

Solar Gard® Architectural Solar Control Window Films Frequently Asked Questions

Solar Gard® Architectural Solar Control Window Films: Environmental Product Declaration

1. What is an Environmental Product Declaration?

An Environmental Product Declaration, or “EPD”, is a complete assessment of all of the environmental impacts associated with creating and using a product, and includes the effects of resource use, manufacturing, useful life, and disposal of a product. The EPD is a formal report audited and verified by independent third-party experts, following International Standards Organization (ISO) procedures 14040 and 14025.

EPDs measure the following environmental impact categories: acidification, eutrophication, fossil fuel, global warming, ozone depletion and photochemical oxidation. For a sum-mary of the impact of Solar Gard solar control window films on each of these categories, please see Solar Gard’s Environmental Product Declaration overview at www.solargard.com.au/energy.

2. How is the environmental impact of a product measured in an EPD?

The data reported in an EPD is calculated by completing a Life Cycle Analysis (LCA) of a product. A Life Cycle Analysis is a methodical process that details all resource use and environmental impacts associated with each phase the life of a product, as shown in Figure 1. The phases include Raw Materials, which includes extracting resources from the Earth and refining them into raw materials. The Manufacturing phase then examines all steps associated with the product’s manufacturing process, product distribution, shipping, product use throughout its useful life, and the disposal of the product at the end of its useful life. It is quite literally an accounting of the entire life of the product. A diagram depicting the Life Cycle for Solar Gard’s architectural solar control window films is shown in Figure 1.

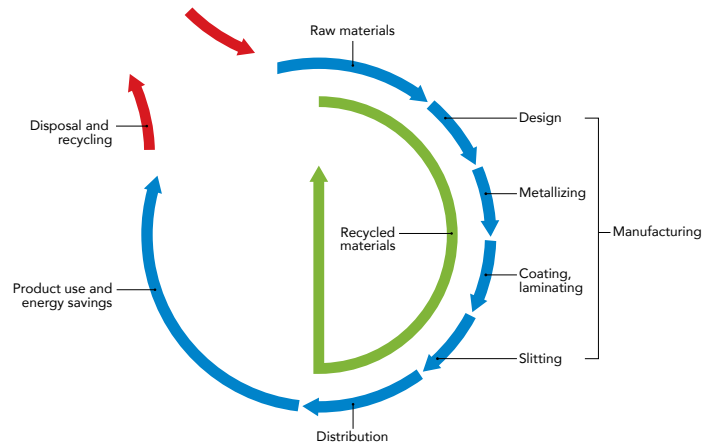


Figure 1 Life Cycle Analysis of Solar Gard Solar Control Window Films

3. What did your analysis cover?

Our analysis included a full cradle-to-grave Life Cycle Analysis (LCA) of Solar Gard architectural solar control window films. Solar Gard’s LCA consisted of raw materials and manufacturing operations, recycling, distribution of the product, product usage and energy savings, and finally, disposal at the end of the product’s useful life, which was estimated to be 15 years.

4. How does Solar Gard’s LCA differ from the life cycle for other manufacturers’ products?

Solar Gard’s LCA is specific to the raw materials, suppliers, manufacturing processes, distribution channels, and energy savings performance specific to Solar Gard architectural solar control window films. Solar Gard’s LCA should not be viewed as a proxy for other window film manufacturers’ life cycles since supply chain, manufacturing processes and product construction and performance vary by manufacturer.

Solar Gard’s EDP is the largest EPD undertaken to date, covering the largest use phase and taking into account a wide variety of commercial and residential buildings in diverse climates around the world.



5. What does the EPD say about Solar Gard architectural solar control window films?

The EPD concludes that Solar Gard architectural solar control window films produce a net positive impact in an overwhelming majority of countries where these films are sold. Installing these films also results in a net positive impact in acidification, eutrophication, fossil fuel, and photochemical oxidation in the overwhelming majority of geographical regions analyzed in the Solar Gard EPD.

The report also finds that Solar Gard architectural solar control window films produce a net reduction of greenhouse gas emissions. As a family of products, they have a negative carbon footprint. Solar Gard's EPD verified that Solar Gard architectural solar control window films prevent, on average, 1001 times more greenhouse gas emissions from entering the environment over their lifetime than are used and/or created during their manufacturing process.

6. What steps did Solar Gard take to achieve its EPD?

To date, Solar Gard has invested more than \$1M in its environmental programs to assess the company's carbon footprint, update environmental management systems, and measure/audit the environmental impact of its architectural solar control window films. To achieve its EPD, Solar Gard's dedicated, cross-functional task force spent more than one year collecting data and performing a cradle-to-grave life-cycle analysis (LCA) of the window films, following ISO 14040 and 14025 standards. Some of the data were collected internally; other data were extracted from SimaPro Life Cycle Analysis software, a widely used program to assist with life-cycle analysis. Then two independent third-party organizations, Alta Nova, LLC and Five Winds International, reviewed and audited the data. The resulting Environmental Product Declaration is registered with two registrars: [The Green Standard](#) in the US, and [The International EPD® System](#) in Europe.

7. Why did Solar Gard seek an Environmental Product Declaration?

Our motive for pursuing an EPD was simple: environmental responsibility is a core value at Solar Gard. We strive to do all we can to create a better environment. We believe



consumers have a right to know the real environmental performance of the products they purchase, and our research pointed us to the ISO 14000 standards and EPD as one of the most globally-recognized tools for reporting the environmental impact of our solar control window films to our partners and consumers. You can view our Environmental, Health and Safety Policy at www.solargard.com.au/energy and our organizational carbon footprint, which is registered with the [California Climate Action Registry](#).

8. What kind of buildings and what kind of glass were used in your models?

Hundreds of commercial and residential buildings across the globe were modeled using various industry and proprietary software programs. A 185 m² (2,000 square foot) home (where windows made up 10% of the walls) served as the residential model, and a ten story building with 6,500 m² (70,000 square feet) of glass and 25% glass coverage was the model for commercial buildings. Single pane glass was used for warmer climates, and double pane glass was selected for cooler climate analyses.

9. Does architectural solar control window film work better in some regions than others?

Yes, regional differences will impact carbon savings and other environmental impact categories. Two main regional differences determine window film's performances around the world. First, geography and climate differences dictate how much solar energy each region receives and therefore, how much air conditioning is used in commercial buildings. The second consideration is the predominant source of electricity for each region analyzed: some are cleaner (nuclear, hydroelectric) than others (coal). For the full summary of results for each category, see Solar Gard's Environmental Product Declaration overview at www.solargard.com.au/energy.

Solar Gard's EPD shows that Solar Gard solar control window film is carbon negative even in many colder climates. The combined factors of clean energy sources, cold climates, average amounts of sunlight and more efficient buildings impact the carbon emissions saved by installation of Solar Gard window film. With the exception of one film in France Sterling 20) for residential installation and all films in Canada for residential applications. Solar Gard architectural solar control window films are carbon negative worldwide.

10. How does the carbon footprint of installing architectural solar control window film compare to new windows?

According to the 2009 Buildings Energy Data Book, published by the U.S. Department of Energy, the carbon footprint of low-e windows with several different frame types is shown in Table 1. The most carbon intensive architectural solar control window film has a carbon footprint, or carbon cost, of about 1 kilogram per square meter. 1 square meter of a wood frame low-e window, the type with the smallest carbon footprint, has a carbon cost of 253 kilograms per square meter.

11. Does the cost of the film factor into the EPD calculations?

There is no economic analysis included in an EPD as its purpose is to solely examine the environmental impact of a product. However, building managers and homeowners looking to conserve energy may want to conduct a carbon-cost benefit analysis as shown in Table 1.

Table 1

Window film or window frame type	Carbon footprint of 1 square meter, installed (kg)	Approximate cost of 1 square meter, installed (in AUD)*
Window Film	0.998	\$60 to \$150
Aluminium	348	\$370
PVX-clad wood	303	\$550
Wood	253	\$550
Vinyl (PVC)	402	\$600
Curtainwall viewable glazing	301	\$750

Carbon-cost benefit analysis of window film compared with various types of window frames

* These are Solar Gard estimates based on data obtained from retail installers in Southern California in US\$ and converted to GBP.

12. Which Solar Gard window films were included in the analysis?

Following films included in the analysis are available in the United Kingdom:

Bronze Silver 15
Bronze Silver 20
Bronze Silver Bronze 10
Grey Silver 15
Grey Silver Grey 10
LX 70
Quantum® Silver Quantum 10
Quantum® Silver Quantum 20
Silver 20
Silver 35
Silver 50
Silver AG 25 Low-e
Slate 10
Slate 20
Slate 30
Slate 40
Slate 50
Solar Bronze 20
Solar Bronze 35
Solar Bronze 50
Stainless Steel 10
Stainless Steel 20
Stainless Steel 30
Stainless Steel 35
Stainless Steel 50
Sterling 20
Sterling 40
Sterling 50
Sterling 60
Sterling 70

13. What about other films not included in your EPD?

Solar Gard has released additional films after the EPD analysis timeframe. Thorough scrutiny of the construction and solar performance of these films shows they are also carbon negative.

These additional films include:

Sentinel™ Silver 20
Sentinel™ Silver 35
Sentinel™ Solar Bronze 20
Sentinel™ Solar Bronze 30
Sentinel™ Solar Bronze 40
Sentinel™ Stainless Steel 15
Sentinel™ Stainless Steel 25
Sentinel™ Stainless Steel 40
Sentinel™ Stainless Steel 45
TrueVue™ 5
TrueVue™ 15
TrueVue™ 30
TrueVue™ 40

Note: films are carbon negative worldwide, except in Canada for residential applications. Sterling 20 is not carbon negative in France for residential applications.



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