling into eyes, a dust mask if in a poorly ventilated area, and gloves.





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## Residual Material

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Waste is minimized by the modular aspect of the ceiling panels, and this analysis assumes a 5% installation scrap rate, which is modeled as landfilled. The Symphony *f* product was modeled as being disposed of in a landfill at the end of its life. However, CertainTeed Ceilings has developed a ceiling panel take back and recycling program which allows recovery of mineral fiber ceiling panels from construction sites. The ceiling panels are then used to manufacture new ceiling panels. As this program expands, it has the opportunity to significantly reduce environmental impacts associated with raw materials extraction and processing by offsetting virgin raw material demand.

## Packaging

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Ceiling panels are packaged using sleeves made from recycled cardboard and plastic shrink wrap. It is recommended that packaging materials are recycled if recycling infrastructure exists. The packaging was modeled and is included in the life cycle impacts of the EPD.

## Use Stage

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### Cleaning and maintenance

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Once installed, ceiling panels typically require no cleaning or maintenance. Maintenance personnel should wear clean, white cotton gloves when handling panels so oils and dirt from the hands do not transfer to panels.

### Prevention of Structural Damage

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To ensure longevity of the product, make sure panels are not exposed to high humidity or high temperatures. Criteria can be found in the CertainTeed Ceilings warranty information for each specific product. Please visit [www.certainteed.com/ceilings](http://www.certainteed.com/ceilings) for more information.

### Effects on the Environment and Health

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This ceiling panel is stationary during typical use and does not emit harmful emissions.

Broken or damaged panels should be picked up and placed in a container. Remaining waste material can be swept or vacuumed into a container. Avoid the creation of excessive dust during cleanup. A dust suppressant may be implemented if necessary.

### Useful Life

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The product is warranted for a service life of 1-10 years of use (and up to 15 if used in conjunction with CertainTeed Ceilings Suspension Systems). However, the useful life of ceiling panels can be as long as the buildings' useful life if properly installed and maintained. The useful life of these panels is considered to be 50 years.

## End-of-Life

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### Recycling or Reuse

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The preferred method for unfaced mineral wool ceiling panels is to be recycled through CertainTeed's Ceiling Recycling Program; however, current operations cannot recycle faced fiberglass products such as Symphony *f* panels. Information on this program can be found at the link below.





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Please visit [www.certainteed.com/ceilings](http://www.certainteed.com/ceilings) for more information.

**Disposal**

Disposal of Symphony f ceiling panels in municipal landfill or commercial incineration facilities is permissible and should be done in accordance with local, state, and federal regulations.

**Life Cycle Assessment**

**Product System and Modeling of the Life Cycle**

**Functional Unit**

One square foot (1"x12"x12") ceiling panel for use of 50 years. The use stage is considered for 50 years of service life, though based on typical operational data, this product does not require any inputs during the Use Phase. The reference flow is one square foot (1"x12"x12") of modular ceiling panel.

**Life Cycle Stages Assessed**

1. Production
2. Final Product Shipping
3. Installation and Use
4. End-of-Life

**System Boundaries**

The life cycle analysis for the production of ceiling panels comprises the life cycle phases from cradle-to-grave. It begins with the consideration of the ceiling panel production (extraction of raw materials and product manufacturing), final product shipping, installation and use, and end-of-life stages, as shown in Figure 6 to the right. Manufacturing overhead (heating & lighting) was excluded from the system boundary.

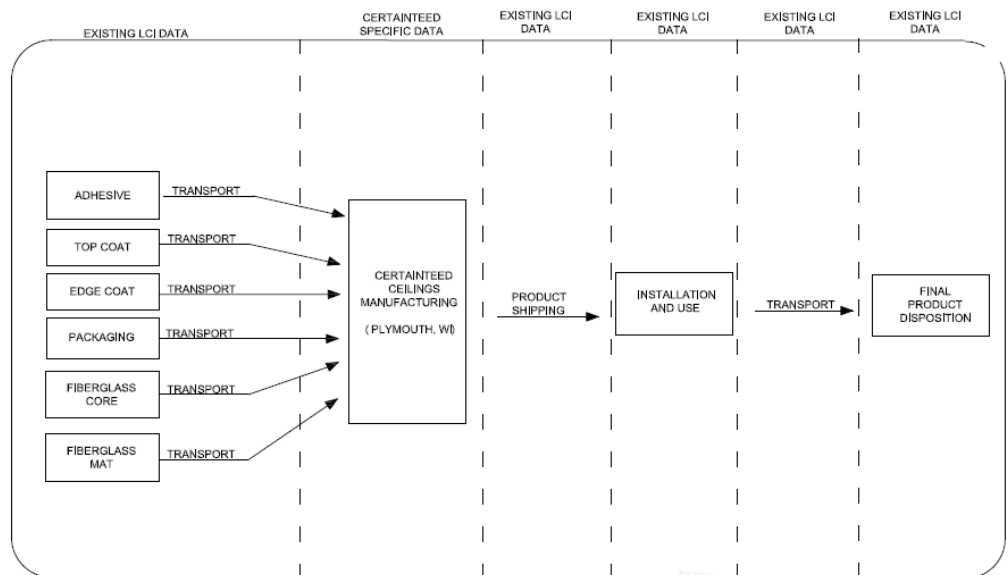


Figure 6: Life System Stage Diagram for Fiberglass Ceiling Panels

**Assumptions**

There are no specific assumptions to list.

**Cut-off Criteria**

Processes whose total contribution to the final result, with respect to their mass and in relation to all considered impact categories, is less than 1% can be neglected.

The sum of the neglected processes may not exceed 5% by mass of the considered impact categories. For that a documented assumption is admissible.

For Hazardous Substances, as defined by the U.S. Occupational Health and Safety Act, the following requirements







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apply:

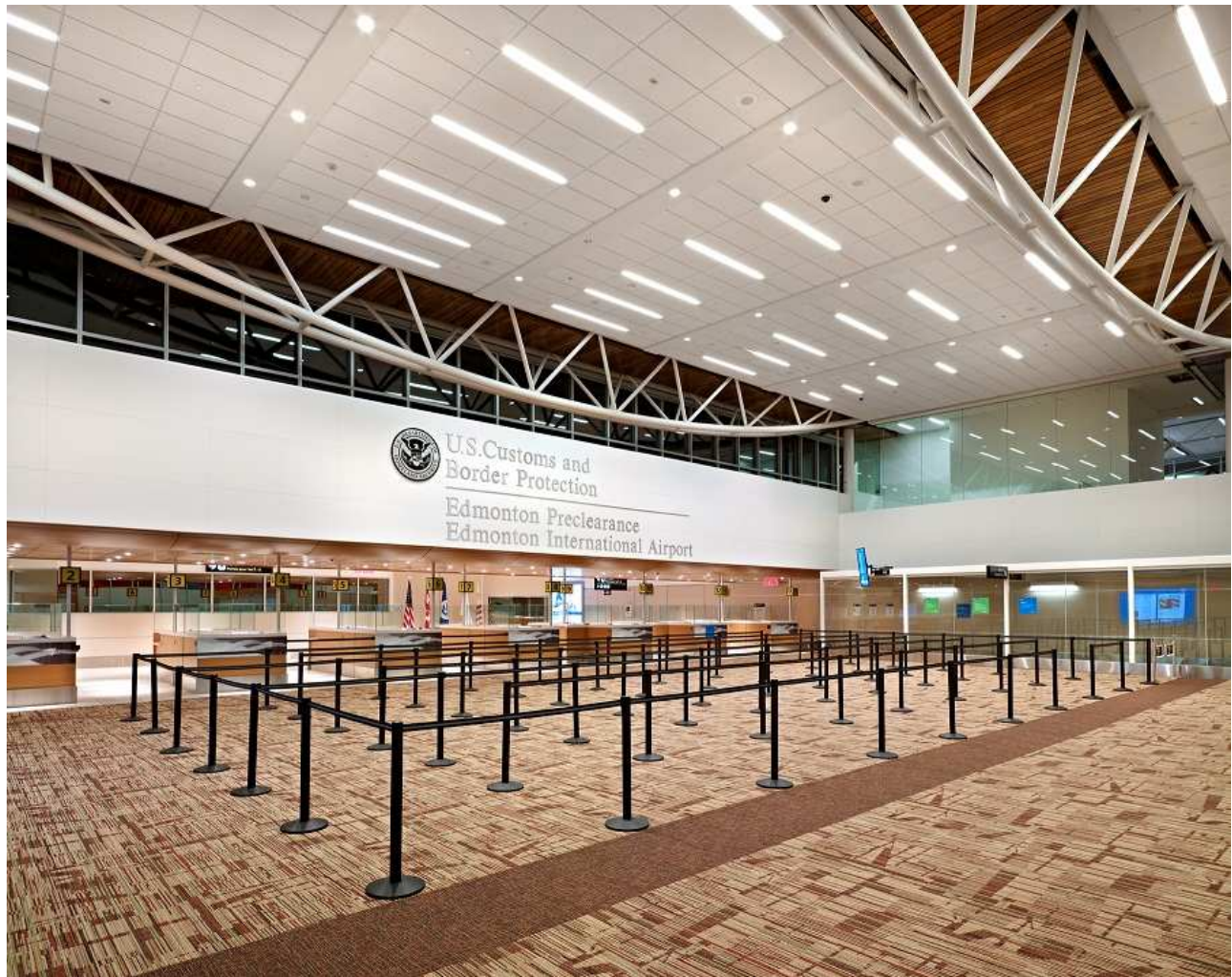
- The Life Cycle Inventory (LCI) of hazardous substances will be included, if the inventory is available.
- If the LCI for a hazardous substance is not available, the substance will appear as an input in the LCI of the product, if its mass represents more than 0.1% of the product composition.
- If the LCI of a hazardous substance is approximated by modeling another substance, documentation will be provided.

This EPD is in compliance with the cut-off criteria. No processes were neglected or excluded. Capital items for the production processes (machines, buildings, etc.) were not taken into consideration.

**Transportation**

Raw Material	Distance (mi)	Mode of Transportation
Fiberglass Core	< 350	Truck
Scrim	< 5,000	Ship & Truck
Coatings	< 1000	Truck

Relative shipping distances for the base raw materials are shown in Table 3 to the right. Final product is typically sold within the continental United States and transported by truck.





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## Period under Consideration

The data used refer to the production processes of the calendar year 2011. The quantities of raw materials, energies, auxiliary materials, and supplies used have been ascertained as average annual values. The LCA was created for the reference area “United States”.

## Background Data

For life cycle modeling the SimaPro v7.3 Software System for Life Cycle Engineering, a recognized LCA modeling software program, was used. All background data sets relevant for production and disposal were taken from this software.

## Data Quality

For the data used in this LCA, the data quality is considered to be “good to high” quality. The definition of this quality range stems from the following descriptions. The data and data sets cover all relevant process steps and technologies over the supply chain of the represented ceiling products. The LCIs are from the SimaPro v7.3 database and wherever secondary data is used, the study adopts critically reviewed data where ever possible for consistency, precision, and reproducibility to limit uncertainty. The data source is complete and representative of North America in terms of the geographic and technological coverage and is of a recent vintage, i.e. less than ten years old.

## Allocation

The LCI data was collected from the Plymouth, WI facility for the production year 2011. The Plymouth facility is the finishing facility that applies the scrim to the core for the Symphony® *f* product. The manufacturing process for all products made at these facilities has similar energy, waste, and water input requirements. Allocation was done on a mass basis. This manufacturing flow data was combined with resource extraction, processing, transportation, installation, use, and disposition data to construct the cradle-to-grave LCI for CertainTeed fiberglass ceiling panels.

## Notes on the Use Stage

The product is warranted for a service life of 1-10 years of use (and up to 15 if used in conjunction with CertainTeed Ceilings Suspension Systems), however, ceiling panels can last the full life of a building. The ceiling panel is mainly used for acoustics and aesthetics throughout its useful life. No direct maintenance or cleaning is required during the panel useful life. The useful life of these panels is considered to be 50 years.

## End-of-Life Scenario

The ceiling panel was modeled as being disposed of in a landfill.

## Assessment Results and Analysis

### Water and Waste

Water and waste for each of the Life Cycle Stages per Square Foot of Symphony *f* produced are reported in the table below (based on functional unit – Symphony *f* 1”x12”x12”).

	Production	Product Shipping	Installation and Use	End of Life	Total	Unit
<b>Water Use</b>	1.2	<0.1	<0.1	<0.1	1.3	liters/sf
<b>Non-hazardous Waste<sup>1</sup></b>	<0.1	<0.1	<0.1	0.3	0.4	lbs/sf

<sup>1</sup>No significant amount of additional waste types were generated during the Life Cycle of this product.





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**Primary Energy**

Tables and Figures below are based on functional unit – Symphony f (1"x12"x12").

	Unit	Production	Final Product Shipping	Installation & Use	End of Life	Total
<b>Total Energy Use</b>	MJ	10.2	0.5	0.5	0.2	11.4

Table 4: Total Primary Energy Use by Life Cycle Stage per Square Foot Produced

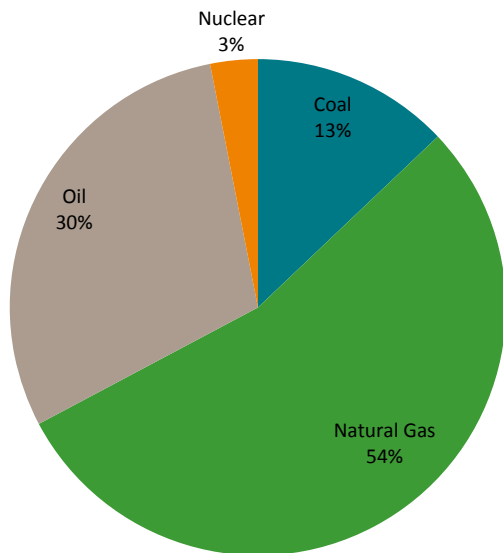
Type	Unit	Production	Product Shipping	Installation and Use	End of Life	Total
Coal	MJ	1.4	<0.1	<0.1	<0.1	1.4
Natural Gas	MJ	5.7	<0.1	0.3	<0.1	6.1
Oil	MJ	2.5	0.5	0.2	0.2	3.3
Nuclear	MJ	0.3	<0.1	<0.1	<0.1	0.3
<b>Total</b>	<b>MJ</b>	<b>9.9</b>	<b>0.5</b>	<b>0.5</b>	<b>0.2</b>	<b>11.2</b>

Table 5: Primary Non-renewable Energy of All Life Cycle Stages by Source per Square Foot Produced

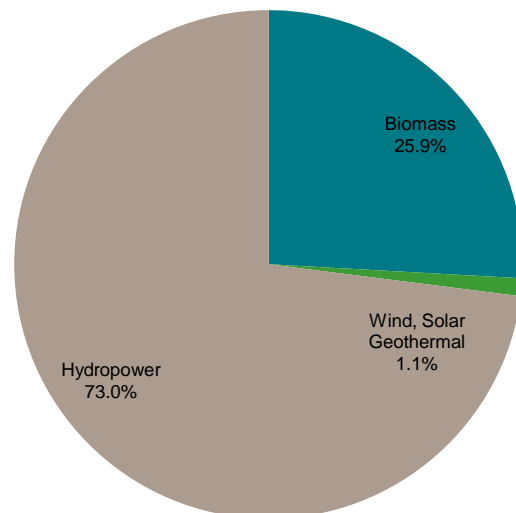
Type	Unit	Production	Product Shipping	Installation and Use	End of Life	Total
Hydropower	MJ	0.2	<0.1	<0.1	<0.1	0.2
Wind, Solar Geothermal	MJ	<0.1	<0.1	<0.1	<0.1	<0.1
Biomass	MJ	<0.1	<0.1	<0.1	<0.1	<0.1
<b>Total</b>	<b>MJ</b>	<b>0.3</b>	<b>&lt;0.1</b>	<b>&lt;0.1</b>	<b>&lt;0.1</b>	<b>0.3</b>

Table 6: Primary Renewable Energy of All Life Cycle Stages by Source per Square Foot Produced

Figure 7: Relative Primary Energy Use



Non- Renewable Energy Use



Renewable Energy Use





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**Life Cycle Impact Assessment**

The environmental impacts listed below were assessed throughout Symphony f’s lifecycle – including raw material extraction, transportation, manufacturing, packaging, use, and disposal at end-of-life.

ATMOSPHERE			WATER		EARTH	
<p><b>Global Warming Potential</b> refers to long-term changes in global weather patterns – including temperature and precipitation – that are caused by increased concentrations of greenhouse gases in the atmosphere.</p>	<p><b>Ozone Depletion Potential</b> is the destruction of the stratospheric ozone layer, which shields the earth from ultraviolet radiation that’s harmful to life, caused by human-made air pollution.</p>	<p><b>Photochemical Ozone Creation Potential</b> happens when sunlight reacts with hydrocarbons, nitrogen oxides, and volatile organic compounds, to produce a type of air pollution known as smog.</p>	<p><b>Acidification Potential</b> is the result of human-made emissions and refers to the decrease in pH and increase in acidity of oceans, lakes, rivers, and streams – a phenomenon that pollutes groundwater and harms aquatic life.</p>	<p><b>Eutrophication Potential</b> occurs when excessive nutrients cause increased algae growth in lakes, blocking the underwater penetration of sunlight needed to produce oxygen and resulting in the loss of aquatic life.</p>	<p><b>Depletion of Abiotic Resources (Elements)</b> refers to the reduction of available non-renewable resources, such as metals and gases, that are found on the periodic table of elements, due to human activity.</p>	<p><b>Depletion of Abiotic Resources (Fossil Fuels)</b> refers to the decreasing availability of non-renewable carbon-based compounds, such as oil and coal, due to human activity.</p>

Impact Assessment Method: TRACI 2 V4.00		
PCR Impact Category	Impact	Units
Global warming	0.58	kg CO2 eq
Acidification	0.38	mol H+ eq
Eutrophication	5.8E-04	kg N eq
Ozone depletion	2.4E-07	kg CFC-11 eq
Smog	0.06	kg O3 eq
Impact Assessment Method: CML 2 baseline 2000 V2.05		
PCR Impact Category	Impact	Units
Global warming (GWP100)	0.58	kg CO2 eq
Acidification	6.5E-03	kg SO2 eq
Eutrophication	5.9E-04	kg PO4 eq
Ozone layer depletion (ODP)	1.4E-07	kg CFC-11 eq
Photochemical oxidation	3.5E-04	kg C2H4

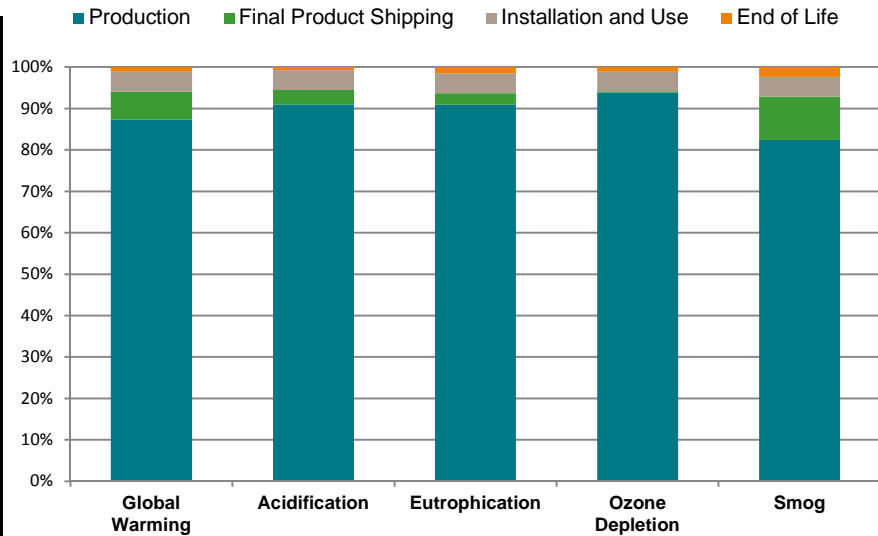


Figure 8: Relative Environmental Impact by Life Cycle Stage

**Interpretation**

**Production Process Impacts**

The majority of the environmental impacts occur during the extraction and processing of raw materials which is included in the Production stage. Fiberglass represents the highest percentage of impacts from raw materials.

**Installation Stage**

Installation has minimal impacts due to the modular nature of ceiling panels and minimal energy requirements for installation. Transport energy from the distribution center to jobsite is included in this stage. A 5% scrap rate was assumed for the installation of ceiling panels.





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## Use Stage

The assumption is that the ceiling panels require no cleaning or maintenance so use phase impacts are zero.

## End-of-Life Impacts

End-of-life impacts are a result of landfill disposition.

## Additional Information

### Biopersistence of Glass Fibers

Glass fiber has been classified as “not classifiable as to its carcinogenicity to humans” (Group 3) by the International Agency for Research on Cancer (IARC). Primary routes of exposure are inhalation, eyes, and skin. Follow installation instructions and MSDS to reduce any effects.

### VOC Emissions

This product meets the testing and product requirements of the California Department of Public Health CDPH/EHLB/Standard Method Version 1.1,2010 (Emissions Testing Method for CA Specification 01350). Independent test reports are available.

### LCA Development

This EPD and corresponding LCA were prepared by Sustainable Solutions Corporation of Royersford, Pennsylvania.



SustainableSolutions  
CORPORATION





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## References

PCR	Product Category Rules for Environmental Product Declarations – ceiling panels for suspended ceiling systems. Confirmed by IBU Advisory Board October, 2010
IBU 2006	Leitfaden Umwelt-Produktdeklarationen (Ausgabe 20.01.2006) für die Formulierung der produktgruppen-spezifischen Anforderungen der Umwelt-Produktdeklarationen (Typ III) für Bauprodukte, (Guideline for Setting Up the Product Category Requirements of AUB Declarations (Type III) for Construction Products) Institut Bauen und Umwelt e.V. <a href="http://www.bau-umwelt.com">www.bau-umwelt.com</a>
US LCI	LCI Database for Life Cycle Engineering, National Renewable Energy Laboratory, Lakewood, CO, 2008

## Standards and laws

ISO 14025	ISO 14025: 2007-10, Environmental Labelling and Declarations - Type III – Environmental Declarations - Principles and Procedures (ISO 14025:2006); German and English version
ISO 14040	ISO 14040:2006-10, Environmental management - Life cycle assessment - Principles and framework (ISO 14040:2006); German and English version EN ISO 14040:2006
ISO 14044	ISO 14044:200610, Environmental management - Life cycle assessment - requirements and guidelines (ISO 14044:2006); German and English version EN ISO 14044:2006
ASTM E1264	Classification for Acoustic Ceiling Products
ASTM E84	Test Method for Surface Burning Characteristics of Building Materials
ASTM E119	Fire Test of Building Construction and Materials
ISO 9001	ISO 9001:2008-12, Quality management systems - Requirements (ISO 9001:2008); Trilingual version EN ISO 9001:2008, Corrigendum to ISO 9001:2008-12; Trilingual version EN ISO 9001:2008/AC:2009
ASTM C636	"Std Practice for Installation of Metal Ceiling Suspension Systems for Acoustic Panel and Lay-in Panels"
ASTM C423	Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method
ASTM E1414	Test Method for Airborne Sound Attenuation Between Rooms Sharing a Common Ceiling Plenum
ISO 14001	ISO 14001:2009-11, Environmental management systems - Requirements with guidance for use (ISO 14001:2004 + Cor. 1:2009); German and English version EN ISO 14001:2004 + AC:2009
CA Specification 01350	California Dept. of Public Health CDPH/EHLB/Std Method Version 1.1, 2010 (Emission testing method for CA Specification 01350)

