



Graffiti Shield Window Films contributions to a facility seeking LEED Certification.

This is a 3rd party opinion which was prepared following dialog with representatives of Graffiti Shield Window Films and a further review of their publicly available materials information and test data.

Initially when we review the aspirations of the LEED Ratings systems we find several aspects that parallel or perhaps one could say are supported by the goals of Graffiti Shield Window Films.

“The LEED rating systems aim to promote a transformation of the construction industry through strategies designed to achieve seven goals:

- To reverse contribution to global **climate change**
- To enhance individual **human health** and well-being
- To protect and restore **water resources**
- To protect, enhance, and restore **biodiversity** and ecosystem services
- To promote sustainable and regenerative **material resources** cycles
- To build a **greener economy**
- To enhance social equity, environmental justice, **community** health, and quality of life”¹

Graffiti Shield Window Films contribute to ...

- reversing the contribution to global **climate change** in buildings using their films by reducing the embodied energy in glazing products that would be otherwise required to be replaced as a result of vandalism.
- Enhancing individual **human health** and well-being in buildings using their films by rejecting 99.9% of the sun’s ultraviolet rays, providing glare reduction and reducing exterior sound transmission to the interior of the building.
- Promoting sustainable and regenerative **material resources** cycles via their dedicated use of recycled and renewable resources.
- building a **greener economy** via their Corporate Sustainability practices.

As you view this terse evaluation and opinion, I must first state that I firmly believe in the benefits of sacrificial vandalism and graffiti barrier products and their positive contributions to facility resilience and embodied energy conservation when properly used.

When we consider the applicability and contributions that Graffiti Shield Window Films could potentially add to a facility being designed, constructed or updated to pursue LEED Certification those considerations are many. Primarily this paper will reference a LEED Credit Category and then make any reference to applicability of Graffiti Shield Window Films contribution to the attainment of credits within that Credit Category.

We must remember that products cannot be LEED Certified and can only contribute to successful certification efforts when the facilities construction and application conditions are favorable to their application.

¹ LEED Reference Guide for EB O+M v4; LEED Reference Guide for BD+C v4.
<http://www.graffiti-shield.com/products/glass-shield>.

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Location and Transportation (LT)²

Rewards thoughtful decisions about building location, with credits that encourage compact development, alternative transportation, and connection with amenities, such as restaurants and parks.

LEED Location and Transportation Credit Category

Graffiti Shield window films could provide a positive contribution to the vandalism resistance of the vehicles used yet this benefit has no way to quantify within the current structure of the various LEED Rating Systems



Sustainable Sites (SS)³

Select appropriate sites to develop and addresses environmental concerns related to building landscape, hardscape and exterior building issues.

LEED Sustainable Sites Credit Category

Graffiti Shield window films seem to be inert in their contribution towards the Heat Island Reduction and Light Pollution Reduction Credits within both the LEED v4 for New Construction and Major Renovation and the LEED v4 for Operations & Maintenance: Existing Buildings rating systems. The reduction of ultraviolet (UV) energy intrusion however can be accomplished via the installation of a suitable Graffiti Shield window films, this characteristic is more suited for the Energy and Atmosphere Category. The major benefit that will be seen with the use of Graffiti Shield window films is the exterior maintenance and management aspects and resiliency to damage, vandalism and graffiti. These benefits can be referenced as contributors for Innovation in Design or Operations Credits.



Water Efficiency (WE)⁴

Maximize water efficiency and reduce the burden on water supply and waste water systems.

LEED Water Efficiency Credit Category (continued)

When considering Water Efficiency initially there would seem to be no correlation between water consumption and Graffiti Shield window films yet the determining factor would be if water is used for the cooling systems of a facility.

We know that Graffiti Shield window films reduce the external Ultraviolet Energy load transmitted through the glazing system thus reducing the overall energy required to cool or heat a building. Many factors will additionally affect the quantity of water consumed within a

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building's HVAC system's cooling towers yet the application of Graffiti Shield window films should provide a measureable differential and a reduction in required resources as compared to the equivalent building without some energy reduction technology utilized.

The theoretically or proposed water reductions are very difficult to quantify yet certainly when benchmarking an existing building before and after field measurements can be utilized to determine the contributions that process water use reduction can make to the attainment of the overall water reduction goals.



Energy and Atmosphere (EA)⁵

Conserve energy, control refrigerant use reduce ozone and explore renewable energy sources

LEED Energy and Atmosphere Credit Category

Graffiti Shield window film was not designed as an energy efficiency product however it does assist with the embodied energy of a building by increasing service life of the glazing system and providing a resiliency benefit.

Graffiti Shield window films will provide 99% UV A+B reductions in Ultraviolet Energy intrusion into the building and will consequentially reduce the cooling demand in a hot climate yet this quantity would not be typically evaluated by the building's energy modeling to assess the mild benefits in specific applications. Many factors will additionally affect the quantity of energy consumed within a building's HVAC system's components yet the application of Graffiti Shield window films will provide a differential and a reduction in required resources as compared to the equivalent building without some energy reduction technology utilized. The theoretically or proposed energy use reductions are very difficult to quantify yet certainly when benchmarking an existing building before and after field measurements can be utilized to determine the contributions that an energy reduction component can contribute to the attainment of the overall energy use reduction goals.

The resiliency aspect that Graffiti Shield window films provides as well as the other combined positive attributes may align better with Innovation Credits since Graffiti Shield window film can positively contribute in a manner not addressed within the LEED Rating Systems. The window replacements costs versus the capital expenditure benefit via the application of Graffiti Shield window film to an existing window assembly is substantially favoring the film with a cost of approximately one tenth as compared to replacements.

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Material Resources (MR)⁶

Reduce construction waste, use materials with high-recycled content and consider local materials to minimize transportation costs and positively influence local economies.

LEED Material Resources Credit Category

Graffiti Shield window films provide a positive contribution to reducing the desire or necessity to replace perfectly good glazing(s) that are at risk of vandalism and in some cases windows that have been vandalized can be restored by the application of Graffiti Shield window film, saving substantial capital resources and ... importantly... keeping these glazing(s) from impacting landfill contributions! Within this category Graffiti Shield Window Films Abatement Solutions Products may contribute to the attainment of MR Building life-cycle impact reduction.

The film's ability to reject over 99% of UV A+B Rays inherently protects interiors from Ultraviolet damage and premature aging thus increasing the usable life of interior products and finishes. When considering materials and resources credits in new buildings certainly a very efficient material is desired, yet Graffiti Shield window films have a large quantity of recycled and recyclable content within their films which could contribute to gaining that credit in a newly constructed building.

Within Existing Building Purchasing and Maintenance and Renovation policies, exists the opportunity to add products such as Graffiti Shield window films with their substantial benefits and further contributions to waste management policies when considering the ability for the product to be recycled at the end of its exceedingly long service life as compared to other glazing resiliency options.

Graffiti Shield Abatement Solutions Products are manufactured in Anaheim, California 92806. New Construction projects within a 100 mile and 250 mile radius of this location can use this information to document their MR Credit Building product disclosure and optimization – sourcing of raw materials, Option 2 as they contain a minimum of 35% recycled content; as well as contribution to MR Credit Building product disclosure and optimization – material ingredients, Option 3. Product Manufacturer Supply Chain Optimization



Interior Environmental Quality (IEQ)⁷

Improve IEQ parameters that contribute to the comfort and well-being of the building's occupants by improving the enhancing indoor air quality, reducing indoor pollution and providing a connection to the outside.

LEED Interior Environmental Quality Credit Category

When we consider indoor environmental quality and the factors that affect systems performance, comfort, acoustics and air quality Graffiti Shield window films can enhance those indoor interior

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(continued) environmental quality strategies.

Graffiti Shield window film will assist thermal decoupling properties for enhanced thermal comfort reducing ultraviolet light transmission thru the windows; the film can as well potentially contribute to daylighting strategies via off axis glare reduction thus increase occupant comfort the quality of life.

LEED v4 Acoustic Performance has now become a credit earning consideration, application of Graffiti Shield window films will inevitably contribute positively in this regard due to its sound dampening qualities that become obvious during the field measurements during acoustic STC performance testing when pursuing the respective credits.



Innovation (ID-EP-IO)⁸

Provide design teams and projects the opportunity to be awarded points for exceptional performance above the requirements set by the LEED Green Building Rating System and/or innovative performance in green building categories not specifically addressed by LEED.

LEED Innovation (ID-EP-IO) Credit Category

Facilities that utilize Graffiti Shield window films should pursue an Innovation Credit for the positive contributions the use of this product will always have.

- In an existing building drastically increasing the building's envelope resiliency by its application.
- Bird collision reduction as an unobtrusive to occupant strategy
- Increasing the occupants comfort via acoustic performance
- Operational cost benefit scenario strategy

In order to qualify for an Innovation Credit we have to achieve a significant measurable environmental performance using a strategy not addressed with in the respective LEED Green Building rating system. Further to be successful one has to “identify the following:

- the intent of the proposed innovation credit;
- proposed requirements for compliance;
- proposed submittals to demonstrate compliance; and
- the design approach or strategies used to meet the requirements.”

Innovation in Design, Innovation in Operations, LEED Accredited Professional



To support and encourage the design integration required by LEED to streamline the application and certification process.

Graffiti Shield window films cannot affect this Credit's attainment.

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Regional Priority⁹

To provide an incentive for the achievement of credits that address geographically specific environmental priorities.

LEED Regional Priority Credit Category

Regional Priority Credits are specific place based solutions that strategically address some environmental issues particular to a specific locale. These credits provide additional acknowledgement to project teams that work hard to address these issues of specific priority for each of 'six' identified regional priority credits available for every location and respective rating system.

The issues could be naturally occurring or manmade or affect environmental concerns which we have a concern for. Most areas within the Americas struggle with energy independence and resiliency. Graffiti Shield window films will provide a positive resiliency contribution and may assist with Regional Priority Credit threshold attainment.

One could make outrageous claims that a specific product automatically gets an applicant LEED Points towards LEED Certification yet any claim of the sort is simply not true and not applicable to every project seeking LEED Certification. LEED Certification is a complex process where many factors are evaluated and contribute to the success of a project seeking certification. The purpose of this assessment is to provide the reader with a terse assessment of the LEED Credit Categories that can be positively affected via the installation of Graffiti Shield window films.

Graffiti Shield Incorporated was founded to address the need to provide a sustainable material, resource and operational expense saving technologies which would protect a variety of building and material surfaces from the effects of vandalism and graffiti.

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